How Prepared are UK Medical Graduates for Practice?

Final report from a programme of research commissioned by the General Medical Council

Main Research Team:

Dr Lynn Monrouxe (PI: Cardiff University)
Prof Alison Bullock (Cardiff University)
Dr Judith Cole (RA: Queen's University Belfast)
Dr Gerard Gormley (Lead: Queen's University Belfast)
Dr Kathrin Kaufhold (RA: Cardiff University)
Dr Narcie Kelly (RA: University of Exeter)
Dr Karen Mattick (Lead: University of Exeter)
Prof Charlotte Rees (Lead: University of Dundee)
Dr Grit Scheffler (RA: University of Dundee)

Associate Researchers:

Mr Christopher Jefferies (Cardiff University)
Ms Camille Kostov (Cardiff University)

Additional Rapid Review Team (Cardiff University):

Ms Mala Mann (Rapid Review Consultant)
Ms Lisa-Jayne Grundy (Research Assistant)
Ms Zoe John (Research Assistant)
Ms Eleni Panagoulas (Research Assistant)

Rapid Review *PROSPERO Registered: CRD42013005305*

Correspondence to: Dr Lynn Monrouxe: monrouxelv@cardiff.ac.uk

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Abstract

This programme of research aimed to understand the extent to which current UK medical graduates are prepared for practice. Commissioned by the General Medical Council, we conducted: (1) A Rapid Review of the literature between 2009 and 2013; (2) narrative interviews with a range of stakeholders; and (3) longitudinal audio-diaries with Foundation Year 1 doctors.

The Rapid Review (RR) resulted in data from 81 manuscripts being extracted and mapped against a coding framework (including outcomes from Tomorrow's Doctors (2009) (TD09)). A narrative synthesis of the data was undertaken. Narrative interviews were conducted with 185 participants from 8 stakeholder groups: F1 trainees, newly registered trainee doctors, clinical educators, undergraduate and postgraduate deans and foundation programme directors, other healthcare professionals, employers, policy and government and patient and public representatives. Longitudinal audio-diaries were recorded by 26 F1 trainees over 4 months. The data were analysed thematically and mapped against TD09. Together these data shed light onto how *preparedness for practice* is conceptualised, measured, how prepared UK medical graduates are for practice, the effectiveness of transition interventions and the currently debated issue of bringing full registration forward to align with medical students' graduation.

Preparedness for practice was conceptualised as both a long- and short-term venture that included personal readiness as well as knowledge, skills and attitudes. It has mainly been researched using self-report measures of generalised incidents that have been shown to be problematic. In terms of transition interventions: assistantships were found to be valuable and efficacious for proactive students as team members, shadowing is effective when undertaken close to employment/setting of F1 post and induction is generally effective but of inconsistent quality. The August transition was highlighted in our interview and audio-diary data where F1s felt unprepared, particularly for the step-change in responsibility, workload, degree of multitasking and understanding where to go for help. Evidence of preparedness for specific tasks, skills and knowledge was contradictory: trainees are well prepared for some practical procedures but not others, reasonably well prepared for history taking and full physical examinations, but mostly unprepared for adopting an holistic understanding of the patient, involving patients in their care, safe and legal prescribing, diagnosing and managing complex clinical conditions and providing immediate care in medical emergencies.

Evidence for preparedness for interactional and interpersonal aspects of practice was inconsistent with some studies in the RR suggesting graduates were prepared for team working and communicating with colleagues and patients, but other studies contradicting this. Interview and audio-diary data highlights concerns around F1s preparedness for communicating with angry or upset patients and relatives, breaking bad news, communicating with the wider team (including interprofessionally) and handover communication. There was some evidence in the RR to suggest that graduates were unprepared for dealing with error and safety incidents and lack an understanding of how the clinical environment works. Interview and audio-diary data backs this up, adding that F1s are also unprepared for understanding financial aspects of healthcare. In terms of being personally prepared, RR, interview and audio diary evidence is mixed around graduates' preparedness for identifying their own limitations, but all data points to graduates' difficulties in the domain of time management. In terms of personal and situational demographic factors, the RR found that gender did not typically predict perceptions of preparedness, but graduates from more recent cohorts, graduate entry students, graduates from problem based learning courses, UK educated graduates and graduates with an integrated degree reported feeling better prepared.

The longitudinal audio-diaries provided insights into the preparedness journey for F1s. There seems to be a general development in the direction of trainees feeling more confident and competent as they gain more experience. However, these developments were not necessarily linear as challenging circumstances (e.g. new specialty, new colleagues, lack of staffing) sometimes made them feel unprepared for situations where they had previously indicated preparedness.

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1.0. Executive Summary

Introduction

1. To address the current gaps in the literature, and to explore the current state of play in terms of preparedness research since the publication of *Tomorrow's Doctors* (2009) (TD09), the GMC commissioned this multi-school and multi-method study to answer the following overarching research question: "How prepared are UK medical graduates for practice?"

2. The three phases of the study comprise an initial rapid review of the literature (Phase 1), a narrative interview study with multiple stakeholders (Phase 2) and a longitudinal audio-diary study with Foundation Year 1 (F1) doctors (Phase 3).

Phase 1: Rapid Review

3. Several quantitative and qualitative studies have been conducted over the last decade or so, including some across multiple settings, and these have indicated key areas of unpreparedness for practice e.g. prescribing, complex clinical procedures, dealing with challenging patients and applying knowledge of the NHS. While helpful, they provide a partial pre-TD09 picture. Neither of these types of studies adequately gets under the skin of what preparedness for practice actually means, adopting a short-term view and typically employ self-reports based on general questions which, along with other problems, conflates confidence with competence.

Rapid Review: Aims and Research Questions

4. Aim: rapid review (using a systematic review process) on preparedness for practice (pre- and post-TD09) to determine the extent to which UK graduates are prepared for practice and whether there is evidence for change in preparedness since the publication of TD09.

5. Research questions:

    a. RQ1: How has preparedness for practice been researched?

    b. RQ2: How effective are final year undergraduate to Foundation Year 1 (F1) transition interventions?

    c. RQ3: How prepared are graduates for specific tasks, skills and knowledge?

    d. RQ4: How prepared are medical graduates for interactional and interpersonal aspects of practice?

    e. RQ5: How prepared are medical graduates for systemic and technological aspects of practice?

    f. RQ6: How personally prepared are medical graduates for practice?

    g. RQ7: Do personal demographic factors contribute to the variance in preparedness?

    h. RQ8: Do situational demographic factors contribute to the variance in preparedness?

Rapid Review: Methodology

6. Using a Rapid Review methodology we searched numerous databases for manuscripts: (1) published 2009 on; (2) in English; (3) all study types; (4) all participant groups (medical students, trainees, clinical teachers, patients, NHS employers); and (5) any outcome measure.

7. 3762 manuscripts were narrowed to 81 by removing duplicates, letters, earlier dates, refining for inclusion/ exclusion criteria and quality assessment.

8. Data were extracted using a coding framework (855 codes) on Atlas-Ti developed by the research team. Codes were cross-checked against TD09 outcomes.

Rapid Review: Results

RQ1: How has preparedness for practice been researched?

9. The concept of preparedness is typically glossed over and/or conflated with other terms in the literature (e.g. readiness). Preparedness is mostly conceptualised as something possessed by the individual and his/her knowledge and skills rather than having a contextual dimension.

10. Most studies conceptualise preparedness as preparedness for the short-term final-year/F1 transition period between.

11. Studies typically explore preparedness through self-report questionnaires and interviews with trainees. Few triangulate data using multiple participant groups or multiple methods.

RQ2: How effective are final year undergraduate to Foundation Year 1 (F1) transitional interventions?

12. Three key transition interventions are outlined in the literature: Final-year undergraduate assistantships, shadowing and F1 induction.

13. Currently no evidence about effectiveness of assistantships.

14. Shadowing is typically effective, although findings are variable as to the most efficacious method.

15. Induction can be effective, although variation in the type of induction programmes offered (e.g. hospital/ward inductions etc.).

RQ3: How prepared are graduates for specific tasks, skills and knowledge?

16. 11 out of 32 TD09 (and an additional 11) practical procedures are cited across 12 studies with contradictory evidence of preparedness (some say prepared others not).

17. Evidence suggests that trainees are:

    a. Prepared for venepuncture;

    b. Unprepared for wound suturing, central venous line insertion, and chest drain insertion (these are specialised procedures, but some F1s are asked to do them).

18. Thirty-one studies inform us of specific skills and knowledge. Studies suggest that trainees are:

     a. Reasonably well-prepared for history-taking and full physical examinations;

     b. Mostly unprepared for prescribing safely and legally, clinical reasoning and making diagnoses and the early management of patients with emergency conditions.

19. Most of the data suggesting graduates are prepared comprise a limited range of studies using generalized acontextual self-report methods.

20. Most of the data suggesting graduates are unprepared come from a broader range of studies using a greater variation of research methods.

RQ4: How prepared are medical graduates for interactional and interpersonal aspects of practice?

21. Fourteen studies deal with graduates' preparedness for interactional and interpersonal aspects of practice providing contradictory evidence around graduates preparedness for team-working, and communication with colleagues and patients.

RQ5: How prepared are medical graduates for systemic and technological aspects of practice?

22. Sixteen studies examine preparedness for systemic or technological aspects of practice providing some evidence suggests graduates are unprepared for dealing with error and safety incidents and lack understanding of how the clinical environment works.

RQ6: How personally prepared are medical graduates for practice?

23. Twelve studies inform us of graduates' personal preparedness. Graduates are:

     a. Prepared to identify own limitations (some evidence);

     b. Unprepared for time management;

     c. Somewhat prepared for identifying own learning needs, reflective practice and ethical and legal aspects of practice (contradictory evidence).

RQ7: Do personal demographic factors contribute to the variance in preparedness?

24. Two self-report studies inform us of personal demographic factors and preparedness. Studies suggest:

     a. Ethnicity and personality traits are related to student perceptions of preparedness (some evidence);

     b. Gender does not predict perceptions of preparedness (some evidence).

RQ8: Do situational demographic factors contribute to the variance in preparedness?

25. Ten studies inform this research question (mainly self report) indicating that some graduates feel better prepared than others:

    a. Graduates from more recent cohorts;

    b. Graduate-entry students;

    c. Graduates from problem-based learning courses;

    d. UK-educated graduates;

    e. Graduates with an intercalated degree.

Rapid Review: Discussion

26. This rapid review of the literature on preparedness for practice contributes to that same literature by synthesizing it and identifying patterns of similarity and difference across the higher quality published studies.

27. Recommendations for research methodology around preparedness for practice:

    a. Adopt a more rigorous approach to developing a body of research that considers the issue of methodological consistency enabling small-scale research efforts to be combined to provide transferable knowledge;

    b. More multi-site and longitudinal research to understand the *process* of preparedness;

    c. Include multiple stakeholder perspectives;

    d. Include a range of research methods for triangulation.

28. Recommendations for research focus around preparedness for practice:

    a. Different models of assistantship, and the effectiveness of these models, given that medical schools are now adopting this it as standard at the end of their curricula;

    b. Trainees' communication within multi-professional teams and particularly within the context of handover;

    c. Trainees working in end of life care (including breaking bad news);

    d. Trainees dealing with difficult or violent people;

    e. Trainees' dealing with error and safety incidents and understanding the clinical environment;

    f. Trainees' management of their own health (including stress) and dealing with problems in the performance, conduct and health of colleagues.

Phases 2 & 3: Introduction

29. The research design for the interviews (Phase 2) and the longitudinal audio-diary study (Phase 3) was informed by:

    a. The rapid review (Phase 1);

    b. Current key topics within healthcare;

    c. Conversations with the study funders (GMC).

30. Interviews across a range of stakeholders allows for consideration of UK graduates' preparedness for practice from a variety of perspectives.

31. Audio diaries provide insights into the development of newly qualified doctors in their Foundation Year 1 (F1) posts over a period of 4 months and at least one transition into a new specialty.

Phases 2 & 3: Aims and Research Questions

32. The aims of the interviews are to:

    a. Explore issues around preparedness for practice in terms of how the concept is understood across a range of stakeholder groups;

    b. To shed light on areas of preparedness for practice that are relatively under researched;

    c. To understand further aspects in which medical graduates feel prepared or not.

33. The aim of the audio-diaries is to explore in depth the lived experiences of preparedness and unpreparedness of a subset of F1 doctor participants, in real time as they were happening.

34. The research questions examined are:

    a. RQ1: How do stakeholders conceptualise 'preparedness for practice'?

    b. RQ2: How effective are undergraduate Year 5 – F1 transition interventions?

    c. RQ3: To what extent do recent graduates perceive themselves to be prepared for practice and how does this compare with the views of other stakeholders?

    d. RQ4: How does preparedness for practice on graduation affect the experiences of F1 doctors over time and during later F1 transitions?

    e. RQ5: What are stakeholders' views about the proposition of bringing forward the time of full registration to graduation?

Phases 2 & 3: Methodology

35. Interviews took place across the UK and sampling was purposeful, being designed to ensure good coverage across stakeholder groups. An additional longitudinal solicited audio diary method (Monrouxe 2009) drew on a sub-sample of F1 interview participants.

36. Following ethical approval, 185 individuals from 8 stakeholder groups were recruited from all 4 study sites:

    a. F1 trainees (n=34);

    b. Fully Registered Trainee Doctors (FRTD: n=33);

    c.   Clinical Educators (CE: n=32);

    d.   Deans (undergraduate and postgraduate) and Foundation Programme Directors (D_FP: n=30);

    e.   Other Healthcare Professionals (HCP: n=13);

    f.   Employers (EMP: n=7);

    g.   Policy and Government Representatives (P_GVT: n=11);

    h.   Patient and Public Representatives (PPR: n=25).

37.   Twenty-four group and 58 individual interviews were analysed (61hrs and 6mins) comprising 23 F1s, 28 FRTDs, 20 CEs, 23 D_FPs, 11 HCPs, 7 EMP, 9 P_GVT; and 18 PPRs (n=139 total, a representative sample of the full 185 participants).

38.   All data from the 26 F1s who recorded audio diaries of their experiences were analysed.

39.   The audio data were transcribed and managed using Atlas-ti. A thematic Framework Analysis method (Ritchie & Spencer, 1994) developed by the research team based on

    a.   The codes from Study 1;

    b.   Initial group readings of the data itself;

    c.   The TD09 outcomes document.

40.   The unit of analysis in the first instance was the narrative (i.e. the entire story of an event that was told from the point of introducing the story though the description of actions and evaluation of actions until the focus of talk shifted to another event).

41.   All narratives were coded according to the specific theme/sub-theme they addressed in the coding framework and the level of preparedness that was narrated.

42.   We classified each narrative as 'prepared', 'unprepared' and 'unspecified'. We also coded each narrative for additional information such as facilitating and inhibiting factors. We identified n=1,729 narratives:

    a.   23.7% (n=409) prepared;

    b.   32.0% (n=553) unprepared;

    c.   44.4% (n=767) unspecified.

Phases 2 & 3: Results

RQ1: How do stakeholders conceptualise 'preparedness for practice'?

43.   Interviewees found it initially hard to conceptualise the term "preparedness for practice".

44. Their conceptualisations of preparedness have temporal aspects (long term, short term) and constituent aspects (knowledge, skill, behaviour). Additional aspects include professionalism as well as psychological and emotional dimensions.

RQ2: How effective are final year undergraduate to F1 transition interventions?

45. Transition interventions, especially assistantships and shadowing, were widely discussed, mostly by F1 participants.

    a. Assistantship quality was variable and affected by multiple factors, including: personal characteristics of the student (e.g. confidence), interpersonal factors (e.g. team leadership), and cultural or systemic factors (e.g. knowing protocols);

    b. Shadowing alone did not guarantee the facilitation of graduates' preparedness: personal characteristics (e.g. highly proactive); interpersonal factors (e.g. being an integral team member) and logistics (e.g. site and timing) maximised benefit;

    c. Induction was infrequently discussed, but F1s reported it was often superficial and brief, although some felt it had been valuable.

46. All participant groups discussed the August transition with most narratives being coded 'unprepared'. Some F1 participants cited the 'all change' on the same day in August as their biggest concern regarding patient safety.

47. F1 doctors' feelings of preparedness were facilitated by:

    a. Familiarity with the specific working environment;

    b. Confidence in their training.

48. F1 doctors reported feeling stressed and unprepared for the step change in responsibility, the workload, the degree of multitasking, deciding who and when to ask for help, understanding how the hospital works (which varied by hospital) and dealing with underperformance of other team members.

49. The PPR group's perceptions tended to originate from the popular press and were unambiguously negative.

RQ3: To what extent do recent graduates perceive themselves to be prepared for practice and how does this compare with the views of other stakeholders (e.g. employers)?

Doctor as Scholar and Scientist

50. With the general focus of participants' narratives on F1s' practicing as doctors, there was little data coded to this theme. The main points were (as identified by F1s, with additional stakeholder group in brackets):

    a. Translating knowledge into clinical practice was challenging for F1s;

    b. Understanding human structure, function and pathological mechanisms provided confidence for decision-making;

c. Trainees were generally poorly prepared to look beyond the biomedical aspects of a patient's condition (F1s, CEs and PPRs).

Doctor as Practitioner

Doctor as Practitioner: Patient Consultation

51. A relatively equal number of preparedness and unpreparedness narratives were identified around patient consultations, with most of the data coming from F1s (none from CEs).

52. History taking and full physical examination: Graduates were confident speaking to patients, summarising histories and examination findings, and communicating these to senior staff, but less prepared for the high number of patients to examine (no data from CEs or P_GVTs).

53. Assessing a patient's capacity for decision-making: Widely discussed across participant groups this was reportedly well covered at medical school but easier in theory than in clinical practice:

   a. F1s highlighted their uncertainty about the degree of patient understanding and of the impact of their decisions;

   b. F1s felt full responsibility for assessing patient capacity, but FRTDs and CEs framed this as a wider-team decision;

   c. While some CEs felt that assessing capacity was within the scope of a junior doctor, other CEs and P_GVTs felt that it could be a difficult issue even for senior clinicians;

   d. The P_GVT group focused mainly on the legal complexities around assessing capacity (also mentioned by CE and PPR participants);

   e. Some F1s felt there were situations in which assessing patient capacity was 'not required'.

54. Involving patients in their own care: Only the PPRs talked about involving patients in their own care expressing a desire to be more involved and be acknowledged for the important role they play but offered no narratives around trainees preparedness for this.

Doctor as Practitioner: Diagnosing and managing clinical conditions

55. The majority of data around diagnosing and managing clinical conditions comes from F1s who provided a relatively equal number of preparedness and unpreparedness narratives. CEs, D_FPs, HCPs and EMPs also contributed, providing more narratives of unprepared situations than prepared ones.

56. F1s felt well prepared for simple diagnosis and treatment planning.

57. In emergency situations, F1s often struggled to gather the relevant information and to prioritise activities.

58. Preparedness was facilitated by F1s' confidence in their own abilities, supportive relationships with supervisors, 'fire drills' (e.g, 'ABCDE' approach) and prior experience.

59. Clinical decisions were made as part of a wider multi-professional team and F1s talked about knowing when to discuss and escalate decisions.

60. The HCP group talked about F1s needing to act upon investigation results rather than just documenting findings in patients' notes. F1 narratives contradicted this statement.

61. F1s felt unprepared for complex cases (e.g. confused patients, co-morbidity), often feeling uncertain. Some participants reported being better prepared for making diagnoses than the patient management.

62. F1s rarely talked about involving the patients' family or carers in discussions about diagnosis and management. Their narratives focused on clinical aspects. Similarly, the CEs felt F1 doctors didn't collect sufficient contextual information to treat patients holistically.

63. F1s skills around the interpretation of x-rays were variable. Training during medical school appeared to facilitate preparedness.

Doctor as Practitioner: Communicating effectively with patients and colleagues

64. F1s contributed around half the data around preparedness for communicating effectively. PPRs talked about this a lot but not always from their personal experiences with trainees. F1s, CEs, P_GVTs and PPRs gave more narratives of situations where trainees were unprepared, the EMPs provided more narratives of trainee preparedness.

65. Some F1s reported communicating sensitively and effectively with a wide range of patients and families, across a range of settings and situations. This was reinforced by D_FP participants. Other participant groups (e.g. HCPs, PPR) noted an improvement in today's F1s communication with patients.

66. Areas of under-preparedness included difficult situations when F1s were dealing with:

    a. Angry or upset patients and relatives and managing complaints (identified by F1s, FRTDs and P_GVTs);

    b. Communicating with patients whose first language was not English;

    c. Communicating with vulnerable patients (including those with mental health issues);

    d. Breaking bad news (identified by F1s and CEs);

    e. Dealing with more informed patients.

67. Communication challenges were emotionally difficult, with frequent F1 reports of distress during and after the event and occasional fear for their physical safety.

68. Many F1s narrated events demonstrating they were well prepared to communicate with colleagues, but some narratives contradicted this (F1 and D_FP). Particular challenges included:

    a. Clinical disagreements with senior medics or nursing staff;

    b. Challenges in gaining support from seniors (identified by F1s and CEs);

c. Communicating interprofessionally (identified by F1s, NRDTs, HCPs, although EMPs felt F1s were overall prepared). Occasionally, communication breakdown between F1s and nursing staff became serious, resulting in confrontation, distress and ongoing working difficulties (identified by F1s);

d. Not providing or receiving sufficient information during handovers (identified by F1s, FRTDs, CE).

Doctor as Practitioner: Providing immediate care in medical emergencies

69. Data for preparedness around F1s providing immediate care in medical emergencies mainly comes from F1s and FRTDs with no narratives around preparedness from the D_FP, HCP, EMP or P_GVT groups.

70. With almost twice as many unprepared narratives than prepared ones, the data strongly suggests that graduates are not well prepared for emergencies, especially when on-call during evenings and weekends as support is less available.

71. Inexperience of on-call duties as a student led to strong feelings of unpreparedness, both for working independently and in practical aspects (e.g. using bleeps, managing tiredness).

72. F1s felt unprepared for their own emotional response, changing a consultants' management plan, knowing when and how to escalate the situation to their seniors and what to do if the patient was not improving or no support was available.

73. F1s felt well prepared for some aspects (e.g. ABCDE approach, CPR).

74. Some F1s felt medical schools had prepared them well for emergencies through simulation and repeated exposure but FRTD participants felt simulation provided limited preparation for the reality of managing a sick patient.

Doctor as Practitioner: Prescribe drugs safely, effectively and economically

75. The majority of data around trainees' preparedness for safe, effective and economical prescribing comes from F1 and HCP participants:

    a. F1s narrated equal numbers of prepared/unprepared situations;

    b. HCPs overwhelmingly talked about F1s unpreparedness.

76. Graduates felt that practising prescribing skills and working with different professional groups at medical school provided good learning opportunities.

77. Even with good underpinning knowledge, some F1s found prescribing difficult due to limited 'in situ' prescribing experience and limited support on the wards, describing frequent referral to the BNF, and double-checking drug choice and dose calculations.

78. Some stakeholders felt that graduates lacked an understanding of basic pharmacology (e.g. D_PV, EMP groups) and prescribing economically (e.g. D_PV, EMP, HCP groups).

79. The HCP group felt graduates:

a. Knew how to access support for prescribing but lacked knowledge of information they needed to convey in order to get advice;

b. Couldn't write a legally controlled drug prescription;

c. Unprepared for taking a patients' drug history with sufficient detail and care;

d. Saw prescribing as absolute, rather than requiring clinical judgment, and suggested they needed a greater diagnostic understanding of the patient;

e. Were unaware of common error sources and safety checks.

80. Facilitating factors for feeling prepared for prescribing included F1s' proactiveness, positive relationships with supervisors and sufficient time to think and access information. Inhibiting factors cited by F1s included lack of confidence, time pressures and poor staffing.

Doctor as Practitioner: Carry out practical procedures safely and effectively

81. The practical procedures mentioned by F1s in their narratives were mapped against TD09 outcomes and classified according to the level of preparedness described by them.

82. F1s reported themselves to be relatively well prepared to carry out every day practical procedures (e.g. taking, managing and checking bloods, cannulation, catheterisation, ECGs, respiratory function tests).

83. Despite feeling prepared, routine procedures could become problematic leading to feelings of unpreparedness (e.g. patients' veins that were difficult to access).

84. For procedures where they felt unprepared, F1s were generally insistent on gaining the support needed to preserve patient safety, however difficult this was.

85. Occasionally an F1 reported undertaking a procedure unsupported, despite feeling unprepared, because they could not find anyone to help.

Doctor as Practitioner: Use information effectively in the clinical environment

86. F1s narratives contained numerous examples of information use in the clinical environment including the use of mobile apps, letters and notes.

87. F1 participants felt prepared for some scenarios (e.g. using computers to access hospital services, using websites and mobile apps to look up information, recording blood results) but not others (e.g. documenting certain procedures such as catheterisation, accessing computer records or patients' notes).

88. The P_GVT and EMP groups talked about the importance of keeping good patient records, something which they felt graduates needed further training on.

89. Many F1s talked about difficulties arising from patients' notes being incomplete or involving illegible handwriting.

Doctor as Professional

Doctor as Professional: Behaving according to ethical and legal principles

90. As with 'Doctor as Scholar', it was highly unusual for narratives to focus on these specific outcomes, rather they were mentioned as part of the broader narrative event.

91. The pattern of prepared versus unprepared narratives suggests that F1s are relatively unprepared in this respect.

92. F1 participants talked about being prepared for:

    a. Filling out death certificates;

    b. Gaining patient consent for procedures.

93. F1 participants talked about being less well prepared for:

    a. Completing DNAR forms and acting when the DNAR situation are unclear;

    b. Deciding when a coroner or the police should be involved in a death;

    c. Confidentiality for patients brought into hospital by the police or prison service;

    d. Self-discharge from hospital.

94. There was an appreciation of the underpinning ethical principles and examples of when junior doctors had challenged their colleagues about their professional behaviour, but F1s were sometimes uncertain about what to do as events unfolded, and felt unprepared for their own emotions in these complex situations.

95. F1s were often unclear about their responsibilities and felt constraint by hierarchical structures in some medical teams.

96. Facilitating factors included confidence and positive relationships. Inhibiting factors were lack of confidence, maturity, supervisors, leadership, time pressures and poor staffing.

97. Broader stakeholders felt F1s' patient-centeredness and ethical reasoning was good (indicated by FRTD, D_FP and EMP).

Doctor as Professional: Reflecting, learning and teaching others

98. There was little data available for this area.

99. Effective time-management and maintaining a work-life balance was described as challenging.

100. Both the D_FP and F1 group felt that new graduates were not working efficiently:

    a. Taking too long to clerk patients;

    b. Asking questions that were not relevant;

    c. Requesting tests that might not be required.

101. In their narratives, F1s reflected on difficulties they had encountered and how they might improve their own practice as a result, sometimes following feedback from seniors.

102. Some F1s told us about situations where they have acted as clinical teachers for undergraduate medical students, adapted their teaching according to their own experiences.

Doctor as Professional: Learning and working effectively in a multi-professional team

103. The data around preparedness was mixed around half of narratives suggesting F1s are prepared and the other half not.

104. Overall, graduates seemed relatively well prepared to work effectively in teams, although there were mixed opinions about the role of their medical schools in this.

105. The wider stakeholder group also felt that todays' graduates were better prepared and 'oriented towards' multi-professional team working.

106. Most F1s appeared to have insight into their own role in the multi-professional team and understood they were relative newcomers who needed to learn from others (e.g. nurses).

107. F1s talked about making efforts to build a positive working relationship with HCPs and working with wider healthcare professional groups (e.g. social workers).

108. Challenges in the multi-professional team working were presented by systemic factors (e.g. hierarchies and ward-cultures), which often differed across settings.

109. F1s reported their uncertainty around reporting inappropriate behaviour they witness.

110. Some 'them and us' thinking was evident, for example, when F1s talked about having non-medics as their seniors and differences in 'work ethic' of colleagues.

Doctor as Professional: Protecting patients and improving care

111. Overall, the data suggest that graduates are unprepared in this area.

112. F1 participants generally talked negatively about coping with uncertainty and change but repeated exposure to change sometimes led to better coping.

113. F1s and D_FPs described junior doctors' involvement in audits and projects on improving care. This involvement was evaluated by participants in the D_FP group as providing a wider awareness of the NHS.

114. Some F1s talked about self-care, recognizing the need for appropriate sleep, nourishment and work life balance but this was always narrated in relation to benefits for patient care. This contrasted with senior clinicians' historical narratives about long working hours.

115. F1s were generally unaware or unconcerned with the financial implications of their practice. FRTDs thought cost efficiency was for 'later on' in their careers.

116. CEs, D_EPs, HCPs and EMPs talked about the F1s' lack of financial awareness for healthcare.

RQ4: How does preparedness for practice on graduation affect the experiences of F1 doctors over time and during later F1 transitions?

Types of transitions

117. The largest transition was from medical student to F1 but other notable transitions include:

   a. Moving to new wards;

   b. Changing rotation;

   c. On-call.

118. There were significant differences between wards (notably surgery and medicine) in:

   a. Workload;

   b. Knowledge and skill requirements;

   c. Availability of senior support;

   d. Working styles;

   e. Ward-practices.

119. Moving to a different hospital was not uncommon within a training programme. Sometimes these moves proved beneficial, with F1s in smaller hospitals often having greater responsibility or autonomy.

120. Team working was challenging around global transition time-points, for example, when all members of a ward team moved at the same time.

121. Audio-diary entries highlighted the medical student to F1 doctor transition, emphasising their shifting identity to that of doctor, taking on responsibility, and doing things 'for real'.

122. Some participants enjoyed the autonomy and relative lack of scrutiny associated with being an F1 compared to a student and felt they could be more 'themselves'.

Factors facilitating and inhibiting transitions

123. Even those with the most positive outlooks and experiences described difficult times at the beginning of their F1 careers.

124. Transitions varied enormously, both according to the environments moved between and by characteristics of the F1 themselves, such as attitude and resilience.

125. Successful transitions were facilitated by:

   a. Friendly staff;

   b. Supportive working environments;

   c. Good inductions;

    d.   The opportunity to shadow the job.

126. Poor transitions involved:

    a.   Unsupportive or disrespectful colleagues;

    b.   Situations of overall poor organization;

    c.   Situations of understaffing.

127. F1s felt transitions became easier as they gained experience and confidence.

128. Some F1s commented on medical schools differences (e.g. what they taught and how), which highlighted the variability of graduates entering F1.

129. The transition to work was made easier when F1s stayed in the Deanery associated with their medical school, due to the familiarity of environment, systems and people.

Preparedness journey over time

130. The longitudinal case studies provided insights into the preparedness journey and the variability in F1s' feelings of preparedness: some trainees recounted mostly experiences of preparedness and others of unpreparedness.

131. F1s recounted in their audio diaries feelings of preparedness for clinical and procedural skills but unpreparedness for 'ward craft' and interprofessional team-working.

132. Trainees' own self-doubt about their preparedness was apparent across all cases.

133. There seemed to be a general development across all longitudinal case studies in the direction of trainees feeling more confident and competent with more F1 experiences.

134. However, challenging circumstances (e.g. new specialty, new colleagues) could make F1s feel unprepared where they had previously indicated preparedness.

135. There was a general feeling that medical school could never fully prepare F1s for certain things (e.g. responsibility, interprofessional team-working, night shifts and on-calls) which could only be learned as they were doing the job.

RQ5: What are stakeholders' views about the proposition of bringing forward the time of full registration to graduation?

136. The proposal to align full registration with graduation elicited a wide range of views.

137. The majority of interviewees argued against bringing registration forward.

138. Some stakeholders in most groups believed that early registration would have little impact on F1s daily practice (identified across the F1, FRTD, CE, D_FP, HCP, P_GVT groups).

139. Both for and against viewpoints, however, agreed that changes in registration would require big changes in undergraduate education (identified by CE, D_FP, HCP groups).

140. Greater emphasis on integrating clinical experiences on the wards into undergraduate curricula would be required and would make graduates more effective doctors (identified by CE and D_FP groups).

141. Positive structural consequences that were mentioned included:

    a. Clarification of responsibilities between medical schools and deaneries that are currently overlapping;

    b. Bringing a practical solution to oversubscription of F1 posts as graduates would be able to work anywhere;

    c. Controlling medical conduct;

    d. Application of regulatory measures early on.

142. Arguments against the earlier registration that were raised emphasized concerns that medical schools cannot deliver graduates ready for independent medical practice, particularly in relation to professionalism.

143. Stakeholders questioned the feasibility of sufficiently embedding medical students in the workplace to gain a comparable amount of experience prior to 'day 1', believing that this can be achieved by being a doctor in paid employment. These arguments implied higher expectations of registered graduates (raised by EMP, HCP, CE, D_FP members).

144. Participants questioned whether it would put into question current changes in undergraduate and postgraduate education that seek to smooth the transition.

145. Similarly, if early registration would still imply the need for safeguards and supervision, then the meaning of registration would be diluted (identified by EMP, P_GVT, D_FP groups).

146. The F1 period was described by participants across stakeholder groups as a safe learning space. It also ensures early intervention, allowing graduates to grow into competent and safe doctors especially in terms of decision-making (identified by CE, D_FP groups).

147. The supportive F1 structure was understood by members of all stakeholder groups as vital for patient safety. Concerns were raised that giving full registration early, even under the condition that workplace supervision was ensured, might give rise to undermining effective supervisory structures (identified by D_FP, HCP groups).

148. Interviewees from all groups emphasized that despite practical exams and clinical placements, medical schools were not always successful in detecting problems in students' abilities to practice. Even when they did, they did not always have sufficient evidence to prevent graduation.

149. Concerns were raised around implications for staffing (EMP) and attitudes to locum posts with less integration into the inter-professional teams (by F1, FRTD groups).

150. Stakeholders from the CE, D_FP and HCP groups questioned whether moving registration was mainly politically motivated and might impede the education of the trainee doctors.

151. There was a concern that further stress for F1s might counteract measures in patient care (from P_GVT, HCP, F1 groups).

152. Different agendas of universities and medical schools, the difference between being a graduate and being a trainee, were put forward as obstacles for the feasibility of the change.

153. Finally, graduation-registration alignment would require additional assessment (e.g. for professionalism) which was deemed difficult to implement by stakeholders (raised by P_GVT, D_FP, EMP groups).

Phase 2 & 3: Discussion

154. While experience develops both a sense of preparedness in trainees and actual preparedness for a wide variety of competencies, the concept of preparedness is not just one-dimensional or a simplistic case of individuals being either prepared or not: it is a continual non-linear process.

155. Our data reveal the complexity of the concept and how trainees can prepared one day but not the next, or feel prepared in principle but unprepared for the volume or certain turns of events.

156. Our study goes further by identifying the challenges of a high-volume time pressured workload, often with inadequate levels of staff. Trainees may feel prepared for situations when all goes to plan, but unprepared when exposed to high volumes of work which demand prioritization and multi-tasking; or uncertain thresholds (not knowing when to refer to seniors); inadequate team-working; or when seniors are not easily accessible.

157. The transition from medical student to F1 is momentous and can generate profound feelings of responsibility in new trainees. However well-prepared they might have felt in medical school, as new doctors, their responsibilities for patient care weigh heavily and can challenge new trainees' self-confidence.

158. These feelings were commonly expressed across our interview and audio-diary data and we repeat here some of their moving, at times disturbing, language to stress the new doctors' responses to responsibility: Ben, the audio-diary participant for case study 1, described his experiences using words such as: "*under pressure*", "*scared*", "*bit of panic almost or fear*", "*nervous*", "*worried*," and "*freaking out*".

159. While trainees worried about responsibilities, other stakeholders understood Foundation training as just that: a base training extending over a two-year period.

160. These stakeholders, conversely, spoke of the need for trainees to know their limitations and to know when to seek help. F1 doctors are *expected* to seek help from others and work as part of a team, and therefore, they do not have responsibility for many aspects of patient case and indeed are not fully registered for this year.

161. Our study adds to the evidence about the effectiveness of assistantships, which were found to be lacking in the literature, by providing evidence for role of assistantships in smoothing the transition from medical student to F1. They are vital for developing contextual and

situational knowledge. However, for both assistantships and shadowing, individual and context factors impact on their effectiveness.

162. Our data about the August transition gives a clear picture of unpreparedness and raises serious concerns about patient safety. Clearly, many of these concerns interface with discussion about assistantships, shadowing and induction; all of which can ameliorate some of the concerns expressed.

163. On the topic of full registration at graduation we heard both sides of the argument: Knowing that Foundation trainees would begin their work with full registration might serve to encourage greater integration of students on assistantships and thus may enhance the likelihood that integration into the team occurs. In this way, earlier registration could act as a positive catalyst.

164. However, participants in our study provided twice as many arguments against change than for change: the only 'pro-group' being undergraduate deans.

165. While there were numerous arguments against the change the most compelling one is the 'safety-net' issue: pre-registration acts as a safety net for the trainee doctor, for Deaneries, and most importantly for patients.

166. In addition to undertaking secondary analysis of our data, further research examining the undergraduate student to F1 transition phase should be prioritised by medical education researchers.

167. Longitudinal and/or action research studies, following cohorts of students through their final year assistantships and into their F2 year would be very beneficial and informative. Without the active engagement of all stakeholders involved in the education and development of tomorrow's doctors we may find it impossible to understand the complex interplay between individual, relational, and cultural factors in the development of Foundation doctors' preparedness for practice.

2.0. Introduction

It is in the interest of everyone that medical graduates are prepared to start work on their first day as a trainee doctor in the hospital setting. Indeed, publications such as those by Vaughn et al. (2011), that provide evidence to suggest the August transition period has a negative impact on patient care and safety, remind us of this necessity. But it is not just patients who might suffer unnecessarily if newly graduating medial students are unable to carry out their duties: the wider healthcare professional team and the incoming trainees themselves might also experience difficulties.

It is the responsibility of the General Medical Council (GMC) to protect and maintain the health and safety of the public, and developing high standards within medical education is a core aspect of this. With the introduction of the pamphlet entitled *Tomorrow's Doctors* (TD93) (General Medical Council 1993), the Education Committee of the GMC first published its recommendations on undergraduate medical education. Since then a number of changes have been made to the document resulting in a dramatically revised version of *Tomorrow's Doctors* (TD09) being published in 2009 (General Medical Council 2009).

TD09 represented the GMC's first document with explicitly identified outcomes, rather than guidance. The range of outcomes classified in TD09 was developed from evidence, including specifically commissioned research, (Illing J, Peile E et al. 2008) and extensive consultation with stakeholders responsible for medical education and patient care. There are 106 specific outcomes in TD09 across the three broad domains of the *doctor as scholar and scientist*, the *doctor as practitioner* and the *doctor as professional*. While these have been recommended outcomes for graduates since the publication of TD09, they only became mandatory in the 2011-2012 academic year.

In addition to these outcomes the TD09 specifically comments on medical graduates' first few months prior to work: "Students must be properly prepared for their first allocated F1 post. Separate from and following their Student Assistantship, they should, wherever practicable, have a period working with the F1 who is in the post they will take up when they graduate." (paragraph 110). This shadowing period is to comprise protected time (at least one week) timetabled as close to their point of employment as possible to enable graduates to use their medical knowledge and skills in the workplace and develop working relationships with their colleagues as well as with clinical and educational supervisors. Amongst other things, feedback from employers about the preparedness of graduates would be used as evidence of preparedness, feeding back into further development of training process.

2.1. Changes to healthcare driving reform of undergraduate and postgraduate education

As the GMC have developed policy and practice around undergraduate medical education, the healthcare needs of society have been changing. It is well recognised that the demographics of our population are changing: we have an ageing population living with increasing complex co-morbidity and chronic healthcare and social needs. Medical knowledge, and ways of treating disease is also rapidly expanding. There is an increasing desire to provide a greater proportion of healthcare provision in the community setting. Therefore healthcare delivery requires transformational change in order to meet the needs of patients both now and in the future.

Responding to these challenges, the Collins Report (Collins 2010), Francis Report (Francis 2013), Keogh Review (Keogh 2013) and Berwick Review (Berwick 2013) have identified key recommendations for the reconfiguration of future healthcare delivery. In order to deliver care that is of high quality, safe, integrated and which places patients first, education and training of the workforce is essential and must keep pace with such changes and challenges. In the UK, training of

medical students begins in medical school. Following graduation, the Foundation Programme provides a key stage in the training of our future doctors.

2.2. Shape of training review

Following an intensive period evidence-gathering with a range of stakeholders, including individuals and organisations with an interest in postgraduate training, the recently-published final report of the review of medical training identified a number of priorities for the future healthcare workforce (Greenaway 2013). It recommend that medical training was 'broader for longer' in order to ensure that medical professionals were well equipped to deal with the challenges of patient comorbidity, that there was greater patient involvement, and that there was a greater emphasis on multi-professional communication and team working: "there is no doubt that doctors must be trained to work in multi-professional teams and respect the roles and responsibilities of their colleagues" (p.17). Recently, Health Education England, in their document 'Broadening the Foundation Programme' also set out a number of key recommendations for the training of Foundation doctors (Eden, Bell et al. 2014), stressing the need for foundation doctors to work in multi-disciplinary teams and to understand how such teams function in the planning and delivery of service around patient care pathways. Thus while this important aspect of clinicians' practice has been identified as a 'must' for future doctors, whether or not graduates are prepared of this is, as yet, relatively unknown.

These current reports also highlight the need for doctors to be trained in a broad spectrum of care (e.g. emergency / acute care and mental health) to meet future healthcare demands and to ensure that our future healthcare workforce are able to care for the 'whole patient' (Greenaway 2013, Eden, Bell et al. 2014). Medical graduates' preparedness for working with groups of people who are particularly vulnerable (e.g. elderly people, people with dementia, mentally impaired) is another area that may be under-researched currently. This aspect of preparedness is addressed in TD09 under the themes of *Doctor as Practitioner* (outcome 15g: 'Communicate appropriately with vulnerable patients' and 13d 'Perform a mental-state examination') and *Doctor as Professional* (outcome 20f: 'Understand and accept the legal, moral and ethical responsibilities involved in protecting and promoting the health of individual patients, their dependents and the public – including vulnerable groups such as children, older people, people with learning disabilities and people with mental illnesses'). Finally, one core recommendation made by Greenaway (2013), and central to the issue of preparedness, was the moving of full registration to the point of medical school graduation (provided measures are in place to demonstrate graduates' fitness to practice at this point).[1] Currently graduates are only partially registered which restricts their practice (e.g. prescribing). Given this key document was published immediately prior to the recruitment of participants to Studies 2 and 3 we aimed to shed further light on these under-researched aspects of preparedness alongside attitudes towards the issue of timing of full registration.

2.5. Pre-TD09 preparedness of medical graduates

We now briefly consider some of the data on medical graduates' preparedness for practice pre-TD09. While the data presented here is not an exhaustive account of the state of play pre-TD09, it is a useful indication of the main issues of the time. This will be extended by the findings of the Rapid Review that forms part of the current research programme.

Using postal questionnaires to survey all UK medical graduates qualifying from all UK medical schools in 1999, 2000, 2002 and 2005, Goldacre and his colleagues have arguably conducted the largest-scale research to date (Goldacre, Davidson et al. 2008, Goldacre, Taylor et al. 2010, McPherson and McGibbon 2010). All four cohorts of students received a survey one year following

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[1] Recommendation 5: "Full registration should move to the point of graduation from medical school, subject to the necessary legislation being approved by Parliament and provided educational, legal and regulatory measures are in place to assure patients and employers that they doctors are fit to practise" (p.32).

their qualification, with the 2000, 2002 and 2005 cohorts also being surveyed three years following graduation. The survey itself covered a range of issues including graduates' career intentions, career progression and future plans. The main outcome measure regarding preparedness for practice for the 1999 and 2000 year cohorts comprised the level of agreement respondents had with the broad-brush question 'Experience at medical school prepared me well for the jobs I have undertaken so far' with responses on a 5-point scale from 'strongly agree' to 'strongly disagree' (only 25% of the 2000 cohort randomly received this question: Goldacre, Taylor et al. 2010). For subsequent cohorts, additional probing questions were asked related to specific areas of practice: *clinical knowledge*, *clinical procedures*, *administrative tasks*, *interpersonal skills* and *physical, emotional and/or mental demands*. Participants were also asked whether any lack of preparedness was a *serious*, *medium-sized* or *minor* problem for them.

Response rates across all 4 cohorts in years one and three were 63.7% (n=11,610) and 60.2% (n=8427) respectively (Goldacre, Taylor et al. 2010). They found that one year following graduation, 30.8% of graduates disagreed or strongly disagreed that they were well prepared for practice with 29.5% doing so three years after graduation. Furthermore, white trainees, males, and those graduating from a graduate-entry programme were significant positive predictors of feeling prepared at three years. The degree to which all graduates felt prepared also differed across medical schools both at one and at three years following graduation: ranging from 30-82% one year following graduation and from 27-70% at three years. In terms of seriousness, 30% (one year post-graduation) and 33.1% (three years post-graduation) of respondents considered their unpreparedness to be a serious or medium-sized problem, with cohort, ethnicity and medical school all being significant predictors (all $p<0.001$). The category which elicited the greatest number of participants saying they felt unprepared was *clinical procedures* (37.9% overall) with significantly more female doctors reporting this. However, significantly more males felt underprepared for *administration duties* and significantly more non-white respondents for *communication skills*.

In a later study examining preparedness in the 2008 and 2009 cohorts, Goldacre (2012) found that overall 2.7% of graduates felt unprepared on interpersonal skills (range across schools 0.0%-8.8%), 17.5% reported feeling unprepared in clinical knowledge (range 2.4%-28.9% across schools), 21.3% were unprepared on clinical procedures (range 4.1%-41.2%), 26.4% were unprepared for the physical, emotional and mental demands (range 0.0%-45.3%), and 31.8% were unprepared for administrative tasks (range 5.2%-54.7%). Therefore, we can see that during 2008-9 there are still considerable differences between graduates' perspectives in terms of on whether or not their medical school prepared them well for work.

While Goldacre's research provides us with insight from large UK cohorts, it is by no means the only study that has examined UK graduates' preparedness for practice. The GMC-commissioned work by Illing and her colleagues (Illing J, Peile E et al. 2008, Morrow, Johnson et al. 2012), which utilised both qualitative and quantitative data from newly graduated participants from three medical schools with differing curricula: two direct-entry programmes – one integrated systems-based and one problem-based learning (PBL) – and one graduate-entry programme. They collected 479 questionnaires from trainees and 78 'triangulating' questionnaires from clinical teams who worked with the F1s. They also conducted longitudinal interviews with graduates (n=46 completing all three over the year) and 'triangulating' interviews with 92 clinicians. Data from a safe prescribing assessment was also used as additional data on F1s' 'preparedness for practice' in the domain of prescribing.

From the graduate cohort questionnaire, Illing and her colleagues (Illing J, Peile E et al. 2008, Morrow, Johnson et al. 2012) found a self-reported greater preparedness for *working as part of a team*, *probity*, *communication skills*, and *clerking*. Furthermore, graduates from two sites felt well prepared to *employ a patient-centred approach*. Situations that elicited a low-preparedness response demonstrated a greater variation across schools, but *prescribing*, *carrying out complex practical procedures*, *dealing with challenging patients*, and *applying knowledge of the NHS* came in

the 'bottom 10' (of 53) for all schools. Interestingly, more variation was reported between different areas of practice than between medical schools. When there were differences between schools, the largest differences were being prepared for paperwork: in particular preparing death certificates and cremation forms. Triangulating data concurred with self-reports around lack of preparedness for prescribing (from pharmacists) and clinical procedures such as urinary catheterisation. Qualitative analysis of interviews was undertaken using a grounded theory approach and identified the following key themes: the process of transition from undergraduate to F1, practical aspects of doing the 'doctor' job, the continued need to learn, the demands on trainees in the clinical workplace, the stress of being an F1 and how to cope.

2.4. Defining preparedness for practice

While *preparedness for practice* has been defined as 'the combination of knowledge, skills and behaviour that medical graduates should possess at the point of entering the workforce', the GMC also recognize a broader understanding of the term to include a longitudinal dimension (General Medical Council 2012). Thus, medical schools are tasked with balancing their remit to prepare their graduates for practice on graduation, alongside their remit to prepare them for life-long learning, development and adaptation. Indeed, the GMC talks of the difference between competencies and competence, thereby highlighting the difference between preparing medical graduates for specific tasks, such as performing a mental-state examination or providing a safe and legal prescription, and preparing them for 'becoming a doctor'. There is a difference between preparing for immediate practice, and the preparing for practice over many years in an ever-changing healthcare environment.

However, if we define preparedness for practice as a 'long-term' project, the wider issue is to what extent could or even should medical schools be preparing graduates for healthcare as it will be in the future, given that graduates today may still be practicing in 50 years. For example, should there be more focus on independent study skills to maintain knowledge, skills and behaviours, or more focus on community-based medicine or population level intervention, which is arguably the direction of travel? In other words, a thorny question would be preparedness for what exactly? In reality however, the majority of research rarely considers the issue of defining preparedness, and tends to focus on the immediate question of how well undergraduate medical education prepares their students to work upon graduation (Goldacre, Davidson et al. 2008, Illing J, Peile E et al. 2008, Goldacre, Taylor et al. 2010, Goldacre, Lambert et al. 2012).

2.6. Preparedness for practice methodology 'constructs'

We now provide a brief critique of the ways in which preparedness had been conceptualised and measured in the literature and the impact that these issues have on assessing whether medical graduates are prepared. We continue with this critical approach later when we present the new data from our Rapid Review. The issues presented here are of crucial importance and direct relevance to the broader issue at hand: how best to measure medical graduates' preparedness for practice in the future thereby evidencing the impact of the GMC's policy documents on effective changes in undergraduate medical curricula.

How preparedness for practice is interpreted has implications for our understanding of the evidence from studies. As mentioned earlier, most researchers define preparedness for practice as a 'short-term, entering the workforce' concept and use proxy measures to examine preparedness. Thus framed, medical graduates' preparedness for clinical practice has been investigated using a range of quantitative and qualitative methods, as illustrated above: questionnaire surveys (e.g. Cave, Goldacre et al. 2007, Goldacre, Davidson et al. 2008, Illing J, Peile E et al. 2008, Brennan, Corrigan et al. 2010, Goldacre, Taylor et al. 2010, McPherson and McGibbon 2010, General Medical Council 2011, Tallentire, Smith et al. 2011, Morrow, Johnson et al. 2012, Balfour 2013, Goldacre and Lambert 2013), focus groups (e.g. Watmough, Taylor et al. 2006) and individual interviews (e.g. Watmough, O'Sullivan et al. 2009, Sawyer, Salter et al. 2013). Due to the large number of

students going through medical school and into the workplace, one of the most common methods for assessing preparedness is via self-reported questionnaires. In addition to methodological issues around 'proxy measures', such measures of graduates' own perceptions of preparedness can be problematic in that they conflate confidence with competence.

The problems of poor definition and the issue of how to 'measure' this concept are evident in the research literature. While Goldacre's research involved large numbers and the data were collected across the UK with a high response-rate, caution is needed in interpreting the results. Firstly, the concept of preparedness was not adequately defined (in both the Goldacre and Illing studies, the reports reflected a narrow 'right now' conceptualisation focused on the transition from being a final year undergraduate to an F1[2]). The question(s) in Goldacre's studies around graduates' preparedness are very broad-brush, as are the response frames (i.e. Likert scales) and the studies rely solely on self-reports.

There are a number of factors about self-report data that renders them problematic. For example, on what basis do individuals make their decisions regarding preparedness: do they assess themselves against absolute measurements (am I good enough? am I minimally competent?) or against relative measures (am I average? below average? and compared with whom? my seniors? my peers?). When relative measures are used, these might be subject to social cognitive processes such as the 'better-than-average' effect whereby the majority of people believe themselves a better driver, a more competent parent etc., than the average person due to the inherent heuristics and biases we use when forming decisions.

Indeed, Eva and Regehr identified a range of factors that can affect individuals' self-reports drawing from the literature on individuals' belief in their own ability to complete tasks (self-efficacy), their ability to draw context-free general conclusions about their own skills or knowledge in specific domains (self-concept), individuals' access to their own knowledge (meta-cognition), the various heuristics and 'short-cuts' in thinking individuals use (cognition), pattern-recognition and fact-checking (models of expert performance) and reflective practice (Eva and Regehr 2005). The main conclusion we might draw from this critique is that, in isolation, quantitative self-reported measures of 'preparedness in general', as a meaningful and useful construct of whether graduates are actually prepared, is somewhat lacking. According to their critique, Eva and Regehr argue "that asking the question "are health professional trainees effective self-assessors?" is not likely to lead to insightful discoveries about the nature and value of self-assessment: "Rather, researchers must ask questions such as: On what basis do individuals make these decisions? What factors affect their reasoning? How fine tuned does the assessment need to be in order to be useful?" (p.S47). They further argue that "... there is an important distinction between general assessments of one's ability in an area and the more specific question of how one did on a particular task" (p.S47). They make the distinction between 'reflection-on-practice' and 'reflection-in-practice.' Self-report data is mainly the former, but what is needed is both types of reflection. Furthermore, they assert that 'reflection-on-practice' is more accurate when we consider specific events (rather than generalised events). In terms of safe practice in health professionals' performance requires therefore requires that they reflect on a situation regarding a *particular* patient – this contextual self-assessment is more accurate than rating "one's own strengths and weaknesses in an acontextual manner" (p.S53). The subsequent findings from such studies remain equivocal at best. For example, it might be that gender (male), ethnicity (white) and graduate entry factors are significant predictors for feeling prepared because of respondents' greater self-efficacy and therefore confidence, rather than being due to their actual level of competency (Goldacre, Taylor et al. 2010) and that responding to questions generalizing all situations of 'X' may be subject to individuals' biases and heuristics in thinking.

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[2] However, if we define preparedness for practice as a 'long-term, becoming a doctor' concept, we come up against the issue of the much debated characteristics of a 'good doctor.'

Another concern, not evident in the Goldacre and Illing work, is that studies report improvements over time. Thus doctors more recently qualified report feeling better 'prepared' for work than those qualifying previously (Davie, Mazmanian et al. 2006, Watmough, Garden et al. 2006, Cave, Goldacre et al. 2007). Further, findings have frequently been related to single-school sites for many studies and may be influenced by publication bias.

The problem with self-report data applies not only to data collected from questionnaires, but also from interview studies. This is especially so when qualitative self-reports are taken at face-value (e.g. when subjected to a simple thematic analysis: Illing J, Peile E et al. 2008, Brennan, Corrigan et al. 2010). However, this factor can be overcome though the use of more sophisticated 'multi-layering' analytical strategies whereby both *what* is said is considered alongside *how* it is being said (Monrouxe 2009, Monrouxe, Rees et al. 2009, Monrouxe and Sweeney 2010, Bullock, Monrouxe et al. 2011, Monrouxe, Rees et al. 2011, Monrouxe, Rees et al. 2011, Rees and Monrouxe 2011, Monrouxe and Rees 2012). For example, factors around identity and social desirability when accounting for one's behaviours can be unpicked using a variety of analytical frameworks (Rees, Knight et al. 2009, Monrouxe, Rees et al. 2011, Rees and Monrouxe 2011).

In this section we have critiqued the literature around researching medical graduates' preparedness for practice in terms of (a) how it has been conceptualized by researchers; (b) broadly, what do we know about UK graduates' preparedness pre-2009; and (c) the methodological issues facing researchers who wish to investigate this are. We now present our programme of work that examines these issues further, beginning with our rapid review of the literature post-2009.

3.0. Phase 1: A rapid review of the literature 2009-2013

3.1. Introduction

The first phase we report on was undertaken between July-September 2013 and comprises a rapid review on the literature from 2009-2013. We begin by outlining what a rapid review is before going on to state the aims and research question(s) for this review.

3.1.1. Rapid reviews

A traditional systematic review "attempts to collate all empirical evidence that fits pre-specified eligibility criteria in order to answer a specific research question. It uses explicit, systematic methods that are selected with a view to minimizing bias, thus providing more reliable findings from which conclusions can be drawn and decisions made" (Green, Higgins et al. 2008). While systematic reviews can be thought of as the *gold standard* of knowledge synthesis within a positivist paradigm, they do have limitations. They typically require anything from six months up to years to complete and tend to concentrate on narrow clinical questions or sets of questions. A Rapid Review (RR), as its name implies, is designed to answer a question swiftly, thereby addressing urgent demands for synthesized evidence (Khangura, Konnyu et al. 2012). RRs follow a systematic review methodology within a restricted time frame. For the purposes of this study the time frame comprised a 3-month period. In order to complete a quality review within such a tight deadline, RRs need to be clearly focused, carefully planned and simplified in terms of the literature search.

3.1.2. Aims and research questions

The broad aim of this RR is to inform the GMC of the evidence since 2009 regarding how prepared for practice UK graduates are and whether this has changed since the publication of TD09. The overarching research question therefore is "How prepared are UK medical graduates for practice?" However, this deceptively simple question is highly complex and taking into account the outcomes stated in TD09, along with the available evidence that has examined graduates' preparedness, we

have broken this question into the specific research questions outlined in Box 1 below. Each question, where possible, is considered against the broad aim of examining the evidence of whether effectiveness has changed since the TD09 publication.

3.2. Methods

A Rapid Review Methodology was employed. The main review work was undertaken by the three researchers working on the project (LJG, ZJ & EP) under the direction of MM. LVM oversaw the work, advising on process when appropriate.

3.2.1. Criteria for considering studies

The criteria used for studies were as follows:

- Manuscripts published from 2009 onwards (to address the issue of change since TD09)[3];
- Manuscripts published in English;
- All types of studies;
- Participants who are final year medical students, medical graduates, clinical educators, patients or NHS employers;
- All outcome measures considered (as one purpose of the RR is to identify the range of measures).

3.2.2. Literature search

All eligible studies regardless of publication status (published, unpublished, in press, and in progress) were identified. The following databases were searched for articles relevant to the research question: Cinahl, the Educational Resources Information Centre (ERIC), Embase, Medline, Medline in Process, HMIC (Health Management Information Consortium: Grey literature), Psycinfo, Web of Knowledge (WOK) and Scopus. Searches included original research, reports and conceptual pieces between 2009 and 2013, with 'medical' and 'UK' as the key variables for inclusion.

BOX 1: THE RESEARCH QUESTIONS (RQS) TO BE EXAMINED IN THE RAPID REVIEW

RQ1: How has Preparedness for Practice been researched?

RQ2: How effective are final year undergraduate to Foundation Year1 (F1) transitional interventions?

RQ3: How prepared are graduates for specific tasks, skills and knowledge?

RQ4: How prepared are medical graduates for interactional and interpersonal aspects of practice

RQ5: How prepared are medical graduates for cultural, systemic and technological aspects of practice

RQ6: How personally prepared are medical graduates for practice?

RQ7: Do personal demographic factors contribute to the variance in preparedness?

RQ8: Do situational demographic factors contribute to the variance in preparedness?

Following a number of drafts, a protocol was developed using the PICO strategy. The acronym "PICO" summarises the different aspects that a question must address: [**P**] Specific population/problem under investigation; [**I**] Intervention being evaluated; [**C**] Comparison/control

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[3] Given lead times to paper preparation and publishing frameworks, we include data collected prior to the publication of TD09. Whether the data were collected pre- or post-TD09 was classified in the database. See footnote 8.

under scrutiny; [**O**] Outcome of interest. Seventy search terms were specified in the databases. The search strategy used Boolean operators, adjacency operators, truncation, wildcard symbols and both subject headings as well as free text search terms.[4] These were combined in three stages. Firstly, terms representing the population of interest were combined using 'OR' (Box 2).

BOX 2: DETAILS OF THE SEARCH STRATEGY FOR PARTICIPANTS (STAGE 1)

1   Junior doctor*1.mp.
2   pre-registration house officer.tw.
3   (foundation doctor* or F1 or FY1 or F2 or FY2 or foundation year 1 or foundation year one or foundation year 2 or foundation year two).tw.
4   (PRHO* or houseman* or house man* or house officer* or intern).tw.
5   new* qualif* doctor*.tw.
6   (SHO or senior house officer*).tw.
7   (medic* adj3 graduat*).tw.
8   "Internship and Residency"/
9   or/1-8

BOX 3: DETAILS OF THE SEARCH STRATEGY FOR PREPAREDNESS VARIABLES (STAGE 2)

10   exp Professional Competence/
11   exp Clinical Competence/
12   exp Self Efficacy/
13   (Confidence adj3 practice).tw.
14   exp Professional Practice/
15   exp Resilience, Psychological/
16   exp coping behavior/
17   exp Competency-Based Education/
18   *"Education, Medical, Graduate"/
19   *"Education, Medical"/
20   "Education, Medical, Continuing"/
21   (prepar* adj3 practi*).tw.
22   ((readiness or ready) adj3 practi*).tw.
23   (transition* adj3 pract*).tw
24   ((Competence or prepare* or confiden* or ready) adj3 (practise or purpose or employab*)).tw.
25   (resilien* adj3 medical).tw.
26   (effective* adj3 medical curriculum).tw.
27   foundation train*.tw.
28   medical education.tw.
29   professionalism.tw.
30   prescribing skill*1.tw.
31   scientific knowledge.tw.
32   (fitness adj3 practise).tw.
33   (fitness adj3 purpose).tw.
34   (defin* adj3 practi*).tw.
35   (asses* adj3 prepar*).tw.
36   (toler* adj3 uncert*).tw.
37   Leadership.tw.

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[4] Boolean searches allow the researcher to combine words and phrases using AND, OR, NOT and NEAR (Boolean operators) to limit, widen, or define the search. Boolean operators are also called 'logical operators' as they organize searches in a logical manner.

38   Ethical manner.tw.
39   Clinical analysis.tw.
40   Clinical* effective*.tw.
41   Communicate effectively.tw.
42   *"Communication"/
43   Communicate appropriately.tw.
44   Clinical responsibil*.tw.
45   (Adapt adj3 chang*).tw.
46   Patient safety.tw.
47   *Patient Safety/
48   Clinical judgement.tw.
49   Patient care.tw.
50   *Quality Assurance, Health Care/
51   Quality assurance.tw.
52   (CPD or Continuing professional development).tw.
53   (Inadequate adj3 (supervision or train* or support or preparedness)).tw.
54   ((Inadequate or clinical) adj3 (supervision or train* or support or preparedness)).tw.
55   clinical performance.tw.
56   (Situation adj3 uncertainty).tw.
57   (Emergency adj3 judgement).tw.
58   Safe prescribing.tw.
59   Reflection.tw.
60   "Feedback"/
61   (Work adj3 autonomously).tw.
62   (Assistantship or Mentoring).tw.
63   psychology knowledge.mp.
64   Psychology/
65   or/10-64

Secondly, 54 searches after this combination represented the variables of preparedness developed from the TD09 outcomes: including the skills, tasks and knowledge that might have influence. These are listed 10-64 in Box 3 and were also combined using the 'OR' Boolean command. Finally, the five geographic inclusion areas of the research were added and combined using 'OR' (Box 4). The three combined 'OR' searches were then selected and submitted for a total search with the 'AND' function and the data were limited to the past 5 years (see lines 72 and 73, Box 4).

This final search strategy was developed using keywords and Medical Subject Headings (MeSH headings) on OVID Medline database. The search strategy was modified to search the rest of the bibliographic databases (Appendix A, p.192). To increase the sensitivity of the search a total of 15 relevant journals were searched from January 2011 onwards with the same inclusion criteria as the databases. A separate protocol was developed for this process using three terms per search relating to either 'junior doctor', 'foundation doctor' or 'medical graduate', alongside two factors of preparedness. This protocol also used website searches. Finally, the researchers hand searched journals and reference lists. Once each search was complete, the citations were exported into either EndNote X6 or EndNote Web. We identified n=3,762 manuscripts using this search strategy (full details of searches and results in Appendix B, p.210).

BOX 4: DETAILS OF THE SEARCH FILTER FOR GEOGRAPHIC DEMOGRAPHICS (STAGE 3)

