A MULTIFACTORIAL STUDY OF MEDICAL MISTAKES INVOLVING INTERNS AND RESIDENTS

Merrilyn Walton

A thesis submitted in fulfilment of the requirements for the degree of Doctor of Philosophy

Faculty of Medicine   University of Sydney

2004

ABSTRACT

This study is an exploration of medical mistakes involving interns and residents. Retrospective studies confirm the substantial number of hospital patients harmed as a result of their health care. Data from the *Quality in Australian Health Care Study* showed causes of adverse events included inadequate supervision of medical staff, pressure not to admit patients, to discharge them early, poor hospital systems and patient factors. My research builds on previous studies by examining junior doctors' experiences and their perceptions of the causes of mistakes by reference to their own mistakes or those they have observed. It adds new knowledge about the relationship between mistakes involving junior doctors and the underlying factors associated with these mistakes.

Semi-structured interviews were conducted with 32 interns and residents from all departments in a Sydney metropolitan teaching hospital. Eighty-one mistakes were described by the 32 interns and residents (JMOs), 57 of these were examined in detail. Mistakes described by JMOs fell into four categories: treatment, patient management, medication errors and diagnoses. Junior doctors identified treatment mistakes more than other types and raised issues of timeliness, quality of supervision and preparedness.

The JMOs in this study identified many causes of mistakes including misunderstanding of orders/instructions, lack of specificity of instructions, lack of opportunity to clarify instructions, competing demands, quick assessments, lack of assertiveness, fear and intimidation, lack of preparedness, and unavailability of senior staff. But Interns and residents believe personal individual factors are the main causes of mistakes. The work situation, hospital organisation, medical culture and the changing hospital patient population were all identified as factors in mistakes but were not thought significant in terms of either being the main cause or for the insights they provided for prevention.

Most informants had little understanding of how the system of health care contributes to mistakes or how improvements in the system of health care might improve patient outcomes and minimise opportunities for mistakes. This study also showed a low rate of disclosure of mistakes to patients and their families after adverse events.

The problems highlighted in this study such as those associated with unfamiliar protocols, different ward routines and unfamiliar environments identify that further research is required, particularly around the merits of standardisation of work processes such as hand-overs and out-of-department consultations. This study identifies many opportunities for system improvement as well as improvements in the training and education of interns and residents. In addition the findings will help hospitals and clinicians confront the sensitivity surrounding medical mistakes in relation to the disclosure of mistakes to patients and their families. Finally the study will help hospitals, supervisors and educators to better understand how interns and residents manage their mistakes in the first two clinical years.

CONTENTS

Chapter One: Introduction

Chapter Two: The environment

Chapter Five: Results - Mistakes and Factors

Chapter Six: Results- reporting mistakes, responding and discussing mistakes, avoiding mistakes and awareness of mistakes.

Chapter Seven: Conclusions, Implications and Recommendations

Appendices

Appendix 1   Letter to interns and residents inviting them to participate in the study

Appendix 2   The questionnaire

Appendix 3   The consent form

Appendix 4   Statement of confidentiality

Appendix 5   Heading and sub-headings developed to assist analysis

DIAGRAMS

Definition of Terms

Health organisations concerned with quality and safety are attempting to standardise definitions. While most concede the need for a standardised set of terms and definitions for describing quality and safety issues, there is still no consensus. Stakeholders engaged in the quality and safety debate come from diverse areas: health policy, negligence law, indemnity insurance, clinical care and clinical research. Words such as mistakes and negligence carry varied meanings depending on the discipline. Sources of definitions are identified in the endnotes.

Accident	An event that involves damage to a defined system that disrupts the ongoing or future output of the system.[1]
Active failures	Unsafe acts (errors and violations) committed by those delivering the health service (surgeons, anaesthetists, nurses, physicians etc.). [2]
Adverse event	An event that results in unintended harm to the patient by an act of commission or omission rather than by the underlying disease or condition of the patient.[3] The Australian Council on Quality and Safety in Health Care defines an adverse event as an incident in which unintended harm resulted to a person receiving health care.
Adverse drug event	Any incident in which the use of a drug (or biologic) at any dose, a medical device or a special nutritional product (supplement, infant formula, medical food) resulted in an adverse outcome for the patient.[4]
Accountability	Being held responsible.[5]
Accreditation	Being granted recognition for meeting designated standards.[5]

Bad outcome   Failure to achieve a desired outcome of care.[6]

Blame   Being held at fault (implies culpability).[5]

Chart review   The retrospective review of a patient's complete written record by an expert for the purpose of a specific analysis.[3]

Clinical audit   Assessment or review of any aspect of health care to determine its quality; audits may be carried out on the provision of care, community response, completeness of records, etc.[7]

Clinical Risk Management

The process of risk management as it relates to clinical care.[8]

Close call   An event or situation that could have resulted in an adverse event but did not, either by chance or through timely intervention.[9]

Conceptual model   A model of the main concepts of a domain and their relationships.[3]

Critical incident   A human error or equipment failure that could have led (if not discovered or corrected in time) or did lead to an undesirable outcome, ranging from increased length of hospital stay to death.[10]

Complaint   An expression of dissatisfaction with something.[11]

Credentialling | The process of analysing and conferring approval on a person's suitability to provide a defined type of health care. (Can be synonymous with clinical privileging).[5]

Error (active) | An error that occurs at the level of the frontline operator and where the effects are felt almost immediately.[12]

Error (latent) | Errors in the design, organisation, training or maintenance that lead to operator errors and whose effects typically lie dormant in the system for lengthy periods of time.[12]

Human error | Occasions in which a planned sequence of mental and/or physical activities fails to achieve its intended outcome, and when these failures cannot be attributed to the intervention of some chance agency.[12] Errors may occur by doing the wrong thing (commission) or by failing to do the right thing (omission).

Harm | Death, disease, injury, suffering and /or disability experienced by a person.[5]

High reliability organisation

Highly complex, technology-intensive organisations that must operate, as far as humanly possible, to a failure-free standard.[13]

Iatrogenic | Arising from or associated with health care rather than an underlying disease or injury. Consequences of omission (failing to do the right thing) as well as commission (doing the wrong thing) are included.[5]

Integrated risk management

A process of assessing all of an organisation's risks and the development of strategies to coordinate the management of those risks, including financial, operational and clinical. It uses a structured and disciplined approach focussed on aligning strategy, processes, people, technology and knowledge, and it should be integral to the culture of an organisation.[8]

Lapses
An action that generally involves a failure of memory.[13]

Legal protection
A facility for preventing the discovery in court of certain information or documentation generated during a defined process.[8]

Liability
Responsibility for an action in a legal sense.[5]

Mistake
An unsafe outcome resulting from an unsuitable plan of action carried out in the absence of appropriate procedures.[13]

Medical technology
Techniques, drugs, equipment and procedures used by health care professionals in delivering medical care to individuals and the systems in which such care is delivered.[14]

Micro system
Organisational unit built around the definition of repeatable core service competencies. Elements of the micro system include (1) a core team of health professionals (2) defined population of patients (3) carefully defined work processes and (4) an environment capable of linking information on all aspects of work and patient or population outcomes to support ongoing evaluation of performance.[6]

Misuse   The right service provided badly and leads to avoidable

                      complication, reducing the benefit the patient receives.[15]

Morbidity   The negative consequences (symptoms, disabilities or

                      impaired physiological state) resulting from disease,

                      injury or treatment.[8]

Near miss   An event or situation that could have resulted in an

                      accident, injury or illness, but did not, either by chance or

                      through timely intervention.[16]

Negligence   Care that fell below the expected standards of doctors in

                      a particular community.[17]

Organisational culture

                      The values, beliefs, assumptions, rituals, symbols and

                      behaviours that define a group, especially in relation to

                      other groups or organisations.[18]

Open disclosure   The process of open and honest discussion of the

                      adverse event with the patient harmed or their carers.[8]

Over use   Occurs when the risks of a health service outweigh the

                      benefits.[15]

Patient safety   Freedom from accidental injury. Ensuring patient safety

                      involves the establishment of operational systems and

                      processes that minimise the likelihood of errors and

                      maximise the likelihood of intercepting them when they

                      occur.[6] The Institute of Medicine defines patient safety as

                      the prevention of harm caused by errors of commission

                      and omission.