66   exp Great Britain/
67   exp Scotland/
68   exp Northern Ireland/

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69    exp Wales/
70    (Great Britain or Britain or England or Scotland or Wales or Ireland or UK or United Kingdom
or welsh or english or scottish or irish).tw.
71    or/66-70
72    9 and 65 and 71
73    limit 72 to yr="2009 -Current"
```

3.2.3. Study selection

Starting with the entire database (n=3,762, see Figure 1), duplicate references were removed using EndNote and hand screening, reducing the total of manuscripts to n=2206. Books, letters and editorials were then removed, excluding 569 documents. A further 20 documents were excluded due to being published pre-2009, leaving n=1,617 manuscripts. Each manuscript title and abstract was reviewed against the inclusion and exclusion criteria, resulting in a further n=1,410 documents being excluded.

Two hundred and seven documents remained for the full text assessment. All manuscripts were obtained in full and, following an initial search of their reference lists for any missing relevant work, 49 additional documents were obtained for full review (resulting in n=256 manuscripts going forward for the full text review process). The documents were divided between the researchers and a full review of the texts against the inclusion and exclusion criteria was undertaken to ensure that all manuscripts were relevant. Borderline cases were discussed and consensus sought within the team. Ninety-three documents were excluded during this process: 15 because they were international studies and 78 did not discuss preparedness for practice.

3.2.4. Quality assessment

One-hundred and sixty three full text manuscripts were quality assessed. The references were managed in Excel with a different workbook for systematic reviews, qualitative, quantitative and mixed methods research designs. Two authors independently assessed the quality of the selected papers using criteria specifically adapted from the Medical Education Research Study Quality Inventory (MERSQI) (Reed, Cook et al. 2007) for quantitative designs and Mays & Pope (2000) for qualitative designs (Mays and Pope 2000). For mixed methods both sets of indices were used depending on the part of the study being assessed. Additionally, the issue of 'triangulation' was considered: are the results from either two or more different methods of data collection (for example, interviews and questionnaires) comparable? Did the researchers look for patterns of convergence to develop or corroborate their interpretation? See Appendix C (p.212) for the details of all the quality categories.

Rather than using a basic numerical scoring system for inclusion-exclusion, as not all quality criteria are equal, two of the review authors independently judged the inclusion/exclusion of the papers based on an overall impression of its quality. Each of the marked criteria on the

FIGURE 1: STUDY SELECTION PROCESS
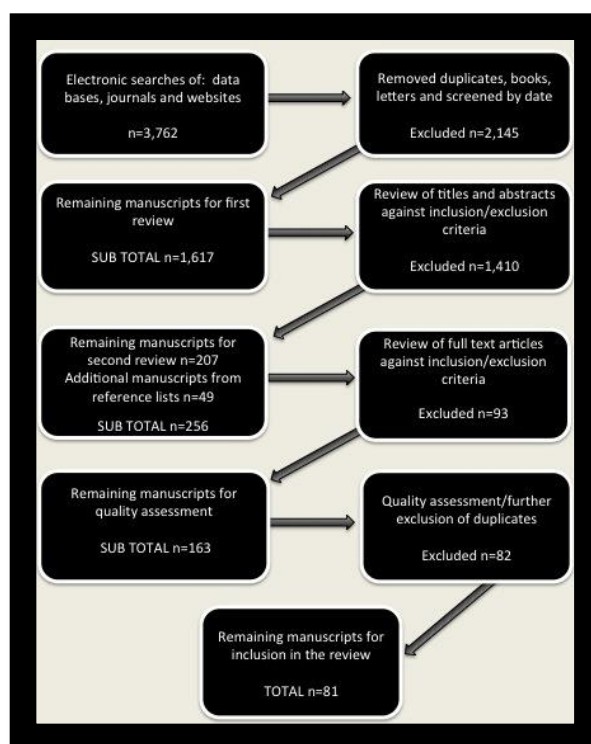
spreadsheet was therefore considered and scored before concluding whether the manuscript was suitable for data extraction. The reviewers then categorized each manuscript for inclusion as follows: 'Yes – absolutely', 'Yes – with reservations' or 'No'. For the majority of the manuscripts, reservations were made relating to generalisability and/or the reliability of the methods. For example, the statistical tests used to determine the results were not mentioned in some manuscripts while others conducted questionnaires without prior testing of questions or with little explanation in the manuscript as to how they were developed. All discrepancies between reviewers were discussed and negotiated. Those manuscripts accepted with reservations were accompanied by an explanation in the spreadsheet as to why there were reservations. Those rejected were also accompanied by a similar explanation. Eighty-one manuscripts were excluded during the quality assessment process, leaving n=82 manuscripts to be included in the initial review. Whilst undertaking the review a further duplicate manuscript was identified leaving a final total of n=81: n=4 reviews, n=46 quantitative studies, n=17 qualitative studies and n= 14 mixed methods studies (see Appendix D, p.214, for full list of documents along with details of data collection and research questions).

3.2.5. Critique of the studies in terms of conceptualization and measurement of preparedness.

Before we go on to discuss how we extracted the data regarding preparedness in this review, it important to understand the heterogeneity of ways in which preparedness has been measured across the studies. This is because a number of assumptions needed to be made regarding the level of preparedness that was 'acceptable' for us to classify any given construct (skill, knowledge, behavior) as suggestive that graduates are prepared or not. We will outline these assumptions following our description of the problem at hand.

Even with studies ustilising a seemingly similar method of data collection (e.g. questionnaires), the methods adopted for conceptualizing and measuring preparedness varied greatly across studies in this review. When Likert scales were used, the data were sometimes treated as being parametric and other times as non-parametric (e.g. categorical or ordinal data). Furthermore, the manner in which the numbers were attributed to the scales was sometimes reversed: some numbers representing a conceptual scale from 'prepared to unprepared' (e.g. Goldacre, Lambert et al. 2012) and others representing 'unprepared to prepared' (e.g. Watmough, Cherry et al. 2012). Some used 5-point scales and others used 4-points.

For example, Bleakley and Brennan simply asked "how well did your undergraduate course prepare you for examining patients" (Bleakley and Brennan 2011) and provided the five categories: '*unprepared'*, '*not very well prepared'*, '*prepared'*, '*well prepared'* and '*extremely well prepared'* (analysed and presented as categorical data). Others gave a general preparedness statement such as "my experience at [medical school] prepared me well for the jobs I have undertaken so far" (Goldacre, Lambert et al. 2012, Watmough, Cherry et al. 2012) with a 5-point Likert scale response from '*strongly agree'* to '*strongly disagree'* (analysed categorically) (Goldacre, Lambert et al. 2012) or '*generally not at all'* to '*generally very well prepared'* with '*generally quite well prepared'* as the midpoint (analysed using the Mann Whitney U test suggesting they conceptualized these data points as ordinal) (Watmough, Cherry et al. 2012). For Goldacre, if the respondents did not feel prepared, they were then asked to indicate in what area this was – which included clinical procedures – and then asked "was lack of preparedness a serious, medium-sized or minor problem for you?" (Goldacre, Lambert et al. 2012: p.2).

Another approach was to ask F1 doctors to rate their preparedness for practice *at the point of graduation* (so more specific than the previous general question) against a range of curricula outcomes using a 4-point Likert scale '*poor'*, '*satisfactory'*, '*good'* and '*very good'* (analysed as parametric data utilizing the concept of a mean level of preparedness) (Tallentire, Smith et al. 2011). However, some researchers did not specify the exact question they asked. For example, Morrow et al. (2012) used a 5-point likert scale "from 1 for '*not at all prepared'* to 5 for '*fully*

prepared'" mapped against 53 items derived from TD03 (Morrow, Johnson et al. 2012). Furthermore, in their report, they subsequently failed to specify all the points on their scale, therefore leaving it difficult for the reader to know the exact point at which 'unpreparedness' begins. Other studies did not specifically ask whether their undergraduate course had prepared them, but merely asked a general question such as "I feel that I am competent to perform a male [female] genital [and pelvic] examination" with a *'strongly agree'* to *'strongly disagree'* 5-point Likert scale response (analysed categorically) (Estcourt, Theobald et al. 2009). Not all studies used likert scales of confidence/competence judgments. Some studies were knowledge-based. For example, Atrey and his colleagues used a short test comprising different scenarios based on 'essential' and 'useful' topics that consultant orthopaedic surgeons felt were important for medial graduates' first 'on-calls' in their ward or in the Emergency Department (Atrey, Hunter et al. 2010).

Having revealed the complexity and challenging comparability of the data, we now consider how we extracted the data from the studies depending on the individual scale each study utilizes (for quantitative research studies) and how the data were presented (for qualitative studies).

3.2.6. Data extraction

Data extraction was undertaken using Atlas.ti software. The codes for data extraction were developed from TD09 and informed by discussions with the GMC and the included literature (see Appendix E, p.224, for full list of codes). In addition, each code had four 'preparedness' codes associated with them so the researchers could code the appropriate level of preparedness that was concluded by the authors of each manuscript: the codes were 'data suggests trainees are prepared'[5], 'data suggests trainees unprepared', 'data are ambiguous regarding preparedness' and 'data are inconclusive regarding preparedness'.[6] For the data to suggest that graduates are prepared, we used the following rule of thumb (although each time we coded we weighed up a number of factors including the distribution of scores):

- For quantitative studies:
  - When the % of respondents is cited in the results (so likert scale data are considered to be categorical) at least 20% of the respondents needed to have said they felt prepared at the highest level (if there was a normal distribution of responses this rule of thumb meant that no more than 20% felt highly unprepared). This was chosen to avoid the acceptance of a preparedness judgment when respondents clustered around the mid-point in the 'neither prepared nor unprepared' category.
  - Where likert data were analysed parametrically (so means were reported rather than % of participants), the mean level of preparedness needed to be above the mid-point (or equivalent depending on the levels utilised in the scale, for there is no midpoint in the 4-point likert scale used by some researchers).
- For qualitative studies:
  - A theme (or subtheme) indicating a high level of preparedness was used.

All 81 manuscripts were entered into Atlas.ti. As there were a total of 855 codes (including the associated levels of preparedness codes), code families were created according to each of the main research questions to aid the coding process.[7] A crib-sheet for the coding process was developed

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[5] Sometimes the words 'understand' (for knowledge domains), or 'recognise' were used rather than 'prepared' where appropriate.

[6] In this context, the term *ambiguous* means the data are messy and some of it says 'yes prepared' and other data in the same paper say 'not prepared'. *Unclear* means that the paper itself is not clear – perhaps the findings are not very strong and the authors are not very forceful in saying if trainees are prepared.

[7] Atlas.ti filters the codes by 'family' so only the relevant codes are displayed thereby focusing the coding of the data.

by LVM and a joint training session was held to ensure consistency of coding across the researchers.

The three researchers (LJG, ZJ & EP) initially worked independently on a subset of the data. Along with coding each manuscript, researchers made additional written comments on the data, recording these in the main Atlas.ti file. Thirty per cent of the 81 papers were cross-checked by a second researcher. No significant changes to the chosen codes were made as a result of this process, but additional comments were made. Further codes were produced inductively from the research findings in the manuscripts. Due to these developments, some of the earlier papers needed to be re-coded. Through this process, therefore, each researcher double-checked the majority of their papers, further improving the quality of coding and reflections on the comments made.

3.2.7. Mapping process

The codes were then cross-checked against the outcomes identified in TD09 to ascertain the amount of data coverage each of the outcome domains and specific skills, knowledge and procedures has (Appendix F, p.229). As we can see from Appendix F, the coverage of research evidence across the TD09 outcomes is very patchy for the past 5 years, with many areas having very little (or no) data for us to work with (e.g. the domain 'Doctor as a scholar and a scientist').[8]

3.3. Results

The results section is structured according to the research questions. Each question is considered in turn, and where possible pre-TD09 data is compared with post-TD09 data.[9] Comments are included on the quality of the data in terms of its strengths and limitations as derived from our quality assessment process.

3.3.1. RQ1 How has preparedness for practice been researched?

This first section considers some of the ways in which preparedness for practice has been conceptualized and measured within the literature identified for this review. In doing so we highlight both the strengths and limitations of this work, which we later consider when we discuss the broader issues of how prepared medical graduates are for practice in general.

3.3.1.1. RQ1a How has preparedness been conceptualised?

We can consider the issue of conceptualisation in terms of the types of phrases researchers use to describe how prepared medical graduates are. We review (a) the timeframe they consider when researching this; and (b) whether preparedness is considered to be something one person possesses (or not) or whether it is a process which happens over time and in specific contexts.

For the majority of manuscripts in this review, these nuances were glossed over and the issue of preparedness for practice was either conflated with other terms (e.g. preparedness for practice and readiness for practice are used interchangeably: Bleakley and Brennan 2011, Goldacre,

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[8] We have not organized our data using the a-priori clusters outlined in the TD09 such as doctor as scholar, doctor as scientist etc., because such heuristics were not typically found in the papers we reviewed. Instead, we utilise themes that cluster at the levels of the individual, the interpersonal, the technological and the cultural to capture the complexities of the demands within the workplace environment.

[9] For this comparison, we noted all the manuscripts that clearly stated when the data were collected and classified those accordingly. For manuscripts that did not mention this, we took the pragmatic assumption that data in manuscripts published between 2009-2011 was likely to have been collected pre-TD09 due to reasonable research and publishing timeframes, whereas data in manuscripts published between 2012-2013 were likely to have been collected after 2009. As this is very much a pragmatic and therefore arbitrary classification we will comment on this aspect as we present the data for each research question when appropriate.

Lambert et al. 2012, Morrow, Johnson et al. 2012) or just assumed to be a straightforward immediate skills-based competency or knowledge-based issue (e.g. Dawson, Bruce et al. 2009, Dickson, Morris et al. 2009, Tallentire, Smith et al. 2012). These included prescribing skills, diagnostic skills, practical clinical skills and knowledge (e.g. of a wide range of specific aspects such as statistics, sexual health and orthopaedics). One study, however, along with considering predefined notions of preparedness, included an open question in their questionnaire asking medical graduates and their educational supervisors to identify any additional areas they felt were important regarding preparation for practice (Tallentire, Smith et al. 2011).

Thus, in many of the studies in this review, *preparedness for practice* as a construct was not explicitly mentioned. Indeed, the issue of how well prepared undergraduate medical education had made the foundation doctors in their particular studies was not always discussed (e.g. Jen, Bottle et al. 2009, Atrey, Hunter et al. 2010, Franklin, Reynolds et al. 2011, Ahmed, Arora et al. 2012, Gordon 2012, Bertels, Almoudaris et al. 2013). Rather, the focus of such studies was often addressed as individual, immediate skills-based competencies or knowledge-based issues that needed to be developed *in situ* during the foundation years.

While some studies in this review examined quite a broad range of knowledge, skills and personal attributes (including 'coping with uncertainty, e.g. Brennan, Corrigan et al. 2010), others focused purely on the personal/interpersonal aspects of preparedness in terms of student resilience (e.g. Linklater 2010, Benbassat, Baumal et al. 2011, Fox, Doran et al. 2011) and interpersonal skills (e.g. Arora, Ashrafian et al. 2010). In doing so, this broadens the scope from being an immediate transitional skills/knowledge-based preparedness issue towards becoming a longer-term preparation for becoming a doctor.

In terms of this temporal aspect of preparedness, many of the research papers in this review explicitly focused on the narrow transition from medical student to F1 doctor (e.g. Roberts 2009, Brennan, Corrigan et al. 2010, Matheson, Matheson et al. 2010, Bleakley and Brennan 2011, Dickson 2011, Vaughan, McAlister et al. 2011, Kavanagh, Boohan et al. 2012, Wijnen-Meijer, Kilminster et al. 2012). This transition sometimes comprised the initial few weeks – some explicitly citing the August transition period (Jen, Bottle et al. 2009, Vaughan, McAlister et al. 2011) – others referring to the GMC's TD93 statement that "Students must be properly prepared for their first day as a Pre-Registration House Officer" (e.g. Cave, Woolf et al. 2009, Goldacre, Taylor et al. 2010) as these studies were probably conducted before later editions of *Tomorrow's Doctors* which broaden the issue out. For the majority of studies, however, the period under examination spanned many months, and for some, the period covered the entire two years of Foundation training. Only one study, however, explicitly stated how they wished to evidence the effectiveness of the undergraduate curriculum for graduates' preparedness in up to 6 years beyond graduation (Watmough, Cherry et al. 2012).

Although still focusing on collecting data in the short-term transitional timeframe, some studies did adopt a more long-term conceptualization of preparedness. However, preparedness here was not necessarily to do with skills and knowledge, but rather it was concerned with issues of personal preparedness in terms of how students coped with stress and illness during the transitional period (Benbassat, Baumal et al. 2011, Fox, Doran et al. 2011). While one might consider that the ways in which individuals deal with such issues has little to do with their undergraduate training, there is a cultural issue: it is during their training period that doctors learn that 'illness belongs to patients' (Fox, Doran et al. 2011: p.1252) and medical students can experience great difficulties in adopting the patient role as they are being socialised into a profession that can view illness as failure (Monrouxe and Sweeney 2013). Fox and her colleagues explicitly consider this issue of preparedness.

Interestingly, while preparedness is constructed in many different ways across the studies, the most under-debated issue around preparedness within manuscripts was whether it is a personal, an interpersonal and/or a contextual construct. This broader conceptual debate was discussed in

the only paper in the review to explicitly define their working definition of preparedness for practice (Kilminster, Zukas et al. 2011). By studying the key transitions points for foundation year and specialist trainee doctors and theorising about doctors' performance during transitions, Kilminster and her colleagues were able to problematise the issue of preparedness. Through their analysis of trainees' personal accounts of their experiences the researchers understood how individuals' performances are "fundamentally affected by organizational practices, activity and cultures" (p.1013). This finding, and their conceptualisation of transitions (and therefore preparedness for them) as a contextual as well as a personal construct, is of great importance for the future development of medical education curricula. We will elaborate further on this issue later in this report.

3.3.1.2. RQ1b How has preparedness been measured?

There is a range of data collection methods across the manuscripts within this review including quantitative (e.g. surveys, questionnaires, assessments of knowledge), qualitative (e.g. interviews, observations) and desk-based methods (e.g. systematic reviews, scoping exercises). The most common measure of graduates' preparedness (in all its guises) is the self-report questionnaire, comprising 44% of the manuscripts (n=36 studies, see Appendix G, p.236, for details of all methods and studies). The next most common method comprised self-reported preparedness via qualitative interviews (either one-to-one or in focus groups, 21%; n=17 studies). The use of self-reports is not unproblematic, as discussed in the introduction: for example, factors such as gender, ethnicity and graduate entry may be significant predictors for feeling prepared (Goldacre, Taylor et al. 2010) because of respondents' (e.g. male, white, graduate entry) greater self-efficacy and therefore confidence rather than their actual level of competency per se. Furthermore, there is the issue of asking graduates a generalized acontextual question around how prepared they are for certain skills and procedures that is divorced from the actual patient encounter. This ignores the important question of "how, and in what circumstances are you prepared" which can shed light onto the ways in which we might address issues of unpreparedness in the future.

Some studies collected data from more than one source (e.g. trainees and trainers) to assess preparedness (e.g. Brown, Watmough et al. 2010, Kilminster, Zukas et al. 2011, Cresswell, Howe et al. 2013), and some used more than one type of data-collection method (e.g. Kilminster, Zukas et al. 2011), thus providing a method of triangulation (and therefore, enhanced confidence in their findings). It is interesting to note, however, despite calls to include patients in the process of evaluating and developing doctors' practice, that only one study included patients as a participant group (Cresswell, Howe et al. 2013).

The fact that we have a range of studies with different research methods and participant groups, all considering similar issues, means that this review will provide us with a greater understanding of medical graduates' preparedness for practice: this 'triangulation' of data is one strength of the rapid (systematic) review process.

SUMMARY BOX (RAPID REVIEW): RESEARCH APPROACHES USED IN THE PUBLISHED LITERATURE

- Most studies did not define or conceptualise 'preparedness for practice';
- Most studies focused on the knowledge and skills needed immediately upon graduation (days, weeks or months into clinical practice);
- Fewer researched longer-term preparedness for becoming a doctor and/or considered attributes beyond knowledge and skill;
- Whether preparedness was a personal, interpersonal and/or contextual construct was underdebated;
- The most common method used was self-report questionnaires, followed by self-report qualitative interviews;
- The most common limitations of the studies were:

- o self-report data that may not reflect actual preparedness;
- o generalised acontextual data that were disconnected from clinical encounters.
- A few studies collected data from more than one source (e.g. trainees and trainers) and / or used more than one data-collection method;
- Only one study included patients as a participant group.

3.4. RQ2 How effective are final year undergraduate-F1 transition interventions?

Following recommendations by Illing et al. (2008), TD09 deemed that students should gain practical experience across a number of healthcare settings. It therefore introduced the concept of compulsory student assistantships where medical students were able to use their skills with real patients. TD09 also encouraged medical schools to coordinate shadowing periods so that students could assist the F1 presently in the post that they would assume post-graduation.

Eighteen per cent (n=15) of the papers in this review contained data on transition interventions: assistantships, induction, and shadowing. Although there were some papers that touched on the issue of mentors and mentoring, they were scarce and the data seemed conflated with the influence of role models. These are not specific to the transition process per se and have been excluded here.

3.4.1. Student Assistantships

> "*A student assistantship is a type of clinical placement. It should be designed to increase the preparedness of the medical student to start practice as an F1. Although some direct care of patients is implicit and necessary, it is primarily an educational experience which should provide a number of hands-on learning experiences that allow the medical student to gain experience of working within clinical settings and practise clinical skills. The students should be fully integrated within a clinical team and should be responsible for carrying out specified duties under appropriate supervision*" (General Medical Council 2011: p.2)

The GMC require medical schools to provide students with at least one final year period of student assistantship. During this period, rather than being passive observers, they are an active assistant to their supervising junior doctor (General Medical Council 2009, General Medical Council 2011). Analogous schemes in New Zealand have cumulated in positive results with students reporting increased levels of preparedness (Collins 2010).

Despite numerous 'hopeful' comments by authors cited in this review regarding the promise of assistantships being the answer to numerous issues uncovered around junior doctors' unpreparedness (e.g. Dornan, Ashcroft et al. 2009, Goldacre, Taylor et al. 2010, Kavanagh, Boohan et al. 2012, Morrow, Johnson et al. 2012, Rothwell, Burford et al. 2012, Illing, Morrow et al. 2013), only one paper in our rapid review reported data (self-reports) on assistantships (Brennan, Corrigan et al. 2010), although this was not the specific focus of the paper. Rather than examining the effectiveness of assistantships in terms of outcomes for students, two further papers examined what activities could be (or should be) undertaken during the assistantship period (Vivekananda-Schmidt, Crossley et al. 2011, Tallentire, Smith et al. 2012). While providing us with no evidence of efficacy, we have kept these papers in the review as they provide us with important conceptual understandings of the assistantship period.

Brennan et al. (2010) explored the experiences of 31 junior doctors during their first year of clinical practice via qualitative interviews, with ten of these also keeping audio diaries. While assistantships were not explicitly asked about, some participants talked about learning from prior experience – "*I think it also helped the fact that I had already worked with that team in my medical*

school training, so I knew the individuals there and that was very helpful and I think it helped relieve a lot of my anxieties about starting work as a doctor" (p.454). Assistantships in this way were beneficial to the participants; they not only relieved anxieties but were invaluable at incorporating the student into the multi-disciplinary team (MDT) removing inter-professional barriers and forging mutual relationships of trust. However, it must be noted that the specific word 'assistantship' was not mentioned in this paper (although the concept itself was present) and only a handful of quotations from junior doctors referred to these medical school experiences.

When considering the views of heads of schools, deans, and final-year leads regarding what could or should be undertaken during assistantships, Vivekanada-Schmidt et al. (2011) found that not every duty an F1 undertakes was considered suitable for assistantships. However, an extensive range of skills, such as history taking, examination, diagnosis, clinical decision-making, safe prescribing, medical administration, infection control, teamwork, practical procedures and selecting appropriate investigations, can invaluably be assimilated into assistantships. When asked about the most useful learning opportunity of the assistantship period by Tallentire et al. (2012), the top three chosen by both junior doctors and their educational supervisors were prescribing, acute care and prioritisation of ward tasks. Conversely, activities such as recognising and reviewing do not attempt resuscitation (DNAR) decisions, corresponding with outside professional bodies and effective communication of bad news, were not deemed as appropriate (Vivekananda-Schmidt, Crossley et al. 2011).

SUMMARY BOX (RAPID REVIEW): EFFECTIVENESS OF STUDENT ASSISTANTSHIPS

- Student assistantships are intended to provide an opportunity to be an active assistant to a supervising junior doctor;
- Only one paper reported data relevant to the effectiveness of assistantships and this was broadly supportive;
- The most important learning opportunities within assistantships were considered to be prescribing, acute care and prioritisation of ward tasks;
- Senior medics deemed 'do not attempt resuscitation' (DNAR) decisions and effective communication of bad news inappropriate activities for student assistants.

3.4.2. Shadowing

"*Shadowing is primarily about familiarising the student with a specific site where they will be working in the future … Separate from and following their student assistantship, they should, wherever practicable, have a period working with the F1 who is in the post they will take up when they graduate … The 'shadowing' period should normally last at least one week and take place as close to the point of employment as possible*" (General Medical Council 2011: p.54).

The shadowing period is aimed at enabling students to become familiar with their future working environment and will be expected of them. It provides protected time to develop relationships with their clinical and educational supervisors and the colleagues they will work with in their new F1 role. Shadowing is distinct from the general induction sessions that are provided for new employees and Foundation Programme trainees (General Medical Council 2011).

Shadowing is the transitional intervention that appears to have been mentioned reasonably frequently in research cited within this rapid review (although shadowing is not always the main focus of the document): Seven papers reported relevant data collected pre-TD09 and four presented findings post-TD09 (Box 5 below). All studies collected self-reported data only, except for two (Kavanagh, Boohan et al. 2012, Illing, Morrow et al. 2013). However, while Illing et al. (2013) reported in their 'Shadowing' theme that "The importance of developing expertise in the

workplace was reinforced by data collected from the clinicians who worked with the new junior doctors" (p.8), they reported no data from clinicians regarding the efficacy of the shadowing experiences already in place. Further, only 28 clinical supervisors responded to the questionnaire in Kavanagh et al.'s (2012) study.

BOX 5: STUDIES WITH SHADOWING DATA PRE- AND POST-TD09 BY PARTICIPANT-TYPE

	Pre-TD09	**Post-TD09**
Self-report	(Cave, Woolf et al. 2009, Dornan, Ashcroft et al. 2009, Brennan, Corrigan et al. 2010, Brown, Watmough et al. 2010, Matheson, Matheson et al. 2010, Burns 2011, Vaughan, McAlister et al. 2011)	(General Medical Council 2011, Kavanagh, Boohan et al. 2012, Illing, Morrow et al. 2013, Mattick, Rees et al. 2013)
Educator-report	NONE	(Kavanagh, Boohan et al. 2012, Illing, Morrow et al. 2013)

The majority of studies, both pre- and post- TD09, found shadowing to be an effective intervention for preparing medical graduates for practice. However, shadowing is not a singular concept. There have been variable findings regarding the most efficacious method of shadowing, particularly related to the timing and duties undertaken whilst shadowing.

Overall, the data in this review suggest that shadowing is viewed as a proficient method at developing preparedness by graduates (so, self-reports Brennan, Corrigan et al. 2010, Burns 2011, Vaughan, McAlister et al. 2011, Kavanagh, Boohan et al. 2012, Illing, Morrow et al. 2013). Furthermore, while not presenting data on the effectiveness of shadowing per se, 44% of the F1 respondents in Van Hameland Jenner's (2011) study requested a longer period of shadowing to increase their feelings of preparedness, a feeling echoed by participants in other studies (e.g. Vaughan, McAlister et al. 2011). This suggestion is not without evidence: F1s' feeling of preparedness has been demonstrated to correlate with length of time shadowing and agreement with the statements 'My teaching was relevant to real life as a doctor' and 'As a house officer I found it easy to get help when I needed it' (Cave, Woolf et al. 2009).

While this might be the case, just how long should a period of shadowing be in order for it to become efficacious? Research cited in this review suggests that prolonged shadowing can be ineffectual due to the repetitive nature of the tasks undertaken with little opportunity for new learning (Dornan, Ashcroft et al. 2009). This aspect of the shadowing experience clearly needs further attention. And whilst the data cited in this review clearly demonstrate that some shadowing is better than none (Cave, Woolf et al. 2009, Brennan, Corrigan et al. 2010), shadowing is not a panacea and preparedness is not guaranteed (Cave, Woolf et al. 2009) and should be reinforced with related teaching. Furthermore, the shadowing experience must be truly reflective of the F1s' new post in order for it to be beneficial (Matheson, Matheson et al. 2010).

So what is it about shadowing that benefits the transition process? One recurring theme is the idea of increased responsibility in terms of having shared ownership of patient care (e.g. Brennan, Corrigan et al. 2010, Burns 2011, Illing, Morrow et al. 2013). Increased responsibility is quite a concern for many junior doctors (Burns 2011) but shadowing provides a superior sense of belonging than merely observing, providing greater understanding of the reality of being a doctor (Brennan, Corrigan et al. 2010, Burns 2011). Furthermore, shared ownership acts as "a safety net for those who have been hesitant to become more participatory, enabling them to engage more with the new role which is ahead of them" (Illing, Morrow et al. 2013: p.8). It might also be the recognition that they are actually going to have to undertake this job very soon.

In terms of what should be covered during shadowing periods, the following aspects were specifically called for in the research cited within this review: death certification, prescribing, working with pharmacists, medication management, and patient handovers (Cleland, Ross et al. 2009, Dornan, Ashcroft et al. 2009, Matheson, Matheson et al. 2010, Illing, Morrow et al. 2013). Furthermore, medical students have asked to be able to undertake shadowing on call, and at night and weekends (Matheson, Matheson et al. 2010). Indeed, working on night duty for the first time and being on-call is a very stressful time for junior doctors, but those given opportunities to shadow on night duty find it less stressful (Brennan, Corrigan et al. 2010). Students also report feeling despondent when they are sent home early or not included in shift work as this did not truly reflect, and thus prepare them for actual real-life practice (Matheson, Matheson et al. 2010). This lack of inclusion is echoed in the data from Kavanagh et al. (2012) who found that only 57% (n=16) of educators agreed/strongly agreed that shadowing enhanced students' clinical skills, while 75% (n=18) considered that their practical skills[10] were improved. This could be attributed to the lack of opportunity for students to undertake clinical skills during shadowing due to ethical reasons, and perhaps the implementation of assistantships (already discussed above) will help address this disparity in skills.

As for the timing of the shadowing experience, it has been suggested that this is best attended close to employment (Vaughan, McAlister et al. 2011, Illing, Morrow et al. 2013): the 'business of being a junior doctor' is the area where students feel extremely unprepared thus shadowing should incorporate every aspect of being a new F1.

Although the majority of data suggest that shadowing is efficacious in general, data in the review are inconclusive about the perceived educational engagement by students and doctors and with the assessment of shadowing through logbooks (Dornan, Ashcroft et al. 2009, Kavanagh, Boohan et al. 2012). For example, Dornan et al. (2009) found a culture of ineffective shadowing with some students reporting being sent home early, or being told not to worry as they would develop skills later in their careers, and Kavanagh et al. (2012) reported that only 46.5% of clinicians felt students took full advantage of their shadowing period. This might be attributed to student's sense of lack of relevance to their shadowing – which could be addressed by moving the shadowing period closer to graduation and thereby emphasizing its relevance and immediacy. It might, however, reflect students' disgruntlement with their assessment process: the logbook. Students reasoned that just because a logbook is signed it didn't necessarily reflect actual competence: some reported that it was very easy to get a logbook signed, irrespective of actual competence (Kavanagh, Boohan et al. 2012). Indeed, 42.9% disagreeing that the signatures in the logbook gained by the students indicate that the students have genuinely completed/ performed the task which has been signed off. This culture of signing off competencies (or not signing at all) regardless of ability is not uncommon in the postgraduate arena (Rees, Cleland et al. 2013).

SUMMARY BOX (RAPID REVIEW): EFFECTIVENESS OF SHADOWING

- Shadowing aimed to enable students to become familiar with their future working environment;
- Most studies found shadowing to be an effective intervention but the degree depended on the timing, duration and duties;
- Shadowing was deemed most effective close to employment;

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[10] Many studies use the terms clinical skills, practical skills, practical procedures interchangeably so we contacted the authors for clarification here. The study was undertaken during the academic year 2007-8 and thus before the publication of TD 2009 where the full list of practical procedures was created. The researchers referred to the Tomorrow's Doctors 2003 edition. They didn't provide specific definitions to the students. However, they worked on the premise that the students would interpret these skills according to pages 12 and 13 of TD03 (and assume that the clinical skills refer to those listed at the top half of page 12 and practical skills the lower half).

- Perceived preparedness correlated with duration of shadowing;
- Death certification, prescribing, working with pharmacists, medication management, patient handovers, and shadowing on call, and at night and weekends were all useful shadowing activities;
- Students didn't appreciate being sent home early or being excluded from shift work and were often disgruntled with the logbook assessment, which didn't seem to reflect competence and was easy to get signed off.

3.4.3. Induction

"*Induction is normally understood to be the mandatory process whereby a new employee, such as a medical graduate about to take up a Foundation Programme position, is introduced to the environment and employment policies of a new position. It is fundamentally about ensuring that all members of staff have received the information that they need in order to start their new job and is normally the responsibility of a Human Resources department. Induction sessions should be clearly distinguished from shadowing*" (General Medical Council 2011: p.5).

Despite this clear definition, some researchers (and participants) still confused shadowing with induction (Van Hamel and Jenner 2011, Vaughan, McAlister et al. 2011). Furthermore, induction can be face-to-face, via information packs given to foundation doctors prior to starting on a new ward and online induction (Van Hamel and Jenner 2011, Vaughan, McAlister et al. 2011, Mattick, Rees et al. 2013). As such, caution needs to be taken when interpreting the results, as no two induction programmes are the same. The majority of studies in this section comprised self-report data (Box 6 below).

BOX 6: STUDIES WITH INDUCTION DATA PRE- AND POST-TD09 BY PARTICIPANT-TYPE

	Pre-TD09	Post-TD09
Self-report	(Dornan, Ashcroft et al. 2009, Burns 2011, Van Hamel and Jenner 2011, Vaughan, McAlister et al. 2011)	(General Medical Council 2011, General Medical Council 2012, Goldacre, Lambert et al. 2012, General Medical Council 2013, Mattick, Rees et al. 2013)
Educator/Other-report	(Burns 2011)	NONE

The majority of studies in this review with data on induction found it to be an effective intervention in preparing medical graduates for their roles as F1 doctors (Dornan, Ashcroft et al. 2009, Burns 2011, General Medical Council 2011, Van Hamel and Jenner 2011, General Medical Council 2012, Goldacre, Lambert et al. 2012, General Medical Council 2013, Mattick, Rees et al. 2013). For example, analyzing data collected across the East of England Deanery (both hospital trust and new graduate participants), Burns (2011) found their specific induction and shadowing intervention 'Preparing for Professional Practice' (PfPP) in 2010 to be extremely effective in preparing graduates for practice[11]. Over 90% (n=27) of hospital-trust respondents (comprising Foundation Training Programme Directors, Clinical Teachers, Medical Education Managers & HR

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[11] We note that the authors' definition of induction included an element of shadowing and it was not explicit the extent to which the benefits were due to the HR element or the shadowing experience.

personnel) from 18 different trusts thought that the medical graduates were better prepared for their new role as F1 doctors following their PfPP programme, with 78% (of 426) of graduate respondents either strongly agreeing or agreeing that they understood and felt confident of their roles and responsibilities. Indeed, for the majority of areas there was a marked improvement from pre-PfPP questionnaire responses around preparedness compared with post-PfPP questionnaire responses. Only 11% reported that the PfPP was not useful.

Not only is it in the East of England where induction appears as a positive and effective intervention across NHS trusts. This seems to be the case nationally. While data does not exist for cohorts pre-2011, the GMC training survey 2011 reports that 64.1% of all trainees surveyed found their induction to be good or excellent (General Medical Council 2011). Furthermore, there has been a small rise in this number in subsequent years: 64.7% (General Medical Council 2012) and 65.3% (General Medical Council 2013) indicating that trainees generally value induction.

However, while induction appears to be effective when medical graduates receive it, the biggest issue appears to be that induction is inconsistent across trusts or across/within each ward (General Medical Council 2011, Vaughan, McAlister et al. 2011, Goldacre, Lambert et al. 2012, Mattick, Rees et al. 2013). Problems regarding insufficient induction appear to stem from timetable difficulties and staff shortages. This has led researchers to suggest a potential correlation between feelings of unpreparedness and poor/no induction (Vaughan, McAlister et al. 2011, Goldacre, Lambert et al. 2012, Mattick, Rees et al. 2013), which in turn can breed errors and feelings of unpreparedness, anxiety, frustration and a sense or disorganization (Vaughan, McAlister et al. 2011, Mattick, Rees et al. 2013).

In terms of study quality, it is worth noting that the studies discussed in this section are all considered to be of high quality (i.e. they were classified during the quality assessment process as 'yes absolutely' for inclusion in this review). Furthermore, we found no difference in the study findings across data collected pre-TD09 and post-TD09.

SUMMARY BOX (RAPID REVIEW): EFFECTIVENESS OF INDUCTION

- The term induction was often confused with shadowing;
- Induction could be face-to-face, via information packs or online;
- Induction was generally found to be an effective intervention;
- However, induction appears to be inconsistent across hospital trusts and/ or across wards.

3.5. RQ3 How prepared are graduates for specific tasks, skills and knowledge?

Having considered the data regarding the various transition interventions, we now focus on the data concerning medical graduates' preparedness for specific tasks, skills and knowledge. However, it is important to note that the data are complex and comparisons were not straightforward. There are variations across the studies in terms of how preparedness was measured with different sized Likert scales and with different anchors: so higher values sometimes equaled more prepared and sometimes equaled less prepared (see earlier section for our more detailed critique of this).

3.5.1. Carry out practical procedures safely and effectively

TD09 lists 32 Practical procedures for graduates in their Appendix. In our review we include eight papers with data collected pre-TD09 that comment on medical graduates' abilities to carry out a range of specific practical procedures safely and effectively which we draw on here, along with three studies with data collected post-TD09 (Box 7). As the procedures each study examined cover

a wide range of skills and in some cases there are only one or two papers that considered the specific skill itself (or reported data on it) we present the pre-TD09 and post-TD09 data together.

The only large-scale multi-site study examining graduates' preparedness for clinical procedures is Goldacre et al. (2010; 2012) with over 50% of all UK junior doctors across the 2005-2009 graduating cohorts responding to this question across both studies. While the majority of those surveyed indicated they felt prepared for undertaking clinical procedures, around one fifth felt unprepared in recent years (21.3%: Goldacre, Lambert et al. 2012). It is worth noting that one smaller-scale study found that 37% of participants from the traditional curriculum participant group (total n=116) reported themselves as being 'less than quite well prepared' for the broad question 'undertaking practical procedures on patients' but 64% of the reformed curriculum participants (total n=117) felt 'generally more than quite well prepared' (Watmough, Cherry et al. 2012). Therefore, curricula design potentially has much to do with preparedness. Furthermore, Tallentire and her colleagues asked trainees (F1s) and educational supervisors (ES: total over 3 cohorts n=107 F1s and 85 ES) whether graduates were prepared 'to carry out practical procedures (e.g. venepuncture)' using a 4-point likert scale (poor=1, satisfactory=2, good=3, and very good=4). They reported an overall lower mean response from the ESs' (m=2.08; SD=0.78) than FY1s (m=2.94; SD=0.80), suggesting a greater concern by supervisors that some graduates were unprepared (Tallentire, Smith et al. 2011).

BOX 7: STUDIES WITH PRACTICAL PROCEDURES DATA PRE- AND POST-TD09 BY PARTICIPANT/DATA-TYPE

	Pre-TD09	**Post-TD09**
Self-report	(Brown, Watmough et al. 2010, Elsayed, Roberts et al. 2010, Goldacre, Taylor et al. 2010, Bleakley and Brennan 2011, Tallentire, Smith et al. 2011, Goldacre, Lambert et al. 2012)	(Morrow, Johnson et al. 2012, Wijnen-Meijer, Kilminster et al. 2012, Illing, Morrow et al. 2013)
Desk-based research / Other-report	(Dornan, Ashcroft et al. 2009, Matheson and Matheson 2009, Naghavi and Sanati 2009, Tallentire, Smith et al. 2011)	(Morrow, Johnson et al. 2012, Wijnen-Meijer, Kilminster et al. 2012, Illing, Morrow et al. 2013)

However, these broad-brush questions provide us with no detail about where preparedness is at issue. Indeed, no study (or set of studies) has examined all 32 of the practical procedures for graduates as outlined in the TD09 in detail. When we look at the evidence examining specific skills, there is wide variation of preparedness across the different skills themselves. Due to the size of the table, we set out the details of the studies in our review that evidence medical graduates' preparedness for specific practical procedures in Appendix H, p.238.

As can be seen in Appendix H there are some practical procedures specified as outcomes in TD09 where the evidence for or against preparedness is clear. For example, four studies across a range of curricula (including self-reports and other-reports) suggest that medical graduates are prepared to undertake venepuncture, with no studies suggesting otherwise (Matheson and Matheson 2009, Bleakley and Brennan 2011, Morrow, Johnson et al. 2012, Illing, Morrow et al. 2013). Suturing is the only area where there are no studies supporting preparedness.

Administering intramuscular and subcutaneous injections and making up drugs for parenteral administration appear to be the practical procedures where preparedness seems to be more problematic (Matheson and Matheson 2009, Naghavi and Sanati 2009, Brown, Watmough et al. 2010, Bleakley and Brennan 2011, Morrow, Johnson et al. 2012). For each of these, while there are data suggesting that sometimes graduates are prepared, these data are partial in that they are prepared accorded to self-report data but not supervisor data (e.g. Brown, Watmough et al. 2010), or they only concern one of the participant cohorts studied (e.g. Bleakley and Brennan 2011).

TABLE 1: STUDIES IN REVIEW ON GRADUATES' PREPAREDNESS FOR SPECIFIC TASKS, SKILLS AND KNOWLEDGE (MAPPED AGAINST TD09 OUTCOMES)

Domain (with specific TD09 outcome)	Studies with data suggesting prepared	Studies with data suggesting unprepared
Knowledge of anatomy (TD09 8*)	0	1
Understanding disease processes (TD09 8e*)	2	1
Applying clinical pharmacology and therapeutics (CPT) to prescribing (TD09 8f*)	0	2
Knowledge of clinical, behavioral and social sciences for medicine (TD09 9* & 10*)	2	0
Basic nutritional care/knowledge (TD09 11h)	2	0
Taking a history (TD09 13a)	8	0
Performing a full physical examination (TD09 13c)	5	0
Perform a mental-state examination (TD09 13d)	2	1
Using evidence and guidelines for patient care (including developing critical thinking) (TD09 14a*)	1	4
Recognising the social and emotional factors in illness and treatment (TD09 14a*)	3	1
To draw up an examination plan for a new patient at the outpatient department (TD09 14c*)	1	1
Selecting appropriate investigations and interpreting the results (TD09 14d*)	2	1
Planning discharge for patients (TD09 14g*)	1	0
Identifying signs of abuse (TD09 14i)	0	1
End of life care (TD09 14j)	0	2
Clinical reasoning and making a diagnosis (TD09 14f*)	3	8
Treating acutely ill patients (TD09 item 16*)	3	2
Diagnose and manage acute medical emergencies (TD09 16b)	3	10
Prescribing safely and legally (TD09 17c)	5	24
Calculate drug dosage and record outcome (TD09 17d)	0	5
Apply knowledge of alternative/complimentary therapies and how they affect other treatments (TD09 17h)	0	1
Explain drug prescription choice to pharmacist (TD09 17b)	1	1
Overall patient-centred practice and humane care/ recognizes all aspects of care (TD09 20b*)	1	1
Providing appropriate care for people of different cultures (TD09 20d*)	2	1
Knowledge of key mental health legislation (TD09 20f*)	1	0
Reducing the risk of cross-infection (TD09 23h)	1	0
Pre-operative assessment of patients	0	1
Taking part in advanced life support	1	1
Functioning safely in an acute 'take' team	0	1
Educating patients (health and public health) promotion	1	0
Maintaining good quality care	1	0
To ask a representative critical questions about the pharmaceutical product	0	1
Skills of close observation	0	1

NOTE: * Partially relevant to the specified outcome.

There are other areas where evidence suggests that graduates might have problems with some of the practical procedures included in the TD09 outcomes. These areas are carrying out basic respiratory function tests (Matheson and Matheson 2009, Bleakley and Brennan 2011, Morrow, Johnson et al. 2012 Brown, 2010 #3701) and the use of local anesthetics (Brown, Watmough et al. 2010, Bleakley and Brennan 2011). But for each of these procedures there are only two studies suggesting graduates are unprepared, but self-reported data and data from a single cohort suggests some level of preparedness exists for both local anesthetic use and performing/interpreting basic respiratory function (Brown, Watmough et al. 2010, Bleakley and Brennan 2011).

Finally, Appendix H (p.238) identifies 11 practical procedures not mentioned in TD09 for which there is some tentative data that preparedness is an important consideration (e.g. inserting a central venous line or a chest drain, nasograstric tube (NG) insertion). However, as these are not part of the TD09 outcomes, these might be of lesser concern (unless these are procedures that are 'expected' of graduates from their supervisors despite not being expected as outlined in TD09).

Therefore the data are very mixed. Firstly, only 11 of the 32 practical procedures are specifically considered in the studies in this review. Furthermore, for many of them there are little data, with some having only a single study providing evidence of preparedness (e.g. taking blood cultures from peripheral and central sites, control of haemorrhage). For some practical procedures, the data are inconclusive with a similar number of studies supporting preparedness and unpreparedness, and with those studies being evenly weighted according to their quality. Having said that, the differences between studies to some extent lie in the participant group, with educational supervisor reports (e.g. Matheson and Matheson, 2009) being lower than trainees self-reports (e.g. Bleakley and Brennan 2011). But on the other hand, due to the different studies drawing from a 'site-specific' participant group, the reason for the disparity could be due to the different curricula influences (Bleakley and Brennan 2011). Finally, most of the data suggesting graduates are prepared comprise a limited range of studies using generalized acontextual self-report methods, whereas the majority of data suggesting graduates are unprepared come from a broader range of studies using a greater variation of research methods.

SUMMARY BOX (RAPID REVIEW): PREPAREDNESS OF GRADUATES FOR PRACTICAL PROCEDURES

- Graduates generally felt quite well prepared for clinical procedures, although educational supervisors generally rated preparedness lower than the self-reports;
- Only 11 of the 32 practical procedures listed were specifically considered in the literature and, for many, the data were limited;
- Medical graduates appeared prepared to undertake venepuncture but less prepared to administer injections or make up drugs for parenteral administration and for medical emergencies.

3.5.2 Carry out a broad range of competencies

Many of the research papers cited in our review have published data on medical graduates' preparedness across a broad range of competencies and situations (see Table 1 above for an overview of the evidence and Appendix I, p.241 for the full table for research questions 3-6 complete with all references).

As we can see from Table 1, there are some areas where the question of whether graduates are prepared or not seems reasonably clear. Data suggests that trainees are reasonably well prepared for history taking and performing a full physical examination. Where preparedness is problematic includes graduates' clinical reasoning and diagnoses, safe prescribing, calculating drug doses and recording the outcome, and early management of patients with emergency conditions. We discuss these domains here; we do not comment further on the remaining domains identified for RQ3 in

Table 1 due to the paucity of data for them. Many of these domains have only one study reporting data and sometimes this is inconclusive in that different groups of participants in the same study or different respondents (i.e. self-reports versus supervisor reports) identify different levels of preparedness.

3.5.2.1. Taking a history

Medical graduates should be able to "Take and record a patient's medical history, including family and social history, talking to relatives or other carers where appropriate" (General Medical Council, 2009: outcome 13a, p.19). This data includes a range of self- (both qualitative and quantitative) and supervisor reports (questionnaires). Interestingly, this is one of the few areas that both trainee self-reports and supervisor reports concur and suggest that medical graduates are prepared for this activity both pre- and post TD09.

3.5.2.2. Performing physical examinations

The GMC specify that medical graduates should be able to perform a full physical examination (General Medical Council 2009: outcome 13c, p.19). In our review we cite seven papers with data collected pre-TD09 that comment on medical graduates' abilities to perform physical examinations (either a full examination or specific types) (Estcourt, Theobald et al. 2009, Matheson and Matheson 2009, Atrey, Hunter et al. 2010, Bleakley and Brennan 2011, Sirisena, Begum et al. 2011, Tallentire, Smith et al. 2011, Watmough, Cherry et al. 2012). One paper collected data post-TD09 (Morrow, Johnson et al. 2012). When asked about their preparedness for performing a full physical examination, medical graduates tended to respond positively, suggesting that they felt at least adequately prepared (Bleakley and Brennan 2011, Tallentire, Smith et al. 2011, Morrow, Johnson et al. 2012, Watmough, Cherry et al. 2012). This concurs with the views of specialist registrars (SpRs) and consultants (albeit from different teaching hospitals in the Trent Deanery: Matheson and Matheson 2009). However, these same SpRs and consultants suggested that trainees are unprepared to interpret the findings from the history, the physical examination and the mental-state examination, giving them a mean score below the average (Matheson and Matheson 2009). Interestingly, when we consider medical graduates' assessments of their own preparedness with those of their educational supervisors, although graduates' assessments were sometimes higher, both suggested at least a basic competency (Tallentire, Smith et al. 2011, Morrow, Johnson et al. 2012). However, these data were collected across a reasonably small number of medical schools, they covered a range of different cohort years and sometimes data were collected many years post-graduation. Additionally, the majority of the data supporting this conclusion come from research reporting mean Likert scale data with standard deviations. What this averaging of what is essentially non-parametric data tends to omit, therefore, is the number of medical graduates who feel (or who others feel) are unprepared.[12]

3.5.2.3. Clinical reasoning and diagnostic skills

The GMC states that medical graduates should be able to "Make clinical judgements and decisions, based on the available evidence, in conjunction with colleagues and as appropriate for the graduate's level of training and experience. This may include situations of uncertainty" (General Medical Council 2009: outcome 14b, p.20). 11 studies cited in our review (only two of which are post-TD09) contributed to our understanding of graduates' preparedness in this domain (Davis and MacLullich 2009, Estcourt, Theobald et al. 2009, Matheson and Matheson 2009, Atrey, Hunter et al. 2010, Brown, Watmough et al. 2010, Bleakley and Brennan 2011, George, Warriner et al.

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[12] This averaging of Likert scales masks people at the extremities of those scales: by saying the average is 3 on a 5-point Likert scale can give the impression that 100% of the sample are 3, but it could also mean that 50% are 1 and 50% are 5. While standard deviations often (but not always) accompany the mean, this still masks the actual number of medical graduates who are deemed to be unprepared.

2011, Tallentire, Smith et al. 2011, Laws, Baker et al. 2012, Morrow, Johnson et al. 2012, Watmough, Cherry et al. 2012). Four of these 11 suggested that medical graduates were prepared in terms of clinical reasoning and diagnosis, including one with mixed data of preparedness and not, with the remaining seven suggesting that trainees were unprepared. Furthermore, of the two studies that were conducted post-TD09, one suggests graduates are prepared and the other does not. The data in this domain come from a range of self- and other-reported methods, particularly where unpreparedness has been reported pre-TD09.

However, while the data appear to be reasonably clear, the GMC are careful to specify that clinical judgements and decisions should be made 'in conjunction with colleagues and as appropriate for the graduate's level of training and experience.' Researchers on the other hand, probably for reasons of expediency (e.g. to avoid overly long questionnaires), have omitted this detail. This could therefore inflate the degree to which trainees in these studies are deemed to be unprepared. It could be that they are prepared to undertake this task with colleagues. Furthermore, some of the studies in this review included general questions around trainees' abilities to reason clinically and make decisions (e.g. Bleakley and Brennan 2011) whereas others considered a specific disease or condition (e.g. delirium or sexual health Davis and MacLullich 2009, Estcourt, Theobald et al. 2009). It might therefore be possible that graduates can be seen as being 'generally' competent at reasoning and diagnosing, but lack the specific knowledge for certain specialist conditions.

3.5.2.4. Diagnose and manage acute medical emergencies

Outcome 16 of TD09 (General Medical Council 2009: p.22) concerns the ability of the medical graduate to provide immediate care in medical emergencies. Generally, the data in our review suggests that students are ill-prepared for this aspect of care (see also our previous analysis of the data on practical procedures). For this section we focus on the specific outcome 16b 'Diagnose and manage acute medical emergencies' as it is here that we have the most evidence from our studies. While two studies provide data that suggests trainees are prepared for this aspect of care (Carling 2010, Hobson 2011, Tallentire, Smith et al. 2011) both are self-report and one of these provides only partial evidence. A further ten provide evidence of unpreparedness (Bleakley and Brennan 2011, Hobson 2011, Mastoridis, Shanmugarajah et al. 2011, Tallentire, Smith et al. 2011, Gordon 2012, Kavanagh, Boohan et al. 2012, Morrow, Johnson et al. 2012, Tallentire, Smith et al. 2012, Tallentire, Smith et al. 2012, Wijnen-Meijer, Kilminster et al. 2012, Illing, Morrow et al. 2013). Once again, of the three studies that suggest a level of preparedness, one has only partial data from one of the cohorts studied (Tallentire, Smith et al. 2011), and the other two assessed levels of knowledge and self-reported preparedness following educational interventions (one during an undergraduate programme and one postgraduate) (Carling 2010, Hobson 2011). Together these two studies provide evidence that, following teaching intervention, there can be a beneficial effect in terms of knowledge, self-efficacy and confidence around managing medical emergencies. However, neither of these addressed trainees' ability to diagnose acute medical emergencies. Additionally, their findings are solely based on self-perception of knowledge and preparedness shortly following the intervention.

As for the studies that suggest a level of unpreparedness in trainees, the findings are not trivial. Indeed, across the ten studies that suggested deficiencies, the evidence comes from a range of data including self-reports, other-reports (e.g. supervisors, colleagues), a systematic literature search and audio/videos of simulated acute care scenarios. For example, the conclusions from a systematic literature review was that senior colleagues and other healthcare professionals working with newly qualified doctors considered them to be less prepared in acute care than for any of the other outcomes specified (Tallentire, Smith et al. 2012). Furthermore, they noted that perceived preparedness for acute care appears to have declined since TD93 (Tallentire, Smith et al. 2012). Interestingly, there are four post-TD09 studies cited in our review suggesting graduates are unprepared in the diagnosis and early management of emergency patients so while we cannot say

that preparedness has declined since the publication of TD09 the evidence suggests that the problem still exists.

In order to understand the issues around emergency care Tallentire and her colleagues videoed 38 junior doctors during high-fidelity simulated acute care scenarios (Tallentire, Smith et al. 2012). They identified skills-based slips and lapses (e.g. stating the incorrect heart rate, fails to request a chest x-ray, patient notes not being checked); rule-based lapses (e.g. mismanaging sepsis, failure to telephone the emergency team); knowledge-based mistakes (e.g. not knowing which antibiotics to administer); and violations (e.g. saying that they had taken the patient's pulse when they did not, sending incorrectly labelled blood samples). Additionally, they identify compound errors (where one mistake leads to another) and submission errors whereby a trainee is dissuaded from taking the most appropriate course of action by someone else (e.g. a senior doctor) suggesting a less appropriate measure. This latter scenario highlights the interactional component to managing acute medical emergencies and the possibility that junior doctors' lack of confidence around preparedness for emergency situations can lead them to ignore what they do know in favour of the others' perceived better knowledge. Furthermore, it has been suggested that taking on the central role of care – being the first in line for decision-making and action – further highlights graduates' lack of confidence in managing and assessing acutely sick patients (e.g. during night shifts) (Illing, Morrow et al. 2013). Interestingly, knowledge and skills around emergency diagnosis and management appears to take a long time to develop, with F1s at the end of their year still reporting that 'being the first doctor to deal with a sick patient was an area of concern' with some trainees suggesting it had implications for patient safety (Tallentire, Smith et al. 2012). Finally, data from one small-scale study suggests that graduates sometimes lack strong education around emergency care during their undergraduate years, whereby the majority of their participants reported receiving fewer than 5 hours of bedside teaching in trauma medicine with 18% of final-year students claiming not to have received any bedside teaching whatsoever (Mastoridis, Shanmugarajah et al. 2011).

3.5.2.5. Safe prescribing skills

The broad outcome 17 (General Medical Council 2009: p.23) says that graduates should be able to prescribe drugs safely, effectively and economically. This outcome has eight specific outcomes attached to it. We focus on just two in this section as the data are complex in that they do not always neatly map onto the TD09 specifications.[13] The two we focus on here are 17c: 'Provide a safe and legal prescription'; and 17d: 'Calculate appropriate drug doses and record the outcome accurately'. It is for these two questions that we have been able to map our review studies against as they either directly ask the question to their participants (e.g. via questionnaires), or they observe prescribing errors, or in the case of qualitative interviews these issues arise during conversations.

Five studies in our data have supporting evidence that suggests medical graduates are prepared in terms of providing safe and legal prescriptions. However, a further 24 studies suggest trainees are unprepared (see Appendix I for the full list of studies). Furthermore, of the five studies that suggest a level of preparedness amongst trainees, three also suggested a degree of unpreparedness: either different participant groups reported preparedness and other groups did not (Morrow, Johnson et al. 2012, Watmough, Cherry et al. 2012) or self-reports of preparedness differed from observational data of errors suggesting trainees were unprepared (Dornan, Ashcroft et al. 2009).

In terms of the types of prescribing errors recorded (via self-reports, knowledge assessments and actual error reports), the most common are incorrect dose, medication omitted or incomplete prescription, excessive or unnecessary prescribing, incorrect frequency and incorrect drug (e.g.

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[13] Due to the large number of studies that consider prescribing skills, and the nature of the 'rapid review' that aims to keep the scope of the review relatively tight, we are unable to undertake a systematic analysis of these reports at this point in time.

Dornan, Ashcroft et al. 2009, Ross 2013, Seden, Kirkham et al. 2013). However, why these errors occur uncover a complex mixture of individual, interpersonal and environmental/cultural aspects that we now identify.

In terms of individuals, the research cited in our review with data from interviews, questionnaires and knowledge assessments, suggest that trainees who have difficulties in safe prescribing have a lack of knowledge in clinical pharmacology and therapeutics (CPT) or problems in applying their knowledge (e.g. Harding, Britten et al. 2010, Tallentire, Smith et al. 2011, Rothwell, Burford et al. 2012, Illing, Morrow et al. 2013). Furthermore, research using a variety of data including self-reports, knowledge assessments, supervisor reports and reports from other healthcare professionals suggest that medical graduates who have problems prescribing may lack knowledge in terms of common drugs, appropriate doses and the calculation of appropriate drug doses (Dornan, Ashcroft et al. 2009, Matheson and Matheson 2009, Brennan, Corrigan et al. 2010, Bleakley and Brennan 2011, Morrow, Johnson et al. 2012, Rothwell, Burford et al. 2012, Illing, Morrow et al. 2013, Mattick, Rees et al. 2013). These issues around individual knowledge of CPT and of common prescription drugs can be understood when we consider the difficulties around putting theories into practice – with many graduates commenting that they felt prescribing was a skill that needed to be learnt on the job because legal issues around who can prescribe limited the type of hands-on experience they were able to get as undergraduate students. Additionally many trainees reported that their teaching of CPT occurred too early in the curriculum (Years 2 & 3), so the timing of this teaching was not conducive to learning (Dornan, Ashcroft et al. 2009, Rothwell, Burford et al. 2012, Illing, Morrow et al. 2013).

However, while safe prescribing has been traditionally considered to be an individual 'skill', there are also a number of interpersonal aspects that have been shown to impact on medical graduates' abilities to prescribe safely. Poor written documentation of previous prescribing decisions, poor handover procedures or sub-optimal communication have been cited by some researchers as important factors (Dornan, Ashcroft et al. 2009, Mattick, Rees et al. 2013, Ross 2013). For example, the involvement of multiple people, or of multiple professional groups has been cited as factors in error prescribing (Lewis and Tully 2009), especially where patients are moved from ward-to-ward being cared for by a number of healthcare professionals across multiple shifts (Mattick, Rees et al. 2013). Furthermore, some trainees tend to rely on their mistakes being 'picked up' by others (Dornan, Ashcroft et al. 2009, Rothwell, Burford et al. 2012, Mattick, Rees et al. 2013, Ross 2013).

In addition to individual and interpersonal factors, cultural and environmental factors have also been found to play a role in potential for error. For example, being stressed, tired and working in a busy and pressurised environment, misunderstanding protocols or written instructions, problems accessing support, especially when working out-of-hours and lack of information about roles and responsibilities have all been cited across numerous studies (e.g. Dornan, Ashcroft et al. 2009, Rothwell, Burford et al. 2012, Mattick, Rees et al. 2013, Ross 2013). Furthermore, research in this review has reported how prescription errors (including those made by trainees) can vary between wards and between hospital sites (Ross 2013, Seden, Kirkham et al. 2013). Indeed, the prescribing errors made by junior doctors across different wards/sites might be partly explained by them being socialized into 'contingent performances' or adhering to 'prescribing norms' or 'prescribing etiquette,' whereby within certain specialties or wards, junior doctors' prescribing is strongly influenced by the norms or precedents set by their seniors in order to 'fit' with the team, even if these preferences go against the official prescribing protocols (Dornan, Ashcroft et al. 2009, Lewis and Tully 2009, Kilminster, Zukas et al. 2011, Mattick, Rees et al. 2013). Thus, prescribing protocols, evidence-based medicine and individual knowledge and skills do not always determine trainees' prescribing performance. Furthermore, when considering the prevalence of recording errors, Dornan et al. (2009) found that while all grades of doctor, including consultants, made prescribing errors, the highest error rate was for the F2 grade (10.3%). Again, environmental factors come into play, this time mitigating the impact of such prescribing errors: the vast majority of errors made were intercepted by pharmacists before patients were affected, thus pharmacists

appear to act like a 'safety net' in the prescribing process – a finding more recently corroborated by Illing (Illing, Morrow et al. 2013).

One final comment we wish to make regarding the evidence concerning safe prescribing concerns the fact that there are more studies cited in our review classified as post-TD09 than pre-TD09 that demonstrates a lack of preparedness around prescribing. However, this is not to suggest that the situation is getting worse; rather this might be that the problem of unpreparedness in terms of prescribing skills is now well researched and documented, prompting researchers to conduct yet more in-depth research to understand the issues underlying this situation and to continue to measure graduates' perceptions over time.

> **SUMMARY BOX (RAPID REVIEW): PREPAREDNESS OF GRADUATES FOR VARIOUS COMPETENCIES**
>
> - The limited and sometimes poor quality data make firm conclusions difficult;
> - Medical graduates seem generally well prepared to take histories and perform full physical examinations;
> - Graduates seemed less prepared in clinical reasoning and making diagnoses, prescribing safely, calculating drug doses and recording the outcome, and early management of patients with emergency conditions;
> - While safe prescribing is traditionally considered an individual 'skill', interpersonal, cultural and environmental aspects impact on medical graduates' abilities to prescribe safely;
> - Emergency diagnosis and management appears to take a long time to master, with doctors at the end of their F1 year still reporting concerns.

3.6. RQ4 How prepared are medical graduates for interactional and interpersonal aspects of practice

TABLE 2: STUDIES IN REVIEW ON MEDICAL GRADUATES' PREPAREDNESS FOR INTERACTIONAL AND INTERPERSONAL ASPECTS OF PRACTICE (MAPPED AGAINST TD09 OUTCOMES)

Domain (with specific TD09 outcome)	Studies with data suggesting prepared	Studies with data suggesting unprepared
Hold conversation with patient and family to explain a mistake (TD09 13g*)	1	1
Communicate effectively in a medical context (TD09 15)	1	0
Communicate effectively in multidisciplinary team (e.g. nursing and social workers) (TD09 15*)	2	3
Communicating effectively with colleagues (TD09 15*)	4	0
Communicate sensitively, clearly and effectively with patients and relatives (TD09 15a*)	2	0
Breaking bad news to patients and relatives (TD09 15d)	3	3
Dealing with difficult or violent patients (TD09 15e)	0	2
Working effectively in a team (TD09 22*)	6	1
Give presentation at the clinical team meeting after a night shift	1	0
Write letter of referral to colleague	1	1
Able to participate in effective handover	0	3

NOTE: * Partially relevant to the specified outcome.

Having examined the evidence concerning graduates' preparedness for specific clinical and procedural tasks, knowledge and skills, we now consider how prepared they are for interactional and interpersonal aspects of practice. Table 2 below presents the number of studies within our

review that informed us how prepared for practice medical graduates are for these aspects (details of actual studies can be found in Appendix I). As we can see from the table, there have been fewer studies in the past 5 years that have studied these aspects: most of the domains have only one or two studies informing them. Where there are data, looking at the number of studies we might think that medical graduates are prepared for communication with colleagues and patients, especially working in teams, although when communicating within multidisciplinary teams trainees might not be so prepared. Furthermore, participating in handovers might be an area for concern for recent graduates and the data for breaking bad news to patients looks mixed. We therefore now consider the data in more detail for these areas.

3.6.1. Working in teams, communicating effectively with colleagues and in multidisciplinary teams

While this section effectively concerns three distinct domains, we consider this data together. This is because only nine studies in our review inform these three domains with many studies crossing over at least two of them (Lewis and Tully 2009, Brown, Watmough et al. 2010, Bleakley and Brennan 2011, McGettigan, McKendree et al. 2012, Morrow, Johnson et al. 2012, Watmough, Cherry et al. 2012, Wijnen-Meijer, Kilminster et al. 2012, Illing, Morrow et al. 2013) and one spanning all three (Matheson and Matheson 2009). Furthermore, most of the studies consider the issues of teamwork and communication only as part of a larger-scale study on graduates' preparedness for practice and the transition into the workforce (Matheson and Matheson 2009, Bleakley and Brennan 2011, Morrow, Johnson et al. 2012, Watmough, Cherry et al. 2012, Wijnen-Meijer, Kilminster et al. 2012, Illing, Morrow et al. 2013) with only two focusing specifically on team-working (Lewis and Tully 2009, McGettigan, McKendree et al. 2012).

When we consider trainees' effective team-working skills, we have six studies that suggest graduates are prepared (Matheson and Matheson 2009, Brown, Watmough et al. 2010, Bleakley and Brennan 2011, Morrow, Johnson et al. 2012, Watmough, Cherry et al. 2012, Illing, Morrow et al. 2013) with only one suggesting a degree of unpreparedness (Watmough, Cherry et al. 2012). While this is, on the face of it, good evidence to suggest that graduates' team-working skills are acceptable, the Watmough study only gave evidence that one of the two cohorts studied were unprepared, the evidence for preparedness is still reasonably scant. For example, team-working skills comprised only one small aspect for most of the studies demonstrating preparedness: none had examined this issue in depth. Furthermore, given that there were some concerns regarding effective handover in our studies, and that handover is crucial to safe and effective team-working, we are unable to conclude strongly that trainees are prepared in this domain. Communicating effectively with colleagues is another area in which the data in this study suggests a level of preparedness (Matheson and Matheson 2009, Bleakley and Brennan 2011, Wijnen-Meijer, Kilminster et al. 2012, Illing, Morrow et al. 2013), with only one study suggesting graduates might be unprepared (Watmough, Cherry et al. 2012). However, once again, the data are not terribly strong, with communication between colleagues being mentioned as a 'one-liner' along with many other preparedness issues.

While there are fewer papers in our review to inform us, the evidence regarding multidisciplinary team-working is considerably stronger and suggests graduates are not prepared (two suggesting preparedness and three contradicting this). The only two papers in our rapid review that have considered communication as the focus of their study are McGettigan's work on personal constructs required for multidisciplinary team-working (McGettigan, McKendree et al. 2012) and Lewis and Tully's work examining prescribing decisions within multidisciplinary teams (Lewis and Tully 2009). Both conclude that there are issues of preparedness for medical graduates. McGettigan and her colleagues developed a tool using the repertory grid technique[14] to understand

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[14] A repertory grid comprises 'elements' (column headers in the grid), 'personal constructs' (e.g. kind versus cruel set across the row of the grid) and a method for linking the two—often a rating scale.

the different attributes required by F1 trainees to function effectively in multidisciplinary groups. Overall, both staff nurses and senior doctors rated the F1 doctors in their study significantly lower than the 'Ideal F1'. Inter-professional training[15] made no difference to this rating, but UK-trained graduates were rated significantly higher than non-UK-trained graduates against all 15 constructs[16] developed within their tool. Finally, the ranking of the constructs themselves suggested a tension between clinical attributes needed for good team functioning and the more 'social' attributes (McGettigan, McKendree et al. 2012) whereby clinical competence was prioritized over 'softer' social skills such as making an effort to be sociable. Interestingly, while clinical competence was seen to be of utmost importance by participants in the McGettigan study, Lewis and Tully found that junior doctors admitted to prescribing in ways that maintained the overall team relationships (so-called 'soft skills') even if this meant going against clinical competence skills (i.e. ignoring hospital regulations and best practice: Lewis and Tully 2009). This, and other factors (e.g. the hierarchical structure within teams), led junior doctors to experience discomfort when they were uncertain of seniors' prescribing decisions or perceived pressure to prescribe what they considered to be inappropriate medication from the nursing team (e.g. prescribing benzodiazepine medication to sedate disruptive patients). Challenging and refusal were not considered to be options.[17] So rules of prescribing etiquette were adhered to, including the maintenance of other doctors' and teams' prescribing decisions, thereby adhering to prescribing norms. Thus, once again, we see how cultural and environmental factors impact on graduates' preparedness.

When we consider the data that suggests trainees are prepared for multidisciplinary teamworking, we can see how scant this is. Both studies included this as one small part of a large-scale study with simple questions such as ability 'To discuss a patient in a multidisciplinary meeting with nursing and social work professionals" (Wijnen-Meijer, Kilminster et al. 2012) and "Communicate clearly, sensitively and effectively with nursing colleagues" (Matheson and Matheson 2009). For both studies, the trainees themselves deemed preparedness: an opinion that was contradicted by senior colleagues in one of the studies (Wijnen-Meijer, Kilminster et al. 2012).

3.6.2. Breaking bad news to patients and relatives

The GMC outcome 15d requires that medical graduates are able to "communicate appropriately in difficult circumstances, such as when breaking bad news, and when discussing sensitive issues, such as alcohol consumption, smoking or obesity" (General Medical Council 2009: p.22). We focus here on the issue of breaking bad news as we have some data on this. In our review we have cited three studies that provide evidence that trainees are prepared for breaking bad news (Matheson and Matheson 2009, Bleakley and Brennan 2011, Wijnen-Meijer, Kilminster et al. 2012) and three suggesting a level of unpreparedness (Linklater 2010, Wijnen-Meijer, Kilminster et al. 2012, Illing, Morrow et al. 2013). In terms of preparedness the evidence comprises three questionnaire studies containing a single response: all three found trainees self-reported data to suggest confidence in

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[15]McGettigan et al. seem to use the concepts multi-professional and inter-professional interchangeably. While there is a clear difference– multi-disciplinary means everyone works together in a team maintaining their own identities and therefore tasks whereas inter-disciplinary strictly means the different team members come together jointly sharing activates together – we report McGettigan et als findings in their own words.

[16] Learns from experience; Values expertise of others; Deals with events in rational/decisive manner; Anticipates risks/safety issues; Prioritises tasks efficiently; Makes effort to be sociable; Clinically capable; Can be trusted to complete undertakings; Takes into account all aspects of care; Understands expertise of team; Develops rapport with patients; Enthusiastic about work; Communicates clearly and precisely; Acknowledges importance of all opinions; and Good team player.

[17] Interestingly, consultants and SpRs in the study by Matheson and Matheson (2009) gave a low score to the general statement "They [trainees] have the confidence to question or even overrule a decision concerning immediate patient management a senior colleague makes away from the patient".

this area. However, one of these (Wijnen-Meijer, Kilminster et al. 2012) found supervisor reports differed quite considerably to self-reports suggesting a strong concern around graduates' preparedness to break bad news. Furthermore, the two other studies suggesting unpreparedness went slightly further highlighting the breaking of bad news as a more 'complex communication scenario', which is considered by trainees to be more difficult and distressing than other potentially upsetting duties (e.g. certifying death, identifying bodies in the mortuary), with the potential for them to get 'out of their depth' relatively quickly (Linklater 2010, Illing, Morrow et al. 2013). Considering the data in its entirety therefore, while there are many limitations and few focused studies, the evidence in this review suggests concern around graduates' preparedness for the complex communication task of breaking bad new to patients and their relatives.

3.6.3. Able to participate in effective handover

While the GMC do not explicitly mention the issue of handover in TD09, this aspect of teamworking is crucial for patient safety and an area of concern for trainee doctors and their clinical colleagues. While two studies in our review mentioned handover issues, for example, that handover was implicated in trainees' safe prescribing practice and that handovers did not always happen (General Medical Council 2012, Mattick, Rees et al. 2013),[18] only three papers in our study reported findings around trainees preparedness for these situations (Cleland, Ross et al. 2009, Burns 2011, Raduma-Tomàs, Flin et al. 2011). These studies suggest that trainees feel unprepared for handover and are seen as poor at handing over. While Burns (2011) found that 48% of their participant trainees lacked a general understanding of handover, Cleland and her colleagues discovered that their trainee participants expressed confidence in knowing the essential skills for effective handover (e.g. active listening, not interrupting, introducing oneself, questioning, communicating concisely). What seemed to be problematic was putting such skills into practice with evidence that systems factors contributed to this state of affairs: poorly structured handovers, a lack of uniformity in procedures (differing perceptions of 'ideal handover' techniques), no obvious leadership, difficult shift-working patterns, a distrust of information received, large numbers of patients and no protected time for handing over. Nevertheless, individual doctors' handover skills were also problematic with nurses and senior doctors suggesting that junior doctors often found it difficult to know the relevance of information and lacked an understanding of their responsibility to colleagues to hand over information to provide the best patient care. The research on this aspect of preparedness comes from a range of methodologies including self-report, other-report and desk-based work (literature review) all with data collected pre-TD09.

> **SUMMARY BOX (RAPID REVIEW): PREPAREDNESS OF GRADUATES FOR INTERACTIONAL AND INTERPERSONAL ASPECTS OF PRACTICE**
>
> - Medical graduates appeared generally well prepared for communicating with patients, although the data on 'breaking bad news' to patients was mixed, with some self-report data suggesting confidence but less positive supervisor reports;
> - Graduates appeared less well prepared for communicating within multidisciplinary teams, with staff nurses and senior doctors rating the F1 doctors as lower than ideal. Handovers were an area of particular concern;
> - There appeared to be a tension between the clinical aspects and social context of good team functioning.

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[18] In their national survey, the GMC (2012) reported that 21.4% of trainees said handover arrangements were informal with 1.8% saying there were none (n=40,178) and 25.8% of trainees saying that post night duty handover is best described as informal and 4.5% saying there were none (n=40,902). Mattick et al. (2013) reported that systems issues (including handovers) figured significantly in the running of wards and impacted on foundation doctors' safe prescribing.

3.7. RQ5 How prepared are medical graduates for cultural, systemic and technological aspects of practice?

We have already seen how cultural and systemic issues play into medical graduates' preparedness for practice as evidenced in the previous sections focusing on trainees' preparedness for various tasks, skills and knowledge (e.g. safe prescribing, diagnosis and treatment of emergencies) and in complex communication situations (e.g. multi-professional teamworking, breaking bad news, handover). We now focus specifically on trainees' preparedness for understanding and working with these often 'hidden' aspects of care. As we can see from Table 3 below (and from the larger Appendix I, p.241 which provides further details of these studies), the majority of themes across our data are very sparsely evidenced with most comprising just one or two studies so no firm conclusions can be made.

Furthermore, the spread of the evidence across issues of preparedness/unpreparedness for those domains where there are data are often still very scant and inconclusive. For example, three papers suggest that graduates have knowledge of and can use audit to improve patient care and three suggest do not and cannot. Furthermore, due to the scant nature of investigations (one or two questions within a questionnaire) and the fact that exactly the same studies suggest preparedness and unpreparedness issues (due to different cohorts and differences in self-report/other-reports), these data are unreliable in terms of the 'broad-brush' question of preparedness (Brown, Watmough et al. 2010, Bleakley and Brennan 2011, Watmough, Cherry et al. 2012).

However, for some constructs things appear more clear-cut: with more studies suggesting a problem of trainee preparedness around reporting and dealing with error and safety incidents and understanding how the clinical environment works. Therefore it is these studies to which we now turn our attention.

3.7.1. Reporting and dealing with error and safety incidents

Outcome 23e in TD09 requires graduates to be able to "understand and have experience of the principles and methods of improvement, including audit, adverse incident reporting and quality improvement, and how to use the results of audit to improve practice" (General Medical Council 2009: p.28). While there is a paucity of data around many of these aspects within our review, as demonstrated above in terms of trainees' knowledge and use of audit, we have three studies that suggest medical graduates are unprepared in terms of reporting and dealing with error and safety incidents (Bleakley and Brennan 2011, Ahmed, Arora et al. 2012, Cresswell, Howe et al. 2013). While one asked trainees to self-report on a simple question, the other two considered how patient safety is learned and whether trainees participate in error reporting. In terms of self-reports, both cohorts (30% and 37%) in the broader study by Bleakley and Brennan (2009) reported feeling unprepared for reporting and dealing with error and safety incidents. The analysis of junior doctors' written reflections further backs up this lack of preparedness (Ahmed, Arora et al. 2012): 49% (n=68) of trainees' reflections were around patient safety incidents, of these only 4% were formally reported through the Hospital Incident Reporting Systems.

However, it is the large-scale study[19] with a range of pre-registration professional groups and patients undertaken by Cresswell et al. (2013) that provides us with a more detailed understanding of the situation. Patient safety was defined differently according to the different professional groups: physiotherapists highlighted physical safety, pharmacists focused on medication errors, nurses mentioned hands-on care (infection control, safe drug administration) and medical graduates focused on diagnostic errors and high-risk procedures. Explicit teaching

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[19] They conducted 38 focus groups (n=162), 82 observations of placements/learning activities, 33 semi-structured interviews, and analysed 44 key documents.

about incident reporting systems was uncommon with patient safety often being viewed as implicit in the curricula and as an overall programme outcome, rather than a distinct area of competency (Cresswell, Howe et al. 2013). While this is a very large-scale study, it is by no means definitive as it only recruited medical trainees from two medical sites. However, these results do beg the question of how learners might develop a deep conceptual understanding around the more complex systems and processes of safe practice, including error reporting.

TABLE 3: STUDIES IN REVIEW ON GRADUATES' PREPAREDNESS ARE CULTURAL, SYSTEMIC AND TECHNOLOGICAL ASPECTS OF PRACTICE (MAPPED AGAINST TD09 OUTCOMES)

Domain (with specific TD09 outcome)	Studies with data suggesting prepared	Studies with data suggesting unprepared
Protecting patients' rights (TD09 14g*)	1	0
Writing out Part A of a cremation form (TD09 14j*)	0	1
Keeping an accurate and relevant medical record (TD09 19a)	2	1
Using informatics as a tool in medical practice (TD09 19e)	2	2
Obtaining valid consent (TD09 20c*, also a practical procedure in Appendix A)	0	1
Sickness certification (TD09 20g*)	0	1
Ensuring and promoting patient safety (TD09 23a*, d*)	1	1
Using knowledge of the structures and functions of the NHS in practice (TD09 23c*)	0	1
Clinical governance (TD09 23d*)	1	1
Dealing appropriately, effectively, and in patients' interests with problems in the performance, conduct or health of colleagues (TD09 23d*, i*)	0	1
Reporting and dealing with error and safety incidents (TD09 23e*)	0	3
Knowledge/Using audit to improve patient care (TD09 23e*)	3	3
Understanding how the clinical environment works (including the culture and practice of working on wards: e.g. locating forms for ordering tests, correct procedures for ordering an x-ray) (TD09 106, p.54)	1	5
Understanding the relationship between primary/social care and hospital care	0	2
Knowledge and understanding of rehabilitation and care within institutions and the community	1	1
Understanding the purpose and practice of appraisal	0	1
Use information and technology effectively in medical context	1	0
Organisational decision making	0	1

NOTE: * Partially relevant to the specified outcome.

3.7.2. Understanding how the clinical environment works

While understanding the clinical environment is a very broad outcome within TD09, the GMC recognize the need for all medical graduates to become familiar with the specific ways of the ward environment in which they are about to work (General Medical Council 2009: 110, p.55). We have considered ways in which this can be achieved, for example through shadowing, on page 44. This section specifically focuses on the issue of whether medical graduates are prepared in terms of their understanding of the clinical environment.

One paper in our review provided some evidence that graduates are prepared in this domain (Matheson and Matheson 2009). However, the data are not terribly convincing. Matheson and Matheson (2009) reported the data for 5 items together[20] in their questionnaire which related to "General skills, teaching skills, and working environment" and found a general level of preparedness (5-point scale, 5=strongly agree) above the mid-point: 3.40 (SD 0.80) for SpR-raters and 3.51 (SD 0.87) for consultant-raters. However, this aggregation of a broad range and 'rag-bag' of questions provides little specific detail regarding graduates' preparedness. Furthermore, whether trainees are prepared for the clinical environment and the culture and practices of working on wards might be a question best asked of the trainees themselves rather their supervisors.

We have five papers in our review that suggest a level of unpreparedness in trainees around the clinical environment and in particular around the culture and practices on the wards. Two studies employed large-scale questionnaires to examine the issue of preparedness (Tallentire, Smith et al. 2011, Van Hamel and Jenner 2011). While not asking the question directly, within the free text options both F1s and their educational supervisors felt that familiarity with the environment of the wards was an important and missing component of transition. Van Hamel and Jenner (2011) reported that the statement attracting the highest number of negative responses was "*I was familiar with all the equipment I was required to use at the start of my F1 placement*". Finally, the issue of preparedness and the ward environment came up spontaneously across three qualitative studies using a range of self-report, other-report and observational methods examining issues such as preparedness for practice and trainees safe prescribing practices (Kilminster, Zukas et al. 2011, Illing, Morrow et al. 2013, Mattick, Rees et al. 2013). Common findings across these studies suggest that trainee performance is dependent on the specifics of the particular settings. Increased regulation of clinical activities through protocols and care pathways have been found to help improve trainees' performance, whereas complex structures and cultures across the workplace such as rotas and multiple transitions within rotations, can impede performance during a period of transition due to the often stark differences across the wards (requiring new learning to take place).

SUMMARY BOX (RAPID REVIEW): PREPAREDNESS OF GRADUATES FOR CULTURAL, SYSTEMIC AND TECHNOLOGICAL ASPECTS OF PRACTICE

- There was mixed evidence about graduates' preparedness in this area;
- Graduates were ill prepared to report and deal with error and safety incidents, and understand how the clinical environment works;
- F1s and their educational supervisors felt familiarity with the ward environment was an important, and often missing, component of transition;
- Preparedness was contingent upon ward-based culture and practices. It was improved by protocols and care pathways and impeded by complex structures and cultures.

3.8. RQ6 How personally prepared are medical graduates for practice?

The GMC recognize that there are a number of personal factors that graduates need to possess in order to be prepared for practice and these include aspects such as being able to deal with uncertainty, good time management skills, identifying their own learning needs, engaging in reflective practice and knowing their own limitations. It is towards these personal (and professional) aspects of preparedness that we now turn.

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[20] The authors say that as they were only partially surveyed, general skills, teaching skills, and working environment were aggregated into one category

Table 4 (below) summarises the data in this report (along with Appendix I which provides further details of the studies). As with research question 5, the majority of themes across our data are very sparsely evidenced with many comprising just one or two studies making it hard to come to any firm conclusions regarding preparedness. Furthermore, only 11 papers inform us of this range of issues, with all studies providing only partial or mixed support for these domains.

Looking at the table below we can see that there are some areas that are reasonably clear (despite the paucity of data). For example, medical graduates appear to have some issues around managing their time. The only study that provided evidence of preparedness for this aspect was Bleakley and Brennan (2011) who report that only 5% of one of their trainee cohorts reported being unprepared for this capability. However, 21% of the other cohort suggested that they were unprepared, along with other data from questionnaires and qualitative interview data (including both self- and other-reports: Bleakley and Brennan 2011, McGettigan, McKendree et al. 2012, Watmough, Cherry et al. 2012, Illing, Morrow et al. 2013).

TABLE 4: STUDIES IN REVIEW GRADUATES' PERSONAL PREPAREDNESS FOR PRACTICE (MAPPED AGAINST TD09 OUTCOMES)

Domain (with specific TD09 outcome)	Studies with data suggesting prepared	Studies with data suggesting unprepared
Time management (TD09 21d*)	1	4
Coping with uncertainty (TD09 23b)	0	2
Identifying and organizing own learning needs, reflective practice (TD09 21b*)	3	3
Apply scientific principles, method and knowledge to medical practice and research (TD09 9*)	1	0
Being aware of their limitations (TD09 21e*)	4	1
Asking for help (TD09 21e*)	2	0
Understanding ethical and legal issues (such as confidentiality and consent) (TD09 20f*)	6	4
Acting in a professional manner (with honesty and probity) (TD09 20c*)	2	0
Managing their health, including stress (TD09 23i*)	0	1
Maintaining confidentiality (TD09 19c*)	1	0
Ensuring and promoting patient safety (TD09 23a*, d*)	1	1
Protecting patients' rights (TD09 14g*)	1	0
Dealing appropriately, effectively, and in patients' interests with problems in the performance, conduct or health of colleagues (TD09 23d*, i*)	0	1
Undertaking a teaching role (TD08 21f*)	2	2
Carrying out a literature search	1	1

NOTE: * Partially relevant to the specified outcome.

Trainees appear to be able to understand their own limitations (Matheson and Matheson 2009, Brown, Watmough et al. 2010, Bleakley and Brennan 2011, Watmough, Cherry et al. 2012), with only partial evidence to the contrary (25% of graduates from an older curriculum reported problems with this with only 10% from their newer curriculum: Watmough, Cherry et al. 2012). Additionally, the data are inconclusive regarding trainees' ability to identify and organize their own learning needs and their reflective practice, with a similar number and quality of papers suggesting they are (Matheson and Matheson 2009, Brown, Watmough et al. 2010, Watmough, Cherry et al. 2012) and are not prepared (Bleakley and Brennan 2011, Tallentire, Smith et al. 2011, Watmough, Cherry et al. 2012). This issue of reflective practice relates back to our earlier

discussion around the problems with self-reported data and the necessity to develop reflection-in-action as well as reflection-on-action for our medical graduates (Eva and Regehr 2005). There is similar ambiguity around trainees' understanding of ethical and legal issues. It is to this issue that we now turn.

3.8.1. Understanding ethical and legal issues

Four questionnaire studies in our review using a range of self- and other-reported data provided evidence for medical graduates' preparedness to obtain valid consent (Matheson and Matheson 2009, Bleakley and Brennan 2011, Watmough, Cherry et al. 2012) or apply ethical principles to practice (Tallentire, Smith et al. 2011). However, one of these studies reported partial data to the contrary: where the discrepancy lies is with one cohort who studied in an 'out-dated' curriculum, as identified in the previous section (Watmough, Cherry et al. 2012). Therefore, this self- and other-report data suggests a reasonably high degree of general preparedness in this area within more modern curricula. Furthermore, in terms of understanding ethical and legal issues, a survey of what and how law is taught during undergraduate medical programmes concluded that while not as formalized as some areas of the curriculum, teaching did not rely on single individuals and was integrated well within problem-based and small group case-based learning (Preston-Shoot and Judy 2010), thereby offering some level of support to the notion of preparedness for graduates.

On the other hand, some studies have flagged up real problems in terms of preparedness around ethical and legal issues. While, one recent three-centre study reported that 'using knowledge of legal and ethical issues in practice' as one of the 10/53 items with the lowest mean preparedness score across all three sites (Morrow, Johnson et al. 2012), self-reported questionnaire data suggests that issues seemed to be around the more complex ethical scenarios such as caring for dying patients (Linklater 2010) with measures of knowledge suggests that understanding mental health law is the issue (Wadoo, Shah et al. 2011).

SUMMARY BOX (RAPID REVIEW): PERSONAL PREPAREDNESS OF GRADUATES FOR PRACTICE

- Medical graduates seem well prepared to understand their own limitations, obtain valid consent or apply ethical principles to practice;
- Medical graduates seem poorly prepared for time management, and more complex ethical or legal decision-making.

3.9. RQ7 Do personal demographic factors contribute to the variance in preparedness?

So far we have concentrated on graduates' preparedness for practice as if they are an homogenous group of individuals (even when reporting differences across different cohorts and schools). We now turn our attention towards the question of whether personal demographic factors contribute to the variance around graduates' preparedness. The constructs we consider here are ethnicity, gender[21] and personality 'traits' as these are the only factors for which we found data.

Only one study has found a difference in preparedness according to ethnicity (Goldacre, Taylor et al. 2010). In this largest UK study examining preparedness for practice, Goldacre and his colleagues analysed responses to the question '*Experience at medical school prepared me well for*

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[21] Some studies have used the term 'sex', but we refer to this as 'gender' throughout our document as we believe that these studies are referring to socio-cultural differences between males and females rather than biological difference to which 'sex' refers.