Preventability   Implies that methods for averting a given injury are known and that an adverse event results from failures to apply that knowledge.[19]

Risk management   In the context of hospital organisations the term risk management usually refers to self protective activities meant to prevent real or potential threats of financial loss due to accident injury medical malpractice.[20]

Root cause analysis

A process for identifying the most basic or causal factor or factors that underlie variation in performance, including the occurrence of an adverse sentinel event.[21]

Sentinel event   An unexpected occurrence involving death or serious physical or psychological injury, or the risk thereof. Serious injury specifically includes loss of function. The phase "or the risk thereof" includes any process variation from which a patient would carry a significant chance of a serious adverse outcome. Such events are called sentinel because they signal the need for immediate investigation and response.[21]

Slip   An unintended error of execution of a correctly intended action.[22]

System   A set of interdependent elements interacting to achieve a common aim. These elements may be both human and non human (equipment, technologies, etc.).[22]

System failure   A fault, breakdown or dysfunction within operational methods, processes or infrastructure.[8]

System errors   The delayed consequences of technical design or
                 organisational issues and decisions. (See also latent
                 error)[23]

Under use   The failure to provide a health service whose benefit is
                 greater than its risk. [15]

Endnotes for Definitions

1. Perrow C. *Normal Accidents.* New York: Basic Books, 1984.
2. Reason J. Understanding Adverse Events: The Human Factor. In: Vincent C, editor. *Clinical Risk Management:* BMJ Books, 2001:9-14.
3. Institute of Medicine. *Patient safety: Achieving a New Standard for Care.* Washington DC: National Academies Press, 2003.
4. Joint Commission for Accreditation of Health Organizations (JCAHO). Washington DC USA: Joint Commission for Accreditation of Health Organizations (JCAHO) http://www.jcaho.org, 2001.
5. Australian Council for Safety and Quality in Health Care. Shared Meanings. Canberra, 2003.
6. Institute of Medicine. *To Err Is Human Building a safer health system.* Washington DC: National Academy Press, 2000.
7. Robertson L. *Injury epidemiology, research and control strategies.* 2nd edition ed. Oxford: Oxford University Press, 1998.
8. Standards Australia and the Australian Council for Safety and Quality in Health Care. Open Disclosure Standard. Canberra: Commonwealth Department of Health and Aging, 2003.
9. US Department of Veteran Affairs. 2002.
10. Cooper JB, Newbower RS, Kitz JR. An Analysis of major errors and equipment failures in anesthesia management: considerations for prevention and detection. *Anesthesiology* 1984;60:34-42.
11. Leape L, Brennan T, Laird N, Lawthers AG, Localio AR, Barnes BA, et al. The Nature of adverse events in hospitalized patients: results of the Harvard Medical Practice Study II. *New England Journal of Medicine* 1991;324:377-84.
12. Reason JT. *Human Error.* reprinted ed. New York: Cambridge University Press, 1999.
13. Reason JT. *Managing the Risks of Organisational Accidents.* Aldershot, Hampshire, England: Ashgate Publishing Ltd, 1997.
14. Institute of Medicine. *Assessing Medical Technologies.* Washington DC: National Academy Press, 1985.
15. Chassin MR. Assessing strategies for quality improvement. *Health Affairs* 1997;16(3):151.
16. Quality Interagency Taskforce. Doing what counts for patient safety: Federal Actions to reduce Medical Errors and their impact. Report of the Quality Interagency Coordination Task Force (QuIC) to the President. Washington DC: Quality Interagency Coordination Task Force (QuIC) www.quic.gov/report/index.htm, 2000.
17. Brennan TA, Leape LL, Laird N, et al. Incidence of adverse events and negligence in hospitalized patients: results of the Harvard Medical Practice Study I. *New England Journal of Medicine* 1991;324:370-376.
18. Helmreich RL, Merritt AC. *Culture at work in aviation and medicine.* Aldershot UK: Ashgate, 1998.
19. Leape L, Lawthers A, Brennan T, Johnson W. Preventing medical injury. *Quality Review Bulletin* 1993;8:144-49.
20. Kramen SS, Hamm G. Risk Management: Extreme Honesty may be the best policy. *Annals of Internal Medicine* 1999;131:963.
21. Joint Commission on Accreditation of Healthcare Organizations. Conducting Root Cause Analysis in Response to a Sentinel Event. Oakbrook Terrace Ill.: Joint Commission on Accreditation of Healthcare Organizations, 1996.
22. Senders J, Moray NP. *Human Error: Cause prediction and reduction.* Hillsdale NJ: Lawrence Erlbaum Associates, 1991.
23. Battles JB, Kaplan HS, Van der Schaaf TW, Shea CE. The attributes of medical event-reporting systems: experience with a prototype medical event-reporting system for transfusion medicine. *Archives of Pathology & Laboratory Medicine* 1998;122:231.

Chapter One

Introduction

My professional interest in the impact of medical mistakes on patients and doctors
dates from 1985 when I became the Director of the New South Wales Health
Complaints Unit[i] and later when I was the NSW Health Care Complaints
Commissioner.[ii] During the 15 years I spent investigating health complaints, it
increasingly seemed to me that an important majority of complaints were associated
with problems with the system in which health care was delivered rather than being
simply explicable by the actions of individuals without reference to the contexts in
which they occurred. The responsibilities of my position included trying to improve
the standard of information provided to patients about their health care, encouraging
better explanations of treatments and making health care processes more
transparent, as well as encouraging the development and maintenance of
professional standards. Investigations covered all types of complaints and all health
workers. One area susceptible to complaints concerned medical treatment by
hospital interns and residents who were required to make decisions and undertake
procedures often without adequate preparation or supervision.

As Commissioner I observed manifestations of a 'blame' culture, particularly when
patients experienced unexpected outcomes. Often, these patients or their advocates
thought 'incompetent' or 'unethical' doctors responsible for their bad result. I also saw
health professionals and managers scapegoat individual health workers for problems
where wider analysis would have implicated factors within the organisation of the
health system. This focus on the individual as the problem rather than a willingness
to examine aspects of the different systems of care may be a significant impediment
to improving the quality and safety of the health system.

---

[i] I was the Director of the NSW Health Complaints Unit from 1985 to 1994. The Complaints Unit was
responsible for managing and resolving complaints concerning health services and health providers in
New South Wales.
[ii] I was Commissioner for the NSW Health Care Complaints Commission between 1994 and 2000. The
Commission has statutory responsibility for investigating and prosecuting complaints concerning all
health professionals (inc.medical practitioners) and investigating health services (inc. hospitals).

It was not always the case. In the late nineteenth and early twentieth centuries doctors openly discussed medical mistakes with peers. Harvey Cushing[iii] routinely published case reports in professional journals about both his successes and failures caused by mistakes.[1] Such openness helped other doctors to think about mistakes. Routine reporting of medical mistakes enabled clinicians to analyse and learn from them. Reporting also reminded clinicians of their vulnerability to error.[2] After 1930 case studies of individual mistakes were less commonly published in the journals[3] primarily because of the shift away from case notes to studies involving larger numbers of patients being treated.[iv] The development of practice standards and increasing litigation were also factors.[3 4] Today there is a resurgence of interest in mistakes.

How the community responds to adverse treatment outcomes has also shaped how doctors respond. News media reporting of medical errors typically focuses on single catastrophic events, usually connected to individuals who are blamed.[5] We also know that the medico-legal environment influences how doctors manage their mistakes.[6-8] But whether these factors influence how junior doctors respond to medical mistakes is unknown.

All health professionals make mistakes at some stage in their careers. In this study I focus on the experience of mistakes involving interns and residents (junior doctors). I show in Chapter Three that junior doctors are a relatively understudied professional group in the context of mistakes. However, they are a major part of the health care workforce who regularly treat patients. Notwithstanding the importance of medical education throughout a doctor's career, junior doctors are still formally in training. Yet hospitals rely heavily on junior doctors to provide medical services. Heavy work schedules often exclude junior doctors from hospital-wide efforts to improve care and in some cases prevent them from participating in training and education. The nub of this thesis is that if there is to be a reduction in the number of patients harmed by the care and treatment they receive in hospital, we will need to change the hospital

---

[iii] Dr Harvey Cushing (1896-1939) was a neurosurgeon. In 1912 he was appointed Professor of Surgery at Harvard Medical School and Johns Hopkins Hospital.
[iv] Cushing changed from using individual case notes to large scale studies involving many patients. (See Eisenhardt L. Recent Advances in Neurological Surgery. Archives of Surgery 1935,18 (1927-1935):1929

environment in which interns and residents train and work, and in turn, the way interns and residents manage and think about mistakes. They will need to understand why they occur and how they are to be avoided and managed. My research builds on previous work about medical mistakes and junior doctors by examining junior doctors' perceptions of the multiple factors involved in mistakes through reference to their own mistakes or those they have observed.

In this chapter I outline developments in response to the reported high incidence of adverse events occurring in the health system. Research is only now beginning to examine the underlying causes of health care errors. While I detail the research associated with junior doctors and their involvement in mistakes in the literature review (Chapter Three), in this chapter I give a preliminary introduction to the historical and contextual factors that influenced me to study junior doctors' experience of mistakes. The work of junior doctors is integral to the delivery of patient care. Notwithstanding the awareness of errors in the health system and the recognition that health care must be redesigned to reduce the number of errors, the role junior doctors can play in error prevention has received little attention. My study seeks to redress this deficiency. This study of interns' and residents' mistakes requires an understanding of the nature and role of human error in mistakes. Later in this chapter I outline some of the main features of theories on human error. I also provide an overview of my study.

1   How safe is health care?

Studies confirm that a substantial number of patients are harmed by their health care. Table 1.1 below lists international studies and the adverse event rate in four countries.

Table 1.1: Data on Adverse Events in Health Care from Several Countries. World Health Organization Executive Board 109th session, provisional agenda item 3.4, 5 December 2001 EB 109/9.

	Study	Study focus (date of admissions)	Number of hospital admissions	Number of adverse events	Adverse event rate (%)
1	United States (Harvard Medical Practice Study)	Acute care hospitals(1984)	30 195	1 133	3.8
2	United States (Utah-Colorado study) (UTCOS)	Acute care hospitals(1992)	14 565	475	3.2
3	United States (Utah-Colorado study) (UTCOS) 1	Acute care hospitals(1992)	14 565	787	5.4
4	Australia (Quality in Australian Health Care Study) (QAHCS)	Acute care hospitals(1992)	14 179	2 353	16.6
5	Australia (Quality in Australian Health Care Study) (QAHCS) 2	Acute care hospitals(1992)	14179	1 499	10.6
6	United Kingdom	Acute care hospitals(1999-2000)	1 014	119	11.7
7	Denmark	Acute care hospitals(1998)	1 097	176	9.0

1   UTCOS revised using the same methodology as the Quality in Australian Health Care Study (harmonising the four methodological discrepancies between the two studies).
2   QAHCS revised using the same methodology as UTCOS (harmonising the four methodological discrepancies between the two studies).
Studies 3 & 5 present the most directly comparable data for the UTCOS and QAHCS studies.

Retrospective medical record reviews in the United States, Australia, the United Kingdom, Denmark and New Zealand [v] record the extent of patient injury as a result of health care. [9-14]

1.1   Responding to the evidence

Governments in most developed countries have now initiated strategies for improving the safety of health care. In 1998 the US Institute of Medicine established the Committee on the Quality of Health Care in America to provide strategic direction for improvements to the health system in that country. Two major reports underpinned this initiative. The first report *To Err is Human: Building a Safer Health System* [15] (1999) focussed on patient safety and the environment in which medical mistakes occur. It highlighted a failure to observe, record, monitor, analyse and learn from mistakes because of the focus on individual health workers rather than on the design of the systems. The second report *Crossing the Quality Chasm: A New Heath*

---

[v] The New Zealand Study showed adverse events were associated with 12.9% of all admissions and that 4.5% of all admissions in NZ public hospitals were associated with highly preventable adverse events. Analysis of 850 adverse events revealed similar findings to the other studies in Table 1.1

System for the 21st Century [16] (2001) described the inability of the health system to routinely translate clinical knowledge and new technology into practice. While patients expect timely, safe and appropriate treatment the report provided evidence that these expectations were frequently not met.[17] Following these reports health services have developed strategies to reduce harm to patients by improving health care delivery services. More recent reports published by the US Institute of Medicine in 2001 and 2003 outline the key areas needing attention, methods for measuring and addressing them and a plan for the development of data standards for collecting, coding and classifying patient safety information.[18] [19]

In 1998 the US President's Advisory Commission of Consumer Protection and Quality in the Health Care Industry highlighted avoidable medical errors and rated this as one of the four major challenges in improving health care quality. On the Commission's recommendation the Quality Interagency Coordination Taskforce was formed in 1999 (and renamed the Agency for Health Care Research and Quality.) The need for more research on measuring errors, understanding why they occur, exploring the options for reporting errors, developing the means to reduce them and testing the effectiveness and cost effectiveness of various approaches to improving patient safety were priority areas of work.[16]

In the United Kingdom, the publication of *An Organisation with a Memory* [20] (2000) prompted reforms to the National Health Service. This report, using the best available research, said that about 10 per cent of all hospital admissions, or an estimated 850,000 hospital admissions per year in the UK, involved adverse events.

The Australian Council for Safety and Quality in Health Care (ACSQ) was established by Australian Health Ministers in 2000 to improve patient safety and has lifted the profile of safe health care in Australia[vi]. All four strategies outlined in the Council's 2002 national action plan[21] focussed on reducing patient harm and minimising errors. The targeted areas were:-

---

[vi] Other agencies include The Agency for Healthcare Research and Quality (AHRQ) The Institute for Healthcare Improvement (IHI) The Institute for Safe Medication Practices (ISMP) The Joint Commission on the Accreditation of Healthcare Organizations (JCAHO) The Australian Patient Safety Foundation (APSF) The NSW Institute for Clinical Excellence (ICE).

- The development of national standards for 'Open disclosure'. 'Open disclosure' is the term used to describe the provision of honest and complete information to patients or their families after an adverse event.
- Reducing preventable patient harm associated with medication use
- Reducing patient harm as a result of health care associated infections
- Coordinated national action to apply lessons learned from adverse events.

Creating a safer health system requires many different strategies - redesign of hospitals and work routines, leadership, promotion of effective team functioning, clinical practice improvement, incident reporting and error management. Understanding and managing mistakes is central to these strategies. While health workers and policy makers in developed countries are learning about mistakes by reference to the experiences of mistakes in other industries, the applicability of many of those safety concepts are only now being tested in the health care environment. Copying strategies from the corporate and industrial sectors, without understanding the different contexts, is fraught with difficulty. [22]

1.2   Adverse events

Even though the extent of adverse events[vii] in the health system has long been recognised, [23-30] the degree to which they are acknowledged and managed varies greatly across the health system and across health professions. Ignorance of the extent of injury, and the fact that most errors do not cause harm may explain the historical tardiness to make the health system safer. Outcome data are still not routinely published in journals or news media nor are they routinely collected by health professionals. Mistakes affect one patient at a time and staff working in one area may only experience or observe an adverse event infrequently. Mistakes do not all happen at the same time or place which can act to camouflage from staff the extent of errors in the system.

Studies [29 31 32] show that most adverse events arise from preventable mistakes. Leape et al [32] found that more than two-thirds of adverse events are preventable.

[vii] The term adverse event is of recent origin. Previously the literature used the word 'iatrogenesis' to describe the process whereby patients are harmed by their health care. The development and expansion of pharmacological therapies in the 1950s and 1960s led to a rise in iatrogenic complications.

Twenty-eight per cent were due to the negligence of a health professional with 42 per cent caused by other factors not related to such negligence. Bates et al [33] found that medication mistakes were harming patients at an overall rate of about 6.5 per 100 admissions in large US teaching hospitals. Their research, based on self-reports by nurses and pharmacists and daily chart review, is a conservative figure because doctors do not routinely self-report medication errors. About two to three per cent of all hospitals admissions in Australian hospitals relate to medicines (under-use, overuse and adverse events) consumed either inside or outside hospitals.[34]

1.3   Economic costs

The precise costs of adverse events to the Australian health system are unknown. Inconsistencies associated with the collection and classification of hospital data on morbidity, mortality and hospitalisations have yet to be resolved. Although injury was identified as a National Health Priority area in 1986,[viii] insufficient data about the causes of specific injuries prevented a detailed analysis of costs of iatrogenic illness in Australia at that time. *The Final Report of the Taskforce on Quality in Australian Health Care* (1996) estimated the costs of adverse events to be $867 million per year and $4.3 billion over five years.[35]

A 1999 report published by the Australian Institute for Health and Welfare of 1993-4 of all injury data for 1993-94 showed that adverse effects of medical treatment accounted for 16 per cent of all injury costs – behind accidental falls (31%) but more than road traffic accidents (14%), homicide and violence (5%), suicide or self-inflicted injuries (3%).[36] The costs are based on reported injuries and may be under estimates because while formal mechanisms for reporting incidents exist in most hospitals, not all nurses and doctors use them.[20]

One cost component of adverse events is that associated with medical negligence. Accurate data on the cost of medical negligence in Australia are not available because medical defense organisations say this information is 'commercial in confidence'. Nevertheless, the *Final Report on Compensation and Professional*

[viii] Injury prevention and control was endorsed as a National Health Priority Area by Australian Health Ministers in 1986 in recognition of the national burden of injury.
http://www.health.gov.au/pubhlth/strateg/injury/

Indemnity in Health Care (1995) [37] concluded adverse events had significant cost implications for the health care budget. The human costs of pain and suffering, loss of independence and productivity for both patients and their carers is also a cost. Calculations by the Australian Patient Safety Foundation estimated the costs of South Australian claims and premiums on insurance for large medical negligence suits to be about $18 million in 1997/98.[38]

Costs of mistakes are also significant in other countries. The National Health Service in the UK pays out around £400 million in settlement of clinical negligence claims every year.[20] The US Agency for Health Care Research and Quality (AHRQ) reported in December 1999 that preventing medical errors has the potential to save approximately $US8.8 billion per year.[39]

While debates[40-43] within the medical profession about the methods used to determine the rates of injury and their costs to the health system continue, many countries have accepted that the safety of the health care system is a priority area for review and reform.