the jobs I have undertaken so far' from 11,610 trainees one-year post-graduation and 8427 three years post-graduation (data aggregated across sites and cohorts). At both one and three years post-graduation, ethnicity was statistically significant as a predictor of doctors' feeling prepared: 49.3% of white and 45.3% of non-white doctors agreed that they felt well prepared in year one, with 40.4% of white and 32.5% of non-white doctors in year three.

Although one study had mixed findings regarding the relationship between gender and self-reported preparedness (Goldacre, Taylor et al. 2010) and one study concluded no difference (Cave, Woolf et al. 2009), they both essentially report the same outcome. Goldacre and his colleagues found no statistical difference for gender one year post-graduation but gender did show a difference three years post-graduation (males 41.5%, females 37.0%, p = 0.003) (Goldacre, Taylor et al. 2010). In a second study, Cave and her colleagues analysed the responses of 2062 (43.1%) UK PRHOs in May 2005[22] to the same question used by Goldacre (using the same response scale) (Cave, Woolf et al. 2009). No association between gender and self-reported preparedness was found: 58.1% (490/844) of male and 59.2% of female respondents agreed/strongly agreed that they felt well prepared. Therefore, from these studies we might conclude that if there is an effect of gender in the level of self-perceived preparedness, something may well be happening in the workplace itself that affects these changing perceptions (rather than students' undergraduate training per se). Indeed, in section 4.8. below, we see that positive experiences since starting work are significantly associated with self-reported data around feeling prepared.

Cave and her colleagues also examined personality 'traits' to see if they contributed to the variance in preparedness (Cave, Woolf et al. 2009). They report low but statistically significant positive correlations between 'agreeableness' and 'conscientiousness' with preparedness and a negative correlation between 'neuroticism' and preparedness. There was no correlation between 'openness' and preparedness. However, while statistically significant, it is worth noting that the effect sizes were incredibly low (all well below r=.20) suggesting these findings might not be of any practical use.

3.10. RQ8 Do situational demographic factors contribute to the variance in preparedness?

Having considered gender, ethnicity and personality factors, we now consider the question of whether situational demographic factors contribute to the variance around graduates' preparedness. The factors we focus on here are: medical school, graduate entry vs. undergraduate programmes, cohort, intercalated degree, experience since starting work, shadowing and other attachments, type of course and UK trained versus non-UK trained graduates.[23]

Table 5 below provides us with an overview of the studies for which preparedness was either associated or not with different situational demographic factors. From here we can see that the studies cited in our report are relatively in agreement. In summary, graduates from more recent cohorts, graduate-entry students, students on problem-based learning courses, UK (versus non-UK trained) trainees and those with an intercalated degree feel better prepared. Furthermore, those who have undertaken shadowing or other attachments and those who have had positive experiences since graduating[24] report that their undergraduate degree prepared them well. This

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[22] While these data were collected 8 years ago the study was published within the criteria for this review so we consider it here.

[23] We have included this here in the situational demographics section as it is constructed as a 'place of training' variable rather than an ethnicity variable. However, we recognize that implicitly, the variable has an associated ethnicity aspect.

[24] A positive correlation was found between trainees' self-reported preparedness and their agreement with the statement 'As a house officer I found it easy to get help when I needed it', and with also feeling well supported by the nursing staff and by senior colleagues.

latter finding is interesting as it suggests that such self-reported data around preparedness is highly contingent upon the cultural, situational and organizational factors experienced by respondents at the time of their self-report (so during postgraduate training). Having summarized the main body of Table 5, we now consider the aspect of preparedness where we have contradictory data: the association between medical school and preparedness for practice.

TABLE 5: SITUATIONAL DEMOGRAPHIC FACTORS ASSOCIATED WITH PREPAREDNESS FOR PRACTICE

Situational demographic factor	Difference in preparedness	
	Yes	**No**
medical school	Goldacre et al. (2010); Goldacre et al. (2012); Bleakley and Brennan (2011); Morrow et al. (2012); Rothwell et al. (2012); Van Hamel and Jenner (2011)	Illing et al. (2013); Rothwell et al. (2012)
Graduation cohort	Goldacre et al. (2010); Goldacre et a. (2012); Illing et al. (2013)	
Graduate entry	Goldacre et al. (2010); Cave (2009)	
Shadowing and other attachments	Cave et al. (2009)	
Type of course [PBL]	Cave et al. (2009); Illing et al. (2013)	
UK versus non-UK trained	McGettigan et al. (2013); GMC (2009)	
Intercalated degree	Goldacre et al. (2010);	
Experience since starting work	Cave et al. (2009)	

3.10.1. Association between medical school and trainees preparedness for practice

When we consider the data regarding the association of preparedness for practice and medical school we find that six studies suggest differences between schools and two suggest no differences. For example, Goldacre and his colleagues found significant differences across schools: In year one agreement varied from 30% to 82%, and in year three it varied from 27% to 70% (Goldacre, Taylor et al. 2010). Bleakley and Brennan found differences between Peninsula medical school graduates and 'other' graduates, suggesting a greater preparedness across certain constructs: for example, Peninsula graduates' self-reports suggested that they were well-prepared for the 'non-technical' aspects of medicine, such as 'coping with uncertainty', 'breaking bad news to patients and relatives', 'understanding the purpose and practice of appraisal', 'undertaking a teaching role' and 'taking part in advanced life support' (Bleakley and Brennan 2011). Other studies have reported no difference between schools (Rothwell, Burford et al. 2012, Illing, Morrow et al. 2013). Rothwell and her colleagues examined preparedness for practice around prescribing across three medical schools using face-to-face interviews, telephone interviews, questionnaires and data from a safe prescribing assessment (n = 284). They reported no clear differences between graduates of three medical schools (Rothwell, Burford et al. 2012). Furthermore, Illing and her colleagues interviewed medical graduates from three schools with different curricula: at the end of medical school (n = 65), after four months (n = 55) and after 12 months (n = 46) (Illing, Morrow et al.

2013). They triangulated this data with 92 clinician interviews. Again, no substantial differences between sites were found.

When we consider the data as a whole, there is compelling evidence to suggest that medical school does make a difference in terms of self-reported preparedness for the broad question '*Experience at medical school prepared me well for the jobs I have undertaken so far*': Illing and Rothwell's work does not negate the findings of Goldacre and others who have used this question. However, what their work does contribute is an understanding of the more nuanced questions of 'preparedness for what'? Along with questionnaire research which found differences between schools for certain domains of activities (e.g. Bleakley and Brennan 2011, Morrow, Johnson et al. 2012) these types of studies provide us with more practical data with which to develop our curricula.

SUMMARY BOX (RAPID REVIEW): THE CONTRIBUTION OF SITUATIONAL DEMOGRAPHIC FACTORS TO PREPAREDNESS

- Graduates from more recent cohorts of medical school entrants, who had been graduate-entry students, who had studied on problem-based learning courses, who had been training in the UK and / or who had done an intercalated degree felt better prepared;
- Graduates who have undertaken shadowing or other attachments and those who have had positive experiences since graduating report that their undergraduate degree prepared them well;
- Six studies suggest differences between the graduates from different medical schools and two suggest no clear differences.

3.11. Discussion

We have undertaken a rapid review of the literature on the subject of UK medical graduates' preparedness for practice. In doing so, we are mindful that in this review we are not answering questions as such, what we are doing is clarifying the situation around medical graduates' preparedness for practice by summarising the research published over the past five years and highlighting gaps. This discussion will now focus on the strengths and limitations of the methodology we have used before summarizing our findings and suggestions for future research.

3.11.1. Rapid review challenges and strengths

A rapid review is a streamlined approach to synthesizing evidence. It is typically used to inform 'emergent' decisions within health care settings. We have utilized this process to examine the broad question "how prepared are UK medical graduates for practice?". In a similar manner to systematic reviews, rapid reviews have limitations. Additionally, they are produced within a short timeframe and use limited resources. While the methods follow those of a systematic review, once we began the data extraction and narrative synthesis stages, the time-frame was swift and therefore did not facilitate the space for as much rigor as would be applied in a traditional systematic review. Thus, the summaries of data tend to be less detailed. However, at times the narrative synthesis we present here drifts into the realms of a systematic review by coving more detail than is required for a traditional rapid review of the literature. This is partly due to the complex nature of the question we asked, and partly due to the natural inquisitive and critical nature of the research team. Glossing over the detail to provide a broad-brush overview can miss out the important nuances in the research that provide us with unique insights into the data.

As previously mentioned, the specific question asked within this particular rapid review proved highly problematic as the issue of preparedness itself is murky and under-defined, it is not a single construct and the ways in which it has been examined are many and varied (as evidenced by our search strategies). This led us to divide the research question into eight sub-questions. Indeed, as

one of the criteria for a rapid review is that the research question is tightly focused, each of these eight questions alone could provide the basis for a single rapid review. Therefore, as a rapid review, our project could be criticized for being overly ambitious. Had we undertaken the rapid review on any of these specific questions, we might have uncovered further research than we did by examining the broad question of preparedness. Additionally, had we taken more time to unpack the issue of preparedness by consulting a wide range of stakeholders, we might have developed a different set of specific questions to ask around the issue of UK graduates' preparedness.

One further limitation of this research is that we had originally set out to examine how preparedness for practice has changed since the introduction of TD09. We have not been able to answer this question. However, this is less to do with the methodology and more to do with the timing of the review. There is insufficient data that has been collected and published post-TD09 for us to make any claims regarding change.

However, despite these limitations, our rapid review has enabled us to gain a broad overview of the most up to date literature on UK graduates' preparedness for practice. Furthermore, it is heartening to know that research comparing rapid with systematic review methodology found that, despite "axiomatic differences" between them, "the essential conclusions of the rapid and full reviews did not differ extensively" (Watt, Cameron et al. 2008).

3.11.2. Summary of key findings

Having set out the strengths and limitations of our rapid review, we now present the key findings within each research question with the association recommendations for future research in Table 6 (below).

TABLE 6: SUMMARY OF KEY FINDINGS AND ASSOCIATED RECOMMENDATIONS FOR FUTURE RESEARCH

Key findings within each RQ	Key recommendations for further research based on findings
RQ1: How has preparedness for practice been researched?	
• The concept of preparedness is typically glossed over and/or conflated with other terms in the literature (e.g. readiness). • Preparedness is mostly conceptualised as something possessed by the individual and his/her knowledge and skills rather than having a contextual dimension. • Most studies conceptualise preparedness as preparedness for the short-term transition period between Y5/F1 rather preparedness over the longer-term. • Studies typically explore preparedness through self-report questionnaires that consider preparedness as a generalized and acontextual notion. • When qualitative interviews with trainees or trainers are utilized preparedness is analysed acontextually with little consideration of the factors that impact on (self)reports of preparedness. • Few studies triangulate data using multiple participant groups or multiple methods.	• Future research should adopt a more rigorous approach to developing a body of research that considers the issue of methodological consistency to enable the small-scale research efforts prevalent in medical education to be combined to provide transferable knowledge of the issues around preparedness for practice in terms of how this is conceptualised and measured. Attention to the issues around self-reported data should be a priority. • Further research is needed to explore multiple stakeholders' understandings of what preparedness is and how it might be researched in order to understand the complexity of individual patient encounters that might shed light onto the broader question of how we might best support medical graduates to treat patients safely and appropriately.

- Only one single study used patients as participants.
- Questionnaires in the research identified have no general uniformity in terms of the methods adopted to record and analyse responses and therefore act as more like 'stand alone' studies rather than adding to a consistent body of knowledge.

- Further research should attempt to understand longer-term preparedness issues.
- Further research should attempt to understand the complex interplay between individual, relational, technological, and cultural issues in terms of preparedness.
- Further research should include multiple methods and multiple participant groups (e.g. trainees, medical and non-medical trainers, patients etc.).

RQ2: How effective are final year undergraduate to FY1 transitional interventions?

- Three key transition interventions are outlined in the literature: Y5 assistantships and shadowing and F1 induction.
- Although authors cited in the review consider assistantships to be valuable there is currently no evidence about their effectiveness.
- Research evidence shows that shadowing is typically effective, although there are variable findings as to the most efficacious method.
- Research evidence shows that induction can be effective, although there is variation in induction programmes offered (e.g. hospital/ward etc.) and can sometimes be conflated with induction.

- Further research is needed to explore what is currently covered in the different transitional interventions and what should be covered (in terms of learning outcomes, teaching and learning methods, assessment, duration etc.).
- In particular, multi-site and longitudinal research examining the different models of assistantship and the effectiveness of these models is an urgent requirement given that medical schools are now adopting this method as standard at the end of their curricula.
- Further research exploring stakeholders' views and experiences of the three different transitional interventions is needed using multi-site, longitudinal studies with appropriate methodological considerations.

RQ3: How prepared are graduates for specific tasks/skills/knowledge?

- Preparedness for 11/32 TD09 and an additional 11 practical procedures are cited across a range of studies included in this review.
- There is wide variation of preparedness reported across studies of practical procedures with the exception of venepuncture (prepared) and suturing, central venous line insertion, and chest drain insertion (unprepared).
- Most of the data on practical procedures comes from studies with data collected pre-TD09.
- Most of the data suggesting graduates are

- Further research should measure preparedness for tasks/skills/knowledge in a consistent way to enable meta-analyses to be conducted and comparisons to be made across studies.
- Further research on preparedness for specific tasks/skills and knowledge should include all those cited in TD09 and particularly address current gaps in the literature such as students' preparedness for planning discharge.
- Further research on preparedness for specific tasks/skills and knowledge

prepared comprise a limited range of studies using generalized acontextual self-report methods, whereas most of the data suggesting graduates are unprepared come from a broader range of studies using a greater variation of research methods.

- Research suggests that trainees are reasonably well-prepared for history-taking and performing full physical examinations but are mostly unprepared for prescribing safely and legally, clinical reasoning and making diagnoses and the early management of emergency patients.

should include both trainee and trainer perspectives.

RQ4: How prepared are medical graduates for interactional/interpersonal aspects of practice?

- Few studies have explored students' preparedness for interactional/interpersonal aspects of care.
- Some evidence suggests that students are prepared for team-working, and communication with colleagues and patients.
- Evidence tends to suggest that students are ill-prepared for communicating in multidisciplinary teams.

- Further research on preparedness for interactional/interpersonal aspects of practice is required that employs multiple stakeholders' perspectives (e.g. trainees, trainers, patients) and includes observational research.
- Further research should prioritise trainees' communication within multi-professional teams and particularly within the context of handover.
- Further research should also tackle current gaps in the literature such as graduates' preparedness for dealing with end of life care (including breaking bad news), dealing with difficult or violent people (TD09 outcome 15e) and preparedness to deal with patient concerns and complaints in a positive way.

RQ5: How prepared are medical graduates for cultural, systemic and technological aspects of practice?

- Few studies have explored students' preparedness for cultural, systemic and technological aspects of practice.
- Some evidence suggests that students are unprepared for dealing with error and safety incidents and lack understanding of how the clinical environment works.

- Further research on preparedness for cultural, systemic and technological aspects of practice is required that employs multiple stakeholders' perspectives (e.g. trainees, trainers) and includes observational research.
- Further research should prioritise trainees' dealing with error and safety incidents and understanding the clinical environment.
- Further research should also tackle current gaps in the literature such as students' understanding of organisational decision-making and the purpose and practice of appraisal.

RQ6: How personally prepared are medical graduates for practice?

- Few studies have explored students' personal preparedness for practice.
- Some evidence suggests that students are prepared to identify their own limitations.
- Other evidence suggests that students are unprepared for time management.
- Contradictory evidence exists in terms of students' preparedness for identifying their own learning needs, reflective practice and ethical and legal aspects of practice.

- Further research on personal preparedness is required that focuses specifically on trainee perceptions.
- Further research should tackle current gaps in the literature such as students' managing health including stress and dealing with problems in the performance, conduct and health of colleagues.

RQ7: Do personal demographic factors contribute to the variance in preparedness?

- Few studies have explored the relationships between students' personal demographics and their perceptions of preparedness for practice.
- Some research evidence demonstrates relationships between ethnicity; with white students feeling more prepared.
- Evidence typically suggests that gender does not predict perceptions of preparedness.
- Some evidence suggests that personality 'traits' are related to perceptions of preparedness (e.g. conscientiousness) and unpreparedness (e.g. neuroticism).

- Further research is needed to explore the relationships between personal demographic factors and students' perceptions of preparedness for practice.
- Researchers would be wise to explore the interplay between personal _and_ situational demographic factors with perceptions of preparedness (see RQ8 below).

RQ8: Do situational demographic factors contribute to the variance in preparedness?

- Evidence suggests that graduates from more recent cohorts, graduate-entry students, students on problem-based learning courses, UK-educated trainees and those with an intercalated degree feel better prepared.

- Further multi-school studies need to be conducted to explore differences in preparedness by school and perhaps more importantly, to explore why any differences exist.
- Further research on preparedness needs to take into account trainees' postgraduate training experiences at the time of self-report as these experiences may influence their retrospective feelings of preparedness.

4.0. Phases 2 & 3: Qualitative interviews with key stakeholders and trainees' audio-diaries

The rapid review was an important first step in our research programme and directly informed Phases 2 and 3. Phase 2 involved qualitative interviews with key stakeholders around preparedness for practice issues. Phase 3 involved a longitudinal audio-diary methodology examining Foundation Year 1 doctors' lived experiences of their preparedness (and un-preparedness) for practice. In this section, we begin by considering the research questions and methodologies for both phases, before reporting the combined data thematically.

4.1. Background

Our rapid review of the literature highlighted the under-theorised construct of 'preparedness for practice' and identified specific areas where medical graduates were deemed to be prepared/ unprepared for their new roles as F1s working in the clinical arena. It also highlighted a number of under-researched areas of graduates' preparedness, including examining their preparedness for working as part of a multidisciplinary team and tasks such as hand-overs (whereby patient information is imparted from one team of healthcare workers who were finishing their 'shift' to the incoming team) and general information sharing.

4.2. Aims and research questions

The main aim of the interview phase (Phase 2) was to: (1) explore issues around preparedness for practice in terms of how the concept is understood across a range of stakeholder groups (including policy makers, patients, foundation doctors, specialist registrars, heads of medical schools, postgraduate deans/local education providers, NHS employers, training boards, medical educators); (2) to shed light on areas of preparedness for practice that are relatively under researched; and (3) to understand further aspects in which medical graduates feel and are perceived to be prepared and unprepared. The main aim of the audio-diary method (Phase 3) was to explore, in depth, the lived experiences of preparedness/unpreparedness of a subset of F1 doctor participants, in real time as their experiences were happening.

With these broad aims in mind we wished to answer the following research questions:

RQ1: How do stakeholders conceptualise 'preparedness for practice'?

RQ2: How effective are undergraduate Year 5 – F1 transition interventions?

RQ3: To what extent do recent graduates perceive themselves to be prepared for practice and how does this compare with the views of other stakeholders (e.g. employers)?

RQ4: How does preparedness for practice on graduation affect the experiences of F1 doctors over time and during later F1 transitions?

RQ5: What are stakeholders' views about the proposition of bringing forward the time of full registration to graduation?

4.3. Methods

For Phase 2 we utilised a multi-site, cross-sectional qualitative narrative interview method drawing on a stratified maximum-variation cross-sectional purposive sample. For Phase 3 we employed the longitudinal solicited audio diary method (Monrouxe 2009),[25] drawing on a sub-

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[25] Monrouxe (2009) describes the longitudinal audio-diary method as beginning with a group interview (where possible), the participants are introduced to the study and background information is gathered from them. Following this, participants are asked to record a regular (weekly) audio diary entry over time. Further 'catch-up' interviews and an 'exit interview' are also part of this method.

sample of F1 participants engaging in Phase 2. We received University and/or medical school ethics committee approval from all four study sites (not named here to protect anonymity).

4.3.1. Recruitment

Researchers from the four study sites approached a range of stakeholder groups and individuals to participate in the study. Using advice from our extensive reference group (see acknowledgements), we employed multiple methods of recruitment in order to maximise participation including: (1) email; (2) e-notices on virtual learning environments; (3) actual notices on notice-boards; (4) snowballing through organisations such as BMA junior doctor committee, 'Meducation' (Educational social network for medical professionals), patient groups or through networks such as deanery communications; and (5) face-to-face recruitment during formal curricula (for Foundation Doctors) and with patients currently engaging in the undergraduate and postgraduate curricula (sometimes as simulated patients), in addition to directly approaching specific patient support groups who might inform the focus of the enquiry (e.g. Age Cymru, Mencap). Information sheets and consent forms were sent out to prospective participants. F1 doctors were recruited to both the interview and longitudinal solicited audio-diary (as indicated in the information sent to prospective participants) whereby they were asked to 'opt-into' the audio-diary phase when they attended the interview sessions.

4.3.2. Narrative approach to data collection

Both Phases 2 and 3 used a narrative approach to data collection, encouraging participants in the interviews and audio-diaries to tell the researchers about specific events that had happened to them (Riessman 2008). On a theoretical note, 'narratives' can come in a number of different formats. They can be specific stories of single events that happened to the person telling the story (personal incident narratives). They can be an amalgamation of similar events, grouped together because they are classified as being the same by the person talking (e.g. 'it happens all the time'; general incident narratives). They can also be conversational whereby two or more people join together to talk about a specific event they encountered together, or events they have encountered separately but which have a similar essence.

By employing such an approach we were able to ground attitudes and opinions in actual experiences, thereby enabling us to unpack how specific factors enabled or inhibited incidents in which preparedness or unpreparedness was apparent. Furthermore, the use of personal incident narratives (PINs) begins to overcome the problem with self-reports and the issue of the acontextual nature of event reporting that presently prevails in the literature (Eva and Regehr 2005). Through their narratives of situations regarding 'a *particular* patient', or 'a *particular* trainee', participants' self- and other-assessments are more specific and contextually-bound than rating strengths and weaknesses in an acontextual manner (Eva and Regehr 2005). Narratives also enable the analysis of a range of other factors related to issues of preparedness – such as the contexts in which preparedness or unpreparedness occurs and the emotional impact that trainees' preparedness/unpreparedness might have, both on themselves and on other key stakeholders. Ultimately, the use of interviews and audio-diaries allowed a more nuanced account of the situation than a survey could achieve and provided the opportunity for prompting and clarification by the interviewers.

4.3.3. Data collection

Group and individual interviews for Phase 2 were held between November 2013-February 2014 in a location convenient to the participants and conducted by seven researchers (JC, CJ, KK, CK, NK,

LM and GS).[26] The F1 participant group were amongst the first to be interviewed to enable them time to opt-in to the longitudinal solicited audio diary study.

All researchers followed the same interview protocol, which was created through discussion with multiple stakeholders (including patients) and by iterative drafts being shared between the researchers and the funder. The protocol was developed along similar lines for each stakeholder group (See Appendix J, p.249, for the generic set of questions: certain questions were omitted or rephrased depending on the applicability for the specific group). The interviews began with the researchers clarifying the aims of the study, explaining the interview process, data security, right to withdraw and securing valid consent for all participants. All participants, except one[27], gave their consent to be audio recorded and for these recordings to be transcribed.

Following consent, all participants were asked about their understanding of the term *preparedness for practice* (early interviews included the exploration of the difference between *preparedness for* and *preparedness to* practice but as no consistent differences were recognized this question was subsequently dropped from the interview schedule). F1, other trainee doctors and senior doctors were then asked "Thinking about the time you began working as a junior doctor, how prepared were you?" They were then encouraged to share an event that happened when they felt prepared for practice and one where they felt unprepared. Further probing questions were then asked, such as whether they thought their experience was personal to them or experienced by most junior doctors, and what they thought could have prepared them better for that specific experience.

If participants had not discussed team working in their previous responses, towards the end of the interview we asked: "Have you ever had any experiences when team working (i.e. multi-professional team working, hand-overs, general information sharing) went well or was problematic?" Other questions around dealing with end-of-life care, breaking bad news and preparedness for working with patients with mental health problems were explored. The final question examined participants' views on the issue of bringing full registration forward to the point of medical school graduation.

Other stakeholders were asked similar questions on all of these topics but questions were phrased in a way appropriate to the group (e.g. patient and public groups were asked about their encounters with junior doctors and clinical educators were asked about their experiences with trainees and asked to talk about how prepared they thought they were by providing narratives of specific encounters).

The F1 participants who agreed to continue with Phase 3 were then provided with instructions for their audio-diary regarding: (1) *what* to narrate in their diaries; and (2) *how* to record and deliver their diaries. In terms of what to narrate, we simply gave participants the following request: "Thinking back over the past week, please tell us about a situation in which you felt well prepared, and a situation in which you felt less prepared or unprepared. Please give as much detail as possible, including your thoughts on if and how your undergraduate years prepared you for such events." We asked them to submit an audio diary entry on a weekly basis. Most of the F1s participating recorded their audio diaries on their own smartphones. Participants without smartphones were provided with a Dictaphone. All participants emailed their recordings to the site-specific researcher who acknowledged receipt of their diary entry within 48-hours (usually quicker). These acknowledgements sometimes included a request for further information or clarification following review of the diary entry.

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[26] In order to achieve consistency and to develop a team-working approach, we held a face-to-face 2-day workshop with all researchers present.

[27] This participant acted as a carer to a patient participant but declined to be part of the study, any contribution to the interview was therefore omitted from transcriptions.

Phase 3 lasted between early November 2013 until late March 2014,[28] culminating in a final exit face-to-face interview where possible in which participants were asked to reflect on their involvement in the study as well as on preparedness issues. At the end of the study, participants were offered Amazon vouchers as a 'thank you' for their ongoing participation.

4.3.4. Phase 2 Participants

A total of 185 individuals participated across the eight broad stakeholder groups: comprising 34 F1 doctors, 33 registered trainee doctors, 32 clinical educators, 30 deans and Foundation Programme leads, 13 other health care professionals, 7 employers, 25 patient and public representatives, and 11 policy and government officials (see Appendix K on p.250 for all stakeholder group descriptors and participant demographics). There was a good spread of individual and group interviews (see Table 7). The medical trainees interviewed (F1s, F2s, CTs and STs) were 62% female, ranged from 20 to over 40 years in age, and classified themselves as 12 different ethnicities (Appendix K, Table 1K). The healthcare stakeholders (clinical educators, deans & FP leads, policy & government, employers and other HCPs) were 42% female, ranged from 20 to over 60 years in age, and represented 11 different ethnicities (Appendix K, Table 2K). The patient and public representative groups were 68% female, ranged from 30 to over 60 years in age, and classified themselves as 4 different ethnicities (Appendix K, Table 3K). We prioritised F1 interviews at the start of data collection in order to recruit for Phase 3, so these participants would have been in post for approximately 4 months at the time of interview.

4.3.5. Phase 3 Participants

Twenty-six F1s participated in the audio-diary study for an average of 3-months duration:[29] comprising equal numbers of males and females, mostly between 25 to 29 years in age, mainly direct-entry from school at the undergraduate level (n=20, 77%) and representing 10 different ethnicities (Appendix K, Table 4K). In addition to participating in the initial interview during Phase 2, all participants submitted audio diary entries and 19/26 participated in an exit/catch-up meeting.

4.3.5. Data analysis (Phases 2 & 3)

In order to triangulate findings across participant groups, the data analysis synthesized the findings across all stakeholders and datasets. Following each interview, the audio-data was transcribed verbatim including extra-linguistic details (e.g. pauses, laughter, over-talk).[30] The data (audio files and transcriptions) were added to the Atlas.ti progamme containing the rapid review data. The data were initially coded according to the thematic Framework Analysis method (Ritchie, Spencer et al. 1994) that comprises the following steps: (1) Familiarisation; (2) Development of coding framework of themes; (3) Indexing (coding); (4) Charting; and (5) Mapping and interpretation:

> *Familiarisation*: This began with 10 researchers (AB, JC, CJ, KK, CK, NK, KM, LM, CR and GS) and two clinical consultants (PB and PB: see Acknowledgements) independently reading and analysing one of the group interview transcripts from each participant group (with

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[28] This is the time during which the study ran, but the exact duration of each participant's involvement differed as initial interviews were staggered across November. Most participants were in the study for a period of 4 months involving at least one transition between clinical placements.

[29] Participating F1 doctors were in post a minimum of 3 months and a maximum of 8 months (assuming full time working) during this time.

[30] We only include this additional transcription information where specifically relevant; otherwise excerpts presented are 'clean' versions to aid reading.

each transcript being read by at least two of the researchers) and 2-3 audio-diary transcripts each.

Development of coding framework of themes: The researchers then came together in a series of face-to-face and video-conference meetings over two days to discuss and negotiate their impressions of the data and to develop a coding framework inductively. The coding framework from the rapid review was then mapped onto this inductive framework (by LM). This ensured that all of the outcomes from TD09 were included as 'potential codes' alongside any additional preparedness themes/subthemes previously developed. Two working documents were produced (the coding framework document and a crib sheet for coding)[31] to facilitate coding consistency.

Indexing (coding): The codes were inputted into Atlas.ti, alongside the transcriptions and linked audio files. These data were then coded mainly by one researcher (KK), with additional coding by CK (Phase 2 PPR data), CJ (Phase 3 data from one site) and LM (Phase 3 data from 3 sites). The researchers coding the data met regularly to discuss developments to the coding framework and to discuss and check each other's coding decisions. LM also double-checked a subset of other researchers' coding to ensure consistency. The coding framework and crib sheet for coding was developed accordingly. The unit of analysis in the first instance was the narratives of personal experience. There are two kinds of these narratives: (1) The Personal Incident Narrative (PIN) which comprises one (or more) participants recounting a specific event that they have experienced, and (2) the Generalised Incident Narrative (GIN) which comprises one (or more) participants recounting an event that frequently occurs and which they then go on to give a more generalized story about – e.g. "it happens all the time….". All PINs and GINs were coded according to the specific theme/sub-theme they addressed in the coding framework and the level of preparedness that was narrated. We had three codes of 'prepared', 'unprepared' and 'unspecified' for each PIN/GIN. Unspecified narratives – both in PIN and GIN format – made no clear attempt to classify the specific or general event as one of preparedness of graduates for practice. Here the talk was more general (for example, about the need for assuring preparedness in a specific area or discussing the issue generally but having no personal experience of encountering this with today's trainees). We also coded each narrative for additional information such as context (where the situation happened) and facilitating/inhibiting factors.

Charting: The Atlas.ti file was managed using both coding and document families to facilitate the retrieval of data by theme/sub-theme and across participant groups, thereby enabling us to consider similarities and differences across the data.

Mapping and interpretation: LM managed the data retrieval, mapping the themes across participant groups and developing the initial interpretation. This interpretation was commented on and developed by KM, CR, GG, AB and KK.

4.4. Results

We held 27 group and 84 individual interviews for Phase 2 (resulting in total of 94hrs and 30mins audio recordings). Due to time constraints and in agreement with the funder, we transcribed and analysed a subset of Phase 2 data for this final report.[32] The subset involved 24 group and 58 individual interviews (61hrs and 6mins) comprising: 23 F1 doctors, 28 registered trainee doctors, 20 clinical educators, 23 Deans and Foundation Programme leads, 11 other health care professionals, 7 NHS employers, 18 patient and public representatives, and 9 policy and

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[31] Available from the corresponding author.

[32] All data will be fully analysed and included in subsequent publications.

government officials (n=139 total: Table 7). These interviews were selected by the researchers directly involved in data collection to be both representative of the overall study sample, as well as representing the diverse range of experiences and viewpoints (see Appendix K, Tables 5K & 6K).

For Phase 3, in addition to initial interviews (which were undertaken as part of Phase 2) a total 254 discrete diary entries were submitted from the 26 participants: comprising 18hrs and 09 mins (average 4 ½ mins per entry, range 32sec–13min 13sec). Furthermore, at the end of Phase 2, four group and seven individual catch-up/exit interviews were also held (total n=19, comprising 7hr 48min, average 43mins per interview). All audio diaries and second interview data from F1 participants collected by 31st March 2014 are included in the analysis reported here.[33]

TABLE 7: DISTRIBUTION OF GROUP AND INDIVIDUAL INTERVIEWS FOR PHASES 2 & 3 AND SUBSET OF PHASE 2 ANALYSED FOR REPORT

Stakeholder Group	Phases 2 & 3 (n=185)		Subset of Phase 2 Analysed for Report (n=157)	
	Group	Individual	Group	Individual
F1 (including initial audio diary meetings)	7 (18)*	16	7 (18)	15
F1 2nd/exit audio diary meetings	4 (13)	8	4 (13)	8
Registered trainee doctors (FRTD)	6 (25)	8	5 (23)	5
Clinical Educators (CE)	4 (11)	21	3 (9)	11
Deans, Foundation Programme leads (D_FP)	3 (11)	19	2 (9)	14
Other health care professionals (HCP)	2 (6)	7	2 (6)	6
Policy and government officials (P_GVT)	1 (4)	7	1 (4)	6
Employers (EMP)	1 (2)	5	1 (2)	5
Patient and public representatives (PPR)	6 (21)**	4	6(21)	3

Note: * number of participants in brackets; ** one PPI came to two focus groups and is only counted once

4.4.1. Coding Framework

The final coding framework comprised 7 themes, each containing multiple sub-themes (see Box 8). Overall across our data we identified n=1,729 narratives (comprising n=615 Personal Incident Narratives (PINs) and n=1,114 General Incident Narratives (GINs): See Table 8 for an overview of these narratives across the stakeholder groups according to graduates' perceived levels of preparedness and Figure 2 for this represented graphically. It is important to note that many narratives were complex. For example, some elements of a 'preparedness narrative' also contained aspects of unpreparedness and vice versa (e.g. a trainee narrating an incident where they felt fully prepared in terms of diagnosing and managing a patients' condition but was unable to successfully complete a practical procedure required as part of the treatment). In such cases we classified the narrative as a whole according to how the event was constructed by the narrator, as events were often introduced as 'a time when I felt prepared/unprepared'. To ensure this complexity was not lost, the nuances around relative preparedness for specific aspects of clinical practice within each narrative were picked up in the more detailed codings of the event content (including facilitating/inhibiting factors, see Appendix K, Box 2K for detailed descriptions of these).

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[33] All Phase 3 participants were in the initial interview stage of Phase 2, with n=18 included in the Phase 2 subset analysed

Furthermore, some narratives were used as general illustrative examples (for example, about the need for assuring preparedness in a specific area or discussing the issue generally but having no personal experience of encountering this with today's trainees). We coded these as 'unspecified narratives' – which came in both in PIN and GIN formats – as they made no clear attempt to classify the specific or general event as one where graduates were, or were not, prepared of for practice. We draw on this type of data mainly to inform our understanding of participants' conceptualisations of preparedness, their attitudes and beliefs around issues such as how doctors should be trained, the issue of bringing registration forward, and general talk around experiences of events relating to the TD09 outcomes in todays' healthcare.

Where meaningful, we present a frequency count of the PIN/GIN classifications (prepared, unprepared and unspecified) for each theme or sub-theme. However, sometimes this information is misleading (e.g. many complex event narratives contained numerous references to using information in the clinical setting or to F1s carrying out a variety of clinical procedures that were evaluated variously and sometimes inconsistently to the overall/main focus of the event). We therefore present this data in a more appropriate manner.

BOX 8: *THE 7 HIGHER-LEVEL THEMES IDENTIFIED*

(1) Explicit conceptualisations of preparedness for practice;
(2) Undergraduate final year to F1 transitions;
(3) Graduates' preparedness across TD09 outcomes;
(4) Graduates' preparedness across non-TD09 outcomes;
(5) Medical school experiences and preparedness;
(6) Inhibiting and facilitating factors around graduates' preparedness;
(7) Bringing full registration forward

BOX 9: *STAKEHOLDER ABBREVIATIONS*

F1	Foundation year 1 trainees
FRTD	Fully registered trainee doctors
CE	Clinical educators
D_FP	Undergraduate/postgraduate deans & foundation programme leads
HCP	Other healthcare practitioners (e.g. nurses)
EMP	NHS employers
P_GVT	Policy & government officials
PPR	Public and patient representatives

TABLE 8: DISTRIBUTION OF PERCENTAGE (AND NUMBER) OF PREPARED, UNPREPARED AND UNSPECIFIED NARRATIVES ACROSS STAKEHOLDER GROUPS FOR THE DATA IN THIS REPORT

	FY	FRTD	CE	D_FP	HCP	EMP	P_GVT	PPR	TOTALS
Prepared	35.0% (286)	25.9% (41)	4.3% (6)	13.9% (23)	18.2% (18)	25.9% (22)	6.5% (5)	4.2% (8)	23.7% (409)
Unprepared	40.0% (326)	40.5% (64)	18.6% (26)	20.0% (33)	34.3% (34)	25.9% (22)	32.5% (24)	12.7% (24)	32.0% (553)
Unspecified	25.0% (204)	33.5% (53)	77.1% (108)	66.1% (109)	47.5% (47)	48.2% (41)	62.3% (48)	83.1% (157)	44.4% (767)
TOTALS	47.2% (816)	9.1% (158)	8.1% (140)	9.5% (165)	5.7% (99)	4.9% (85)	4.5% (77)	10.9% (189)	100.0% (1729)

NOTE: The narratives in this table comprise both PIN and GIN combined. The percentages in the table are calculated using the total of each column, corresponding to each stakeholder group. The totals in the bottom row and right hand side column are calculated as a percentage of the overall total, 1729.

Figure 2: Percentage of narrative types by stakeholder group
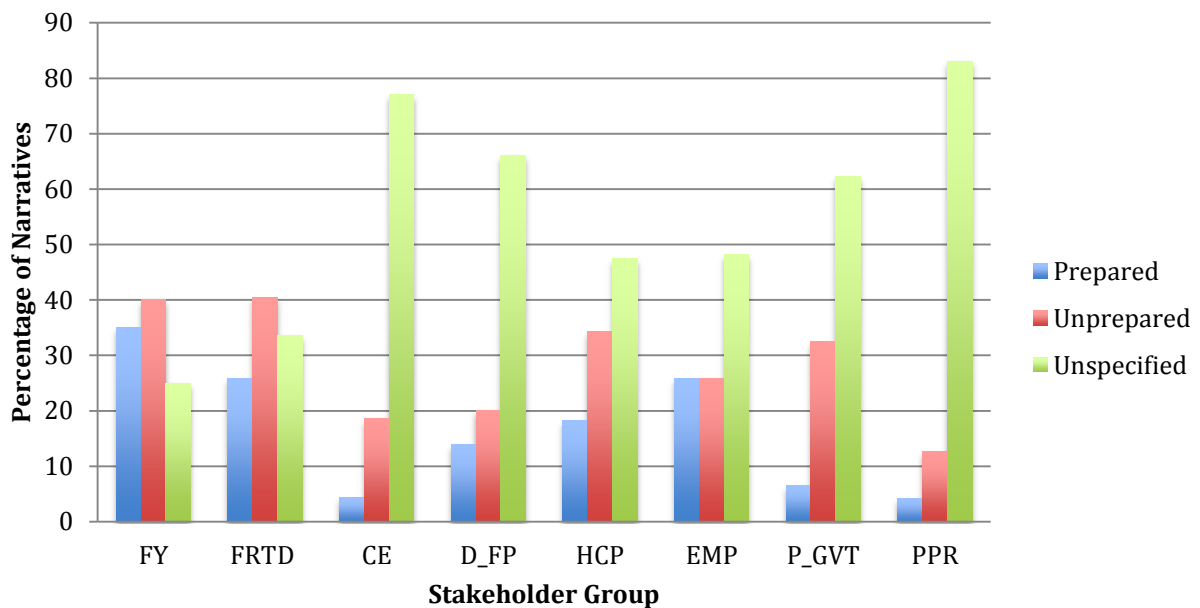
Personal Incident Narratives (PIN): One (or more) participants recounting a <u>specific event</u> experienced;
Generalised Incident Narratives (GIN): One (or more) participants recounting <u>an event that frequently occurs,</u> then give a <u>generalized story</u> about – e.g. "it happens all the time….";
Prepared PIN/GIN: Narrator clearly specifies the overall feeling of preparedness;
Unprepared PIN/GIN: Narrator clearly specifies the overall feeling of unpreparedness;
Unspecified PIN/GIN: No clear attempt made to classify the event as one of preparedness of graduates for practice.

We begin by considering the first research question (and our first theme) concerning how different stakeholders explicitly understand the term *preparedness for practice*. As we present our findings we accompany them with excerpts of talk from participants across the stakeholder groups (see Box 9 for abbreviations used). To preserve anonymity we identify participants by gender, stakeholder group and participant number only. Thus, M_CE_144 is 'male', 'clinical educator', 'participant number 144' (of 185). Additionally, as this results section of the report contains numerous medical terms and abbreviations we explain these in the notes underneath the relevant box. A full list of abbreviations and medical terms can be found at the end of the report on page 192.

4.4.2. RQ1: Participants' explicit conceptualisations of preparedness for practice

Many participants found our first question ("thinking about medical graduates, what does the term preparedness for practice mean to you?") difficult to answer, as indicated through responses with pauses, hesitations and 'hedges' (e.g. "probably", "maybe", "I think") from members of all participant groups (see Box 10 below, Excerpts 1-3).

When participants did begin to articulate their thoughts, it seemed that preparedness for practice had both temporal and constituent dimensions. In terms of temporal aspects, preparedness for practice was considered to be both a short- and long-term construct. In terms of the constituent

dimensions, these comprised a range of knowledge, skills and behaviours that differed according to the temporal aspect.

PREPAREDNESS FOR PRACTICE AS *SHORT-TERM*: Some participants highlighted how undergraduate medical school is about preparing graduates to 'hit the ground running' and work as an F1 doctor on day 1 of their working lives. Preparedness here means graduates being able to do the job – to provide a clinical service as a foundation doctor. Although there was no expectation that they had to be very good at everything, it was expected that graduates had a certain baseline level across the board. When defining preparedness for practice in this way, some focused on the skills, competencies and knowledge for graduates to be able to undertake the various tasks expected of them on day 1, whereas others considered graduates to be 'generally ready' for their new careers from the beginning (Box 10, Excerpts 4-6). Included in this short-term preparedness perspective was the central aspect concerning graduates' knowing the limits of their competence and when to ask for help.

PREPAREDNESS FOR PRACTICE AS *LONG-TERM*: Other participants defined preparedness for practice in terms of preparing for the long-term: the constant development of competent and confident graduates who are to practice over subsequent years. This longer term, lifetime practice included preparing them for issues such as: (1) the moral dilemmas graduates might encounter over time (including situations in which they might feel a failure when things go unexpectedly wrong and patients subsequently die); (2) lifelong learning (due to the ever-changing landscape of medicine); (3) coping with transitions during their training; (4) coping with uncertainty; (5) recognizing and coping with stress; (6) displaying emotional intelligence and sensitivities; (7) professionalism and team working skills; (8) leadership; and (9) being able to manage their own time effectively (Box 10, Excerpts 7-8). Essentially, this long-term perspective highlighted the psychological and emotional dimensions of preparedness to ensure that F1s could enter the workforce fully equipped to provide effective and safe patient care.

PREPAREDNESS FOR PRACTICE AS AN *ONGOING ENDEAVOR*: Finally, it was also acknowledged that preparedness for practice was a continual venture, not only undertaken across the undergraduate years. Preparedness here focused on the end-point of being prepared for accepting full responsibility and complete accountability (Box 10, Excerpt 9).

BOX 10: *EXCERPTS FROM STAKEHOLDERS REGARDING THEIR EXPLICIT CONEPTUALISATIONS OF THE TERM PREPAREDENSS FOR PRACTICE*

Difficulties in defining preparedness for practice

Excerpt 1:

> "Preparedness for practice gosh my understanding of it ((breathes deeply and sighs followed by 2-second pause and another sigh))" [M_CE_144].

Excerpt 2:

> "Um ((sighs)) mainly that, um, you know, from the first day that they st-start as, um, well maybe start their job that they, you know, at least understand what their role is going to be on the ward, and I don't know, who the patients they're looking after, um… "[F_HCP_82]

Excerpt 3:

> "Yes but I can't put it into words ((laughs))…" [F_F1_123]

Preparedness for practice as short-term

Excerpt 4:

> "a state of readiness of an individual* to come in to work as a doctor" [M_EMP_152]

Excerpt 5:

"They should be prepared in terms of their <u>knowledge of medicine and medical specialties</u>, they should also be prepared in terms of <u>their skills, particularly skills in eliciting a clinical history</u> and <u>doing a physical examination</u> and <u>performing these practical procedures like taking blood or ...doing a particular test</u>" [F_CE_109]

Excerpt 6:

"...it's not just about book knowledge, it's about, being prepared to <u>communicate effectively</u> and <u>take action effectively</u>, it's the difference between being a scientist and being a doctor" (F_PPR_151]

Preparedness for practice as long-term

Excerpt 7:

"being <u>psychologically</u> prepared and <u>emotionally</u> prepared to enter the workplace and actually provide care to your patients..." [M_CE_144]

Excerpt 8:

"it's not just that initial- it's, it's ensuring that <u>they don't then just fall off their perch after the first few weeks</u> when they're actually expected to be functioning as an F1" [F_EMP_150]

Preparedness for practice as ongoing endeavour

Excerpt 9:

"... so it's really about <u>the transition</u>, making sure that they're prepared from the transition or being a medical student and being quite passive, to then <u>taking on the responsibility</u> and being <u>accountable</u> for your actions, albeit on a very supervised environment. Then there's <u>a further transition at the end of F1</u> when they become fully registered...actually be <u>completely accountable</u> for their own actions and decision making" [F_EMP_180]

NOTE: *We have underlined relevant words/phrases in the excerpts to emphasise meaning

Overall, while we had relatively equal numbers of participants highlighting short and long-term preparedness, and some mentioning both aspects, there were differences across the participant groups in terms of what they focused on. Participants in the ME, P_GVT, EMP and FRTD stakeholder groups talked equally about both short and long-term preparedness aspects. Participants in the D_FP, HCP and F1 groups defined preparedness more in terms of short-term skills-based activities. Interestingly our PPR participants rarely mentioned the short-term, rather they focused on the longer-term preparedness issues and specifically around their interaction with graduates within the doctor-patient relationship, rather than about the development of doctors themselves. Finally, employers were the only group to highlight the issue of full registration at the end of the F1 year, and preparedness being an ongoing endeavor during this time.

SUMMARY BOX (PHASES 2 & 3): CONCEPTUALISATIONS OF PREPAREDNESS

- Participants found it hard to conceptualise the term "preparedness for practice";
- Conceptualisations of preparedness had temporal aspects (long term, short term) and constituent aspects (knowledge, skill, behaviour);
- Sometimes preparedness was conceptualized as being able to do the F1 job, with a focus on knowledge and skills; sometimes it was conceptualized as ready for a career in medicine, with a focus on the psychological and emotional dimensions of preparedness.

4.4.3. RQ2: How effective are undergraduate final year – F1 transition interventions?

Before we consider in more detail participants' reports on the specific areas of graduates' preparedness and unpreparedness, we report on what our data tell us about the specific UG final year to F1 formal transition interventions, student assistantships, shadowing and work induction, along with participants' talk about the August transition period itself (Theme 2). We do this for two main reasons: firstly, this follows the chronology of the F1 journey, and secondly, by highlighting this aspect of their transition period we are able to foreground some of the complexities around preparedness for practice. This complexity is important to consider when we later attempt to map our data against the TD09 outcomes document.

It is important to note that the majority of the talk around the effectiveness of transition interventions came from F1 and FRTD participants. Although most of our other stakeholder groups also discussed these issues, PPR stakeholders did not. In the following sections we therefore highlight which stakeholder groups our evidence is drawn from (and to what extent) as we report on their perceptions of the effectiveness of transition interventions and the enabling and inhibiting factors (Theme 6) that impact on this effectiveness. Finally, at the end of this section we present our findings regarding specific talk around the initial August transition time in terms of trainee's preparedness for practice and the enabling and inhibiting factors that impact on their performance during their very first week as F1 doctors.

4.4.3.1. Perceived effectiveness of student assistantships

Assistantships were considered by P_GVT stakeholders to be an arena in which to "act up as a medical student", to try out their future roles and to translate theory into practice (see Excerpt 1, Box 11 on page 83). The perceived effectiveness of student assistantships was discussed across all participant stakeholder groups except for the PPRs (with 49 PIN/GINs (2.8%) being coded to this). The majority of data comes from the F1s themselves. All stakeholder groups who discussed this issue highlighted the effectiveness of student assistantships (with 35 PIN/GINs (71.4%) coded as effective, 10 (20.4%) coded as ineffective and 4 (8.2%) as complex[34]).

In terms of effectiveness, assistantships were seen as being pro-active forums, essential for students' learning of how things work on the ward, for seeking out practice of practical skills (such as venous blood sampling and inserting peripheral venous cannulas: Box 11, Excerpt 2), affording the opportunity to follow the patients' journey and enabling them to

BOX 12: ASSISTANTSHIPS: FACILITATING AND INHIBITING FACTORS

Facilitating	
Personal	Students' confidence, proactivity, resilience and approachability.
Interpersonal	Leadership, positive role models, wider team.
Cultural/systemic	Knowing protocols.
Inhibiting	
Personal	None cited.
Interpersonal	None cited.
Cultural/systemic	Not knowing protocols, technology.

see the consequences of clinical decisions and treatments. Some F1 participants commented on how they felt that there was only a 'slight jump' from assistantship to their F1 year in terms of responsibility. When they were an 'F0'[35] they felt they always had someone to ask, whereas by implication, F1 doctors are less supported. Aside from this support, as an F1 they felt it was 'business as usual' as they already understood how the system worked and what would be required of them once they became an F1 (Box 11, Excerpt 3). This view was echoed by participants in the D_FP group who believed that assistantships reduced stress in F1s when

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[34] Complex narrative comprised aspects of effectiveness and ineffectiveness with no clear outcome specified

[35] The assistantship phase of their undergraduate degree was often referred to as the 'F0' year.

starting their new job due to their increased confidence in undertaking practical skills as well as feeling part of the team (Box 11, Excerpt 4).

However, a few F1s talked about their experiences of assistantships very differently, and alongside other stakeholders, they felt that assistantships were not always effective in preparing them for practice. While assistantships frequently prepared some graduates for practice, other graduates felt it was sometimes left to chance in terms of dealing with challenging or difficult situations; such situations were often left for more experienced doctors (e.g. inserting a urinary catheter into a patient with an enlarged prostate gland), with little opportunity for teaching these challenging procedures. Thus trainees highlighted a lack of responsibility within their assistantships with no opportunities to work on-call or during out of hours shifts (Box 11, Excerpt 5), leaving some feeling sheltered and calm during their F0 year, a far cry from the disturbance of the F1 'ocean' (Box 11, Excerpt 6). Other stakeholders talked about assistantships in terms of the difficulties in students being fully included as members of the multidisciplinary team, particularly when teamworking comprised a multitude of interrelated facets and not just patient care: aspects such as the nuances of communication, leadership and peer-support (Box 11, Excerpt 7).

Finally, participants in the CE group talked about the varying nature across assistantship programmes. Some students had more of an opportunity to be proactive and part of the team than others for various reasons: including medical school, placement setting, and student characteristics such as being proactive (Box 11, Excerpt 8). All participant groups referred to facilitating and inhibiting factors that contributed to the effectiveness of assistantship programmes (see Box 12 on page 82). Personal factors were cited more highly as being facilitating than interpersonal or cultural/systemic factors with students' proactivity and confidence being commonly mentioned. Leadership, positive role models and the wider team were also facilitating factors, along with students knowing the explicit rules and procedures regarding 'when X happens'. Conversely, not knowing the protocols and not having access to computer passwords were cited as inhibiting factors.

Box 11: *Participants' views and experiences of assistantship programmes*

Views of Assistantship

Excerpt 1:

"and then in the final year, preparation for practice when students are really doing shadowing* for most of the time, is the chance really to make sure that that knowledge does translate into day-to-day activity" [M_P_GVT_112]

Assistantship Effective

Excerpt 2:

"I think that assistantship was really good in terms of you got to actually do the job of a doctor without actually having all the exams around it … which was really useful … I was on a respiratory ward so I got to do about 40 ABGs ((arterial blood gas sampling)) or something…which you don't really get to do that many ABGs as a med student so it was actually really useful, so assistantship was really good for that…I started at the end of 4th year just cannulating people…by the time you get reasonably good at cannulating they'll start letting you cannulate everything and then everything in sight, so you start of at the antecubital fossa and then you work your way down to the hands and then by the time you get to F1 I'm already cannulating people's feet, whereas some people don't do that until their SHO (Senior House Officer) level" [F_F1_19]

Excerpt 3:

"We had a patient who came in with epididymo-orchitis and the cultures were positive for various different things and the bug was sensitive to different drugs and we wanted to send him home, but if he was on IV antibiotics we weren't going to send him home with that, so calling up microbiology

and asking them 'what can we switch him to?' and then knowing that you had to ring rapid response if you had to send him home with IV antibiotics. <u>I knew. I was prepared for that because I had done it before on the wards quite a few times when I was a fifth year,</u> because that's the kind of things they let you do just for you to get used to- so I knew how to call rapid response because I'd done it before and I knew what to say to the microbiologist, <u>whereas some people might not have been prepared in that situation</u>" [M_F1_36]

Excerpt 4

"…giving the students meaningful things to do in a safe way…It's good for the students. It's good for the patients. It's good for the hospital…<u>it kind of wins all the way around</u>…making them being in one place with the same clinicians and seeing the role modelling of a well operating team of professionals, of different health care trades working together, that imprints on them and then they hopefully go out and say "yeah I can to that" [M_D_FP_113]

Assistantship Ineffective

Excerpt 5:

"I mean the majority of our last couple of years were on placement, weren't they, but you don't get given- well <u>we didn't get given any responsibility</u> as a student. You're there to shadow. You're there to watch. And you get to clerk patients you don't do the actual job even on our assistantship…where that's what you're meant to do. You don't really. Like they'll say "oh can you fill this blood form out?" or "can you do one or two things?" but you don't actually get given the chance to be in charge of all the patients and know about all of the patients. On-calls again. I've never been forced to do an on-call shift. Whereas I think we probably should've to give us experience. So yeah definitely not enough responsibility as medical students, and I don't think it should come during the first few years, but during the fifth year" [F_F1_27]

Excerpt 6:

"when you were a student on the ward you were just given a little- you were almost kept in <u>a little harbour where there was no disturbance whatsoever</u>, and then once you become an F1, you're <u>released out into the ocean and you're hit by big waves</u>, and there's no sort of calmness anymore…as a medical student you've always got the great barrier of 'sorry I'm a medical student'… I used it up until the last day of the fifth year…everyone does "sorry…I'm a medical student, I'm off"…there's no transitional period. I know there's supposed to be this transitional period with the student assistantship, but even that is still sheltered" [M_F1_22]

Excerpt 7:

"we attempt to provide them with exposure…an opportunity to attend multi disciplinary team workings, and certainly within our assistantship there is an issue about observing a multi disciplinary team at work…you're the outsider looking in. <u>Its only when you actually become embedded within the team that you suddenly realise how teams work</u>…I think <u>we probably could invest more time in ensuring that these individuals become part of the team rather than an addition</u>…sitting on the periphery…multi disciplinary teams that they observe are very much based around service, and there's an agenda, and things to be covered…not just about the delivery, it's about the peer support, it's about the by-law of the understanding and the communication within a team…it's about understanding the dynamic and it's also about how teams are led" [M_D_FP_165]

Assistantship Variable

Excerpt 8:

"F_CE_159: Well this F0 did answer the bleep
F_CE_157: Did she?
F_CE_159: Yeah

F_CE_157: Well that's great if you can be in a team and you can have a bit of that an element of that <u>responsibility supervised</u> I think that would be really helpful
F_CE_159: They were quite prepared to get like- she didn't go for lunch if we didn't go for lunch
F_CE_157: That's good but that would probably- <u>some people wouldn't always get that</u>
F_CE_159: Yeah"

NOTE:*This participant uses the term shadowing here, although they are referring to the longitudinal assistantship programme. ****Antecubital Fossa:** Triangular cavity on the anterior view of the elbow; **Arterial Blood Gas (ABG):** Blood test performed using blood from an artery to measure the amount of oxygen and carbon dioxide in the blood; **Cannulation:** Insertion of an indwelling plastic tube (cannula) into a patient's vein to allow fluids to be infused into the vein; **Epididymo-orchitis:** Inflammation of the epididymis (a tube that connects the testis to the vas deferens) and testicle.

SUMMARY BOX (PHASES 2 & 3): EFFECTIVENESS OF STUDENT ASSISTANTSHIPS

- Student assistantships were widely discussed, particularly by F1 doctor participants, with far more participants considering their experience effective than ineffective;
- Student assistantships were perceived to smooth the transition to F1 doctor, by enabling students to find out how things work on the ward, practice practical skills, feel part of the team and follow patients' journeys;
- The degree to which participants could engage with opportunities, take on responsibility or feel part of the team was variable, however, and affected by multiple factors, including personal characteristics of the student (e.g. confidence), interpersonal factors (e.g. team leadership) and cultural / systemic factors (e.g. knowing protocols).

4.4.3.2. Effectiveness of Shadowing

The shadowing experience was discussed more frequently across participants (with 48 (2.8%) PIN/GINs coded to this theme) with a similar number of narratives indicating the perceived effectiveness and ineffectiveness of graduates' shadowing experiences (with 24 PIN/GINs (50.0%) coded as effective, 20 (41.6%) coded as ineffective and 4 (8.3%) as complex). The data here comes from our F1 and FRTD groups (equally split, with no data from the PPR, HCP, P_GVT or EMP groups). Interestingly, while the F1s in our study more frequently talked about how shadowing was ineffective, or complex,[36] FRTDs, D_FTs and CEs talked more about the effectiveness of shadowing. However, all of these three participant groups agreed that shadowing alone did not guarantee the facilitation of graduates' preparedness: as with assistantships, medical students need to be highly proactive in their approach for the experience to benefit them. Other common aspects that were thought to impact on the effectiveness of shadowing were (in order of frequency in our data) the: (1) quality of shadowing; (2) location of shadowing; (3) timing of shadowing; and (4) duration of shadowing.

4.4.3.2.1. Quality of shadowing

When effective, shadowing was talked about in terms of it being a mutually agreeable situation where the medical student would be an integrated part of the team, holding a bleep and jointly attending patients to agree on diagnoses and treatments. In this situation, the medical student felt accepted and came to know about 'a week in the life of an F1' (Excerpt 1, Box 13 on 87). Indeed, some F1's, reflecting on their experiences as medical students, confessed to not knowing even the basics of ward procedures prior to their shadowing experiences. The narratives about quality of shadowing all came from F1 participants, with both F1 and F2s highlighting the lack of quality as

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[36] Complex situations are events in which levels of effectiveness are mixed, so participants tell us that there are some aspects that were good and some not so good and no clear conclusion around effectiveness is drawn.

inhibiting its effectiveness. Clearly, not all experiences of shadowing were of a similar quality. Some participants talked about not feeling part of the team, not being allowed to have any hands-on experience (mostly passively observing), a lack of supervision and training, being given 'other tasks' to do and not having any patients to care for (Box 13, Excerpt 2).

4.4.3.2.2. Site of shadowing

All grades of trainees talked about effective shadowing in terms of it being tied to the specific job they are about to enter, where they get to know the team and understand how the system works, both in general terms and in terms of the specific unit itself (Box 13, Excerpt 3). Participants in the deans group also highlighted this as a time to get to know what the team structure is like, and the way that things work, how to use the IT systems and as an opportunity to be involved in the actual care of patients they are about to encounter so that there are no 'surprises' when they take over the F1 role: essentially they are experiencing "a four day hand-over of care" [M_D_FP_51] which is "setting them up to succeed" [M_D_FP_57]. Only the F1s in our study talked about the site of shadowing in terms of how it inhibited their preparedness for practice. Essentially, shadowing sometimes occurred in different specialties, different wards, different hospitals and even different hospital trusts to the ones that graduates were actually entering. This caused practical problems when graduates began working as F1s in terms of the different way investigations were processed and different layouts of request forms (e.g. computer versus handwritten forms, the use of 'pods' which are sent or 'boxes' which are paged and collected), as well as the difficulties around not knowing the team, the timings and procedure of ward-rounds and the physical layout of the ward. In extreme cases, these relatively 'simple' issues were compounded when their new wards were short-staffed and the entire atmosphere of the ward itself was less supportive (in stark contrast to the trainee's shadowing experience: Box 13, Excerpt 4).

4.4.3.2.3. Timing of shadowing

Shadowing was deemed effective by trainees when it occurred immediately prior to starting their F1 (Box 12, Excerpt 5). By contrast, having a gap between shadowing and beginning the F1 post was deemed to be ineffective in preparing trainees for practice, not only because learning could be forgotten but also because the timing of shadowing might encroach on graduates' much-needed summer break following their final exams, causing a lack of engagement in the shadowing experience (Box 13, Excerpt 6).

BOX 14: _SHADOWING: FACILITATING AND INHIBITING FACTORS_

Facilitating	
Personal	Graduates' proactivity, maturity, resilience.
Interpersonal	Wider team, peers, supervisors, positive role models.
Cultural/systemic	Knowing protocols.
Inhibiting	
Personal	Confidence.
Interpersonal	Wider team, supervisors.
Cultural/systemic	Staffing, not knowing protocols.

4.4.3.2.4. Duration of shadowing

A few participants across the F1 and D_FP groups explicitly mentioned the duration of shadowing. When they did so they all commented on the relatively short duration of graduates' shadowing experiences. Furthermore, they mainly asserted that shadowing should be a longitudinal endeavor spanning weeks or months. Indeed, the concept of shadowing and assistantships began to merge as being an integral part of medical students' final year 'in some form or another' (Box 13, Excerpt 7).

As with assistantships, a range of facilitating and inhibiting factors were cited by participants (see Box 14 above). By far the most commonly mentioned facilitating factor for the success of the shadowing experience was graduates' own proactivity along with support from the wider team and peers (Box 13, Excerpt 8). The most commonly cited factor contributing to ineffective shadowing experiences was inadequate/unsupportive supervisors (Box 13, Excerpt 9).

BOX 13: PARTICIPANTS' EXPERIENCES OF SHADOWING

Quality of shadowing

Excerpt 1 (effective):

"I followed everything. Well I kind of didn't quite follow everything he did, but under his guidance, did jobs and things, and it was great to have him as a resource, you know, even stupid questions like 'where do you keep the paper?' 'where do you do this?'" [F_F1_91]

Excerpt 2 (ineffective):

"Well my first four days of shadowing. The first thing, I had an F1, and for the next three days he was on-call. So I was having difficulty finding my way round the ward, and then no one actually explained a lot of things to me as well. And I had a registrar for two days, and then the last day he was gone as well. So technically I didn't- really didn't know what I was doing for the first four days, and then after that I was on-call, and then back in the wards, and for the two weeks I was the only one in the team. No consultant. No SHO. No registrar. It was horrendous. I nearly burst out crying. But I think it really depends on the team that you get things like that and then it's crazy…I just had to learn everything on my own" [F_F1_11]

Site of Shadowing

Excerpt 3 (effective):

Five days of shadowing in June. But only because I specifically requested it, not because the foundation programme was willing to give it to me. Like I specifically asked for it…on the ((name)) ward where I'm at right now…so at least I was in the same department that I was going to be starting out at" [F_F1_106]

Excerpt 4 (ineffective):

"my shadowing was on a quieter medical team and I've been thrown on to, I'd say probably the busiest surgical team in the hospital, and I found it really hard its- there's three consultants, two registrars and SHOs and three F1s. One F1 is academic, but the way the rota works, you're often working on your own, with not much senior support on our team because they have so many surgical lists and clinics and other responsibilities. You're often left to fend on your own for forty plus patients. It's so-it's really difficult…this has been particularly hard…the nurses, other doctors, mostly nurses, I don't know if they really grasp that you've just come out of medical school and…" [F_F1_27]

Timing of shadowing

Excerpt 5 (effective):

"We did a four-day shadowing immediately before starting work, and I think that was probably more focused and useful…" [F_F1_6]

Excerpt 6 (ineffective):

"we had our kind of shadowing block which is a month block before we go away on our elective sometime between late March and April…I'm being honest for the tape…after the finals you've worked so hard…you don't really give it your all. You don't really think. Because then you're sent off on your medical elective for three months… everyone's in really high spirits really positive. You've had that time off and you feel fantastic and you feel really ready to start working. But that time immediately after you've had your exams it was- for me it was just pretty much wasted…the F1 inevitably does his jobs by one or two…you finish your jobs by three, and he kind of says 'oh you know what, you can go home if you want'. You of course go home because it's the middle of summer and you've finished your finals" [M_F1_35]

Duration of shadowing

Excerpt 7 (ineffective):

"M_CE_96: I'm not sure shadowing is long enough…I think it's around the maximum of four weeks
INT: okay so you would think there needs to be longer periods of
M_CE_96: yeah, if not the whole of fifth year being shadowing of some form or another"

Enabling/inhibiting factors

Excerpt 8 (wider team, enabling):

"…luckily I had a nurse prac for my first job … this was purely by coincidence…I didn't know this role had a nurse prac until being in the role and I would recommend anybody to go into their first job with a nurse prac, because they have done this job for years so they know what goes on, and they are such a vital part to go '*oh my god I don't know what I'm doing*' or '*I don't know who to go and see about this*' and they know everybody in the hospital …so I felt a lot more supported knowing that they were there and they had the experience" [F_F1_3]

Excerpt 9 (supervisors, inhibiting):

"yeah involved and being part of the team rather than just kind of being a slave ((laughter)) … and you don't actually know why you're doing it, so you're just being told to '*just do it*'… it's usually the junior doctors who tell you to do this or even the registrars" [F_F1_106]

SUMMARY BOX (PHASES 2 & 3): EFFECTIVENESS OF SHADOWING

- Participants were divided in their opinion about the effectiveness of shadowing, with almost equal numbers of narratives referring to shadowing as effective and ineffective;
- The consensus was that shadowing alone did not guarantee the facilitation of graduates' preparedness: as with assistantships, medical students need to be highly proactive in their approach to maximise the benefit;
- In terms of quality, effective shadowing involved being adopted as an integral team member and able to gain hands on experience with real patient care;
- In terms of site, shadowing the specific job they are about to enter was important, for team familiarisation and to understand the ward environment, both generally (e.g. team culture) and specifically (e.g. IT processes);
- In terms of timing and duration, shadowing that occurred immediately prior to starting their F1 job was deemed most effective and the duration of shadowing was generally considered short.

4.4.3.3. Effectiveness of Induction

Induction was discussed infrequently across participants (with 33 PIN/GINs (1.9% of all data) coded to this theme: with 12 PIN/GINs (36.4%) coded as effective, 18 (54.5%) coded as ineffective and 3 (9.1%) as complex). The majority of the data on shadowing comes from our F1 participants (10 PIN/GINs (30.3%): with no data from the PPR, HCP or P_GVT groups). F1s reported that induction was sometimes a valuable intervention that prepared them for aspects such as request form-filling and understanding the way the wider healthcare system works at the hospital (Box 15, Excerpt 1). However, some vital aspects were reported as being missed by some F1s, such as information regarding how computer systems worked and correct passwords resulting in trainees

working ineffectively and inefficiently during their first few days on the ward. Overall, however, inductions were deemed to be superficial and relatively brief (Box 15, Excerpt 2).

BOX 15: PARTICIPANTS' EXPERIENCES OF INDUCTION.

Excerpt 1:

"in the introduction week they gave us a quick scenario…we had to consent a patient for a OGD, which was really useful because it showed us what the consent form actually looked like. So this is a situation where I felt that I was well prepared for a situation that I was put in that had I not had that training I perhaps wouldn't have been" [M_F1_28]

Excerpt 2:

"the induction I don't really remember the induction… we kind of- we had a chat in a lecture theatre for about half an hour/45 minutes, I think, and then it was very much like 'this medicine- this is medicine we're all a team, go and have fun' " [M_F1_35]

NOTE: **Oesophageo-gastro Duodenoscopy (OGD):** A diagnostic test done by passing a tube with a camera attached through the upper part of the gastrointestinal tract,

SUMMARY BOX (PHASES 2 & 3): EFFECTIVENESS OF INDUCTION

- Induction was discussed infrequently across participants
- F1s reported that induction were often superficial and brief, although some felt they had been valuable
- F1s felt that important information that could help their first few days in post was missing from induction, including IT information and passwords.

4.4.3.4. The August Transition

We now consider the very first few days of being an F1 – the 'August transition' period (with n=53 PIN/GINs (3.1%) being coded to this sub-theme; 7 (13.2%) were coded as trainees being prepared, 29 (54.7%) as unprepared and the remainder were general narratives around the final-F1 transition, sometimes comparing todays' experiences with the experiences of how things used to be). Different stakeholders talked about this in different ways and to different extents, with the F1 trainees and FRTDs discussing this more frequently than other groups (with no data from P_GVT or EMP groups) and providing the majority of our data on preparedness. Only one PPR group member drew on personal experiences (she was an ex-healthcare worker) the remainder drawing on second-hand understandings of the transition period as reported in the popular press. Indeed, the perceptions of this transition period from one PPR group appeared quite unambiguously negative, suggesting that August was a very bad time to get sick and that hospital was to be avoided at all costs (see Box 16, Excerpt 1). Such public perceptions of the first few working days of F1s appear to be founded on hearsay, and media coverage of this transition time. However, similar concerns were talked about by a few F1 participants (Box 16, Excerpt 2), who cited the 'all change' on the same day in August as their biggest concern regarding patient safety.

In terms of preparedness (rather than unpreparedness), our data came from discussions within F1, FRTD and HCP stakeholder group discussions. Factors that seemed to facilitate preparedness were familiarity with the specific working environment in which F1s were entering, graduates' feelings of confidence that they have attained the right level of training in practical procedures, and have the appropriate communication skills to talk with patients and engage in joint decision-making activities (Box 16, Excerpt 2).

For F1 and FRTD participants, one way of understanding personal experiences of the August transition period is by considering not just *what* they said about preparedness, but paying attention to *how* they talked about this transition time. Their narratives were replete with vivid

metaphors about the enormity of their new F1 role: they talked about '*feeling completely alien*', taking '*that step*', '*the biggest jump*', feeling as if they were '*in the deep end*', not '*knowing how to bridge the gap'*, when '*everything goes out of the window'* because they experience '*a clash between simulation and reality*' and it's like they are '*starting from scratch*'. In terms of the transition itself, recent graduates and newly-registered doctors repeatedly referred to the 'one day-next day' scenario: '*one day you're not asked anything, and then the next day you get asked everything*', '*one day you're a 5th year student, and one day you're a doctor'*. The stark reality of the situation as summed up in terms of the difference between focusing on passing the placement (in their student role) and focusing on settling in with the team (in their F1 role). Overwhelmingly their talk implicitly or explicitly focused on the issue of responsibility and how this became quite different overnight: 'you go from no responsibility, to whole responsibility'. This issue of responsibility was also talked about by participants in the D_FP and CE groups: some felt that this was something that could not be taught to graduates, and thus they will always be unprepared in that aspect.

Within their narratives, participants in the FRTD group frequently talked about the many things that they did not learn as medical students that they needed to know as an F1 doctor: being prepared for the amount of work that they would have to do (including managing the high volume of paperwork), the level of multitasking required of them, learning *who* to ask and *when* to ask for help (including who to refer to) and understanding how the hospital works (which can be very different across hospitals). Working with, and dealing with, inadequate team members (including other healthcare professionals) was also mentioned frequently, along with being prepared for working unsupported since their seniors also rotated concurrently (Box 16, Excerpt 2).

BOX 16: PARTICIPANTS' TALK AROUND THE AUGUST TRANSITION PERIOD

Excerpt 1:

F_PPR_43: they do say don't go into hospital in August because you'll die
M_PPR_45: that's right don't
F_PPR_43: no they do say that
Several: ((laughter))
M_PPR_45: oh yes, yes
F_PPR_44: or at the weekends ((laughter))
M_PPR_45: or at weekends ((laughter))
F_PPR_43: quite a big- you know it's quite frightening- don't get ill
F_PPR_44: yes, yes
F_PPR_43: you know- feed yourself in the house like
F_PPR_44: yes, yes
F_PPR_43: you know, but don't go in to hospital
F_PPR_44: I mean, I used to feel quite sorry for the housemen you know…the newly qualified ones because there they were landed with all these patients
M_PPR_45: yeah, yeah
F_PPR_43: yes
F_PPR_44: and not a lot of supervision…and trying to make decisions and then getting told off if they made the wrong decision ((laughter)) yeah

Excerpt 2:

"We didn't have any time actually following the job that we were going to do in the hospital… for instance, I didn't follow this job, and I wasn't in this hospital. So I didn't know how to use the system when I turned up, the computer system's different. I didn't know where to go. A chest x-ray, for instance, *now* I'd go and give [it] to the person on floor 2, and that takes me 30 seconds to think, do, and take to them. On day-1 you don't know how to fill out an x-ray form, where to take

an x-ray form, <u>you don't know</u> who to speak to for an x-ray form, <u>you don't know</u> how to then check the x-ray form, and <u>you don't know</u> what to do with the x-ray form. So you know that's just five things with the x-ray form. That alone, *getting* the actual x-ray and interpreting…another important thing that in general for junior doctors is this is our first day. We were new. We were brand new to this hospital and our SHOs and our registrars were also new, and <u>all changed on the same day</u>, which was a <u>really dangerous</u> thing to have done. A massive oversight by whoever decided that was the case, and really, really to be perfectly blunt, *stupid* of whoever decided it was a good idea to have all F1s, all CTs, all SHOs, all registrars, change on the same day because they were all in inductions, so we were on the ward with <u>no senior help and no one</u>. We didn't know who to call because they hadn't picked up their bleeps, so we had no way of contacting the right seniors, we had no way of knowing where they were, let alone who they were, what their names were, and <u>we didn't know what we were doing</u> to start with, let alone having the clinical knowledge to be able to work with what we did…I think that was- <u>that was worrying</u>. But, yeah I think, otherwise…" [M_F1_28]

Excerpt 3:

"Just to add, with medical students throughout their curriculum and as they graduate as F1s <u>they're more prepared for practice</u> because they have acquired more observational skills, their communication skills and they've learnt better, and seen the significance and the importance of actually listening to the patient and listening to what the patient has to say to help with the diagnosis, or to help relieve an anxiety." [F_HCP_164]

SUMMARY BOX (PHASES 2 & 3): EXPERIENCES AND PERCEPTIONS OF THE AUGUST TRANSITION

- The August transition was discussed by all participant groups, with most narratives being coded 'unprepared';
- Some F1 participants cited the 'all change' on the same day in August as their biggest concern regarding patient safety;
- F1 doctors' feelings of preparedness were facilitated by familiarity with the specific working environment and confidence in their training, particularly practical procedures, communication and decision-making;
- F1 doctors felt unprepared for the step change in responsibility, the workload, the degree of multitasking, deciding who and when to ask for help, understanding how the hospital works (which varied by hospital) and dealing with underperformance of other team members;
- The transition experience was stressful, with vivid descriptions of the abrupt shift from medical student to the F1 doctor role and extensive use of metaphor;
- The PPR group's perceptions tended to originate from the popular press and were unambiguously negative.

Having highlighted a range of viewpoints and experiences around the issue of preparedness for practice for 'day 1' of the August transition, we now turn to consider participants' viewpoints and experiences of medical graduates over the first few months of becoming an F1 doctor.

4.4.4. RQ3: To what extent do recent graduates perceive themselves to be prepared for practice and how does this compare with the views of employers and other key partners?

In this section we map our data across the three broad domains identified in the TD09 report (Theme 3), identifying areas of preparedness and unpreparedness. In doing so we comment on the similarities and differences across our eight stakeholder groups, along with the strength and type

of data we draw upon as we do so (e.g. PINs/GINs; interviews/audio-diaries). For example, sometimes participants expressed an opinion about certain aspects of preparedness but offered no specific examples of the issue in practice. While general opinions and hearsay are interesting, a more grounded understanding of experience is arguably more informative. Examples of actual specific events (e.g. PINs) enable us to understand the bigger picture and the interplay of a variety of inhibitory and facilitatory factors involved and the implications of these across the different stakeholder groups in our study (Theme 6). However, rather than falling neatly within the specific outcome categories of TD09, such events often cross-cut different outcome domains. Therefore, many of the examples we provide will have been coded to more than one of the TD09 specific outcomes, and some narratives demonstrate a preparedness in one outcome but unpreparedness in another. Furthermore, when mapping our data across the three core themes of doctor as a scholar and scientist, as a practitioner and as a professional we notice that we have more data relating to some areas than to others, the relative size of these sections along with the way in which we are able to treat our data therefore differs (for example, where there is sufficient data for it to be meaningful, we will present numerical tables: we present the full mapping process of PIN/GIN narratives across all 15 of the broad outcomes under the domains of doctor as 'scientist and scholar' as 'practitioner' and as 'professional' in Appendix L). Finally, note that the perceptions and experiences recounted by current F1 doctors are based on their first 8 months' experience, having started their F1 jobs in August 2013.

4.4.4.1. Outcomes 1 – The doctor as a scholar and a scientist

The first five broad outcomes in TD09 are themed according to *the doctor as a scholar and a scientist* (Box 1M of Appendix M). We had a relative paucity of data coded to this group of outcomes (a total of 46 PIN/GINs (2.7%) across the 33 specific aspects of the 5 broad outcomes, with data mainly coming from the F1 stakeholder group: 19 narratives (41.3%). This was unsurprising as the focus of most participants' talk was around the everyday activities of F1s that are observable and knowable, rather than knowledge that is often 'hidden' or 'tacit' and only made available upon further questioning. Of these five outcomes, most data mapped onto the first (biomedical scientific principles: 38 PIN/GINs (82.6%), of these: 10 (26.3%) prepared, 19 (50.0%) unprepared, 9 (23.7%) unspecific with general agreement across stakeholder groups[37]). Fewer narratives were coded on the second and third outcomes (psychology and sociology principles: 8 PIN/GINs (17.4%)). None were coded on the fourth and fifth (population health and health/healthcare improvement; and research).

4.4.4.1.1. Applying biomedical scientific principles, method and knowledge

F1 participants often talked about selecting appropriate investigations for common clinical cases but did not 'justify' them in their narratives in terms of how they applied their scientific knowledge. However, we were able to identify some narratives that related to these outcomes relating to medical graduates' preparedness. When asked what medical school could or should be doing to help prepare junior doctors for practice, there was a view from the CE and D_FP groups that medical school has moved too far away from understanding the basic building blocks of practice such as anatomy, physiology, and so on (Box 17 below, Excerpt 1). Foundation trainees' biomedical knowledge was thought to be quite variable and experiences of our patient group suggested this was sometimes the case (Box 17, Excerpt 2). However, even when present, some F1s reported that translating their 'lofty' knowledge into clinical practice – what to do with the actual patient in front of them – was not a straightforward matter (Box 17, Excerpt 3). And although this perspective was also alluded to by a member of the clinical educator group (Box 17, Excerpt 4), there was a view from the FRTD group that their core clinical knowledge saw them through their first year. F1 trainees found that lack of support, both on the ground in terms of having more senior doctors to hand and also in terms of having the infrastructure in the hospital to

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[37] Meaning the pattern of prepared/unprepared narratives has the same weighting across all groups.

deal with any potential emergencies, only compounded the situation for them (Box 17, Excerpt 5). Despite this, F1s acknowledged that learning about normal human structure and function and understanding the science behind the disease during medical school gave them more confidence in their decision-making, even if they sometimes failed to utilize their knowledge (Box 17, Excerpt 6).

F1s told of events in which they either were unaware of (Box 17, Excerpt 7) or understood (Box 17, Excerpt 8) the side-effects of specific drugs. These highlight the impact of having and not having knowledge of drug actions and the consequences for patient immediate wellness and health outcomes, and for the F1s in terms of their confidence.

Box 17: Participants' views and experiences concerning knowledge of biomedical scientific principles and method

Unprepared

Excerpt 1:

"they also, I think, are quite light in a lot of knowledge aspects, which we had the benefit of having a very much more grounded scientific basis to medical practice, which <u>nowadays they just don't get</u>" [M_D_FP_87]

Excerpt 2:

"there were some sort of <u>glaringly weird things said</u>, which you know, I'm thinking 'I, you know, I didn't get an 'O' level in biology and I know, you know, I know that's not there'… I remember one junior doctor suggesting that it was a liver, and the liver's not anywhere near there" [F_PPR_151]

Excerpt 3:

"well applied knowledge really, I mean <u>I knew a lot about diabetes</u> but when I'm there on the ward and someone comes to me and talks about setting up a sliding scale because someone's levels are too high…I found <u>I knew a lot about the you know receptors and all these sort of like lofty things about how they work</u>, but I didn't necessarily know "right this is what I got to do"… it's good that I know why they're having the pathology that they're having, but <u>I didn't know well enough properly how to put in place the treatment for it</u>…I knew about it but I'm the little man on the ground who still has got the problems so need to know how to deal with it" [M_F1_19]

Excerpt 4:

"medical school teaches you disease process, but dealing with patients and looking after patients …you know understanding diabetes is one thing, understanding chest diseases is another thing, understanding heart disease is another thing, but <u>actually dealing with a patient with those things and then considering surgery</u>…" [M_CE_149]

Excerpt 5:

"there was a lady who, on Friday night, at seven o'clock as it happens, was discovered to have a sodium of 110 after receiving 124, so it's quite a dramatic drop…<u>whilst I understood the physiology of what was happening</u>, I was quite surprised in myself at how well I understood what was happening and at how I was able to grasp that she was not responding to the treatment and even why she wasn't responding to the treatment, <u>I did not feel comfortable having this patient under my care at night with just two doctors in the hospital with no ICU available and no lab on site</u>. It just wasn't it wasn't ideal. I wasn't happy with it. I didn't feel comfortable with the situation. I think it was more due to a lack of immediate support had it been needed <u>it was pretty scary</u>" [F_F1_168, AD]

Excerpt 6:

"one of our registrars told me that a patient was going to go and have an embolisation of their vessels, of their renal arteries, and I had just gone and told them that without speaking to the

radiologist etcetera so this patient was expecting to get done…but then the radiologist said 'no it's not going to get done because their urea and creatinine levels are way too high so they're- it's going to compromise the other kidney and so forth'…I should have been more prepared in the sense that I- you know <u>I should have covered my bases and having a good like scientific background</u> to what I should of done in the correct way really" [M_F1_36, AD]

<u>Excerpt 7</u>:

"I saw this lady who came in with chest pain and she was having nausea and vomiting as well so we were doing all the ECGs, there were no acute changes, she wasn't having an acute coronary syndrome or anything so it was- it was fine…so I thought '*I'll just- oh she's not keeping anything down. I'll just give her some Cyclizine*' and so I wrote some Cyclizine out just 50 mgs just normal PRN [as needed], just standard dose"… the nurse gave it to her and <u>as she gave it to her I thought she was having a stroke</u>…she started slurring all her speech her face started kind of drooping a little bit I looked at her and <u>I just panicked</u>. An outright panic… my registrar was just across the way…he goes 'oh what have you done'… <u>I was panicking quite a lot at this point</u>, I was 'oh, oh she felt quite nauseous' and he goes 'did you give her Cyclizine… ah this can happen sometimes'…and apparently if you give Cyclizine too quickly it can just make people go completely bonkers…genuinely I thought she'd had a stroke in front of me" [M_F1_35, AD]

Prepared

<u>Excerpt 8</u>:

"I noticed that an elderly lady's MSU [*mid stream urine*] result had just become available on the labs system. She had tested positive for a UTI so I wrote this, plus the name of the causative organism in her notes. I also listed the antibiotic sensitivities…<u>I remembered that the antibiotic that had been prescribed was one of those to which the organism was resistant</u>. I found the patient's cardex, stopped the current antibiotic and commenced one of those to which the organism was sensitive. I informed the pharmacist of this and we selected the antibiotic least likely to have a negative impact upon this lady's reduced renal function. I felt confident that I had responded to the MSU result appropriately and that I had made my prescribing decision within the wider context of the patient's overall condition" [F_F1_172, AD]

NOTE: **Acute Coronary Syndrome:** Disease of the coronary arteries, including angina and *myocardial infarction*; **Embolisation:** The introduction of material into an artery to reduce or completely obstruct blood flow; **Mid-stream Specimen of Urine (MSU):** A specimen of urine examined for the presence of microorganisms; **Urinary Tract Infection (UTI):** Infection of the urinary tract

4.4.4.1.2. Applying psychological and Sociological principles

We had very little in our data in terms of narratives of actual events where these issues were raised. When these wider issues were mentioned, they were discussed by the CE participants in terms of how unprepared junior doctors were for looking beyond the biomedical aspects of the patients' condition (Box 18, Excerpt 1). Comments from the PPR group suggested that they thought such holistic understanding was appropriate but suspected it was not always the case, whereas comments from the HCP group suggested that such an understanding was 'unavoidable' although not necessarily a certainty (Box 18, Excerpt 2). However, as many of our narratives were mainly about actual daily events occurring as F1s navigated their new role, the relative absence of talk around the core principles of psychological and sociological issues does not necessarily mean that they were not considered; these may be the more implicit, and therefore 'hidden', aspects of F1 preparedness. Indeed, although a far-cry from applying core principles, some F1 participants did talk about the importance of taking a social history (Box 18, Excerpt 3), suggesting that there was an understanding of the wider mechanisms of health and illness. Others, however, were unprepared of the impact that attending to social/psychological dimensions of healthcare can have on the normal functioning of the workplace (Box 18, Excerpt 4).

BOX 18: PARTICIPANTS' VIEWS CONCERNING PSYCHOLOGICAL AND SOCIAL ASPECTS OF GRADUATES' PREPAREDNESS

Excerpt 1:

"it's very complex isn't it because […] a lot of medical problems are not about taking a tablet to lower your blood pressure, or taking insulin or tablets to treat your diabetes, it is about lifestyle…obviously involves the psycho-social aspects of paediatrics, but certainly beyond the medical aspects of paediatrics. I think we [are] expecting a lot of them [F1s] but the problem there is that there is not enough focus probably on that in medical school…but do we really show them the- the integration between physical and mental health to lifestyle and health, and society and health, these are so important in first world countries…although it'd be- it'd be fair on them to make them aware of it…because they don't…none of them are. Not even the junior doctors …I've always have to guide them towards taking a two tier approach to towards a problem like headaches or abdominal pain or, I don't know, tummy pains and headaches are the most common ones but a lot of them - a lot of paediatric problems are partly anxiety from the parents or over interpretation or just stress in the children…or lifestyle related… they've always been focused to rule out medical conditions, that they have not focused on what it is then what causes the pain…and that is often the psycho-social and social environment…or lifestyle issues" [F_CE_18]

Excerpt 2:

"I think you can't avoid that [the whole patient issue], I think with a lot of patients, because especially with children, it effects so much of their life being poorly, and a lot of it is about children going home and families being able to cope with an illness or any sort of, you know, needs they have. You can't help but be holistic, I would hope, I would hope that perhaps they would realize that. I don't think it is necessarily '*so and so's got this infection and this has been done, these tests have been done, that needs to be done*'. I think they do, I like to think they look at it a bit more holistically" [F_HCP_135]

Excerpt 3:

"… then just following on from that just to get the social history, a lot of our patients can be quite elderly or be suffering various social issues, you know with their condition, so I just make sure to check if they're living at home if they have any sort of care package at the moment, if they need one, check if they're living in a house with stairs or a flat or a bungalow or if they're able to manage at home with stairs, if they're able to manage with dressing and eating things like that just make sure everything's covered" [F_F1_170, AD]

Excerpt 4:

"there's more to it than that - you can't just send them [old people who fall] home you can't necessarily admit them and there's a lot more of the social care that goes on inside with the A&E department that I didn't realise … they basically assess the patients before they are discharged home- assess the home situation to make sure there are all the right tools in place to keep them safe and check out their home, and most of them have all gone home whether it's to their daughter children's home or whether it's back to their care home…the alcoholic lady was ready to go. Medically fit for discharge. Had no cause for the fall apart from alcohol, but ended up spending 36 hours in A&E because she had smeared her house with faeces, and you don't really expect to see a patient three days in a row, whilst you know, when you go back into work. It's something that shouldn't be an A&E problem" [M_F1_29, AD]

NOTE: **A&E:** Accident and Emergency

SUMMARY BOX (PHASES 2 & 3): PREPAREDNESS IN RELATION TO OUTCOME 1 (DOCTOR AS SCHOLAR AND SCIENTIST)

- There was little data coded to this outcome, with the general focus of discussion on practical skills, rather than underpinning knowledge.
- Of the five subheadings, most data mapped onto biomedical scientific principles, a smaller amount onto psychology and sociology principles, and none onto population health and health/healthcare improvement, and research.
- Some F1s reported that translating knowledge into clinical practice was challenging but that understanding human structure, function and pathological mechanisms provided confidence for decision-making.
- Clinical Educators felt junior doctors were generally ill prepared to look beyond the biomedical aspects of a patients' condition and the Patient and Public Representatives agreed that holistic understanding was important but not always demonstrated.

4.4.4.2. Outcomes 2 – The doctor as a practitioner

The next 7 broad outcomes in TD09 are classified under the domain of *doctor as practitioner.* Unsurprisingly, this was a core focus of the majority of the narratives in our study.

4.4.4.2.1. Patient-consultation

We begin by considering the outcomes focused on graduates' preparedness for consultation with a patient (see Box 2M in Appendix M, for the 7 specific outcomes on this aspect of practice). A total of 101PINs/GINs (5.8%) were coded to these outcomes (see Table 9 below for preparedness/ unpreparedness across stakeholder groups). As we can see, from Table 9, although all participant groups talked about these aspects of clinical practice, the majority of data comes from our F1 participants. Furthermore, in the general area of patient consultation, there is an even spread of preparedness and unpreparedness narratives across all participant groups (given low numbers in some groups we do not over-interpret the % data).

TABLE 9: DISTRIBUTION OF PERCENTAGE (AND NUMBER) OF PREPARED, UNPREPARED AND UNSPECIFIED NARRATIVES ACROSS STAKEHOLDER GROUPS FOR GRADUATES' PREPAREDNESS FOR CONSULTATION WITH A PATIENT

	FY	FRTD	CE	D_FP	HCP	EMP	P_GVT	PPR	TOTAL
Prepared	48.2% (27)	14.3% (1)	0.0% (0)	16.7% (1)	28.6% (2)	40.0% (2)	0.0% (0)	12.5% (1)	33.7% (34)
Unprepared	42.9% (24)	42.9% (3)	0.0% (0)	16.7% (1)	42.9% (3)	60.0% (3)	14.3% (1)	37.5% (3)	37.6% (38)
Unspecified	8.9% (5)	42.9% (3)	100.0% (5)	66.7% (4)	28.6% (2)	0.0% (0)	85.7% (6)	50.0% (4)	28.7% (29)
TOTALS:	55.4% (56)	6.9% (7)	5.0% (5)	5.9% (6)	6.9% (7)	5.0% (5)	6.9% (7)	7.9% (8)	100.0% (101)

NOTE: The percentages in the table are calculated using the total of each column, corresponding to each stakeholder group. The totals in the bottom row and right hand side column are calculated as a percentage of the overall total number of narratives concerning preparedness for consultation with a patient (n=101).

The main areas that participants talked about were: (a) history taking; (b) full physical examinations; and (c) assessing patients' capacity for decision-making. We present our summary of findings regarding preparedness across these specific outcomes below. However, we do not have sufficient data relating to all the remaining specific outcomes around patient consultations (e.g. performing a mini-mental state examination, eliciting patients' questions and understanding

of their condition and treatment options) to summarise in this way as we have very few coded examples for each of these.

4.4.4.2.1.1. History taking

The vast majority of our data suggests that today's graduates are generally well prepared in terms of histories (38 (2.2%) PIN/GINs coded, of these 28 (73.7%) were from F1 stakeholder groups, all other groups only provided narratives of preparedness with an absence of data from CE stakeholders). F1s talked about how much practice they had already had with taking patients' histories, something they had been doing prolifically over the past few years during their undergraduate medical education: they were 'well-rehearsed'. They talked about feeling relatively comfortable about asking medical questions pertaining to the patient's clinical presentation, past medical and drug history, systematic questioning and making sure they collected the relevant information. They highlighted how they felt comfortable in being able to speak to a patient and being able to get information that they needed rather than skirting around issues even in the context of difficult situations such as patients with cancer, patients who were under the influence of alcohol or drugs, patients who had miscarried, patients with mental health problems or who had attempted suicide (Box 19, Excerpt 1). They also talked about being quite prepared to contact other sources (such as the patient's GP) to get further information if required (e.g. an accurate up-to-date record of their prescribed medications). However, history-taking is highly contextual and is undertaken with a specific purpose in mind, as highlighted by the F1 participants in our study, while they feel highly proficient in history taking, they feel less prepared for the consequences of what they might find, often having to learn this aspect of patient-consultation on the job (Box 19, Excerpt 2). One aspect that was rarely explicitly mentioned was taking a social history. The bulk of participants' talk concerned obtaining patients' 'past medical history': only 4 (10.5%) of the 38 narratives in our data on histories explicitly mentioned patients' social histories. In terms of unpreparedness, only the F1 group discussed this issue. The number of patients they had to see, which was more than they expected, contributed to their feelings of unpreparedness in this area.

4.4.4.2.1.2. Full physical examination

The majority of our data in this area suggests graduates are prepared for full examinations (with 27 (1.6%) PIN/GINs coded to this outcome, 18 (66.7%) of these from F1s and an absence of data from the HCP and P_GVT groups).[38] F1s talked about how performing physical examinations was a significant part of their workload, and how they were extremely familiar with this process - having experienced hundreds of physical examinations during placements and in clinical skills settings during their undergraduate training. There were also confident that they could summarise patients' histories and communicate these to senior staff. They talked about being quite prepared to examine a patient's respiratory system, perform a precordial and cardiovascular examination and examine a patient's abdomen. Again, one of the major difficulties around this aspect of their job, according to the F1s, was the sheer number of patients they were required to examine. Although our F1 participants talked about being sensitive to patients' needs whilst taking their history, this was not highlighted when they talked about undertaking full physical examinations. Indeed, one of the carers in the PPR stakeholder group gave a powerful example of the need for junior doctors – or any doctor – to be mindful of ethical practice, obtaining consent for physical examinations, appropriate communication with particularly vulnerable patients and including carers in the clinical encounter (Box 19, Excerpt 3).

4.4.4.2.1.3. Assess a patient's capacity for decision-making:

This aspect of preparedness was discussed widely across our participant groups n=38 (2.2%) PINs/GINs. Although participants did talk about specific events concerning assessing patient capacity for decision-making, there was also a lot of talk about the complexity of the issue in terms

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[38] The data reported here is for 'full' physical examinations, rather than specific examinations. We only coded this here if participants actually described undertaking full examinations rather than general talk around this ability.

of what F1s could and should be able to, do rather than being grounded in actual lived experiences of events. F1s talked about situations in which they had to assess patient capacity for their ability to refuse treatment.[39] They talked about speaking with the family to try to resolve such situations when in doubt. They highlighted that assessing patient capacity to consent had been 'drummed into them' during their undergraduate medical education. However, some trainees felt there were situations in which assessing patient capacity was 'not required', for example in A&E where patients were 'in and out' very quickly. Although some F1s felt confident in assessing patient capacity (Box 19, Excerpt 4), others expressed anxiety around this issue and whether patients truly understood what was going to happen to them as a consequence of their decisions. They talked about the difference between theory and practice; in theory patient capacity was a tick-box exercise but in practice things were more complex and it was often a 'tough call' for them to make. What is striking here is that, unlike the other groups, none of our F1 participants talked about their own limitations. Indeed, the anxiety F1s expressed about their own decision-making when faced with a patient who lacked capacity suggests that they were unaware of the requirement to communicate this to the wider team, rather than deal with it single-handedly.

Unlike the F1s, the FRTD participants knew that they should assess patient capacity alongside the wider interprofessional team, including nurses. They talked about how, as an F1, you are not able to authorize the 'within capacity' form, so when in doubt a senior should be involved (Box 19, excerpt 5). They highlighted the importance of communication amongst the team when a patient's capacity to consent was in question (e.g. via patient's notes and during hand-overs).

P_GVT stakeholders framed the issue in terms of wider aspects of communication with patients and joint decision-making activities. There was awareness of the complexity of this issue and how assessing the capacity of a patient to make decisions about their own care was difficult for even senior doctors with great experience. The complexity here was expressed in terms of continual changes in the law and the need for further education on legal aspects of consent for care to be available to all doctors even amongst the higher ranks. Indeed, the P_GVT group, more than any other group in our study, focused on the legal complexities of assessing capacity (although this was also mentioned by some PPR and CE participants).

CE stakeholders talked a lot about how the F1s had been taught and examined on how to assess patient capacity to make decisions during their undergraduate curriculum. In terms of the complexity, this group was divided in their opinions. Some talked about standard questions that were easy to perform. Others talked about the difficulty in assessing capacity even after lengthy training. There was also lots of talk around the complexity of ethical law and concerns that some consultants in secondary care believed that consent comprised the signing of the form: something that F1s could easily do. There was, however, agreement that F1s should be proficient in assessing patient capacity to give their full consent for physical examinations or practical procedures such as obtaining a blood sample from a patient.

Within the D_FP group, there was recognition that F1s would be expected to seek help from a senior colleague, but that they should still be proficient in the initial assessment procedure. In this respect they talked about medical students' training to understand their own limitations. There was a recognition amongst this group that, compared to the situation 10 years ago, F1s are probably more aware of some ethical issues around consent, mental capacity and their own limitations as a doctor.

4.4.4.2.1.4. Involving patients in their own care:
Only the PPR stakeholder group talked about the issue of involving patients in their own care. Rather than based on their experiences of medical graduates' actual preparedness, they talked about it in terms of what they wanted medical graduates to be prepared for. Although they

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[39] As mentioned in the previous section, they did not talk about patients' capacity to consent to other aspects of their care such as physical examinations or obtaining a venous blood sample.

recognized that not all patients were the same, and some just wanted to be told what to do, they talked about being more involved: wanting to know the protocols for taking new medication, what was done, how, when and where, and the outcome of clinical trials. There was a call for doctors to help patients understand better their conditions, as it made life easier for all, rather than doctors thinking they had to solve everything themselves. There was also a call for new doctors to recognise that patients have an important role to play, one that is very different from their role as a doctor, but no less important (Box 19, Excerpt 6).

BOX 19: PARTICIPANTS' VIEWPOINTS AND EXPERIENCES AROUND PREPAREDNESS FOR PATIENT CONSULTATIONS

History-taking

Excerpt 1:

"another patient that came in on call was a patient that took an overdose. Again, through medical school I think, through just various experiences shadowing doctors, I think you become quite aware of the sort of relevant questions you need to ask for an overdose with [name] medical school we had quite a few psychiatrists that sort of promoted- well psychiatrists and OSCE* stations which sort of prepared you to revise histories for sort of vulnerable adults…so it was nice to sort of take a history of what she had taken, why she had taken it, and what types of tablets, and then also discuss with her if she was hearing voices and if she was having hallucinations and sort of getting a better picture of the acute stage of her schizophrenia diagnosis. So I think the medical school was really good in preparing us for those kind of cases" [M_F1_30]

Excerpt 2:

"I was working today in pre-assessment clinic …today I saw a patient that was a smoker, she was asthmatic. She had quite poorly controlled asthma and she'd find it difficult to climb one flight of stairs. On examination, she had bilateral widespread expiratory wheeze, so I thought to myself that she should have pulmonary function tests to assess her risk for the operation she was going to have done. Luckily I've kind of learnt to do that because of my job at the moment, it's a surgical job and I've had to learn. My seniors often ask me to book pulmonary function tests for patients that are going to have an operation but otherwise I wouldn't have known to do it and that could have gone missed and the patient may not have been well enough, or had a good enough pulmonary or respiratory reserve for the operation. Other things as well, patients that are on Warfarin or Aspirin or Insulin it - we don't really get taught what to tell them with regards to how they should manage that before an operation. So in one respect I was prepared because I- we do a lot of clerkings as medical students, so I feel quite confident in doing that, but actually doing it in this setting of a pre op assessment clinic is something we've never been taught about. It's sort of the significance of the things that you pick up and knowing what to do with them. Because at the end of the day, you're assessing someone's anaesthetic risk as well as their- the risk from the surgery. It's quite a big responsibility and really probably isn't the best thing for an F1 to be doing when we don't perform any operations and don't- only have a few days of anaesthetic experience behind us but it is part of the job for most surgical house officers" [F_F1_27]

Full physical examination

Excerpt 3:

"I can certainly share from a personal perspective…feeling a great deal of empathy for the junior doctor who obviously didn't have a clue what they were doing as in didn't have any idea how to speak with my husband…this was in a hospital setting in an acute setting…he was in the earlier stages of dementia looked a very fit healthy specimen, but I did kind of say '*I needed to be with him whilst he was examined…can I just advise you how to do this*', the answer basically was '*no*' so I sat back and thought '*now wait for it so*'. It was- the same speak as you would speak to any other adult but no chance to assimilate, to even test to see if there was any level of understanding, but I looked at my husband's eyes and thought '*there's a belt coming, I can see it*' … so with that he broke the

nose of- *bang-* ... I did try and point out about his dignity *da-dee-da da da* because what he did, this guy, was go straight to my husband's stomach...whipped up his top...and I was about to say to him '*do not approach him straight in the face because*', well it was lucky he didn't get nutted actually. If you approach him, and in fact on one side he's always more amenable that the other, I was about to say this but I was told- '*fine*'. I could have prevented that... I said '*well there's a life lesson for you isn't there don't ever- always listen to carers'*...but well he was streaming ((shows blood streaming from nose))..." [F_PPR_71]

Assess a patient's capacity for decision-making

Excerpt 4:

 "so I feel like the elderly, I've always felt really, really prepared to deal with that, and even kind of I feel, I felt- I felt prepared from day one to test people's capacity, which is quite unusual really...I've seen so many doctors test capacity that it didn't kind of bother me testing capacity even though that's often considered quite a scary thing, deciding whether somebody does have capacity or not...somebody who came in the other week...quite a vulnerable adult and she was severely disabled and she had burns across her chest and it was it was quite easy to explain in that the burns were compatible with the story she gave with the burns, so they were clearly wasn't anything that was referable to social services or anything... she had capacity to make the decision, she didn't have learning disabilities... but that made me kind of think '*what would I have done if I was kind of really worried about those burns*?' Because every time I see a vulnerable adult with something like burns I kind of think, it goes off in your head '*does this need a referral to social services*?' and I kind of thought actually '*what would I have done?*' and that kind of scared me a little. But so I guess in that sense I didn't feel particularly prepared" [F_F1_19]

Excerpt 5:

"I've seen enough confused patients that I am happy dealing with all sorts of situations. Back in FY1 I had a couple of times where I had to get the reg involved to help me with things. Not that I felt out of my depth, but as an FY1 you can't sign an adult's within capacity form and if you don't have an adult's within capacity form, for some vulnerable adults especially like the elderly, if they are delirious and need treatment you can't you can't force...but if you're needing to put a venflon in to give antibiotics to treat their infection that's making them confused and making them refuse you can't physically restrain them. But if you have the adult's within capacity you- we have the power to give them the treatment they need. So it's not so much I felt out of my depth but there are limits on what we can do as an FY1, and you have to get more senior people involved to assess the patients....I mean it's something you get with the experience, working out when somebody has capacity or not... you're given the tools at medical school but you need to actually experience it" [F_FRTD_89]

Involving patients in their own care

Excerpt 6:

M_PPR_132: The patients need to be the centre of this, they're experts in what's going on, they have so much information to share. I mean they can learn from patients, that's a –
F_PPR_133: That's exactly right isn't it...it's not humility, it's reality...I spend on average, as a patient, five hours a year with medics, but all the other hours in the year I'm managing this on my own...I have levels of expertise in doing that, but that's not recognized enough by enough of the doctors I see. It's '*what can I do for you*?' '*what can I put right for you*'? It's not a magic wand scenario is it?...this is what I've been doing...they don't want to know. It's all about what I, I as a doctor, do for you. And that's the wrong culture, and it's a very old-fashioned mind-set.

Note: * **OSCE** is "Objective Structure Clinical Examination": Type of examination designed to test clinical and communication skills where students rotate between stations; **Pulmonary Function Test:** A group of tests that measure how well the lungs are working.

SUMMARY BOX (PHASES 2 & 3): PREPAREDNESS IN RELATION TO OUTCOME 2 (DOCTOR AS PRACTITIONER) SUBHEADING 1 (PATIENT CONSULTATION).

- In relation to patient consultation generally, there was an even spread of preparedness and unpreparedness narratives;
- In relation to history taking, graduates were comfortable to speak to patients and confident not to skirt around difficult issues, but less prepared for the high volume of patients they had to see and the consequences of what they might find. Taking a social history was rarely mentioned explicitly;
- In relation to full physical examination, graduates were confident to summarise patients' histories and examination findings, and communicate these to senior staff, but less prepared for the high number of patients to examine. F1 participants talked about being sensitive to patients' needs during history taking but this was not mentioned in relation to full physical examinations;
- Assessing a patient's capacity for decision making was reportedly well covered at medical school but easier in theory than in clinical practice. F1 doctor participants highlighted the need for judgment, for example their uncertainty about the degree of patient understanding of the impact of their decisions. Interestingly, F1 doctors did not talk about discussing or communicating their decisions around patient capacity to the wider healthcare team, and some trainees felt there were situations in which assessing patient capacity was 'not required';
- Only the Patient & Public Representatives talked about involving patients in their own care, and this was in terms of what they wanted junior doctors to be prepared for in future, rather than based on current experiences. They wanted to be more involved, discuss the evidence base for different treatment options, receive help from doctors to understand their conditions better and be acknowledged for the important role they play.

4.4.4.2.2. Diagnosing and managing clinical presentations

We now consider the outcomes around graduates' preparedness for diagnosing and managing clinical presentations (see Box 3M, Appendix M for the 10 specific outcomes on this aspect of practice). We coded 241 (13.9%) distinct PINs/GINs although F1s provided the majority of narratives (see Table 10 below for the distribution across stakeholder groups as a proportion of their overall talk). Generally, the pattern of prepared versus unprepared narratives across F1 and FRTDs are relatively equal across this broad domain, with other stakeholders generally narrating more unprepared than prepared events. However, when we consider the specifics of this domain in greater depth, the picture is multifaceted. For example, we had more preparedness narratives for simple diagnoses and treatment planning but more unpreparedness narratives for complex cases. Further, despite the large amount of data within our study there are some outcomes for which there is little or no data (e.g. supporting patients in caring for themselves and identifying signs of abuse in young or vulnerable people). We also had very few narratives coded specifically to end of life care, although some of these aspects (e.g. certification and communicating bad news) are picked up later. As the narratives are complex, and therefore do not map onto specific outcomes neatly, we summarise our findings across all 10 outcomes below rather than report on each specific outcome within TD09.

TABLE 10: DISTRIBUTION OF PERCENTAGE (AND NUMBER) OF PREPARED, UNPREPARED AND UNSPECIFIED NARRATIVES ACROSS STAKEHOLDER GROUPS FOR GRADUATES' PREPAREDNESS FOR DIAGNOSING AND MANAGING CLINICAL PRESENTATIONS

	FY	FRTD	CE	D_FP	HCP	EMP	P_GVT	PPR	TOTAL
Prepared	42.3% (74)	37.5% (3)	8.3% (1)	10.0% (1)	9.1% (1)	11.1% (1)	33.3% (1)	0.0% (0)	34.0% (82)
Unprepared	47.4% (83)	50.0% (4)	25.0% (3)	40.0% (4)	54.5% (6)	55.6% (5)	0.0% (0)	15.4% (2)	44.4% (107)
Unspecified	10.3% (18)	12.5% (1)	66.7% (8)	50.0% (5)	36.4% (4)	33.3% (3)	66.7% (2)	84.6% (11)	21.6% (52)
TOTALS:	72.6% (175)	3.3% (8)	5.0% (12)	4.1% (10)	4.5% (11)	3.7% (9)	1.2% (3)	5.4% (13)	100.0% (241)

NOTE: The percentages in the table are calculated using the total of each column, corresponding to each stakeholder group. The totals in the bottom row and right hand side column are calculated as a percentage of the overall total number of narratives concerning preparedness for diagnosing and managing clinical presentations (n=241).

The majority of data on graduates' preparedness comes from the F1s themselves. Their narratives were richly descriptive accounts of encounters with specific patients and included detailed talk of events from their first meeting with patients, running through exactly what happened and what they thought about the situation (both clinically and personally), culminating in an 'evaluation' of the event and reflecting on what they felt had prepared them (or not) for the encounter. We therefore draw on both trainees' accounts of events and their associated evaluations of facilitating and inhibiting factors as we summarise the data below.

4.4.4.2.2.1. Diagnosing and managing clinical presentations: Prepared

In terms of preparedness, when talking about common presentations, F1s explained how they used their own 'common sense (developed from previous experiences of seeing patients with similar conditions, their observations of senior clinicians, and undergraduate teaching), in order to formulate diagnoses and management plans. They highlighted the need to look beyond the patients' immediate symptoms, thinking more widely in terms of: differential diagnosis and making sure that the right information was in place before coming to any decisions (this view was also backed up by a participant in the P_GVT group). Thus there is evidence (from F1s at least) that for many straightforward presentations they are able to synthesise a full assessment of patients' problems and develop differential diagnoses accordingly.

F1s frequently mentioned how their medical school experiences were key in terms of feelings of preparedness: medical school 'drummed into' them to 'cover all bases' (Box 20, Excerpt 1), to ensure they undertook a comprehensive assessment of the patient, to take time when going through patient histories and examinations and to ensure they approached their assessment logically. They talked about being prepared in their clinical skills, including cannulation, taking bloods and blood cultures. A common perception amongst the F1 and FRTD groups was the value of seeing 'literally hundreds' of patients during their undergraduate clinical placements. Thus, they believed that their clinical decision-making skills had been developed through experience, through seeing real patients rather than book learning. However, there was variability amongst F1s with some feeling less confident around diagnosis and management plans. Although they talked about a logical approach to histories and physical examinations and the need to be thorough, F1 narratives talked little about the wider impact of psychological, spiritual, religious, social and cultural factors. When wider issues were talked about, this was limited to the availability of social support from families or friends.

Many F1s expressed the view that clinical decision-making was not an individual endeavor. It was about understanding their own limitations and sharing their thoughts with the wider

interprofessional team (mainly nurses). Therefore part of their decision-making includes consultation with others, and having the understanding and ability to change their mind if they are on the wrong track (Box 20, Excerpt 2). Indeed, there was a lot of talk about knowing when to escalate the situation to one's senior – knowing their limitations – and there being 'no shame in calling for help'. Relationships between F1s and their seniors featured quite highly in their preparedness for diagnosis and management. For example, knowing that their seniors trusted their judgment and their abilities to manage their own limitations was seen as a positive force behind their feelings of preparedness. However, there was virtually no talk about involving patients' families or carers when sharing their thoughts on diagnosis. When this was talked about, it came across as being a 'them and us' situation rather than a collaborative endeavor (Box 20, Excerpt 3).

There was a strong developmental flavor to many of the narratives around being prepared. Some F1s reported initially doubting their own knowledge and others' expectations of them in terms of how much clinical work they should initiate themselves and how much they should be asking for senior support. Developing confidence in themselves and understanding when they should ask for help was thought to develop over time. F1s talked how their F1 experiences enabled them to deal with unexpected situations more effectively. They highlighted that through observing more senior doctors manage and diagnose problems and talking with them about different management plans, they were able to think more widely about diagnoses and management plans. Furthermore, while most F1s reported feeling very confident and competent in their abilities to undertake clerking, some participants reported their confidence developing gradually (this being reported around 4 months into their F1 posts).

In addition to coding our data on activates undertaken during graduates' first two placements, we also coded data for facilitating and inhibiting factors. We did not include F1s' undergraduate experience here as we discuss this background aspect in more detail as we go along and tie it into the specifics of the events. Here, facilitating and inhibiting factors are those 'in the moment' things that impact on F1s' levels of preparedness for specific aspects of their work over and above previous training. We classified these according to personal, interpersonal and cultural/systemic factors. In terms of facilitating factors for preparedness for interpreting findings and diagnoses, by far the most common factors cited were F1s' confidence in their own abilities, supportive relationships with supervisors and the usefulness of 'fire drills' (commonly mentioned was the ABCDE approach and Sepsis 6 guidelines: see Box 21 above for the full list).

Box 21: *Diagnosing and managing clinical prepsentations: facilitating and inhibiting factors*

Facilitating	
Personal	Confidence, motivation, proactivity, maturity.
Interpersonal	Supervisors, wider team, peers.
Cultural/systemic	'Fire drills', protocols and form, staffing, time, digital technology.
Inhibiting	
Personal	Confidence (lack)*.
Interpersonal	Wider team, quality of handovers, supervisors.
Cultural/systemic	Time, staffing, 'fire drills', protocols and forms

*NOTE: Inhibiting factors indicate a lack or deficiency in something

4.4.4.2.2.2. Diagnosing and managing clinical presentations: Unprepared

While we had large numbers of preparedness narratives, we had a greater proportion of unpreparedness narratives. These typically focused on more complex clinical cases (Box 20, Excerpt 4). Furthermore, even FRTDs found that they lacked experience to diagnose and manage complex clinical cases (Box 20, Excerpt 5). Essentially, the view here is that medical school prepares graduates to deal with straightforward cases, but experience is needed before F1s feel prepared to deal with complexity. As one EMP participant put it "*patients never read textbooks*",

[M_EMP_101] so clinical situations are rarely straightforward. The F1s' unpreparedness narratives contained frequent references to their emotional states when dealing with complex cases, often reporting feeling distressed, anxious and scared.

Our F1 participants narrated detailed situations where they were the first person to encounter the patient, or the patient had a complex history and they were called to an emergency situation. In such cases they struggled to gather the relevant information and to prioritise the order in which things should be done for the best outcome. This was made worse when F1's felt anxious about their newly acquired responsibility (Box 20, Excerpt 6).

In terms of complexity, F1s highlighted a range of situations where patients were mentally confused or intoxicated with alcohol (so taking a history or examining them further compounded difficulties) and talked about patients arriving in hospital for one reason (e.g. having a fall and suspected fractured rib) only to discover a more complex and unrelated problem arising through general investigations (e.g. suspected lymphoma). When talking about complex situations, F1s referred to issues such as uncertainty around how to approach the situation and its clinical management, including prescribing issues (Box 20, Excerpt 7). One common complex area that was discussed in terms of unpreparedness was neurology. F1s often talked about consulting with their SHOs and supervisors (Box 20, Excerpt 8). Other F1 and EMP participants talked about F1s being relatively prepared for recognising disease processes and making diagnoses, but being less prepared for the management side of things.

Participants cited enabling and inhibiting factors in their narratives of feeling unprepared (Box 21). The most common enabling factors cited were interpersonal factors: namely supervisors and near-peers. Frequently these were the people who F1s turned to when they felt out of their depth and they managed to bring a positive outcome to these difficult and sometimes traumatic situations. Inhibiting factors mainly cited were personal feelings of confidence and having limited time and poor staffing. Indeed, these aspects appeared to be confounding with many narratives citing poor staffing, meaning that F1s felt that they had no-one to call on, leaving limited time to investigate and make diagnoses. F1s were not confident in undertaking such critical (sometimes life threatening) tasks under time pressures.

4.4.4.2.2.3. X-ray interpretation within diagnosing and managing clinical presentations
One aspect that was repeatedly mentioned when narrating the interpretation of findings, and which features in TD09 outcomes, is the interpretation of x-rays (23 (1.3%) PIN/GINs, of which 9 (39.1%) were prepared, 9 (39.1%) were unprepared and 5 (21.7%) were unspecified). While some F1s felt that the teaching of x-ray interpretation was well covered in their undergraduate degree, others struggled. In the preparedness narratives, F1s emphasised the vast amount of practice they had received as students, often due to their own pro-activity (Box 20, Excerpt 9), and the confidence their seniors had in their interpretations. Conversely, when narrating unpreparedness in x-ray interpretation, F1s talked about doubting their own judgements or not having the experience to interpret everything (the job of an F1 being the ordering of the x-ray rather than its interpretation) and therefore needing to run them by their seniors. Some F1 participants suggested that more x-ray teaching should be done as part of the undergraduate curriculum given that x-ray interpretation *is* a common activity for F1s (Box 20, Excerpt 10).

Box 20: F1 AND FRTD PARTICIPANTS' VIEWPOINTS AND EXPERIENCES AROUND DIAGNOSING AND MANAGING CLINICAL PRESENTATIONS

Prepared

Excerpt 1:

F_F1_27: …didn't you see an exacerbation of asthma or something and you knew how to treat that
M_F1_26: …Yeah when I was on call last I saw someone who came in with asthma and
F_F1_27: you could remember…because that's something you would have learnt for finals
M_F1_26: yeah I could remember what you learn in med school, so yeah, I did feel prepared for that I suppose…but then you're always doubting yourself. Well I am I'm always thinking '*oh should I be doing this differently maybe*'…it's difficult to know what to initiate as an F1. How much you should be asking for senior support. I guess when we started we were scared to prescribe paracetamol, but now…it's all from the job…I knew from med school, I'd learnt the symptoms and signs that you look for in someone who has life threatening asthma and I could recall them because they were drummed into us…I had in my mind- I knew how to recognise if the patient was really, really sick and needed to go to ITU, and I was able to recall them, and luckily the patient wasn't really, really sick and didn't need to go to ITU, and then I could recall exactly how I would treat someone who was very sick because an asthma exacerbation- I did feel prepared for that…I prescribed the drugs that she needed I knew how to assess her peak flow and everything…we were taught for finals…

Excerpt 2:

"I've always said medicine's not about knowing everything it's about having common sense…for example, for second year resuscitating you get taught the doctor ABC so response, airway, breathing, circulation. Being able to run through that, and take a deep breath, work through it in a logical manner, and think '*right they're not breathing, right because of this, so I need to treat this*' is better than just going in all guns blazing…just avoiding missing the obvious and remembering the common things are common. It's not going to be some weird and wonderful syndrome, it's probably just gonna to be a chest infection and just again, it's something that's difficult to explain, and it's something that takes experience…If something goes wrong the more experience you have in fixing things, the number of different ways you can think to try and fix something, and being able to look at a patient and really be able to say '*this is the most likely thing to work*' I think that's what clinical decision making is, being able to look at a patient and say '*they need this antibiotic*' or '*they need this antibiotic*' or '*they need this test to exclude x y or z*' that's clinical decision making…experience, ok, so no medical school could really prepare you for that…getting on the wards, taking the opportunities seeing the patients, you're not going to get that particularly from reading a book…I mean there are certain things you can get from reading a book like looking at x-rays being able to know what a pneumonia looks like…that's part of clinical decision making but you need to have the experience that you know that you need the chest x-ray to see that you need to know what the chest might sound like with different things to know that you need the chest x-ray to see these different things…and then when you see the chest x-ray to know what to do from there…in my head it seems like fairly logical sequence but some people struggle…and you need to know where your boundaries are, when to go and chat to someone else. So that's also part of clinical like your decision is to chat to someone else… and if it's the wrong line to go down, I'll go back to the beginning and I'll start again then a different line…" [F_FRTD_98]

Excerpt 3:

"I felt the examination and the questions that that certainly should have been asked were asked by the by the patients' daughter… she gave me quite a good grilling ((laughter)) 'why has my mother got this illness? how long its going to take? why are you giving her these medications? how long does she need to take these medications?' I actually armed myself quite well with information before the whole consultation examination, and I think by the time I consulted with my seniors and they kind of agreed on the treatment plan that we'd provided, which would be prednisolone and

acyclovir, and then a chance to review her again in two weeks time back in the medical decisions unit, then we were we were pretty happy with how the whole thing went   " [M_F1_35, Audio diary]

Unprepared

Excerpt 4:

"there's not many clear cut things that you see like when you learn for finals you learn for specific conditions. Someone comes in with that, and you know how to treat that, but often on the wards patients have been in for a very long time they've got a confusing past medical history, or with me, because I'm on surgery they have confusing operations that I don't know. If you get called to see a post op complication, I don't know how that operation is carried out and what the possible complications could be I find it difficult then to come in and assess all of the notes and sort of deal with that situation…that's something for a senior who has theatre experience to be able to do, I guess its slightly different on medicine but yeah- often when a patient has been in hospital for a long time they've had complications, they've had infections, there's been lots of different medications and investigative imaging and things, it's hard to know what you should do and where you should target your thoughts because it's not just a clear cut '*oh they've come in with an MI*' or something. It's more complicated isn't it." [F_F1_27]

Excerpt 5:

"Well I'm doing Obs and Gynae at the moment and I have to go round seeing pregnant women. All different times throughout their pregnancies and I just don't feel prepared at all. Half the time I'm not really sure what I'm doing, and you know it's fine as we have a Registrar to ring and ask for advice, but at the same time, you know, I know how to take a history, but I don't really know how to form any sort of management plan because you know it all varying different things you know and I think it does kind of need more senior input than just an F2, so I don't really feel prepared for this job. I feel like the stuff that we learned in Obs and Gynae in medical school was quite basic, and actually what I'm doing on the job is a lot more- you do need experience before making any of these decisions…like today I was called to see a lady who had ruptured her membranes early and they said do a ((unclear)) '*oh I've never done one of these before. Can't do one, and I'm the only doctor around so they want me to do one*' and you feel like you need to say '*no, I don't have that experience or knowledge*' you know '*I'm not prepared to do that you need someone to shadow me and teach me first*' …so I think it's a bit of a battle at the moment, you know, obviously I want to do a good job and do well and at the same time I don't want to put patients at risk and I also need to learn and gain experience as well. Obviously the Registrars are busy in theatre and other things so it's a bit of a challenge" [F_FRTD_08]

Excerpt 6:

"on a daily basis feel a little under prepared or a little- little anxious…I'm seeing sick people that probably haven't been seen by anyone else yet…if you live the experience it comes into focus particularly when someone is sick. It's not that I don't know the medicine…I think it's probably the responsibility and the ultimate responsibility in that which is really quite hard to prepare for in medical school…dealing with the fact that…the buck stops with you to a certain extent now and it hasn't done before…for instance, like I saw someone a few weeks ago who was quite sick and 35 minutes, while I'm first in, aware that you know this person is sick potentially could become very sick and could lead to dying and that I should know what to do. And I sort of do know what to do, but your confidence at the end of those circumstances knowing what to do is probably diminished…they had signs of sepsis…a temperature of over 39 degrees and a low systolic blood pressure and a raised heart rate and they were also chemotherapy patient…no one really knows about this patient, no other doctor knows about this patient until I go and see another doctor and say- so tell them about what happened…the clock ticks away as long I let it to a reasonable level trying to gather information until I go and see someone and say '*this is what I've been seeing*' and

you know it's hard to go straight away because…you don't know anything…it takes, amount of time, longer probably for us because we're juniors…I know how to do all the things, it's just sometimes a reasonable increased level of anxiety because you know some of the responsibility of this persons health is with us absolutely…as I said, you don't feel like you're in the this position until you are the doctor…I'm suddenly a doctor. I didn't use to be a doctor…" [F_FY_120, in A & E, 2-months in post]

Excerpt 7:

"Another thing that's happened this week was that I was asked to review a patient because he'd been hallucinating- I was able to identify that the patient was opioid toxic…he had perianal function. I feel that we had good teaching on this during our oncology block and how to identify a patient that was opioid toxic, what I find that I wasn't so prepared for in this case was deciding what to do about the patient because he wasn't so opioid toxic that his respiratory rate was affected and his pain was not controlled. However, because of his other conditions, and his perianal function, made it difficult for other choices for analgesia. I feel like again pharmacology and prescribing is something that we could be taught a lot more and especially in terms of complex patients which I understand is difficult to teach unless you understand the basics, but I think an approach to complex patients and how to manage them would be something that is useful. In this patient I tried to contact the acute pain team to see if they could give any advice but I didn't manage to get in touch with them, I used the BNF online resources and discussed it with the surgical registrar to come up with a plan for the patient which better controlled his pain and reduced his opioid toxicity." [F_F1_95]

Excerpt 8:

"…an 66-year-old man who was admitted to the hospital with shortness of breath, fluid overload, not compliant with fluid restriction and worsening confusion which is probably why he was not compliant with fluid restrictions. Patient has been on haemodialysis for quite some time he was on dialysis through a permcath because his fistula wasn't working. One day, following dialysis, patient had a temperature spike but was not getting antibiotics at the time because it was thought that his fever temperature spike was potentially due to a- was potentially a transfusion reaction because he also received blood on dialysis. Later that night he had another temperature spike and I was asked to see him. On arrival at patient's bedside, patient complained to me about a severe headache worse than had ever been before, as well as neck pain specifically flexion as well as back pain. He was also increasingly confused as per family who was at bedside. I immediately asked him if he was feeling nauseous and if he was vomiting as well as if he was experiencing photophobia. He answered that he was. I then proceeded to see if I could elicit meningeal signs by neck and hip flexion, which to me, I thought, it was because patient complained of increasing pain in his head and neck. I became very concerned that he had meningitis and phoned my SHO because I wanted him to sort of double check and help in assessing this patient. I felt unprepared because I thought this was basically a neurological emergency, which I was always taught that meningitis was because patient needs to receive antibiotics right away in order to have his condition be treated as soon as possible. When the SHO arrived he did an abbreviated, but a multidisciplinary, sort of exam on the patient and came to the conclusion that patient was more likely suffering from a line infection rather than meningitis because his fever spike was right after his line was used and later or earlier in the day rather patient, we also phoned the renal registrar on call…I felt very unprepared for this. *I'm very rusty with my neurological exam*. Always have been to be honest, didn't really have the opportunity to practice and it's quite difficult to find time at work currently to find time to practice the exam. But I to be honest, in fair, I've never actually seen anyone with positive meningeal signs and I'm also not really sure how painful does flexion have to be to the patient in order to be considered a positive sign, so it's a lot of it is probably is lack of experience in me not seeing enough patients I think. I have to say that thankfully my SHO arrived literally within a couple of minutes of me calling him and was able to sort that out…..he wrote a note in the

patient's chart, which I also read and I think this was <u>a very good learning opportunity for me</u> both from watching him examine and deal with the patient as well as reading his note and seeing what he's put in the note" [F_FY_166 Audio Diary, 3 months in post]

X-ray interpretation

Prepared

<u>Excerpt 9:</u>

"looking at x-rays or ordering looking and reviewing at x-rays, so I think that <u>as a student I had quite a lot of exposure</u> and I made the most of my opportunities when I was there because I was aware that in a short space of time I would be doing the job so…<u>I was trying to be as proactive as possible</u>" [F_F1_91]

Unprepared

<u>Excerpt 10:</u>

"When I was working yesterday I was covering two of the general surgery wards. One of the things that I got handed over in one of the wards was that a man who'd had a sort of duodenal stent inserted the previous day was vomiting up coffee ground vomit, so they were worried that he had a duodenal perforation and they had sent him for a chest x-ray and could I review the chest x-ray looking for signs of the sort of duodenal perforation on the chest x-ray in particular in the area of the mediastinum. <u>This isn't something that I'd ever had experience of doing before. I wasn't entirely sure what I was aiming to look for, and they suggested that I should discuss it with a radiologist</u>. So when I came to review the chest x-ray I couldn't see any obvious area in the mediastinum myself so tried to bleep one of the radiologists. <u>Couldn't get hold of them</u>. Went down to radiology but because it was out-of-hours all the radiologists had gone home. <u>I felt out of my depth reviewing this chest x-ray for a potentially unwell patient</u>. However, I <u>sought advice from an FY2 and also from a consultant</u> who was on the ward and discussed the chest x-ray with him. <u>I think radiology teaching is something I would have liked more of as a student and is something I don't feel entirely comfortable with</u> and I find myself seeking advice for quite a lot. So this is just an incidence where <u>I felt not very prepared</u> in this case." [F_F1_95, Audio Diary, 4 months into post]

NOTE: **Duodenal perforation:** A tear or hole in the duodenum (part of the small intestine)**; Duodenal stent:** A tube placed inside the duodenum (part of the small intestine) to reopen or keep it open**; Haemodialysis:** A technique for removing waste material from the blood using the principle of dialysis (a method for separating particles within a liquid)**; Mediastinum:** The middle section of the chest cavity**; Meningeal signs:** Signs of meningitis**; Meningitis:** Acute inflammation of the protective membranes covering the brain and spinal cord (the meninges)**; Myocardial Infarction (MI):** Death of a segment of heart muscle following interruption on its' blood supply**; Obstetrics and Gynaecology (Obs and Gynae):** The care of women during pregnancy and childbirth (obstetrics) and the study of diseases of women and girls (gynaecology)**; Opioid toxicity:** An acute condition due to excessive use or an overdose of opioids (analgesic drug)**; Permcath:** A long term central venous catheter**; Photophobia:** A symptom of abnormal intolerance to visual perception of light**; Sepsis:** A life-threatening condition triggered by infection.

While the majority of data around diagnosing and managing clinical presentations comes from F1s, other stakeholders also talked about these aspects, mainly in terms of unpreparedness (see Table 10). The PPR group talked about problems with protocols and thought that doctors tended to stop as soon as they had reached a diagnosis, when PPRs felt that things were more complex and there was a need for multiple diagnoses. Another viewpoint from the PPR group was that doctors were reluctant to refer patients on if they, or the patients, felt their diagnosis was incorrect. There was also an expressed frustration across many narratives that patients and carers were not included in the diagnostic, treatment and management processes (Box 22, Excerpt 1).

The CE group talked a lot about how things were in their day and compared that with the present day. They talked about trainees not seeing patients' journeys and that this could impede their

learning in terms of the outcomes of treatment (Box 22, Excerpt 2). Other common comments were about F1s not gleaning enough information about patients' personal circumstances and therefore them not being treated holistically (e.g. aggressive treatment when palliative care might be the kindest option). This was emphasized particularly against the backdrop of an ageing population and patient-centred care requiring an understanding of treating patients as individuals rather than as a 'case of x'. Treating people as 'cases' was thought to lead some F1s to request unnecessary investigations (e.g. x-rays), which not only causes patient distress but wastes valuable resources.

Unlike the F1 group, the D_FP group talked a lot about the issue of gaining consent for undertaking investigative procedures. There were mixed opinions on this issue with some reporting F1s being very good at the ethical side of care, and others highlighting a lack of understanding where vulnerable patients (e.g., those with dementia or requiring end of life care) were concerned.

The HCP group talked about F1s not understanding how to act appropriately on the findings of their investigations. The view here is that F1s think that documenting findings in patients' notes is the end of their job, rather than interpreting and acting on the findings. This view, however, runs counter to our F1 narratives in which they talk about interpretation and acting on findings in great detail. Other narratives from this HCP group picked up on the lack of preparedness of F1s around gaining consent, especially with children and vulnerable adults, and their lack of consideration around the individual patient and the need to consider their situation holistically.

We had very few narratives for this theme in our data from the P_GVT group. Those we did have mentioned the need to treat patients as individuals and the changing demographic of the patient population. They called for more training around todays' common illnesses.

Participants in the EMP group talked a lot about the growing issue of clinical complexity in terms of comorbidity and the need for F1s to avoid thinking in silos. They also talked about a need for them to understand the patient holistically and this includes carers' perspectives. Financial aspects of diagnosing and managing patients was also of concern here, in terms of F1s' tendencies to over-request expensive investigations and to understand the implications of their actions (for example, too much time in aimless history-taking when a team of surgeons are waiting for patients to be prepared for surgery, see Box 22, Excerpt 4). So, an understanding of their role within the wider interprofessional team was called for.

BOX 22: WIDER STAKEHOLDER GROUPS' VIEWPOINTS AND EXPERIENCES AROUND DIAGNOSING AND MANAGING CLINICAL PRESENTATIONS

Excerpt 1:

"it's about early intervention- that they ((doctors)) didn't diagnose for however many years. Well with a mental health issue, my two children were in college and university and I felt that there was something wrong because they weren't behaving and so and so, and it took just as many years for the doctor to diagnose mental health disorder- schizophrenia and bipolar. It took all that time. They just didn't recognise- '*oh right you- you want to be off sick-right? anxiety state, off you go-anxiety state- anxiety state*' all the time. Well it didn't help them. It didn't help me. It didn't help their college career- university career. Nothing. It ended up in total misery ((banging on desk)) that is what they're responsible for, total misery of people who are trying to care, from the carers a total misery...so I would like them to take on board that they have- if they can't diagnose it properly well refer on but don't put that person through so many years and years before they finally got into ((hospital name)). There was no need for it. Early intervention- medication would have sorted the problem out, but no. Since then they've been hobbling, I suppose, you know, hobbling along through life, which I think if it was sorted out right at the very start and information shared among the family. But there was no sharing. Nothing. And if I wanted to know about the medication they would say 'confidentiality' and, ah, I can't tell you how frustrating that is..." [F_PPR_72]

Excerpt 2:

"…giving somebody an intervention in terms of a medication and they're not seeing the you know- the repercussions of having given the say antibiotic and then following them- following them up- certainly some of our foundation doctors do general practice so they do it for four months so sometimes they can follow up sort of acute illnesses and actually see that as part of…so sometimes they don't understand the different ways in which people will respond to different interventions and why do you give some patients antibiotics and why you don't give others and sometimes that's quite difficult to gather in just a period of four months understanding… I guess it's about can you bring some sort of stability to the team, you know- what you might want to see is a pool of the same doctors covering two wards and being able to actually give each other the handover- this is what you did and this is actually, you know, the consequences of that. So that you- instead of covering a different ward because you're doing medicine, you cover one ward one day and another ward the next day- that you are actually covering the same ward- but that's very difficult to organise cause there's always somebody off on holiday or there's somebody off sick" [F_CR_86]

Excerpt 3:

F_HCP_82: patients have blood tests a lot…sick patients might have a blood test every day and then the blood test results are usually available around lunchtime. The doctor will sit down and document them in the notes so they might have this blood test result and the patient's kidney function has deteriorated or maybe their potassium level has been lowered, it's now normal, and they will just- might document results in the notes but then maybe don't take that next step and think '*ooh that patient's on a potassium supplement their potassium's now gone from low to normal*' or '*is now high*' and they might not then- you have examples where they don't then stop the medication that they're using to supplement it, or maybe stop the medication that could be causing their kidney function to worsen, and it's maybe only the next day when you go and say '*can you stop that*' or '*you know you need to adjust this*' so again it perhaps just comes back to they know the processes of what they need to do, like checking the blood test results and
writing documenting them in the notes, but it's what- it's that next step of applying it
F_HCP_81: sometimes I feel it's lacking
M_HCP_83: yeah say they write it all in '*potassium's high*' and then you note '*potassium's high*' as '*that's it'*. They move to the next patient …without thinking what is the implication of
F_HCP_81: this is quite serious
M_HCP_83: yeah
F_HCP_81: you know maybe it's only then, when something does happen, like you know a patient maybe becomes sick as a consequence or something like that, they learn. And then they don't do it again and so…

Excerpt 4:

"because they haven't got a clue what they're up to and they don't seem to, they might be able to take the history,…but they don't understand what- they don't seem to understand why…I'd use the term again, situational awareness…I think that's really helpful. So classically in anaesthetics and theatres we talk about the situational awareness and that's about the environment that you're working in, the risks that are occurring, but its having that wider view of the world so that if something comes at you from the right side you understand what that is, and what the risk is on what you're trying to do as a team, and I think it's that team working and situational awareness around that team…what are consequences if you just sit there for thirty minutes taking a history and have a nice conversation with the patient and you haven't got them ready for theatre. Well the consequences are there's a whole theatre team sat waiting, the boss surgeon getting irritated, the theatre's cost £17 a minute to run…you know it's just not happening and sometimes the people just don't see that- their role in that crisis." [M_EMP_145]

> **SUMMARY BOX (PHASES 2 & 3): PREPAREDNESS IN RELATION TO OUTCOME 2 (DOCTOR AS PRACTITIONER) SUBHEADING 2 (DIAGNOSING AND MANAGING CLINICAL CONDITIONS).**
>
> - F1 doctors were well prepared for simple diagnosis and treatment planning, but less well prepared for complex cases or immediate care of acutely unwell patients. In emergency situations, they often struggled to gather the relevant information and to prioritise activities. With complex cases (e.g. confused patients, co-morbidity), they often felt uncertain. Some participants reported being better prepared for making diagnoses, than the patient management;
> - Feeling prepared to diagnose and management was facilitated by F1's confidence in their own abilities, supportive relationships with supervisors, and 'fire drills' such as the 'ABC' approach, as well as seeing large numbers of patients;
> - Clinical decisions were-made as part of a wider interprofessional team and F1s talked about knowing when to discuss and escalate decisions;
> - There was notable development in the first months as an F1 doctor, with initial doubts about own knowledge and expectations of them, then increasing confidence gained through experience and observing/talking with more senior doctors;
> - The HCP group talked about F1s needing to act upon investigation results rather than just documenting findings in patients' notes, although the F1 narratives contradicted this statement;
> - F1s rarely talked about involving the patients' family or carers in discussions about diagnosis and management and their narratives focused on clinical aspects, rather than broader psychological, social and cultural factors. Similarly, the clinical educators felt F1 doctors didn't collect sufficient contextual information to treat patients holistically;
> - Employers highlighted increasing clinical complexity and comorbidity, requiring holistic understanding of the patient, including the carers' perspectives. Financial aspects of diagnosing and managing patients were also noted, with F1s tending to over-request expensive investigations;
> - The PPR group thought that doctors tended to stop when they reached a simple diagnosis and were reluctant to accept greater complexity or support patients in seeking a second opinion;
> - Despite the large amounts of data mapping onto this subheading, there was very little in some areas, for example supporting patients in caring for themselves, and being able to identify the signs of abuse.

4.4.4.2.3. Communicating effectively with patients and colleagues

We now consider the outcomes around graduates' preparedness for effective communication with patients and colleagues (see Box 4M, Appendix M for the 8 specific outcomes on this aspect of practice). We coded 405 (23.4%) distinct PINs/GINs to this category across all stakeholder groups. Interestingly, this is one of the few areas of preparedness that all stakeholders in our study contributed plenty of narratives. The pattern of prepared versus unprepared narratives across stakeholder groups together suggests that graduates are often unprepared for practice in this area (Table 11 below), although this view was not necessarily the case for our FRTD, D_FP HCP and EMP stakeholder groups. We begin by examining the data in terms of F1s' perceived preparedness for communicating with patients and then colleagues, and then their unpreparedness.

We begin by examining the data in terms of F1s' perceived preparedness for communicating with patients, and follow that with their perceived preparedness for communication with their colleagues, before considering what the data tells us about aspects of F1s' unpreparedness across a range of communication events with both patients and colleagues.

TABLE 11: DISTRIBUTION OF PERCENTAGE (AND NUMBER) OF PREPARED, UNPREPARED AND UNSPECIFIED NARRATIVES ACROSS STAKEHOLDER GROUPS FOR GRADUATES' PREPAREDNESS FOR COMMUNICATING EFFECTIVELY WITH PATIENTS AND COLLEAGUES

	FY	FRTD	CE	D_FP	HCP	EMP	P_GVT	PPR	TOTAL
Prepared	36.8% (68)	41.0% (16)	2.9% (1)	28.1% (9)	23.8% (5)	44.4% (8)	5.3% (1)	5.4% (3)	27.4% (111)
Unprepared	45.4% (84)	38.5% (15)	22.9% (8)	25.0% (8)	28.6% (6)	27.8% (5)	73.7% (14)	21.4% (12)	37.5% (152)
Unspecified	17.8% (33)	20.5% (8)	74.3% (26)	46.9% (15)	47.6% (10)	27.8% (5)	21.1% (4)	73.2% (41)	35.1% (142)
TOTALS:	45.7% (185)	9.6% (39)	8.6% (35)	7.9% (32)	5.2% (21)	4.4% (18)	4.7% (19)	13.8% (56)	100.0% (405)

Note: The percentages in the table are calculated using the total of each column, corresponding to each stakeholder group. The totals in the bottom row and right hand side column are calculated as a percentage of the overall total number of narratives concerning preparedness for communicating effectively with patients and colleagues (n=405).

4.4.4.2.3.1. Communicating effectively with patients: Prepared

F1s talked about being able to communicate sensitively and effectively with patients on the ward in their role as doctor, but also as 'one human to another' across a range of situations (including medical and surgical settings and across a range of patient groups). They used words such as 'comfortable', 'ease' and 'confident' when they narrated these preparedness narratives. Some talked about having the time in which to do this, unlike the nursing staff who were more time pressured. They often talked about how they were able to communicate their medical knowledge to patients by delivering it in lay terms (e.g. one trainee talked about communicating with the patient around her potential diagnosis of Cushing's Syndrome, ensuring that she understood that the investigations were underway to rule out the possibility of this being the case: Box 23, Excerpt 1). F1s also talked about communicating with patients around prescription drug use, carefully explaining why patients had been given certain prescriptions and how they should take those drugs. Their relationships with the patient were perceived to facilitate discussions with those patients, their families and carers. So, knowing the patient over a period of time, and often since admission, enabled them to communicate effectively and sensitively, even at difficult times (e.g. during end-of-life care).

Communicating effectively with vulnerable adults and children is another area in which F1s felt prepared (e.g. adults and children with learning difficulties, elderly patients). They cited their intensive training during medical school as being an important factor around this preparedness. They talked about how their training enabled them to identify who was vulnerable, and to understand how to deal with situations as they unfolded. F1s talked about being sensitive to intimate examinations and procedures, and how these could sometimes be emotionally charged. They understood when it was appropriate for a chaperone to be present at such times. Although there was recognition that medical school had prepared them for just such events, others reported unpreparedness for the emotionality of certain situations (e.g. examining a woman following miscarriage).

F1s shared with us their personal narratives around dealing with angry patients and relatives. They explained how they understood that sometimes people needed to express their feelings and that they needed to acknowledge those feelings. By allowing patients to "vent it all out", they were then able to talk through problems in a rational manner. Again, they related their skills in this area to training during medical school, particularly within the simulated communication skills teaching, along with OSCE assessments during their final exams. Facilitating factors here include the use of templates that had been "ingrained" into them during this time. They also talked about how having the support of the wider team helped them deal with difficult situations, including colleagues

taking over patient interactions so that F1s could continue on their ward rounds. Common ways of dealing with difficult communicative events included attempts to calm people down, listening actively and moving the situation away from busy wards into private spaces. F1s talked about these communicative situations as being something that required their active engagement and that such engagement develops further develop over time.

A number of F1s talked about feeling prepared for communicating under difficult circumstances (e.g. discussing do not resuscitate (DNAR) forms or breaking bad news to patients). Although they felt prepared for this through their medical school training, they reported finding it very difficult when patients expressed extreme emotion (e.g. openly crying). They acknowledged how important the 'news' was for the patient, possibly being the most important information they might be given in their life, and the need to convey this sincerity as they communicated the news. However, some F1s, although prepared, felt that it was not their place to break bad news to patients and that this should be something undertaken by more senior colleagues. In terms of end-of-life care, some participants talked about how their experiences as an F1 had provided them with opportunities to develop their sensitivities to communicate with patients appropriately, and rather than engaging in 'aggressive treatment regimes', they were able to recognize when someone was dying, communicating this to the family and discussing more appropriate palliative treatment options. Finally, F1s gave rich descriptions that involved both communicating with patients and with other HCPs to achieve positive patient outcomes. Such interactions were narrated as 'smooth transactions' in the normal business of being an F1 and caring for patients (e.g. Box 23, Excerpt 2).

In terms of other stakeholders, FRTDs' narratives echoed the experiences of F1s with numerous reports of feeling prepared for breaking bad news, communicating with vulnerable patients and with angry patients. There were narratives of situations where, as an F1, they had been complained about and so the talk was mainly around how to prevent complaints and how to say 'sorry' without actually apologising for poor care (which they felt they had not given). Participants in the D_FP group were also quite positive in terms of the abilities of F1s to deal with difficult communicative situations with patients. They felt that they were also good with avoiding complaints by ensuring good communications with patients. However, there was an acknowledgement that while they felt medical school prepared them well for certain tricky communicative situations (e.g. breaking bad news), there was only so much that could be done via simulation. The HCP group talked mainly about how much better todays' F1s are than '10 years ago': a view echoed by one EMP group participant. Some HCP and CE group members also reported some F1s being better than others, and felt that this was to do with personality, rather than where they trained. The PPR group reported that things had improved. Interestingly, some of this group acted as simulated patients and reported the 'difficult patient' scenario to be one of the most rewarding to play, with medical students demonstrating high levels of empathy towards them.

4.4.4.2.3.2. Communicating effectively with colleagues: Prepared

In terms of communicating with colleagues, many F1s believed they were prepared. They talked about how they understood that they needed to be in command of all the facts before they went to consult their seniors or before requesting the services of other healthcare professionals (e.g. radiologists, social workers etc.). F1s described not being afraid to ask a senior colleague if they did not know something. For example, one trainee said they did not know what thermogram was prior to starting their neurology placement, and feeling quite comfortable in asking their registrar to explain the procedure. Additionally, they talked about their preparedness for asking advice or for assistance from other health care workers or doctors in other specialties. Furthermore, some F1s talked about positive patient outcomes after following advice offered by other HCPs (e.g. nursing staff).

Some F1s talked about being prepared for difficult communications with colleagues. For example, they talked about how they approached their discussions with their seniors and other healthcare professionals with whom they disagreed regarding, for example, diagnosis, patient's ability to

consent and treatment plans. Handovers were a particular area that F1s talked about. Some participants discussed individual doctor-to-doctor handovers, which they felt fully prepared for. They explained the importance of speaking face-to-face with colleagues, in addition to writing in the notes. Some talked about having learned to undertake handovers during placements while at medical school, the importance of reading the patient's notes when they were admitted, and summarising events, including the results from investigations so that they could communicate the patient's situation since arrival into hospital quickly and effectively. However, others talked about learning this process during their time as an F1.

In terms of the wider stakeholders views, we had very few comments (and no personal narratives). The FRTD group, felt that handover training during medical school went some way to prepare them for practice. There was also a feeling from the EMP group that F1s were trained well for communicating in multi-professional teams.

4.4.4.2.3.3. Communicating effectively with patients: Unprepared

Difficulties around communication with patients and their families was talked about in a number of ways. Despite many narratives around being taught good communication skills during their undergraduate years, in the real world communication was much more complex. Therefore a common thread in these narratives was: '*things they didn't teach me at medical school'.*

F1s talked about feeling unprepared for a number of communicative aspects with patients. While we did have narratives where some F1s felt prepared, other F1s reported that dealing with angry patients and relatives in real life was not the same as dealing with them in a simulated environment at medical school. Some F1s admitted to actively avoiding having to communicate with patients' families under such difficult circumstances. They recognised that in real life their own emotions were a very powerful aspect of the situation. During medical school simulations they felt it was easy to accept others' anger, and relatively simple to bring situations back to a mutually achievable outcome. However, in real life patients' anger was difficult to manage and did not always go according to their trained scenario: leaving them feeling 'overwhelmed', 'flustered' and 'anxious', sometimes worried that they might be physically attacked. One F1 recounted, for example, the husband of a woman with dementia who demanded to take his wife home because she was becoming distressed, partly because they were made to wait for their appointment (Box 23, Excerpt 3). Furthermore, having angry patients make complaints about other doctors – including their seniors – was a difficult situation sometimes recounted by F1s. Not only did they need to calm angry patients down, but they were unsure whether they to tell their fellow doctors about accusations made against them. There was a feeling that medical school did not prepare them for such complex situations.

Breaking bad news was another area that F1s sometimes felt unprepared for: they often felt too inexperienced to respond to patients' and families' questions around prognosis (particularly when the patient was present in the room). They also felt it was 'not their place' to deliver such news to patients, particularly in the early stages of their F1 year (Box 23, Excerpt 4). Such situations were emotionally difficult for trainees, with frequent reports from them of feeling out of their depth, very distressed during the event and sometimes crying afterwards.

F1s reported difficulties in communicating with some patients, in particular patients with mental health difficulties. While they admitted to having undertaken communication skills training in this area, they reported feeling generally unprepared, and even 'embarrassed' about their lack of communication skills. One participant reported in her audio diary (recorded in January 2014) feeling shocked at her lack of preparedness for communicating with an elderly woman with dementia around her diabetes. She felt that she would have been more prepared for this back in August on graduation, but as this was the first time she had encountered a patient with dementia, she now felt completely taken aback, with no idea of how to approach the situation. Further difficulties with communicating with patients that were commented on (in narratives of events F1s had witnessed) included graduates who had English as their second language. Older patients were

reported to find it difficult to understand such trainees, particularly when confused and delirious, with patients sometimes making 'slightly politically incorrect' (i.e. racist) remarks.

Other stakeholders also talked about communication difficulties with patients. Unpreparedness for communicating with vulnerable patients, including those with mental health issues, was also flagged by the FRTD group, resulting in trainees having to learn as they went along. Furthermore, communicating with patients whose first language was not English caused some problems for trainees as newly graduating medical students. Communicating under difficult circumstances, such as breaking bad news and dealing with angry patients, was also another area of concern. While they felt that aspects such as breaking bad news was covered during their undergraduate degree, like the F1 group, they agreed that real life scenarios were very different. Furthermore, some FRTDs reported not being taught to deal with angry patients. The CE, D_PF and HCP groups recognised the complexity of real-life communication and the limitations of the simulated communication skills training environment in the undergraduate years. They talked about the problems F1s experienced when communicating in challenging circumstances and with vulnerable patients in complex situations (Box 23, Excerpt 5). Some participants in the CE group thought that a lot of students, especially those from difficult cultural and religious backgrounds were quite shy and more uncomfortable in situations of breaking bad news. P_GVT group members thought that graduates were unprepared in terms of handling patient complaints, negotiating with more informed patients and communicating with patients with mental health issues.

4.4.4.2.3.4. Communicating effectively with colleagues: Unpreparedness
F1s talked about difficulties in communicating to their seniors around patient concerns. For example, being reluctant to ask seniors to come and review a patient who they felt was in decline, but instead waiting for the senior to come along before conveying information. Confidence in communication with colleagues was thought to be the problem, both in terms of over- and under-confidence. There was a view that some F1s were extremely confident, almost "verging on the arrogant" and worries that they might make rash decisions, decisions that should first be passed by their seniors. Finding the right level of confidence, and knowing when to communicate events to seniors and the team, was thought to be something that developed over time. Such confidence was linked with understanding one's own limitations.

In addition to issues around confidence and team communication, there were narratives of unpreparedness from our F1 participants around difficulties in dealing with differences in opinion between senior staff and themselves. These were often narrated with strong emotion as F1s recounted their anxieties in challenging their seniors' opinions, or in dealing with complex situations that involved poor written and/or verbal communication. Sometimes F1s and their seniors just did not 'click' and this lack of compatibility led to further difficulties later on. One powerful example came from an F1 participant whose encounters with her SHO during night-shift work (involving an emergency patient who was known to the F1), led to a range of intense emotions and feelings of lack of support and isolation (Box 23, Excerpt 6).

While we had some narratives of preparedness around communicating with other healthcare professionals including nurses and radiologists (see above), we also had a number of narratives where F1s were unprepared for this. Foundation doctors did not always understand the level of information that was required by the other healthcare professionals when communicating about patients and requests for diagnostic procedures. They often admitted to missing vital information that led to communication difficulties, sometimes resulting in angry exchanges between the F1s and other parties. More often than not, time pressures, along with a lack of appreciation for communicating specific patient details, was cited as a mitigating factor (Box 23, Excerpt 7). F1s also narrated difficulties with nursing staff: sometimes putting this down to poor communication (e.g. not communicating the urgency of the situation, Box 23, Excerpt 8). In addition to asking nurses to undertake specific tasks, differences in opinion regarding the course of patient care resulted in communication difficulties (e.g. an F1 continuing to treat a dying a patient under the

instructions of the registrar when the nursing staff felt that palliative care was the better option). Occasionally, communication breakdown between F1s and nursing staff became very serious, resulting in great distress for the F1s who narrated the events. Sometimes F1s admitted to being quite confrontational in their exchanges with nursing staff, and vice versa. While situations were sometimes escalated to their seniors, there often remained a lasting difficulty in having to work and communicate with one another following such events.

Handovers were another area that our F1 participants talked a lot about in terms of unpreparedness. Some F1s reported not having been taught how to handover during their undergraduate years. There were narratives around F1s being unprepared in terms of not having sufficient information required for an effective handover. However, difficulties with information flow were both ways – sometimes F1s were not provided with the appropriate information (therefore impacting on their feelings of preparedness for other aspects of their work). This often led to putting patients at risk. Sometimes F1s took it upon themselves to address this lack of information flow with the team member/s concerned, sometimes resulting in positive outcomes (Box 23, Excerpt 9). There was also a view that handovers were mainly from doctor-to-doctor with no real communication flow between nurses or physiotherapists and doctors.

In terms of other stakeholders' narratives around graduates' unpreparedness for communication skills with colleagues we had many examples from our FRTD participants, mainly agreeing with the F1 group. Handovers were often mentioned, with the addition of highlighting how poor handovers during weekend shifts resulted in them feeling unprepared for the amount of work required during an already under-staffed time. Understanding the importance of clear written and verbal communication was another aspect in which the FRTD participants felt unprepared. Finally, there was a recognition by the FRTD group of being unprepared for the emotional aspects of their job and how difficult this adjustment was to make, particularly when they were unable to talk with their colleagues about how they felt (Box 23, Excerpt 10). The CE group's narratives also backed up F1s experiences in terms of the difficulty they had in asking their seniors for help, suggesting that some F1s were '*too scared*' to ask. They also recognised difficulties F1s had in terms of their preparedness for handover. The D_FP group also talked about F1s being unprepared for communicating with colleagues in terms of them not gleaning full information about the patients they wished to discuss. Some felt that this was because F1s were used to being on the periphery of practice, observing events, and that making the transition to being actively engaged in conversations about patients was hard.

BOX 23: STAKEHOLDER GROUPS' VIEWPOINTS AND EXPERIENCES AROUND GRADUATES' RELATIVE PREPAREDNESS FOR COMMUNICATING EFFECTIVELY WITH PATIENTS AND COLLEAGUES

Prepared

Excerpt 1:

"The other day I had a distressed patient. Very upset, crying on the ward round, and the ward round was just me so after I had finished … I took her off the ward to just a quiet room where we sat down … she had been there for quite a few days already so I had fortunately already sort of established a bit of a rapport with her. She knew me, I knew her, we'd already had a couple of quiet chats just me and her sort of at the bedside a few times because there was a diagnosis of Cushing's being looked into, so obviously this was quite upsetting for her 'cause it had never been mentioned before…this patient was really upset crying an awful lot - sort of verging on hysterical about the whole situation, and there was lots of social problems with her daughter and social services were involved. So it wasn't really a medical chat, it was more of a *really upset person* is how I look at it, really, when there's situations like this it was easier for me just to look at her as another person who was upset who wanted someone to talk to. She doesn't have visitors, there's a- obviously a situation going on with her daughter. Nursing staff don't have time, quite understandably they don't have time to sit down and chat, so I just gave up thirty minutes of my

ward round to sit down and just have a talk with her, and that turned from a very upset patient, who after five-ten minutes calmed down a bit, and once we were able to talk things through and I could get a full understanding of why she was upset and sort of start with the beginning, work our way through the situation and educate her a little bit. Which is another thing which I think you could also put into under the preparedness, for someone to be prepared with the knowledge, also the ability to deliver the knowledge. You have to know how to communicate what you understand as a as a doctor to a patient in layman's terms, and that's another thing that you practise in your communication skills at ((name of hospital)) is translating what Cushing Syndrome is, or the possibility of having Cushing Syndrome, to a patient in layman's terms, and also making sure she understands it was just an investigation for it. It doesn't mean she has it…and trying to let the patient be satisfied with leaving the room with '*we don't know yet*'…and once she's calmed down enough then the situation's sort of dealt with" [M_F1_22]

Excerpt 2:

"On a late shift in the Care of the Elderly building I was asked to take a blood sample for a group and cross match from an older gentleman who was anaemic. He had recently been admitted through A&E and was found to have a low haemoglobin with a background of oesophageal cancer. I had been told that the task was not an emergency, but that it needed to be done by the end of the shift. After having finished the task list in my current ward I went up to see the patient who needed transfused. He was sitting up in bed, was comfortable, alert and stable. I explained to him about his low haemoglobin and that he would need to be transfused. Nursing staff who saw me getting my equipment together made me aware that the patient did not yet have a venflon. I got one, obtained informed consent, checked the patient's details carefully and managed to insert the venflon and take the group and cross match blood sample together. I made sure that the date and site of the venflon's insertion was documented and took care to write the correct patient details on the sample bottle while I was at the patient's bedside. Nursing staff asked me when the transfusion should be started. I recalled from my haemovigilance training that it was safer to transfuse during daytime hours. As the time was 10pm and the patient was stable I advised them to wait until morning, unless the patient became unstable overnight. The following day I was working in the Care of the Elderly building again, so I followed up on the gentleman in question. He had been stable overnight and was receiving his transfusion. I felt satisfied that I facilitated this patient's transfusion in a manner that had minimised risk and maximised benefit." [F_FY_172, Audio Diary, 4 ½ Months in post]

Excerpt 3:

"I got called, it was a lady with dementia and she was- she was very agitated in hospital and the husband was there demanding she- he wanted to take her home, and I don't know if I was- it was one of my patients but you're so constantly stretched to such an extent you can't get places at, you know you can't get places quickly, so obviously this patient had been waiting for an hour or two to go home and the husband wanted her to go and he said '*well I'm just going to sign the self-discharge form if you won't just send her home'* and I'd not done that before, so I had to ask the nurses about the forms to fill in…that wasn't very nice because I was stressed that day myself and to have someone angry at you for not arriving promptly because you're seeing to other things and it's almost like admitting defeat, giving them the self-discharge form, that you haven't done enough for them that they have to go home- they want to go home- I think I've probably seen more but that one was quite upsetting" [F_FY_27]

Excerpt 4:

"…I think it was made worse by the fact that his son then came it was at visiting time…his mother had recently died and he was worried that his dad was now going to die and he was very confrontational about it, like '*you need to tell me is he going to die right now*' and I didn't have the experience to say- I still don't have the experience to say, like '*yes he's going to die'* or '*no he's not'*

so it was quite a difficult situation to be in and it was quite stressful for a sort of one of my first few days...so I just said to him- I just told him what we were doing...that he was unwell and that we were trying to doing everything that we could for him, but that I didn't have the experience to say how unwell he was, that I would get one of the more senior doctors to speak to him. And although he wasn't entirely happy with that, he was happy that somebody else would come and speak to him...and so I stabilised the patient as much as I could and then spoke to the FY2 and then spoke to the registrar...I did end up having a little cry, I just think it was so overwhelming that it all just happened so quickly..." [F_FY_95]

Excerpt 5:

"they're prepared to a certain extent because they do go through communication skills, but sometimes I don't think they can integrate everything together...sometimes I feel that they're not dealing with patients consents well enough in that if a patient is on the attack it's how do you deal with that how do you defuse that situation to turn it around to defuse the anger to maybe do get a two way conversation going...and that's where sometimes relatives are involved in that as well and that's where I feel you have to look at the patient, yes they're paramount, but you do have to deal with the relatives as well...sometimes those situations you actually don't be prepared until you've faced one and it's the experience that you know." [F_HCP_164]

Unprepared

Excerpt 6:

"the SHO I was working with, we didn't really click, there was no teamwork...In our night shifts there is just the F1 and the SHO so it's just the two of you. This particular week unfortunately a former colleague's parent of mine was admitted as an emergency...I had mentioned to the SHO my personal involvement with this patient so that he was aware that I was finding it quite difficult... I was called to see this patient, they were opiotoxic, something I hadn't particularly dealt with before. I was quite sad about the situation...I discussed it with the nurses, we thought it was maybe best to get the SHO down just to benefit everyone really, to have someone more senior taking charge. Also the notes had been misplaced so I had no record of what had happened with him since his admission, but I knew the SHO had clerked him in...when I contacted the SHO he was quite annoyed that I had called him without seeing the patient myself. He was also quite annoyed that the notes were missing. He said I had to find the notes...I made him aware of that this patient really needed to be seen and he said he wasn't going to come down if I hadn't seen the patient. At which point I was quite upset about the situation. I was very fortunate that the nurses on the ward that evening were very experienced so I managed to discuss with them, we came up with a plan, we saw the family and we got it sorted. Unfortunately the emotional impact on this was quite high for me. I was very upset I was crying on the ward for quite a lengthy period of time. It was very difficult for me to deal with. I felt very isolated and left alone. I did document in the notes what had happened, I had spoken with the SHO and the action I had taken at the time. Later on the next morning the SHO did go and see the patient and he obviously saw my note, didn't agree with it, wrote a big lengthy piece about how I had not asked him to see the patient. I was a bit annoyed about this I didn't think it was accurate, obviously our communication lines were crossed... I felt like I was being quite undermined....that my knowledge was being questioned and my professionalism was being questioned...I found it quite difficult to work without that sort of support that I have had from other members of staff, so I've not been prepared for having to deal with a senior who we just haven't really got on...It made the whole week very difficult for me it was very emotionally harrowing...I would have hoped for a bit of support...I got nothing. Not even '*are you ok?*' This was quite upsetting. I certainly wasn't prepared for this this level of discord between myself and my immediate colleague." [F_FY_170, Audio Diary, 4 months in post]

Excerpt 7:

"there was a haematology patient who was in a renal ward, who I didn't know anything about

because…it wasn't a patient that I was to take care of in any shape or form…but I was on the ward and the telephone rang and so I picked it up and it was the lab calling with her lab results with platelets of 8, white cells of 0.1, and haemoglobin of 16 ,so quite pancydopenic basically, and I ran to the haematology ward to tell them that one of their patient is quite in need of a multiple transfusions, but didn't really have time, or at least I *didn't think I had time* to look up any information about her…as to what her underlying condition is…had she had low blood counts before this or is this brand new for her, and I got hold of a haematology reg who told me off basically, about not having all that information on me. At first I thought '*well how rude'* and then I thought '*well maybe she was right, maybe I should have done that…maybe I should have looked up all that information before I actually ran down and told her*' but I still think that, yes maybe I should have looked that up, but to me platelets of 8 is quite severe, and so I thought she needed a blood transfusion right away, or sooner rather than later, and so I was probably more worried about the patient than actual you know her previous history or previous whatever she had and so anyway it wasn't very pleasant for me" [F_FY_166]

Excerpt 8:

"I went to see patient on the ward by myself one afternoon…the patient's blood results came back that they had extremely low potassium…I had been prepared at university as what to do, although I don't think I'd actually carried out or seen the actual practical procedure, or actually seen a potassium result that low, I'd only read about it really. The issue came when I wrote up the patient's fluids, I had a lot of other things to do. I spoke to the nurse and said that this patient needed these certain fluids and they need this amount of potassium added to it. I came back fifteen minutes later and it hadn't been done. I mentioned it to the nurse and she said it would get done. I came back another fifteen minutes later and it still hadn't been done, in the end I went and did it myself. I got a bag of correct fluids I put them up and run them through at the appropriate time scale. I was really frustrated this hadn't been achieved by the nurse, I mean I understand she's busy, but it just wasn't really on considering I stressed how important it was to her and this issue had priority over the other issues which I was aware about in that bay. Again, this communication issue, you know, I don't think I really was told about communication with other medical staff or nursing staff, again, perhaps this is human skill, but I really realise this is one to be nurtured or one that perhaps medical schools should really…highlight you know, make sure students realise how important it is because it affects everything and ultimately it does affect the patient which is why we're all there." [M_F1_102, Audio Diary, 5 months in post]

Excerpt 9:

"Communication skills is something that's taught very well at ((names place)) with lots of communication sessions, breaking bad news, angry patient, those kind of scenarios…one that's not really addressed when you're at medical school…dealing with a team member who may not share the same view as you, or just may not be of the same opinion as you. An SHO on my team who was-is not the best of communicators, he lacks a certain amount of communication skill, and as a result actually put a patient at risk the other day. A patient he admitted into A&E, who had acute pancreatitis, and was appropriately scored by him. However…did not act on the situation. Did not notify any seniors. And as a result, the patient was just left in A&E for a period of time…this was through poor communication. This SHO has a communication problem…I've had problems with him myself in terms of jobs not being passed on to me via him because of his lack of communication, and both of us doing the same jobs up on the wards through lack of communication, and its something that we addressed. And I had to bring up to him and speak about, which is awkward, and its a situation which you don't really know how to go about being the junior doctor you don't feel its your place to be bringing things up and pointing fingers at other people more senior…well I had to go about it in a tactful way, one that I didn't really know, I hadn't really experienced before, even thought about, but one that enabled me to get my message across to the SHO that he had to improve his communication skills for our team to work efficiently, and I

think that was achieved and there was an understanding there that the message did come across and hopefully things will get better from there." [M_F1_22, Audio Diary, 4 ½ months in post]

Excerpt 10:

"about your emotional reaction to things, and think breaking bad news, when I tried to- for the first kind of 5 times I had to listen to someone to be told that a relative had died or something, I found that so hard not to cry myself. And you know its not professional thing to do, so you try not, and obviously people say its right to show emotions, but actually not to start balling my eyes out. I found that incredibly hard, and I still do, and I always make myself- I always put myself in those situations to get the experience its almost like desensitising process…what sometimes I found hard is when I've known a patient and who's then died and I've come in and discovered that and I think '*ah that's really upsetting, I want to talk about it*' how everyone else just gets on with it and doesn't seem to affect them. Think as you get older, as you move on to your career, you do just get a bit desensitised to death and you build up your defenses and you move on, and I think that's a- that's a sad adjustment to make as a junior doctor…you can see it when you're an F1, '*ok, just get on with it*' then but actually you want to be '*ah I really liked him, that was sad*'." [F_FRTD_139]

NOTE: **Acute pancreatitis: I**nflammation of the pancreas (gland that lies behind the stomach)**; Anaemic:** Low haemoglobin in the blood**; Cushing's or Cushing's Syndrome:** A collection of symptoms that develop as a result of very high levels of the hormone cortisol in the body**; Haemoglobin:** A substance contained within red blood cells**; Haemovigilence:** Awareness of haematological conditions (diseases of the blood)**; Oesophageal cancer:** Cancer of the oesophagus**; Opiotoxic:** An acute condition due to excessive use or an overdose of opioids (analgesic drug)**; Pancytopenic:** Low levels of red cells, white cells and platelets in the blood**; Reg:** Registrar**; Venflon:** A type of cannula (plastic tube inserted into vein)

4.4.4.2.3.5. Communicating effectively: facilitating and inhibiting factors

Participants cited a number of factors that facilitated or inhibited their preparedness for communicating with patients and their colleagues. By far the most common personal factors in terms of facilitation was the motivation and confidence of the F1s themselves. Supervisor support, other HCPs and having enough time were also mentioned frequently (see Box 24 for more details).

When talking about unpreparedness for communication with patients and colleagues participants mentioned lack of confidence and of F1s' emotional reactions being inhibitive personal factors. They also mentioned relationships with other HCPs, their supervisors and the quality of handovers a lot, along with limited time and poor staffing levels as being inhibiting factors.

BOX 24: COMMUNICATING EFFECTIVELY: FACILITATING AND INHIBITING FACTORS

Facilitating		
	Personal	Motivation, confidence, proactivity, gender, self-awareness, maturity.
	Interpersonal	Supervisors, wider team, peers, leadership.
	Cultural/systemic	Time, 'Fire drills', protocols and form, staffing, ward culture.
Inhibiting		
	Personal	Confidence, emotional reactions, ethnicity, gender, self-awareness, resilience.
	Interpersonal	Wider team, quality of handovers, supervisors.
	Cultural/systemic	Time, staffing, 'fire drills', protocols and forms

SUMMARY BOX (PHASES 2 & 3): PREPAREDNESS IN RELATION TO OUTCOME 2 (DOCTOR AS PRACTITIONER) SUBHEADING 3 (COMMUNICATING EFFECTIVELY WITH PATIENTS AND COLLEAGUES).

- Overall, the coding of narratives suggested that graduates are not well prepared in this area;
- Some F1s reported communicating sensitively and effectively with a wide range of patients and their families, across a range of settings and situations, and this was reinforced by D_FP participants. Other participant groups (e.g. HCPs, PPR) talked about how much better todays' F1s are than '10 years ago'. However, there were several reported areas of under preparedness:
    - Breaking bad news, which some F1s felt should be handled by more senior doctors;
    - Communicating with vulnerable patients, including those with mental health issues (identified by F1s and FRTDs);
    - Dealing with angry patients and avoiding and managing complaints (identified by F1s, FRTDs and P GVT);
    - Communicating with patients whose first language was not English;
    - Dealing with more informed patients (P GVT);
    - Communicating with patients who are extremely upset and emotional;
- Medical schools work hard to ensure graduates have the required skills but simulation has its limits, given the complexity and unpredictability of real-life communication (identified by F1s, CE, D_PF and HCP groups);
- Communication challenges were emotionally difficult, with frequent reports of distress during and after the event. On occasion, F1 doctors felt fear for their physical safety;
- Many F1's believed they were well prepared to communicate with colleagues, but some narratives contradicted this (F1 and D FP). Particular challenges included:
    - Clinical disagreements with senior medics or nursing staff;
    - Challenges in gaining support from seniors (identified by F1s and CEs);
    - Handovers (identified by F1s, FRTDs, CE), for example not providing or receiving sufficient information;
- Employers felt F1s were trained well for communicating in multiprofessional teams but other narratives contradicted this. F1 doctors felt there was limited communication flow between doctors and other healthcare professionals. F1 doctors did not always understand the level of information required by other healthcare professionals, so vital information was sometimes not shared. Occasionally, communication breakdown between F1s and nursing staff became serious, resulting in confrontation, distress and ongoing working difficulties;
- F1s and FRTDs talked about the importance of speaking face-to-face with colleagues, in addition to writing in patient notes. After receiving a poor handover, F1s had to read the notes from scratch, leading to time pressures.

4.4.4.2.4. Providing immediate care in medical emergencies

We now consider the outcomes around graduates' preparedness for providing immediate care in medical emergencies (see Box 5M, Appendix M for the 5 specific outcomes on this aspect of practice). We coded 114 (6.6%) distinct PINs/GINs to this category across all stakeholder groups. The pattern of prepared versus unprepared narratives across stakeholder groups suggests that this is another area in which graduates are often less prepared with F1s and FRTDs narrating more then twice as many unprepared events than prepared ones (Table 12 below). Very few or no narratives on this subject came from other stakeholder groups (and most given were general, unspecified narratives). Furthermore, the majority of narratives in this section came from situations when F1s were on-call during the evenings and weekends.

TABLE 12: DISTRIBUTION OF PERCENTAGE (AND NUMBER) OF PREPARED, UNPREPARED AND UNSPECIFIED NARRATIVES ACROSS STAKEHOLDER GROUPS FOR GRADUATES' PREPAREDNESS FOR PROVIDING CARE IN MEDICAL EMERGENCIES

	FY	FRTD	CE	D_FP	HCP	EMP	P_GVT	PPR	TOTAL
Prepared	35.4% (34)	18.2% (2)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	33.3% (1)	0.0% (0)	31.4% (37)
Unprepared	61.5% (59)	72.7% (8)	25.0% (1)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	50.0% (1)	58.5% (69)
Unspecified	3.1% (3)	9.1% (1)	75.0% (3)	100.0% (1)	0.0% (0)	100.0% (1)	66.7% (2)	50.0% (1)	10.2% (12)