2   An overview of doctors' mistakes

While there is growing research on under-use, overuse and misuse[44] of health care in the medical specialties and sub-specialities, little research has specifically focussed on the experience of interns (Post Graduate Year 1) or residents (Post Graduate Year 2)[ix]. Of the 152 references about overuse, under-use and misuse cited in *Crossing the Quality Chasm*, none covered the experience of junior doctors. [16] Experienced clinicians were covered but no research specifically examining the clinical context of mistakes by junior doctors was included.

Twenty years ago Bosk,[45][46] a sociologist, was one of the first to categorise medical errors. He classified the errors of young surgical trainees into *technical errors*, *judgemental errors* and *normative errors*. He defined a technical error as one where the trainee speedily acknowledged the error, reported it and treated the patient appropriately. Bosk observed that the trainee was 'forgiven' if all three activities

---

[ix] PGY 1 stands for post graduate year 1 and PGY 2 stands for post graduate year 2.

occurred. Surgical residents were expected to make mistakes but not to make the same mistake twice. This typology reflected the prevailing knowledge about medical mistakes at that time; mistakes were made by people who had a responsibility to learn from them. 'Learning from mistakes' as a theme in educating clinicians was first questioned by Popper and McIntyre[47] in the *British Medical Journal* in 1983, when they observed that if doctors were expected to learn from their mistakes that this required a willingness to admit errors and discuss them.[47] Gorowitz and MacIntyre[48] argue that a misunderstanding of fallibility in medicine is a major problem inhibiting reporting and learning from mistakes. They wrote

"No species of fallibility is more important or less understood than fallibility in medicine. The physician's propensity for damaging error is widely denied perhaps because it is so intensely feared...Physicians and surgeons often flinch from even identifying error in clinical practice, let alone recording it, presumably because they themselves hold that error... arises from their or their colleagues' ignorance or ineptitude."[48]

The proliferation of new drugs and technology, diagnostic tests, and invasive procedures significantly increases the opportunities for errors. With shorter hospital stays[x] there is also decreased opportunity for detailed discussions with and about patients and sharing of information among clinicians. Thomas and Helmreich[49] surveyed 1033 medical personnel in five countries and found that only one in three thought errors were handled appropriately by their hospital. Two-thirds said they had experienced an adverse event with more than 59 per cent saying they found it hard to discuss their mistakes in the workplace.

Fear of litigation, whether perceived or real, has had a major impact on mistake management by clinicians.[50] A publicised medical negligence court hearing can seriously damage a doctor's career even if the mistake was minor or an unpredicted complication of the treatment. Consequently, mistakes tend not to be seen as learning opportunities but instead as serious threats to reputations, careers and referrals.[51]

The notions of perfectibility and infallibility within the medical culture can mean individuals are reluctant to be open about their mistakes for fear of censure.[52] In addition, the 'blame' culture in medicine discourages candour about mistakes.[52]

---

[x] The NSW Department of Health reports the same-day surgery rate in June 2004 was 58.3 per cent and the day of surgery admission rate was 87.4 per cent.

These factors militate against doctors disclosing their mistakes to patients and other health professionals. [53] [54]

2.1 Junior doctors and mistakes

A study by Harrison[55] noted that level of experience and supervision of junior medical staff, pressure not to admit patients, or discharge them early, poor hospital systems and patient factors all caused errors. Her results suggest there are inadequate mechanisms to support junior doctors. Harrison analysed data collected for *The Quality in Australian Health Care Study* [12] and isolated 'failure to act on available information' as a significant cause of adverse events. She found that 88 per cent of adverse events due to 'failure to act' resulted in either a delayed, wrong or failed management in respect of diagnosis, treatment or therapy by the treating medical officer. Thirty-three per cent (n=153) of adverse events were due to incorrect diagnosis on admission, 24 per cent (n=112) related to poor judgement, 16 per cent (n=73) concerned delay or failure to seek more diagnostic information, and 12 per cent (n=57) concerned medication errors. Because her study used secondary data sources she was unable to be specific about the factors involved in the errors as perceived by the people making the mistakes.

The traditional apprenticeship model for training junior doctors is today straining under pressures from health care technology, increasing patient expectations and demands for greater efficiency.[56] An intern's or resident's relationship with a consultant, once core for learning and characterised by daily contact during and after rounds, is now largely a thing of the past in most Australian hospitals. Interns once could expect to make up to four rounds a day: two rounds by the intern alone for checking the status of patients and another two rounds with the consultant and senior registrars.[57]

Despite significant changes in hospital organisation and management, the method for training and educating interns and residents has changed little. The apprenticeship model still exists but an intern or resident today will work with many consultants and interact with multiple clinicians on a daily basis. The one-on-one relationship underpinning the 'old' apprenticeship is rare. Junior doctors are now required to understand the unwritten rules of each consultant from whom they take instructions

and to ensure orders are followed for each consultant's patients.[58] The use of multiple consultants often leads to fragmented supervision, fewer instructions and more frequent sub-standard performances.[57] This, and the lack of standardisation of roles and duties, makes junior doctors more vulnerable to errors.[59]

The apprenticeship model relies on reports from supervising clinicians about the performance and development of young doctors. Junior doctors in training are low in the medical hierarchy and dependent upon supervisors for their instructions and learning. Their progress depends on favourable reports from supervisors: their relationship with senior clinicians often influences how successfully they move up the medical hierarchy.

Maintaining the confidence of a supervisor is paramount. Progression up the medical hierarchy depends on favourable reports based on informal and formal feedback and subjective and objective assessments about their competence and commitment. Disclosing mistakes to supervisors may have repercussions for the junior doctors involved. Interns and residents may hold founded or unfounded fears that disclosing mistakes may lead to unfavourable reports or decreased employment opportunities or reduced chances for gaining access to training programs or all three.

From a junior doctor perspective a good relationship with supervisors is crucial. But over-reliance on supervisors for teaching and assessment may also encourage junior doctors to conceal their mistakes and to perform clinical tasks when requested knowing they are not competent in those tasks. They may be reluctant to admit to their supervisors their inexperience. Junior doctors who have been working long hours and feel fatigued may also be reluctant to advise their supervisors for fear of receiving an unfavourable report or being seen as 'lacking in commitment'. Given the significance of this relationship it is surprising that it has seldom been studied.

Anecdotes by junior doctors to the Postgraduate Medical Council of New South Wales [xi] characteristically depict internship as a survival course, with education and information-sharing low priorities. Time pressures and constantly changing work

---

[xi] I am the Faculty of Medicine University of Sydney's representative on the Postgraduate Medical Council of NSW (appointed 2002) The Council regularly holds junior doctor forums.

routines are barriers to junior doctors accessing hospital information networks that disseminate organisational and clinical information. Rarely are they engaged in quality improvement activities that involve investigation and analyses of mistakes. What they think about medical mistakes and their underlying causes remains unrecorded. Hospital investigations of mistakes that may involve a junior doctor for example, may not necessarily obtain the full picture from the junior doctor who may be concerned that candour will have a negative affect on his or her career. While methods are being developed to measure and capture information about adverse events, there has been very little attempt to understand medical mistakes from the perspectives of those closely associated with them. If junior doctors are not part of the communication network their participation in service improvement is limited or non-existent. [60] [61]

The outcomes of care for a patient or whether a mistake has been made may often be unknown to JMOs because patients often move between wards or are discharged. Ever-changing rosters limit their capacity to know the outcome of treatment decisions. Understanding the many factors involved in mistakes by interns and residents will help us better understand how the work environment and medical culture impact on safe practice. A reduction of mistakes by junior doctors will involve them understanding and learning from their own and others' mistakes.

If we do not pay attention to what individual clinicians think about their mistakes, we may misunderstand the role played by mistakes in the hospital environment. What clinicians think are the main causes of mistakes may be of fundamental importance for better understanding the dynamics of medical mistakes. Whether they see mistakes primarily as system errors or as evidence of 'incompetence' is instructive for both educational programs and organisational improvement.

Clinical experience is central to doctors' education. Biographical accounts by US interns and residents[62-67] of their early medical years are typically disparaging about medical training[xii]. They routinely describe the loneliness, overwork and negligible guidance from senior clinicians.[xiii]

[xii] There are no similar Australian publications.
[xiii] See Chapter Three for a more detailed discussion about their accounts.