TOTALS:	81.4% (96)	9.3% (11)	3.4% (4)	0.8% (1)	0.0% (0)	0.8% (1)	2.5% (3)	1.7% (2)	100.0% (118)

NOTE: The percentages in the table are calculated using the total of each column, corresponding to each stakeholder group. The totals in the bottom row and right hand side column are calculated as a percentage of the overall total number of narratives concerning preparedness for providing care in medical emergencies (n=118).

4.4.4.2.4.1. Providing Immediate care in medical emergencies: prepared

Foundation doctors provided intricate narratives around situations in which they felt prepared for medical emergencies. Some F1s talked about how well medical school had prepared them for medical emergencies through simulation (e.g. using high fidelity manikins) and how repeated exposure to simulated emergencies such as cardiac arrest meant that their behaviors in these situations became instinctive (Box 25, Excerpt 1). F1s talked a lot about using a logical approach to medical emergencies, so-called 'fire drills', which were taught to them during medical school and which enabled them to feel comfortable when faced with these difficult situations.

On-calls were considered to be a time where F1s learn the most, reviewing sick patients and having to 'think on your feet'. As such, F1s talked how their 'instinctiveness' had been developed since being in post. Following numerous situations in which they encountered multiple emergencies, including on-call shifts, tackling these difficult situations became easier. Thus, identifying the severity of the situation, being able to prioritise emergencies, knowing what information was needed and sometimes giving advice over the phone were all ways in which F1s developed their skills in dealing with potential medical emergency situations (Box 25, Excerpt 2). These 'developmental' narratives contained many references to how the F1s felt 'confident', 'calm' and 'in charge' of the situation.

Part of the F1s' preparedness around medical emergencies was knowing when they were out of their depth and not feeling afraid to seek additional help. In situations such as these, F1s talked about undertaking emergency procedures, such as airway management, but when these did not succeed they knew quickly how to escalate the situation to their seniors who would be able to deal with it.

Preparedness for medical emergencies was not necessarily a straightforward matter. For example, some F1s talked about how they felt prepared for some aspects but unprepared for others. For example, they understood how to approach a cardiac arrest using the ABCDE approach and CPR because they had a lot of teaching throughout medical school on these aspects. What they felt unprepared for were the complexities around their own emotions in such situations. Having only worked in a simulated environment previously, they reported never having experienced real patients going into cardiac arrest. When patients did not survive, some F1s reported experiencing lots of different (and sometimes unresolved) emotions.

There were a couple of narratives around being prepared for medical emergencies from the FRTD group that supported F1s' stories around the utility of a structured approach to medical emergencies being 'drilled into' them. This training led to them feeling prepared to give immediate support, identifying the severity of a clinical presentation, including how to identify and treat a

kidney injury. There was also the view from one P_GVT participant that graduates of today were well prepared for medical emergencies, although he admitted having no first-hand experience of this.

4.4.4.2.4.2. Providing immediate care in medical emergencies: unprepared

We had almost twice as many narratives where graduates felt unprepared for providing immediate care in medical emergencies than we did for them feeling prepared (58.5% vs 31.4%). F1s talked about the difficulties around emergency care, frequently occurring while undertaking on-call duties. Some participants reported not having experienced on-call duties as a student, something they now regretted as they had no idea how on-call worked. This lack of knowledge was both around the process of what is required of them and in terms of how physically tiring it can be being 'bleeped relentlessly'. Furthermore, F1s frequently reported working without any real support and feeling out of their depth a lot of the time.

There were many narratives around the F1s' first on-call shifts. Comments included not knowing what was happening, not knowing the process, not knowing the patients, having access to very limited information and therefore relying heavily on nursing staff for help. Indeed, many of the F1s' narratives on being unprepared for giving immediate care in medical emergencies talked about the role of the nurses during on-call shifts in terms of 'nurses as guides', facilitating their navigation around ward procedures, protocols and generally directing them towards 'how things are done'.

F1s often commented on how 'scary' on-calls were during the first few months of a new post. They talked about chaotic situations and where sometimes even the algorithms that they had learned were forgotten due to the acute stress of the moment (Box 25, Excerpt 3). Fortunately, in many cases, others were already at hand to deal with the situation. However, there were times when the F1s were the first on the scene and they struggled to provide emergency care (Box 25, Excerpt 4).

On-call during night shifts were also flagged up as being problematic. F1s talked about their anxiety in knowing that they might be the only person on site. Indeed, F1s reported feeling the "most stressed" and alone when they had a really unwell patient during night shifts and they did not know why they had deteriorated. There was a feeling that some F1s felt reasonably comfortable in assessing patients, and identifying the severity of their clinical presentations and the need to act quickly. However, they felt unprepared for being responsible for emergency care when it entailed things such as changing a consultant's management plan, and very unprepared for situations where they had attempted to deal with the emergency that the patient was not improving (Box 25, Excerpt 5). Furthermore, during on-call situations F1s found the sheer amount of work of being responsible for numerous wards of patients both physically and mentally tiring. This was compounded when rota shifts were complex and unsettling (e.g. being on different wards every day alternating with night shifts). Even experienced F1s found this way of working 'impossible', rendering them feeling unprepared for almost everything but the very basics of care (Box 25, Excerpt 6).

Feelings of unpreparedness by F1s at these times were compounded by their apprehension, nervousness and anxiety around the unknown. Indeed, the ways in which F1 participants narrated their experiences of unpreparedness during medical emergencies is important to note. They frequently used negative emotional expressions such as feeling scared, anxious, frozen, lost, unsure, struggling, panic, fear and stressed (see Box 25)

In terms of other stakeholders' experiences and viewpoints, we had a number of narratives recounted by our FRTD participants. Many of these were around the first day of being on-call, weekend and evening shifts. They talked about how the use of simulation during undergraduate medicine had not prepared them for the chaos of real-life, how disoriented they felt when being placed on an unfamiliar ward, the lack of staffing during night- and weekend-shifts and the sheer responsibility of being the first person around when someone gets very sick (Box 25, Excerpt 7). The only CE participant to talk about emergency care backed up these feelings and talked about

how this was a 'shock to the system' for most F1s. The only other stakeholder group with experience of junior doctors in emergency situations was a member of the PPR stakeholder group who narrated a time when their son was ill in hospital, feeling like it was 'a lottery' whether an experienced doctor would be there to help when he became critically ill (Box 25, Excerpt 8).

BOX 25: F1s VIEWPOINTS AND EXPERIENCES AROUND THEIR RELATIVE PREPAREDNESS FOR PROVIDING CARE IN MEDICAL EMERGENCIES

Prepared

Excerpt 1:

"there was a lady on a ward that had been fine all night apparently…then <u>suddenly I get a bleep</u> saying she's got what we call an early warning score of three…[she] just couldn't breathe, and I said '*why is she only scoring a three*' … and they looked again and said '<u>well actually, no sorry, we've added it up wrong, she's scoring a six</u>' and I was like '<u>*oh, ok, right I'm coming now*</u>' and went and she was- she looked very poorly and she was really finding it hard to breathe and I just didn't- it was <u>that sudden shock that '*oh, gosh she looks she looks almost like she's peri-arrest*</u>'…the fact that she really cannot breathe…her chest oxygen levels are a bit low but you know it was a lot of basic things that I could do, so <u>I rung the SHO</u> '*please come straight away, she's very poorly*' but then- because I'd been <u>done some of the SimMan stuff at medical school it was quite easy to know</u> straight away things like grab some oxygen, get the nurse to get the ECG machine, get some bloods, order a chest x-ray, there were <u>a few really basic steps</u> that I was able to do quite quickly and then put out a call for like the what we call a MET [medical emergency team] call…so just because I had been shown some basic, just basic really quick things…by the time the team of people that are a bit more senior and going to be able to do things that are more dramatic…I think she [patient] was less scared because there was lots of people doing things, and the nurses had got an ECG…<u>by the time everyone else arrived they had a bigger picture so they could start treatment straight away</u> and I think it was only because I had been shown very, very basic practical things to kind of stop-gap a situation, to do something quite quickly, that when they arrived I felt more comfortable. <u>It was very scary</u>…but it was kind of almost by- <u>just by instinct because we'd been shown so many times</u> if- you know get oxygen you know use those kind of five or six basic things…fifth year was when we did a lot of SimMan and we did these kind of scenarios…" [F_FY_124]

Excerpt 2:

"another situation that I've felt quite prepared for during my last set of on-calls was answering my bleep and <u>triaging the things</u> that I was being asked to do. I remember doing the first lot of on-calls…your bleep would go and you would answer it as soon as you could obviously, but <u>then I used to find it quite difficult to decide which were the which calls were more urgent, and what I should prioritise</u>. I think obviously <u>with the more experience</u> that we've had over the past six or seven months <u>it has become a lot easier to prioritise</u> things and to say '*no, I'm sorry, I have to go to this thing next*'. Also, just answering your bleep <u>and knowing exactly what information you want the person whose bleeping you to give you</u>, so for example when we first started it would be '*hi- err- you've bleeped*' and then they'd ask you to do something, or to come and see a patient, and you obviously knew that you had to ask what the obs were and things, <u>but just being able to perhaps sometimes give advice over the phone</u>, to find out how things have changed and <u>just being that much more confident,</u> I found that a lot easier over the past lot of on calls and I think it just comes down to experience and having done things before and being on call." [M_F1_26, Audio Diary, 8 months in post]

Unprepared

Excerpt 3:

"I'm normally on the neurology ward and it's about half nine and we're in middle of the ward round and <u>the crash call went off</u>…so we ran into the bay and <u>there was a woman there</u>, <u>she wasn't one of</u>

our patients, I'd never met her before. It was a really horrible sight. It was this very obese, very, very big woman, and she was completely blue like she was- I'd never seen a person that colour before. She was completely blue, and she was just sat there like completely- like completely still, and she had loads of really feculent vomit. So she was just covered in this sort of vomity faeces, just covered in it. And just blue. And looked dead. And myself and the other F1 just walked in and we just froze. We absolutely froze because it was really quite a shocking sight, and I'd never seen anything like it and it honestly it was the real 'flight or flight' thing. We were like rabbits in a headlights. And we just looked at her, and luckily there was a call trainee on hand who'd already got there and he'd started doing chest compressions and things. And after the initial shock, about a couple of seconds got over that, and knew '*right we need to start doing X and Y and Z*' and we did get there, and obviously within in a few minutes loads of people were there and we became very junior and not particularly needed members of the team because there were a lot of very senior people there…but it was really horrible and I don't think any lecture or any medical school can prepare you for the first time that anything that horrible happens to you…it was just like things like putting on the gloves and the fact that there was so much vomit everywhere, and trying to do chest compressions on this woman…like we said afterwards, I mean, we both went for a cup of tea afterwards and we were quite shook up by it and we were saying, you know, it's really funny we've had all this training at (name), (name) is a medical school, its very ABCDE. When you get to the crash call this is what you must do. And I always thought '*oh yeah, but when I get there I know what to do*' and then the first time it actually happens it's quite shocking and it took- took my brain quite a while to get used to it…and I'm sure, you know, by the time I've done three four five ten twenty each time I will be a bit more your used to it and you will be able to react quicker and be more useful…I think that's the first time I've really felt quite caught out really." [M_FD_121]

Excerpt 4:

"I received a phone call from one of the respiratory wards regarding a patient who had become unresponsive. I went straight to the ward. I was the first doctor to arrive at the patient's bedside. In the past when I had been called to a collapsed patient or a cardiac arrest I had always arrived to find a number of medical staff already present and many tasks already in progress. On this occasion, this was not the case. I was trying to take in what the nursing staff were saying about the patient, an elderly gentleman, while looking at him from the end of the bed for clues as to what was wrong. At first there was too much information to take in and I felt as though I was freezing on the spot. I could see that the patient was breathing spontaneously and was moving which was good, as it meant that he was not in cardiac arrest. It also made things more complicated because, if he was not in cardiac arrest, what was happening to him? The description that nursing staff had given over the phone sounded like a seizure, but I wasn't convinced upon seeing the man, as there was no twitching behaviour. Fortunately, within seconds, the SHO arrived and started giving instructions for cardiac monitoring to be attached and bloods, etc., to be taken. I didn't feel very useful as I had great difficulty trying to get IV access. When further members of the medical team arrived I made myself more useful by running the ABG sample through the analyser. There was an analyser on the ward and I was familiar with how it worked, as I use the machine frequently for respiratory patients on my base ward. I checked online for the patient's most recent blood results and found his medical notes and kardex. I started recording in the medical notes everything that had happened and that had been done for the patient. Reflecting upon the situation afterwards, I realise that I am not ready to deal with an acutely unwell patient on my own. I still have much to learn about assessing the situation from the foot of the bed and drilling into myself an ABCDE approach when under pressure." [F_FY_172]

Excerpt 5:

"we all know…if a patient's got low oxygen saturations, you're probably do a chest x-ray, ABG, put them on oxygen, put them on nebulisers, all those things. And then when it doesn't get any better, that's when you really feel alone because you feel '*right, well I've done all those things and it's not*

making any improvement, and I've kind of exhausted my resources of what I can actually do for this patient'…it's now getting a bit more a case of '*right, well how unwell is this patient? and what do we actually need to do to them*?' rather than for them to try and treat them. So I suppose that's a particular scenario, I can't remember with a particular patient there's been a number of them, where you just- you've tried everything that you know how to do, their blood pressure's low, you've given them the different fluids, all those things, you've looked at their bloods, you've done all the tests you can, you've done all the investigations and they just don't show signs of improvement and you don't have the knowledge or clinical experience to know where to go from there." [M_F1_28]

Excerpt 6:

"this was a short week cause I'd just come off weekend nights but and I was on float for the different wards…and didn't feel prepared generally, I just generally didn't feel prepared at all in work that week. It was a general unease because I was on a different ward every day, had been on nights before that, and before that had been on a different ward every day. So it was just wasn't really nice, and I don't really understand why they do that in a rota, but yeah, generally didn't feel prepared. Didn't feel prepared answering questions from nurses about patient care, didn't feel prepared speaking to families, barely even felt prepared speaking to patients. And it was just because I didn't actually know what was going on with any of them, so I really just spent three days taking blood doing discharge letters and fulfilling a jobs list without knowing very much about anything…I don't know how anyone feels prepared in that situation, but I really didn't. Although I did the best I could and read through the notes before I said or did anything important, but generally wasn't really a level that I'd like to be operating at as a doctor at this stage. I thought…it is kind of unprofessional, but it was an impossible situation." [F_FY_168, Audio Diary, 7 months in post]

Excerpt 7:

M_FRTD_178: I remember my first seven nights I think it was like that awful time, about eight in the morning where you're just exhausted and you're counting down the hours. I was called to see someone who was unwell and as I was assessing her, her SATS just dropped and dropped and dropped and then went down more…and then I thought she kind of wasn't breathing that well. I just like panicked and just called the SHO and said '*come now'* and it turned out SATS probably just fallen off her anyway, and she was she unwell. She had quite a bad pneumonia. But obviously just taking the time to confirm what you think is going on…but it's the panic of being- I think the panic of just having that time pressure where you don't have time to think through what's going on you just know that you need to do something now…and often the reflex is just someone else should you be doing this because I can't…I think everyone's got stories of when they just called for help and they didn't know anything…certainly at the beginning…
F_FRTD_177: I think in your first on call shifts as well because that's kind of the time where you are a bit- you feel a bit more vulnerable and you feel the responsibility of it literally, is me or someone else, and you know you kind of really want the backup and that in those kind of times because nursing staff are busy in those times and have all their patients who they're dealing with and you can feel a bit alone and you just really want someone just there to really- I suppose more than anything else encourage you that you're doing the right thing. You're kind of a bit thinking or worried about doing more harm to someone or that kind of plays on your mind…
M_FRTD_178: You'd be frowned upon if you didn't present it- definitely, yeah…I think at the beginning I didn't have appreciation of how urgent certain things were, as in I kind of assumed that you just needed to get someone there…and then you just get frazzled because you don't want to assess the airway when you knew that they're bleeding and they need fluids so you just kind of- but you know you have to do it as fast as you can…

Excerpt 8:

F_PPR_66: …but I think a lot of doctors- when my son was ill he was in the haematological department in ((Name)) and that was virtually run during the day and most of the night by the sister

and the junior doctors who didn't have the breadth of experience with those sort of problems- my son had aplastic anaemia lots of the other people in the ward had leukaemia or various other diseases like that and it was very difficult- they were all teenagers they didn't realise how little the doctors knew about their individual conditions…but we did- the parents…and that made such a difference to us being there during the night during the day, and you think '*this chap hasn't got a clue, he's only just qualified, he doesn't know the specialist problems'* and to be fair if there was something really bad they would try and get the consultant out but- I don't know if it's the same in other areas but most of the consultants here work between several hospitals, if there's an emergency at ((name)) and an emergency at ((name)) and there's only one consultant on duty overnight it's like a lottery…
INT: can you recall- sorry- at the time even though there were consultants around at the time, when it was just the ward sisters and the junior doctors on the wards who say maybe didn't know as much how did that make you feel?
F_PPR_66: dreadful- really dreadful- because you're sitting there with somebody who you love who's critically ill. There isn't anyone you feel who's going to be able to help.

ABCDE: Airways Breathing Circulation Disability Exposure**; Aplastic Anaemia:** Failure of blood cell production resulting in low haemoglobin in the blood**; Arterial Blood Gas (ABG):** Blood test performed using blood from an artery to measure the amount of oxygen and carbon dioxide in the blood**; Electrocardiograph (ECG):** A tracing of the electrical activity of the heart used to diagnose heart disease**; Leukaemia:** Cancer of the white blood cells**; MET:** Medical Emergency Team**; Nebuliser:** An instrument used for applying a liquid in the form of a fine spray**; Peri-arrest:** Period either just before or just after a full cardiac arrest.

4.4.4.2.4.3. Medical emergencies: facilitating and inhibiting factors

There were a number of enabling and inhibiting factors that were narrated in terms of F1s' preparedness for medical emergencies. On a personal level, being proactive was seen to facilitate preparedness. Positive relationships with supervisors and nurses were frequently mentioned and the use of 'fire drills' were also thought to facilitate preparedness (see Box 26 for full list). In terms of unpreparedness, by far the most common personal factors that inhibited preparedness were emotional reactions and lack of confidence. In terms of interpersonal factors, relationships with supervisors and nurses were occasionally talked about as inhibiting factors in F1s' abilities to provide care during medical emergencies. Finally, the inhibiting factors of lack of time and poor staffing were frequently mentioned.

Box 26: RELATIVE PREPAREDNESS FOR MEDICAL EMERGENCIES: FACILITATING AND INHIBITING FACTORS

Facilitating	
Personal	Proactivity.
Interpersonal	Supervisors, wider team, leadership.
Cultural/systemic	'Fire drills', protocols and form.
Inhibiting	
Personal	Emotional reactions, confidence.
Interpersonal	Wider team, quality of handovers, patient journey.
Cultural/systemic	Time, staffing, 'fire drills', protocols and forms, ward culture.

> **SUMMARY BOX (PHASES 2 & 3): PREPAREDNESS IN RELATION TO OUTCOME 2 (DOCTOR AS PRACTITIONER) SUBHEADING 4 (PROVIDING IMMEDIATE CARE IN MEDICAL EMERGENCIES).**
>
> - Overall, the data suggested that graduates are not well prepared in this area;
> - Some F1s felt medical schools had prepared them well for medical emergencies through simulation and through repeated exposure but FRTD participants felt simulation provided limited preparation for the reality of managing a sick patient without support;
> - Some participants had not experienced on-call duties as a student, which led to a feeling of unpreparedness, both in working independently and in practical aspects (e.g. using bleeps, managing tiredness);
> - The majority of narratives related to on-call during evenings and weekends, suggesting that this is when F1s are most likely to take the lead in providing immediate care, and when support is less available;
> - F1s felt well for some aspects (e.g. ABCDE approach, CPR) but unprepared for others (e.g. their own emotional response, changing a consultants' management plan, what to do if the patient was not improving). Part of the F1s' preparedness was knowing when to ask for help and knowing when and how to escalate the situation to their seniors;
> - Participants narrated a number of enabling factors for F1s' preparedness for medical emergencies (e.g. being proactive, having good support, use of 'fire drills' such as ABC) and also some inhibiting factors (e.g. emotional reactions, lack of confidence, lack of time, poor staffing). Following numerous encounters with medical emergencies, they gradually became confident to assess the severity of the situation and prioritise activities.

4.4.4.2.5. Prescribe drugs safely, effectively and economically

We now consider the outcomes around graduates' preparedness for prescribing drugs safely, effectively and economically (see Box 6M, Appendix M for the 8 specific outcomes on this aspect of practice). 106 distinct PINs/GINs (6.1%). The pattern of prepared versus unprepared narratives across stakeholder groups suggests this as another area where graduates might be seen as being less prepared for practice. However, our F1 stakeholder group (51.9% of the total data) gave the same proportion of preparedness narratives as they did unpreparedness (22.6%; Table 13 below). It is the HCP group, who typically provided evidence to suggest that F1s are unprepared (0.9% vs 16.0% for prepared/unprepared respectively). We had very few narratives on this subject coming from other stakeholder groups (with most of these being general, unspecified narratives).

TABLE 13: DISTRIBUTION OF PERCENTAGE (AND NUMBER) OF PREPARED, UNPREPARED AND UNSPECIFIED NARRATIVES ACROSS STAKEHOLDER GROUPS FOR GRADUATES' PREPAREDNESS FOR PRESCRIBING DRUGS SAFELY, EFFECTIVELY AND ECONOMICALLY

	FY	FRTD	CE	D_FP	HCP	EMP	P_GVT	PPR	TOTAL
Prepared	43.6% (24)	42.9% (3)	0.0% (0)	16.7% (1)	4.2% (1)	28.6% (2)	0.0% (0)	0.0% (0)	29.2% (31)
Unprepared	43.6% (24)	14.3% (1)	0.0% (0)	16.7% (1)	70.8% (17)	28.6% (2)	50.0% (2)	0.0% (0)	44.3% (47)
Unspecified	12.7% (7)	42.9% (3)	100.0% (2)	66.7% (4)	25.0% (6)	42.9% (3)	50.0% (2)	100.0% (1)	26.4% (28)
TOTALS:	51.9% (55)	6.6% (7)	1.9% (2)	5.7% (6)	22.6% (24)	6.6% (7)	3.8% (4)	0.9% (1)	100.0% (106)

NOTE: The percentages in the table are calculated using the total of each column, corresponding to each stakeholder group. The totals in the bottom row and right hand side column are calculated as a percentage of the overall total number of narratives concerning preparedness for prescribing drugs safely, effectively and economically (n=106).

4.4.4.2.5.1. Prescribing drugs safely, effectively and economically: Prepared

Some of the narratives in this theme from our F1 participants were also coded to previously discussed themes around diagnosing and managing clinical presentations and treating patients in medical emergencies (e.g. Box 17, Excerpt 8; Box 20, Excerpt 1). In terms of preparedness, graduates talked about how practising prescribing skills and being assessed through their OSCE provided them with a good opportunity to simulate prescribing and therefore feelings of preparedness. Despite this, some F1s reported feeling 'a bit daunted' in their prescribing tutorials, but having an opportunity to work with different professional groups such as pharmacy teams, provided them with good preparation for practice. However, even when they felt prepared, some F1s admitted to lacking confidence. They talked about how prescribing was one of the hardest things to do, due to the small amount of exposure to prescribing during their undergraduate programme. While they admitted to knowing about drugs and drug actions, they lacked clinical exposure in terms of having to make prescribing decisions in the workplace. They reported initially finding it 'scary' when a nurse asked them to prescribe for a patient, in case they calculated the wrong dose or prescribed inappropriate medications for specific patients. However, some F1s demonstrated in their narratives an awareness of drug actions and the ability to identify the appropriateness of a given drug for a known-patient (Box 27, Excerpt 1).

Other participants talked about preparedness for prescribing in terms of understanding their own limitations and knowing when to seek a senior opinion. Even if they felt they knew which drug to prescribe and how much, they often narrated events in which they 'checked with the SHO' before actually prescribing them. Others talked about how knowing the basic scientific principles around drug actions enabled them to constantly advise and make decisions on appropriate medications. A common event in the F1s' narratives comprised frequent referrals to the BNF when prescribing on the wards, particularly at the start where everything was looked up, no matter how routine (e.g. Paracetamol). Others talked about using computer programmes to assist them in calculating drug doses for specific patients.

Some F1s talked about how they had become more confident in certain prescribing practices, e.g. for pain relief, due to the experiences they had had since becoming an F1. This developmental aspect appeared to facilitate their confidence in prescribing whereby they frequently narrated feeling initially quite 'scared' or 'concerned' around prescribing certain medications, for example, morphine, but over time, this anxiety was reduced considerably due to their greater exposure to prescribing situations.

In terms of other stakeholders' experiences of graduates' preparedness for prescribing practices, the few narratives we had from the FRTD and P_GVT groups on preparedness suggested that graduates had be trained well and were prepared for prescribing 'common' drugs, such as antibiotics

4.4.4.2.5.2. Prescribing drugs safely, effectively and economically: Unprepared

In terms of being unprepared for prescribing skills, the narratives we coded were similar to those coded under F1 narratives of preparedness. What differs in these narratives is mainly the way in which the F1s narrated events in terms of the relative absence of accessing support systems around their prescribing behaviours. Therefore, like the preparedness narratives, there were many in which F1s talk about being out of their depth. In this way, they had a similar flavour to the prepared narratives in which they also talked about not feeling confident in the decisions that they made. However, in these unprepared narratives, F1s often described going ahead and making decisions, prescribing drugs for which they felt unsure. Frequently, this was due to understaffing and their inability to access support (Box 27, Excerpt 2). Furthermore, there was a feeling by some F1s that even though they had good teaching during their undergraduate degree, and they generally had good support and teaching on their placements, they still lacked an understanding around the complexities of prescribing that led them to feeling stressed when left without support

(e.g. out of hours) and when left in charge of prescribing for acutely unwell patients, including patients in a lot of pain (Box 27, Excerpts 3 & 4).

In terms of other stakeholders' narratives around graduates' unpreparedness for prescribing D_PV and EMP groups commented that graduates lacked understanding of basic pharmacology. The narratives from P_GVT, EMP and HCP participants also mentioned the economics of prescribing drugs, with a feeling that F1s did not know how to prescribe economically and therefore wasted scarce financial resource.

Participants in our HCP group, which included pharmacists, mainly discussed graduates' preparedness for prescribing in terms of them being unprepared. They admitted that graduates were prepared in terms of knowing who to speak to, including pharmacists on the wards, but that they lacked knowledge around the actual prescribing itself. They talked about how graduates saw prescribing as being very *black-and-white*, whereby one dose was the only dose. However, in reality, deciding on which dose to prescribe required their clinical judgement. The pharmacists in this group believed that graduates needed to have a greater diagnostic understanding of the patient, where they should be able to say they wished to start patients on a low dose, for example, then deciding on what the low-dose is of any particular drug, and that this judgement should be based on interactions with the pharmacist. In their experience, graduates were not prepared in terms of the type of information that prescribers might need in order to decide on any given dose. Furthermore, they found that graduates were far too reliant on taking pharmacists' word for it, regarding what a good dose might be, despite them not being provided with adequate information about the wider clinical background of the specific patient involved (Box 27, Excerpt 5).

There was a view from the HCP group that most graduates had no idea of how to write a legal controlled drug prescription and that pharmacists often had to talk them through the process or even had to write the prescription themselves. They talked about graduates' unpreparedness being related to their fear around never being able to confidently prescribe controlled drugs, for example, on a palliative care ward. Legal mistakes or errors were often made, resulting in prescriptions being held up in the system. There was also a view that new graduates did not write legibly, resulting in others misunderstanding their writing (e.g. nurses) and therefore making mistakes when administering the drugs. Other HCPs talked about difficulties in terms of F1s' unpreparedness for taking patients' drug histories.

In addition to legal mistakes, prescribing errors were also reported. For example, a patient who had been given a massive overdose by a junior doctor who had not logically thought through the high dose of morphine he was prescribing for a patient (Box 27, Excerpt 6). Furthermore, there was a perception that graduates were not prepared for the kind of mistakes that could go wrong, such as transcription errors. For example, writing down drugs from a list provided by patients, and then working from their own list, rather than the original. Pharmacists gave accounts of such transcription errors resulting in patients being admitted to high-care wards because they missed essential medications. Related to this was the opinion that F1s sometimes lacked an understanding of the *act* of prescribing: checking up the patients' medicines, ensuring that the right drugs had been prescribed for the right patient, with the right label, and the right dose. It was thought that these logical safety steps were missing, either because they had not been taught them prior to prescribing, or if they had, they did not have the time to use them. Junior doctors were thought to be more task-orientated, not applying their knowledge of pharmacy, mainly due to systems issues (overworked, lacking time, experiencing pressure).

BOX 27: F1 AND HCP PARTICIPANTS' EXPERIENCES AROUND GRADUATES' RELATIVE PREPAREDNESS FOR PRESCRIBING DRUGS SAFELY, EFFECTIVELY AND ECONOMICALLY

Prepared

Excerpt 1:

"I found prescribing was one of the hardest things…as a student you get very little exposure of prescribing…you know medications, but you never have the exposure of someone coming at you and putting their cardex in your face, and you're sort of writing it down, or clinical situations for prescribing. When I did part of my elective in [city name] they would be able sort a write on a cardex, but then they would have to put a sticker on it to say this was a medical student…to say this needs signing by another doctor… I still find it scary whenever a nurse comes in and, you know, puts a cardex in my face and says '*can you prescribe something for this*'…I still find it a bit scary that you're writing up a new drug…even if it was something simple, be like '*I'm just gonna get the BNF here*' always just checking yourself because you were so scared of writing the wrong dose or something…but whenever you're on nights…a lot of the time you're asked to prescribe zopiclone or some sort of sleeping tablet and you know there's lots of people want them…so you get you get very blasé just sort of writing everyone up for zopiclone. But I remember…being handed a cardex saying '*oh would you mind writing someone up a zopiclone or something they're not able to sleep*' and it was only just because I normally work in that ward, I remembered they have like myasthenia gravis…it was only because I knew that person I sort of thought, you know, '*maybe they shouldn't -they probably shouldn't get a sleeping tablet*' but you do get very just used to just, you know, squiggling something…just to make it easy for yourself, just write it and move on…next job…sort of think 'I am actually prescribing someone here, better take my time' so…" [M_F1_171]

Unprepared

Excerpt 2:

"I just started my new block in acute medicine…my first long day on call we were based in A&E…a nineteen year old known epileptic female presented with uncontrolled seizures for over twenty minutes, according to the ambulance staff, and they'd done what they'd needed to do and given her a bolus dose of diazepam… she's well known to the [names hospital] she had multiple medication issues where the neurologist she was under, the epileptic specialist, kind of reached the ceiling of care for her because although they'd exhausted most medical issues it was more the social side of things which was really affecting the patient's care she was an alcoholic and a poorly controlled diabetic as well which kind of complicated the matter quite severely, and she was also very non compliant with her medication, so no matter how many times you try chop and changing, getting down to the minimal dose of one medication, it was always an uphill struggle with her, really, the difficulty I found really came in the acute setting. I was very unprepared for dealing with the stress and the speed of which things needed to move in the resus department…I had nurses kind of shoving drug charts in front of me and asked me to scribe this, that and the other, and these were medications I wasn't particularly comfortable in prescribing. I didn't exactly know the dose or which one's, so I found myself very much pressured to write down what they were saying. I wasn't, I wasn't clear on exactly how it was going on. Obviously, my registrar was on the ward looking after a patient who was critically ill on the CCU at the time so I was expected to know all these doses of medications exactly how to give them, when to give them, in what order and what was the efficacy of one over the other and the effectiveness, so it was just a really highly charged and highly stressful environment from my point of view. My learning point from this would be to kind of buckle down and get to know the protocols for the big things that you're going to see regularly as part of the acute medical team on take, seizures, stroke, ACS, really would be the three that I highlight, and I've already seen a few of those, but yeah, it was a really good learning experience for me and I just kind of didn't really feel like I was in control of the situation. I think at the end of the day you've got to be in control because you can't just pressurise people into a highly charged

environment. You can't just have the pressure to kind of fold and collapse on you, and you to buckle underneath it. I think you need to be quite strong and quite steadfast and know exactly what's going on and really take your time to have an understanding and read through the notes and get to know the patient in a in a controlled manner before you start prescribing medications, really. [M_F1_35, Audio Diary, 4 months in post]

Excerpt 3:

"something that I'm not particularly prepared for, it's something that was taught at medical school but it's, I think, something that you need quite a lot of experience in, would be opiate prescribing and getting analgesia to an optimum level for patients. A lot of the patients that I would deal with do have quite chronic pain conditions and can be on a variety of different opiates and they need breakthrough analgesia. This is something that I find very difficult, still four months in, I'm still struggling. If it's beyond giving Paracetamol IV, and then going on to the different variations of morphine, and then like continuous MST, continuous oromorph oxynorm oxycontin longtec, these are all very complicated. I'm always very concerned when I have to prescribe these if there's no one close to talk to. This can happen on long shifts or when we're quite short staffed that someone is in acute pain and you do have to try and prescribe some analgesia, and if there isn't any PRNs written up, or if they're not adequate, this is quite stressful for me. I spend a lot of time checking the BNF, checking the palliative care guidelines, and it's something that I still do not feel comfortable doing. I don't feel that I'm a hundred percent competent. Usually if I can get a chance, I will speak to the ward pharmacist, they're always very, very helpful, I would liaise with the palliative care team. Again, they're really, really good for discussing the different patients' analgesia requirements. However, certainly out of hours these resources are just not available, and then it's sort of left up to me as an F1 being the first port of call to try and decide on appropriate analgesia treatment if there's no SHOs available. I have had to do this on occasions and I have had to prescribe stats of IV morphine which have been good for the patient and they have had a good pain relief for it, but it's still something that's causing me a lot of stress. I'm always very worried when I do prescribe opiates, particularly if I have to then administer them IV myself, just with the risks of opiate toxicity, and just with there's so many different preparations and different methods of delivery, it's just a very, very complicated issue that I find – and it has happened on a few occasions – and I'm just do not feel that it's- I'm particularly prepared for, even though it was attempted to be taught at medical school. Certainly in our oncology placement we did have time talking with the palliative care team and I have had teaching from the palliative care team, but I think it's just one of those areas that I think comes with a lot more experience than I have at the moment." [F_FY_170, Audio Diary, 4 months in post]

Excerpt 4:

"some of the [geriatric] patients have so many different things going on. So they're on so many different drugs and sometimes- that's one thing I would still feel a bit unprepared for actually is like sometimes the nurses are like, or the pharmacy, don't want any trivia on that cardex, they're on too many drugs, and I was sort of thinking to myself '*oh, my goodness, what can I stop? what can I start?*' and half of them, I don't know what they are, or there's lots of combination drugs that I'm like '*well, the others' fair enough, I'm not familiar with this particular combination*' and I think that's just going to be an ongoing thing, and you really have to be mindful what you're prescribing, and then a lot of them have like very poor renal function, and you really have to monitor it, so you have to be- it makes you more careful, I think, in some ways because there's some of them you can start them on an antibiotic and then a couple of days later their eGFR drops, so then you have to drop the dose and it makes you more precise...I think having that sort of cohort of patients, but it can be very challenging especially when they're on so many different drugs and different things going on." [F_FY_172]

Excerpt 5:

"there's probably a myriad of examples but they'd be very similar in in the theme… '*can you can you tell me how to prescribe this drug'* and we'd then have a myriad of questions about who? for what age? their renal function indicting the medicine what else are they on?, but they haven't thought about all that kind of detail." [F_HCP_141]

Excerpt 6:

F_HCP_81: a good example of a junior doctor- a patient came in they were on morphine 10mgs twice a day and the list they brought in from the GP, they have morphine 10 mg a pack of 60 tablets and they'd written the patient up for 60mgs twice a day…instead of 10mgs twice a day. That patient then ended up in a high care bay on an antidote infusion because they stopped breathing
F_HCP_82: massive overdose
F_HCP_81: because they'd been prescribed a massive overdose from a junior doctor not properly reading what they were- just blindly prescribing, not really appreciating information that's there
F_HCP_82: maybe not even thinking '*hang on, clinically you shouldn't- this seems like a lot of morphine for this patient*'
M_HCP_83: yeah
F_HCP_81: yeah
F_HCP_82: and thinking about what they're doing and rather than just writing, you know, copying
M_HCP_83: yeah 'cause that's the thing you see a lot of- you see- who'll just blindly write everything the patient was previously on, and the reason this patient might have come in is because, I don't know, high potassium or they're on the medication that can cause high potassium and they don't think about that sort of thing…a figure of like 60% or something in hospital admissions are due to medication related issues…they're not really looking at the whole sort of clinical picture, they're just blindly writing what they see this patient is on sort of like a tick box exercise…'*oh, this is what the patient is on oh, I need to chart everything of that, and then I need to deal with whatever the other issue is*' but they don't sort of…

NOTE: **A&E:** Accident and Emergency**; Acute Coronary Syndrome (ACS):** Disease of the coronary arteries, including angina and *myocardial infarction***; British National Formulary (BNF):** Pharmaceutical reference book with information and advice on prescribing and pharmacology**; Cardex:** The chart on which medications are written up for hospital inpatients**; CCU:** Critical Care Unit**; Diazepam:** Drug used to treat anxiety, alcohol withdrawal symptoms and muscle spasms**; Estimated Glomerular Filtration Rate (eGFR):** A test to determine kidney function**; IV:** intravenous**; mgs:** milligrams**; Morphine slow release tablet (MST):** A slow and continuous release of morphine **; Myaesthenia Gravis:** A chronic disease marked by abnormal fatiguability and muscle weakness**; Zopiclone:** Drug used for treating insomnia.

4.4.4.2.5.3. Prescribing drugs: facilitating and inhibiting factors

There were fewer enabling and inhibiting factors narrated around F1s preparedness for prescribing drugs. On a personal level, being proactive was the most commonly mentioned aspect that appeared to facilitate preparedness. Positive relationships with supervisors were frequently mentioned. Finally, having sufficient time in which to think and the use of smart phones / tablets to look up drugs in the BNF was also thought to facilitate preparedness (see Box 28 for full list). In terms of unpreparedness for

Box 28: Relative preparedness for prescribing drugs: facilitating and inhibiting factors

Facilitating	
Personal	Proactivity, confidence.
Interpersonal	Supervisors, wider team.
Cultural/systemic	Time, digital technology, protocols and forms.
Inhibiting	
Personal	Confidence, proactivity, emotional reactions.
Interpersonal	Wider team.
Cultural/systemic	Time, staffing, protocols and forms.

prescribing, the main inhibiting factors cited were lack of confidence, interactional difficulties with the wider team (including feeling pressurized by nurses to prescribe), time pressures and poor staffing.

SUMMARY BOX (PHASES 2 & 3): PREPAREDNESS IN RELATION TO OUTCOME 2 (DOCTOR AS PRACTITIONER) SUBHEADING 5 (PRESCRIBE DRUGS SAFELY, EFFECTIVELY AND ECONOMICALLY).

- Overall, the data suggest this as an area in which graduates are thought to be poorly prepared. Interestingly, it was the HCP group, who provided the strongest evidence for this, with the F1s giving equal number of preparedness/unpreparedness narratives;
- Graduates felt that practising prescribing skills and working with different professional groups at medical school provided good learning opportunities;
- Even when they had good underpinning knowledge, some F1s found prescribing difficult due to limited 'in situ' prescribing experiences and support on the wards;
- F1s described frequent referrals to the BNF when prescribing on the wards, and double-checking drug choices and dose calculations;
- Some stakeholders felt that graduates lacked an understanding of basic pharmacology (e.g. D_PV, EMP groups) and did not know how to prescribe economically (e.g. D_PV, EMP, HCP groups);
- The HCP group felt graduates knew how to access support for prescribing but lacked knowledge and couldn't write a legally controlled drug prescription or take a patient's drug history;
- The HCP group felt that graduates saw prescribing as absolute, rather than requiring clinical judgment, and suggested they needed a greater diagnostic understanding of the patient.
- Prescribing errors were common and there was a perception that graduates were not aware of common error sources and safety checks;
- Facilitating factors for prescribing included F1proactiveness, positive relationships with supervisors and sufficient time to think and access information. Inhibiting factors included lack of confidence, time pressures and poor staffing.

4.4.4.2.6. Carry out practical procedures safely and effectively

We now consider the outcomes around graduates' preparedness for carrying out practical procedures safely and effectively (see Box 7M, Appendix M for the 3 specific outcomes on this aspect of practice, and below for our data mapped against the Appendices in TD09). We coded the practical procedures mentioned by F1s as part of their narratives, mapping them against the list in Appendix 1 of TD09, and adding new ones if they were not listed. Procedures were categorized into 'unprepared' when participants explicitly evaluated these actions as such, or when they were constructed as difficult or when the F1s called for support. Doing, for example, a difficult catheterization under supervision was coded as 'unprepared', implying that the trainee felt unprepared to carry out this procedure independently in the specific context of the narrative, despite being prepared to call for help. We coded procedures under 'prepared' when participants evaluated these activities explicitly as prepared, or when they mentioned them as having been done routinely. Therefore, the sharp distinction between 'prepared' and 'unprepared' serves as an indication only, and therefore cannot be taken as absolute. Table 14 below provides an overview of the distribution of incidents with prepared and unprepared practical procedures mentioned five times or more. As we can see from Table 14, F1s reported themselves to be more prepared than unprepared to carry out everyday practical procedures (79.5% vs 20.5% respectively).

TABLE 14: DISTRIBUTION OF PREPARED AND UNPREPARED NARRATIVES BY F1S FOR CARRYING OUT PRACTICAL PROCEDURES*

Procedures	Prepared	Unprepared	Total
Measuring pulse rate	12	0	12
Managing blood	18	4	22
Venepuncture & taking blood cultures	54	15	69
Measuring blood glucose	5	1	6
Managing, performing & interpreting an ECG	17	7	24
Basic respiratory function tests	21	0	21
Administering oxygen	7	0	7
Establishing peripheral intravenous access	36	6	42
Male and female urinary catheterization	8	7	15
Skin suturing	2	4	6
Arterial Blood Gas**	19	2	21
NG Tube insertion**	3	6	9
Total:	**202**	**52**	**254**

NOTE: Table includes procedures mentioned 5 times or more in participants' narratives. **Procedures mentioned by F1s frequently, in addition to those mentioned in TD09 Appendix 1.

Procedures that were specifically mentioned include those related to taking, managing and checking bloods, cannulation, catheterization, ECGs as well as procedures related to emergency tests, such as, respiratory function texts. F1 participants narrated these as being a routine and well-rehearsed aspect of their clinical encounters with patients. Especially the ABCDE procedures were often described as having been "drilled into us" in medical school. While the emergency situation was often described as initially overwhelming, the procedures and knowing their sequence are mentioned as a fall back in these highly stressful instances.

The procedures became problematic, resulting in an F1 feeling unprepared or struggling, when circumstances were difficult. For instance, taking blood could be difficult when patients' veins were difficult to access, even by other clinicians and HCPs. There was a developmental side to carrying out practical procedures: most F1s reported that they had improved their practical skills over time. Thus, while some F1s might have initially struggled at first (even in straightforward situations such as taking blood from patients with 'huge veins'), they reported that such skills greatly improved with practice. Some distinctions were made between different medical schools' provision of opportunities for learning on real patients. Trainees said that they needed to be proactive and seek out such opportunities during their undergraduate education.

While they were unprepared to carry out particular procedures, they were prepared to insist on consulting a senior in order to preserve patient safety. However, this was not always straightforward and help was not always easily accessible. Further complexities occured when a reasonably straightforward practical procedure required clinical decision-making that was beyond their capabilities as F1s (e.g. x-ray interpretation for the safe placement of a PICC line; see Box 28). In cases such as this, F1s were prepared to find alternative interim solutions until a senior clinician was available. No participant explicitly said that they would be happy to carry out a procedure for which they felt uncomfortable or unprepared. However, there were a few situations in which F1s reported feeling unprepared to carry out a procedure, could not find anyone to help, but eventually carried it out unsupported.

BOX 27: CLINICAL DECISION-MAKING AROUND PRACTICAL PROCEDURES

F_FY_27: I wouldn't do a practical procedure I didn't feel comfortable in doing on my own, so I've done- even anything I do pretty much, I have to take a senior with me. So NG tubes, catheters, ascitic taps, ascitic drains, I will take a senior with me, even though I've done a few NGs and catheters before. You do them so infrequently that you forget the technique, and for me I wouldn't go and do something on my own if I didn't feel comfortable doing it …

M_FY_26: I'd agree, I can't think of any times that I've done a practical procedure unsupervised that I haven't done before and at least seen one being done or had the consultant or the reg watch me do it first but I'd agree actually with what (F_FY_27) is saying about making decisions maybe

F_FY_27: like today you were asked about that PICC line weren't you?

M_FY_26: yeah I was asked to say whether the PICC line was safe for use…so the patient had a PICC line put in today, and he needed all his IV medicine to go down into- through the PICC line because he didn't have any access. So the chest x-ray was there…I hadn't had any training in interpreting chest x-rays for placement of PICC lines, so I wasn't sure. I knew that it had to be in the SVC, but I wasn't sure where in the SVC and …well it didn't look like it was in the SVC, so I wasn't happy with saying '*yes you can do- you can put things down this PICC line*' so I ended up saying '*I don't think it's in the right place, I'm not happy to use it*' and I put a cannula in the patient and said '*use the cannula until someone who knows what they're doing can confirm'.* And then I was also asked about whether another PICC line could be used because there was a query yesterday that the PICC line had been fractured, so again chest x-rays. I hadn't had any training in interpreting it so I ended up asking the consultant…

F_FY_27: I think nurses … just assume that because you've qualified as a doctor you should know everything they don't really realise that you're only 6 months in, and you've not come across so many situations, and even if you've come across it once you still want some sort of confirmation of what you're saying because I think it's not life and death, I guess, but it still could put a patient in harm's way and you don't want to do that.…

NOTE: **Ascitic tap/drain:** Insertion of catheter into abdomen to drain or take a sample of ascitic fluid from the abdominal cavity; **Deep Vein Thrombosis (DVT):** A blood clot in one of the deep veins of the body; **IV:** intravenous; **Nasogastric (NG) tube:** Insertion of a plastic tube through the nose into the stomach; **Peripherally inserted central catheter (PICC) line:** A large plastic catheter inserted from a peripheral vein through to a large vein near the heart; **Superior Vena Cava (SVC):** Large vein leading to the heart.

SUMMARY BOX (PHASES 2 & 3): PREPAREDNESS IN RELATION TO OUTCOME 2 (DOCTOR AS PRACTITIONER) SUBHEADING 6 (CARRY OUT PRACTICAL PROCEDURES SAFELY AND EFFECTIVELY).

- F1s reported themselves to be relatively well prepared to carry out every day practical procedures (e.g. taking, managing and checking bloods, cannulation, catheterization, ECGs, respiratory function tests);
- Some procedures (e.g. ABCDE) were described as having been "drilled into us" at medical school but confidence in performing practical procedures with real patients developed with time and practice;
- Opportunities to undertake practical procedures *in vivo* as an undergraduate seem varied and often relied on students being proactive and seeking out such opportunities.
- Even routine procedures could become problematic leading to feelings of unpreparedness (e.g. veins that were difficult to access);
- For procedures where they felt unprepared, F1s were generally insistent on gaining the support needed to preserve patient safety, however difficult this was;
- Rarely, however, an F1 reported undertaking a procedure unsupported, despite feeling unprepared, because they could not find anyone to help.

4.4.4.2.7. Using information effectively in the clinical environment

We now consider the outcomes around graduates' preparedness for using information effectively in the clinical environment (see Box 8M, Appendix M for the 5 specific outcomes on this aspect of practice). As this outcome was very rarely the sole focus of any narratives, instead of presenting percentages of prepared/unprepared narratives we present a broad-brush take on the patterns of 'information-related' words in our data (Table 15). As we can see, there were numerous mentions of information-related words, reflecting the general feel around the vast number of event narratives around clinical work, for this is replete with information requirements. While the narrative data was full of references to information use (but not always specifically indicating preparedness issues) we only coded obvious instances of information use when it was related to the issue of preparedness.

TABLE 15: OCCURRENCES OF 'INFORMATION-RELATED' WORDS IN THE DATA BY TURN AND TOTAL OCCURANCE

Word	Occurrence by turn***	Total Occurrence
phone**	157	222
iphone	3	3
compute*	52	65
internet	9	11
Google	7	8
App**	25	26
iPad	12	13
note	187	300
letter	43	70
laptop	1	1
confidential*	16	28
Total	512	747

NOTE: Table was determined by autocoding for each word to determine occurrence by turn, and searching for the total number of times each word appeared in the data (total occurrence); *abbreviation used for search; **'occurrence by turn' search limited to the specific term;***A turn is a conversational change in the person speaking.

4.4.4.2.7.1. Using information effectively in the clinical environment: Prepared

F1s narrated a range of situations in which they demonstrated effective use of information in the clinical context, mainly around using computers to access services in the hospital, and using iPad Apps and Google to look up information around patient care (Box 29, Excerpt 1). These were often used in 'hot' settings, with F1s consulting information 'on the go'. In their intricate narratives around clinical encounters, participants also talked about writing-up clinical records as a routine part of the procedure. While we did not code every single narrative that mentioned writing in patients' notes to this code (it was mentioned very frequently as part of the F1s' usual patient encounters), we did code narratives if they specifically mentioned the quality of the notes they made and any other factors associated with such record-keeping. While F1s often appeared to know how to record aspects of patient encounters that they (as F1s) frequently experienced (e.g. blood results), learning how to document certain procedures came with time (e.g. catheterization: Box 29, Excerpt 2, in which we also see an example where the F1 acts as a teacher for a medical student: something we pick up on later).

4.4.4.2.7.2. Using information effectively in the clinical environment: Unprepared

The majority of narratives around unpreparedness for using information effectively in a clinical environment were around issues such as accessing computer records or patients' notes. Many F1s talked about difficulties arising from patients' notes being incomplete or the illegible handwriting of their peers and seniors. In terms of accessing computer records, this seemed to be a transition issue in that trainees were unfamiliar with the computer system, there were no logins available to access essential information (e.g. x-ray reports) or passwords were forgotten or lost (Box 29, Excerpt 3). There were also narratives around problems with using information effectively with other team members and not having the correct information to hand when requesting services from other healthcare professions (see discussion around this in our section of communication on page 115, and the earlier example in Box 23, Excerpt 7). We had one narrative whereby an F1 became concerned about breaching patient confidentiality during a telephone conversation with the patient's relative, in which she narrated being unprepared and feeling 'off-guard'. We had very few narratives about F1s being unprepared for using information effectively from our broader stakeholder groups. There were a couple that touched on issues around difficulties with writing discharge letters on patients from the FRTD and D_FP groups, with the FRTD participant explaining how he was involved in developing a website to assist in this process. Additionally, the P_GVT and EMP groups talked about the importance of keeping good patient records, something which they felt graduates needed further training on.

BOX 29: F1 PARTICIPANTS' EXPERIENCES AROUND RELATIVE PREPAREDNESS FOR USING INFORMATION EFFECTIVELY IN A MEDICAL CONTEXT

Prepared

Excerpt 1:

"oh yeah certainly, we've got a- it's like an [iPad] thing which we got off (name of university) actually which gives us access to BNF, BNF for Children, Oxford Clinical Handbook and Oxford Clinical Handbook Specialties and that's really useful. Really, *really* good on the wards…I used the paediatric one all the time in my Maxfax job when we were- because you constantly had to dose kids for Paracetamol or or Brufen or whatnot. When they had lacerations to the head you needed to give them some sort of analgesia, so there's obviously- I always get touchy when it comes to paediatric dosing for any drug, so even if I've done it 100 times I always check the BNF for kids, so I used to check on that so that was quite useful to have with you because the paediatric BNF you're only really going to find it on the Paeds ward which is on the other side of hospital…I [also] do it on my phone…we have a lot of ((unclear)) where a lot of the consultants are talking about things that go straight over a lot of the juniors' heads. So we had a psych one today and someone was talking about, what was it, had it on my phone it's one of the psych conditions where it's actually an organic medical condition where losing your sight you start to think you hallucinate but you're not, you've just lost your sight, so your brain's not receiving enough information, so it just starts fabricating life around you…so I just looked that up on my phone quickly on the Oxford Handbook and it gave me ((unclear)) that's what it is.

Excerpt 2:

"during my last set of on-calls I had a situation that I felt quite prepared for, it was about four o'clock in the morning and there was a patient who'd come into the surgical ward… with haematuria and he'd been catheterised earlier…but he had learning difficulties and kept wanting to take the catheter out. So eventually it was decided that the catheter could come out and that the patient needed to be monitored just in case he went into retention. Which he did, so I made the decision that the patient needed another catheter, and a three way catheter specifically just to make sure that we could wash out any clots that would probably be the cause of the retention. I've never put a three way catheter in before but obviously I've put quite a number of normal catheters in, so it was quite nice to be able to draw on my experience of those and I felt quite comfortable

doing it. Didn't have any difficulties ... it went in easily and <u>I was quite comfortable with what I needed to document in the notes afterwards. I remember when I first started um being quite unsure about what you actually have to write in the notes following catheterization, but felt really comfortable following this, and I had a student with me the same night and I was able to show him exactly how you put a catheter in and I helped him document in the notes and tell him exactly what he had to write</u>" [M_FY1_26, Audio Diary, 8 months in post]

Unprepared

<u>Excerpt 3</u>:

"<u>I've struggled with in the first week beyond ward work</u>, again was <u>administration stuff</u>, so the <u>computer systems ... everything was paper in ((name of place)) so wasn't any computer systems or anything, so it was completely different way of working for me</u>...I think you felt because- you felt-like you knew how to do your job but <u>because you couldn't do it because you had forgotten your password or one particular program had locked you out, and then you had to ring three different people to get your password reset and stuff</u> so that's that I struggled with that in the first week...your first week, and you want to make a good impression, and you're like '*I could do this but I got forgot my password*' so..." [F_FY_112]

NOTE: **British National Formulary (BNF):** Pharmaceutical reference book with information and advice on prescribing and pharmacology**; Brufen:** Ibuprofen**; Haematuria:** Blood in the urine**; Maxfax:** Maxillofacial.

SUMMARY BOX (PHASES 2 & 3): PREPAREDNESS IN RELATION TO OUTCOME 2 (DOCTOR AS PRACTITIONER) SUBHEADING 7 (USE INFORMATION EFFECTIVELY IN THE CLINICAL ENVIRONMENT).

- The pattern of prepared versus unprepared narratives was evenly spread.
- F1s felt prepared for some scenarios (e.g. using computers to access hospital services, using websites and Apps to look up information, recording blood results) but not others (e.g. documenting certain procedures such as catheterisation, accessing computer records or patients' notes).
- The P_GVT and EMP groups talked about the importance of keeping good patient records, something which they felt graduates needed further training on. Many F1s talked about difficulties arising from patients' notes being incomplete or involving illegible handwriting.
- There were also narratives about problems with using information effectively with other team members and not having the correct information to hand when requesting services from other healthcare professions.

4.4.4.3. Outcomes 3 – The doctor as a professional

The final 4 broad outcomes in TD09 are classified under the domain of *doctor as professional.* We coded 472 (27.3%) of our PIN/GINs across the 27 specific outcomes. We do not present a table of frequencies of our preparedness/unpreparedness narratives mapped against TD09 for outcomes 3 as it was highly unusual for these outcomes to be the specific focus of any of the preparedness/unpreparedness narratives. Furthermore, many of the situations where our F1 participants talked about being prepared for these specific outcomes in this section (e.g. knowing the limitations of their own knowledge), were narrated during an unprepared PIN/GIN (e.g. they asked for help).

4.4.4.3.1. Behaving according to ethical and legal principles

We begin by considering the outcomes around graduates' preparedness to behave according to ethical and legal principles (see Box 9M, Appendix M for the 7 specific outcomes on this aspect of

practice). While we do not present numerical data here, the pattern of coding for preparedness/unpreparedness suggests that F1s feel relatively unprepared in these aspects.

4.4.4.3.1.1. Behaving according to ethical and legal principles: Prepared

F1s talked about being prepared for filling out death certificates in terms of having being trained to do this during their undergraduate medical education and in terms of understanding the importance of such documentation. They talked about situations where they had cared for the specific patient who had died and how they were able to suggest to pathologists the most appropriate things to put on a death certificate as a consequence of this. While F1s reported being able to adequately complete the certificate process, they didn't always feel prepared for their own emotional reactions to this, although for some participants this was not overly problematic. There was a view that by being prepared for the form-filling and legal aspects, this could almost protect F1s from their emotions: they have a task to do, and so no time to think about other more emotional things (Box 30, Excerpt 1).

F1s talked about being prepared to consent patients for particular procedures in terms of their communication skills training, their understanding of the consent form documentation and also their understanding of ethical principles around consent. Furthermore, although some F1s admitted to not being trained in the specific aspect of filling in consent forms, they felt able to complete these forms due to their wider understanding of consent. There was also a wider appreciation of consent from a few participants in the F1 group, insofar as they understood the 'best principles' of consent (e.g. the person obtaining consent should be fully aware of what they are consenting the patient for). One participant talked in depth about this and about how he challenged his seniors when they asked him to obtain consent for a patient for a procedure for which the F1 himself was unfamiliar (Box 30, Excerpt 2). His detailed narrative from his audio diary demonstrates how medical school had not only taught him best practice (following GMC guidelines), but it had also empowered him to challenge his seniors when he felt it appropriate to do so (e.g. his seniors had the time and he felt he had a good relationship with them). However, what he felt unprepared for in this scenario was the negative impact that challenging his seniors would have on their relationship. Other narratives by F1s also talked about the issue of feeling prepared to refuse to do something that had not been consented for, but unprepared for the consequences on their relationships with colleagues.

There were very few narratives in terms of the wider stakeholders' experiences and perspectives of graduates' preparedness for ethical and legal issues (most narratives by wider stakeholders discussed the issues but gave no understanding of whether or not graduates were prepared). Of the few narratives that we did have, there was a recognition that graduates of today were prepared in terms of their patient-centeredness and ethical reasoning (FRTD, D_FP and EMP groups).

4.4.4.3.1.2. Behaving according to ethical and legal principles: Unprepared

F1s narrated events in which they felt unprepared in terms of behaving according to ethical and legal principles. However, in these areas the level of preparedness focused both on not knowing what to do as events unfolded, and also being unprepared for their own feelings in these complex, and often new, situations. For example, one participant in our audio diary narrated events occurring over the Christmas period in which he had to treat a young woman who had suffered domestic violence from her boyfriend. His powerful narrative (see Box 30, Excerpt 3) demonstrates how he was unsure about his legal, moral and ethical responsibilities in this situation. In addition to organising specialist care during the Christmas holiday period and dealing with her angry friends and relatives he was also dealing with his own feelings around the 'shocking' events. He felt that while medical school could prepare him for many things, this was one of those occasions for which he could never have been prepared.

Other unprepared situations that were narrated included F1s being asked to fill out a 'do not resuscitate' (DNAR) form, or being in a situation where they were providing emergency care and (due to poor handover/patients' notes) were confused as to whether to resuscitate or not. One

example was where the F1 was the only person available at the time. While the most senior member of the team needed to sign the DNAR off, he felt unprepared for actually filling in the form. He felt also uncomfortable having the responsibility for something he did not feel happy about personally. Indeed, he felt that by filling in the form, he was taking on the responsibility of making the decision itself (despite the senior team member having previously discussed and agreed this with the patient's family). The ethical complexities around the DNAR form itself were acknowledged by those who narrated these events, with the unpreparedness aspect being around their own behaviour (due to those complexities).

As with the preparedness narratives, we also had narratives around graduates' unpreparedness for filling out legal documentation around a patient's death, deciding on whether a coroner needed to be involved, the difficult conversations with upset family members around registering the death certificate and situations where the police became involved. The issue of responsibility came up again in connection with F1s' feelings of being unprepared: F1s felt fully responsible for ensuring patients' families had all their questions answered around what had happened to their relative before and during their death, and ensuring this was dealt with compassionately.

Finally, we had a lengthy narrative around the difficulties an F1 had in understanding his role when dealing with patients brought into A&E by the police or the prison service. Issues included how to address the different parties involved, patient confidentiality (when police and prison officers need to be present) and the general rights and responsibilities that each party had. This was felt to be particularly difficult when mental health issues were involved. There was also a concern around the F1's responsibility for allowing a patient who had attempted suicide to go outside to smoke a cigarette, and who subsequently did not return. The F1 was unprepared for these issues and confused about their ethical and legal responsibilities in terms of self- and patient-care.

In terms of the wider stakeholder perspective, the majority of narratives came from the P_GVT group. Their experiences suggest that it is not only graduates who are unprepared in their ethical and legal behavior, but it is also clinical leaders and educators who are unprepared. This is because ethical and legal dimensions of healthcare are constantly changing. What was appropriate yesterday is no longer appropriate today necessarily. Therefore, clinicians need to continually update their knowledge in this area in order for them to practice ethically and legally. For example, one participant from the P_GVT group narrated a situation in which a senior clinician and educational leader did not understand the ethics around undertaking an appropriate intimate examination (Box 30, Excerpt 4). As well as being concerned about his practice from the patient's perspective, she was also concerned about the implicit messages being passed onto junior doctors. Another situation narrated by the P_GVT group involved a hypothetical scenario around a nurse talking inappropriately to a patient and asking the question to F1s and F2s whether they would challenge the situation. F1s reported they would not, thereby being unprepared for this aspect of practice, whereas F2s reported they would challenge. Furthermore, like some F1s, there was a view within this group that there was a difference in the way that medical schools prepared their students to practice around ethical and legal issues, and therefore a difference in the graduates. The EMP group also provided narratives of unpreparedness. These mainly centered around self-care and general unpreparedness around wider professionalism issues (such as the implications for their career if they were found driving under the influence of alcohol).

BOX 30: STAKEHOLDERS' EXPERIENCES AND VIEWS AROUND RELATIVE PREPAREDNESS FOR GRADUATES' BEHAVING ACCORDING TO ETHICAL AND LEGAL PRINICIPLES

Prepared

Excerpt 1:

" Yeah so I mentioned about confirming death on medical, I haven't done surgical nights yet, but on

medical nights it's down you, and <u>actually that comes up quite a lot</u>…<u>I had a night where I probably verified about three deaths</u>…and it's one of those things that you invariably do every day in the middle of the night, on your own, in a dark ward, and it's all a bit kind of weird. So it helps if you're kind of comfortable with the kind of process of doing that…which <u>oddly I felt I was quite prepared for</u>. Really I did it, and <u>it is kind of a new experience</u>, but I knew how to how to deal with it really just because it's <u>just applying the things you learnt at medical school so it wasn't too bad</u> but …[I was] a <u>bit wary at first</u> but I think if you know what you're doing, and you think about that. Whereas if you turn up to just a dead person, not knowing what you're doing, then it's the reality of it probably more kind of hard hitting, just because you haven't, <u>you're not really thinking about what you're going to do, you're just confronted with this body</u>…but it was something about- it was a bit of a strange situation…it's odd, but I mean with all things, <u>you focus on the task at hand and the kind of emotional aspects of it aren't as problematic</u>, because you've got nothing to focus on…I'm usually quite good at going through that thing…<u>we had like an OSCE on (name)…we did death really well</u>…I know some people have [problems]…it's just unfortunate because they didn't do it at medical school. It's just one of those things, but they got into a bit of bother with it…" [M_FY_126]

Excerpt 2:

"a relatively straightforward patient, who had an abscess, and the plan was for them to go for incision and drainage and in theatre, which is a surgical procedure…my registrar, my SHO…they said '*this person needs to go to theatre for an incision and drainage, can you go and consent them and book them in theatre now*?' Booking them is relatively straightforward. You just have to do a paper form, and go let the anaesthetist know a bit about the patient and the procedure…((gives detailed information on informed consent process and how this was inappropriate))… so I said this to the SHO and the registrar, I said '*oh well, would one of you be happy to consent the patient for it*' and they said '*well, no, you can do it*' and I said '<u>*well my understanding is that it is best principle that I shou- the person who consents the patient for the procedure should have a decent knowledge of it…and be able to do it himself*</u>' and I said '<u>*I haven't even seen one, so I don't think it's best practice for me to go and ask the person to do it'*</u>. And <u>I felt quite happy saying that</u> because I knew my SHO quite well, and neither of them were particularly busy…and the registrar…his approach to the situation, he said to me, well I found it quite patronising actually, <u>he said '*well have you ever cut a cake*</u>?' and I said '*yes*' and he said '<u>*well if you've cut a cake you, can do an incision and a drainage, so just go and tell the patient*</u>' he said '<u>*even if you haven't done one, I know you'd be able to do one*</u>' and he said '<u>*just go and tell the patient, here's the procedure and the risks are bleeding, infection, and so on' reeled off a list of risks*</u>' and I said to him, and I looked at him, and I felt '*well the time it's taken you to talk me through it you could just go and do it yourself and as the sort of registrar on-call <u>I think if you want to take someone to theatre to do something you should be prepared to spend two minutes of your day talking them through it</u>*' and my SHO said to me '*oh it's fine, I can go and do it if you've got any issue with it*' and <u>they both looked at me like I was being really troublesome</u> and sort of slowing down the process and just being deliberately obstructive, because, and I think and I talked to some of my colleagues about this, and they had sort of quite varying approaches to the scenario 'cause some people will say well just for the sake of the day running smoothly, and because it was such a low risk and relatively straightforward procedure it would have been alright just to talk them through it…and other people said '*no you should only- you should stick to your guns*' …the times you might need to consent someone…((if)) the registrar is stuck in theatre and they physically cannot get out to come and talk to the patient, then you can relay the information on and perhaps give the patient a chance for further questions later. But in this scenario, when both of them were relatively free and able to go and talk to…<u>I did feel that I did the right thing but I was a bit disappointed</u>…<u>it might have slightly just for a moment or two affected my relationship with the other people in the team, because I was sort of going against the flow</u>. So I think I did feel prepared for this scenario…<u>medical school did teach us about the GMC and the framework of consent…the sort of medical legal aspects of consent</u>…so I did feel relatively prepared for this

scenario, but what you can't quite be prepared for is the sort of implications on your working relationships…the sort of rolling of, the eyes, and the look that you'll get from your colleagues when you try and stand up for yourself and highlight something that you think it's not exactly bad practice but it's not the best practice in the world. That they might think you are being a bit obstructive or being a bit of a pain or a bit anal about a matter…" [M_FY_121, Audio Diary, 3 ½ months in post]

Unprepared

Excerpt 3:

"probably the most striking thing I saw ((this weekend)) that I wasn't really prepared for was domestic violence on boxing day. It was a young girl, about the same age as myself, twenty-three, twenty-four, and she had an argument with her boyfriend on Christmas day…he'd punched her in the face and he'd punched her so hard that he'd fractured her mandible, and the force of the fall had caused her to fracture her tibia as well, which was a devastating injury and something that the police were bound to get involved in that evening. Having never come across domestic violence before I kind of didn't really know how to deal with the situation. In hindsight I probably didn't press too much on the details of the actual event, just gathering the basic information that she'd been hit by her boyfriend and documenting that very loosely. I was more interesting in the injuries and how to manage them, and I wonder in hindsight really whether I should have taken a full statement for the police records. But I'm sure she'll that's for them to deal with, really, rather than myself, feeling that my part to play in this is document the damage that was done. It was quite, quite shocking and her friends that were with her were furious, they were very angry. So having to deal with angry relatives or friends and family, sorry, as well as the injuries that were incurred, occurred, and it was quite a lot to juggle at the same time because..((talks about the specifics and logistics of the case clinically))…but it was a lot to juggle, and it was an interesting case, but very horrible to deal with at the same time and something that I would feel better- more comfortable approaching if I felt, if- hoping that I never have to- if I approach a situation again with domestic violence, I might feel a bit more confident dealing with that and taking the appropriate history for the events that have occurred was- it was difficult because you can't simulate that situation in any sort of training that you've done and you can't really prepare yourself mentally for it…" [M_FY_29, Audio Diary, 5 months in post]

Excerpt 4:

F_P_GVT_79: I'd say also a lot of time they get it wrong ((the ethical side)) and don't realise they're getting it wrong because of that challenge. There are bits of our guidance that you see or hear about being breached constantly, you know sort of the lower level bits of it if that- if you can phrase it that way. I'm thinking about guidance on intimate examinations and chaperones as a core example where we go out and we talk to doctors about it and our guidance is really clear you should offer a chaperone…regardless of whether you're seeing a patient of the same sex, and those type of things. Every time we go out and talk about that doctors don't know that and it comes as a real shock and it's such a big thing for us you know so I think there's something about not knowing when they're actually getting it wrong … they think they do know the answer but their answer is wrong …

F_P_GVT_76: I think that goes back to actually your phrase about competent but not confident. It's the preparedness for me would be about understanding that they're embarking on a constant learning journey where they need to sort of constantly be testing and refreshing assessing the decisions that they're making in all aspects clinical practical ethical and so on. So to me, preparedness would be if you had a prepared doctor it would be someone who had recognition of that and was able to operate the skills the knowledge to be able to operate effectively …because we see as well as the students who come out of medical schools thinking they already know, we see the practicing doctors who think they know, and obviously those are the people who are helping to

educate the students and the junior doctors … <u>my sense is that they are still being thought of as soft skills that are less important</u> and that can somehow be I don't know gradually absorbed throughout the course of your career rather than a core part of professional responsibility in professional competence that needs to be kind of actively taught and tested and engaged with…only recently encountered <u>a senior medical leader who is very active in education at the highest levels who</u>, on an issue like intimate examination for example, <u>would say *'oh no, we would never offer a patient a chaperone in those circumstances'* and …if you looked at the guidance, we would now</u>. That's the view current view, collective view, of the profession and the public, but it's not the view of a currently active and senior influential medical educator and practitioner…if we don't, as leaders see that as being a core part of preparedness, then my worry would be you have people who are very clinically technically prepared…they're practically prepared in that sense but they're still going to deliver a poor standard of care because they don't have the necessary ((knowledge of)) consent, how to actually engage in a conversation and in an agreement with the patient about care how to involve family members in a way. <u>That means they're not meeting their legal responsibilities</u>…"

4.4.4.2.5.3. Ethical and legal behaviour: facilitating and inhibiting factors

There were very few enabling and inhibiting factors narrated around F1s' preparedness for behaving ethically and legally. Only personal confidence and positive relationships with supervisors were mentioned (see Box 31).

In terms of unpreparedness for ethical and legal behaviour, the main inhibiting factors cited were lack of confidence, maturity, supervisors, leadership, time pressures and poor staffing. Other HCPs were cited as being facilitating factors in the events in which F1s narrated their unpreparedness.

Box 31: *Relative preparedness for ethical and legal behaviour: Facilitating and inhibiting factors*

Facilitating	
Personal	Confidence.
Interpersonal	Supervisors, wider team.
Cultural/systemic	None identified.
Inhibiting	
Personal	Confidence, maturity, motivation, emotional reactions.
Interpersonal	Supervisors, leadership.
Cultural/systemic	Time, staffing, ward culture.

SUMMARY BOX (PHASES 2 & 3): PREPAREDNESS IN RELATION TO OUTCOME 3 (DOCTOR AS PROFESSIONAL) SUBHEADING 1 (BEHAVING ACCORDING TO ETHICAL AND LEGAL PRINCIPLES).

- Although almost half of the narratives were general and unspecific, the pattern of prepared versus unprepared narratives suggests that F1s are relatively unprepared in this respect;
- F1s talked about being prepared for certain activities (e.g. filling out death certificates, gaining patient consent for procedures) but less well prepared for others (e.g. completing DNAR forms, acting when the DNAR situation was unclear, deciding when a coroner or the police should be involved, confidentiality for patients brought into hospital by the police or prison service, self-discharge from hospital);
- There was an appreciation of the underpinning ethical principles and examples of when junior doctors had challenged their colleagues about their professional behaviors. However, F1s were sometimes uncertain about what to do as events unfolded, and felt unprepared for their own emotions in these complex situations. F1s were often unclear about their responsibilities;
- Facilitating factors included personal confidence and positive relationships; inhibiting factors were lack of confidence, maturity, supervisors, leadership, time pressures and poor staffing;
- The broader stakeholders felt graduates of today were generally prepared in terms of their patient-centeredness and ethical reasoning (FRTD, D_FP and EMP groups).

4.4.4.3.2. Reflecting, learning and teaching others

We now consider the outcomes around graduates' preparedness for graduates' preparedness to reflect, learn and teach others (see Box 10M, Appendix M for the 6 specific outcomes on this aspect of practice). There was relatively little data coded to these outcomes.

4.4.3.3.2.1. Reflecting, learning and teaching others: Prepared

The majority of data comes from our F1 participants. Many of the narratives coded here were quite reflective in that they identified certain difficulties that the F1s had encountered during the week, reflected on them and talked about how they might improve their own practice as a result. Some F1s commented on meetings with their clinical supervisors, particularly at the end of rotation, in which they reported receiving positive feedback and constructive criticism. As they evaluated these events, F1s reported that they would work towards addressing any shortcomings identified by their seniors.

In terms of their preparedness to teach others, we had no narratives in which any participants suggested that new graduates were not prepared to teach others. Some F1s told us about situations where they have acted as clinical teachers for undergraduate medical students. In many of these situations, these students were 5th year undergraduates on their 6-week placements, and therefore were 'near peers' to some extent. They talked about how some things, for example, professionalism issues, were probably easier for them as F1s to discuss with the students, rather than for more senior consultants (including issues of personal hygiene or dress code: Box 32, Excerpt 1). Some also talked about trying to teach undergraduate students in a way in which they would have liked to have been taught by trying to impart their own new knowledge to Year 5 medical students. For example, getting students to make their own clinical decisions and to reflect on them with the F1 (see also the previous example in Box 29, Excerpt 2).

While we had many narratives in which our F1 participants talked about 'seeking assistance' from their seniors (far too many to meaningfully code here), we also had some in which they explicitly talked about 'knowing their limits'. Many of these narratives were also coded to the outcomes around diagnosing and managing clinical presentations on Page 102 above (e.g. knowing when to escalate to seniors and there being 'no shame' in asking for help).

We had a number of narratives from F1s that touched on the subject of time management (the majority of which were around being unprepared). In terms of being prepared, some participants talked about how they had 'always' been efficient and effective in their time management skills. Others talked about time management as a skill that, while not being explicitly taught, was 'picked up' during their medical school training.

4.4.3.3.2.1. Reflecting, learning and teaching others: Unprepared

We have very few narratives indicating that todays' graduates were unprepared for the specific outcomes in this area (again, mainly due to these specific outcomes being less of a focus for the narrative events). When data were coded here, however, it was primarily coded to the sections on graduates' unpreparedness around effective time-management and maintaining a work-life balance.[40]

There was a view from the D_FP group that new graduates were not working efficiently. They wasted time, often taking too long to clerk patients, perhaps asking questions that were not useful or relevant and requesting tests that might not be required. This view was backed up by some F1s themselves, who felt they needed to be more focused in their efforts. The difference between the

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[40] Again, while we had very few narratives coded to graduates' unpreparedness for knowing their own limitations, we only coded data here when participants explicitly mentioned this aspect in their narratives. However, many narratives alluded to the possibility that some new graduates might be floundering when they reach the end of their limitations (we presented an example of where an F1 demonstrates this in Box 25, Excerpt 5).

F1s and D_FPs, however, appeared to be the underlying issue behind their comments (D_FPs felt time was money, F1s merely wished to become better at their work and did not mention the financial aspect of this). Furthermore, more often than not, the issue of time management was linked with the problem of understanding *who* should be prioritized, rather than *what* should be prioritized. Indeed, there were a number of narratives from F1s themselves around prioritising patients, knowing the right questions to ask when assessing the situation and deciding on who should be seen first. For F1s this was such prioritization would enable them to be more rested and able to deal with emergencies whilst on-call and to ensure that they didn't leave acutely unwell patients unattended (Box 32, Excerpt 2). Finally, the relative effectiveness of F1s' time management appeared to very much linked to their level of tiredness (the less sleep they reported to have had, the poorer their time management appeared to be).

Related to time management is the issue of work-life balance. This was discussed by a few F1s, and always as problematic for them. Participants talked about the long hours they worked (a few talked about sometimes not taking on patients immediately prior to their shift ending so they could leave on time), the stressful situations under which they worked (making it difficult for them to relax, or even sleep at times) and the issue of workplace culture (whereby nurses appeared to provide social support to one another when things were stressful, but doctors seemed to just have to 'get on with it').

***BOX 32: G**RADUATES' EXPERIENCES AROUND RELATIVE PREPAREDNESS FOR REFLECTING, LEARNING AND TEACHING OTHERS*

Prepared

Excerpt 1:

"ironically we've had 2 male medical students…both had issues around body odor, that a lot of the staff have commented on…pulling a '*that-person-smells*' face when they walk into the department…and saying to us '*oh what do you think about this one, he seems a bit odd*' and that's been quite a difficult thing, because you sometimes think '*well as the F1, and only being you know a year more qualified than them, then maybe the decent thing to do would be to let them know*' …because I think they have a standard of professionalism to reach, and that's not just in your behavior, it's about how you present yourself for work. So maybe if they are coming in really smelly maybe we should have said something…and I do remember that when we were on urology, we had medical students come to us and some of them were wearing trainers with smart clothes so sort of shirt trousers and trainers…so myself and the other F1 said '*oh, you know you need to think about wearing smarter shoes when you come in for a placemen*t' and we try to do it in a sort of buddy kind of way, as if to say we're going to say this to you, and its fine to hear it from us, you know, because we don't matter so much. But its better it comes from us than from a Consultant or registrar who could contribute towards your professionalism judgements and things.." [M_FY_121]

Unprepared

Excerpt 2:

"I was on-call from five to ten after work and I was quite tired because I'd worked nine days in a row, but it was just a really busy on-call and it made me think that it would be worth reflecting on busy on-calls and prioritizing patients, which I think is something, since I've graduated that I've probably found the hardest on an on-call because I was aware that you would be busy, but sometimes you'll have you 6, 7, 8, 9 plus jobs on a list that need to be done in different places in the hospital, when you're covering about 12 wards, and it's really difficult to know which one to go to first…I did have a situation tonight where I just was getting bleeped continuously … so I couldn't even do the jobs. The jobs were just stacking up, and stacking up, and I got- I was quite stressed and frustrated because I thought to myself '*I don't know where to go first, or what to do*' and I think that's quite a hard situation to deal with, especially when you're under so much pressure, and all

the wards want you to be there … I can appreciate it's so <u>frustrating for nurses</u> if they've got a patient that's sick and you're not there … but you've also got 5 or 6 sometimes more overnight wards needing you to do for jobs for them … it's <u>very easy if you've got patient that's unstable. That's the bottom line. You always go there first</u>. But if you've got more than one patient that's unstable, or you're <u>being called to lots of places</u> and you're not sure….what's important to go and see first? how can you prioritize patients? <u>how can you be calm when you can't be everywhere at once</u>?...I just <u>haven't really felt very prepared for that</u> and I often, <u>even now eight months into the job</u>, I'm not sure when I've got lots of jobs, I'm not sure where to go and what to do first…. <u>what questions do you ask when you cannot see the patient</u> and you're not with the patient? how can you draw the information out of the nurses? …I recently got called by a nurse who said to me could I come and see her patient because they were tired, <u>and I was tired</u>…I went through I asked some more questions about…blood pressure…heart rate…oxygen stats and all those things are fine, I said '*are you worried*?' and she said '*no not really*'…<u>I prioritized that quite low</u> on my list … but when I did go and see the patient, <u>I probably should have gone a lot quicker because the patient was really unconscious with opioid overdose</u> and I just hadn't got the correct picture from it at all and felt really bad that I hadn't prioritized it…" [F_F1_123, Audio Diary, 8 months in post]

SUMMARY BOX (PHASES 2 & 3): PREPAREDNESS IN RELATION TO OUTCOME 3 (DOCTOR AS PROFESSIONAL) SUBHEADING 2 (REFLECTING, LEARNING AND TEACHING OTHERS).

- There was relatively little narrative data for this subheading. Whilst there was little data to suggest graduates were unprepared in this area, effective time-management and maintaining a work-life balance was described as challenging;
- Both the D_FP and F1 group felt that new graduates were not working efficiently (e.g. taking too long to clerk patients, asking questions that were not relevant, requesting tests that might not be required);
- Many of the narratives identified certain difficulties that the F1s had encountered, reflected on them and talked about how they might improve their own practice as a result. Some F1s commented on receiving feedback and working towards addressing any shortcomings identified by their seniors;
- In terms of their preparedness to teach others, some F1s told us about situations where they have acted as clinical teachers for undergraduate medical students.

4.4.4.3.3. Learning and working effectively in a multi-professional team

We now consider the outcomes around graduates' preparedness for learning and working effectively in a multi-professional team (see Box 11M, Appendix M for the 4 specific outcomes on this aspect of practice). Around half the data coded here suggests that F1s are prepared, with the other half suggesting not.

4.4.4.3.3.1. Learning and working effectively in a multi-professional team: Prepared

We had many narratives in which F1s talked about their experiences of working well, providing positive patient outcomes, as part of a multi-professional team. The most frequently mentioned professional group when graduates' narrated events concerning multi-professional teams was nurses. We have many narratives where our F1 participants talked about being aware of their own role in the multi-professional team. This includes them being relative newcomers: in the team, on the ward, and often to the specialty itself (Box 33, Excerpt 1). As such, many understood themselves as being able to learn from the rest of the team. For example, F1 participants talking about how they learn both from watching the nurses (including both clinical and communication skills) and from asking nurses for help: nurses in this way were considered to be "brilliant

resources" and "extra pair of hands". Nurses were actively consulted when F1s were unfamiliar with the wards, ward practices and preferences of the senior clinician (e.g. in surgery different surgeons like patients to be prepared prior to surgery in different ways, and nurses were frequently a font of knowledge in this respect). Nurses also offered advice to graduates, and this appeared to be willingly accepted. Often this advice was around ward practices (Box 33, Excerpt 2}, but also nurses offered their assistance with practical procedures. Some F1s talked about general 'acts of kindness' from nurses and how they 'looked out' for them because they were new on the wards. Furthermore, F1's and nurses worked together as a team, both having their specific roles, working together collaboratively. In some cases, nurses were highly active in the smooth-running of the wards, something that the F1s appreciated, working under their guidance (and occasionally enjoying the experience of having someone else undertake the 'obs and bloods' when normally this would be their role).

Efforts to build a positive working relationship with other HCPs on the team were also narrated by F1s. Such efforts include ensuring that they introduced themselves properly to all team members on day one, understanding the importance of building trust with others and making a positive effort to do so (with some narratives saying how this took time), working at getting along with others (e.g. building on common ground) even if they had initial problems (or just didn't 'click'). Conflict resolution (both understanding the need for it and a willingness to engage in it) was also mentioned. However, this was not identified as being learned at medical school.

In addition to nurses, physiotherapists, occupational health therapists, dieticians, nutritionists, pharmacists were also mentioned frequently in terms of asking or offering advice or support. Furthermore, social workers were talked about in terms of giving advice around discharge planning. Often, working with these wider healthcare professional groups opened up new ways of thinking and working (e.g. Box 33, Excerpt 3).

Some F1s talked about how medical school didn't prepare them for a range of aspects they might come across in their working lives, but how by working within the wider team they were now learning. Some talked about how unprepared they felt for multi-professional team-working as their medical school had given them very few experiences for learning about the different roles of the other HCPs. Others, however, talked about how medical school had prepared them for multi-professional team-working by educating them about the roles of the different healthcare practitioners they might be working with.

In terms of other stakeholders, even though we asked the question around multi-professional team working, we only had a handful of preparedness narratives from the wider stakeholder groups. FRTDs essentially said that the wider team was important, especially in the first few weeks of being an F1, and that F1s were aware of this support. There was a view from the CEs that todays' graduates are prepared for multi-professional team working as medical school selects the right people, and there are a lot of opportunities for developing the required skills. The D_FPs, EMP, P_GVT and PPR participants who talked about graduates' preparedness here felt that todays' graduates were much more 'oriented towards' multi-professional team working in a way previous generations were perhaps not. One participant in the D_FP group, like some participants in the F1 group, also talked about conflict resolution and new graduates' preparedness in that respect. The other HCP group drew on their personal experiences of F1s, backing the F1s narratives around nurses and pharmacists teaching them.

4.4.4.3.3. Learning and working effectively in a multi-professional team: Unprepared
While we had more narratives coded suggesting that today's graduates' are prepared for working in multi-disciplinary teams, there were also many examples where this is problematic. Some of the problems F1s experienced were compounded by systemic factors that pre-date their arrival: for example, the complex ways in which patients are admitted to certain wards, the different hierarchies present on wards, the different ward-cultures and the fact that F1s are continually moving from team to team. While these systemic and interactional factors cannot themselves be

responsible for graduates' unpreparedness in the clinical workplace, it is the responses of the F1s to these factors that suggests that some graduates are unprepared for these difficult and complex multi-disciplinary teams and environments. For example, we had a number of narratives where F1s talked about getting into arguments with nurses, radiologists, occupational therapists etc. Healthcare assistants were sometimes talked about as being uncooperative, failing to undertake certain procedures (e.g. doing ECG on the patient's). Sometimes F1s engaged in a heated debate with the healthcare assistant in an attempt to get the work done. One participant called this "a rite of passage" that every new F1 probably has to go through.

Sometimes F1s talked about the pressure they felt when working with other HCP's who saw the F1s as 'all knowing' (e.g. nurses expecting F1s to make decisions for which they felt unprepared). Such situations caused anxiety in the trainees, and rather than working together by way of joint decision-making, some F1s reported feeling isolated. Other times, F1s reported not knowing who they could draw on as part of their wider multi-disciplinary team, and therefore wasting time in attempting to do things themselves when a more efficient way of working was possible (e.g. asking a pharmacist to help with a missing drug chart).

There were some narratives around personality or cultural clashes within multi-disciplinary teams. For example, some F1s felt they had a very different work ethic than other HCP's: thus, when a fellow team member doesn't "pull their weight",[41] doesn't prioritize the F1s work or doesn't provide sufficient information (e.g. during handover), that individual was sometimes constructed as 'an other': someone who did not share the work ethic of an F1s. Indeed, when constructed in this way, this 'difference in work ethic' issue came across as a value judgement (e.g. nurses are 'lazy' or 'rude'[42]). There were also a few issues where F1s felt that other HCPs acted inappropriately (e.g. a nurse giving a patient fluids that had not (yet) be prescribed: Box 33, Excerpt 4). In situations such as this, the F1 had to learn when (or if) to report or challenge their colleague. While some felt unprepared to challenge a colleague, others felt prepared but needed to 'pick their battles'. The issue of trust between F1s and the wider multi-professional team was also discussed (Box 33, Excerpt 5). However, it was discussed by the F1s in terms of others' trust in them, often due to them being relatively new to their F1 post or the placement.

This 'them and us' thinking also came through when F1s talked about having non-medics as their seniors and how it felt challenging working with seniors who don't think the same way as doctors. However, personality clashes were not always across professions. For example, we had (very few) situations where F1s narrated events in which they felt undermined, patronised or in conflict with their seniors. Often this appeared to involve just the F1 and their senior, but occasionally the wider team was involved (e.g. a matron telling the F1 that there were complaints about 'junior doctors' from the consultant running the team, rather than the consultant themselves feeding back this information).

BOX 33: GRADUATES' EXPERIENCES AROUND RELATIVE PREPAREDNESS FOR LEARINING AND WORKING EFFECTIVELY IN A MULTI-PROFESSIONAL TEAM

Prepared

Excerpt 1:

"…very friendly, very kind team … lovely to me and happy to answer any of my questions and give me feedback when I ask for it … I'm the most junior ((team member)), the three nurse specialists and I'm also the newest to the specialty, so really I see myself very much in a learning role, information gathering … every now and then useful from a from a uniquely medical perspective

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[41] We discuss in more depth the issue of nurses not completing the tasks asked of them by F1s when we present our longitudinal case studies.

[42] This was often talked about 'in this context' – therefore on ward x – rather than as a general 'rule'

…but as time goes on more I become more confident, and also prepared more to give my opinion, and if it disagrees with other people….((do so)) in a constructive way, so working with a sort of multi-disciplinary team…" [M_FY_120, Audio Diary, 5 months in post]

Excerpt 2:

"…during the night … I got a call … four or five in the morning to say a patient had been on had a fine bore NG tube in and it had came out … the patient had been getting feeds through the NG tube … the nurses sort of said '*I don't know whether you want to put a new NG tube in or whether we give some fluids*' and to be honest I- I initially wasn't sure at all what was the best thing to do…. ((I'm thinking))'*well we could put the NG tube in now, but then we would need to wait for a chest X-ray to be done and at four or five o'clock in the morning you only get the emergency X-rays, and this really isn't an emergency this is a routine X-ray just to check the placement of the NG tube before we would be able to give any of the feeds for it*' so then I really thought there was no advantage to actually putting the NG tube in, but I was sort of worried that the staff would come in the next morning and see the patient's NG tube wasn't in and they would be you know cross … no-one had put a new one back in again. So I wasn't sure what I was going to do and I was actually going to ring the SHO 'cause I wasn't sure and then another more experienced nurse came and she sort of said '*if an NG tube comes out in the middle of the night you're not going to get it X-rayed, what happens is …. we give the person some fluids to keep them going until the next morning whenever*' …. so that's what I did. I took their advice, and I felt that probably was the best thing to do. I didn't feel like I needed to contact the SHO.

Excerpt 3:

"one of the patients on our ward…he'd been in for a very, very long time and he was really keen to get home… he had no problem with his house and everything and I just remember the physiotherapist saying to us '*do you know he needs handrails on either side, so if he's if he needs handrails on either side, how does he expect to open his front door*?'…. '*who's going to let him into the house*?'…so the physiotherapist saying '*we'll take him and we'll be able to train him to how to get up his front steps, and how to get his keys and stuff*' which is something I would never have thought of …" [M_FY_171]

Unprepared

Excerpt 4:

"I've encountered several things as an F1 where slightly bad practice occurs…I rang the ward and told them I'll be back in a minute to write up some fluids for a patient, and I got back and they'd already been given by one of the nursing staff, and it's sort of examples like that where it was the fluids I would have written up anyway, but they'd given something that is not prescribed… you have to look at the scenario and think '*should I, should I raise this as an issue or should I not*?' and one of my registrars said that '*really, if you go around trying to correct every bit of not quite right practice you just give yourself a headache and create a lot of nightmares for the people around you*' and they said '*you just have to learn to pick your battles, and only pick up on things when they're a serious issue*' and I don't think this one was a serious issue… [M_FY_121, Audio Diary, 4 ½ months in post]

Excerpt 5:

"I think the main problems with feeling unprepared occurs between junior doctors and nurses as nurses are less prepared to trust junior doctors. I think it would be a good idea to look into how this could be remedied because trust between junior doctors and nurses is very important since we are the ones that work closest to them, rather than the more senior doctors who just review patients and usually go and do other jobs and dictations. We are ususaly the first port of call for nurses and trust between colleagues is very important for patient care"[F_FY_106]

> **SUMMARY BOX (PHASES 2 & 3): PREPAREDNESS IN RELATION TO OUTCOME 3 (DOCTOR AS PROFESSIONAL) SUBHEADING 3 (LEARNING AND WORKING EFFECTIVELY IN A MULTI-PROFESSIONAL TEAM).**
>
> - At times, graduates seemed relatively well prepared to work effectively in teams, although there were mixed opinions about the role of their medical schools in this;
> - The wider stakeholder group also felt that todays' graduates were better prepared and 'oriented towards' multi-professional team working;
> - Most F1s appeared to have good insight into their own role in the multi-professional team and understood that they were relative newcomers who needed to learn from others;
> - F1s talked about making efforts to build a positive working relationship with HCPs, for example by introducing themselves, trying to build trust, and resolve conflict;
> - Nurses were most frequently mentioned and often 'looked out' for the F1s because they were new. F1s often asked nurses about ward practices, preferences of senior clinicians, or for help with practical procedures;
> - F1s reported that working with wider healthcare professional groups (e.g. social workers) opened up new ways of thinking and working but sometimes they didn't know who to ask;
> - Challenges in the multi-professional team working were presented by systemic factors, such as hierarchies and ward-cultures, which often differed across settings;
> - Sometimes F1s talked about the pressure they felt when other HCPs expected them to make decisions for which they felt unprepared;
> - Some 'them and us' thinking was evident, for example when F1s talked about having non-medics as their seniors;
> - Sometimes a difference in 'work ethic' of colleagues was problematic and, occasionally, an F1 had to decide whether to report an inappropriate behaviour they had witnessed.

4.4.4.3.4. Protecting patients and improving care

We now consider the final outcomes around graduates' preparedness for protecting patients and improving care (see Box 12M, Appendix M for the 10 specific outcomes on this aspect of practice). The majority of the data coded here suggested graduates are relatively unprepared in these domains.

4.4.4.3.4.1. Protecting patients and improving care: Prepared

F1 participants very rarely talked about positively coping with uncertainty and change. Of the few narratives we had, it was mainly talked about in terms of coping with changes in their environment, for example, new systems, new wards, new teams (Box 34, Excerpts 1 & 2). Furthermore, when this was talked about positively, it was only talked about as a developmental process: the more times you have to change, and the more times you are placed into uncertain situations, the better you become with dealing with change and uncertainty.

We had a number of narratives around F1s' understanding methods of improvement within healthcare, including audit. So, linking with F1s' preparedness for improving their own practice (as discussed in our earlier section on reflection), some F1s also talked about situations in which they have been attempting to improve practice more generally, for example, they discussed things such as participating in audits or joint projects (e.g. improving handover rotations or discharge boards: Box 34, Excerpt 2). This aspect was also talked about by a couple of participants in the D_FP group. These participants linked it with the issue of protecting patients and improving care, and the issue of understanding the framework in which medicine is practiced in the UK. As such, participating in such activities was thought to ensure that foundation doctors were aware that they work for the

wider NHS, rather than for their own smaller department (Box 34, Excerpt 3). In terms of F1s narratives around understanding the wider framework in which they work, we only had one narrative that alluded to this. The narrative involved an F1 who talked about seeing news items on the BBC and linking them directly with his working practice. He talked about how the news misrepresented the situation in hospitals and how his own experiences of working in A&E were very different to those reported in the media. One poignant moment when he realsied how his work was connected to wider NHS issues came when he was responsible for treating a man who had severe brain injury following an accident due to bad weather conditions. Seeing subsequent news reports around the death of his patient made him think of the wider systems in which doctor's work.

We also had a few narratives around F1s' recognition of self-care, mainly involving them ensuring that they had sufficient sleep, nourishment and attending to a work life balance. When this was narrated, however, it was talked about in terms of benefits for patient care, rather than purely for their own benefit (Box 34, Excerpt 4).

4.4.4.3.4.2. Protecting patients and improving care: Unprepared

We identified more than twice as many situations in which we identified F1s as being unprepared in situations of uncertainty and change, than we did of them being prepared. This is unsurprising as a lot of the narratives around feeling or being unprepared involved some degree of uncertainty. In our coding for this aspect therefore, we were careful to only code instances where participants mentioned their concerns around feeling unsure and uncertain, and this resulting in a negative outcome (either emotionally for the F1, or more broadly in terms of the outcome of the event). Situations of uncertainty that were narrated include senior staff members changing their mind around diagnoses and management of patients, F1s' own uncertainty around diagnoses for complex cases, uncertainty around ethical issues (taking them out of their comfort zone), breaking bad news when you "don't have an answer", witnessing a patient die and attending 'crash calls'. Many of these events, however, were talked about in participants' audio diaries. They were constructed as being 'lessons for learning', rather than just stories around uncertainty. They were often highly reflective and as such the recording of them for the study seemed to facilitate this reflection (Box 34, Excerpt 5).

Other areas of unpreparedness in this section included F1s being unaware of the financial implications of their practice, or if they were aware, they expressed a perception that this wider aspect of patient care was not in their mind as they went about their daily activities of ordering blood tests, x-rays or other assessments. The financial issues, however, were introduced to F1s by their seniors, sometimes via direct questions around the cost of equipment or procedures, other times implicitly through the consultants' own practice during which they mentioned financial considerations (Box 34, Excerpt 6). FRTDs also mentioned this aspect but thought cost efficiency was for 'later on' in their careers, when they were responsible for budgets, and admitted to not considering this during their F1 year. Participants from the CE and D_FP groups concurred with that view of F1s, with some saying that F1s tend to request a lot of bloods and x-rays that are expensive and unnecessary. Members of the HCP group talked about the lack of understanding around the cost effectiveness of drugs. Finally, EMP group members talked about the lack of training around the economics of care for undergraduate medical students.

Finally, we identified only one narrative that suggested F1s were unprepared in terms of applying the principles of infection prevention and control. We include it here as it is not only a powerful narrative, but it also hints at a wider issue. The wider issue is that of workplace culture and how, by fitting in with certain workplace 'norms', F1s fail to adhere to good practice. His narrative (Box 34, Excerpt 7), involves attempting to take blood from a patient with HIV and Hepatitis B without proper infection prevention in place. Furthermore, not only does his action suggest this F1 is not prepared in terms of infection prevention at the time of the event, but it also suggest that he has still not fully engaged with the issue. As he reflects on the incident, he lists five things that he

'should have' done, but at no point does he mention that he should have used good practice in terms of infection prevention and control.

BOX 34: GRADUATES' EXPERIENCES AROUND RELATIVE PREPAREDNESS FOR PROTECTING PATIENTS AND IMPROVING CARE

Prepared

Excerpt 1:

"…starting my final new rotation of cardiology…I've done two days of it so far, and so far I've actually quite enjoyed it. It's been quite busy compared to some of my previous jobs and I have left later than my previous job, an hour later, but I've actually quite enjoyed it so far. What I've learnt so far from the job is that I'm learning to adapt to new experiences very quickly. When I first went on to Care of the Elderly as a new rotation I found it … quite difficult to adapt straight away … Care of the Elderly I worked on multiple wards and with different team members and I started to learn skills of adapting quite quickly and I think now that I've reached my third rotation I've got used to new jobs, being on new jobs and new environments and it's become quite an easy transfer, and I suppose expecting it to be quite difficult, but actually it's been relatively enjoyable which is always positive and I've still got another ward to learn how to do, but I think it's going to be very similar to the Care of the Elderly wards and what I've already done so I think this rotation is going to be good, and I think is this this is something you get better at … the more experience you have of working in different environments the better you get at being able to just pick up a new job… " [F_FY_129, Audio Diary, 9 months in post]

Excerpt 2:

"I was part of a move to make the discharges from ward 3 a bit more efficient …we prepared a new board. Now this seems to be working well, that we've got a list of patients in the room in the doctor's room so we can see at a glance who is going on which day. Now the system next week on the ward is actually going to change *again* and we're gonna have a different organisation with the consultants, so I can see that unfortunately although the system, our discharge board…been useful is going to take another change next week. But again, having done improvement work and going through the methodology I think I'm well placed to be OK to deal with the changes and to offer suggestions for how we improve things and look about different things, and I'm not afraid to voice my *opinions* on what we would what we could do, and how we might get a better outcome…" [F_F1_91, Audio Diary, 7 months in post]

Excerpt 3:

"they will have so their first…understanding of who employs them and what employment means…they don't understand they work for an organisation … they think they work in a department but they don't see that it's the department, in a hospital, in a health board, in … a country's NHS …the game has been upped, as I say, by the medical schools and by the GMC trying to get that that message across to them and I still think it it needs further work…equally there are some consultants in hospitals who don't actually think they work for the hospital…they just think they work in their little departments…changing it is by getting them more engaged in… quality improvement projects, giving them quality improvement projects, and I know again the 5th year of our quality improvement projects written in here in (name of hospital) but across across the NHS in ((country)) … so audit's going out the window … and it's a tool which you may use in your quality improvement project but but per se just doing an audit isn't what we're looking for, we're looking for a quality improvement project and giving foundation doctors responsibility around it. A prime example of where that works very well is when the rotas are a bit creaky, or don't seem to be working well. Give it back to the doctors and say '*well how would you organise it*?' so they write their own rotas inclusive of and compliant with the Working Time Directive, so it's things like that and presenting your quality improvement project and understanding that people are listening because it's not a one way street and that you see you know your conclusion implemented"

[M_D_FP_54]

Excerpt 4:

"my first night shift ((names place)) which I was a bit apprehensive about...I'm going to do some things a little bit differently this evening after last night...((tells a story about difficulties encountered the previous evening))...well the change I'm gonna make this evening is a small one ... I'm going to make sure I've got a handover piece of paper for each ward, rather than last night, I kind of had all the wards muddled up all together, so I want to spread it out to make it a bit more easier as I'm working out my tasks, which ward I need to do what things on. I see how that works and maybe I'll be a little bit more prepared for what lies ahead... at the start of the evening I was unprepared in that I was on the cardiac arrest team and the bleep went off, so I had to attend a cardiac arrest which was all was quite unnerving really, I wasn't quite sure what to do but [now] I had- we had prepared and given everybody a role, so my role ... we had spoken about roles so I knew ... what would be expected of me so that was good. Overall I think I had prepared myself physically for it. I tried to sleep and rest and today I've done the same..." [F_FY_91, Audio Diary, 5 months in post]

Unprepared

Excerpt 5:

"...so uncertain that actually you're not going to be able to help the patient because the situation is too much of a shock to your own system, I think it would be very easy to teach and I think it would be something that could be implemented and I think even myself, now I've highlighted that I don't feel very confident, I'm going to try and seek some more time. Hopefully, just doing this reflection alone, I will have I've thought about different ways in which if I was out of my comfort zone, and ...when I'm running down the corridor to wherever I'm running, I'm going, I've already decided I have a little check list in my head...that I'll know straight away where's the kit, what to ask for, have in my head what I'm going to ask for first, and just know a couple of things in my head, who else is there, who's available...I need to be thinking as I'm running down the corridor how we're going to manage this..." [F_FY_124, Audio Diary, 6 months in post]

Excerpt 6:

F_F1_176: I had a consultant yesterday asked me about the price of an IV antibiotic and whether it was indicated for a patient with the price of their hospital stay opposed to an oral agent so I suppose that's a consideration whenever we do start but-
M_F1_173: I always do wonder how much the blood tests that we do cost, because on the ward that we're working on now we just test absolutely everything without even thinking about it but I'm sure it costs a fortune every time and it's not even needed a lot of the time.
F_F1_176: A lot of the patients get daily bloods and most of them it is indicated but I have no idea how much any of the tests cost
INT: Well I suppose finance wouldn't really be in your mind then in your day to day job?
M_F1_173: Not at this stage
F_F1_176: Not when you're thinking about patients if they need the blood test they need the blood test rather than how much it costs

Excerpt 7:

"...my last on-call shift on general surgery, and a blood form was handed over from one of my fellow colleagues to go and do some urgent blood on some patient who needed it today because of some electolyte abnormality. So all she gave me was ... the patient needed bloods, their name and what ward they were on....no information about their past medical history, what kind of illness they came in with...what management they're in for in the hospital ... so I went downstairs to ((ward)) to see the patient ... '*I need to take a drop of blood for you because we need to check if your*

electrolytes are fine' ... he was quite adamant I wouldn't be able to do it because loads of people have tried and everyone's failed, so I said '*I'm okay at taking blood so I'll give it a go and let's see what happens*', I went and grabbed all the equipment. *Normally, my old hospital when I was training, I would always use gloves but at the ((names hospital)) for some reason we don't use gloves*, and there's hardly any infection control nurses around who dare to tell you off, so you know, I just cracked on with everything and grabbed my equipment and went to the patient's bedside, settled down, drew the curtains ... I was trying to identify a vein and couldn't find anything at all ... the patient was being peculiar and quite weird ... and I didn't even look at his notes or anything like that...unfortunately I couldn't find one. Well *fortunately* I couldn't find one. I went and told the sister '*I couldn't get any blood from him*' ...and the sister said to me '*did you know that the patient was HIV and Hep B positive?*' ... I was really shocked at that moment in time because I felt really unprepared for the situation, because I could've gone and poked him with a needle without having any gloves on, and obviously there was a risk of me getting a needle stick ... a small risk of me getting infection from him. And so in that situation I felt very unprepared because I should've possibly asked the F1 about more about the patient...I should have also had a look at his notes to make sure that I knew what was going on with his management plan ...other thing I could have done was talk to the sister on the ward about the patient ...and I should've maybe asked the nurse what kind of patient is he, you know, why do they need bloods etc., but then I guess the F1 who was handing that over to, could have handed that over to me or I could have asked myself so I guess that was a siuation where I felt quite unprepared for" [M_FY_36, Audio Diary, 6 months in post]

SUMMARY BOX (PHASES 2 & 3): PREPAREDNESS IN RELATION TO OUTCOME 3 (DOCTOR AS PROFESSIONAL) SUBHEADING 4 (PROTECTING PATIENTS AND IMPROVING CARE).

- Overall, the data suggest that graduates are unprepared in this area;
- F1 participants generally talked negatively about coping with uncertainty and change (e.g. uncertainty around diagnoses, seniors changing their mind, ethical issues);
- When they talked positively about uncertainty and change, it was usually about how repeated exposure leads to better coping;
- Several F1s showed understanding of methods of improvement within healthcare. Some described their own involvement in audits and projects and this was reinforced by the D_FP group;
- Participating in audit was thought to provide a wider awareness of the NHS;
- Some F1s talked about self-care, recognizing that they needed appropriate sleep, nourishment and work life balance but this was always narrated in relation to benefits for patient care;
- F1s were generally unaware or unconcerned with the financial implications of their practice and this was noted by other stakeholders too, although FRTDs thought cost efficiency was for 'later on' in their careers.

4.4.5. RQ4: How does preparedness for practice on graduation affect the experiences of FY1 doctors over time and during later FY1 transitions?

Twenty-six junior doctors from across four sites participated in the audio-diaries. Between them they generated 254 individual audio-diaries, which were undertaken over a period of between 3 and 5 months (with an average of 4 months). All audio-diary participants also took part in interviews (typically entrance and exit interviews) but these sometimes varied in format due to practical considerations like time commitments or shift-work availability. The audio-diaries and

interviews generated narratives on numerous and varied experiences of preparedness or unpreparedness as illustrated in our in-depth analysis of one case from each site (see below). Indeed, this section of our results starts by looking particularly at the various transitions that junior doctors encounter in their first year as qualified doctors: with the big transition from medical student to F1; and the smaller transitions from first to second rotations and subsequent placements across hospitals, different wards, specialties, and working in different teams. Later in this section we present one longitudinal case, one from each of the four sites to illustrate in-depth the preparedness journeys of four F1s across the UK. Quotes from these four cases can be seen in Appendix N.

4.4.5.1. The journey from medical student to doctor

Audio-diary participants recognized that they had been exposed to various workplace experiences as medical students as they prepared for their first transition to work in a hospital. Numerous audio-diary participants commented on differences between medical schools in terms of what and how they taught things, with one participant questioning why medical schools had different exams when all medical students were being prepared to be doctors in UK hospitals. Audio-diary participants described numerous events highlighting the differences between being a medical student and an F1. Issues that were particularly raised cover a range of factors including personal, interpersonal and systems type elements. Personal aspects often related to identity, as for example, "*you're introducing yourself as a doctor rather than a student*", "*I am a good FY1*", and personal 'ownership', such as referring to a colleague as, "*my nurse*".

Responsibility is a key issue and the comment: "*I think it's different when you're a student because you don't have any responsibility*" would be attributable to the views and feelings of all. A further important difference between being a medical student and an F1 is between simulation and doing the 'real' thing, as one F1 observed: "*suturing bananas and bits of tubing [is one thing] but obviously you can't simulate suturing someone's eyebrow when their brows [are] falling apart*". Similar comments and observations were also made in relation to other skills, clinical knowledge, patient management, and so on.

A number commented more generally on not feeling prepared for the realities of work in hospitals, not really having any ideas of what to expect and how hard things could be. Some suggested that medical schools should provide some form of session to help students know and understand these sorts of facts more comprehensibly, so as to be better prepared for this first and major transition. Even those presenting the most positive outlooks at the beginning of their F1 careers, also described difficulties at times, with one sharing, after six months into F1, that: "*I came home from work and cried today and it's the first time I've done that*".

Though it would be fair to say that most observations on the differences between being a medical student and an F1 and *actual* practice suggests that student experiences tend to be easier due to minimal responsibility, less pressure, reasonable working hours and that any procedures they practice are not going to have any life-or-death consequences, some participants observed that there were bonuses to being an F1 such as not being watched: one F1 found that he was able to be more himself when communicating with patients as a doctor, rather than feeling under scrutiny by his fellow students or tutors in medical school.

4.4.5.2. Transition to and across hospitals

The first transition that all F1 doctors have to make is changing from being a full-time student to a full-time F1 doctor. In the process of doing this they quite naturally move environment, transitioning into their first hospital rotation. For some, this transition was made easier by training in the same Trust that their medical school was based in: they are at least likely to know a little about their hospital. For others, the transitions were arguably more challenging as they transitioned into new locations and hospitals where things may be done very differently. Some found that as they grew familiar with their hospitals and how things worked and where things

were, they grew more comfortable with their situation but still noted newcomers struggling with these issues and other fundamentals such as hospital 'technology'.

Some participants commented upon the way that medical schools prepared them for different changes of scene through the process of regular placements, sometimes with these happening in different hospitals and that this helped prepare them for the realities of F1 and F2 rotations. However, one trainee commented that although this experience itself was helpful, it was not necessarily planned by the medical school as an intentional learning experience.

Movements from one hospital to another also took place within the F1 year as some Trusts used several hospitals for training rotations. This also potentially caused problems for F1s, especially when the movement involved sudden transitions to completely different ward-types or specialties. Others, however, found these transitions beneficial, particularly when the move was to a smaller and/or quieter hospital, where perhaps they were able to be more autonomous or were given greater responsibilities.

4.4.5.3. Transitions across wards

Moving to new wards is part and parcel of F1 life, not only when moving to a new rotation but often during the course of day-to-day working within the same rotation, such as when on-call, doing night shifts or even working within some specialties where duties are undertaken across multiple wards. Participants commented on different types of wards (most notably surgery and medicine), with different levels of busyness across wards, different skill requirements for specialties on wards, different styles of working and 'ward craft', and differences between team-working on particular wards.

The sense of preparedness or unpreparedness of F1s entering new wards, was often described within the context of how others behaved towards them (so interpersonal relations) or the style of management within the wards (so systems issues). Thus, for example, good inductions and/or time spent shadowing were perceived to be helpful in developing F1 doctors' confidence in finding one's way around and knowing what to do, when to do it, what medications to use or not to use, who to call and who not to call and when this is permissible or expected (systems issues). Personal support from seniors and colleagues of all grades, helping an F1 to find things, do things or providing support and teaching through being approachable and friendly were all important relational factors in helping F1s to settle into their new wards. Adequate senior support at entry to a new ward and assuming that F1s do not know things were also cited as important factors in transitions to a new ward.

Though such factors may not temper all feelings of unpreparedness, positive personal support and good introductory systems seemed instrumental in making the transition across wards more comfortable and helping F1s develop confidence and a better sense of preparedness. Where these factors were absent, F1s commented on negative aspects of their moves such as: poor organisation, insufficient staff, inadequate support or guidance for incoming F1s, time-wasting in looking for things or not knowing how to do things; getting things wrong because no one had told them what to do or what medications were used on that ward, being "lucky" if someone does tell them how to do something or finding out by chance, and not knowing anyone (especially if working across multiple wards, or on-calls). Other factors that were cited as causing difficulties and adding to feelings of unpreparedness were assumptions being made as to how much F1s know, adjusting to different hours or work (early starts on some wards), differences in the conduct of ward rounds, and different types of patients and variance in their needs and therefore their management.

4.4.5.4. Transitions across teams

Moving from one team to another is an integral part of rotation transitions and much of what is relevant to ward and specialty transitions is also relevant to transitions across teams. Teams in hospitals consist of various people, either in comprehensive groups of similarly qualified

individuals of different grades (e.g. medical consultant, registrar, F2, F1) or groups of diverse individuals/specialties such as medical staff, nurses and/or pharmacists. F1s described various combinations of people who made up the teams they worked with and in, describing varying sizes from as little as two F1s together to large inter-professional groups. Participants' narratives highlighted the details of how teams worked and the impact of this team-working on their practice and feelings of preparedness (see case studies later).

The key factor relevant to teams lies in the relationships between colleagues over and above any clinical knowledge, skills or management factors: when F1s move into positive supportive and friendly teams, their accounts show how they thrive. F1s particularly refer to being trusted and given responsibility, as well as being able to seek and receive information and support, facilitating their learning and growing their sense of confidence and preparedness. On the other hand, when they are thrown into teams that do not gel, where there are frictions between colleagues, and/or colleagues who are unsupportive and even disrespectful and abusive, then the F1 experience becomes increasingly difficult and may stunt or prevent personal and professional growth, potentially affecting the time it takes for them to feel fully prepared to practice in an independent and responsible way. Some, for example, described how they found it difficult to ask questions or seek support when they were faced with uncooperative or dismissive colleagues or seniors.

A few factors were highlighted that relate to the challenges of working in teams around global transition time-points, for example, when all members of a team for a ward/rotation are moved at the same time. This was felt to result in poor decision-making, being unsure as to what people are going to be like and whether trainees were going to get on, difficulties encountered when there was no obvious team leader and so on. As with most situations, there was variability between the F1s in this study with some looking forward to the challenges of a new experience and others more reticent or wary. Participants from the F1 audio-diary group indicated these differences in the way they described their experiences and their emotional response to these, both in the words they used and how they said things. Participants from other groups regularly referred to F1 variability including comments on their resilience, attitudes and characters.

4.4.5.5. Transitions across specialties

Moving from one specialty to another is again a typical part of the F1 experience and links with transitions to wards, new teams and sometimes, new hospitals. Systems and interpersonal relationships clearly play an important role here in helping F1s settle into their new specialty rotations, but factors such as clinical knowledge, new terminology, specialist skills, knowledge of relevant drugs and their dosages, and their confidence and ability to use these skills and knowledge play a much higher role than the more general factors already discussed above. The importance of this is reflected by the extent to which F1s talk about specialties, moving from one to another and the issues that arise in the process of making these transitions and thereafter.

A key and most obvious transition is that of moving from medicine to surgery or vice versa as these feature fundamentally different foci in their practice. Further, there are also noteworthy differences between specialties/wards within these (in addition to specific skills and knowledge required) such as: hours of work; availability and presence of senior support (generally less in surgical rotations); stress levels; speed of response required; and busyness (e.g. psychiatry and some care of the elderly posts being less busy). Other factors included issues around medication and what external specialists to call for guidance (for example, pharmacists or microbiologists), as these also vary across different specialties and often according to the individual preferences of consultants. These kinds of differences required rapid adjustments to be made and new 'localised' knowledge to be quickly gained in order to be and feel prepared to practice in the new specialty. Comments on these suggest that some transitions seemed harder to make than others such as slow pace of work to speedier modes, yet as one F1 observed on his embarrassment when "*stroll[ing]*" with his Psychiatry colleagues and other colleagues "*overtaking*" them and "*look[ing] like they've*

got to be somewhere and need to get there quick", that there are good reasons for different paces of work, and that this was something he had not identified, understood or felt prepared for.

4.4.5.6. Summary about the relationships between transitions and preparedness

A key question in terms of looking at preparedness, therefore, was to identify how the various transitions work for F1 doctors, whether they felt prepared for them, what factors facilitated and inhibited those transitions and whether making transitions became easier over time. This brief overview, drawn from our longitudinal audio-diary data, indicates that transitions vary both across individuals as well as within individuals: factors such as character, attitude and resilience, matching with interpersonal relations and/or systems, make transitions idiosyncratic to a degree, though certain key factors feature regularly in terms of how transitions work.

Overall, regardless of type (hospital, ward, specialty or team) and being integral to the personal experiences of junior doctor life, transitions generally do become easier as F1s gain experience and confidence and increase their sense of preparedness. This journey does vary from individual to individual (as the following case studies show), but audio-diary participants, in reflecting on these personal experiences, observe that despite difficulties, as they gain more and wider experiences and learn from these, new transitions become less daunting and their sense of preparedness increases.

4.4.5.7. Case Study 1: "I think just with more practice that's the only way that you can be any more prepared"

Ben[43] is a white male F1 in his mid-twenties. He has had placements in Care of the Elderly and General Surgery. He recorded 8 ADs and participated in both entrance and exit interviews (See Appendix N on page 264, Box N1 for quotes from Ben's longitudinal interviews and audio-diaries). He described experiences of being both prepared and unprepared (in the first 7 of his audios), sometimes citing more than one example of each. In his final audio-diary he no longer uses the words 'prepared'/'unprepared' but substitutes them with "confident" (or not) respectively. Altogether he cites 10 cases where he felt prepared and 12 where he felt unprepared, with multiple examples of each appearing in ADs 5-7, which covers the period of entering a new rotation. Ben nearly always uses the expression 'felt' and includes hedges such as 'quite' and 'maybe' when referring to his experiences of preparedness, indicating both his emotion and doubt about whether he was actually prepared. He also uses alternative words to describe his sense of unpreparedness, such as "difficult", "hard" and "scared".

A number of his prepared narratives contain significant reflections highlighting the growth of his preparedness based on increased experience, confidence and getting used to doing things: "I'll just touch on another thing I'm feeling more prepared for is IV fluids. I think this is something again whenever you start it can be quite a daunting task ... but it's something that I think you become more prepared for" (AD7). In terms of scenarios that Ben felt prepared for, he cites emergency situations (AD1), clinical skills such as venepuncture and cannulas (AD2), responding to bleeps and knowing the processes he needs to go through (AD3), speaking with relatives (AD4), reviewing and prescribing analgesia (AD5), managing and treating blood pressure (AD6), managing a patient with an NG tube, managing temperature spikes (AD7), managing IV fluids (AD7) and prescribing (AD8). Of these, the one he describes enjoying is speaking to patients and their families. While he enjoys communication, he seems to lose confidence in *what* he can say to patients and their families once he enters a surgical placement where he says cases are more complicated.

Of the twelve scenarios where Ben describes feeling unprepared, most relate to some form of practical application of skills or treatment and management issues, for example, inserting a catheter, uncertainties with the NG tube, working with Diabetic patients, uncertainties around pre-

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[43] Participants' names in all case studies are pseudonyms.

and post-surgical assessments, treatment and management, and prescribing. He also struggles with completing a death certificate (AD8) and the management of acute alcohol withdrawal (AD2). One of his most frustrating times was at changeover where he felt he was "just chasing [his] tail" (AD3) as he knew no one and nothing about how things functioned in his new ward/specialty (systems) as well as contending with a different (faster) pace of work. Another difficult time for him was when working in surgery and trying to remember all the different preparation preferences of several surgeons (AD4 & AD7). Ben ascribes different reasons to the difficulties he experienced, from acknowledging unpreparedness was "just down to my own lack of experience" (AD1), or more frequently to never having been confronted with a particular scenario before, for example, knowing the medications for alcohol dependency treatment, but "never [having] to prescribe them before", and not knowing their dosages (AD2).

For some of these preparedness/unpreparedness scenarios Ben readily reflects on the input of medical school training, which varied from being constructive to lacking utility for real-life work. Ben describes at least six situations where such training was useful, such as using the ABCDE model in medical emergencies (AD1), the ((name)) course (ADs 1 & 6), the WHO analgesic ladder (AD5) and communications skills with family attachment (AD4). There were, however, other situations where training/information had been given at medical school but was not always fully useful due to other complications. For Ben, this included catheter insertion (AD1), using a University proforma on IV fluids (AD7) and the completion of death certificates (AD8).   Further examples refer to a general lack of exposure to certain scenarios, either from his medical school experience or previous working experiences, such as exposure to patients in acute alcohol withdrawal (AD2), and in some cases not remembering having been taught a subject such as how to action blood results (AD4) and blood sugar observations (AD5). While Ben recognised that there were certain situations where simply following the systems taught by the university was the best way forward, he also thought that there were some situations that you could not be prepared for such as different surgeons with different ways of working (AD7).

One area that was particularly highlighted in terms of personal development was Ben's confidence in seeking help. He uses various emotion talk to describe his feelings around help-seeking: "*embarrassment*", "*under pressure*", "*scary*", "*scared*", "*bit of panic almost or fear*", "*nervous*", "*worried*," "*bit of a shock to the system*" and "*freaking out*". Ben's audio-diaries reflect his lack of confidence in that he regularly describes seeking advice from people with more experience. Gradually, however, a shift is noticeable when in AD5 he reflects on becoming "*comfortable with making decisions and knowing my own capabilities, knowing there's things that I can you know manage myself*", and in AD8, where he describes his developing confidence in prescribing. In his second interview Ben states openly that "*you actually… learn to deal with things yourself… things you probably would have run past an SHO*", showing a change in his behaviour from his early narratives.

Ben's audio-diary journey shows how he grows in confidence during his first rotation on Care of the Elderly but how this takes some knocks when he moves into a surgical rotation where things run very differently, requiring him to learn new things and adjust to new ways of working. There is a sense that despite being less confident than others "*from the start*", he recognises the skills and abilities he does possess, knows his limitations and is not afraid to seek help when needed. His confidence has grown in certain areas and he is happy with the "*bread and butter*" side of his work. Although he presents a 'renewed uncertainty' and unpreparedness when reflecting on some aspects of his second rotation, he recognizes in his exit interview that: "I'll learn… I think just with more practice that's the only way that you can be any more prepared".

4.4.5.8. Case Study 2: "I found that a lot easier over the past lot of on-calls and I think it just comes down to experience and having done things before"

Tom is a male F1 in his mid-twenties. He is currently working in a location different to his medical school and has completed rotations in medicine and surgery, both at the same hospital. Tom

recorded 10 audio-diaries and participated in two entrance and exit group interviews (n=2). In his 10 diaries he records 8 where he describes feeling prepared and cites the role of on-the-job experience in 6 diaries as playing a key role in helping him to feel prepared (ADs 3, 4, 7, 8, 9 & 10: See Appendix N, Box 2N on page 268 for quotes from Tom's longitudinal interviews and audio-diaries). He makes particular references to learning from medical school in two examples: one case where he had done a procedure only once and that this was *not* very helpful as it had not been fully equivalent (AD6); and one case where medical school along with a keen consultant and his own interest had been significant in enabling him to feel prepared (AD8). He also comments on changes in feeling prepared in 2 cases, stating "when I first started my on-calls I didn't feel really prepared" (AD4) and "I felt quite unprepared the first time I did it [gave a specialist injection]" (AD6).

There are only two diaries where Tom gave examples of feeling unprepared. In AD2 he observes that: "I actually found it a little bit more difficult than I thought ... it was just a situation that I originally thought I felt quite prepared for and then on arriving and assessing the patient I felt a little bit underprepared". He thinks the reason for this feeling of unpreparedness is because he was experienced in assessments on a medical ward but those on surgical wards had different criteria, hence requiring different approaches. The second experience where he describes feeling "quite unprepared" (AD5) centres on a case where he disagreed with a management plan that a surgical consultant had put in place (for antibiotics) and changes it thinking it was "best for the patient". He "felt quite comfortable in assessing the patient" and despite some reservations due to the circumstances, changed the plan. In this example there were two factors that were difficult for Tom, both concerning colleagues but what he predominantly "found difficult" and was concerned about was "the [minimal] amount of support that's on offer to you as a surgical".

A key theme in Tom's diaries was that of the well-being of his patients and he makes several references to this, for example: "a good experience for me and the patient" (AD1), "was best for the patient" (AD5) and "the patient said it didn't hurt" (AD6). These comments express sensitivity towards the well-being of his patients and suggests some emotional connection, albeit at a professional level. Other comments that reflect emotional content include his use of the word 'felt' (like Ben above) and similarly to Ben, his use of hedges (particularly 'quite') in describing preparedness or not: "didn't feel *really* prepared" and "felt *a bit more* prepared" (AD4), "didn't feel *very* prepared" (AD6). He only actually denotes preparedness with full conviction as in "felt well prepared" and "felt prepared for" in AD8 (though noting the continuing use of the word 'felt'). Like Ben above, this use of 'felt' and hedges suggests that he doubts his own preparedness somewhat. Linked with this are comments that he makes which serve to construct his feelings, roles and/or identities. For example, he only uses the word "confident" four times, and of these, three appear in the first diary when he was in the final days of his first rotation in medicine. Notably, the only other time he expresses this feeling of confidence is in his tenth and last diary, where he describes himself as "much more confident", a period of approximately 11 weeks into his surgical placement. Tom also comments on the usefulness that being "a key member of a team [and knowing] what your role should be" brings; factors that he refers to in an early audio diary (AD3) and that suggests a sense of security and how he identifies himself. In AD4, however, he notes the difficulties as an F1 to "not stand up [to] but to question GPs".

Tom's changeover from a medical to a surgery rotation plays a noteworthy role in his view of himself as a competent doctor and where he finds himself experiencing unexpected challenges, even when facing practices he had previously felt comfortable with (AD2). Early in this surgical rotation he comments on: "feeling a bit apprehensive" (AD2) before his first surgical twilight on-call that coming evening: a situation that he had experienced little "exposure". About a month later he records a positive diary concerning on-calls and puts this down to his increasing experience of on-calls generally and the types of things that occur regularly such as cardiac arrest: "we've done a lot of on-calls now with it being fifth or sixth month of being junior doctors" (AD3). However, a couple of days later (AD5) he comes across an on-call situation that leaves him in a dilemma (disagreeing with a consultant's prescription and struggling to find someone to call for advice),

highlighting how feeling prepared for practice is not a linear process and that despite confidence and competence in some areas, he does not appear to be prepared for all eventualities. By AD10, his confidence is becoming restored as he reflects on how he has learnt to prioritise, and that: "the more experience that we've had over the past six or seven months" enables this: knowing what questions to ask and "just being that much more confident … I found that a lot easier over the past lot of on-calls and I think it just comes down to experience and having done things before".

Tom's diaries show that preparedness for him is a dynamic process that constantly shifts as new factors or situations challenge his sense of confidence and competence. He describes feeling prepared for various practices and procedures, not only gained from medical school but particularly gained from on-the-job experiences on his first rotation. However, moving to a new and very different placement (medical to surgical) throws him off-kilter as he learns how to cope with fresh challenges. Tom's last audio diary emphasises that the experiences he gains throughout his differing placements contributes to his growing competence and confidence as a doctor.

4.4.5.9. Case Study 3: "I felt I was quite well prepared for acute situations but the daily kind of politics of the wards ((laughs)) are a little bit more difficult to deal with"

Anne is a non-white female F1 in her mid-twenties. She has been based at two different hospitals. She has had placements in General Medicine at both localities (with one part in Orthopaedics). Anne recorded 22 ADs (21 narratives) and participated in an entrance and exit interview (Appendix N, Box 3N on page 269 for quotes from Anne's longitudinal interviews and audio-diaries). Within her 21 narratives she described 10 where she felt prepared and/or had good experiences and 11 where she felt unprepared. Like Ben and Tom above, she always used the expression 'felt' when referring to both prepared and unprepared experiences, and often used hedges such as "quite", sometimes reflecting her doubt about her own preparedness. For example, she referred to feeling "well prepared" 4 times, "quite well" prepared 10 times, and used the expressions "semi-prepared" (AD8) once, and "more prepared" (AD22) and "very well" prepared (AD19) once each. In interpreting Anne's judgement of situations, though she describes herself unambiguously as feeling prepared or unprepared in all but one AD (AD14, where she describes being very confident, hence inferring preparedness), details of her experiences also provide insights into factors that left her feeling prepared or not and indicate the complexity of certain situations and how they impacted on her feelings.

Overall Anne describes several situations in which she felt prepared for clinical reasoning and decision-making. She felt confident in doing basic jobs and clinical and procedural skills, such as taking bloods, doing ECGs, Arterial Blood Gases and so on, as well as feeling prepared for the general "ward craft things", and doing paperwork, multi-tasking and time-management, as she already had experience of these through shadowing as a medical student. This confidence and ability is evident even in some situations where ultimately Anne was left feeling unprepared for other aspects, such as in AD13, where her registrar did not agree with her diagnosis, but as she observes: "in the end I was also quite glad that I made the right diagnosis and that the patient did not have any cardiac event". Conversely, this confidence was not always realised when confronted with a situation that she had not anticipated, such as when she found herself on a night-shift within a couple of weeks of starting as an F1 – an experience she described as "daunting" (AD1) as she found herself "basically on [her] own covering three wards". She also felt out of her depth when asked to do a "junior-led" ward round with "end of life care" patients (AD2) and found herself feeling uncomfortable having to deal with complex communication skills in speaking to patients and/or their families about how long patients were expected to live: this was one of the few occasions in the narratives where she made *direct* recommendations for medical school training suggesting further communication skills training in complex cases was needed. Though she struggled with the responsibility of communicating bad news regarding palliative care, Anne followed this with a similar situation (AD3) that she felt went well and partly attributed this to

knowing the patient well, being able to do something for the patient and having something constructive to talk about.

Despite some bad and difficult experiences, Anne's narratives show a growing confidence as she gains experience and is given and begins to take greater responsibility, even to the point of actively seeking such responsibility out: responsibility and being trusted seem to be important factors for her. A number of early AD narratives illustrate situations where she was either unprepared at onset (AD1) or where unpreparedness seemed to "creep up on her" (AD10, 12 & 13 for example): narratives falling into the latter bracket often involved difficult situations with colleagues (8 ADs) whilst in the former she openly acknowledged when she "wasn't exactly sure what [she] was meant to do" (AD1) or "had no clue what to do" (AD6). Unprepared narratives were not, however, necessarily bad experiences as sometimes the positive support and input of a senior made for a good learning experience (AD1). Other ADs (often later ones), however, show Anne being confident, successful and pleased with her own performance in terms of managing patients and good decision- making (for example, ADs 14, 15, 17 & 22. Several of her narratives describe positive experiences with colleagues such as teaching a fellow F1 (AD5), effective team work (AD7), positive review of a patient and support from a nurse, registrar and consultant (AD9), being well-prepared in clinical skills and liaising with a registrar (AD11), and good patient management and being trusted by a consultant (AD17). Perhaps the most revealing narrative is AD19, where Anne describes pro-actively seeking out an opportunity to be independent and taking personal responsibility by eagerly taking up an opportunity to run her own ward rounds without supervision, something which she now describes doing regularly in her exit interview.

A striking feature of Anne's audio diaries (like Tom's above) was that feelings of preparedness and unpreparedness were rarely linear and that examples of each appeared randomly throughout. Particular aspects of practice, such as interpersonal relationships, follow this pattern and there were 8 situations where encounters with colleagues were difficult, including five involving nurses. Though her narratives suggest that she may have had good reasons to be frustrated with these nurse interactions, who did not seem to support or trust her, problems with nurses were recounted in ADs 4, 6, 8, 18 and as late as AD20. In the first of these narratives Anne openly reveals that a fellow F1 told her she was sometimes confrontational in her communication with nurses and accepted her help to deal with this. Despite saying she felt that things were generally improving in this department in her exit interview, that she had only recently recorded another example of such difficulties (AD20) suggests that this may be an ongoing problem for which she is not adequately prepared. In AD18 she states that: "the main problems with feeling unprepared do occur between junior doctors and nurses", and that this is something that should be dealt with, as nurses and junior doctors have the closest working relationships in hospitals. Some of Anne's other relational difficulties centred on problems with senior colleagues (3 cases in the ADs and 1 case in interviews), where, for example, differences of opinion were cited (like Tom above). Anne also described situations with patients that she found hard to deal with, for example, a male giving her confusing information about his symptoms (AD12) and communication difficulties on sensitive topics with patients and families, as described previously. Despite these difficult interactional experiences, she also cited examples of positive working relations, also described previously, thus highlighting that preparedness may be a somewhat haphazard factor.

Anne did not refer *directly* to whether medical school had prepared her for practice during the course of her ADs, but her narratives indicated that she was well- prepared for some aspects of practice (such as procedural skills) and not so well for others (such as team-working). She made specific recommendations, however, during her exit interview, suggesting finding ways of giving students a clearer idea of the pressures they could face on wards as F1s. She thought that final year medical students should be given a small group of patients to be responsible for (under supervision) when in the workplace and that this would help them better understand the reality of medical work as an F1. She also strongly indicated in her AD narratives that more input was needed to help junior doctors deal with interpersonal relations.

Anne valued being part of the study and found doing the ADs useful for reflecting on her practice. She also believed that with practice and experience F1s became more prepared. In her case, being in a different and smaller hospital, with the opportunity for jobs usually reserved for higher grade doctors, meant that she was able to develop her confidence and competence as a doctor and hence be better prepared for practice.

4.4.5.10. Case Study 4: "Learning something in medical school is great in theory… but there are other factors that apply when you implement these things on the ward in real life"

Jack is a male F1 in his mid-twenties. He did his medical training at a school in a different location to his F1 post. He has completed rotations in Medicine and Surgery, both based at the same hospital. He recorded 10 audio-diaries, participated in an initial entrance interview (with one other person), a mid-term individual interview and submitted a final short feedback audio (See Appendix N, Box 4N on page 271 for quotes from Jack's longitudinal interviews and audio-diaries). In terms of describing preparedness or not, Jack does not actually use the word 'unprepared' in his diaries, though he once says he "kind of wasn't prepared" (AD4). His use of the word 'prepared' is also limited and not used without some form of qualification, such as: "I felt reasonably quite prepared" (AD2), suggesting that he actually doubts his own preparedness. In the three ADs where he makes direct use of the word preparedness, he acknowledges the training he received in medical school and its value for particular issues (for example, confirming death-AD2, escalation-AD4, and unresponsive patients-AD7). In another case he notes that he feels he would have been better prepared if he had been trained and worked in the same Trust, as systems differed (AD4) and further that "learning something in medical school is great in theory and great in a controlled environment but there are other factors that apply when you implement these things on the ward in real life" (AD7). These themes, especially the latter, recurred across a number of his reflections.

Overall, Jack's diaries cover areas where difficulties were present or arose even when he felt prepared or confident in some ways, for example: dealing with difficult patients and balancing empathy with practical and efficient clinical input (AD1); confirming death at night (a "surreal" experience) and completing forms appropriately (AD2); and escalations and problems arising for dealing with these, citing conflicting messages and unclear directions (AD4). A number of his diaries, though in a similar vein, look at more general experiences and situations that occur regularly, and reflect on preparation for these, such as: ward rounds, knowing what to do on these and "how to behave" (AD3); preparing for nights, especially around self-care (AD5); learning to prioritise jobs, especially when on-call (AD6); and team dynamics and effects on junior doctors' learning (AD9). A further example of team working (AD7) describes the difficulties of working with no real leadership (two F1s working together in an emergency situation) and the complications that arose when *he* felt well prepared and knew what to do but had concerns that the other person was not managing things correctly.

In AD8 Jack reflects on his career, his own characteristics and needs in relation to life-work balance, and how the previous eight months had emphasised to him that some of his favoured career aspirations were not in tune with these experiences. Hence he indicates a probable change of plan: he does not feel that medical school prepares students for the practical realities of pursuing certain specialties as a career.

Jack's final diary entry (AD10), though not the only one where he alludes to positive elements such as possessing knowledge and skills, learning, growth or development, is one that presents a strong sense of positive identity in a particular skill (communicating with patients and their families) and in self (as a doctor). He describes good medical training, but reflects on the way this skill becomes easier: "not particularly because you know any more information or have got any better at things [but because] you can kind of do things… your own way… which I think allows you to come across as more sincere and have a… more meaningful conversation with the patient". He attributes this to being: "in a position of a bit more, not authority, but perceived knowledge… because you're introducing yourself as a doctor rather than a student". He also feels that by not: "being watched

and judged by your peers, and recorded and analysed", this takes the pressure off and enables a "more [fluid]" and competent approach.

Key features highlighted in Jack's diaries and interviews emphasise: the usefulness of experiences gained at medical school; having algorithms and known systems to work with and within (gained both from medical school and on wards); and the availability and support of seniors. In his early ADs Jack often describes situations where he knows what to do, works through the systems, makes decisions and then refers to seniors to check his plans or for further input when uncertain about what to do next, indicating that he knows his limitations. His diaries highlight a sense of preparedness for many basic processes but also describes various occasions where the actual circumstances of real-world situations add complicating factors that make working as an F1 'tricky' at times and highlight the way in which knowledge and skills alone are not always sufficient for being prepared to practice effectively and efficiently. A final key linking theme is that of learning from 'on-the-job' practice and experience, growing confidence and sense of preparedness and the role of responsibility in supporting this, which is a key difference between being a student and a working doctor.

Jack's diaries contain few experiences that fall neatly within the boundaries of preparedness or unpreparedness and this may account for his infrequent use of such words. In his case, unpreparedness often relates to non-clinical situations such as feeling unprepared for the realities of night-shifts, on-calls and working hours, prioritising jobs and issues of working with others or within teams where people are not: "on the same page". Further, many of his examples highlight how unpreparedness can arise from a situation that one feels prepared for at first, but that unexpected factors can render even a confident F1 to feeling unprepared or in need of seeking support or clarification.

There was no linear route here but a continuing 'rollercoaster' of experiences, where a new or unexpected episode arises and challenges Jack to reflect and learn how to deal with such incidences next time. His audio-diaries show that he does indeed do this and takes responsibility for his learning, growing in expertise and confidence. He also works to be happy in his job and in the belief that enjoying the work he does will, in addition to developing further skills and expertise, indeed make him a better doctor.

SUMMARY BOX (PHASES 2 & 3): TRANSITIONS AND PREPAREDNESS (LONGITUDINAL AUDIO DIARY CASE STUDIES)

Types of transitions

- The largest transition was from medical student to F1 but there were other notable transitions within the F1 job;
- Moving to new wards was part of F1 life, even within a rotation, and when on call or working out of hours. There were significant differences between wards (most notably surgery and medicine), in terms of workload, knowledge and skill requirements, availability of senior support and working styles;
- Moving to a different hospital was not uncommon within a training programme. Sometimes these moves proved beneficial, with F1s in smaller hospitals often having greater responsibility or autonomy;
- Team working was challenging around global transition time-points, for example, when all members of a ward team move at the same time;
- Audio-diary entries highlighted the transition from medical student to F1 doctor, highlighting their shifting identity to that of doctor, taking on responsibility, and doing things 'for real';
- Some participants enjoyed the autonomy and relative lack of scrutiny associated with being an F1 compared to a student and felt they could be more 'themselves'.

Factors facilitating and inhibiting transitions

- Even those with the most positive outlooks and experiences described difficult times at the beginning of their F1 careers;
- Transitions varied enormously, both according to the environments moved between and by characteristics of the F1 themselves, such as attitude and resilience;
- Successful transitions were facilitated by friendly staff, supportive working environments, good inductions, and the opportunity to shadow the job;
- Poor transitions involved poor team relationships, where colleagues are unsupportive and disrespectful, and where there is understaffing and / or poor organisation;
- Overall, F1s felt transitions became easier as they gained experience and confidence.

Degree of preparedness for transitions

- Some participants commented upon medical schools differences (e.g. what they taught and how), which highlighted the variability of graduates entering F1;
- Some participants felt they had been well prepared them for transitions through regular changes in placements;
- The transition to working in a hospital was made easier when F1s stayed in the Deanery associated with their medical school, due to the familiarity of environment, systems and people.

4.4.6. RQ5: What are the views of stakeholders around the issue of bringing forward the time of full registration to graduation?

The question on the possible alignment of full registration with the point of graduation brought about a range of views echoing points of transition and implications for medical education made earlier in the report. As can be seen in the overview (Table 16), we coded 147 individual comments around the issue aligning full registration with graduation (44 of the views raised by participants were for the alignment, 78 against with 25 undecided). It is important to note that we coded each viewpoint, rather than the number of participants as some raised arguments for and against.

TABLE 16: DISTRIBUTION OF ARGUMENTS IN PIN/GINS FOR AND AGAINST BRINGING FULL REGISTRATION FORWARD TO THE POINT OF GRADUATION ACROSS STAKEHOLDER GROUPS

	F1	FRTD	CE	PG_D_FP	UG_D	HCP	EMP	P_GVT	PPR	TOTAL
For change	1	4	3	8	7	1	2	3	0	44
Against Change	6	13	11	8	2	11	10	2	2	78
Undecided	2	2	4	1	2	1	3	5	1	25
TOTAL	9	19	18	17	11	13	15	10	3	147

NOTE: The group of D_FPs has been divided into Undergraduate Deans (UG_Deans) and Postgraduate Deans with Foundation Programme Directors (PG_D_FP) sue to the differing viewpoints within this group on this topic.

Within these viewpoints we identified five main themes (that included for and against arguments): (1) Implications for undergraduate medical education (for and against change); (2) FY1 as an opportunity for safety and learning in a workplace environment (against change); (3) implications for patient safety (against change); (4) implications for FY1 work practice (for and against change); and (5) financial, structural and political implications (for and against change).

In addition to participants taking a view, and debating or arguing 'for or against' the issue of bringing registration forward, there were also a number of 'undecided' participants. These individuals picked up on the above themes identified by us, but without taking sides. They talked about the following topics: the balance between empowering responsibility, the need for F1s to mature as an individual and to understand the ethical and legal implications of the medical profession; how necessary changes could be made to undergraduate education that would involve medical students taking responsibility for patients; whether these curriculum changes would entail an extension of the five year period of undergraduate study; what the financial implications for students and their families would be with an extended period of study, as well as in a system where they might fail after graduating for a medical degree; whether further assessments would be required for licencing and entry into a foundation year programme; whether the meaning of registration itself would change; and implications for trainee doctors who qualified outside the UK. As these issues are also picked up in the following sections, we do not discuss them further here. We therefore begin by considering the arguments *for* aligning full registration with the point of graduation. This will be followed by a discussion of the arguments *against* such a move.

4.4.5.1 Arguments for aligning full registration with the point of graduation

Arguments for aligning full registration with graduation centred around the three themes of: implications for undergraduate medical education (Theme 1), implications on FY1 practice (Theme 4) and financial, structural and political implications (Theme 5). As all these themes also contain arguments against bring forward the timing of full registration, we begin by focussing on the argument for change.

4.4.5.1.1. Implications for undergraduate medical education: For change

In terms of undergraduate medical education, there was a view that changing the timing of registration to coincide with the end of students' undergraduate degree would bring greater clarity in an otherwise fuzzy picture. At the moment, there appeared to be no definitive point at which the medical graduate was deemed to be 'fully formed' and the transition from student to practicing doctor is a lengthy and somewhat confusing process. This situation was thought to bring misunderstandings over exactly what is to be expected of a newly qualified doctor. Therefore, from this perspective, it was thought that the shift in registration would mean big changes to the Tomorrow's Doctors outcomes framework and the structure of teaching and assessment during the undergraduate curriculum. For example, some believed that the undergraduate curriculum might need extending by a year (including CE, D_FP and HCP group participants), others talked of the addition of a formal assessment of professional practice or even bringing in a national licencing examination. This was thought to be a positive step forward (Box 35, Excerpt 1). Furthermore, recent changes placing greater emphasis on students' clinical experience through placements and assistantships meant some CEs thought that their schools were already moving in this direction (and therefore would require 'tweaks' rather than whole curriculum re-thinks).

While changes to the content, structure, and admissions criteria that might be required in order for registration to be moved forward was thought by some to be "a big hurdle" and a mammoth task, participants highlighted the beneficial effects. In terms of effective student learning there was a view that the patient is relatively absent in undergraduate medical education: hindering effective learning and affective engagement. Changes in registration might mean that medical students would be able to practice medicine and therefore learn better (Box 35, Excerpt 2). Thus having the opportunity to take on responsibilities for patients' treatments earlier was seen as the basis for more effective (and affective) learning. However, from this perspective, the exact point at which registration would occur might have to be even sooner than is currently proposed. In terms of junior doctors the benefit was highlighted in terms of them being able to move along their career path more swiftly. The benefit for patients was thought to be more effective doctors.

4.4.5.1.2. Impact on practice: For change

The issue of taking up more responsibility was also included in discussions around the impact on F1s work practices. Although most trainees felt it to be an advantage in the current system to have a level of protection should they make a mistake, some argued that they already carried responsibility for their own actions. Furthermore, bringing registration forward would mean 'business-as-usual' for their day-to-day practice, as they were already involved in tasks requiring registration (e.g. discharging, albeit under supervision: Box 35, Excerpt 3). FRTDs explained that their support-seeking behaviour had not changed the moment they gained full registration. Rather there was a gradual change, one that depended on their own level of experience in different areas. Thus gaining registration after the first foundation year was seen as "just part of a process" without any major practical implications. This argument that early registration would change little in the daily running of the hospital was echoed across other stakeholder groups: although some participants (and F1s in general) might not understand exactly what pre-registration doctors can and cannot legally do in the workplace (Box 35, Excerpts 4 & 5). Instead, some participants underlined the importance of other factors, such as the structuring of the working environment with appropriate supervision by seniors and clarity on effective protocols for practice (Box 35, Excerpt 6).

4.4.5.1.3. Structural consequences: For change

On a structural level, stakeholders discussed reasons for raising the issue of moving the point of registration. They suggested that the change was one way of overcoming the "messy" situation of overlapping responsibilities between medical schools and Deaneries. This overlap causes difficulties when F1s who encounter problems are returned to the oversight of the medical schools for fitness to practice proceedings (e.g. when undergraduate and postgraduate training are in different locations, Box 35, Excerpt 7). Some participant's linked the original idea for the shift in registration to the Greenaway report *The Shape of Training* (i.e. providing a solution for the problem of oversubscription for F1 posts). Thus full registration would allow graduates to apply for jobs anywhere in the world and avoid what is seen by some policy bodies as the "moral obligation" to provide F1 jobs: "*because going through five years of medical school and then not being able to get a job is not a very happy situation*" (M_D_FP_182). From a perspective of regulating medical conduct, participants found that it could be an advantage to bring graduates within the remit of the GMC and to be thus able to influence junior doctor's behaviour early on (Box 35, Excerpt 8). Finally, other arguments for the move suggested that the graduation-registration alignment would be positive because it would simplify the foundation year(s) admissions process.

BOX 35: BRINGING REGISTRATION FORWARD: PARTICIPANTS' VIEWPOINTS IN FAVOUR

Implications for undergraduate education

Excerpt 1:

"It would also provide a greater clarity over what were the expectations of a newly qualified doctor at the moment there is an assumption that someone who is graduated should have enough experience to function as a foundation year 1 trainee but they still seem to be not fully formed. If we move the point of registration to the time of graduation then we will bring into much more clarity and focus what do we mean by a fully registered newly graduated doctor and I think the GMC will then need to revise and review what are the attributes qualities and skills that we need at that time. There may be subsequent attributes qualities and skills that are required during further professional training as part of life-long learning but we need to be clear what we think we want universities to produce and in turn once the GMC identifies that, universities will need to reflect on what training they provide and will also need to reflect on how they assess these qualities and attributes for example elements such as professionalism, ethical awareness,

communication skills…I suspect that <u>we would need to bring a much more formalised structure into the final year of shadowing</u>. Instead of being attaching students to a ward or GP, we would need to formalise that structure make it accessible and have some outputs that could be evaluated by the trainer during that period of time" [M_P_GVT_112]

Excerpt 2:

"Well I think medical education is about trying to improve the quality of care for patients I think it should be based in practice from the beginning and the more opportunities there are for medical students to practice being a doctor by practicing medicine the more effectively they're going to learn and more effectively they are going to be as doctors. So the sooner they can take on responsibility from my perspective the better. So the simple answer to the question that you've asked is <u>I think it's a good idea as it gives them more responsibility and we can structure the learning better</u> […] The medical act has prevented medical students getting engaged with providing direct treatment for patients because they are not registered. Once they're registered they can provide direct treatment and that changes the game completely because the nature of the learning is considerably different because the affect has been engaged […] Making people think about the relationship between themselves and the patient if the patient isn't there, as is so typical in medical education, the patient is absent or the patient is a book or an actor. Then things are not really as effective as they could be unless it had been a real patient". [M_D_FP_02, Undergraduate]

Implications on practice

Excerpt 3:

"In terms of what would we be able to do that would be different, and apart from sectioning, I can't think of- and discharging patients and things, but you end up having to do that anyway. I don't know how I feel about that. I don't really see why you aren't registered and I do think if you should make a mistake, <u>the onus should be on you. But I think it's a steep learning curve, F1, and it's quite nice that there is this protection system in place</u>" [F_FRTD_139]

Excerpt 4:

"why would it be any more scary? <u>That's based on the assumption that you can do more things if you're fully registered</u> … you know when you're provisionally registered you are able to go and prescribe and do all the things that you would do as an F1 as I understand it. <u>There's nothing- you're not being prevented from actually carrying out the things that you might be scared about</u>….I think we need to think through what the legal implications would be…" [M_P_GVT_181]

Excerpt 5:

"It wouldn't have any kind of effect <u>I don't think in hospital it wouldn't affect the day-to-day prescribing</u> I'm not sure they've [F1s] even particularly realised what they can and can't do" [F_HCP_81]

Excerpt 6:

"Whether you start as an F1 doctor provisionally registered or fully registered it does not change the magnitude of the change we talked about earlier becoming a doctor and so for me it is that environment in context into which they're introduced <u>whether you are provisionally registered or fully registered is irrelevant so long as it's a safe environment</u> in which you can be supported in an appropriate way that is safe for patients and safe for the learner" [M_D_FP_90]

Structural consequences of change

Excerpt 7:

"… in reality eighty percent of graduates from here will go somewhere else for that training and therefore <u>as a university we cannot take responsibility for something that we have no control</u>

over and if we change the point of registration to the time of graduation <u>then the university's</u> <u>responsibility will cease at the time of graduation and then the responsibility for further</u> <u>postgraduate training falls entirely onto the postgraduate deanery</u>" [M_P_GVT_112]

<u>Excerpt 8:</u>

"<u>the sooner you bring forward the registration, the sooner you are then in a position to</u> <u>determine the rules with regards to the individual once they are registered</u>…the sooner the GMC becomes involved the greater its potential influence over that group of individuals. So I see it very much from that point of view, that they may wish to be in a position to evaluate performance and evaluate the development of the doctors in a slightly different way, and also against the background of some of the external pressures the GMC are dealing with at the moment with regard to getting post Mid Staffs. A whole host of things where people have asked the question as to what extent are the doctors accountable for what they've done, and I think it helps strengthening their position to be saying '*well actually all these doctors are accountable in this way*' and for them to then be in a position to shape the infrastructure" [M_EMP_101]

4.4.5.2. Arguments against moving full registration to the point of graduation

Not only did we have more data coded to the argument against moving graduation forward but also the range of issues discussed was greater. Furthermore, unlike the arguments for moving registration, participants who were against the move drew more on personal experiences of situations where, if registration had already moved forward, then issues such as patient safety would have been compromised.[44] Thus, besides the issues already discussed around implications for undergraduate medical education (Theme 1), F1s' daily practice (Theme 4) and structural, financial and legal implications (Theme 5), the arguments against this change also included the themes of F1s' safety and learning (Theme 2) and patient safety (Theme 3).

4.4.5.2.1. Implications for undergraduate medical education: Against change

The theme around implications for curriculum change cross-cuts both for and against arguments for moving the point of registration forward. While there appears to be consensus amongst (both for and against) participants that the current change towards truly embedding undergraduate medical students within multi-disciplinary teams and the work on wards is a positive change and would ultimately benefit patients, there were differences of opinion as to whether this would be sufficient to compensate for the loss of the F1 'safety-net'. The difference in argumentation, therefore, was a matter of degree (just how embedded can a student ever be) and on how feasible or realistic these changes might be: the majority view from undergraduate deans was that this was possible (although not everyone felt this), while postgraduate deans, Foundation Programme leaders, employers and HCPs were more sceptical. Thus, this latter view perceived that changes in the undergraduate curriculum would have to be radical and assurances would have to be made that any changes would benefit both service and patients. Areas of concern that were mentioned included prescribing and other practical procedures as well as what was referred to as 'soft' skills such as communication, team-working and professionalism (Box 36, Excerpt 1). Participants mentioned that gaining these experiences had to be done in a workplace environment and that it had to be more than a signing-off exercise.

Furthermore, there was a view that changes in the content of an already 'crammed' curriculum could be an impossible job, unless some things were taken out. Much more consultation would be needed between undergraduate deans, the GMC, and other stakeholders in order to prioritise this content (Box 36, Excerpt 2). Graduates needed to be competent to deal with procedures made

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[44] The implication here is that when participants draw on personal experiences, the argument is based on more real-life situations, than on 'ungrounded' attitudes and opinions.

difficult through, for instance, patients' comorbidities. These comments seem to imply higher expectations of graduates who are fully registered.

The concerns that were raised from a more sceptical perspective included the extent to which changes to the curriculum would have to be introduced, implications for examinations, and differences between the ethos of a university education and workplace training. Some participants questioned bringing registration forward and what it meant for the changes already underway to ensure a smooth transition between undergraduate and postgraduate arenas: by bringing registration forward, the connotation of blending across undergraduate and postgraduate years is taken away and the result would be an all or nothing scenario (Box 36, Excerpt 3). Furthermore, as some P_GVT stakeholders suggested, if specific safeguards were still needed in the F1, year despite full registration, then the meaning of registration would be diluted.

Another structural obstacle was identified in the timing of FY1 post allocations. The current system with later allocation does not allow medical schools to ensure that graduates would be able to complete their assistantships in the same hospital in which they will take up their FY1 post. Thus graduates lose out on the advantage to familiarise themselves with the workplace setting, an issue that has been flagged up throughout the interviews by CEs, D_FPs and F1s.

4.4.5.2.2. FY1 as an opportunity for safety and learning in a workplace environment: Against change

A major concern raised by all levels of clinicians and other HCPs was that moving registration forward might impact on trainees' learning in the workplace. Pre-registration was evaluated as a necessary transition period and 'buffer zone' between graduation and being a doctor. It was described as providing a protected space for gaining experience, becoming a doctor and 'finding yourself' as a professional. Senior clinicians, as well as F1s, felt that some trainees still had much growing up to do in that time and emphasised the importance of having a protected space for gaining experience while simultaneously being part of the workforce (Box 36, Excerpt 4).

Participants underlined the importance of the F1 year as part of the foundation training with specific support structures in place. FRTDs mentioned that not having full-registration status made it easier for them to ask for help. Senior clinicians underlined that the pre-registration year provided opportunities to support those who struggle through the F1 year as opposed to when they are registered and struggle through their career. In this view, the pre-registration year would ensure early intervention allowing graduates to grow into competent and safe doctors. Despite having gained a wide range of knowledge and clinical experience during undergraduate studies, working as an F1 was deemed to provide the unique opportunity to learn clinical decision-making in the role of a doctor (Box 36, Excerpt 5) and to start to contextualise what had been learned as a student (Box 36, Excerpt 6).

4.4.5.2.3. Implications for patient safety: Against change

The supportive pre-registration structure was understood by members of all stakeholder groups as vital for patient safety. One patient representative discussed this issue in depth and voiced concerns about being treated by a newly qualified doctor without some oversight of a senior clinician (Box 36, Excerpt 7). Similarly, FRTDs reported that not being able to discharge patients without the agreement of a senior clinician prevented mistakes that would have harmful consequences for patients. Senior clinicians argued that the current FY1 required a high level of supervision. This has to be ensured in the staffing and rota levels. Giving full registration early, even under the condition that workplace supervision was ensured, might give rise to undermining effective supervisory structures (Box 36, Excerpt 8). While this view agrees with the supporters of early registration, that F1s are currently involved in tasks they are restricted to perform, it underlines the legal force of the pre-registration year to ensure adequate involvement by senior clinicians (Box 36, Excerpt 9). Patient representatives also raised the issue of it being an ethical requirement to inform patients about trainee doctors' range of capabilities within the health care system. As comprised within the above section on arguments for registration-graduation

alignment, this stakeholder emphasized the need for clarity and transparency about the responsibilities of trainee doctors.

4.4.5.2.4. Implications for F1 year work practice: Against change

From a wider perspective of ensuring safe practice within the NHS, the period of working as a doctor with restrictions and under close supervision was described as an opportunity to find out whether the graduate was fit for purpose: indeed, the term frequently used here was that the pre-registration year served as a 'safety-net' for graduates, deaneries and the NHS (Box 36, Excerpt 10). Interviewees of all groups emphasized that despite practical exams and clinical placements, medical schools were not always successful in detecting problems in students' abilities to practice, and even when they did, they did not always have sufficient evidence to prevent graduation (Box 36, Excerpt 11). Examples were given of people who were highly academic but could not cope with the demands of working as a doctor. Suggested reasons for this were that these graduates were perceived to be not suited to the profession, that they were too academic and insufficiently practical, as well as mental health issues. The F1 year was seen as providing an opportunity to detect these people and to either support them appropriately or suggest a different career path. D_FPs who gave examples for the latter case reported that this decision was in the interest of the graduate who acknowledged that working as a doctor was not their preferred career.

Even with a greater emphasis on practical work experience at the undergraduate level, some EMPs did not feel that medical schools could deliver competent enough doctors. The continuing need for supervision in a scenario of early registration was perceived by some as putting greater pressure on employers to ensure adequate staffing and rota levels (Box 36, Excerpt 12). Participants discussed possible negative consequences of giving fully registered graduates the opportunity to take up locum jobs. Locum posts entail a lower degree of integration into the medical team, carry less overall responsibilities and enjoy fewer opportunities to learn within multi-disciplinary teams. Participants suggested that locum doctors might work more as individuals and were less inclined to work with and help out other members of the team. With the possibility to work anywhere as a locum and change frequently, there was less opportunity for a holistic supervision as "people don't really notice your tracks as much as when you are in a training programme".

4.4.5.2.5. Structural implications: Against change

In our previous section on structural implications we saw the view that practical solutions to issues such as overlapping governance and the oversubscription of F1 posts were positive outcomes for bringing registration forward, we coded a greater number of arguments against this. Stakeholders from the CE, D_FP and HCP groups questioned whether moving the point of registration was mainly politically motivated and might impede the education of the trainee doctors. Some interviewees found that this move would simply shift the responsibility of possible medical error to graduates and in the final instance to the medical schools without regard for trainee or patient safety (Box 36, Excerpt 13). Instead of empowering the graduate, it might lead to more stress and anxiety in newly qualified doctors. This in turn might counteract current measures to instill empathy and improve patient care.

The previous section on structural implications also discussed coming under the regulation of the GMC as a positive consequence of early registration. However, a P_GVT representative suggested that the GMC already had influence on shaping the behaviour of newly qualified doctors as they set standards and worked with medical schools. It was suggested that further regulatory action might not be in the best interests of the doctors because "*people don't necessarily learn when you're under sanction*".

A major concern was expressed around the distinctive agendas of universities and medical schools. Universities were described as academic institutions with an aim to produce graduates whereas medical schools saw their responsibility in ensuring that these graduates would be safe doctors.

The latter was seen to require a training year as F1. This links in with the issue that was expressed around registering someone as a doctor who has never been a doctor, only a student (Box 36, Excerpt 14&15). Reasons for the different agendas were financial pressures on universities in the current economic and political climate (Box 36, Excerpt 16). Participants also understood medical schools as being increasingly reluctant to fail students because this could be understood as failing on their part as institutions (Box 36, Excerpt 17). The issue of assessing professionalism in a university setting was deemed difficult by several interviewees. This relates in particular to one of the opinions articulated across the stakeholder groups that the pre-registration year in which trainee doctors are part of the workforce would be the best time to develop and assess both clinical and professional competencies.

BOX 36: PARTICIPANTS' ARGUMENTS: PRE-REGISTRATION PERIOD AS A PROTECTED LEARNING SPACE

Implications for undergraduate education

Excerpt 1:

"There would have to be a radical review of the undergraduate curriculum …I think that the F1 year is a year which is a transition in itself between being a student and being a fully registered doctor they work in a very, very close and supervised environment as an apprenticeship but they are allowed to prescribe even with that there are errors that occur and so for me to be confident that the change would be right both for the service and well I say that for the patients and also for the trainees I would need some assurance about the mechanisms that were going support to them and how you cannot have them not prescribing and suddenly here you go you've got a Carte Blanche. That would be my big concern. So there must be a period of an apprenticeship then as an undergraduate" [F_EMP_180].

Excerpt 2:

"The trick here is as follows if we move registration forward by one year then it means one of two things either registration doesn't mean what it used to mean right or the final year of undergraduate medical school has to change. Okay because if you just move it forward and say well we just moved it forward we close our eyes and nothing has changed why does anybody need an F1 year. That actually means we're saying the F1 year was a complete waste of time. So that's a tricky one. So the medical school's job- as medical school Dean my job is to train them to *Tomorrow's Doctors.* Okay so if the public and the GMC want the final year of medical school competency to be different at the end of it, then they need to say so. They can ask us how we think it should be changed or we can do a kind of card trick and just close our eyes and pretend nothing has happened and just pretend and to be honest if we did that our graduates will be just as well prepared as anybody else in Europe and nothing bad would happen and the sky won't fall in. That's probably what we're going to end up doing because there isn't really very much going for cramming a whole load more stuff into the undergraduate programme. There isn't any room. So if you make new things that have got to go in then something's got to go out and that's always difficult but we have to be- there is that sort of elephant in the room type question if you moved it by a year why- I understand all the operational reasons about Europe and house jobs and international stuff and all the rest of it but there's some quite deep questions which probably are not going to be- I would suspect probably won't be tackled head on" [M_D_FP_113]

Excerpt 3:

It seems to go against the harmonisation model of the new curriculum because that is about harmonisation it almost gives a connotation of blending doesn't it so that you blend from being a student into being a practicing doctor so you harmonise across whereas the Greenaway Report is saying that that stops here and then you practice as an individual registrant" [F_EMP_69]

FY1 as an opportunity for safety and learning

Excerpt 4:

"I think that the professional learning takes place in the practice. It doesn't take place in the classroom or the lab it takes place in the practice and they will learn more about the job when they know what to look for and what knowledge to call upon and where to find things if they need to find things they'll learn all about that. So the one year in practice, I think is crucial and should not be reduced should not be removed in fact it might even be two years but probably one is enough" [M_PPR_104]

Excerpt 5:

 "My biggest learning experience of my life. I think I've learnt more in this year- in these eight months than I learnt almost at the whole of medical school, relevant learning anyway for clinical practice. I just think that we're not ready for full registration at the end of medical school. There's nothing that could prepare for having to actually sign for the medication yourself and prepare you for actually having to make decisions about patients. When you're a medical student you don't have the same concern or care that you do when you're actually a doctor. I just think keeping registration where it is at the end of foundation year one is the best decision because I don't think people are ready to start, aren't ready to have their full registration right at the end of medical school because you do a lot of growing up in the foundation year" [F_F1_129]

Excerpt 6:

"It's all very well having certain courses going on before they graduate where they get a taste of that…but it's in the F1 year that all of that's pulled together … they acquire better communication skills because they're out there with a multi-disciplinary team and it's working together…the F1 year, whilst it is a 'doing' year it is also very much a 'learning' year as well" [F_HCP_164]

Implications for patient safety

Excerpt 7:

"I do honestly believe that the first year on a ward as an F1 is where they really start to learn something…learn to deal with things in their own way, with the backup of somebody there that they can call on if they have to, because their experience doesn't begin to let them cope with that particular situation. I would be very hesitant personally about an F1 doctor, particularly newly qualified, having complete control of what was happening to me as a patient" [M_PPR_108].

Excerpt 8:

 "I just think as long as the patient being examined, spoken to, treated is informed of what that individual medic can and can't do for them and the levels of their responsibility, accountability, I think that it would be okay. But it's just about knowing and understanding…one hospital I worked in once, we had a consultant who had brought his nephew, his fifteen-year-old nephew, in and described him to patients as a medical student. It was a sort of work experience thing. Totally inappropriate obviously and he got hauled up, but you know it's a- I think it's a sort of ethical thing there about just making sure people understand" [F_PPR_151]

Excerpt 9:

 "It [moving registration] would speed things up in terms of post-graduation, so I can understand that. As a foundation programme director there are I mean we have ((gives number)) foundation 1 trainees in this organisation and each year there are between ((number)) and a ((number)) trainees who need quite a lot of remedial help in some form or other…which is quite a high proportion really…and it's usually at the level of the sort of ward-working, professional behaviours, those sorts of things rather than a knowledge gap and it's a really useful period that year to be able to instill a genuine understanding of what it means to be a medical professional