3   Theoretical framework for this study

3.1   Learning from other disciplines

Even though researchers who have attempted to synthesise the nature of medical mistakes concur that no one body of knowledge can adequately explain medical mistakes, medicine has tended to focus on the individual performances of clinicians[68-70] as the main factor in mistakes. It has paid little attention to knowledge from other disciplines. Lessons from other industries show that analysing mistakes at least involves an understanding of psychology, sociology, anthropology, process theory and organisational theory.

The day-to-day experiences of clinicians described in anthropological medical ethnographies can provide a context to understand the work of clinicians. Sociologists and anthropologists have long been writing about medicine and have established bodies of knowledge about the doctor-patient relationship, professional power and autonomy, the uncertainty in medicine particularly in clinical decision making and the socialisation of young doctors into medical culture. [46 71-77] Ethnographic studies[46 77 78] have emphasised the role medical culture has on the management of mistakes.

Paget's[79] phenomenological study of medical mistakes focuses on the language of mistakes. The clinical process, she observed, is one of discovery involving trial and error where a mistake is not seen as a failure but an inevitable part of medical practice. She views medicine as an 'error- ridden activity'.[79] How junior doctors view medical mistakes and whether they view them as inevitable has received little attention.

These above studies demonstrate that the way doctors handle their mistakes cannot be understood without reference to professional behaviours, attitudes and values.

Process and systems theories provide a means of examining and measuring medical work and its inter-relationships with other parts of the health care system. Cognitive psychology provides ways of understanding human error, problem-solving and the impact of stress and the environment on individuals. All these areas help to provide a

deeper understanding of mistakes. Lessons from continuous quality improvement theory developed by the manufacturing industry have facilitated different ways of understanding clinical care. Early pioneers of continuous improvement theory include Walter Shewhart[80] who invented statistical process control, and W. Edwards Deming[81] who developed the plan-do-check-action cycle. More recent work in the 1970s by Joseph Juran[82], Armand Feigenbaum[83] and Kaoru Ishikawa [84] resulted in Total Quality Management. For them, quality was not something controlled at the end of the production line but an integral concern to be applied throughout the work process. This shift from quality control at the end to quality assurance /management throughout also means a shift in the design of systems to allow such integration. The health system, using knowledge from quality management, has introduced a variety of methods for analysing adverse events. (Root Cause Analysis[xiv], Clinical Practice Improvement methods are widely used.[xv]) These rely on identifying and measuring all the steps in a given process, not just those relating to the outcomes of care.

3.2   The uncertainty of medicine

Eric Cassell, [85] Clinical Professor of Public Health at Cornell University Medical College, wrote while reminiscing about his early medical education in the 1950s that his training was underpinned by four assumptions. The first was that the disease explained the illness. The second assumption was that the same disease in a different person produced the same illness. The final assumptions were that to know the science of disease was to know diagnosis and treatment and to know medical science was to know medicine. Cassell asserts that even though these are erroneous assumptions, doctors are still trained as if they are valid. [85] Popper and McIntyre [47] agree that such assumptions were never valid. They argue that because medicine mistakenly believed that knowledge grows by accumulation, by collecting more and more facts, scientific knowledge was certain knowledge which could be acquired and stored in a person's mind. The authors assert that far more knowledge is acquired by recognising errors - a process which is critical for learning. Nearly 50 years ago Fox[77]

[xiv] Root Cause Analysis is a process for identifying the most basic or causal factor or factors that underlie variation in performance, including the occurrence of an adverse sentinel event.
[xv] Clinical Practice Improvement (CPI) is the practical application of continuous quality improvement theory developed by the manufacturing industry. CPI is concerned with improving processes of care and reducing variation so that everyone's performance progressively improves.

identified two types of medical uncertainty: incomplete or imperfect mastery of available knowledge and the limitations of current medical knowledge. Regardless of the expertise a clinician has in any one area it is impossible to have complete access to information for 'perfect' decision making. Therefore mistakes are an inevitable part of the practice of medicine.

Further uncertainty arises with the difficulty in distinguishing between personal ignorance and ineptitude and the limitations of medical knowledge[86]. How do junior doctors view mistakes? Do they see them as evidence of incompetence or as an inevitable part of medical practice? How do they react to and how do they manage mistakes? Even though junior doctors have limited knowledge and experience, the design of hospitals and their work schedules often places them in situations where lack of knowledge is not taken into account.

In 1984, Hilfiker[53] observed that physicians are trained in a way that assumes they can always perfectly diagnose and perfectly treat patients. At the heart of the perfectibility model is the belief that if only doctors and nurses would try harder and were more knowledgeable and skilful then errors would not happen. This view does not take into account the role played by other factors such as the organisation and human factors. The study of human factors concerns the interrelationships between humans, the tools they use, and the environment in which they live and work. Early human factors work in the military and industrial sectors[87] concentrated on human interactions with physical devices or appliances. But today it has broader application.

The technological revolution in health care has increased the relevance of human factors because the potential for harm when technology is mishandled or misapplied can be greater than without technology. Using human factors, one Harvard Medical School study [88 89] analysing anaesthetic mistakes, found that 82 per cent were caused by human error and 12 per cent from equipment failure. At the core of human factors analysis is the belief that understanding the environment is central to improving human performance and resolving human-machine interactivity problems. Awareness of the importance of the environment on performance though is not a recent development. In 1949 Chapanis wrote

"...Our human requirements and our expectations of what a man can do in a system depend to a great extent on the kinds of environment into which the system is thrown. Too little attention has been given to this problem in the past, and it seems almost certain that a considerable amount of improvement can be made by altering many characteristics of the environment in which men work."[90]

3.3   Applying knowledge about mistakes to health care

Leape, an Adjunct Professor at Harvard School of Public Health, was one of the first clinicians to use a multi-dimensional framework for understanding medical errors. Extracting cases from the Harvard Medical Study, Leape and his colleagues [32] developed a typology of errors with four domains: diagnostic errors, treatment errors, preventive errors and other errors caused by failure in communication, equipment failure and systems failure.[xvi] Leape has written extensively about the importance of viewing errors as system failures rather than as evidence of 'guilt' of individual health professionals. This is a useful approach given what is known about human error.

System theorists[xvii] argue that mistakes are more often caused by pre-existing organisational factors (poor processes, poor designs, poor teamwork, financial restraints and institutional factors) than by human blunders or negligence. We know that hospitals are complex organisations comprising multiple components and relationships which are prone to dysfunctionality yet we do not know how interns and residents experience this environment in relation to mistakes they make or witness. Health professionals have difficulty applying systems theory to health care delivery because typically, they are not trained to think in the concepts or language of systems theory nor do they use its tools to make sense of the systems in which they work[91].

The role played individually or collectively by inadequate design of medical or hospital apparatus, poor teamwork, inadequate supervision and training in medical mistakes may be recognised by clinicians but awareness of strategies to address such problems is lacking. Systems and organisational design theories enable different perspectives on the complexity of health services. Plsek[92] argues that the machine metaphor on which much of medicine has relied is the wrong metaphor for thinking about hospitals. The machine metaphor, which implies that a problem in one

---

[xvi] A more detailed discussion about the types of errors is found in Chapters One, Three and Four.
[xvii] System theory is an interdisciplinary field which studies systems as a whole. System theory focuses on complexity and interdependence.

part can be easily fixed without reference to other parts, is inappropriate because the health system is complex, dynamic and adaptive.

Major barriers to improving quality of care have been the lack of information,[93][94] credible data[95] and comprehensive measurement tools,[16][96] but professional fear and resistance to performance scrutiny and accountability are also factors.[97][98] There is strong evidence that better health outcomes are achievable when data collection and measurement is integrated into everyday clinical practice.[95](p.581) Americans Tom Nolan, Brent James and Don Berwick are leading the way by incorporating quality improvement principles into clinical improvement methods. The identification and examination of each step in the process of health care delivery is the core of quality improvement activities.

These methods are important for identifying areas for improvement but they assume that all the organisational and environmental factors will become evident through asking the 'what' and 'how' questions when investigating and analysing medical mistakes.

The health system is now attempting to use this knowledge and learn from other complex organisations about managing and understanding mistakes and accidents caused by human error. In 1990, NASA developed an accident investigation method, Man-Technique-Organisation (MTO), taken up the Swedish National Board of Health and Welfare.[99] The principles of MTO have been adapted for analysing medical process problems and include an examination of these factors: oral communication, written procedures, workplace design, physical environment, working environment, task supervision and training.[99]

4   Underpinning assumptions and knowledge about human error

4.1   Human error

Human error is a complex subject. Errors occur in different parts of organisations or systems and require a variety of solutions for remediation.[45] A universally agreed system for classifying errors has yet to emerge. Another reason for the lack of consensus is that human error can be characterised from several perspectives: task

characteristics, behavioural characteristics (errors of omission, commission or substitution), environmental factors or human psychological mechanisms.[100]

Since the 1920s a number of accident causation models[xviii] have emerged. The organisational accident model developed by James Reason is the central model on which I rely. It has also been used by Vincent[101] and others[102] [52] for analysing mistakes in the health system.