and to practice. I think one of the other things that happens is that because people are not registered, the level of supervision which is required for patients with F1s. It means that F1s can't be unsupervised, they need to be genuinely supervised, and so what that means is that your team structures have to enable there to be good quality supervision. I think the world being the way that it is if that requirement wasn't there <u>it would dilute the level of supervision that they get and you'll end up reducing patient care</u>…F1s by definition currently need to be supervised directly, it means that you have an additional layer, usually within clinical teams and so…<u>patient care is better than if they were fully registered at that point</u>. The justification for not enabling them just to get on wouldn't necessarily be there, and <u>you may end up exposing patients to more junior medical staff</u> ….<u>quality of patient care would suffer actually</u>" [M_D_PD_51]

Implications for FY1 work practice

Excerpt 10:

M_F1_121: "I think that it is easier than people might think to get through medical school and still have the potential to be a terrible doctor"
F_F1_122: "Yeah god yeah"
M_F1_121: "And I think it would be harder still possible but harder to get through F1 and not get found out would you agree with that"
F_F1_122: "I'd agree with that <u>I think provisional registration gives everyone a safety net</u>"

Excerpt 11:

"One of the advantages of being in the pre-registration year is that … in my personal experience, and you see it with some of our current F1s … some people still don't get it, as much as we try and embed them…<u>the actual reality of being a doctor sometimes isn't big</u>. It's a <u>very different world than one that they imagined</u> … that's probably even <u>more obvious from schools that maybe have a slightly more traditional model where you're not embedded in teams and you know you don't do so much hands on stuff</u> and suddenly you're let loose … it's a small- but <u>there is a significant cohort of students who walk. Nearly-qualified graduates who just don't want to do it. Either don't want to do it, or suddenly realise they are not equipped with the skills, or someone else realises they're not equipped with the skills</u>. We had a student two years ago…who within the first four months, we had concerns about his professional behaviour but <u>we didn't quite have enough for us to stop him graduating</u>. Within the first four months of him graduating he was <u>suspended by both the Trust, then by the GMC</u>, … <u>if he was registered at the point of graduation actually it would be quite difficult to stop him being a doctor</u>" [F_D_FP_127]

Excerpt 12:

"We will have a responsibility in terms of rotas, making sure that we have the right level of doctor on at the right time. So it's something that we will have to work very closely with the University on. <u>I</u> think but all the rotas will change because- I don't know- it's the responsibilities coming back a year seem to be- it seems to be huge. I don't know where to start with it really but <u>I can see a level of risk and that will only be mitigated by having a different way or rostering a different way of organising rotas</u>. A more team based approach I don't know because at the same time we're talking about having two tiers of consultants aren't we. We're having junior consultants and senior consultants. It's not much discussed at the moment but does that come into- you know is there something else that's going to come into the equation here in support of these very junior registrants" (F_EMP_69)

Structural implications: Against change

Excerpt 13:

"if you look at the Prof Greenaway's report that's just come out *The Shape of Training* he's saying that all FY1s should actually be fully registered at birth basically…well …when they graduate…so

from the time they set on the ward they're a fully qualified responsible, legally accountable practitioner. So how that's going to offset the spasmodic terror? I don't know, but you know when you think of the Francis Report where it was all about, sort of, error resulted in catastrophic outcomes for a significant amount of patients, that doesn't sort of tally with what Greenaway is saying because he's saying *'yeah we admit there's error, but actually, we don't actually care that much about that because we just want to get fully licensed practitioners very early on'* and he's actually bumping the responsibility down to us in undergraduate level in some instances of what he says *'well it's your responsibility by training them to ensure that they're ready, ward ready'* so the whole concept of preparedness is, I don't know, it's kind of getting dragged into the political debate like waiting times and performance measures… [M_HCP_107]

Excerpt 14:

"A lot of the medical schools certainly some of the ones that I've spoken to have- there's a challenge between the medical school and the university and the medical school has issues with people as a future doctor whereas the university just wants the students to go through and graduate and actually when the people leading the medical course are saying I'm not convinced that this person has what it takes to be a doctor the university are saying where's the evidence they're failing their exams and actually those two things are slightly contradictory" (F_P_GVT_79)

Excerpt 15:

F_D_FP_60: You can't register them [graduates] as a doctor when they're not a doctor. They haven't actually been a doctor. They haven't even been a doctor for five minutes. They're a medical student. They're a graduate from a university. They're not a doctor. How can we then put them on a register to go and work internationally on a medical register when they've never worked as a doctor

M_D_FP_58: It's a crazy idea. It turns a medical degree into a medical degree rather than a training. My reaction to it was *'no, we need to knock it back until they've finished F1'*

Excerpt 16:

"Obviously in many parts of the world you look to a formal professional examination to get your registration above and beyond your university degree that you're given as it's the board examination model isn't it? I would be cautious, I would be really, really cautious about moving back from where we are, particularly given some of the pressures universities across the UK are finding themselves in. I think the softer stuff maybe the stuff that would start to struggle in in terms of around some of … financial pressures within universities and it's actually the softer stuff that the GMC are looking for with regard to your registration…the behaviours, what makes a doctor a well-rounded, reflective individual who understands not only the importance of the medicine that they've been taught but their importance of the role that they have in in society" [M_EMP_101]

Excerpt 17:

M_D_FP_57: You would have to toughen up and be prepared to fail people earlier
F_D_FP_60: The universities need to take that on. We always used to have people that didn't pass and now that's not acceptable
M_D_FP_57: About ten percent would drop out in the first year about another four five percent in the second year and then you didn't really drop out then because you'd had the hard time
F_D_FP_59: Because medical schools I mean it's the same everywhere if they have ten percent now who've failed they would be seen as a failing medical school and they need to get over that and realise that that isn't a sign of failure that's a sign of robustness
F_D_FP_56: sign of strength isn't it
F_D_FP_59: It's a sign of robustness in their assessment techniques. Just because they took 200 students on if only 150 get through that's because they're rigorous in the assessment criteria not

because they're rubbish as an educational institute

M_D_FP_57: And <u>it's completely anachronistic moving the full registration backwards but making F1 tougher</u> more rigorously assessed which is what's going on because once you start it's always going to get tougher and tougher when we can do nothing about it

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Summary box (Phases 2 & 3): RQ5: What are stakeholders' views about the proposition of bringing forward the time of full registration to graduation.

- The proposal to align full registration with graduation elicited a wide range of views;
- The majority of interviewees agreed that it would require changes to undergraduate education and in TD09 Outcomes (CE, D_FP, HCP);
- Arguments in favour:
    - The change will result in emphasising integrating clinical experiences on the wards into undergraduate curricula and make graduates more effective doctors (CE, D_FP);
    - Early registration would have little impact on F1s daily practice (F1, FRTD, CE, D_FP, HCP, P_GVT);
    - Positive structural consequences included clarification of responsibilities between medical schools and deaneries that are currently overlapping; bringing a practical solution to oversubscription of F1 posts as graduates would be able to work anywhere; controlling medical conduct and application of regulatory measures early on.
- Arguments against:
    - Concerns that medical schools cannot deliver graduates ready for independent medical practice, particularly in professionalism. Stakeholders questioned the feasibility of sufficient embedding of medical students in the workplace to gain a comparable amount of experience that can be achieved by being a doctor in paid employment. These arguments implied higher expectations of registered graduates (EMP, HCP, CE, D_FP);
    - Early registration will counteract current changes in undergraduate and postgraduate education that seek to smoothen the transition. Similarly, if early registration would still imply the need for safeguards and supervision, then the meaning of registration would be diluted (EMP, P_GVT, D_FP);
    - The pre-registration period was described as a safe learning space for F1s across stakeholder groups. It also enables early intervention allowing graduates to grow into competent and safe doctors, especially in terms of decision making (CE, D_FP);
    - The supportive pre-registration structure was understood by members of all stakeholder groups as vital for patient safety. Concerns were raised that giving full registration early, even under the condition that workplace supervision was ensured, might give rise to undermining effective supervisory structures (D_FP, HCP).
    - Interviewees of all groups emphasized that despite practical exams and clinical placements, medical schools were not always successful in detecting problems in students' abilities to practice;
    - Other concerns were raised around implications for staffing (EMP) and attitudes to locum posts with less integration into the interprofessional teams (F1, FRTD);
    - Stakeholders from the CE, D_FP and HCP groups questioned whether moving the point of registration was mainly politically motivated and might impede the education of the trainee doctors;
    - Further stress for F1s might counteract measures in patient care (P_GVT, HCP, F1);
    - Different agendas of universities and medical schools, the difference between being a graduate and being a trainee, were put forward as obstacles for the feasibility of change;
    - Finally, additional assessment will be required, e.g., for professionalism, which was deemed difficult to implement by stakeholders (P_GVT, D_FP, EMP).

4.5. Discussion

4.4.1. The preparedness continuum [or the complexity of the concept of preparedness]

> "*Preparedness for practice, gosh, my understanding of it* ((*breathes deeply and sighs followed by 2-second pause and another sigh*))" [M_CE_144].

By directly exploring how preparedness is conceptualised, this study adds significantly to existing literature, which apart from the work of Kilminster and her colleagues (Kilminster, Zukas et al. 2011), tends to gloss over this challenging question. The concept of preparedness is not one-dimensional or a simplistic case of individuals being either prepared or not: while progress is certainly made over time, during this transition period it is a continual non-linear process. Our data reveal the complexity of the concept and how trainees can feel well-prepared for some aspects of patient care but not others, or feel prepared one day but not the next, or feel prepared in principle but unprepared for the volume or certain turns of events. The case studies (Tom from site 2, Anne from site 3 and Jack from site 4) illustrate the non-linear development of preparedness: "a continuing 'rollercoaster' of experiences" (Jack). The rollercoaster is partly a consequence of frequent change and the need for trainees to familiarize themselves rapidly with different environments, teams and ward cultures.

Although our results concord with a general finding from the rapid review about students being reasonably well-prepared for history-taking and physical examination, our study goes further by identifying the challenges of a high-volume time pressured workload, often with inadequate levels of staff. Trainees may feel prepared for situations when all goes to plan, but unprepared when exposed to high volumes of work which demand prioritization and multi-tasking; or uncertain thresholds (not knowing when to refer to seniors); inadequate team-working; or when seniors are not easily accessible. These provide illustration of the distinction between theoretical and practical preparedness. Thus, although the F1s in our study seemed well-prepared for simple diagnosis and treatment planning (which contrasts with the findings of the rapid review suggesting that trainees were mostly unprepared for making diagnoses[45]), the real workplace creates complex challenges affecting the judgements made by new doctors such as when to call for investigations.

Preparedness, against a backdrop of complexity and holistic approaches to practice, is increasingly important. Greenaway recommends 'broader for longer' medical training in order to ensure that medical professionals are well equipped to deal with the challenges of patient comorbidity (Greenaway 2013). Although trainees may be initially concerned to advance a checklist of competencies, the development of lifelong attitudes and abilities in more complex areas (such as coping with ethical dilemmas, regular transitions, stress and uncertainty, and multi-disciplinary team-working) is essential and our data highlight the importance of supporting students in their development of these long-term aspects of preparedness. Perhaps there is too great an emphasis on short-term preparation for undergraduates at the expense of longer-term preparation?

Some of the more problematic aspects of preparedness relate to non-technical skills such as communication and team-working. Greenaway recommends that medical training is 'broader for longer' to partly ensure a greater emphasis on multi-professional communication and team-working (Greenaway 2013). While some F1s reported positive situations of preparedness when communicating with patients and relatives, even in difficult situations (perhaps reflective of the communication skills drive in undergraduate medical education over the last decade or so), there were many stories where they struggled. For example, our data unpack the intricacies of doctor-patient communication scenarios by distinguishing the many and varied situational factors in play, including the emotional state of the patient (angry, upset), their vulnerability, and level of English, as well as the extent to which they have researched their condition (possibly resulting in the

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[45] There are some further interesting contrasts with the RR which found specific areas of unpreparedness, including wound suturing, central venous line insertion, chest drain insertion and prescribing.

patient being well/over/mis-informed). Changing demographics – an aging population and increasing incidence of dementia – leads to an increasing number of vulnerable patients with communication difficulties and possible violent outbursts. The unpredictable interplay of these factors makes it difficult for trainees to feel well-prepared for all eventualities, despite good training in medical school.

Our data on preparedness for communication with colleagues is not straightforward. While F1 doctors knew that it was important to build a good working relationship with nurses, they felt that communication between doctors and other healthcare professionals did not always flow smoothly. What stands out in our data is the importance of handover as a point where good communication is essential, which was also highlighted in the rapid review (Raduma-Tomàs, Flin et al. 2011). Regrettably, this links to and intensifies the responsibility issue in that trainees not only need to be insightful about their own limitations but need also to communicate this to the healthcare team.

Finally, our work extends previous work around the issue of graduates' understanding of the framework in which they work, including both structural and financial. When stakeholders discussed this issue they believed that F1s were relatively naïve in these areas: not understanding the wider healthcare context, ordering expensive and unnecessary tests and being completely unaware of the economics of prescribing. These views concurred with F1s' reports, whereby they developed these understandings over time and sometimes believed that aspects such as financial considerations were not of their concern.

4.4.2. Responsibility and emotion

"*increased level of anxiety because you know some of the responsibility of this persons health is with us absolutely… you don't feel like you're in the this position until you are the doctor…I'm suddenly a doctor. I didn't use to be a doctor…*" [F_FY_120, in A & E, 2-months in post]

Having outlined a number of key points that our work has highlighted, we will now consider some of the cross-cutting issues identified by our research. We begin by considering the all-pervasive subject of responsibility. Indeed, the consideration of responsibility was one of the most common issues discussed by all stakeholders. For our F1 participants, in particular, it was accompanied by much emotional turmoil.

The transition from medical student to F1 is momentous and can generate profound feelings of responsibility in new trainees. However well-prepared they might have felt in medical school, as new doctors, their responsibilities for patient care weigh heavily and can challenge new trainees' self-confidence. These feelings were commonly expressed across our interview and audio-diary data and we repeat here some of their moving, at times disturbing, language to stress the new doctors' responses to responsibility. Ben, the audio-diary participant for case study 1, described his experiences using words such as: "*under pressure*", "*scared*", "*bit of panic almost or fear*", "*nervous*", "*worried,*" and "*freaking out*". Another trainee, when describing being the first to arrive at the bedside of an unresponsive patient, stated: "…*there was too much information to take in and I felt as though I was freezing on the spot*". Moving from: "*being a student one day to a doctor the next*" was likened to being: "*in the deep end,*" and described as "*the biggest jump*". The "*overnight*" change in responsibility, "*you go from no responsibility to whole responsibility,*" was a common refrain.

While trainees worried about responsibilities, other stakeholders understood Foundation training as just that: a base training extending over a two-year period. These stakeholders, conversely, spoke of the need for trainees to know their limitations and to know when to seek help. Foundation doctors are *expected* to seek help from others and work as part of a team, and therefore, they do not have responsibility for many aspects of patient case and indeed are not fully registered for this year. F1 is a 12-month transition period, a time when the doctor takes on increased responsibility. However, not all seemed to share this understanding and so we hear of Foundation trainees feeling under pressure to make patient care decisions. This discrepancy

underscores the importance of communication and shared expectations and warrants further articulation of the steps toward full responsibility.

The relationship between trainee confidence and competence is a knotty one. A trainee's sense of their own competence is intertwined with their feeling of self-confidence. A certain level of confidence better enables trainees to develop their competence: feeling prepared to diagnose and manage care was facilitated by F1s' confidence in their own abilities. However, 'confidence' is not 'competence' and a lack of insight into their limitations (including over-confidence) is also undesirable.

4.4.3. The importance of the workplace

"*I've learnt more in this year- in these eight months than I learnt almost at the whole of medical school*" [F_F1_129]

It is clear from our data that it is unrealistic to expect 'preparedness' to be developed solely in medical school. Important aspects of becoming a doctor can only be learnt in the workplace while working as a trainee doctor (such as responsibility as discussed above). The workplace is where students and trainees are socialized into the medical profession, experience the nuances of communication, leadership, team cultures and so forth and learn directly from observing others. After all, their trainers are role models and the importance of good role modelling in assistantship and shadowing cannot be under-emphasized. Trainees spoke of the workplace being the place of 'real' learning and the only meaningful place for some learning (e.g. prescribing). This accentuates the value of assistantships which allow medical students to gradually 'act up' as a doctor and translate many theoretical skills into practice in a complex and often unstable working environment.

Our study adds to the evidence about the effectiveness of assistantships, which were found to be lacking in the literature by providing evidence for role of assistantships in smoothing the transition from medical student to F1. They are vital for developing contextual and situational knowledge. However, for both assistantships and shadowing, individual and context factors impact on their effectiveness. Currently the onus is on the individual student to make the most of the opportunity these interventions provide to developing their preparedness. But trainees often felt that they were not included as members of the multidisciplinary team during these student assistantships. To appropriately involve undergraduate students needs an investment of time on the part of team members, as well as the students themselves. On-call, weekend and night shifts often presented significant never-before-experienced learning but not all students got exposure to these circumstances: "...*we didn't get given any responsibility as a student*" [F_F1_27].

The GMC (2011) referred to: "specific duties under appropriate supervision" but expectations of the outcomes of assistantships could be more clearly delineated. There are also quality assurance issues: not all settings are appropriate and how the workplace integrates the student into the team and facilitates hands-on patient experience needs to be quality assured. Given the importance of the workplace experience in developing preparedness, a single week of shadowing is insufficient, significantly so if registration is moved to the end of undergraduate medical training (an issue we discuss further below).

Our data about the August transition gives a clear picture of unpreparedness and raises serious concerns about patient safety. Clearly, many of these concerns interface with discussion about assistantships, shadowing and induction; all of which can ameliorate some of the concerns expressed. A more extensive period of shadowing prior to the August start, for example, would smooth the transition and make it less of a big-bang start across the system, so reducing risks to patient safety. Integration into the work team prior to the official August start and a more gradual uptake of responsibility for patient care during a period of shadowing would lessen this step-change.

4.4.4. Bringing registration forward

"*I think provisional registration gives everyone a safety net*" [F_F1_122].

The Greenaway proposal to align full GMC registration with graduation may serve to exacerbate over-whelming feelings of responsibility in the early days of Foundation training (Greenaway 2013). The evidence in our study suggests that having earlier registration would need to be linked both to a widespread, shared understanding of the expectations of new doctors and the central role of assistantships and shadowing as part of undergraduate training: "*..there must be a period of an apprenticeship then as an undergraduate*" [F_EMP_180]. However, one of the issues with assistantships and shadowing was that not all team members actively worked to facilitate the integration of the student into the team and support them in taking responsibility for aspects of patient care. Knowing that Foundation trainees would begin their work with full registration might serve to encourage greater integration of students on assistantships and during shadowing and thus may enhance the likelihood that students are integrated into the team and given some patient care responsibility. So, earlier registration could act as a positive catalyst.

While some participants were 'pro-change' and some were not, many could see both sides of the case. However, overall, participants in our study provided twice as many different reasons why change should not happen than they did for change: the only fully 'pro-group' being undergraduate deans (although they raised against-change issues they unanimously felt change was possible and beneficial). The concerns raised from the more sceptical perspective included the extent to which changes to the curriculum would have to be introduced, including serious implications for examinations. Other tensions included differences between the ethos of a university education and workplace training (possibly highlighting why there were differences between undergraduate and postgraduate deans, with the former arguing for change and the latter against). But the most compelling argument against change appears to be the 'safety net' issue: pre-registration acts as a safety net for the trainee doctor, for Deaneries, and most importantly for patients.

4.4.5. Patient involvement

"*It's not a magic wand scenario is it?...this is what I've been doing…they don't want to know. It's all about what I, I as a doctor, do for you. And that's the wrong culture, and it's a very old-fashioned mind-set.*" [F_PPR_133]

Greenaway provides a number of reasons for recommending that medical training is 'broader for longer' and one of these is about ensuring that there is greater patient involvement (Greenaway 2013). It is alarming that only patients and public representatives in our study referred to the importance of involving patients in their own care. They wanted to be more involved, discuss the evidence base for different treatment options, receive help from doctors to understand their conditions better and be acknowledged for the important role they play. Carers wanted to be included in conversations as not only are they an essential font of knowledge about the patient but they need to be informed and involved as they are ultimately responsible for patient care at home. This raises the importance of reviewing expectations and assumptions about levels of involvement.

4.4.6. Phases 2 & 3: Challenges and strengths

The aim of the qualitative Phases 2 and 3 was to ascertain what 'preparedness for practice' meant to different groups of people and their views around how prepared graduates of today are for their roles as F1 doctors. The in-depth narrative interviews (Phase 2) with individuals and groups of key stakeholders allowed discussions around these issues, the focus on narratives of specific events helped to tease apart attitudes and opinions from actual experiences thereby grounding our understanding around specific events. The situational nature of these narratives allowed insights into enabling and inhibiting factors on personal, interpersonal and structural levels. Thus, this research began to overcome the problem with self-reports and decontextualized event reporting that currently prevails in the literature. Furthermore, we involved diverse stakeholders including

policy, employer and patient/carer representatives to gain multiple perspectives and triangulate our data.

The audio-diaries (Phase 3) facilitated depth of insight into the preparedness journeys of F1s, alongside their real-time development. The multi-site approach enabled us to include a range of regional contexts and to address the variety of influences on graduates' preparedness. That our findings are consistent across different sites and UK countries suggests that our data is broadly transferable to other UK contexts. Furthermore, our research provides a broader, more complex picture than other published studies to date.

However, as with any scientific approach there are methodological challenges. The interview format did not allow us to cover all outcomes detailed in TD09, plus additional ones discussed in the reviewed literature. Instead, we aimed to determine what issues were most relevant for diverse stakeholders through a set of initial open questions. Likewise the free format of the audio-diary method captured experiences that were memorable and important to those F1 narrators. In addition, we probed for key issues established in the rapid review and from discussions with the GMC. This open questioning, however, enabled us to see the different emphasis that each stakeholder group placed on specific aspects of graduates' preparedness for practice.

While the number of participants, the multi-site nature of the research and the large amount of data legitimises quantification, the numerical data reported in this document must be seen in context: not all interview participants were asked the same questions, audio diaries were free-flowing and we have analysed a subset of data (albeit a very large subset chosen for its representative quality and for breadth). The nature of such data therefore does not allow for meaningful statistical analysis. Instead, the quantification of the data serves to uncover patterns in our data, highlighting similarities and differences between stakeholder groups in terms of important issues around graduates' preparedness and unpreparedness.

The quantity of data we have gathered from a range of stakeholders warrants further interrogation via secondary analysis. For example, the issue of responsibility and the different discourses of responsibility that stakeholder groups draw upon when talking about graduates' preparedness would be a fruitful area for further examination. Examining the differences across preparedness and unpreparedness narratives of F1s' emotional talk might shed further insight into the emotional labour of F1s during their first few months in post. Indeed, the large amount of emotional talk within F1s narratives highlights the need to explore how these newly graduated medical students regulate their emotions during their early years of postgraduate medical training and whether there is any evidence of emotional recovery (i.e. their ability to successfully come back from the emotional intensity of a particular event). Furthermore, our data is replete with powerful metaphoric talk which we have not yet discussed in this report. An exploration of common metaphors around 'war' (e.g. "it's a bit of a battle at the moment") and other aspects of danger (e.g. "sink or swim", "in the deep end") to unpick the areas that appear to be more problematic for F1s would be informative.

In addition to undertaking secondary analysis of our data further research examining the undergraduate student to F1 transition phase should be prioritised by medical education researchers. Longitudinal studies, following cohorts of students through their final year assistantships and into their F2 year would be very beneficial and informative. This might include novel (and challenging) methodologies such as video observation and video reflexivity, whereby participants view and reflect on videos of their own practice, to engage all stakeholders in the process of change. Indeed, without the active engagement of all stakeholders involved in the education and development of tomorrow's doctors we may find it impossible to understand the complex interplay between individual, relational, and cultural factors in the development of Foundation doctors' preparedness for practice.

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5.0. References

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Definitions of all medical terms used

Medical Term	Definition
Acute Coronary Syndrome (ACS)	Disease of the coronary arteries, including angina and *myocardial infarction*
Acyclovir	An antiviral drug
Anaemia	Low levels of haemoglobin in the blood
Anatomy	The study of the human body
Antecubital fossa	Triangular cavity on the anterior view of the elbow
Aplastic Anaemia	Failure of blood cell production resulting in low haemoglobin in the blood
Arterial Blood Gas (ABG)	Blood test performed using blood from an artery to measure the amount of oxygen and carbon dioxide in the blood
Ascitic drain/ tap	Insertion of catheter into abdomen to drain or take a sample of ascitic fluid from the abdominal cavity
Assistantship	A type of clinical placement designed to increase the preparedness of the medical student to start practice as an F1
Blood Cultures	A microbiological culture of blood to detect organisms in the blood
Blood Test	A laboratory analysis performed on a blood sample that is usually extracted from a vein
British National Formulary (BNF)	Pharmaceutical reference book with information and advice on prescribing and pharmacology
Cannula	A hollow tube designed for insertion into a body cavity
Cannulation	Insertion of an indwelling plastic tube (cannula) into a patient's vein to allow fluids to be infused into the vein
Cardex	The chart on which medications are written up for hospital inpatients
Catheterisation	See *urinary catheterization*
Central Venous Line insertion	Insertion of an indwelling plastic tube (cannula) into a large vein leading directly to the heart
Chest drain insertion	Insertion of a plastic tube into the space between the lung and the chest wall
Complementary and Alternative Therapy	Various forms of therapy that are viewed as complementary or an alternative to conventional medicine
Creatinine	A breakdown product of creatine phosphate in muscle that can be used as a measure of renal function
Cultures	See *Blood Cultures*
Cushing's Syndrome	A collection of symptoms that develop as a result of very high levels of the hormone cortisol in the body
Deep Vein Thrombosis	A blood clot in one of the deep veins of the body

Cyclizine	An antihistamine drug
Diazepam	A Benzodiazepine drug used to treat a variety of conditions such as anxiety related symptoms, muscle spasms and epileptic seizures
Duodenal perforation	A tear or hole in the duodenum (part of the small intestine)
Duodenal stent	A tube placed inside the duodenum (part of the small intestine) to reopen or keep it open
Electrocardiogram (ECG)	A tracing of the electrical activity of the heart used to diagnose heart disease
Embolisation	The introduction of material into an artery to reduce or completely obstruct blood flow
Epididymo-orchitis	Inflammation of the epididymis (a tube that connects the testis to the vas deferens) and testicle
Estimated Glomerular Filtration Rate (eGFR)	A test to determine kidney function
Haematuria	Blood in the urine
Haemodialysis	A technique for removing waste material from the blood using the principle of dialysis (a method for separating particles within a liquid)
Haemoglobin	A substance contained within red blood cells
Haemorrhage	The escape of blood from a ruptured blood vessel
Kardex	See *Cardex*
Induction	A mandatory process whereby a new employee, such as a medical graduate about to take up a Foundation Programme position, is introduced to the environment and employment policies of a new position
Insulin	A hormone and an anti-hyperglycaemic drug
Intravenous (IV)	Infusion of a liquid or substance directly into a vein
Leukaemia	Cancer of the white blood cells
Local Anaesthetic	A type of medication used to numb specific areas of the body
Lymphoma	A cancer that starts in the lymph glands or other organs of the lymphatic system
Mediastinum	The middle section of the chest cavity
Meningeal signs	Signs of *meningitis*
Meningitis	Acute inflammation of the protective membranes covering the brain and spinal cord (the meninges)
Microbiology	The study of microscopic organisms
Mid-steam Specimen of Urine (MSSU)	A specimen of urine examined for the presence of microorganisms
Morphine	An opioid analgesic drug

Morphine slow release tablet (MST)	A slow and continuous release of morphine
Multidisciplinary	A group of healthcare professionals with different areas of expertise who unite to plan and carry out treatment of complex medical conditions
Myaesthenia Gravis	A chronic disease marked by abnormal fatiguability and muscle weakness
Myocardial Infarction (MI)	Death of a segment of heart muscle following interruption on its' blood supply
Nasogastric (NG) tube insertion	Insertion of a plastic tube through the nose into the stomach
Nebuliser	An instrument used for applying a liquid in the form of a fine spray
Neurology	The study of the structure, functioning and diseases of the nervous system
Objective Structured Clinical Examination (OSCE)	Type of examination used in medical school designed to test clinical and communication skills
Obstetrics and Gyneacology (Obs & Gynae)	The care of women during pregnancy and childbirth (obstetrics) and the study of diseases of women and girls (gyneacology)
Oesophago-gastro Duodenoscopy (OGD)	A diagnostic test done by passing a tube with a camera attached through the upper part of the gastrointestinal tract
On call	Available to be called for work
Opioid toxicity	An acute condition due to excessive use or an overdose of opioids (analgesic drug)
Opiotoxic	See *Opioid toxicity*
Orthopaedic	The practice of correcting deformities caused by disease or damage to the bones and joints
Paediatrics	The general medicine of childhood
Pancreatitis	Inflammation of the pancreas (gland that lies behind the stomach)
Pancytopenic	Low levels of red cells, white cells and platelets in the blood
Peri-arrest	Period either just before or just after a full cardiac arrest
Peripherally inserted central catheter (PICC) line	A large plastic catheter inserted from a peripheral vein through to a large vein near the heart
Permcath	A long term central venous catheter
Photophobia	A symptom of abnormal intolerance to visual perception of light
Precordial	Portion of the body over the heart and lower chest
Prednisolone	An corticosteroid drug
Pulmonary Function Test	A group of tests that measure how well the lungs are working
Respiratory Function tests	See *pulmonary function test*
Sepsis	A life-threatening condition triggered by infection
Shadowing	A period of time where medical students work with the F1 who is

	in the post they will take up when they graduate
Superior Vena Cava (SVC)	Large vein leading to the heart
Urea	Waste product excreted by the body in the urine
Urinary catheterization	Passing a plastic tube into the urinary bladder to permit drainage of urine
Urinary Tract Infection (UTI)	Infection of the urinary tract
Venepuncture	Inserting a needle into a patient's vein to take a sample of blood for testing, or to give an injection into the vein
Venflon	A type of cannula – see *cannulation*
Wheeze	An abnormal sound heard due to narrowing of the airways
Wound Suturing	Repairing defects in the skin by apposition of the wound edges using stitches
X-ray	A procedure used to produce images of the inside of the body
Zopiclone	Drug used for treating insomnia

Explanation of all abbreviations used

Abbreviation	Term	Definition
ABC	Airways Breathing Circulation	Acronym used for resuscitation
ABCDE	Airways Breathing Circulation Disability Exposure	Acronym used for resuscitation
ACS	Acute Coronary Syndrome	Disease of the coronary arteries, including angina and myocardial infarction
BNF	British National Formulary	Pharmaceutical reference book with information and advice on prescribing and pharmacology
CCU	Critical Care Unit	Special department that provides intensive care medicine
CE	Clinical Educators	Participants who represented medical educators
CPR	Cardiopulmonary Resuscitation	An emergency procedure for life support
CPT	Clinical Pharmacology and Therapeutics	A subspecialty of medicine overseeing that safe and effective use of medicines and new therapies
CT	Core Trainee Doctor	The first common period of specialty training following Foundation Year 2
D_FP	Deans and Foundation Programme Leads	Participants have a role as medical school Deans or leads in the Fountation Programme
DNAR	Do Not Attempt Resuscitation	A legal form to respect the wishes of a patient not to undergo CPR or advanced life support if they needed it

DVT	Deep Vein Thrombosis	A blood clot in one of the deep veins of the body
ECG	Electrocardiogram	A tracing of the electrical activity of the heart used to diagnose heart disease
eGFR	Estimated Glomerular Filtration Rate	A test to determine kidney function
EMP	Employers	Participants who worked as NHS directors or managers
FRTD	Fully Registered Trainee Doctor	Foundation year 2 trainees and all trainee doctors above (CT, ST, SpR)
F1	Foundation Year 1 Doctor	First year of work as a doctor following graduation from medical school
F2	Foundation Year 2 Doctor	Second year of work as a doctor following graduation from medical school
GIN	General Incident Narrative	Description of an event told in a generalised way
GMC	General Medical Council	Regulatory body for doctors in the UK
GP	General Practitioner	A doctor working in the community who provides family health services to a local area
HCP	Health Care Professional	People who work in any health care occupation or service
ICU	Intensive Care Unit	See *CCU*
IT	Information Technology	The application of computers and telecommunications equipment to store, retrieve, transmit and manipulate data
IV	Intravenous	Infusion of a liquid or substance directly into a vein
MET	Medical Emergency Team	Medical team who provide emergency care
MI	Myocardial Infarction	Death of a segment of heart muscle following interruption on its' blood supply
MST	Morphine slow release tablet	A slow and continuous release of morphine
MSU	Mid-stream Specimen of Urine	A specimen of urine examined for the presence of microorganisms
NG	Nasogastric	A nasogastric tube goes from the nose to the stomach
NHS	National Health Service	Publicly funded health service in the UK
OGD	Oesophago-gastro Duodenoscopy	A diagnostic test done by passing a tube with a camera attached through the upper part of the gastrointestinal tract
OSCE	Objective Structured Clinical Examination	Type of examination used in medical school designed to test clinical and communication skills

P_GVT	Policy and Government Officials	Members of regulatory bodies and government administration in the UK
PBL	Problem-based Learning	A teaching and learning method which puts a problem first, and in which further learning is conducted in the context of that problem
PfPP	Preparedness for Professional Practice	The handover period which starts right before the F1 post begins
PIN	Personal Incident Narrative	Description of a specific event experienced
PPR	Patient and Public Representatives	Representatives of patient groups and the public
PRN	Pro re nata	Medication given as needed
RR	Rapid Review	A streamlined approach to synthesizing evidence
SHO	Senior House Officer	A junior doctor undergoing training within a certain specialty in the Republic of Ireland or formerly in the British National Health Service (FY2 - ST1/2)
SpR	Specialist Registrar	A doctor in the Republic of Ireland and formerly in the UK who is receiving advanced training in a specialist field of medicine (ST2/3 – Consultant)
SSC	Student Selected Component	Parts of the medical curriculum that allow students to choose what they want to study (current term)
SSM	Special Study Module	Parts of the medical curriculum that allow students to choose what they want to study (old term)
SVC	Superior Vena Cava	Large vein leading to the heart
TD09	*Tomorrow's Doctors* 2009	Sets current standards for medical education in the UK
UK	United Kingdom	England, Wales, Scotland and Northern Ireland
UTI	Urinary Tract Infection	Infection of the Urinary Tract

Appendix A: Final Searches and Results

Database: Ovid MEDLINE(R) <1946 to June Week 4 2013>

436 Results

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1   Junior doctor*1.mp. (1519)
2   pre-registration house officer.tw. (57)
3   (foundation doctor* or F1 or FY1 or F2 or FY2 or foundation year 1 or foundation year one   or foundation year 2 or foundation year two).tw. (40696)
4   (PRHO* or houseman* or house man* or house officer* or intern).tw. (2826)
5   new* qualif* doctor*.tw. (97)
6   (SHO or senior house officer*).tw. (1005)
7   (medic* adj3 graduat*).tw. (7127)
8   "Internship and Residency"/ (34048)
9   or/1-8 (82614)
10   exp Professional Competence/ (82404)
11   exp Clinical Competence/ (63261)
12   exp Self Efficacy/ (11734)
13   (Confidence adj3 practice).tw. (232)
14   exp Professional Practice/ (215546)
15   exp Resilience, Psychological/ (1272)
16   exp coping behavior/ (100563)
17   exp Competency-Based Education/ (2705)
18   *"Education, Medical, Graduate"/ (14401)
19   *"Education, Medical"/ (34246)
20   "Education, Medical, Continuing"/ (20783)
21   (prepar* adj3 practi*).tw. (2393)
22   ((readiness or ready) adj3 practi*).tw. (253)
23   (transition* adj3 pract*).tw. (502)
24   ((Competence or prepare* or confiden* or ready) adj3 (practise or purpose or employab*)).tw. (361)
25   (resilien* adj3 medical).tw. (18)
26   (effective* adj3 medical curriculum).tw. (4)
27   foundation train*.tw. (43)
28   medical education.tw. (24142)
29   professionalism.tw. (4052)
30   prescribing skill*1.tw. (58)
31   scientific knowledge.tw. (3028)
32   (fitness adj3 practise).tw. (76)
33   (fitness adj3 purpose).tw. (156)
34   (defin* adj3 practi*).tw. (2392)
35   (asses* adj3 prepar*).tw. (1922)
36   (toler* adj3 uncert*).tw. (174)
37   Leadership.tw. (18613)
38   Ethical manner.tw. (50)
39   Clinical analysis.tw. (4760)
40   Clinical* effective*.tw. (9746)
41   Communicate effectively.tw. (392)
42   *"Communication"/ (26239)
43   Communicate appropriately.tw. (4)
44   Clinical responsibil*.tw. (258)
45   (Adapt adj3 chang*).tw. (1810)

46   Patient safety.tw. (11959)
47   *Patient Safety/ (1584)
48   Clinical judgement.tw. (1250)
49   Patient care.tw. (35296)
50   *Quality Assurance, Health Care/ (27761)
51   Quality assurance.tw. (17192)
52   (CPD or Continuing professional development).tw. (3858)
53   (Inadequate adj3 (supervision or train* or support or preparedness)).tw. (1614)
54   ((Inadequate or clinical) adj3 (supervision or train* or support or preparedness)).tw. (18527)
55   clinical performance.tw. (4913)
56   (Situation adj3 uncertainty).tw. (51)
57   (Emergency adj3 judgement).tw. (8)
58   Safe prescribing.tw. (103)
59   Reflection.tw. (27262)
60   "Feedback"/ (26196)
61   (Work adj3 autonomously).tw. (18)
62   (Assistantship or Mentoring).tw. (3103)
63   psychology knowledge.mp. (4)
64   Psychology/ (20398)
65   or/10-64 (684911)
66   exp Great Britain/ (295235)
67   exp Scotland/ (20714)
68   exp Northern Ireland/ (3907)
69   exp Wales/ (11989)
70   (Great Britain or Britain or England or Scotland or Wales or Ireland or UK or United Kingdom or welsh or english or scottish or irish).tw. (229183)
71   or/66-70 (443340)
72   9 and 65 and 71 (1501)
73   limit 72 to yr="2009 -Current" (436)

Database: CINAHL

191 Results

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1.   TX ''Junior doctor*'' (270)
2.   TX "pre-registration house officer" (7)
3.   TX "foundation doctor*" OR "F1 w/3 doctor" OR "FY1 w/3 doctor" OR "F2 w/3 doctor" OR "FY2 w/3 doctor" OR "foundation year 1" OR "foundation year one" OR "foundation year 2" OR "foundation year two" (43)
4.   TX PRHO* OR" houseman*" OR "house man*" OR "house officer*" OR intern (137)
5.   TX ''new* qualif* doctor*'' (33)
6.   TX SHO OR ''senior house officer*'' (134)
7.   TX medic* W3 graduat* (404)
8.   TX Internship AND TX Residency (272)
9.   S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 (1161)
10.   (MH "Professional Competence+") (38881)
11.   (MH "Clinical Competence+") (24361)
12.   (MM "Self-Efficacy") (3740)
13.   AB confidence OR AB practice OR AB "junior doctor*" (163157)
14.   (MH "Professional Practice+") (165677)
15.   (MH "Adaptation, Psychological+") (21194)
16.   TX "coping behaviour" (430)

17. TX "Competency-Based Education" (364)
18. TX *Education, Medical, Graduate (3708)
19. (MH "Education, Medical+") (20984)
20. (MM "Education, Medical, Continuing") (2286)
21. AB (prepar* W3 practi*) (1024)
22. TX (readiness W3 practi*) OR (ready W3 practi*) (670)
23. TX (transition* W3 pract*) (2367)
24. TX ((Competence OR prepare* OR confiden* OR ready) W3 (practise OR purpose OR employab*)). (672)
25. TX (resilien* W3 medical) (195)
26. TX (effective* W3 medical curriculum) (10)
27. TI "foundation train*" OR AB "foundation train*" (29)
28. TI medical education OR AB medical education (5841)
29. TI professionalism OR AB professionalism (2555)
30. TI "prescribing skill*" OR AB "prescribing skill*" (22)
31. TI "scientific knowledge" OR AB "scientific knowledge" (834)
32. TI (fitness W3 practise) OR AB (fitness W3 practise) (163)
33. TI (fitness W3 purpose) OR AB (fitness W3 purpose) (64)
34. TI (defin* W3 practi*) OR AB (defin* W3 practi*) (867)
35. TI (asses* W3 prepar*) OR AB(asses* W3 prepar*) (374)
36. TI (toler* W3 uncert*) OR AB (toler* W3 uncert*) (39)
37. TI "Leadership" OR AB "Leadership" (16780)
38. TI "Ethical manner" OR AB " Ethican manner" (1)
39. TI "Clinical analysis" OR AB "Clinical analysis" (205)
40. TI "Clinical* effective*" OR AB "Clinical* effective*" (2166)
41. TI "Communicate effectively" OR AB "Communicate effectively" (248)
42. TI (*"Communication") OR AB (*"Communication") (40288)
43. TI "Communicate appropriately" OR AB "Communicate appropriately" (1)
44. TI "Clinical responsibil*" OR AB "Clinical responsibil*" (91)
45. TI (Adapt W3 chang*) OR AB (Adapt W3 chang*) (323)
46. TI "Patient safety" OR AB "Patient safety" (9589)
47. TI "*Patient Safety" OR AB "*Patient Safety" (9589)
48. TI "Clinical judgement" OR AB "Clinical judgement" (327)
49. TI "Patient care" OR AB "Patient care" (18319)
50. TX "*Quality Assurance, Health Care" (38)
51. TI "Quality assurance" OR AB "Quality assurance" (3894)
52. TX CPD OR "Continuing professional development" (5258)
53. TX (Inadequate W3 (supervision or train* OR support OR preparedness)) (3657)
54. TX ((Inadequate OR clinical) W3 (supervision OR train* OR support OR preparedness)) (26663)
55. TI "clinical performance" OR AB "clinical performance" (1280)
56. TI (Situation W3 uncertainty) OR AB (Situation W3 uncertainty)(20)
57. TI (Emergency W3 judgement) OR AB (Emergency W3 judgement) (1)
58. TI "Safe prescribing" OR AB "Safe prescribing" (90)
59. TI "Reflection" OR AB "Reflection" (7175)
60. TX "Feedback" (70168)
61. TI (Work W3 autonomously) OR AB (Work W3 autonomously) (13)
62. TI (Assistantship OR Mentoring) OR AB (Assistantship OR Mentoring) (3024)
63. TX "psychology knowledge" (10)
64. (MH "Psychology, Occupational") (411)
65. S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR S34 OR S35 OR S36 OR S37 OR S38 OR S39 OR S40 OR S41 OR S42 OR S43 OR S44 OR S45 OR S46

OR S47 OR S48 OR S49 OR S50 OR S51 OR S52 OR S53 OR S54 OR S55 OR S56 OR S57 OR S58 OR S59 OR S60 OR S61 OR S62 OR S63 OR S64 (509,723)
66.   (MH "Great Britain+") (72,023)
67.   (MH "Scotland") (11,985)
68.   (MH "Northern Ireland") (2,556)
69.   (MH "Wales") (5,894)
70.   TI (("Great Britain" OR Britain OR England OR Scotland OR Wales OR Ireland OR UK OR "United Kingdom" OR welsh OR english OR scottish OR irish)) OR AB (("Great Britain" OR Britain OR England OR Scotland OR Wales OR Ireland OR UK OR "United Kingdom" OR welsh OR english OR scottish OR irish)) (75,158)
71.   S66 OR S67 OR S68 OR S69 OR S70 (127,706)
72.   S9 AND S65 AND S71 (191)

Database : ERIC

1540879 Results

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1.   AB,TI(Junior doctor*1) (51)
2.   ab,ti(pre-registration house officer) (1)
3.   ab,ti(("foundation doctor*" OR F1 OR FY1 OR F2 OR FY2 OR "foundation year 1" OR "foundation year one" OR "foundation year 2" OR "foundation year two")) (125)
4.   AB,TI(PRHO* OR "houseman*" OR "house man*" OR "house officer*" OR intern) (2796)
5.   AB,TI(new* qualif* doctor*) (81)
6.   AB,TI(SHO OR "senior house officer*") (11)
7.   AB,TI(medic* NEAR/3 graduat*) (786)
8.   AB,TI(Internship and Residency) (82)
9.   S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 (3893)
10.   SU.EXACT.EXPLODE("Professional Competence") (3)
11.   SU.EXACT.EXPLODE("Clinical Competence") (13)
12.   SU.EXACT.EXPLODE("Self Efficacy") (6944)
13.   AB,TI((Confidence NEAR/3 practice)) (88)
14.   Professional AND Practice (30366)
15.   SU.EXACT.EXPLODE("Resilience (Psychology)") (755)
16.   SU.EXACT.EXPLODE("Coping") (9243)
17.   SU.EXACT.EXPLODE("Competency Based Education") (10649)
18.   AB,TI(*Education, Medical, Graduate) (718)
19.   AB,TI(*Education, Medical) (7166)
20.   AB,TI(Education, Medical, Continuing) (853)
21.   AB,TI((prepar* NEAR/3 practi*)) (1893)
22.   AB,TI readiness OR ready NEAR/3 practi* (60)
23.   AB,TI((transition* NEAR/3 pract*)) (528)
24.   AB,TI((Competence OR prepare* OR confiden* OR ready) NEAR/3 (practise OR purpose OR employab*)) (921)
25.   AB,TI((resilien* NEAR/3 medical)) (4)
26.   AB,TI(effective* NEAR/3 "medical curriculum") (2)
27.   AB,TI("foundation train*") (17)
28.   AB,TI("medical education") (2345)
29.   AB,TI("professionalism") (3226)
30.   AB,TI("prescribing skill*") (4)
31.   AB,TI("scientific knowledge") (1168)
32.   AB,TI(fitness NEAR/3 practise) (35)

33. AB,TI(fitness NEAR/3 purpose) (71)
34. ("defin*" NEAR/3 "practi*") (1434)
35. ("asses*" NEAR/3 "prepar*") (1106)
36. AB,TI(toler* NEAR/3 uncert*) (46)
37. "Leadership" (56817)
38. "Ethical manner" (26)
39. "Clinical analysis" (30)
40. "Clinical* effective*" (50)
41. ("Communicate effectively") (483)
42. "*Communication" (129322)
43. "Communicate appropriately" (6)
44. "Clinical responsibil*" (6)
45. Adapt NEAR/3 chang* (573)
46. "*Patient Safety" (79)
47. "Clinical judgement" (14)
48. "Patient care" (811)
49. "*Quality Assurance", "Health Care" (53)
50. "Quality assurance" (2883)
51. CPD OR "Continuing professional development" (846)
52. AB,TI (Inadequate NEAR/3 (supervision or train* or support or preparedness)(648)
53. (Inadequate OR clinical) NEAR/3 (supervision OR train* OR support OR preparedness) (2523)
54. "clinical performance" (173)
55. Situation NEAR/3 uncertainty (36)
56. Emergency OR judgement (19881)
57. Safe prescribing (5)
58. Reflection (22435)
59. "Feedback" (25970)
60. Work NEAR/3 autonomously (11)
61. Assistantship OR Mentoring (7302)
62. "psychology knowledge" (15)
63. Psychology (122587)
64. S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19 OR S20 OR S21 OR S22 OR S23 OR S24 OR S25 OR S26 OR S27 OR S28 OR S29 OR S30 OR S31 OR S32 OR S33 OR 34 OR 35 OR 36 OR 37 OR 38 OR 39 OR 40 OR 41 OR 42 OR 43 OR 44 OR 45 OR 46 OR 47 OR 48 OR 49 OR 50 OR 51 OR 51 OR 52 OR 53 OR 53 OR 54 OR 55 OR 56 OR 57 OR 58 OR 59 OR 60 OR 61 OR 62 OR 63 (409300)
65. "Great Britain" (9473)
66. "Scotland" (4290)
67. "Northern Ireland" (1270)
68. "Wales" (4909)
69. AB,TI(Great Britain OR Britain OR England OR Scotland OR Wales OR Ireland OR UK OR United Kingdom OR welsh OR english OR scottish OR irish) (1540880)
70. S35 OR S35 OR S37 OR S38 OR S39 (1540879)

Database: HMIC

71 Results

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1   Junior doctor*1.mp. (883)
2   pre-registration house officer.tw. (20)

3   (foundation doctor* or F1 or FY1 or F2 or FY2 or foundation year 1 or foundation year one or foundation year 2 or foundation year two).tw. (43)

4   (PRHO* or houseman* or house man* or house officer* or intern).tw. (452)

5   new* qualif* doctor*.tw. (31)

6   (SHO or senior house officer*).tw. (269)

7   (medic* adj3 graduat*).tw. (263)

8   "Internship and Residency"/ (1)

9   or/1-8 (1543)

10   exp Professional Competence/ (536)

11   exp Students/ or exp Assessment/ or exp Clinical practice/ or exp Professional competence/ or exp medical staff/ or exp Skills/ or exp Competence assessment/ (37158)

12   Self Efficacy.mp./ (346)

13   (Confidence adj3 practice).tw. (34)

14   exp Professional Practice/ (15225)

15   exp Stress/ or exp Mental health/ or exp Depression/ (9267)

16   exp Occupational stress/ or exp Statistical data/ or exp Students/ or exp behaviour/ (48128)

17   exp Competence based learning/ 29

18   *"Education, Medical, Graduate"/ (0)

19   *"Education, Medical"/ (0)

20   "Education, Medical, Continuing"/ (0)

21   (prepar* adj3 practi*).tw. (247)

22   ((readiness or ready) adj3 practi*).tw. (25)

23   (transition* adj3 pract*).tw. (37)

24   ((Competence or prepare* or confiden* or ready) adj3 (practise or purpose or employab*)).tw. (29)

25   (resilien* adj3 medical).tw. (4)

26   (effective* adj3 medical curriculum).tw. (0)

27   foundation train*.tw. (16)

28   medical education.tw. (1308)

29   professionalism.tw. (458)

30   prescribing skill*1.tw. (3)

31   scientific knowledge.tw. (103)

32   (fitness adj3 practise).tw. (75)

33   (fitness adj3 purpose).tw. (51)

34   (defin* adj3 practi*).tw. (242)

35   (asses* adj3 prepar*).tw. (88)

36   (toler* adj3 uncert*).tw. (8)

37   Leadership.tw. (3328)

38   Ethical manner.tw. (6)

39   Clinical analysis.tw. (9)

40   Clinical* effective*.tw. (1089)

41   Communicate effectively.tw. (40)

42   "Communication"/ (10086)

43   Communicate appropriately.tw. (1)

44   Clinical responsibil*.tw. (59)

45   (Adapt adj3 chang*).tw. (82)

46   Patient safety.tw. (1687)

47   exp Patient Safety/ (2553)

48   Clinical judgement.tw. (149)

49   Patient care.tw. (4919)

50   exp Quality assurance in health services/ (15975)

51   Quality assurance.tw. (2746)

52   (CPD or Continuing professional development).tw. (458)

53   (Inadequate adj3 (supervision or train* or support or preparedness)).tw. (186)
54   ((Inadequate or clinical) adj3 (supervision or train* or support or preparedness)).tw. (1469)
55   clinical performance.tw. (204)
56   (Situation adj3 uncertainty).tw. (2)
57   (Emergency adj3 judgement).tw. (0)
58   Safe prescribing.tw. (5)
59   Reflection.tw. (759)
60   "Feedback"/ (148)
61   (Work adj3 autonomously).tw. (9)
62   (Assistantship or Mentoring).tw. (246)
63   psychology knowledge.mp. (1)
64   Psychology/ (349)
65   or/10-64 (118047)
66   exp Great Britain/ (443)
67   exp Scotland/ (5016)
68   exp Northern Ireland/ (1368)
69   exp Wales/ (3558)
70   (Great Britain or Britain or England or Scotland or Wales or Ireland or UK or United Kingdom or welsh or english or scottish or irish).tw. (51863)
71   or/66-70 (54958)
72   9 and 65 and 71 (340)
73   limit 72 to yr="2009 -Current" (71)

Database: Ovid PsychINFO

51 Results

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1   Junior doctor*1.mp. (227)
2   pre-registration house officer.tw. (10)
3   (foundation doctor* or F1 or FY1 or F2 or FY2 or foundation year 1 or foundation year one or foundation year 2 or foundation year two).tw. (1316)
4   (PRHO* or houseman* or house man* or house officer* or intern).tw. (545)
5   new* qualif* doctor*.tw. (20)
6   (SHO or senior house officer*).tw. (104)
7   (medic* adj3 graduat*).tw. (1057)
8   "Internship and Residency"/ (14)
9   or/1-8 (3126)
10   exp Professional Competence/ (3549)
11   exp Clinical Competence/ (314)
12   exp Self Efficacy/ (8479)
13   (Confidence adj3 practice).tw. (107)
14   exp Professional Practice/ (2368)
15   exp Resilience, Psychological/ (5149)
16   exp coping behavior/ (16976)
17   exp Competency-Based Education/ (55)
18   *"Education, Medical, Graduate"/ (0)
19   *"Education, Medical"/ (0)
20   "Education, Medical, Continuing"/ (0)
21   (prepar* adj3 practi*).tw. (906)
22   ((readiness or ready) adj3 practi*).tw. (129)
23   (transition* adj3 pract*).tw. (392)

24   ((Competence or prepare* or confiden* or ready) adj3 (practise or purpose or employab*)).tw. (126)
25   (resilien* adj3 medical).tw. (13)
26   (effective* adj3 medical curriculum).tw. (0)
27   foundation train*.tw. (12)
28   medical education.tw. (4777)
29   professionalism.tw. (2017)
30   prescribing skill*1.tw. (5)
31   scientific knowledge.tw. (1494)
32   (fitness adj3 practise).tw. (20)
33   (fitness adj3 purpose).tw. (40)
34   (defin* adj3 practi*).tw. (994)
35   (asses* adj3 prepar*).tw. (351)
36   (toler* adj3 uncert*).tw. (125)
37   Leadership.tw. (23242)
38   Ethical manner.tw. (57)
39   Clinical analysis.tw. (151)
40   Clinical* effective*.tw. (874)
41   Communicate effectively.tw. (258)
42   *"Communication"/ (6804)
43   Communicate appropriately.tw. (8)
44   Clinical responsibil*.tw. (68)
45   (Adapt adj3 chang*).tw. (571)
46   Patient safety.tw. (1348)
47   *Patient Safety/ (0)
48   Clinical judgement.tw. (160)
49   Patient care.tw. (4238)
50   *Quality Assurance, Health Care/ (0)
51   Quality assurance.tw. (1033)
52   (CPD or Continuing professional development).tw. (709)
53   (Inadequate adj3 (supervision or train* or support or preparedness)).tw. (494)
54   ((Inadequate or clinical) adj3 (supervision or train* or support or preparedness)).tw. (5392)
55   clinical performance.tw. (298)
56   (Situation adj3 uncertainty).tw. (36)
57   (Emergency adj3 judgement).tw. (0)
58   Safe prescribing.tw. (16)
59   Reflection.tw. (13071)
60   "Feedback"/ (5164)
61   (Work adj3 autonomously).tw. (8)
62   (Assistantship or Mentoring).tw. (4412)
63   psychology knowledge.mp. (38)
64   Psychology/ (9476)
65   or/10-64 (115354)
66   exp Great Britain/ (755)
67   exp Scotland/ (2039)
68   exp Northern Ireland/ (1173)
69   exp Wales/ (3294)
70   (Great Britain or Britain or England or Scotland or Wales or Ireland or UK or United Kingdom or welsh or english or scottish or irish).tw. (63028)
71   or/66-70 (63037)
72   9 and 65 and 71 (92)
73   limit 72 to yr="2009 -Current" (51)

Database: Web of Science

253 Results

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1.   TS=(Junior doctor*) [580]
2.   TS=("pre-registration house officer") [3]
3.   TS=("foundation doctor*" OR (F1 NEAR/3 doctor) OR (FY1 NEAR/3 doctor) OR (F2 N/3 doctor) OR (FY2 N/3 doctor) OR "foundation year 1" OR "foundation year one" OR " foundation year 2" OR "foundation year two") [67]
4.   TS=((PRHO* OR "houseman*" OR "house man*" OR " house officer*" OR intern)) [1367]
5.   TS=(new* qualif* doctor*) [77]
6.   TS=((SHO OR "senior house officer*")) [232]
7.   TS=((medic* NEAR/3 graduat*)) [1829]
8.   TS=(''Internship and Residency'') [167]
9.   #8 OR #7 OR #6 OR #5 OR #4 OR #3 OR #2 OR #1 [3948]
10.   TS=''Professional Competence'' [1365]
11.   TS=''Clinical Competence'' [2359]
12.   TS=''Self Efficacy'' [9869]
13.   TS= (Confidence NEAR/3 practice) [171]
14.   TS=''Professional Practice'' [10843]
15.   TS=(Resilience AND Psychological) [360]
16.   TS=(coping behavio$r) [2835]
17.   TS="Competency-Based Education" [117]
18.   TS=(*"Education, Medical, Graduate") [12]
19.   TS=(*"Education, Medical") [144]
20.   TS="Education, Medical, Continuing" [12]
21.   TS= (prepar* NEAR/3 practi*) [1061]
22.   TS=((readiness OR ready) NEAR/3 practi*) [154]
23.   TS=(transition* NEAR/3 pract*) [351]
24.   TS=((Competence OR prepare* OR confiden* OR ready) NEAR/3 (practise OR purpose OR employab*)) [1079]
25.   TS= (resilien* NEAR/3 medical) [11]
26.   TS= (effective* N/3 ''medical curriculum''). [2]
27.   TS="foundation train*" [40]
28.   TS= ''medical education'' [15569]
29.   TS= professionalism [1440]
30.   TS= "prescribing skill*" [30]
31.   TS= "scientific knowledge" [1432]
32.   TS= (fitness NEAR/3 practice) [91]
33.   TS= (fitness NEAR/3 purpose) [166]
34.   TS= (defin* NEAR/3 practi*) [1150]
35.   TS= (asses* NEAR/3 prepar*) [834]
36.   TS= (toler* NEAR/3 uncert*) [213]
37.   TS= " Leadership" [5677]
38.   TS= "Ethical manner" [14]
39.   TS= "Clinical analysis" [806]
40.   TS= "Clinical* effective*" [2393]
41.   TS= " Communicate effectively" [116]
42.   TS=(*"Communication") [103616]
43.   TS= (Communicate AND appropriately) [102]
44.   TS= "Clinical responsibil*" [64]
45.   TS= (Adapt NEAR/3 chang*) [3195]

46.   TS = "Patient safety" [5936]
47.   TS= "*Patient Safety" [5943]
48.   TS= " Clinical judgement" [171]
49.   TS= " Patient care" [7543]
50.   TS= ("*Quality Assurance" AND "Health Care") [313]
51.   TS= "Quality assurance" [5810]
52.   TS= (CPD OR "Continuing professional development") [1358]
53.   TS= (Inadequate NEAR/3 (supervision OR train* OR support OR preparedness)) [522]
54.   TS= ((Inadequate OR clinical) NEAR/3 (supervision OR train* OR support OR preparedness)) [8204]
55.   TS= " clinical performance" [1566]
56.   TS= (Situation NEAR/3 uncertainty) [193]
57.   TS= (Emergency NEAR/3 judgement) [11]
58.   TS= "Safe prescribing" [45]
59.   TS= "Reflection" [35439]
60.   TS="Feedback" [66710]
61.   TS= (Work NEAR/3 autonomously) [73]
62.   TS=(Assistantship OR Mentoring) [2370]
63.   TS= "psychology knowledge" [3]
64.   TS= Psychology [5855]
65.   #64 OR #63 OR #62 OR #61 OR #60 OR #59 OR #58 OR #57 OR #56 OR #55 OR #54 OR #53 OR #52 OR #51 OR #50 OR #49 OR #48 OR #47 OR #46 OR #45 OR #44 OR #43 OR #42 OR #41 OR #40 OR #39 OR #38 OR #37 OR #36 OR #35 OR #34 OR #33 OR #32 OR #31 OR #30 OR #29 OR #28 OR #27 OR #26 OR #25 OR #24 OR #23 OR #22 OR #21 OR #20 OR #19 OR #18 OR #17 OR #16 OR #15 OR #14 OR #13 OR #12 OR #11 OR #10 [280693]
66.   TS="Great Britain" [2352]
67.   TS= Scotland [4574]
68.   TS="Northern Ireland" [1061]
69.   TS=Wales [6836]
70.   TS= ("Great Britain" OR Britain OR England OR Scotland OR Wales OR Ireland OR UK OR "United Kingdom" OR welsh OR english OR scottish OR irish) [127342]
71.   #70 OR #69 OR #68 OR #67 OR #66 [127342]
72.   9 and 65 and 71 [253]

Database SCOPUS

199 RESULTS

_____
1.   "Junior doctor*" [ALL] 8201
2.   "pre-registration house officer" [ABS, TITLE, KEYWORD] 176
3.   "foundation doctor*" or "F1 W/3 doctor" or "FY1 W/3 doctor" or "F2 W/3 doctor" or "FY2 W/3 doctor" or "foundation year 1" or "foundation year one" or "foundation year 2" or "foundation year two" [ABS, TITLE, KEYWORD] 7915
4.   ("PRHO*" or "houseman*" or "house man*" or "house officer*" or "intern") [ABS, TITLE, KEYWORD] 2401
5.   new* qualif* doctor*[ABS, TITLE, KEYWORD] 684
6.   ("SHO" or "senior house officer*") [ABS, TITLE, KEYWORD] 734
7.   (medic* W/3 graduat*) [ABS, TITLE, KEYWORD] 30,467
8.   "Internship and Residency" [ALL] 32,262
9.   #1 OR #2 etc (can only search a certain amount of characters, need to add in fields) 72,517
10. "Professional Competence" [ALL] 90,912
11. "Clinical Competence" [ALL] 176,240

12.   "Self Efficacy" [ALL] 250,195
13.   (Confidence W/3 practice) [ABS, TITLE, KEYWORD] 1,479
14.   "Professional Practice" [ALL] 459,448
15.   "Resilience, Psychological" [ALL] 1,156
16.   "coping behavi?r" [ALL] 162,502
17.   "Competency-Based Education" [ALL] 8,151
18.   *"Education, Medical, Graduate"[ALL] 20,251
19.   *"Education, Medical"[ALL] 154,535
20.   "Education, Medical, Continuing"[ALL] 19,735
21.   (prepar* W/3 practi*)[ABS, TITLE, KEYWORD] 7,666
22.   ((readiness or ready) W/3 practi*) [ABS, TITLE, KEYWORD] 844
23.   (transition* W/3 pract*)[ABS, TITLE, KEYWORD] 2216
24.   ((Competence or prepare* or confiden* or ready) W/3 (practise or purpose or employab*))[ABS, TITLE, KEYWORD] 2,181
25.   (resilien* W/3 medical) [ABS, TITLE, KEYWORD]59
26.   (effective* W/3 medical curriculum) [ABS, TITLE, KEYWORD] 298
27.   "foundation train*"[ABS, TITLE, KEYWORD] 9,217
28.   "medical education" [ABS, TITLE, KEYWORD] 347,912
29.   professionalism[ABS, TITLE, KEYWORD] 11,239
30.   "prescribing skill*"[ABS, TITLE, KEYWORD] 733
31.   "scientific knowledge" [ABS, TITLE, KEYWORD] 9213
32.   (fitness W/3 practise) [ABS, TITLE, KEYWORD] 129
33.   (fitness W/3 purpose) [ABS, TITLE, KEYWORD] 1,065
33.   (defin* W/3 practi*)[ABS, TITLE, KEYWORD]8483
35   (asses* W/3 prepar*)[ABS, TITLE, KEYWORD]5925
36   (toler* W/3 uncert*)[ABS, TITLE, KEYWORD] 1303
37   Leadership[ABS, TITLE, KEYWORD] 88435
38   "Ethical manner"[ABS, TITLE, KEYWORD] 140
39   "Clinical analysis"[ABS, TITLE, KEYWORD]1692524
40   "Clinical* effective*"[ABS, TITLE, KEYWORD]625660
41   "Communicate effectively"[ABS, TITLE, KEYWORD] 3551
42   "Communication" [ALL] 4960405
43   "Communicate appropriately"[ABS, TITLE, KEYWORD] 17
44   "Clinical responsibil*"[ABS, TITLE, KEYWORD] 20772
45   (Adapt W/3 chang*)[ABS, TITLE, KEYWORD] 9947
46   "Patient safety"[ABS, TITLE, KEYWORD] 291353
47   "Patient Safety" [ALL] 84150
48   " Clinical judgement"[ABS, TITLE, KEYWORD] 20704
49   "Patient care"[ABS, TITLE, KEYWORD] 1143807
50   "Quality assurance in health services" [ABS, TITLE, KEYWORD] 18684
51   " Quality assurance"[ABS, TITLE, KEYWORD] 125626
52   (CPD or "Continuing professional development") [ABS, TITLE, KEYWORD] 7959
53   (Inadequate W/3 (supervision or train* or support or preparedness)) [ABS, TITLE, KEYWORD] 3246
54   ((Inadequate or clinical) W/3 (supervision or train* or support or preparedness)) [ABS, TITLE, KEYWORD] 43954
55   "clinical performance"[ABS, TITLE, KEYWORD] 258325
56   (Situation W/3 uncertainty) [ABS, TITLE, KEYWORD] 1177
57   (Emergency W/3 judgement) [ABS, TITLE, KEYWORD] 105
58   "Safe prescribing"[ABS, TITLE, KEYWORD] 1468
59   Reflection[ABS, TITLE, KEYWORD] 336065
60   "Feedback" [ALL] 354706
61   (Work W/3 autonomously) [ABS, TITLE, KEYWORD] 213

62   (Assistantship or Mentoring) [ABS, TITLE, KEYWORD] 8535
63   "psychology knowledge" [ABS, TITLE, KEYWORD] 23557
64   Psychology [ALL] 391730
65   #10-64 (Manually combine all) 1115811
66   "Great Britain" [ALL] 296,897
67   Scotland [ALL] 198,883
68   "Northern Ireland"[ALL] 46,455
69   " Wales" 401,528
70   ("Great Britain "or Britain or England or Scotland or "Wales" or Ireland or UK or "United Kingdom" or welsh or english or scottish or irish) 1,734,719
71   #66-70 (Manually combine all) 9,319
72   9 and 65 and 71 2,654
73   limit search result 72, to years 2009-2013, manually input all limitations/exclusions as per the protocol into the relevant boxes 199

Appendix B: List of all Search Results including Additional Web Sites and Journals Searched

DATABASES	Researcher	Date	Results
Cinahl	EP	10.07.13	191
ERIC	EP	10.07.13	91
Embase	LJG	09.07.13	**387**
Medline	MM	10.07.13	436
Medline in Process	MM	10.07.13	26
Psycinfo	ZJ	10.07.13	51
WOK- Web of science	EP	10.07.13	253
Scopus	LJG	09.07.13	199
HMIC	EP	10.07.13	71
			TOTAL 1705

WEBSITES	Researcher	Date	Results
Academy of Medical Royal Colleges	LJG	05.07.13	0
General Medical Council	LJG	08.07.13	60
Health Education England	EP	08.07.13	0
Royal College of Psychiatrists	EP	08.07.13	0
The Royal College of Midwives	EP	08.07.13	0
Royal College of Nursing	EP	08.07.13	0
Royal College of General Practitioners	EP	08.07.13	0
Royal College of Physicians	LJG	08.07.13	30
Royal College of Obstetricians and Gynaecologists	LJG	08.07.13	11
Royal College of Paediatrics and Child Health	LJG	08.07.13	18
Royal College of Anaesthetists	LJG	08.07.13	0
The Royal College of Surgeons of England	LJG	08.07.13	55
Royal College of Pathologists	ZJ	10.07.13	0
The Royal College of Radiologists	ZJ	10.07.13	0
The Royal College of Surgeons of Edinburgh	EP	08.07.13	0
The Royal College of Ophthalmologists	ZJ	05.07.13	0
Royal College and Physicians and Surgeons of Glasgow	ZJ	08.07.13	86
Membership of the Royal Colleges of Physicians of the UK	LJG	05.07.13	0
Healthboard East Midlands	LJG	05.07.13	0
Healthboard East of England	LJG	05.07.13	0
Healthboard Yorkshire and Humber	LJG	05.07.13	0
Healthboard Wessex	LJG	05.07.13	0
Healthboard Thames Valley	LJG	05.07.13	0
Healthboard North West London	LJG	05.07.13	0
Healthboard South London	LJG	05.07.13	0
Healthboard North Central and East London	LJG	05.07.13	0
Healthboard Kent, Surrey and Sussex	LJG	05.07.13	0
Healthboard North East	LJG	05.07.13	0
Healthboard North West	LJG	05.07.13	0
Healthboard West Midlands	LJG	05.07.13	0

Healthboard South West	LJG	05.07.13	0
			TOTAL 260

JOURNALS	Researcher	Date	Results
Academic Medicine	EP	05.07.13	226
Advances in Health Sciences Education	LJG	04.07.13	70
Annals of The Royal College of Surgeons of England	LJG	05.07.13	105
BMC Medical Education	LJG	04.07.13	108
BMJ	LJG	04.07.13	23
BMJ Quality and safety	ZJ	08.07.13	195
Clinical Teacher	EP	04.07.13	209
Evaluation and the Health Professions	ZJ	05.07.13	16
International Journal for Quality and Health Care	EP	08.07.13	17
Journal of American Medical Association	LJG	04.07.13	40
Journal of Continuing Education in the Health Professions	ZJ	10.07.13	51
Journal of Graduate Medical Education	LJG	05.07.13	207
Medical Defence Union Journal	LJG	08.07.13	145
Medical Education	LJG	04.07.13	31
Medical Teacher	EP	05.07.13	44
New England Journal of Medicine	EP	05.07.13	21
Postgraduate Medical Journal	ZJ	04.07.13	176
Student British Medical Journal	EP	08.07.13	102
The British Journal of General Practice	EP	08.07.13	7
The Lancet	EP	08.07.13	4
			TOTAL 1797
		GRAND TOTAL	**3762**

Appendix C: Quality assessment criteria

Quality Indicator for QUANTITATIVE studies

Quality Indicator	Detail
Research question	Is the research question(s) or hypothesis clearly stated?
Study Participants	Is the participant group appropriate for the study being carried out (number, characteristics, selection, and homogeneity)? Were the participants from more than one location?
'Data' collection method	Are the methods used reliable and valid for the research question and context?
Completeness of 'data'	Have participants dropped out? Is this attrition rate less than 50%? For questionnaire based studies, is the response rate acceptable (60% or above) or has the response rate issue been addressed appropriately?
Control for confounding	Have multiple factors/variables been removed or accounted for where possible?
Analysis of results	Are the statistical methods appropriately used? If not, why not?
Conclusions	Is it clear that the data justify the conclusions drawn as reported in the abstract?
Reproducibility	Could the study be repeated by other researchers?
Theoretical Perspective	What is the theory? Is it explicit?
Study design	What is the design of the study? Is it explicit?
Ethical issues	Were all relevant ethical issues addressed? If not, what wasn't addressed?

Quality Indicator for QUALITATIVE studies

Quality Indicator	Detail
Research question	Is the research question(s) clearly stated?
Study Participants	Is the participant group appropriate for the study being carried out (number, characteristics, selection and homogeneity/diversity)? Are the participants from more than one location?
Theoretical Perspective	What is the theory? Is it explicit? Is it apriori or post hoc?
'Data' collection method	Are the methods used reliable and valid for the research question, context and theory?
Completeness of 'data'	Have participants dropped out? Is this attrition rate less than 50%?
Analysis of results	Are the analytical methods appropriately used? Was there more than one person developing the thematic coding framework (if there was one)? If not, why not?
Conclusions	Is it clear that the data justify the conclusions drawn as reported in the abstract?
Reproducibility	Could the study be repeated by other researchers?
Study design	What is the design of the study? Is it explicit?
Clear explanation of methods of data collection and analysis	Is there a clear account of the process of data collection and analysis? Is there sufficient data (quotations) to judge whether the authors' interpretation is adequately supported? Alternatively, do the researchers rely too heavily on verbatim quotes with little of their own description of themes?
Fair dealing	Does the research design explicitly incorporate a range of different perspectives so one group is not presented as if it represents the whole truth about a situation.
Ethical issues	Were all relevant ethical issues addressed? If not, what wasn't addressed?
Attention to negative cases	As well exploring alternative explanations for the data, have the authors discussed elements in the data that (apparently) contradict the 'main trend' of the phenomena under study.
Reflexivity	Have the authors reflected on their role(s) in the study? What is the relationship between the researcher and the participants?

Quality Indicator for MIXED METHODS studies

Use both sets of indices depending on the part of the study you are assessing – and also consider the issue of 'Triangulation' - are the results from either two or more different methods of data collection (for example, interviews and questionnaires) comparable? Did the researchers look for patterns of convergence to develop or corroborate their interpretation?

Appendix D: Full list of studies in this review with details of context, study design and research questions

Author	Year Pub	Study Design	Number of Participants	Theme	Research Question(s)
Ahmed et al.	2012	Cross sectional retrospective review of portfolios	30	Health and Safety	*"...to evaluate whether foundation year (FY1) doctors reflect on PSIs within their portfolios and to explore the potential value of such reflections for quality of care"* (p. 125)
Arora et al	2010	Systematic Review	16 articles in final review	Resilience	*"...the primary aim of determining the relationship of EI to the ACGME competencies with a specific focus upon educational and clinical outcomes" (p. 751).*
Atrey et al.	2010	Test-training then improvement recorded	Survey of 88 consultants Examination of 95 candidates 63 candidates of a different cohort after the intervention period	Scientific Knowledge	1. *"...assess if the current knowledge of junior doctors fell below some consultants' expectations".* 2. *"..to see if a training programme focussed purely on those expectations could increase their knowledge, and hence confidence"* (p. 42).
Benbassat et al.	2011	Narrative review of literature		Resilience	*"To review the common professional stressors, suggest additional ones, and propose ways to reduce their impact"* (p. 486).
Bertels et al.	2013	Cross-sectional descriptive survey of junior doctors and hospital pharmacists	94	Prescribing Skills	*"...to explore the views of junior doctors and hospital pharmacists regarding feedback on individual doctors' prescribing errors...how feedback was currently provided, and any associated problems, to explore views on other approaches to feedback and to make recommendations for designing suitable feedback systems"* (p. 332).
Bleakley & Brennan	2011	Questionnaire	146	Readiness to practice	*"To compare a graduate cohort from one medical school with a cohort from other medical schools in the same Foundation Year (FY1) programmes in terms of retrospective perceptions of readiness for practice"* (p. 459).
Brennan et al.	2010	Interview	31	Transition to practice	*"...explored the experiences of junior doctors during their first year of clinical practice...the study sought to gain understanding of how junior doctors experienced the transition from the role of student to that of practising doctor and how well their medical school education had prepared them for this"* (p. 449).

Brown et al.	2010	Questionnaire	531	Fitness to practice	*"…investigates the views of University of Liverpool graduate foundation doctors and their consultants on their preparedness to undertake skills and competencies expected of new doctors in relation to the latest GMC recommendations (GMC 2007)…"* (p. 159).
Burns	2011	Presentation of surveys	Online survey; 16 Trusts. Trainee feedback consisted of 2 questionnaires, the 1st having 518 respondents and the 2nd 426. 17/18 had returned these questionnaires	Fitness to practice	*"1. Identify their main concerns about F1 2. Expectations and confidence in key areas"* (p. 15).
Carling	2010	Interview	7	Knowledge of Acute care	*"Evaluating the effectiveness of teaching was vital, as junior doctors are often the first responders to deteriorating patients who require prompt life-saving interventions" (p. 102).*
Cave et al.	2009	Questionnaire	2062	Readiness to practice	*"To determine factors associated with preparedness"* (p. 403).
Cleland et al.	2009	Focus-group	21	Team work	*How can we best prepare new doctors to handover?* (p. 267).
Collins	2010	Evaluation included: Literature review, Medical Students, Trainees, Trainers, Service Provider, Devolved Administrations, Oral hearings, Written submissions		Fitness to practice	*"- What were the original objectives of the Foundation Programme? -How successfully is the Foundation Programme delivering against these objectives? - What are the future needs of the service and of trainees from the first two postgraduate years? - How successfully is the Foundation Programme delivering against these future needs? -What changes are needed to ensure that the first two postgraduate years deliver against future needs? "* (p. 26).
Consultation Institute	2013	Questionnaire	328	Fitness to practice	Survey of 18 questions based on the following themes: '*Balance of workforce'* (p. 5), '*Flexibility'* (p. 23), '*Patient needs*' (p. 30), '*Scope and breadth of training'* (p. 36), and '*Tensions between service and training'* (p. 55).
Cresswell et al.	2013	Case studies; focus groups, observations, semi structured interviews, document analysis	162	Health and Safety	*"…to investigate the formal and informal ways preregistration students from medicine, nursing, pharmacy and the allied health professions learn about patient safety"* (p.1).
Davis and MacLullich	2009	Questionnaire	784	Scientific Knowledge	*"…to ascertain respondents' knowledge of delirium, specifically with respect to its phenomenology and relation to adverse outcomes…to determine attitudes of trainee physicians towards their own understanding of delirium diagnosis and management"* (p. 559).

Dawson et al.	2009	Questionnaire	331	Scientific Knowledge	*"...aimed to asses the perceived student need for anatomical teaching packages to support clinical attachments in the later years of the undergraduate medical curriculum"* (p. 267).
Dewhurst	2010	Group interview	17	Readiness to practice	*"...explored the learning opportunities on post-take ward rounds...and how these might be incorporated into the realities of current clinical practice"* (p.231).
Dickson et al.	2009	Hand anatomy test	26	Scientific Knowledge	*"...assessment of hand anatomy knowledge in doctors in training"* (p.682).
Dornan	2009	Systematic literature review, telephone interviews	20 hospital sites	Prescribing Skills	*"...to explore the prevalence and causes of prescribing errors made by first year foundation trainee (FY1) doctors, concentrating on the interplay between doctors' educational background and factors in the practice environments...also to arrive at evidence-based recommendations to improve patient safety and define a future research agenda"* (p.2).
Etscourt et al.	2009	Questionnaire	1729	Fitness to practice	*"...determines recent medical graduates' views on their undergraduate educational experience and their preparedness to manage patients with sexual health and HIV related problems as a benchmark against which the impact of the Core Learning Outcomes in sexual and reproductive health and HIV can be measured"* (p.325).
Fox et al.	2011	Semi-structured interviews	8	Coping Behaviour	*"What happens when trainee doctors become unwell during their formative period of education and training? What support do they experience and how do they perceive that the experience of ill health affects their training trajectory?"* (p. 1251)
Foundation Programme Annual Report	2009	Questionnaire	25 Foundation schools	Fitness to practice	Survey focussed on the following themes: Becoming a foundation doctors, the learning environment, progression and outcomes.
Foundation Programme Annual Report	2010	Questionnaire	25 Foundation schools	Fitness to practice	Survey focussed on the following themes: Becoming a foundation doctors, the learning environment, progression and outcomes and recruitment.
Foundation Programme Annual Report	2011	Questionnaire	25 Foundation schools	Fitness to practice	Survey focussed on the following themes: Becoming a foundation doctors, the learning environment, progression and outcomes and recruitment.
Foundation Programme Annual Report	2012	Questionnaire	25 Foundation schools	Fitness to practice	Survey focussed on the following themes: Becoming a foundation doctor, the learning environment, progression and outcomes and recruitment.

Franklin et al.	2011	Observation, semi-structured interviews.	3 hospitals	Prescribing Skills	*"… (1) to compare the prevalence, types and clinical importance of prescribing errors and how quickly they were rectified in at least 2 wards in each of three NHS organisations; (2) to identify common themes in relation to their causes (3) to make recommendations for error prevention"* (p. 739).
George et al.	2011	National survey	2149	Scientific Knowledge	*"To determine levels of confidence of doctors in training in the management of diabetes and establish their training needs in this area of clinical practice"* (p. 761).
Gibbins et al.	2011	Interview	21	Fitness of purpose	*"…to explore: 1. their experiences of caring for patients with palliative care needs or who were dying; 2. What and how they had learned in medical school, and 3. how they learn to care for these patients during their first foundation year"* (p.390).
GMC	2009	Questionnaire	42714	Fitness to practice	Survey was split into the following chapters with questions pertaining to each of the following themes: 1. *Trainees' satisfaction with training* (p.21) 2. *Service versus education* (p.27) 3. *Workplace based assessment* (p.37) 4. *Medical Error* (p. 48) 5. EWTD (p. 59) 6. S*tress* (p.70)
GMC	2010	Questionnaire	46774	Fitness to practice	Survey was split into the following chapters with questions pertaining to each of the following themes: 1. Satisfaction with training (p.15) 2.Supervision (p.23) 3. Workplace based assessment (p.33) 4. Foundation Doctors (p.43) 5. European working time regulations (p.55) 6. Preparedness (p.67)
GMC	2011	Questionnaire	46668	Fitness to practice	Survey was split into the following chapters with questions pertaining to each of the following themes: 1. Satisfaction with training (p.10) 2. Clinical Supervision (p.16) 3. Feedback about assessment and performance (pp.22) 4. Foundation trainee's experiences (p.28) 5. The Working Time Regulations (p.42) 6. Preparedness for practice (p. 56)
GMC	2012	Questionnaire	51316	Fitness to practice	Survey was split into the following chapters with questions pertaining to each of the following themes: 1. Overall satisfaction with training (p.3) 2. Educational supervision (p.3) 3. Clinical supervision (p.4) 4. Undermining (p.4) 5. Feedback to trainees on their performance (p.4) 6. Adequate experience (p.5) 7.Handover (p.5) 8. Induction (p.5)
GMC	2013	Questionnaire	52797	Fitness to practice	Survey was split into the following chapters with questions pertaining to each of the following themes: 1. Overall satisfaction with training (p.3) 2. Educational supervision (p.4) 3. Clinical supervision (p.4) 4. Feedback to trainees on their performance (p.5) 5. Adequate experience (p.5) 6.Handover (p.5) 7. Induction (p.6) 8. Local teaching (p.6) 9. Workload (p.7)

Goldacre et al.	2012	Questionnaire	5369	Readiness to practice	To discover whether F1s feel that medical school prepared them for clinical practice
Goldacre et al.	2010	Questionnaire	22036	Readiness to practice	Explores the perspective of junior doctors on whether their school prepared them for practice
Gordon	2012	Longitudinal survey	32	Fitness to practice	*"To determine knowledge, skills and confidence of junior medical emergency department staff in managing mental health patients"* (p.186)
Harding et al.	2010	Assessment-EMQs and WUSCEs	128	Prescribing Skills	*"...to provide objective data on the ability of UK foundation year 1(FY1) doctors to apply safely and effectively CPT knowledge and prescribing skills to standardised clinical cases"* (p.599).
Hobson	2011	Questionnaire	89	Fitness to practice	*"-Are junior doctors aware of their role during a major incident? - How effective is a teaching intervention on improving awareness*?"(p.1)
Illing et al.	2013	Cross-sectional study; interviews, focus groups	152	Readiness to practice	*"...to examine whether medical graduates from three diverse UK medical schools were prepared for practice"* (p.1).
Jen et al.	2009	Retrospective study using administrative hospital admissions data	299,741	Transition to practice	To *"...investigate whether in-hospital mortality is higher in the week following the first Wednesday in August than in the previous week"* (p.1)
Kavanagh et al.	2012	Focus groups and questionnaires	143	Transition to practice	*"...to evaluate the WSP at Queen's University Belfast, and gain the views of both students and Foundation Programme Supervisors and Directors (FPSDs)"* (p.83).
Kidd et al.	2010	Training package and assessment	30	Prescribing Skills	*"Ongoing monitoring of junior doctors' prescribing competency to assess the effect of...national and local initiatives"* (p.219)
Kilminster et al.	2011	Interviews, observations, desk-based research	21	Transition to practice	To *"...investigate the effects of transitions upon medical performance"* (p.1006) through the following objectives; to *" 1.explore the regulation, management and monitoring of transitions in the study sites; 2. to examine the relationship between formal frameworks for managing transitions and observable and reported practice 3. to investigate how performance specifically in relation to the study markers of responsibility is understood by trainees and health care professionals, and 4. to investigate how performance in relation to the same markers of responsibility is understood by employers and regulatory bodies"* (p.1007)

Laws et al.	2012	Questionnaires	118	Fitness to practice	*"…assessed the self-reported competencies of Foundation Year 1 (FY1) doctors in the diagnosis and management of skin disease correlated against their undergraduate dermatology experience"* (p.108)
Lewis and Tully	2009	In-depth interviews	48	Prescribing Skills	*"…investigated the effect that team interaction and structure had upon UK hospital doctors' prescribing decisions, particularly their discomfort felt prescribing"* (p.481)
Linklater	2010	Postal questionnaire	132	Fitness of purpose	*"…to explore the experiences of junior doctors looking after dying patients, with a view to developing an educational intervention that would address any identified educational needs" (p.13)*
Mastoridis et al.	2011	Questionnaire	218	Readiness to practice	*"To provide insight into the quality and quantity of teaching on trauma medicine currently received at the UG level by directly eliciting the experiences of medical students"(p. 585)*
Mattick et al.	2013	Interviews	33	Prescribing Skills	*"To undertake qualitative research across two locations to inform the development of educational strategies to support foundation doctor's antimicrobial prescribing"* (p.4)
Matheson and Matheson	2009	Questionnaire	228	Fitness to practice	1. *"to survey consultants and SpRs in two teaching hospitals… about the preparedness for practice of their F1s in relation to 73/108 topics, covering eight of the 11 curricular themes from Tomorrow's Doctors"* 2. *"to rate how important each of these competencies is for a new doctor"* 3. *"to triangulate the preparedness in these competencies with generic questions not directly derived from Tomorrow's Doctors"* (p.583)
Matheson et al.	2010	Online survey	76	Transition to practice	*"1.to determine the extent to which the lecture/seminar course and shadowing period achieved their stated aim of smoothing the transition from life as a medical student to work as a new doctor; 2. to evaluate perceptions of the importance of various forms of knowledge in easing the transition between medical student and doctor" (p.1)*

McGettigan et al.	2012	Repertory grid technique	152	Team work	*"…to develop and test an instrument to assess the MDT performance of newly qualified doctors…also…to explore whether Hull York medical school (HYMS) graduates, whose final year curriculum included 2 weeks of interprofessional training in a ward setting, were rated more highly in the MDT than graduates without such training"* (p.226).
Miles et al.	2010	Questionnaire	130	Scientific Knowledge	*"…to inform educators implementing GMC guidelines as to how undergraduate teaching of probability and statistics can best prepare medical students for their role as doctors"* (p.2)
Morrow et al.	2012	Questionnaire	479	Readiness to practice	*"Examine the extent to which graduates from different UK medical schools differed in their perceptions of preparedness for practice, and compare their perceptions with those of clinical team members"* (p.123).
Naghavi and Sanati	2009	Longitudinal study	175	Health and Safety	*"To study the epidemiology and time trends of blood and body fluids exposures among hospital doctors"* (p.101)
Nikkar-Esfahani et al.	2012	Questionnaire	238	Fitness to practice	To *"…investigate medical student attitudes and participation in extracurricular research and audit focusing on their opportunities, obstacles, motivation and outcomes"* (p.317).
O'Donnell et al.	2012	Prospective survey based study	253	Resilience	*"…to assess personality traits and levels of anxiety in Foundation Year 2 (F2) doctors during the foundation doctor training programme"* (p.19)
Preston-Shoot and McKimm	2010	Questionnaire	31 medical schools	Medico-Legal Knowledge	*"Questions were asked about the location, content and methods of teaching and assessment of law in undergraduate medical education"*(p.694) *"…to ascertain how law is currently taught and assessed in UK undergraduate medical programmes and to compare the findings against the consensus statements and evidence from a systematic literature review"* (p.695)
Raduma-Tomas et al	2011	Literature Review	32 studies were used	Team work	*"To review studies on hospital doctors' handovers to identify the methods and main findings"* (p.128)
Ross	2013	Interview	40	Prescribing Skills	*"…aimed to investigate the perceived causes of prescribing errors among foundation (junior) doctors in Scotland"* (p.97)
Ross et al.	2012	Observational study	183	Prescribing Skills	*"…to identify prescriptions where the decision maker and the prescription writer were not the same doctor, and in these cases, to describe the level of detail about the recommended medication regime (eg, name, dose, frequency, formulation, route, duration) communicated between the decision maker and the prescription writer"* (p.507).

Rothwell et al.	2012	Focus groups and questionnaires	284	Prescribing Skills	"*...to explore new doctor's preparedness for prescribing*" (p.194)
Seden et al.	2013	Audit	9 hospitals	Prescribing Skills	"*To evaluate the prevalence, type and severity of prescribing errors observed between grades of prescriber, ward area, admission or discharge and type of medication prescribe*" (p.1) "*...also tested for a relationship between occurrence of error and medical school training of prescribers*" (p.2).
Sharma et al.	2013	Audit	Extremely large audit. Three different periods were reviewed; 1990-3; 2000-3; 2007-9. States mortality rates	Communication	To determine whether regional and national trends mask an increase in mortality during the junior doctor changeover.
Sirisena et al.	2011	Questionnaire and interview	150	Practical Skills	"*...to review current practice, determining the frequency of patient exposure to appropriate examination and confidence of junior doctors when dealing with MSK conditions*" (p. 403).
Sochos et al.	2012	Questionnaire-based correlational design	184	Resilience	"*... hypothesized that different work stressors would indirectly lead to burnout via different sources of social support*"(p.65).
Tallentire et al	2012	Review	256 articles but 10 in the final analysis	Knowledge of Acute care	"*...how perceived preparedness in acute care compares with perceived preparedness in other Tomorrow's Doctors (2009) outcomes... how the change in perceived preparedness in acute care over time compares with the change in perceived preparedness in other Tomorrow's Doctors (2009) outcomes over the same period... whether preparedness in acute care is a source of concern*" (p.365)
Tallentire et al.	2012a	Questionnaire	97	Transition to practice	" *Which potential learning opportunity, from a predefined list, do FY1s and educational supervisors consider most important for the student assistantship? Do their opinions differ? What additional learning opportunities do FY1s and educational supervisors identify as important for the student assistantship?*" (p.211)
Tallentire et al.	2011a	Focus group	36	Knowledge of Acute care	1. "*Explore the salient factors identified by newly qualified doctors and their senior colleagues*". 2. "*Compare perceptions of these factors between the two groups*". 3. "*Use the emerging themes to develop a framework that conceptualises the influence on newly qualified doctors' behaviour in the context of caring for acutely unwell patients*" (p.996)

Tallentire et al.	2012b	Video recorded scenarios	38	Knowledge of Acute care	*"Can GEMS be used to classify the errors made by junior doctors working in small teams, using simulated acute care scenarios to provide contextualized data? And how can the framework be amplified to accurately reflect the range of errors made by junior doctors working in small teams"* (p.793).
Tallentire et al.	2011b	Questionnaire	192	Readiness to practice	*"1. How well do medical graduates feel that their primary medical training prepared them for starting work as a doctor in a variety of predefined domains? 2. How well do ES of medical graduates feel that primary medical training prepared those graduates for starting work as a doctor in a variety of predefined domains? 3. How do medical graduates' perceptions of their preparedness for practice in predefined domains compare with those of ES? 4. Which additional areas do graduates and/or ES identify as important in preparation for practice?"* (p.590)
Van Hamel	2011	Survey	892	Readiness to practice	*"1. assess whether F1s in the 2011 cohort felt that they were adequately prepared for their post, 2. measure anxiety levels in the 2011 F1 cohort, and 3. generate hypotheses for future research"* (p.1)
Vaughan et al.	2011	Online questionnaire	763	Transition to practice	*"...to explore the views of doctors in the UK on the impact of junior doctor changeover on patient safety and hospital functioning and to assess the level of support for the different options that have been proposed to improve patient care, reduce inefficiency and provide a better experience for junior doctors"* (p.322)
Vivekananda-Schmidt et al.	2011	Questionnaire	22 Schools	Transition to practice	*"To investigate the feasibility of these assistantships"* (p.267)
Wadoo et al.	2011	Semi-quantitative, interview, questionnaire	60	Medico-Legal Knowledge	*"To assess junior doctors' knowledge of the procedures involved in involuntary admission of patients detained under Sections 5(2), 2 and 3 of the Mental Health Act 1983"* (p.460)
Wakeling et al.	2011	Semi-structured interviews	93	Fitness to practice	*"...to examine perceptions of Foundation Year trainees, consultants and senior nurses about the introduction of the Foundation Programme. Specifically, to examine whether Foundation trainees acquire appropriate skills, experience and responsibility"* (p. 87)
Walters et al.	2010	Survey	51	Professionalism	*"To see what sickness certification training had been received by practising hospital postgraduate trainees and establish how confident and knowledgeable they were in this area...also evaluated the feasibility and face validity of a paper-based educational module"* (p.152)
Watmough et al.	2012	Questionnaire	233	Readiness to practice	*"...to evaluate the long-term impact of curriculum reform on graduates' perceived competencies"* (p.562).

Author	Year	Method	Sample	Topic	Aim
Wijnen-Meijer et al.	2012	Questionnaire	110	Transition to practice	*"…to understand how transitions in licensure and increased responsibility may affect trainee's competence development"* (p.929) *"How do trainees evaluate their readiness to be entrusted with selected clinical tasks at three stages of training: final year medical school, FY1 and FY2? How do clinical supervisors evaluate the readiness to be entrusted with selected clinical tasks of final year medical students, FY1 trainees and FY2 trainees? What is the differential impact of a responsibility transition (medical school to FY1) and a licensure transition (FY1 to FY2) on self-perceived competence and supervisor perceptions?"* (p.930)
Woolf and Potts	2011	Systematic review with meta-analysis	23 reports	Fitness of purpose	*"To determine whether the ethnicity of UK trained doctors and medical students is related to their academic performance" (p.1)*

Appendix E: Full list of codes developed for data extraction

01. Conceptualising and measuring preparedness

01.01. Defining preparedness
01.01.01. Synonyms for preparedness
01.01.01.01. Transition to practice
01.01.01.02. Readiness to practice
01.01.01.03. Fitness of purpose
01.01.01.04. Fitness to practice
01.01.02. As an immediate skills-based competency concept
01.01.02.01. Practical skills
01.01.02.02. Diagnostic skills
01.01.02.03. Prescribing skills
01.01.02.04. Knowledge
01.01.03. As a personal development concept
01.01.03.01. Resilience
01.01.03.02. Uncertainty/Ambiguity
01.01.03.03. Interpersonal skills

01.02. Assessing preparedness
01.02.01. Self-reported measures of confidence via likert scales (survey/questionnaire)
01.02.02. Medical Graduates qualitative interviews
01.02.03. Supervisor-reported measures of confidence via likert scales (survey/questionnaire)
01.02.04. Supervisor qualitative interviews
01.02.06. Patient qualitative interviews
01.02.11. Observation
01.02.15. Assessment
01.02.19. Repertory grid technique
01.02.20. Policy Makers Qualitative Interviews
01.02.21. Health Service Staff Qualitative Interviews
01.02.22. Desk-Based Research

02. What is the effectiveness of formal Y5 to F1 transition interventions?
02.01. Induction
02.02. Shadowing
02.03. Assistantship
02.04. Mentoring
02.04.03. Data is unclear regarding mentoring
02.05. Simulation
02.06. GMC registration
02.07. Training

03. To what extent individual graduates prepared for specific task/skill or knowledge based capabilities?

03.01. Practical Skills
03.01.01. Perform a full physical examination
03.01.02. Perform a mental-state examination
03.01.03. Carry out practical procedures safely and effectively
03.01.04. Take and record a patient's medical history, including family and social history
03.01.05. Elicit patients' questions, their understanding of their condition and treatment options, and their views, concerns, values and preferences
03.01.06. Assess a patient's capacity to make a particular decision in accordance with legal requirements and the GMC's guidance
03.01.07. Provide explanation, advice, reassurance and support to patient
03.01.08. Contribute to the care of patients and their families at the end of life

03.01.09. Diagnose and manage clinical presentations
03.01.10. Interpret findings from the history, physical examination and mental-state examination
03.01.11. Clinical judgements and decisions
03.01.12. Able to write appropriate certificates
03.01.13. Perform general activities
03.01.14. Perform clinical activities

03.02. Prescribing Skills
03.02.01. Understand prescribing procedures
03.02.02. Prescribe drugs safely, effectively and economically
03.02.03. Establish an accurate drug history, covering both prescribed and other medication
03.02.04. Provide a safe and legal prescription
03.02.05. Calculate appropriate drug doses and record the outcome accurately
03.02.06. Provide patients with appropriate information about their medicines
03.02.07. Access reliable information about medicines
03.02.08. Detect and report adverse drug reactions
03.02.09. Demonstrate awareness of complementary and alternative therapies
03.02.10. Demonstrate knowledge of drug actions
03.02.11. Plan appropriate drug therapy for common indications
03.02.12. Plan appropriate drug therapy for common indications

03.03. Knowledge
03.03.01. Psychology
03.03.01.01. Understand psychological concepts of health, illness and disease
03.03.01.02. Understand patients with dependence issues and other demonstrations of self-harm
03.03.01.03. Understand adaptation to major life changes
03.03.01.04. Understand psychological aspects of behavioural change and treatment compliance
03.03.01.05. Understand psychological factors that contribute to illness, the course of the disease and the success of treatment
03.03.01.06. Apply psychological theoretical frameworks to individuals, groups and societies to disease
03.03.02. Sociology
03.03.02.01. Understand normal human behaviour at a societal level
03.03.02.02. Apply social science principles, method and knowledge to medical practice
03.03.02.03. Understand sociological concepts of health, illness and disease
03.03.02.04. Apply sociological theoretical frameworks to individuals, groups and societies to disease
03.03.02.05. Understand sociological factors that contribute to illness
03.03.02.06. Understand sociological aspects of behavioural change and treatment compliance
03.03.03. Scientific Knowledge
03.03.03.01. Understand the adequacy of scientific knowledge
03.03.03.02. Understand normal human structure and functions
03.03.03.03. Understand the scientific bases for common disease presentations
03.03.03.04. Justify the selection of appropriate investigations for common clinical cases
03.03.03.05. Understand the fundamental principles underlying such investigative techniques
03.03.03.06. Select appropriate forms of management for common diseases
03.03.03.07. Make accurate observations of clinical phenomena and appropriate critical analysis of clinical data
03.03.03.08. Understand normal human behaviour at an individual level
03.03.03.09. Understand the role of nutrition in health
03.03.03.10. Have adequate knowledge of statistics
03.03.03.11. Apply scientific method and approaches to medical research
03.03.03.12. Critically appraise the results of relevant research
03.03.03.13. Formulate simple relevant research questions and study design
03.03.03.14. Apply findings from the literature to answer questions raised by specific clinical problems
03.03.03.15. Understand ethical/governance issues involved in medical research
03.03.04. Epidemiology and health provision knowledge
03.03.04.01. Apply to medical practice the principles, method and knowledge of population health and the improvement of health and healthcare.

03.03.04.02. Understand basic principles of health improvement
03.03.04.03. Understand how health behaviours and outcomes are affected by the diversity of patient populations
03.03.04.04. Understand measurement methods relevant to the improvement of clinical effectiveness and care
03.03.04.05. Understand the principles underlying the development of health and health service policy
03.03.04.06. Apply basic principles of communicable disease control in hospital and community settings
03.03.04.07. Apply epidemiological data in managing healthcare for the individual and the community
03.03.04.08. Recognise the role of environmental and occupational hazards in ill-health and discuss ways to mitigate their effects
03.03.04.09. Understand principles and application of primary, secondary and tertiary prevention of disease
03.03.04.10. Understand a global perspective of health determinants
03.03.05. Knowledge of Acute/Emergency care
03.03.05.01. Provide immediate care in medical emergencies.
03.03.05.02. Assess and recognise the severity of a clinical presentation and a need for immediate emergency care.
03.03.05.03. Diagnose and manage acute medical emergencies.
03.03.05.04. Provide basic first aid.
03.03.05.05. Provide immediate life support.
03.03.05.06. Provide cardio-pulmonary resuscitation or direct other team members to carry out resuscitation.
03.03.05.07. Emergency judgement
03.03.06. Governance Knowledge
03.03.06.01. Use information effectively in a medical context.
03.03.06.02. Keep accurate, legible and complete clinical records.
03.03.06.03. Make effective use of computers
03.03.06.04. Maintain confidentiality
03.03.06.05. Access information sources
03.03.06.06. Apply the principles, method and knowledge of health informatics to medical practice.
03.03.07. Safeguarding skills
03.03.07.01. Identify the signs of abuse
03.03.08. Knowledge of ethics
03.03.08.01. Act according to ethical and legal principles
03.03.08.02. Understand and adhere to the GMC's ethical guidance and standards
03.03.08.03. Demonstrate clinical responsibility
03.03.08.04. Act in accordance to the ethical duties of a doctor
03.03.09. Medico-Legal knowledge
03.03.09.01. Understand and accept the legal, moral and ethical responsibilities
03.03.09.02. Demonstrate knowledge of laws, and systems of professional regulation
03.03.09.03. Understand the framework, in which medicine is practiced in the UK
03.03.10. Prepared to provide palliative/end of life care
03.03.11. Knowledge and experience of the ward
03.03.11.01. Understands ward logistics such as where special equipment (catheters etc) or forms are
03.03.11.02. Understands how the clinical environment works
03.03.11.03. Trainees are prepared to work on call and during Hospital at night

04. To what extent individual graduates prepared for interactional/interpersonal capabilities?

04.01. Communication and team work
04.01.01. Communication with clinicians
04.01.02. Communication interprofessional
04.01.03. Handover
04.01.04.Discharge
04.01.05. Learn and work effectively within a multi-professional team
04.01.06. Understand and respect the roles and expertise of health and social care professionals
04.01.07. Understand the beneficial effect of working in interdisciplinary team working
04.01.08. Work with colleagues to put patients first
04.01.09. Build positive working relationships
04.01.10. Understand the role of doctors as managers
04.01.11. Involve patients in their care
04.01.12. Involve patient's carers/families with care

04.01.13. Attitude,Respect, Equality
04.01.13.01. Preserve patient dignity and act with integrity
04.01.13.02. Act with respect
04.01.13.03. Acknowledge equality and diversity

04.02. Communication with patients/relatives
04.02.01. Effective communication across patient diversity
04.02.02. Effective communication across language barriers
04.02.03. Effective communication across a range of media
04.02.04. Effective communication about topics
04.02.05. Effective communication in difficult circumstances
04.02.06. Effective communication in various roles
04.02.07. Effective communication around patient-involvement in decision-making
04.02.08. Formulate a plan of investigation, treatment, management in partnership
04.02.09. Obtain informed consent

04.03. Continuing Professional Development
04.03.01. Acquire new knowledge
04.03.02. Lifelong learning
04.03.03. Reflect
04.03.04. Appraisal
04.03.05. Teaching and Leadership
04.03.05.01. Reflect, learn and teach others
04.03.05.02. Function effectively as a mentor and teacher
04.03.06. Limitations
04.03.06.01. Recognise own personal and professional limits
04.03.06.02. Recognise own personal health needs
04.03.07. Time Management
04.03.07.01. Prioritise
04.03.07.02. Work-Life Balance
04.03.07.03. European Working Time Directive Knowledge
04.03.07.04. Manage time and priortise tasks
04.03.07.05. Recognise the duty to take action if a colleague's health, performance or conduct is putting patients at risk.

04.04. Clinical Supervision

05. To what extent individual graduates prepared for cultural, systemic and technological based capabilities?

05.01. Protect patients and improve care.

05.02. Place patients' needs and safety at the centre of the care process.

05.03. Health and Safety
05.03.01. Promote, monitor and maintain health and safety in the clinical setting
05.03.02. Understanding how errors can happen in practice
05.03.03. Understand risk management and prevention
05.03.04. Understanding responsibilities within the current systems for raising concerns about safety and quality.
05.03.05. Understand and have experience of the principles and methods of improvement
05.03.06. Understand infection control

06. To what extent are individual graduates prepared for practice on a personal level?

06.01. Resilience

06.02. Uncertainty/Ambiguity
06.02.01. Deal effectively with uncertainty and change
06.02.02. Tolerance of uncertainty

06.02.03. Adaptation to change
06.02.04. Situation uncertainty

06.03. Coping behaviour

06.04. Responsibility

06.05. Support seeking behaviour

07. Do demographic factors contribute to variations in preparedness?
07.01. Age
07.02. Ethnicity
07.03. Gender
07.04. English second language
07.05. Undergraduate training location
07.06. Disability
07.07. Personality
07.08. Degree status
07.09. PBL course
07.10. Traditional course

Appendix F: Mapping Exercise of Rapid Review Data against Tomorrow's Doctors (2009) Outcomes

Higher & Lower-Order outcomes	Grey = Data Black = No Data
THE DOCTOR AS A SCHOLAR AND A SCIENTIST	
8: The graduate will be able to apply to medical practice biomedical scientific principles, method and knowledge relating to: anatomy, biochemistry, cell biology, genetics, immunology, microbiology, molecular biology, nutrition, pathology, pharmacology and physiology. The graduate will be able to:	
(a) Explain normal human structure and functions.	
(b) Explain the scientific bases for common disease presentations.	
(c) Justify the selection of appropriate investigations for common clinical cases.	
(d) Explain the fundamental principles underlying such investigative techniques.	
(e) Select appropriate forms of management for common diseases, and ways of preventing common diseases, and explain their modes of action and their risks from first principles.	(grey)
(f) Demonstrate knowledge of drug actions: therapeutics and pharmacokinetics; drug side effects and interactions, including for multiple treatments, longterm conditions and non-prescribed medication; and also including effects on the population, such as the spread of antibiotic resistance.	(grey)
(g) Make accurate observations of clinical phenomena and appropriate critical analysis of clinical data.	
9: Apply psychological principles, method and knowledge to medical practice	
(a) Explain normal human behaviour at an individual level.	
(b) Discuss psychological concepts of health, illness and disease.	
(c) Apply theoretical frameworks of psychology to explain the varied responses of individuals, groups and societies to disease.	
(d) Explain psychological factors that contribute to illness, the course of the disease and the success of treatment.	
(e) Discuss psychological aspects of behavioural change and treatment compliance.	
(f) Discuss adaptation to major life changes, such as bereavement; comparing and contrasting the abnormal adjustments that might occur in these situations.	
(g) Identify appropriate strategies for managing patients with dependence issues and other demonstrations of self-harm.	
10: Apply social science principles, method and knowledge to medical practice.	
(a) Explain normal human behaviour at a societal level.	
(b) Discuss sociological concepts of health, illness and disease.	

(c) Apply theoretical frameworks of sociology to explain the varied responses of individuals, groups and societies to disease.

(d) Explain sociological factors that contribute to illness, the course of the disease and the success of treatment – including issues relating to health inequalities, the links between occupation and health and the effects of poverty and affluence.

(e) Discuss sociological aspects of behavioural change and treatment compliance.

11: Apply to medical practice the principles, method and knowledge of population health and the improvement of health and healthcare.

(a) Discuss basic principles of health improvement, including the wider determinants of health, health inequalities, health risks and disease surveillance.

(b) Assess how health behaviours and outcomes are affected by the diversity of the patient population.

(c) Describe measurement methods relevant to the improvement of clinical effectiveness and care.

(d) Discuss the principles underlying the development of health and health service policy, including issues relating to health economics and equity, and clinical guidelines.

(e) Explain and apply the basic principles of communicable disease control in hospital and community settings.

(f) Evaluate and apply epidemiological data in managing healthcare for the individual and the community.

(g) Recognise the role of environmental and occupational hazards in ill-health and discuss ways to mitigate their effects.

(h) Discuss the role of nutrition in health.

(i) Discuss the principles and application of primary, secondary and tertiary prevention of disease.

(j) Discuss from a global perspective the determinants of health and disease and variations in healthcare delivery and medical practice.

12: Apply scientific method and approaches to medical research.

(a) Critically appraise the results of relevant diagnostic, prognostic and treatment trials and other qualitative and quantitative studies as reported in the medical and scientific literature.

(b) Formulate simple relevant research questions in biomedical science, psychosocial science or population science, and design appropriate studies or experiments to address the questions.

(c) Apply findings from the literature to answer questions raised by specific clinical problems.

(d) Understand the ethical and governance issues involved in medical research.

DOCTOR AS PRACTITIONER

13: The graduate will be able to carry out a consultation with a patient:

(a) Take and record a patient's medical history, including family and social history, talking to relatives or other carers where appropriate.

(b) Elicit patients' questions, their understanding of their condition and treatment options, and their views, concerns, values and preferences.

(c) Perform a full physical examination.

(d) Perform a mental-state examination.

(e) Assess a patient's capacity to make a particular decision in accordance with legal requirements and the GMC's guidance.

(f) Determine the extent to which patients want to be involved in decision-making about their care and treatment.

(g) Provide explanation, advice, reassurance and support.

14: Diagnose and manage clinical presentations.

(a) Interpret findings from the history, physical examination and mental-state examination, appreciating the importance of clinical, psychological, spiritual, religious, social and cultural factors.

(b) Make an initial assessment of a patient's problems and a differential diagnosis. Understand the processes by which doctors make and test a differential diagnosis.

(c) Formulate a plan of investigation in partnership with the patient, obtaining informed consent as an essential part of this process.

(d) Interpret the results of investigations, including growth charts, x-rays and the results of the diagnostic procedures in Appendix 1.

(e) Synthesise a full assessment of the patient's problems and define the likely diagnosis or diagnoses.

(f) Make clinical judgements and decisions, based on the available evidence, in conjunction with colleagues and as appropriate for the graduate's level of training and experience. This may include situations of uncertainty.

(g) Formulate a plan for treatment, management and discharge, according to established principles and best evidence, in partnership with the patient, their carers, and other health professionals as appropriate. Respond to patients' concerns and preferences, obtain informed consent, and respect the rights of patients to reach decisions with their doctor about their treatment and care and to refuse or limit treatment.

(h) Support patients in caring for themselves.

(i) Identify the signs that suggest children or other vulnerable people may be suffering from abuse or neglect and know what action to take to safeguard their welfare.

(j) Contribute to the care of patients and their families at the end of life, including management of symptoms, practical issues of law and certification, and effective communication and teamworking.

15: Communicate effectively with patients and colleagues in a medical context.

(a) Communicate clearly, sensitively and effectively with patients, their relatives or other carers, and colleagues from the medical and other professions, by listening, sharing and responding.	
(b) Communicate clearly, sensitively and effectively with individuals and groups regardless of their age, social, cultural or ethnic backgrounds or their disabilities, including when English is not the patient's first language.	
(c) Communicate by spoken, written and electronic methods (including medical records), and be aware of other methods of communication used by patients. The graduate should appreciate the significance of non-verbal communication in the medical consultation.	
(d) Communicate appropriately in difficult circumstances, such as when breaking bad news, and when discussing sensitive issues, such as alcohol consumption, smoking or obesity.	
(e) Communicate appropriately with difficult or violent patients.	
(f) Communicate appropriately with people with mental illness.	
(g) Communicate appropriately with vulnerable patients.	
(h) Communicate effectively in various roles, for example, as patient advocate, teacher, manager or improvement leader.	

16: Provide immediate care in medical emergencies.

(a) Assess and recognise the severity of a clinical presentation and a need for immediate emergency care.	
(b) Diagnose and manage acute medical emergencies.	
(c) Provide basic first aid.	
(d) Provide immediate life support.	
(e) Provide cardio-pulmonary resuscitation or direct other team members to carry out resuscitation.	

17: Prescribe drugs safely, effectively and economically.

(a) Establish an accurate drug history, covering both prescribed and other medication.	
(b) Plan appropriate drug therapy for common indications, including pain and distress.	
(c) Provide a safe and legal prescription.	
(d) Calculate appropriate drug doses and record the outcome accurately.	
(e) Provide patients with appropriate information about their medicines.	
(f) Access reliable information about medicines.	
(g) Detect and report adverse drug reactions.	
(h) Demonstrate awareness that many patients use complementary and alternative therapies, and awareness of the existence and range of these therapies, why patients use them, and how this might affect other types of treatment that patients are receiving.	

18: Carry out practical procedures safely and effectively.

(a) Be able to perform a range of diagnostic procedures, as listed in Appendix 1 and measure and record the findings.

(b) Be able to perform a range of therapeutic procedures, as listed in Appendix 1.

(c) Be able to demonstrate correct practice in general aspects of practical procedures, as listed in Appendix 1.

19: Use information effectively in a medical context.

(a) Keep accurate, legible and complete clinical records.

(b) Make effective use of computers and other information systems, including storing and retrieving information.

(c) Keep to the requirements of confidentiality and data protection legislation and codes of practice in all dealings with information.

(d) Access information sources and use the information in relation to patient care, health promotion, giving advice and information to patients, and research and education.

(e) Apply the principles, method and knowledge of health informatics to medical practice.

THE DOCTOR AS A PROFESSIONAL

20: The graduate will be able to behave according to ethical and legal principles. The graduate will be able to:

(a) Know about and keep to the GMC's ethical guidance and standards including Good Medical Practice, the 'Duties of a doctor registered with the GMC' and supplementary ethical guidance which describe what is expected of all doctors registered with the GMC.

(b) Demonstrate awareness of the clinical responsibilities and role of the doctor, making the care of the patient the first concern. Recognise the principles of patient-centred care, including self-care, and deal with patients' healthcare needs in consultation with them and, where appropriate, their relatives or carers.

(c) Be polite, considerate, trustworthy and honest, act with integrity, maintain confidentiality, respect patients' dignity and privacy, and understand the importance of appropriate consent.

(d) Respect all patients, colleagues and others regardless of their age, colour, culture, disability, ethnic or national origin, gender, lifestyle, marital or parental status, race, religion or beliefs, sex, sexual orientation, or social or economic status. Graduates will respect patients' right to hold religious or other beliefs, and take these into account when relevant to treatment options.

(e) Recognise the rights and the equal value of all people and how opportunities for some people may be restricted by others' perceptions.

(f) Understand and accept the legal, moral and ethical responsibilities involved in protecting and promoting the health of individual patients, their dependants and the public – including vulnerable groups such as children, older people, people with

learning disabilities and people with mental illnesses.

(g) Demonstrate knowledge of laws, and systems of professional regulation through the GMC and others, relevant to medical practice, including the ability to complete relevant certificates and legal documents and liaise with the coroner or procurator fiscal where appropriate.

21: Reflect, learn and teach others.

(a) Acquire, assess, apply and integrate new knowledge, learn to adapt to changing circumstances and ensure that patients receive the highest level of professional care.

(b) Establish the foundations for lifelong learning and continuing professional development, including a professional development portfolio containing reflections, achievements and learning needs.

(c) Continually and systematically reflect on practice and, whenever necessary, translate that reflection into action, using improvement techniques and audit appropriately – for example, by critically appraising the prescribing of others.

(d) Manage time and prioritise tasks, and work autonomously when necessary and appropriate.

(e) Recognise own personal and professional limits and seek help from colleagues and supervisors when necessary.

(f) Function effectively as a mentor and teacher including contributing to the appraisal, assessment and review of colleagues, giving effective feedback, and taking advantage of opportunities to develop these skills.

22: Learn and work effectively within a multi-professional team.

(a) Understand and respect the roles and expertise of health and social care professionals in the context of working and learning as a multi-professional team.

(b) Understand the contribution that effective interdisciplinary teamworking makes to the delivery of safe and high-quality care.

(c) Work with colleagues in ways that best serve the interests of patients, passing on information and handing over care, demonstrating flexibility, adaptability and a problem-solving approach.

(d) Demonstrate ability to build team capacity and positive working relationships and undertake various team roles including leadership and the ability to accept leadership by others.

23: Protect patients and improve care.

(a) Place patients' needs and safety at the centre of the care process.

(b) Deal effectively with uncertainty and change.

(c) Understand the framework in which medicine is practiced in the UK, including: the organisation, management and regulation of healthcare provision; the structures, functions and priorities of the NHS; and the roles of, and relationships between, the agencies and services involved in protecting and promoting individual and population health.

(d) Promote, monitor and maintain health and safety in the clinical setting, understanding how errors can happen in practice, applying the principles of quality assurance, clinical governance and risk management to medical practice, and understanding responsibilities within the current systems for raising concerns about safety and quality.	
(e) Understand and have experience of the principles and methods of improvement, including audit, adverse incident reporting and quality improvement, and how to use the results of audit to improve practice.	
(f) Respond constructively to the outcomes of appraisals, performance reviews and assessments.	
(g) Demonstrate awareness of the role of doctors as managers, including seeking ways to continually improve the use and prioritisation of resources.	
(h) Understand the importance of, and the need to keep to, measures to prevent the spread of infection, and apply the principles of infection prevention and control.	
(i) Recognise own personal health needs, consult and follow the advice of a suitably qualified professional, and protect patients from any risk posed by own health.	
(j) Recognise the duty to take action if a colleague's health, performance or conduct is putting patients at risk.	

Appendix G: Studies in the review and data collection methods

Self-Reported measures via questionnaires (n=36)	Self-reported measures of knowledge (n=8)	Self-reported qualitative interviews (n=17)	Trainer/ Educator reported measures via questionnaires (n=15)	Trainer/ Educator qualitative interviews (QI) (n=6)	Patient QI (n=1)	Other (e.g. NHS employees, policy makers) QI (n=4)	Observation (n=6)	Desk-based Research (n=13)
Bertels et al. (2013) Bleakley & Brennan (2011) Brown, et al. (2010)* Burns, A. (2011)* Cave, et al. (2009) Dawson, et al. (2009) Estcourt, et al. (2009) GMC (2010)*; (2011)*; (2012)*; (2013)* George, et al. (2011) Δ Goldacre, et al. (2010); (2012) Gordon (2012) Δ Van Hamel & Jenner (2011) Kavanagh, et al. (2012)* Laws, et al. (2012) Linklater (2010) Mastoridis, et al. (2011) Matheson, et al. (2010) McGettigan et al.	Atrey, et al. (2010) Davis & MacLullich (2009) Dickson et al. (2009) Δ Harding, et al. (2010) Hobson, (2011)Δ Kidd, et al. (2010) Δ Wadoo et al. (2011) Δ Walters, et al. (2010)Δ	Brennan, et al. (2010) Carling (2010) Δ Cleland, et al. (2009) Δ Cresswell, (2013)* Dewhurst, (2010) Δ Dornan, et al. (2009)* Franklin et al. (2011)* Gibbins, et al. (2011) Illing, et al. (2013)* Kavanagh, et al. (2012)* Kilminster, et al. (2011)* Lewis & Tully (2009) Matheson, et al. (2010) Mattick, et al. (2013) Ross, (2013) Δ Sirisena, et al. (2011) Δ Wakeling, et al.	Brown, et al. (2010)* Burns, A (2011)* GMC (2010)*; (2011)*; (2012)*; (2013)* Kavanagh, et al. (2012)* Matheson & Matheson (2009) Δ Miles, et al. (2010) Morrow, et al. (2012)* PMETB (2009) Tallentire, et al. (2011)b*; (2012)a*Δ Wijnen-Meijer, et al. (2012) Vivekanada-Schmidt et al. (2011)	Cresswell, et al. (2013)* Illing, et al. (2013)* Kilminster, et al. (2011)* Rothwell, et al. (2012) Tallentire, et al. (2011)* Wakeling, et al. (2011)* Δ	Cresswell, et al. (2013)*	Cresswell, et al. (2013)* GMC (2012)*; (2013)* PMETB (2009)	Dornan, et al. (2009)* Elsayed, et al. (2010) Δ Franklin et al. (2011)* Kilminster, et al. (2011)* Ross, et al. (2012) Δ Tallentire, et al. (2012)bΔ	Ahmed, et al. (2012). Arora et al. (2010) Benbassat, et al. (2011) Dornan, et al. (2009)* Kilminster, et al. (2011)* Naghavi &. Sanati (2009) Preston-Shoot & McKimm (2010) Δ Raduma-Tomàs, et al. (2011) Sirisena, et al. (2011) Seden, et al. (2013) Sharma, et al. (2013) Tallentire, et al. (2012)a Woolf et el. (2011)

(2012)
Morrow, et al.
(2012)*
Nikkar-Esfahani, et
al. (2012) Δ
O'Donnell, et al.
(2012) Δ
PMETB (2009)
Pattison, et al.
(2013)
Robert (2009)
Ross et al. (2013)
Rothwell, et al.
(2012)
Sochos, et al. (2012)
Δ
Tallentire, et al.
(2011)b*;(2012)a*Δ
Vaughan, et al.
(2011) Δ
Watmough, et al.
(2012)Δ
Wijnen-Meijer, et al.
(2012) Δ

(2011)* Δ

NOTE: * Studies with more than one type of data collected; Δ Studies accepted in the review 'with reservations' following quality assessment

Appendix H: Medical graduates' preparedness for practical procedures (Rapid Review literature)

Skill	Data suggests prepared		Data suggests unprepared	
	Pre-TD09	**Post-TD09**	**Pre-TD09**	**Post-TD09**
‡ Venepuncture	Bleakley and Brennan (2011); Matheson and Matheson (2009);	Illing et al. (2013); Morrow et al. (2012)		
‡ Urinary catheterisation	Bleakley and Brennan (2011)*; Brown et al. (2010); Matheson and Matheson (2009)		Bleakley and Brennan (2011)*	Morrow et al. (2012); Illing et al. (2013)
‡ Wound suturing			Matheson and Matheson (2009); Bleakley and Brennan (2011); Naghavi and Sanati (2009).Δ	
‡ Administering intramuscular and subcutaneous injections	Bleakley and Brennan (2011)*		Bleakley and Brennan (2011)*; Brown et al. (2010); Matheson and Matheson (2009).	
‡ Carry out basic respiratory function tests	Bleakley and Brennan (2011)*		Matheson and Matheson (2009); Brown et al. (2010); Bleakley and Brennan (2011)*	Morrow et al. (2012)*
‡ Blood cultures from peripheral and central sites	Bleakley and Brennan (2011)			
‡ Use of local anaesthetics	Brown et al. (2010)++		Brown et al. (2010)++; Bleakley and Brennan (2011)	
‡ Making up drugs for parenteral administration	Bleakley and Brennan (2011)*		Brown et al. (2010); Bleakley and Brennan (2011)*; Naghavi and Sanati (2009)Δ	Morrow et al. (2012)

‡ Perform and interpret electrocardiograms (ECG)	Brown et al. (2010)++; Bleakley and Brennan (2011)		Brown et al. (2010)++	
‡ Administer oxygen therapy	Bleakley and Brennan (2011); Brown et al. (2010) ++		Brown et al. (2010)++; Matheson and Matheson (2009)	
‡ Establishing peripheral intravenous access and setting up an infusion	Bleakley and Brennan (2011)*; Brown et al. (2010)++; Matheson and Matheson (2009)		Brown et al. (2010)++; Bleakley and Brennan (2011)*	
Nasogastric tube insertion	Bleakley and Brennan (2011)*; Brown et al. (2010)++		Bleakley and Brennan (2011)*; Brown et al. (2010)++; Matheson and Matheson (2009)	Morrow et al. (2012)
Establish IV access for patient with broken veins		Wijnen-Meijer et al. (2012)++		Wijnen-Meijer et al. (2012)+
Arterial blood sampling	Bleakley and Brennan (2011); Brown et al. (2010) Matheson and Matheson (2009)		Morrow et al. (2012); Naghavi and Sanati (2009)Δ	
Inserting a central venous line			Goldacre et al. (2010);* Naghavi and Sanati (2009)Δ	
Inserting a chest drain			Goldacre et al. (2010); Elsayed et al. (2010).	
Correct use of a nebuliser	Bleakley and Brennan (2011)*	Morrow et al. (2012)*	Bleakley and Brennan (2011)*; Matheson and Matheson (2009)	Morrow et al. (2012)*
Basic CPR (TD09 16e)	Bleakley and Brennan (2011); Matheson and Matheson (2009)			Morrow et al. (2012)*

Control of haemorrahage		Bleakley and Brennan (2011)

NOTE: BLUE text = Self report only; RED text = Mixed participants/methods; BLACK text = Trainer report only; GREEN text = Observational/Desk based only; ‡ = **classifies skills specifically identified in the TD09 Appendix A;** * = Concerns of unpreparedness are evidenced partially (either free text responses or data is not relevant to all participant groups studied); Δ = While not asking medical graduates directly about their preparedness, this study demonstrates that medical graduates receive a high number of blood and body fluids (BBF) exposures when undertaking these procedures, thus putting them at risk of infection; **++** = self-report measures differ from supervisor-reports.

Appendix I: The broad range of competencies investigated across the studies within our review: Pre- and Post TD09 preparedness

Domain (with specific TD09 outcome)	Data suggests prepared		Data suggests unprepared	
	Pre-TD09	**Post-TD09**	**Pre-TD09**	**Post-TD09**
RQ3: HOW PREPARED ARE GRADUATES FOR SPECIFIC TASKS, SKILLS AND KNOWLEDGE?				
Taking a history (TD09 13a)	Bleakley and Brennan (2011); Brown et al. (2010); Escourt et al. (2009); Matheson and Matheson (2009); Tallentire et al. (2011b); Watmough et al. (2012)	Illing et al. (2013); Morrow et al. (2012)		
Performing a full physical examination (TD09 13c)	Bleakley and Brennan (2011); Matheson and Matheson (2009); Tallentire et al. (2011b); Watmough et al. (2012)	Morrow et al. (2012)		
Perform a mental-state examination (TD09 13d)	Matheson and Matheson (2009); Watmough et al. (2012)			Gordon (2012)
To draw up an examination plan for a new patient at the outpatient department (TD09 14c*)		Wijnen-Meijer et al. (2012)‡		Wijnen-Meijer et al. (2012)‡
Skills of close observation			Bleakley and Brennan (2011)	
Identifying signs of abuse (TD09 14i)			Estcourt et al. (2009)	
Selecting appropriate investigations and interpreting the results (TD09 14d*)	Bleakley and Brennan (2011); Watmough et		Matheson and Matheson (2009)	

	al. (2012)		Bleakley and Brennan (2011); Matheson and Matheson (2009); Tallentire et al. (2011b); Watmough et al. (2012)Δ	
Using evidence and guidelines for patient care (including developing critical thinking) (TD09 14a*)	Watmough et al. (2012)Δ		Bleakley and Brennan (2011); Matheson and Matheson (2009); Tallentire et al. (2011b); Watmough et al. (2012)Δ	
Recognising the social and emotional factors in illness and treatment (TD09 14a*)	Bleakley and Brennan (2011); Matheson and Matheson (2009); Watmough et al. (2012)Δ		Watmough et al. (2012)Δ	
Clinical reasoning and making a diagnosis (TD09 14b,f*)	Bleakley and Brennan (2011); Watmough et al. (2012)	Laws et al. (2012);	Atrey et al. (2010); Brown et al. (2010); Davis and MacLullich (2009); Estcourt et al. (2009); George et al. (2011); Matheson and Matheson (2009); Tallentire et al. (2011b)	Morrow et al. (2012)
Prescribing safely (TD09 17c)	Dornan et al. (2009)†; Matheson and Matheson (2009); Tallentire et al. (2011b)‡; Watmough et al. (2012)+	Morrow et al. (2012)Δ	Brown et al. (2010); Bleakley and Brennan (2011); Brennan et al. (2010); Dornan et al. (2009)†; Goldacre et al. (2010); Franklin et al. (2011); Harding et al. (2012); Killminster et al. (2011); Lewis and Tulley (2009); Tallentire et al. (2012); Watmough et al. (2012)+	Ahmed et al. (2012); Bertels et al. (2013); Morrow et al. (2012)Δ; Illing et al. (2013); Kavanagh et al. (2012); Mattick et al. (2013); Ross et al. (2012) Ross et al. (2013); Rothwell et al. (2012); Seden et al. (2013); Wijnen-Meijer et al. (2012)
Calculate drug dosage and record outcome			Bleakley and Brennan	Mattick et al. (2013);

(TD09 17d)			(2011); Dornan et al. (2009); Matheson and Matheson (2009)	Morrow et al. (2012)
Applying clinical pharmacology and therapeutics (CPT) to prescribing			Harding et al. (2012)	Mattick et al. (2013)
Explain drug prescription choice to a pharmacist (TD09 17b)		Wijnen-Meijer et al. (2012)‡		Wijnen-Meijer et al. (2012)‡
To ask a representative critical questions about the pharmaceutical product				Wijnen-Meijer et al. (2012)
Apply knowledge of alternative and complimentary therapies and how these may affect other treatments (TD09 17h)				Morrow et al. (2012)
Overall patient-centred practice and humane care/ recognizes all aspects of care (TD09 20b*)	Bleakley and Brennan (2011)			McGettigan et al. (2012)
Treating acutely ill patients (TD09 item 16)	Carling et al. (2010); Burns et al. (2011)	Tallentire et al. (2012)	Watmough et al. (2012)	Illing et al. (2013)
Pre-operative assessment of patients				Morrow et al. (2012)
Diagnose and manage acute medical emergencies (TD09 16b)	Carling et al. (2010); Hobson et a. (2011)Δ; Tallentire et al. (2011b)Δ ‡		Bleakley and Brennan (2011)Δ; Hobson et al. (2011) Δ; Kavanagh et al. (2012); Mastoridis et al. (2011); Tallentire et al. (2011b) Δ‡	Gordon et al. (2012); Illing et al. (2013); Morrow et al. (2012) Δ; Tallentire et al. (2012a,b); Wijnen-Meijer et al. (2012)
Taking part in advanced life support	Bleakley and Brennan (2011)Δ		Bleakley and Brennan (2011)Δ	
Functioning safely in an acute 'take' team			Bleakley and Brennan (2011)	
Planning discharge for patients (TD09 14g*)	Bleakley and Brennan (2011)Δ			
Educating patients (health and public health) promotion	Bleakley and Brennan (2011)			
Maintaining good quality care	Bleakley and Brennan (2011)			

Reducing the risk of cross-infection (TD09 23h)	Bleakley and Brennan (2011)			
End of life care (TD09 14j)			Gibbins et al. (2010); Linklater et al. (2010)	
Basic nutritional care/knowledge (TD09 11h)	Bleakley and Brennan (2011); Matheson and Matheson (2009)			
Understanding disease processes (TD09 8e*)	Matheson and Matheson (2009); Watmough et al. (2012)Δ		Watmough et al. (2012)Δ	
Providing appropriate care for people of different cultures (TD09 20d*)	Bleakley and Brennan (2011)Δ; Matheson and Matheson (2009)		Bleakley and Brennan (2011)Δ	
Knowledge of clinical, behavioral and social sciences for medicine (TD09 9* & 10*)	Matheson and Matheson (2009); Tallentire et al. (2011b)			
Knowledge of anatomy (TD09 8*)			Dickson et al. (2009);	
Knowledge of key mental health legislation (TD09 20f*)	Wadoo et al. (2011)			
RQ4: HOW PREPARED ARE MEDICAL GRADUATES FOR INTERACTIONAL AND INTERPERSONAL ASPECTS OF PRACTICE				
Breaking bad news to patients and relatives (TD09 15d)	Bleakley and Brennan (2011); Matheson and Matheson (2009)	Wijnen-Meijer et al. (2012)‡	Linklater et al. (2010)	Illing et al. (2013); Wijnen-Meijer et al. (2012)‡
Hold conversation with patient and family to explain a mistake (TD09 13g*)		Wijnen-Meijer et al. (2012)‡		Wijnen-Meijer et al. (2012)‡
Communicate sensitively, clearly and effectively with patients and relatives (TD09 13b*)	Bleakley and Brennan (2011); Matheson and Matheson (2009)			
Communicating effectively with colleagues (TD09 15a*)	Bleakley and Brennan (2011); Matheson and Matheson (2009)	Illing et al. (2013); Wijnen-Meijer et al. (2012)	Watmough et al. (2012)	

Working effectively in a team (TD09 22*)	Brown et al. (2010); Bleakley and Brennan (2011); Matheson and Matheson (2009); Watmough et al. (2012)Δ	Morrow et al. (2012) Illing et al. (2013)	Watmough et al. (2012)Δ	
Communicate effectively in multi-disciplinary / inter-disciplinary team (e.g. nursing and social workers)	Matheson and Matheson (2009)	Wijnen-Meijer et al. (2012)‡		McGettigan et al. (2012); Lewis and Tulley (2009); Wijnen-Meijer et al. (2012)‡
Communicate effectively in a medical context	Tallentire et al. (2011b)			
To give a presentation at the clinical team meeting after a night shift		Wijnen-Meijer et al. (2012)		
Write letter of referral to colleague		Wijnen-Meijer et al. (2012)‡		Wijnen-Meijer et al. (2012)‡
Dealing with difficult or violent patients (TD09 15e)			Matheson and Matheson (2009)	Morrow et al. (2012)
Able to participate in effective handover			Burns (2011); Cleland et al. (2009); Raduma Tomas et al. (2011);	
RQ5: HOW PREPARED ARE MEDICAL GRADUATES FOR CULTURAL, SYSTEMIC AND TECHNOLOGICAL ASPECTS OF PRACTICE				
Understanding how the clinical environment works (including the culture and practice of working on a ward; e.g. locating forms for requesting tests, correct procedures for requesting an x-ray) (TD09 106, p.54)	Matheson and Matheson (2009);		Van Hamel & Jenner (2011); Kilminster et al. (2011); Tallentire et al. (2011b)	Illing et al. (2013); Mattick et al. (2013);
Keeping an accurate and relevant medical record (TD09 19a)	Brown et al. (2010); Matheson and Matheson (2009)		Bleakley and Brennan (2011)	
Sickness certification (TD09 20g*)			Walters et al. (2010)	
Writing out Part A of a cremation form (TD09 14j*)				Morrow et al. (2012)

Understanding roles of other healthcare professionals (TD09 22a*)	Watmough et al. (2012)Δ		Watmough et al. (2012)Δ	
Reporting and dealing with error and safety incidents (TD09 23d*)			Bleakley and Brennan (2011)	Ahmed et al. (2012); Cresswell et al. (2013)
Clinical governance (TD09 23d*)	Bleakley and Brennan (2011)Δ		Bleakley and Brennan (2011)Δ	
Knowledge/ Using audit to improve patient care (TD09 23e*)	Bleakley and Brennan (2011)Δ; Brown et al. (2010)‡; Watmough et al. (2012)Δ		Brown et al. (2010)‡; Bleakley and Brennan (2011)Δ; Watmough et al. (2012)Δ	
Understanding the relationship between primary/social care and hospital care			Bleakley and Brennan (2011); Watmough et al. (2012)	
Knowledge and understanding of rehabilitation and care within institutions and the community	Matheson and Matheson (2009)‡		Matheson and Matheson (2009)‡	
Understanding the purpose and practice of appraisal			Bleakley and Brennan (2011)	
Using informatics as a tool in medical practice (TD09 19e)	Bleakley and Brennan (2011)Δ; Watmough et al. (2012)Δ		Bleakley and Brennan (2011)Δ; Watmough et al. (2012)Δ	
Use information and technology effectively in medical context	Tallentire et al. (2011b)			
Using knowledge of the structures and functions of the NHS in practice (TD09 23c*)				Morrow et al. (2012)
Organisational decision making			Bleakley and Brennan (2011)	
RQ6: HOW PERSONALLY PREPARED ARE MEDICAL GRADUATES FOR PRACTICE?				
Time management (TD09 21d*)	Bleakley and Brennan (2011)Δ		Bleakley and Brennan (2011)Δ; Watmough et al. (2012)	McGettigan et al. (2012); Illing et al. (2013)
Coping with uncertainty (TD09 23b)			Bleakley and Brennan (2011); Watmough et al. (2012)	

Identifying and organizing own learning needs, reflective practice (TD09 21b*)	Brown et al. (2010); Matheson and Matheson (2009)Watmough et al. (2012)Δ		Bleakley and Brennan (2011); Tallentire et al. (2011b); Watmough et al. (2012)Δ	
Carrying out a literature search	Watmough et al. (2012)Δ		Watmough et al. (2012)Δ	
Apply scientific principles, method and knowledge to medal practice and research (TD09 9*)	Tallentire et al. (2011b)			
Being aware of their limitations (TD09 21e*)	Brown et al. (2010); Bleakley and Brennan (2011); Matheson and Matheson (2009); Watmough et al. (2012)Δ		Watmough et al. (2012)Δ	
Asking for help (TD09 21e*)	Brown et al. (2010); Matheson and Matheson (2009)			
Understanding ethical and legal issues (such as confidentiality and consent) (TD09 20f*)	Brown et al. (2010); Preston-Shoot and McKimm (2010); Bleakley and Brennan (2011); Matheson and Matheson (2009); Tallentire et al. (2011b); Watmough et al. (2012)Δ		Linklater et al. (2010); Wadoo et al. (2011); Watmough et al. (2012)Δ	Morrow et al. (2012);
Acting in a professional manner (with honesty and probity) (TD09 20c*)	Bleakley and Brennan (2011); Matheson and Matheson (2009)			
Maintaining confidentiality	Matheson and Matheson (2009)			
Ensuring and promoting patient safety (TD09	Bleakley and Brennan			McGettigan et al.

23a*, d*)	(2011)			(2012)
Protecting patients' rights (TD09 14g*)	Matheson and Matheson (2009)			
Dealing appropriately, effectively, and in patients' interests with problems in the performance, conduct or health of colleagues (TD09 23d*, i*)			Matheson and Matheson (2009)	
Undertaking a teaching role (TD08 21f*)	Bleakley and Brennan (2011)Δ	Wijnen-Meijer et al. (2012)‡	Bleakley and Brennan (2011)Δ	Wijnen-Meijer et al. (2012)‡
Managing their health, including stress (TD09 23i*)			Bleakley and Brennan (2011)	

NOTE: BLUE text = Self report only; RED text = Mixed participants/methods; BLACK text = Trainer report only; GREEN text = Observational/Desk based only; * = Partially relevant to the specified outcome; + = Medical and nursing respondents saw F1s as prepared for prescribing, which contrasts with the findings of the cohort questionnaire, as only 26% of participants perceived themselves as prepared for writing safe prescriptions for different types of drugs and 20.2% for calculating drug dosages; ‡ = F1 trainees rated themselves consistently higher than did supervisors in these studies so sometimes trainees suggest preparedness where supervisors do not. Δ = Different cohorts and sometimes preparedness differed between them; † = self-reports of preparedness differ from observational data of errors which suggests trainees are unprepared.

Appendix J: Generic interview schedule

Concept

- Thinking about medical graduates what is your understanding of the term 'preparedness for practice'? (What is the range of meanings?)
- Some people talk about 'preparedness for practice' and some about 'preparedness to practice'. Is there a difference for you? (if no answer then move on without giving explanation)

Preparedness for Practice

- Thinking about the time you began working as a junior doctor, how prepared were you?
- Do you want to tell me about a time when you felt prepared? Can you think of the aspects that you felt prepared for? What were they? Can you give an example? What was it in your degree (or other) that prepared you?
- One thing we want to explore in the research is the prevalence of these occurrences. Do you think this applies to your peers as well or is personal to you?
- Where there any aspects you felt unprepared for? What are they? Is there a situation that is particularly memorable?
- Do you think this is personal to you or do you think happens to most junior doctors/is a broader issue?
- How do you think you could have been better prepared for this situation (hypothetical narrative)?
- Have you ever had any experiences when team working (i.e. multi-professional team working, hand over's, general information sharing) went well or was problematic?

Finish:

- Before we finish: there is a suggestion at the moment that full registration might be brought forward to the point of graduation. Currently graduates are only partially registered which restricts their practice (e.g. prescribing). What is your view on this issue? Is there a scenario that you could think of that supports your view?

Prompts for narratives:

- o Can you tell me of a time when you felt his way?
- o Can you think of an example when it wasn't like that?
- o Can you think of a specific example when X happened to you?
- o Could you share an experience that illustrates this?
- o Can you think of a particular incidence?
- o When was the last time this happened?
- o Why do you think this was?
- o Have you got an example that raised ethical legal issues / that required interpersonal / interactional skills?
- o (In group setting) What do the others think of that?
- o Can you tell us about a time when you noticed that in your colleagues?

Appendix K: Further details of participants and coding for Studies 2 and 3

BOX 1K: DESCRIPTORS OF THE 8 STAKEHOLDER GROUPS PARTICIPATING IN PHASE 2

Foundation year 1 doctors:

This group includes all F1 doctors, including a subset of the group who also participated in the audio-diary study (Phase 3).

Fully registered trainee doctors:

This group includes all fully registered trainee doctors, i.e., F2s and doctors in core training (CT) and specialty training (ST). While these participants are often also involved in medical education (as supervisors in clinical settings or lecturers), their perspective differs from the 'Clinical Educator' group because of their own trainee status and the smaller time gap between the interview and the completion of their own F1 training.

Clinical Educators:

This group includes undergraduate and/or postgraduate clinical educators able to provide perspectives on junior doctors' preparedness from both under/postgraduate perspectives. As all of these participants are clinicians, these interviews also include their clinical perspectives on junior doctors' preparedness.

Deans and Foundation Programme leads:

This group includes undergraduate and postgraduate deans, and foundation programme directors of medical schools. This group presents perspectives from leading figures across the healthcare education continuum.

Policy and government:

This group includes participants leading NHS trusts, policy initiatives and Chief Medical Officers. These participants present the wider perspectives of employers and regulatory bodies.

Employers:

This group comprised senior hospital managers and leaders, and medical directors across a range of health boards or hospital Trusts.

Other healthcare practitioners (HCPs):

This group includes all non-medical participants, for example, those involved in pharmacy or nursing at different levels, and who work closely with F1 doctors. This group includes practicing HCPs, as well as directors of nursing or pharmacy education with HCP training. These participants add a HCP perspective on preparedness of medical students.

Patient and public representatives (PPR):

This group includes all patient representatives. Among these are patient carer groups, regional patient representative groups (Alzheimer's Society, Age Concern, British Lung Foundation) and simulated patients involved in undergraduate and/or postgraduate education. These groups present the views of service users.

TABLE 1K: DEMOGRAPHIC AND EDUCATION-RELATED CHARACTERISTICS OF MEDICAL TRAINEES IN OVERALL SAMPLE FOR PHASES 2 & 3 ACROSS GEOGRAPHIC LOCATION

Characteristic	Overall (n=67)	Site 1 (n=26)	Site 2 (n=16)	Site 3 (n=11)	Site 4 (n=14)
Current stage of training					
F1	34 (51%)	10 (39%)	11 (69%)	5 (45%)	8 (57%)
F2	18 (27%)	11 (42%)	2 (12%)	4 (36%)	1 (7%)
CT/ST	15 (22%)	5 (19%)	3 (19%)	2 (18%)	5 (36%)
Age					
20-24	6 (9%)	1 (4%)	2 (13%)	0	3 (21%)
25-29	39 (58%)	18 (69%)	8 (50%)	8 (73%)	5 (36%)
30-34	13 (19%)	5 (19%)	4 (25%)	2 (18%)	2 (14%)
35-39	3 (5%)	0	0	1 (9%)	2 (14%)
40 or over	4 (6%)	1 (4%)	1 (6%)	0	2 (14%)
Missing	2 (3%)	1 (4%)	1 (6%)	0	0
Gender					
Male	25 (37%)	9 (35%)	5 (31%)	3 (27%)	8 (57%)
Female	42 (63%)	17 (65%)	11 (69%)	8 (73%)	6 (43%)
Ethnicity					
Chinese	1 (2%)	1 (4%)	0	0	0
Indian	2 (3%)	1 (4%)	0	0	1 (7%)
Other Asian	2 (3%)	0	0	2 (18%)	0
British	26 (39%)	10 (39%)	2 (13%)	4 (36%)	10 (71%)
English	6 (9%)	3 (12%)	0	0	3 (21%)
Irish	5 (7%)	0	5 (31%)	0	0
Northern Irish	6 (9%)	0	6 (38%)	0	0
Scottish	5 (7%)	0	0	5 (46%)	0
Welsh	9 (13%)	9 (35%)	0	0	0
Other White	3 (4%)	1 (4%)	2 (13%)	0	0
Mixed Asian	1 (2%)	1 (4%)	0	0	0
African	1 (2%)	0	1 (6%)	0	0
Medical School					
England	19 (28%)	7 (27%)	1 (6%)	3 (27%)	8 (57%)
Wales	15 (22%)	14 (54%)	0	0	1 (7%)
Scotland	6 (9%)	0	0	6 (55%)	0
Ireland	11 (16%)	0	11 (69%)	0	0
Europe, outside UK	1 (2%)	0	1 (6%)	0	0
Missing data	15 (22%)	5 (19%)	3 (19%)	2 (18%)	5 (36%)
Intercalated degree?					
Yes	28 (42%)	8 (31%)	4 (25%)	5 (46%)	9 (64%)
No	37 (56%)	18 (69%)	9 (56%)	5 (46%)	5 (36%)
Missing data	1 (2%)		3 (19%)	1 (9%)	0
Direct entry to Medical School?					
Yes	42 (63%)	16 (62%)	10 (63%)	8 (73%)	8 (57%)
No	10 (15%)	5 (19%)	3 (19%)	1 (9%)	1 (7%)
Missing	15 (22%)	5 (19%)	3 (19%)	2 (18%)	5 (36%)
Parents in healthcare?					
Yes, one parent	8 (12%)	4 (15%)	3 (19%)	1 (9%)	0
Yes, both parents	12 (18%)	4 (15%)	1 (6%)	3 (27%)	4 (29%)
No	28 (42%)	13 (50%)	9 (56%)	5 (46%)	1 (7%)
Missing	19 (28%)	5 (19%)	3 (19%)	2 (18%)	9 (64%)

TABLE 2K: DEMOGRAPHIC AND EDUCATION-RELATED CHARACTERISTICS OF HEALTHCARE STAKEHOLDERS IN THE OVERALL SAMPLE FOR PHASE 2 ACROSS GEOGRAPHIC LOCATION

Characteristic	Overall (n=93)	Site 1 (n=38)	Site 2 (n=16)	Site 3 (n=16)	Site 4 (n=23)
Stakeholder type					
Clinical Educator	32 (34%)	15 (40%)	6 (38%)	5 (31%)	6 (26%)
Dean	30 (32%)	11 (29%)	4 (25%)	5 (31%)	10 (44%)
Policy & govt	11 (12%)	7 (18%)	2 (12%)	2 (13%)	0
Employers	7 (8%)	2 (5%)	1 (6%)	1 (6%)	3 (13%)
Other HCP	13 (14%)	3 (8%)	3 (19%)	3 (19%)	4 (17%)
Age					
20-29	2 (2%)	2 (5%)	0	0	0
30-39	12 (13%)	6 (16%)	1 (6%)	2 (12%)	4 (17%)
40-49	21 (22%)	9 (24%)	3 (19%)	3 (19%)	6 (26%)
50-59	41 (44%)	15 (39%)	8 (50%)	7 (44%)	10 (44%)
60 or over	10 (11%)	1 (3%)	4 (25%)	2(12%)	2 (9%)
Missing data	7 (8%)	5 (13%)	0	2 (12%)	1 (4%)
Gender					
Male	55 (59%)	19 (50%)	11 (69%)	12 (75%)	13 (57%)
Female	38 (41%)	19 (50%)	5 (31%)	4 (25%)	10 (44%)
Ethnicity					
Indian	2 (2%)	2 (5%)	0	0	0
Pakistani	1 (1%)	1 (3%)	0	0	0
Caribbean	1 (1%)	1 (3%)	0	0	0
British	38 (40%)	14 (37%)	7 (44%)	3 (19%)	14 (61%)
English	17 (18%)	6 (16%)	0	2 (13%)	9 (39%)
Irish	6 (6%)	1 (3%)	4 (25%)	0	0
Northern Irish	3 (3%)	0	4 (25%)	0	0
Scottish	10 (11%)	0	0	10 (63%)	0
Welsh	9 (10%)	9 (24%)	0	0	0
Other White	3 (3%)	1 (3%)	1 (6%)	1 (6%)	0
Other Mixed	2 (2%)	2 (5%)	0	0	0
Missing	1 (1%)	1 (3%)	0	0	0
Specialty					
Medical (medicine)	20 (22%)	8 (21%)	5 (31%)	2 (13%)	5 (22%)
Medical (surgery)	9 (10%)	1 (3%)	4 (25%)	1 (6%)	3 (13%)
Medical (services)	11 (12%)	2 (5%)	2 (13%)	4 (25%)	3 (13%)
Medical (GP)	18 (19%)	7 (18%)	2 (13%)	5 (31%)	4 (17%)
Nursing	5 (5%)	0	1 (6%)	3 (19%)	1 (4%)
Other health professional	11 (12%)	4 (11%)	2 (13%)	0	5 (22%)
Not applicable	18 (19%)	16 (42%)	0	0	2 (9%)
Missing	1 (1%)	0	0	1 (6%)	0

TABLE 3K: DEMOGRAPHIC AND EDUCATION-RELATED CHARACTERISTICS OF PATIENT AND PUBLIC REPRESENTATIVES IN THE OVERALL SAMPLE FOR PHASE 2 ACROSS GEOGRAPHIC LOCATION

Characteristic	Overall (n=25)	Site 1 (n=19)	Site 3 (n=2)	Site 4 (n=4)
Age				
30-39	1 (4%)	1 (5%)	0	0
50-59	4 (16%)	2 (11%)	0	2 (50%)
60 or over	18 (72%)	14 (74%)	2 (100%)	2 (50%)
Missing data	2 (8%)	2 (11%)	0	0
Gender				
Male	8 (32%)	5 (26%)	2 (100%)	1 (25%)
Female	17 (68%)	14 (74%)	0	3 (75%)
Ethnicity				
British	12 (48%)	8 (42%)	0	4 (100%)
English	2 (8%)	2 (11%)	0	0
Scottish	2 (8%)	0	2 (100%)	0
Welsh	8 (32%)	8 (42%)	0	0
Missing	1 (4%)	1 (5%)	0	0

TABLE 4K: DEMOGRAPHIC AND EDUCATION-RELATED CHARACTERISTICS OF PHASE 3 (AUDIO DIARY STUDY) F1 PARTICIPANTS.

Characteristic	Overall (n= 26)	Site 1 (n= 8)	Site 2 (n=7)	Site 3 (n=4)	Site 4 (n=7)
Age					
20-24	4 (15%)	0	1 (14%)	0	3 (43%)
25-29	16 (62%)	7 (88%)	3 (43%)	3 (75%)	3 (43%)
30-34	4 (15%)	0	2 (29%)	1 (25%)	1 (14%)
40 or above	1 (4%)	0	1 (14%)	0	0
Missing	1 (4%)	1 (13%)	0	0	0
Gender					
Male	13 (50%)	7 (88%)	2 (29%)	1 (25%)	3 (43%)
Female	13 (50%)	1 (13%)	5 (71%)	3 (75%)	4 (57%)
Ethnicity					
Other Asian	1 (4%)	0	0	1 (25%)	0
British	11 (42%)	3 (38%)	1 (14%)	2 (50%)	5 (71%)
English	4 (15%)	2 (25%)	0	0	2 (29%)
Scottish	1 (4%)	0	0	1 (25%)	0
Welsh	2 (8%)	2 (25%)	0	0	0
Mixed Asian	1 (4%)	1 (13%)	0	0	0
African	1 (4%)	0	1 (14%)	0	0
Irish	1 (4%)	0	1 (14%)	0	0
Northern Irish	3 (12%)	0	3 (43%)	0	0
Other white	1 (4%)	0	1 (14%)	0	0
Medical School					
England	10 (38%)	3 (38%)	0	1 (25%)	6 (86%)
Wales	6 (23%)	5 (63%)	0	0	1 (14%)
Scotland	3 (12%)	0	0	3 (75%)	0
Northern Ireland	6 (23%)	0	6 (86%)	0	0
Europe outside UK	1 (4%)	0	1 (14%)	0	0
Intercalated degree?					
Yes	7 (27%)	2 (25%)	2 (29%)	1 (25%)	2 (29%)
No	19 (73%)	6 (75%)	5 (71%)	3 (75%)	5 (71%)
Direct entry to Medical School?					
Yes	20 (77%)	7 (88%)	4 (57%)	3 (75%)	6 (86%)
No	6 (23%)	1 (13%)	3 (43%)	1 (25%)	1 (14%)
Parents in healthcare?					
Yes, one parent	4 (15%)	1 (13%)	2 (29%)	1 (25%)	0
Yes, both parents	4 (15%)	1 (13%)	1 (14%)	0	2 (29%)
No	14 (54%)	6 (75%)	4 (57%)	3 (75%)	1 (14%)
Missing	4 (15%)	0	0	0	4 (57%)

TABLE 5K: DEMOGRAPHIC CHARACTERISTICS OF MEDICAL TRAINEES IN OVERALL SAMPLE AND SUBSAMPLE

Characteristic	Overall (n=67)	Subsample (n=61)
Current stage of training		
F1	34 (51%)	33 (54%)
F2	18 (27%)	16 (26%)
CT/ST	15 (22%)	12 (20%)
Age		
20-24	6 (9%)	5 (8%)
25-29	39 (58%)	36 (59%)
30-34	13 (19%)	11 (18%)
35-39	3 (5%)	3 (5%)
40 or over	4 (6%)	4 (7%)
Missing	2 (3%)	2 (3%)
Gender		
Male	25 (37%)	20 (33%)
Female	42 (63%)	41 (67%)

TABLE 6K: DEMOGRAPHIC CHARACTERISTICS OF STAKEHOLDERS IN OVERALL SAMPLE AND SUBSAMPLE

Characteristic	Overall (n=118)	Subsample (n=96)
Stakeholder type		
Clinical Educator	32 (27%)	20 (21%)
Dean	30 (25%)	23 (24%)
Policy & Government	11 (9%)	10 (10%)
Employers	7 (6%)	7 (7%)
Other HCP	13 (11%)	12 (13%)
Patient and Public Involvement Representative	25 (21%)	24 (25%)
Age		
20-29	2 (2%)	2 (2%)
30-39	13 (11%)	12 (13%)
40-49	21 (18%)	14 (15%)
50-59	45 (38%)	36 (38%)
60 or over	28 (24%)	24 (25%)
Missing data	9 (8%)	8 (8%)
Gender		
Male	63 (53%)	46 (49%)
Female	55 (47%)	49 (51%)

NOTE: Due to rounding, the %s will not always come to 100%

BOX 2K: *DEFINITIONS OF FACILITATING AND INHIBITING FACTORS MOST CITED*

Individual factors

This set of codes includes factors that focus on a person's abilities and personal traits.

Confidence: Being confident about skills and being prepared for the job. Confidence might help to get on with the job while overconfidence might result in acting beyond one's capability and not asking for help.

Proactive graduates: Graduates who have demonstrated proactive behaviour or the lack of it during their undergraduate studies or in their F1 jobs, e.g., in actively seeking opportunities to do procedures.

Motivation: Being motivated for the work or specific aspects of the work or a lack of motivation for specific aspects of the work.

Resilience: Being able to quickly recover from extreme experiences in a stressful environment or lacking this ability.

Self-awareness and Emotional intelligence: Demonstrating self-awareness and emotional intelligence or lack of it as perceived by interviewee.

Personality differences: Other personality traits that positively influence preparedness or inhibit being prepared.

Gender: Perceived as advantage, e.g., the perception that it is easier for females to show emotions, or perceived as disadvantage.

Maturity: Age and life experience as positively influencing preparedness or negatively influencing preparedness, or the lack of maturity.

Ethnicity: Includes ethnicity, nationality, having studied in a different country. This can be perceived as advantage or disadvantage for preparedness.

Interpersonal/Interactional factors

This set of codes includes factors that focus on relational aspects.

Wider team: This has an emotional dimension as well as a learning dimension. Sometimes this can include the issue of the wider teams' perception of the new F1 and their abilities at any given time This code is about being or not being able to identify sources of support, building up working relationships and getting the support from the team.

Role models: Positive professional role models during FY1 who affect personal practice positively or negatively. Sometimes negative professional role models can have a positive effect on F1s' practice.

Peers: This code is for behaviour of peers that is supportive but distinct from being a role model or mentoring or behaviour of peers that is disruptive or has a negative influence on F1's practice in some way.

Mentors: Availability or lack of formal or informal mentors, incidents of mentorship including near-peer mentoring.

Supervisors/Seniors: Supportive or unsupportive behaviour of supervisors (educational, clinical) as well as senior clinicians more generally who are not considered as mentors.

Support versus autonomy: This code captures the perspective of the trainee. It includes help-seeking behaviour on the part of the trainee and times when trainees talk about not seeking assistance. It also includes talk about independent and autonomous behaviour of trainees, such as getting on with jobs

they know how to do (or are expected to know by other interviewees). Seeking help also extends beyond the clinical environment and may include relatives or friends.

Patient journey learning: This code is about learning by seeing what happened to the patient after the initial diagnosis or treatment the F1 was involved in.

Other means of support: Includes other means of support not mentioned above, e.g., pastoral care.

Cultural, systemic and technological aspects of practice

This set of codes focuses on factors that are wider than the individual or the interactional level. They include aspects of organizational culture, managerial systems and the use of technology.

Protocols and forms: This is about the availability of explicit rules/procedures for certain situations, e.g., who to contact or having log-ins for electronic systems. It also includes the use of forms, e.g., for handovers, and awareness of organisational processes, e.g., how jobs are delegated on nightshifts. Protocols and forms or the lack thereof may enhance or hinder the workflow.

'Fire Drills': Drills, e.g., ABCDE, Sepsis6 that can be applied support preparedness. Lack of procedures that match learnt drills may inhibit preparedness.

Leadership: This is about the whole team. Leadership by seniors in multi-professional teams or the lack of it might enhance or hinder the workflow.

Time: This includes talk/perceptions around time pressures or availability of time to reflect.

Staffing: This is about the managerial side of staffing and how it affects medical practice on the ward. It also captures the effects of changes to shift work as inhibiting or facilitating factor. Staffing levels can be seen as supportive or insufficient and therefore impact negatively on medical practice.

Quality of handovers: The quality of management of handovers enables or inhibits good medical practice including FY1 learning.

Digital technology: This includes perceptions of beneficial or negative effects of the use of digital technology, e.g., medical apps, on medical practice, or the rejection of digital technology.

Cultural shift: Changes in the understanding of the NHS and the medical profession as enabling or inhibiting medical practice.

Wider culture/society: Expectations and shifts that are perceived to influence medical practice positively or negatively beyond the realm of the NHS and the medical profession.

Ward culture: This is about the unwritten, implicit rules and ward politics that can be enabling or inhibiting medical practice.

Relation between medical school and deanery: Relation between medical schools and deaneries as enabling or inhibiting.

Admissions to medical school: Admission processes to medical school as enabling or inhibiting medical practice as F1.

Assessment of medical students and trainees: Perceptions on how assessment types and processes of medical students and trainees affects medical practice positively or negatively.

Space: Availability or lack of space to enable teaching and learning, e.g., in clinics.

Coding for facilitating and inhibiting factors enabled us to extract contextual factors for F1s preparedness/unpreparedness issues. These factors were only coded when explicitly reflected upon by the interviewees and not on interpretation during the coding process. Narratives often included multiple factors. Therefore several codes could be selected per narrative.

Appendix L: Data mapped against the TD09 broad 'Doctor as practitioner' outcomes

TABLE 1L: PREPAREDNESS, UNPREPAREDNESS AND UNSPECIFIED NARRATIVES* MAPPED AGAINST THE TD09 BROAD OUTCOMES FOR 'DOCTOR AS PRACTITIONER'

	FY1	FRTD	CE	D_FP	HCP	EMP	P_GVT	PPR	TOTALS:
The graduate will be able to carry out a consultation with a patient: PREPARED	4.8% (27)	1.4% (1)	0.0% (0)	1.8% (1)	3.2% (2)	5.0% (2)	0.0% (0)	1.3% (1)	34
The graduate will be able to carry out a consultation with a patient: UNPREPARED	4.2% (24)	4.2% (3)	0.0% (0)	1.8% (1)	4.8% (3)	7.5% (3)	2.7% (1)	3.8% (3)	38
The graduate will be able to carry out a consultation with a patient: UNSPECIFIED	0.9% (5)	4.2% (3)	8.6% (5)	7.3% (4)	3.2% (2)	0.0% (0)	16.6% (6)	4.0% (4)	29
Diagnose and manage clinical presentations: PREPARED	13.1% (74)	4.2% (3)	1.7% (1)	1.8% (1)	1.6% (1)	2.5% (1)	2.7% (1)	0.0% (0)	82
Diagnose and manage clinical presentations: UNPREPARED	14.6% (83)	5.5% (4)	5.2% (3)	7.3% (4)	9.5% (6)	12.5% (5)	0.0% (0)	2.5% (2)	107
Diagnose and manage clinical presentations: UNSPECIFIED	3.2% (18)	1.4% (1)	13.8% (8)	9.1% (5)	6.3% (4)	7.5% (3)	5.5% (2)	13.8% (11)	52
Communicate effectively with patients and colleagues in a medical context: PREPARED	12.0% (68)	22.2% (16)	1.7% (1)	16.4% (9)	7.9% (5)	20.0% (8)	2.7% (1)	3.8% (3)	111
Communicate effectively with patients and colleagues in a medical context: UNPREPARED	14.8% (84)	20.8% (15)	13.8% (8)	14.5% (8)	9.5% (6)	12.5% (5)	38.8% (14)	15.0% (12)	152
Communicate effectively with patients and colleagues in a medical context: UNSPECIFIED	5.8% (33)	11.1% (8)	44.8% (26)	27.3% (15)	15.9% (10)	12.5% (5)	11.1% (4)	51.3% (41)	142
Provide immediate care in medical emergencies: PREPARED	6.0% (34)	2.7% (2)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	2.7% (1)	0.0% (0)	37
Provide immediate care in medical emergencies: UNPREPARED	10.4% (59)	11.1% (8)	1.7% (1)	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	1.3% (1)	69
Provide immediate care in medical emergencies: UNSPECIFIED	0.5% (3)	1.4% (1)	5.2% (3)	1.8% (1)	0.0% (0)	2.5% (1)	5.5% (2)	1.3% (1)	12
Prescribe drugs safely, effectively and economically: PREPARED	4.2% (24)	4.2% (3)	0.0% (0)	1.8% (1)	1.6% (1)	5.0% (2)	0.0% (0)	0.0% (0)	31

Prescribe drugs safely, effectively and economically: UNPREPARED	4.2% (24)	1.4% (1)	0.0% (0)	1.8% (1)	27.0% (17)	5.0% (2)	5.5% (2)	0.0% (0)	47
Prescribe drugs safely, effectively and economically: UNSPECIFIED	1.2% (7)	4.2% (3)	3.4% (2)	7.3% (4)	9.5% (6)	7.5% (3)	5.5% (2)	1.3% (1)	28
TOTALS:	567	72	58	55	63	40	36	80	971

NOTE: [+]Numbers are presented first followed by the percentage, calculated using the total number of coded narratives per column, i.e. per stakeholder group. This is to facilitate comparison of the emphasis on certain outcomes across each stakeholder group. *The table indicates the number of times each narrative was coded, not the total number of narratives.

Appendix M: TD09 Specific outcomes

BOX 1M: *THE 5 TD09 SPECIFIC OUTCOMES RELATING TO DOCTOR AS SCHOLAR AND SCIENTIST*

8. The graduate will be able to apply to medical practice biomedical scientific principles, method and knowledge relating to: anatomy, biochemistry, cell biology, genetics, immunology, microbiology, molecular biology, nutrition, pathology, pharmacology and physiology.
9. Apply psychological principles, method and knowledge to medical practice.
10. Apply social science principles, method and knowledge to medical practice.
11. Apply to medical practice the principles, method and knowledge of population health and the improvement of health and healthcare.
12. Apply scientific method and approaches to medical research.

NOTE: Numbers in box relate to paragraphs in TD09

BOX 2M: *THE 7 TD09 SPECIFIC OUTCOMES AROUND GRADUATES' PREPAREDNESS FOR CONSULTATION WITH A PATIENT (PARAGRAPH 13)*

a. Take and record a patient's medical history, including family and social history, talking to relatives or other carers where appropriate.
b. Elicit patients' questions, their understanding of their condition and treatment options, and their views, concerns, values and preferences.
c. Perform a full physical examination.
d. Perform a mental-state examination.
e. Assess a patient's capacity to make a particular decision in accordance with legal requirements and the GMC's guidance.
f. Determine the extent to which patients want to be involved in decision-making about their care and treatment.
g. Provide explanation, advice, reassurance and support.

BOX 3M: *THE 10 TD09 SPECIFIC OUTCOMES FOR GRADUATES' DIAGNOSING AND MANAGING CLINICAL PRESENTATIONS (PARAGRAPH 14)*

a. Interpret findings from the history, physical examination and mental-state examination, appreciating the importance of clinical, psychological, spiritual, religious, social and cultural factors.

b. Make an initial assessment of a patient's problems and a differential diagnosis. Understand the processes by which doctors make and test a differential diagnosis.

c. Formulate a plan of investigation in partnership with the patient, obtaining informed consent as an essential part of this process.

d. Interpret the results of investigations, including growth charts, x-rays and the results of the diagnostic procedures.

e. Synthesise a full assessment of the patient's problems and define the likely diagnosis or diagnoses.

f. Make clinical judgements and decisions, based on the available evidence, in conjunction with colleagues and as appropriate for the graduate's level of training and experience. This may include situations of uncertainty.

g. Formulate a plan for treatment, management and discharge, according to established principles

and best evidence, in partnership with the patient, their carers, and other health professionals as appropriate. Respond to patients' concerns and preferences, obtain informed consent, and respect the rights of patients to reach decisions with their doctor about their treatment and care and to refuse or limit treatment.

h. Support patients in caring for themselves.

i. Identify the signs that suggest children or other vulnerable people may be suffering from abuse or neglect and know what action to take to safeguard their welfare.

j. Contribute to the care of patients and their families at the end of life, including management of symptoms, practical issues of law and certification, and effective communication and teamworking.

BOX 4M: THE 8 TD09 SPECIFIC OUTCOMES FOR GRADUATES' COMMUNICATING EFFECTIVELY WITH PATIENTS AND COLLEAGUES IN A MEDICAL CONTEXT (PARAGRAPH 15)

a. Communicate clearly, sensitively and effectively with patients, their relatives or other carers, and colleagues from the medical and other professions, by listening, sharing and responding.

b. Communicate clearly, sensitively and effectively with individuals and groups regardless of their age, social, cultural or ethnic backgrounds or their disabilities, including when English is not the patient's first language.

c. Communicate by spoken, written and electronic methods (including medical records), and be aware of other methods of communication used by patients. The graduate should appreciate the significance of non-verbal communication in the medical consultation.

d. Communicate appropriately in difficult circumstances, such as when breaking bad news, and when discussing sensitive issues, such as alcohol consumption, smoking or obesity.

e. Communicate appropriately with difficult or violent patients.

f. Communicate appropriately with people with mental illness.

g. Communicate appropriately with vulnerable patients.

h. Communicate effectively in various roles, for example, as patient advocate, teacher, manager or improvement leader.

BOX 5M: THE 5 TD09 SPECIFIC OUTCOMES FOR GRADUATES' PROVIDING IMMEDIATE CARE IN MEDICAL EMERGENCIES (PARAGRAPH 16)

a. Assess and recognise the severity of a clinical presentation and a need for immediate emergency care.

b. Diagnose and manage acute medical emergencies.

c. Provide basic first aid.

d. Provide immediate life support.

e. Provide cardio-pulmonary resuscitation or direct other team members to carry out resuscitation.

BOX 6M: THE 8 TD09 SPECIFIC OUTCOMES FOR GRADUATES' PRESCRIBING DRUGS SAFELY, EFFECTIVELY AND ECONOMICALLY (PARAGRAPH 17)

a. Establish an accurate drug history, covering both prescribed and other medication.

b. Plan appropriate drug therapy for common indications, including pain and distress.

c. Provide a safe and legal prescription.

d. Calculate appropriate drug doses and record the outcome accurately.

e. Provide patients with appropriate information about their medicines.

f. Access reliable information about medicines.

g. Detect and report adverse drug reactions.

h. Demonstrate awareness that many patients use complementary and alternative therapies, and awareness of the existence and range of these therapies, why patients use them, and how this might affect other types of treatment that patients are receiving.

BOX 7M: THE 3 TD09 SPECIFIC OUTCOMES FOR GRADUATES' CARRYING OUT PRACTICAL PROCEDURES SAFELY AND EFFECTIVELY (PARAGRAPH 18)

a. Be able to perform a range of diagnostic procedures, as listed in Appendix 1 and measure and record the findings.

b. Be able to perform a range of therapeutic procedures, as listed in Appendix 1.

c. Be able to demonstrate correct practice in general aspects of practical procedures, as listed in Appendix 1.

BOX 8M: THE 3 TD09 SPECIFIC OUTCOMES FOR GRADUATES' USING INFORMATION EFFECTIVELY IN A MEDICAL CONTEXT (PARAGRAPH 19)

a. Keep accurate, legible and complete clinical records.

b. Make effective use of computers and other information systems, including storing and retrieving information.

c. Keep to the requirements of confidentiality and data protection legislation and codes of practice in all dealings with information.

d. Access information sources and use the information in relation to patient care, health promotion, giving advice and information to patients, and research and education.

e. Apply the principles, method and knowledge of health informatics to medical practice.

BOX 9M: THE 7 TD09 SPECIFIC OUTCOMES FOR GRADUATES' BEHAVING ACCORDING TO ETHICAL AND LEGAL PRINCIPLES (PARAGRAPH 20)

a. Know about and keep to the GMC's ethical guidance and standards including Good Medical Practice, the 'Duties of a doctor registered with the GMC' and supplementary ethical guidance which describe what is expected of all doctors registered with the GMC.

b. Demonstrate awareness of the clinical responsibilities and role of the doctor, making the care of the patient the first concern. Recognise the principles of patient-centred care, including self-care, and deal with patients' healthcare needs in consultation with them and, where appropriate, their relatives or carers.

c. Be polite, considerate, trustworthy and honest, act with integrity, maintain confidentiality, respect patients' dignity and privacy, and understand the importance of appropriate consent.

d. Respect all patients, colleagues and others regardless of their age, colour, culture, disability, ethnic or national origin, gender, lifestyle, marital or parental status, race, religion or beliefs, sex, sexual orientation, or social or economic status. Graduates will respect patients' right to hold religious or other beliefs, and take these into account when relevant to treatment options.

e. Recognise the rights and the equal value of all people and how opportunities for some people may be restricted by others' perceptions.

f. Understand and accept the legal, moral and ethical responsibilities involved in protecting and promoting the health of individual patients, their dependants and the public – including vulnerable groups such as children, older people, people with learning disabilities and people with mental illnesses.

g. Demonstrate knowledge of laws, and systems of professional regulation through the GMC and others, relevant to medical practice, including the ability to complete relevant certificates and legal documents and liaise with the coroner or procurator fiscal where appropriate.

BOX 10M: THE 6 TD09 SPECIFIC OUTCOMES FOR GRADUATES' REFLECTING, LEARNING AND TEACHING OTHERS (PARAGRAPH 21)

a. Acquire, assess, apply and integrate new knowledge, learn to adapt to changing circumstances and ensure that patients receive the highest level of professional care.

b. Establish the foundations for lifelong learning and continuing professional development, including a professional development portfolio containing reflections, achievements and learning needs.

c. Continually and systematically reflect on practice and, whenever necessary, translate that reflection into action, using improvement techniques and audit appropriately – for example, by critically appraising the prescribing of others.

d. Manage time and prioritise tasks, and work autonomously when necessary and appropriate.

e. Recognise own personal and professional limits and seek help from colleagues and supervisors when necessary.

f. Function effectively as a mentor and teacher including contributing to the appraisal, assessment and review of colleagues, giving effective feedback, and taking advantage of opportunities to develop these skills.

BOX 11M: THE 4 TD09 SPECIFIC OUTCOMES FOR GRADUATES' LEARNING AND WORKING EFFECTIVELY WITHIN A MULTI-PROFESSIONAL TEAM (PARAGRAPH 22)

a. Understand and respect the roles and expertise of health and social care professionals in the context of working and learning as a multi-professional team.

b. Understand the contribution that effective interdisciplinary team working makes to the delivery of safe and high-quality care.

c. Work with colleagues in ways that best serve the interests of patients, passing on information and handing over care, demonstrating flexibility, adaptability and a problem-solving approach.

d. Demonstrate ability to build team capacity and positive working relationships and undertake various team roles including leadership and the ability to accept leadership by others.

Appendix N: Longitudinal audio diary excerpts

BOX 1N: LONGITUDINAL AUDIO-DIARY QUOTES FOR CASE STUDY 1

Self-identity - confidence

Int1: I think for me it's just some people are more confident than others... from the start for me I think I was always sort of second guessing myself... when I was making decisions... like, is that the right thing to do... and then I was thinking maybe I shouldn't have done that whereas something about them's more confident... when you're at the start and you're dealing with- they'll go "*yeah we'll give them some more fluids, that's fine, we'll stop that medication*"... I just found some people are just more confident than others when I first started and you're sort of thinking... I wish I was a bit more confident, you know, the others get stuck in the way so they are, so... personality I think, yeah.

AD5: One thing you notice over the past few months is that initially I would have always sort of felt like I needed to run things past the SHO cause I'd no confidence in my own sort of judgement or ability, and I think over the past few months I've learned to, you know, become comfortable with making decisions and knowing my own capabilities. Knowing there's things that I can, you know, manage myself.

Confidence – having the answers

AD5: I find myself, and talking to others, they wouldn't have done before... they would have seen someone sick and just rang the SHO right away. Whereas there's actually other things that you know, that you can do because that's the sort of thing you'll learn, that that's the sort of things they'll ask for so it means that whenever they ring you're prepared and you have all the answers and then they're ready to give you advice based on that.

Confidence – speaking with relatives

AD5: I think that's one of the good things maybe that I felt prepared for is being able to speak to relatives and really feel- you know I think they appreciate whenever someone speaks with them and something which I quite enjoy actually is being able to speak with the with the patient's relatives... and something which I find quite rewarding is being able to speak with someone and give them an update and help to reassure them that they are being well cared for and that we are aware of all the different medical issues going on and we are looking out for their relatives or family members. So that's something which I did feel prepared for and I think something which I said I do enjoy as part of my job is being able to speak with patients and relatives and it's something which I enjoy and something which I do think as well [the University] helps to prepare us for.

Growing confidence – prescribing

AD8: I think one of the things I've felt I've became more confident with as the time has went on, now it's sort of six months into the job, is prescribing and on the wards... at the start... you were having to look every single drug up in the BNF to make sure you were giving the right medication, giving the right dose, how frequently you give it, what is the max dose in 24 hours and... you have to do that to be sure and it's just what you have to do at the start, but the more times you write up the medications, particularly you know the anti-emetics and the analgesics, you know, you just start to learn... you feel quite confident in taking the kardex and writing down the dose knowing because you've done it, you know so frequently, that you now are confident enough to just write something up.

Getting used to things

AD3: I think over the past four months you feel yourself just becoming more prepared for the times when your bleep goes off and you're called to go and see someone who's sick or you just

get used to what you're supposed to… you learn what is expected… you sort of learn the pattern of what things you're expected to investigate and then whenever you're able to go to your SHO you're able to say, "*I have the results of their blood, I have sent off blood cultures, I have got a chest x-ray, I've spoken to chest physio*" so then you feel more prepared going to the SHO asking for advice because you have a more clear picture as opposed to I think whenever I started when I would have just seen the patient and then rang the SHO and said "*this person's has had a temperature and their oxygen demand has increased … what do you want me to do?*" whereas you sort of learn what you need to do and then I think they're generally happier as well because it shows that you've made an effort. You've tried to work through a system in your own head and then draw your own conclusions… and I think that's something that's just came with experience of the past few months.

'Security blanket'

Int2: Actually the one where I work, you know they have the BNF on the computers I find it all the time particularly whenever you're clerking people in and… you get their list of medications and you're like, I better see what that is, BNF… just type it in and go "*oh that's for that, okay grand, that's the right dose*"… I use the BNF I use it quite a lot during the day jus …"*don't know what drug that drug is*"… "*can't remember the dose of that drug*" so I'd use the BNF a lot. At the start I would have carried around like an Oxford Handbook in my pocket when I was out of hours, I didn't have it on my phone but- and you can get the App for your phone but I think it's like £35 or something so I had the book anyway so I used to just carry the book… it was almost like a bit of like, a comfort you know, in case you were asked to see someone you had the Oxford Handbook there but I found that I ended up just leaving it on the ward and then couldn't find it for the rest of the night anyway, so I don't like carrying it around anymore but I relied maybe a little bit at the start at least anyway.

Becoming more autonomous

Int2: …you actually learn to deal… with things yourself… things you probably would have run past an SHO… like well see I can't obviously work this out … myself… there was one day someone became very unwell… do I ring the SHO and ask him to go and see them and they're fine… I find them all… very approachable but it's just… it's harder picking up the phone and ringing them than it is- but I thought it was good… you learn I think, someone else said you learn on-call a bit more… and get on with things yourself, but there is always someone there at the end of the phone… if you do need them so it's fine it's not like… you're expected to do anything outside your depths if there is someone there if you need them.

Seeking advice – receiving support

AD6: So, this was again something which I felt I had to discuss with the SHO in terms of further management. I knew the tests, the investigations I needed to do and I knew the particular management which we could follow. I knew the options I could have. I would consider giving aspirin and plavix which is one of the common managements but again this was something- it wasn't a massive rise in the troponin but it was a significant enough rise that it was creating a 100 per cent increase. Again this was something I had to discuss with one of the SHOs who had previously worked in cardiology and was able to provide me with some advice me on how to further manage the patient.

Changeover – unprepared – comfort of previous rotation

AD3: And one of the things I think is difficult around changeover is that after being somewhere for 4 months you become quite comfortable in your surroundings. You come in every day and know what you're supposed to do, you know what your jobs are… the nurses know what to expect from you, you know the patients and then at changeover then you start in a completely new environment the next day and the consultants and the registrars expect you just to be able to pick up from where you the

other F1s have left off. And they are aware of the circumstances and some of them do try to help you and talk you through about what's expected but others just expect you to show up and know what to do, and it's often difficult to show up on a ward which is completely different surroundings and there's new nursing staff, different patients, new registrars, new consultants and it can be quite difficult. I've found it quite difficult today just to find my surroundings I sort of thought I was just chasing my tail today you know, different people telling me different things. I found even in care of the elderly whenever I was on the ward rounds started around half nine and they would have been you know done at quite a leisurely pace whereas it was just completely different today in a surgery ward round where it was started sharp at eight and it was at a lot quicker pace and trying to keep up, and trying to find notes, and find what had been done was actually quite difficult. So I think that was something that I didn't feel prepared for today it was just a real shock to the system going somewhere new going from somewhere you felt like you were comfortable and you sort of have nostalgia again about the last placement even though before it you might have been saying that you were looking forward to the change and then whenever it happens you then start to have nostalgia about the last rotation, so I think that's something I would maybe talk about for being unprepared.

Medical school training – positive

AD4: I think in medical school at [the University] we are out in the hospital environment a lot and we are speaking with people, there's communication skills you know, we do family attachment I think all that helps to prepare us for speaking to people and speaking with relatives… something which I do think as well [the University] helps to prepare us for.

AD5: I think the main thing which I've found useful and something which we were taught in university was the WHO analgesic ladder and I think this is really useful… and I do think the WHO ladder which was sort of drilled into us in Uni did help in a way prepare us for this just getting the practical use out of it.

AD6: This is something I think was covered well particularly in fourth year whenever we were doing the POEM course and dealing with you know giving fluid boluses and things fluid management I think that was something that was quite well covered.

AD6: I was quite worried that the person… might have had a bowel obstruction and the person had been to theatre about 10 days previously had been to ICU had an NG tube placed came back to the ward their NG tube was taken out a couple of days before so it could also have been a paralytic ileus and I think this was well covered in the surgical part of my medical teaching. With query obstruction the immediate management was place an NG tube, make the person nil by mouth, write them up for IV fluids, and get them an abdominal X-ray, so as I knew this was well covered in [my University] I felt well prepared and I did all the management steps.

Following taught university systems

AD5: Initially wasn't quite sure how to do- I hadn't really done much of it 'cause in medicine it wasn't something that we that we did however now, you know, after doing a few of them you become quite comfortable with doing them, you know. But it's just like following the system like any system we've been taught in University… this is something initially you know I sort of was a bit scared about in case you know, would I miss something out, would I get something wrong but really when you just follow the system that you've been taught in University it's hard to miss something. Medical school training – not so effective

AD7: I know [my University] teaches quite a lot on IV fluids which is very good and very useful and it is very detailed and sometimes on the wards I think it's a bit unrealistic to expect that specific proforma which [the University] lays out.

No previous exposure

AD2: As a student I did not have much experience or much exposure to patients who were in acute alcohol withdrawal and therefore didn't really know the doses of medications as I had also not seen many patients in acute alcohol withdrawal as a student … and I think it was just unfortunate that as a student I didn't get much exposure to seeing patients in acute alcohol withdrawal so this is something which I will, as I said, will read up on.

Not taught

AD4: Really I don't think this is something that you're really prepared for whenever you're taught or you're really taught much during medical school is how to action blood results. It's nothing, it's not something that you're taught about but yet as a junior doctor it's a very important part of your job is checking the blood results and actioning them as appropriate.

AD5: I sort of felt unprepared for something which I wasn't sure about… they were diabetic- the nurses asked, "*Do you know what you want to do with their insulin?*". The person had said you know, hold this patient's lantus tonight and also you know just keep an eye on their blood sugars. "*I'm sure that you know I'm sure they'll be fine*" was what the nurses told me but I was asked to call and see them because their blood sugar was actually 16 and whenever I got that call I sort of was walking towards the ward thinking, "*I'm actually not too sure what I'm going to do with this myself*". I hadn't really came across this situation before so something wasn't sure about- and I thought I might have to ring the SHO or something but whenever I sort of showed up to the ward there was actually a lot simpler than I thought. But again it was something I felt unprepared for cause it was not something I'd came across and it was not really something that I can remember ever being taught about what to do, but it was very simple.

Cannot be prepared for – confusion – surgeon differences

AD7: In doing this I came across different surgeons and different teams doing things differently it all got quite, it all sort of gets quite confusing, and some which I found quite difficult and something which I can't really be prepared for you know and it's just something I suppose you'll learn with experience in the ward but it makes it very difficult for us because different surgeons like different things and you don't want to annoy one of the surgeons by doing the wrong thing for their patient… you want to do what they like but it's very difficult because it's hard to keep up and it's hard to remember what they all like and this is something I don't really think they can prepare you for when starting work but I think it's something that you probably find very difficult when you do start in surgery just… based on just- have to learn what surgeons like what but I found that quite difficult and often you have to go to the nurses and just say you know, "*what does this surgeon like their patients to have?*" because often they worked in the ward for years and they know the ins and outs of the surgeons better than we do.

Renewed uncertainty

Int2: For me it's just more in terms of surgery wise feeling unprepared as you know, just the actual- sorry like there seems to be a lot like complex surgeries going on and… like the patients you sort of see… we obviously aren't involved in the operation at all we just see them whenever they come back up to the ward and like to be asking the Regs and consultants are up drawing diagrams often themselves are trying to understand it, so I'm like I feel unprepared whenever patients or families turn up at the ward and you know, "*How did she get on?*" it's just like, I honestly don't know… what they did and in terms of that or nurses saying you know you know, "So can this drain come out?" or "Can this be done?" I'm okay I think doing the bread and butter basic ward stuff but actual surgical management of the patient I still don't think my knowledge is really really that great… well I'll learn… getting scans and who's good veins and things like that but in terms of the actual surgical management how the procedures are working when you keep the drains in when you take the drains out I still feel a bit unprepared for making them sort of decisions and that's the sort of decisions where you can't sort of

say well the SHO will be up this afternoon you know I'll ask them then …and I think just with more practice that's the only way that you can be any more prepared.

Box 2N: Longitudinal audio-diary quotes for Case Study 2

On-call on surgery – from apprehension to growing confidence due to experience

AD2: Tonight is my first surgical on-call shift I'm doing the twilight which is four till twelve ward cover um I feeling a bit apprehensive about it because like I've said I've only just moved to surgery and haven't really had much exposure to it in quite a long time so we'll see how it goes tonight … probably more audio recordings to come.

On-call – identity talk, roles and being part of the team

AD3: … I think I was one of the first or second doctors there felt quite prepared for the arrest obviously because … we've done a lot of on-calls now with it being fifth or sixth month of being junior doctors … things tend to come a little bit easier now that we've had more experience and you know what your role should be [working in team] it was quite a good experience one I learnt a fair amount from and obviously being a key member of a team is quite it's quite useful I often find that you end up going to cardiac arrests when you are on-call and a lot of people have not much to because of the amount of people that turn up um there's a lot of standing about and watching more than anything so it was a good it was a good experience I felt quite prepared for it.

On-call – experience and growing confidence

AD10: I remember … doing the first lot of on-calls that we did your bleep would go and you would answer it as soon as you could obviously but then I used to find it quite difficult to … decide which … calls were more urgent and what I should prioritise I think obviously with the more experience that we've had over the past six or seven months it has become a lot easier to prioritise things … also just answering your bleep and knowing exactly what information you want … and just being that much more confident … I found that a lot easier over the past lot of on calls and I think it just comes down to experience and having done things before …

Prepared – previous experience under supervision

AD1: It was a situation that I felt quite prepared for which was quite nice I've put a couple of NG tubes in patients before with supervision and more senior colleagues and today I felt confident enough to put the NG tube in myself because I've had the experience … it went really well … I also felt quite confident in doing it because I'm taking part in an audit at the moment that's looking into proper insertion of NG tubes and then the aftercare.

New surgical rotation – thought was prepared but not

AD2: I originally thought that this would be something well I thought I felt quite prepared at the time … but I actually found it a little bit more difficult than I thought … I found that there was quite a difference between assessing a medical patient and a sick surgical patient especially being as I haven't worked in surgery before and hadn't really done much surgery since finals really and finals were at the end of March so yeah I found it quite difficult.

Good weekend of on-calls – role of F1 – communicating with GPs

AD4: A long weekend of on-calls for surgery it was quite a good weekend for on-calls and I've felt quite prepared for a lot of the situations that came up … your role as an F1 for surgery is to hold the bleep that gets the GP referrals out-of-hours when I first started my on-calls I didn't feel really prepared for it it's quite difficult being an F1 to- not stand up but to question GPs when they ring you up and try and send in patients- um obviously with experience it does become a little bit easier.

Lack of support on surgical – learning from difficult experiences

AD5: The thing I found difficult as well is the amount of support that that's on offer to you as a surgical junior is quite minimal a lot … of your seniors are in theatre a lot of the time so I ended up asking ITU to come and review the patient who did come and see him quite quickly and again they carried on with the fluid resuscitation but unfortunately it wasn't enough and the patient ended up passing away which obviously wasn't … good and it was quite disheartening as well but and I suppose you learn- I learnt quite a lot from it and I had some good feedback from the ITU doctors that did come some good feedback about the way I had managed the patient which was nice.

Lots of experience – teaching students

AD7: Again I've had a lot of experience doing them over the past couple of months and that experience has also helped me in knowing how to examine the body in the morgue following completion of the form it was quite nice as well because I was able to do some teaching with some of the medical students that are attached to the firm at the moment so yeah a situation that I felt quite prepared for.

Positive experience – well prepared – good teaching at medical school and keen consultant

AD8: I had to examine a patient who had a skin complaint … I felt well prepared for because during medical school we had some very good teaching … in dermatology and it was also a subject that I found quite interesting and fairly easy to revise for and to remember so it was a situation I felt quite comfortable in … so this was something that I have a fair amount of experience in and I was able to rely on some background knowledge as well … in medical school I was on placement … where we had some good teaching from a consultant who was very keen at the time and we also had some … e-learning modules … which was very helpful I think part of the reason why it's so easy to recall is because once you've seen a picture of a condition it's quite easy to recognise that so maybe that's why I find it quite easy to recall but another situation I felt prepared for.

Differences between having (or not having) experience

AD8: I was able to- I knew what exactly I was looking for and I could diagnose the problem and then I knew the treatment that was required as well quite a nice change quite a nice change from some of the usual surgical problems that I get asked to review where I have very little experience.

Transferable skills

AD9: I've never put a three way catheter in before but obviously I've put quite a number of normal catheters in so it was quite nice to be able to draw on my experience of those and I felt quite comfortable doing it didn't have any difficulties and it was just- it went in easily and I was quite comfortable with [that].

BOX 3N: LONGITUDINAL AUDIO-DIARY QUOTES FOR CASE STUDY 3

Prepared for acute situations but not responsibility and ward politics

"I felt I was quite well prepared for acute situations but the daily kind of politics of the wards ((laughs)) are a little bit more difficult to deal with… I felt prepared in the knowledge that I had, I knew exactly what I had to do in terms of acute management but I wasn't so sure how much responsibility we had to take."

The importance of learning on the job

"I would think [preparedness] it's kind of longer-term because you keep learning throughout the foundation programme and as you learn you feel more and more prepared to deal with different situations more complicated situations and even with the politics of (smiles) the wards (giggles) and dealing with senior doctors which can be quite difficult at times …"

Unprepared for complex communication in palliative care setting and need for further training at medical school

"It's quite difficult to give a timeline for people in palliative care because they may last longer than you thought or they may die on the same day so in that respect I felt unprepared because the communication skills involved were quite complex. Explaining to the family that a patient *is* going to die when the patient is actually in the room is also quite difficult and I think it would be wise for us to have some further training at breaking bad news and communicating this bad news with the family as well as with the patient."

Communication easier because of knowledge of the patient

" … I thought that went quite well and I was quite well prepared for that particular episode because I knew the patient really well I had been involved with her since admission and there were things that we were doing we were actually doing things for her so I had something to talk about and I was able to explain what we were doing and why we were doing that and the kind of follow up after that which is quite good and very different to explaining to a palliative care patient that the end is quite near and there is nothing else we can do."

The importance of trust between F1s and nurses

"I think the main problems with feeling unprepared do occur between junior doctors and nurses as nurses are less prepared to trust junior doctors. I think it would be a good idea to look into how this could be remedied because trust between junior doctors and nurses is very important since we are the ones that work closest to them rather than the more senior doctors who just review patients and usually go and do other jobs and dictations. We are usually the first port of call for nurses and trust between colleagues is very important uh for patient care."

Difficulties dealing with seniors

"I started my … night shift as usual and the ST is usually there to listen to any kind of hand over and really unwell patients she's got a (laughter) different manner it's kind of hard to explain but she's quite rude at times to junior staff condescending and she swears a lot and is unprofessional to be honest."

Comfortable seeking advice if unsure

" … if I'm unsure about something I think it's better to be cautious and ask about advice rather than just sit on it …"

Audio-diaries help F1 reflect on practice and make improvements

"Just kind of reflect on my practice and I think like doing this study has quite helped me a little bit because I have been thinking about ways I can change my practice and things … I've got a like a record of how I handled … good situations and bad situations … and that's been quite a helpful to reflect and use the good and continue with the same actions in the good situations and then reflect on the bad ones and think about different things like we have done to change ((laughs)) the way things went."

Self-doubt and self-confidence

"At first I was kind of really down and I thought maybe I'm not meant to be a junior doctor because I don't know what I'm doing but I thought about it and I thought I did the right thing and I know my stuff and I'm confident *I am a good* FY1 and I told them that and yeah (giggles)."

Preparedness increases with experience and responsibility

"As I went a long it I thought it was a bit harder for me to find kind of situations where I was not prepared so it's just I guess experience you get more prepare … I feel a lot more prepared to be honest I think it's mainly because of the change of scenery because yeah um I asked to do kind registrar level work rather than just doing ((laughs)) jobs because I do my own ward rounds now and I do my own jobs as well if the registrar is kind of busy [elsewhere] she'll just ask me to go in and see those patients

and then I'll give my own thing. So it's way different from [the other hospital] where you kind of just were- you were just kind of following the registrar and doing jobs and not really knowing exactly what's going on with a patient but when you have to review a patient you have to read… the whole notes and you have to review all the results, everything, so it's easier for you just to kind of remember those patients."

BOX 4N: *LONGITUDINAL AUDIO-DIARY QUOTES FOR CASE STUDY 4*

Training and real life – differences

AD2: [My university] were quite good at … introducing us to this particular situation we were taught about the different processes the different kind of stages you have to go through in confirming death and then how you document that in the medical notes and … it was something that even came up in our exams in my finals OSCE… I felt reasonably quite prepared … actually came to it the actual kind of real life version of that was I think a lot easier to deal with because I'd had that kind of training… there's a lot of other things that make it more complicated… than an exam situation. It's in the middle of the night, and the hospital, and you're tired and you have a lot of other things to do and then you you are bleeped by the nursing staff to confirm a death and when you get round to doing it- it's- it's quite a kind of surreal experience.

Real life medical school training – but no responsibility

AD3: In the final year they're quite keen to … get us involved in not just… medicine as a whole but specifically performing the duties as an F1 and part of that is going on a ward round and… writing in the notes and doing all the things that you should do I think it's different when you're a student because you don't have any responsibility really… you don't have kind of sustained responsibility.

Recommendation for medical school training – ward rounds

AD3: So … I turned up to (place) not really with a coherent plan of how to … behave and perform in a ward round… so just a kind of few tips… these are things I only learnt because I didn't do them properly ((smile in voice)) … flagged up for that and I think… a quick teaching session at medical school could really be quite useful in bestowing some of these little tips on finding a medicals unit… maneuvering a big ward round … it's worth knowing what those thing are things are just like drawing one of the curtain and ((laugh)) which seems obvious but … you don't always do it immediately … it all seems fairly obvious but it's just something that can come unstuck if you haven't learnt it in medical school.

Escalation not well taught – differences between Trusts

AD4: I didn't know what to do just because I'd conflicting messages from two different senior teams and so I think it's a good thing to reflect on just because it's perhaps it's something that's overlooked a bit at medical school cause it's one of those kind of practicalities of being on the ward that maybe doesn't really get through medical training at [my med school] we were taught about [name] forms which is a a form put in place to say whether someone should be resuscitated or not (the school) were good at kind of pointing out the reasons when a [name] form would be appropriate … but in (name of current hospital) they have a slightly different system they have something called a [name] form which … includes the decision on resuscitation but also includes a kind of what they call a ceiling of care.

Challenges of night shifts

AD5: Nights and specifically the … importance of preparing for nights properly and how to … look after yourself uh when doing a series of consecutive nights I've just come off … a seven consecutive night week which was quite long quite arduous I think … I clocked up something like almost a hundred hours in a week … in terms of preparing for nights … in terms of practical things [we] didn't get any advice at all … you're kind of left to work out yourself and … it's not really the most serious of points

but it's something ... that can affect how you feel whilst doing nights and your kind of productivity whilst ... doing a night shift ... thinking what your strategy is [about sleep] because you don't want a situation where ... you've been up for twelve hours before your night shift ... and you feel dreadful ... it kind of affects ... how well you do your job

Prioritising jobs – getting better with experience

AD6: Prioritise jobs ... particularly when on-call ... again a uh an issue that will come up on a daily basis and something that you just kind of get better at with experience without kind of realising that it is a big part of your job and it's something that you have to think about almost all the time whilst at work on the ward or on-call.

Following algorithms – differences between training and real-life scenarios

AD7: Assessing an unresponsive patient is something that any junior doctor any doctor should be able to do and there's a specific kind of algorithm and step-by-step thing that that we're taught and we're assessed on again and again I've done many OSCEs about assessing people using a doctor ABCDE approach and following the cardiac arrest aneurysm and that kind of thing so I was reasonably comfortable with following the steps but there was a couple of kind of real life actors that made things a little bit more tricky and that was something I never really struggled with it was in an exam setting but actually ... implementing these things on a ward in a real life environment was a little bit more problematic.

Difficulty of preparing for real life situations and bridging theory and practice

AD7: ... if I had done the assessment myself I might have come to a different conclusion so I don't think this patient came to any harm and I think things were more or less done properly ... but it's just an example where when you try to apply something you know extremely well ... when trying to coordinate different people involved in this situation ... that can apply to whether or not you trust another colleague's judgment or what do you do about someone who you believe ... isn't doing things as a efficiently or effectively as you think they should be and it's difficult to prepare for those things but it's I guess you get better with real world experience but as an example how learning something in medical school is great in theory and great in a controlled environment but there are other factors that apply when you when you implement these things on the ward in real life.

Career choices – reality check

AD8: My ambition and my choice in likely career has changed through medical school for reasons that I didn't really appreciate when I was at medical school ... what's changed in the last eight months having started the job and how this has undone a lot of my career decision making as I had in mind when at university.

Career choices – reality check – work-life balance

AD8: I think now the importance of a good work-life balance is something that I'm more aware of and something which I know is actually a very significant factor in my career decision-making which I probably neglected whilst at medical school just because you know the simple ... reason that I hadn't I hadn't done enough work in medical school I hadn't spent enough time on the wards I hadn't you know done I'd done the occasional full day but not you know not for 12 days straight ... which we have to do um on both medical and surgical rotas so I really kind of felt what it's like working hard arguably too hard and realise now that that my current workload isn't something I'd like to continue into my senior training ... so as much as [various] medical things appeal to me intellectually the actually the practicalities of getting there and the sacrifice and hard work one has to put in in my mind don't make that ... a worthwhile career decision just because I think I think quite simply the costs outweigh the benefits.

The importance of team-working

AD9: A team that enjoys working together really does add a kind of multiply affect onto your productivity and also your enjoyment of the job … which is very important since … you're working quite long hours and… a lot of time in the hospital [it] is important to enjoy your job and I think a lot of this is down to personal factors and interpersonal factors I guess and how well a team pulls together and again it's something that I knew was going to be important but whilst at medical school I probably didn't appreciate the degree to which working in a good team really… the team is directly proportional to the amount you enjoy your job.

Talking to patients getting easier

AD10: It gets easier talking to patients about difficult things having difficult conversations breaking bad news talking to relatives about patients who are not improving that kind of thing I'm going to talk about how I think that gets easier when you're an F1 as to when you're a medical student not particularly because you know any more information or have got any better at things it's just because you're in a different role and feel more able to have a sincere conversations with patients.