Reason developed three categories, slips, lapses and mistakes to help analyse and understand the nature of errors. He defined errors as planned sequences of mental or physical activities that fail to achieve their intended outcomes, when these failures cannot be attributed to the intervention of some chance agency.[103](p.9) Errors may occur by doing the wrong thing (commission) or by failing to do the right thing (omission). The definition contains three elements: first, a plan or intervention that includes a goal and the means to achieve it; second, a sequence of steps or actions initiated by that plan; and third, the extent to which the steps or actions are successful in achieving their purpose.[45]

Slips and lapses are defined as errors resulting from some failure in the execution and/or storage stage of an action sequence regardless of whether or not the plan which guided them was adequate to achieve its objective.[103] James Reason defined mistakes as deficiencies or failures in the judgmental and/or inferential processes involved in the selection of an objective or in the specification of the means to achieve it, irrespective of whether or not the actions directed by this decision-scheme run according to plan.[103]

Irrespective of whether errors are described as slips, lapses or mistakes, they all involve a deviation from the goal. When a person making one of these types of errors is in direct contact with another person, equipment or system, Reason calls these active failures. The origins of the events leading to an active failure may have commenced days, months or even years earlier. Reason [104] says two primary elements are always involved in accidents: active failures and latent conditions.

[xviii] 1920s Heinrich's domino model, 1960s Bird's loss control model, 1970s Hale & Hale's model and James Reason's organisational accidents model which was developed in 1990.

Active failures are errors made by humans (for example, pilots, taxi drivers, crews, factory operators) which have an immediate adverse effect. Latent conditions involve poor decisions, poor designs, poor supervision, inadequate tools and equipment and actions by humans long before a given adverse event.

Reason likens latent conditions to 'resident pathogens' which may or may not lead to an adverse event. Management decisions, instructions by designers, builders and clinicians all have the potential to lead to future errors.

Reason [105] distinguishes violations from errors. Violations are intentional deviations from protocols, standards, safe operating procedures or rules. But he theorises these are rare[106] with the majority of errors arising from aberrant mental processes (poor attention, memory lapse, distraction, poor motivation, forgetfulness) rather than intentional unsafe acts.

Reason argues that lower-order errors, commonly referred to as slips or lapses usually involve attentional, perceptual or memory failures usually associated with execution of an activity. Higher order failures involve mental processes such as misjudgement, miscalculation, or misunderstanding leading to a failure in formulating the intention or the plan (planning failures). He categorises mistakes into rule based mistakes and knowledge based mistakes.[xix] He theorises that three separate cognitive stages exist for each type of error. 'Mistakes' involve the cognitive stage of planning, 'lapses' involve the cognitive stage of storing and 'slips' involve the stage of execution.

[xix] Rule based mistakes cover the misapplication of normally good rules, application of bad rules, or the failure to apply a good rule (violation). Knowledge based mistakes occur when prepackaged solutions fail and the operator has to think out for themselves the solutions.
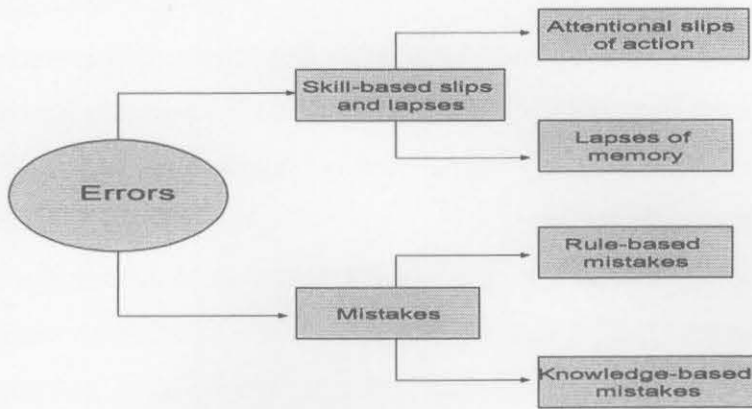
Diagram 1 James Reason: Summary of the principal error types.[45]

Norman,[107] using a similar taxonomy to Reason, distinguishes slips and lapses from mistakes by simply stating that an error is a mistake when the intention is not appropriate and if the action is not what was intended it should be considered a slip. Norman, building on the work of Meringer,[108] Mayer[109] and Freud, [xx] classified three main sources for slips: the formation of the intention, activation and triggering.

At the centre of Reason's organisational model of human error is the belief that errors (being symptoms revealing latent conditions in the system) are best viewed as consequences rather than as final causal events. He argues strongly that even though human-system interfaces are present as significant factors in most post disaster investigations, the causes of catastrophes are set in motion well before the actual disasters by a combination of a number of causal factors that alone are insufficient but when combined lead to the disaster.

Rasmussen[100] agrees with Reason and adds that it is impossible to define errors alone by looking at the performance of humans or equipment in isolation. A multifaceted approach is necessary because one can only define an error as an error after detailed examination of the behaviour of the total man-task system. He observes that humans may think their intentions and actions were appropriate but their selected goal may not be appropriate in the context of the whole system.

[xx] Sigmund Freud gave an early theoretical account of slips in 1901.

4.2   Organisational safety culture

The development of organisational frameworks for safer workplaces and safer organisational cultures was assisted by the impetus provided by a number of large scale technological disasters[xxi] in the 1980s.The core principle underpinning these frameworks was that not one but multiple factors are invariably involved in accidents: individual situational factors, workplace conditions and latent organisational and management decisions. The more complex the organisation, the greater potential for a larger number of latent errors in the system.

Turner's[110][111] examination of organisational failures in the 1970s set the scene for accident analysis throughout the 1980s and 1990s. He was first to appreciate that tracing the 'chain of events' was critical to an understanding of the underlying causes of accidents. Reason's work on the cognitive theory of latent and active error types and risks associated with organisational accidents builds on his work. Reason[104][112] analysed the shared features of many of the large scale disasters occurring in the 1980s and noted that latent human errors dominated rather than technical failures. Even when faulty equipment or components were present he observed that human action could have averted or mitigated the bad outcome.

Pidgeon,[113] who analysed the findings of the investigation into the Chernobyl catastrophe, observed that some large scale investigations failed to examine the wider organisational cultural issues. He argues that organisational errors and violations of operating procedures are often viewed as evidence of a 'poor safety culture'[114] rather than organisational characteristics contributing to the incident.

Another lesson arising out of investigations of large scale disasters is the extent to which the prevailing organisational culture tolerates violations of rules and procedures. Vaughan's[115] historical analysis of the events prior to the Challenger crash[xxii] show how violations can become the rule rather than the exception.

[xxi] Spacecraft, ferries, off shore oil platforms, railway networks, nuclear power plants, chemical installations.
[xxii] The viton O-ring seals failed in the solid rocket boosters shortly after launch. The Rogers Commission also found that other flaws in shuttle design and poor communication may have also contributed to the crash.

Vaughan described how violations are the product of continued negotiations between experts searching for solutions in an imperfect environment with incomplete knowledge.[xxiii] This process of identifying and negotiating risk factors, he suggests, leads to the normalisation of risky assessments. Vaughan terms this process the *'normalisation of deviance.'* [115] Turner [111] referred to such negotiations as 'trade offs' which can make organisations vulnerable to breakdown. Reason[106] theorises that these conditions are systemic problems caused by 'upstream' factors.

While the relationship between organisational failure and safety outcomes has been examined, [113 116] there is no consensus on the components of this relationship and how it plays out in the real world. The necessary interdisciplinary nature of the research means that much of the work on safety cultures is fragmented and disconnected. Zhang et al's[117] literature review of 'safety culture'[xxiv] noted that a majority of articles (30) appeared to share a number of features. First, safety culture is a concept defined at the group level referring to shared values, including a concern with formal organisational issues (management and supervisory systems). Second, everyone, at every level, is required to participate in efforts to maintain a safe environment. Third, safety culture impacts on behaviour and is usually reflected in a reward system based on monitoring of safety performance. Fourth, there is a willingness to develop and learn from errors, incidents and accidents. Finally, safety cultures are relatively stable and resistant to change.[xxv]

Reason[106] theorises that only a systems approach (as opposed to a person approach) will create safer work cultures because it is easier to change work conditions than human actions. He supports his theory with evidence from the

---

[xxiii] For nearly a year before the Challenger's last mission the engineers were discussing a design flaw in the field joints. Efforts were made to redesign a solution to the problem but before each mission, both NASA and Thiokol officials (company who designed and built the boosters) certified the solid rocket boosters were safe to fly. (Challenger: A major malfunction. Malcolm McConnell Simon & Schuster 1987.p.7 Challenger had previously flown nine missions before the fatal crash.
[xxiv] The term 'safety climate' was included in the search term because the authors noted it was often used in conjunction with safety culture.
[xxv] I use Zhang and his colleagues' definition of safety culture which is defined in the definitions of terms section in Chapter One.

technological hazard industries showing the benefits of built-in defences, safeguards and barriers.[xxvi]

For Reason, the pivotal post incident/accident question is why safeguards fail, rather than who caused it. Reason created the 'Swiss Cheese' Model[45] to explain how faults in the different layers of the system lead to incidents.
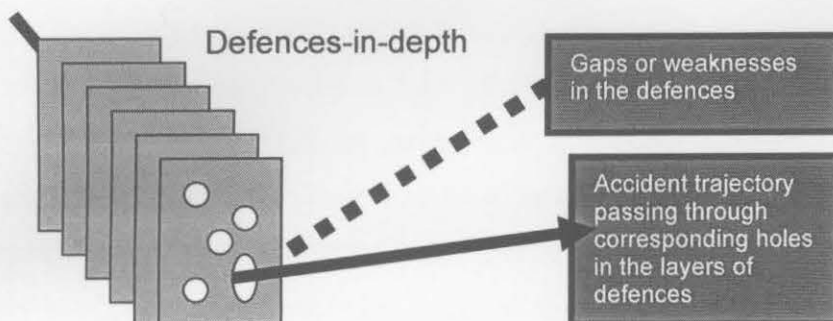
Diagram 1.2: The 'Swiss cheese' model of how defence barriers and safeguards may be penetrated by an accident trajectory.[118]

Reason's diagram shows that a fault in one layer of the organisation is usually not enough to cause an accident. Bad outcomes in the real world usually occur when a number of faults occur in a number of layers (for example, rule violations, inadequate procedures, faulty equipment) and momentarily line up to permit a trajectory of accident opportunity. To combat this happening Reason invokes the *'defence in depth'* principle.[45] Successive layers of protection (understanding, awareness, alarms and warnings, restoration of systems, safety barriers, containment, elimination, evacuation, escape and rescue) are designed to guard against the failure of the underlying layer.

4.3   The blame cycle

When failures or mistakes occur it is common for individuals to be singled out and held accountable. This act of 'blaming' in health care is commonly referred to as the 'blame culture'. Since 2000 there has been a dramatic increase in the number of references to the 'blame culture' in the health literature.[119]   The pervasiveness of a

---

[xxvi] Engineered defensive systems include automatic shut-downs (alarms, forcing functions, physical barriers). Other defensive mechanisms are dependant on people such as pilots, surgeons, anaesthetists, control room operators. Procedures and rules are also defensive layers.

'blame culture' is thought to be one of the main constraints on the health system's ability to manage risk.[45] [120-123]

A demand for answers as to why 'the event' occurred is not an uncommon response. It is easier to blame someone than undertake complicated detailed analysis of the factors surrounding an adverse event.

Charles Perrow [124] in 1984 was one of the first to write about the need to stop 'pointing the finger' at individuals when he observed that between 60 and 80 per cent of system failures were attributed to 'operator error'.[124] At that time the prevailing cultural response to mistakes in the workplace was to punish individuals rather than address any system problems that may have contributed to the error(s). Underpinning this practice was the belief that, since individuals are trained to perform tasks, then a failure of that task must relate to the failure of individual performance, thus deserving punishment. But to Perrow socio-technical breakdowns are a natural consequence of complex technological systems.[112]

Douglas,[125] an anthropologist, partially agrees with Perrow's analysis but she argues that his analysis concentrates too much on an industry typology and ignores the human factor at an individual and institutional level. The general structure of institutional authority, symptoms, clues, lines of communication, incentives and sanctions all involve humans and separately and individually are worthy of separate investigation and analysis. How humans experience or manage these factors have a bearing on the perception of risk in an organisation.

Pivotal to blame sentiment is the belief that punitive action sends a strong message to others, that errors are unacceptable and that those who make them will be punished. The problem with this assumption is that it is predicated on a belief that the offender somehow chose to make the error rather than adopt the correct procedure: that he/she intended to do the wrong thing. Because individuals are trained and/ or have professional/organisational status we think that they 'should have known better'.[118] Our notions of personal responsibility play a role in the search for the guilty party. Expressions such as *'the buck stops here'* or *'carrying the can'* are widely used. Professionals accept responsibility for their actions as part of their training and

code of practice. It is easier to attribute legal responsibility for an accident to the mistakes or misconduct of those in direct control of the operation then on those at the managerial level.[118]

Reason,[45] building on the earlier work of Perrow [124] and Turner,[111] provides this rationale for managing human error:

- Human actions are almost always constrained and governed by factors beyond an individual's immediate control.
- People cannot easily avoid those actions that they did not intend to perform.
- Errors have multiple causes: personal, task-related, situational and organisational factors.
- Within a skilled, experienced and largely well intentioned workforce, situations are more amenable to improvement than people.

Reason warns against being wise after the event because most people involved in serious accidents are neither stupid nor reckless, though they "may be blind to the consequences of their actions". [112] He counsels against 'fundamental attribution error' and 'hindsight bias'.

Today most complex industrial/high technological managers realise that a blame culture will not bring safety issues to the forefront.[102] Safe organisations do not depend on finger pointing or cover-ups but on open communication to identify failures or breaks in the 'defences'. Safe organisations routinely examine equipment design, procedures, training and other organisational features.[126] But in non-industrial fields such as health, the attribution of blame and punishment dominates management philosophy.

4.4   Using knowledge about errors in this study
The theoretical underpinnings of this study draw principally on the work of Reason [106] and Leape[52 127] who identify failures in the design of processes, tasks, training, and conditions of work that make errors more likely. The literature, summarised in greater depth in Chapter Three, identifies factors associated with medical mistakes. In my study I have categorised factors associated with mistakes as: Intern and

resident factors (the individual junior medical officer); patient factors; and the system of medical training and health care delivery. *Intern and Resident factors* include both personal (stress response and personality factors) and professional factors (medical knowledge and skill level). *Patient Factors* concern the complexity and severity of the patient's illness and personal demographics such as gender, age, and language spoken at home. *System factors* include the type of resident or intern training program (level of responsibility and degree of supervision), the hospital setting concerns organisational variables, scheduling of work, and unit cultures. Other external factors are likely to be also relevant such as Department of Health guidelines and regulations, the medical culture, budget constraints, and professional standards. Diagram 1.3 below describes the framework I use for my study.
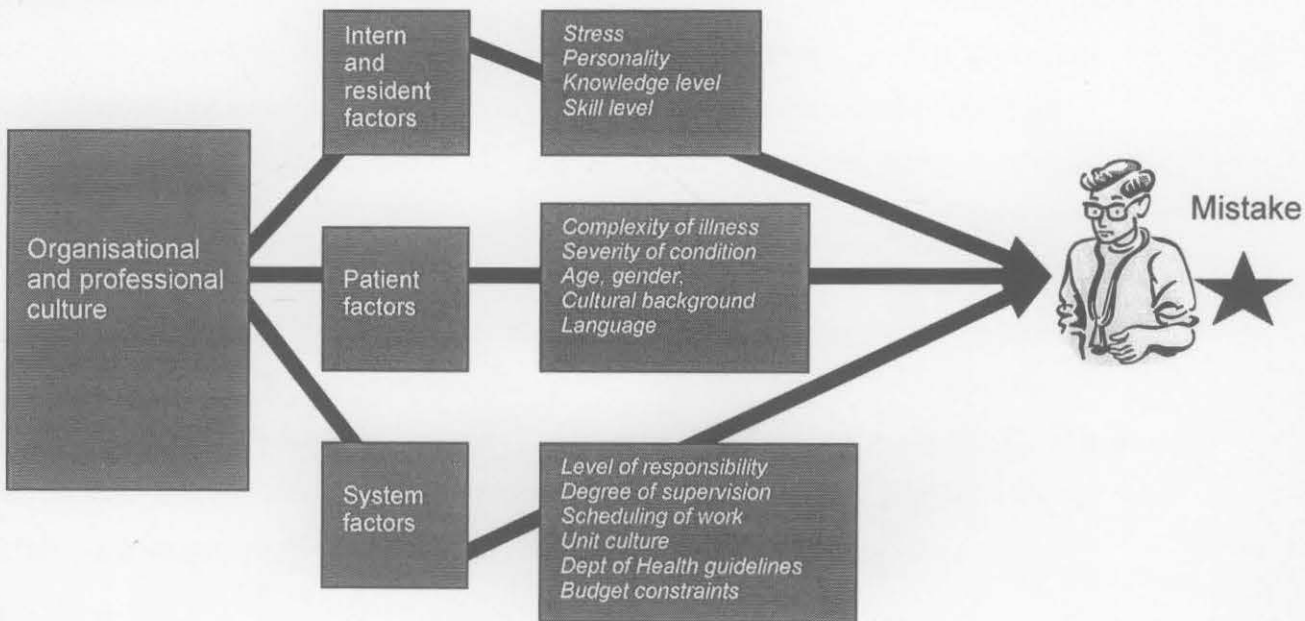
Diagram 1.3 Factors influencing junior doctors' mistakes

5   Outline of the thesis

5.1   This study

This is an in-depth study of interns' and residents' experiences and perceptions of the causes of medical mistakes using the framework outlined on the previous page and in Diagram 1.3. The literature about error causation provides a multidimensional approach for analysing accounts of junior doctors' experiences. Theories of error assume there is rarely one discrete cause but several interactive causes of any one error. The application of this principle to medical mistakes then must assume that any analysis of medical mistakes will need to elicit and explore that complexity. Complexity is best explored using qualitative investigation.

5.2   Aims of this study

The purpose of this research is to reach a deeper understanding of the experience of medical mistakes involving interns and residents. Adverse events research to date has focussed on either select patient groups (diabetes, stroke, mental illness) or places of work (for example, whole hospitals or hospital departments such as emergency departments and surgical theatres). There is little research examining the experience of junior doctors which takes its starting point from their perspective or experience. What they think about mistakes and how they handle them are important because their accounts may identify circumstances in which patients are more vulnerable to mistakes and provide insights into whether they are sufficiently prepared to handle mistakes. Whether interns and residents advise patients about mistakes and their reactions to patients suffering adverse events will indicate the level of support available to junior doctors.

The sensitivities surrounding any open discussion of mistakes have been a significant barrier to research involving the examination of actual cases. Research into mistakes has relied heavily on the use of hypothetical cases studies. But hypothetical cases only gauge informants' imagined responses. They cannot examine context.

A review of methods used to study mistakes[xxvii] shows that no studies have involved in-depth interviews to investigate the multiple factors underpinning mistakes by

---

[xxvii] I critique these methods in Chapter Four.

interns and residents. Nor are there published studies of any in-depth interviews for analysing actual mistakes using a multifactorial framework for exploring the underlying factors that may have been present or contributed to their occurrence. Anonymous surveys have questioned doctors about their mistakes but because they provide no opportunity to further question informants about their responses, these studies tend to yield superficial, condensed accounts of what the informants thought were the main problems. My study is the first to try to rectify these shortcomings and use in-depth discussions with interns and residents to explore mistakes in which they have been involved. We need to better understand their experiences to identify what areas we need to improve.

An understanding of interns' and residents' experience with mistakes requires an appreciation and understanding of the origins of hospital training for junior doctors and the experience of junior doctors in the health system. In Chapter Two I provide an overview of the historical and environmental factors that impact on the work of interns and residents today. This context is necessary to understand the particular vulnerability of junior doctors caused by the training system. I review the research literature on mistakes including the experiences of interns and residents in Chapter Three. I describe the research method used in this study in Chapter Four. Chapters Five and Six present the results in six sections - total mistakes described and the factors identified, acknowledging and reporting mistakes, responding and discussing mistakes with others, avoiding mistakes, the environment and awareness of mistakes. In Chapter Seven I discuss my conclusions and the implications of my findings. I conclude with recommendations for improvements and further study.

Endnotes for Chapter One

1. Denzel JF. *Genius with a scapel: Harvey Cushing*: New York Messner, 1971.
2. Pernick MA. *Calculus of suffering: pain, professionalism and anaethesia in the Nineteenth Century America*: New York: Columbia University Press, 1985.
3. Pincus RL. Mistakes as a social construct: an historical approach. *Kennedy Institute of Ethics Journal* 2001;11(2):117-133.
4. Mohr J C. American Medical Malpractice Litigation in Historical Perspective. *Journal of the American Medical Association* 2000;283(13):1731-7.
5. Jackson T, Harper A. Blunders will never cease How the media reports medical errors. *British Medical Journal* 2001;322:562.
6. Vincent C, Stanhope N, Crowley-Murphy M. Reasons for not reporting adverse incidents: an empirical study. *Journal of Evaluation in Clinical Practice* 1999;5:13-21.
7. Kapp M. Legal anxieties and medical mistakes. *Journal of General Internal Medicine* 1997;12:787-88.
8. Applegate W. Physician management of patients with adverse outcomes. *Archives of Internal Medicine* 1986:2294-52.
9. Davis P, Lay Lee R, Briant R, Schug S, Scott A, Johnson S, et al. Adverse Events in New Zealand public hospitals: Principal findings from a national survey. *Occasional Paper 3 Wellington New Zealand Ministry of Health* 2001.
10. Brennan TA, Leape LL, Laird N, et al. Incidence of adverse events and negligence in hospitalized patients: results of the Harvard Medical Practice Study I. *New England Journal of Medicine* 1991;324:370-376.
11. Leape L, Brennan T, Laird N, Lawthers AG, Localio AR, Barnes BA, et al. The Nature of adverse events in hospitalized patients: results of the Harvard Medical Practice Study II. *New England Journal of Medicine* 1991;324:377-84.
12. Wilson RM, Runciman WB, Gibberd RW, Harrison BT, Newby L, Hamilton JD. The Quality in Australian Health Care Study. *Medical Journal of Australia* 1995;163:458-71.
13. Gawande AT, EJ Zinner, MJ Brennan, TA. The incidence and nature of surgical adverse events in Colorado and Utah in 1992. *Surgery* 1999;126:66-75.
14. Secker-Walker J, Taylor-Adams S. Clinical incident reporting. In: Vincent C, editor. *Clinical Risk Management*. London: British Medical Journal Books, 2001:422.
15. Institute of Medicine *To Err is Human: Building a Safer System*. Washington DC: National Academy Press Institute of Medicine, 2000.
16. Institute of Medicine. *Crossing the Quality Chasm: a New Health System for the 21st Century*. Washington DC: National Academy Press, 2001.
17. Walton M. *The Trouble with Medicine: Preserving trust between patients and doctors*. Sydney: Allen and Unwin, 1998.
18. Institute of Medicine. *Envisioning the National Health Care Quality Report*. Washington DC: National Academies Press, 2001.
19. Institute of Medicine. *Patient safety: Achieving a New Standard for Care*. Washington DC: National Academies Press, 2003.
20. Expert group on learning from adverse events in the NHS. An Organisation with a Memory. London: Department of Health United Kingdom., 2000.
21. Australian Council on Safety and Quality in Health Care. *The National Action Plan 2002*. Canberra: Australian Council on Safety and Quality in Health Care,, 2002.
22. Schulman PR. Medical errors How reliable is reliability theory? In: Rosenthal M, Sutcliffe K, editors. *Medical Error: What do we know? What do we do?* San Francisco: Jossey Bass, 2002:200-16.
23. Steel K, Gertman PM, Crescenzi C, Anderson J. Iatrogenic illness on a general medical practice service at a university hospital. *New England Journal of Medicine* 1981;304:638-42.
24. Schimmel E. The hazards of hospitalization. *Annals of Internal Medicine* 1964;60:100-10.
25. US Congress House Sub Committee on Oversight and Investigation. Cost and quality of health care: Unnecessary surgery. Washington DC: USGPO, 1976.
26. Barr D. Hazards of modern diagnosis and therapy-the price we pay. *Journal of American Medical Association* 1956;159:1452-6.
27. Couch NP, Tilney NL, Rayner AA, Moore FD. The high cost of low-frequency events: the anatomy and economics of surgical mishaps. *New England Journal of Medicine* 1981;304:634-37.

28. Friedman M. Iatrogenic disease: Addressing a growing epidemic. *Post Graduate Medicine* 1982;71:123-9.
29. Dubois R, Brook R. Preventable deaths: who, how often, and why? *Annals of Internal Medicine* 1988;109:582-9.
30. McLamb J, Huntley R. The Hazards of Hospitalization. *Southern Medical Association Journal* 1967;60:469-72.
31. Bedell S, Deitz DK, Leeman D, Delbanco T. Incidence and characteristics of preventable iatrogenic cardiac arrests. *Journal of American Medical Association* 1991;265:2815-20.
32. Leape L, Lawthers A, Brennan T, Johnson W. Preventing medical injury. *Quality Review Bulletin* 1993;8:144-9.
33. Bates DW, Cullen D, Laird N, Petersen LA, Small SD, Servi D, et al. Incidence of adverse drug events and potential adverse drug events: implications for prevention. *Journal of American Medical Association* 1995;274:29-34.
34. Australian Council for Safety and Quality in Health Care. Second National Report on Patient Safety: Improving Medication Safety. Canberra: Australian Council for Safety and Quality in Health Care, 2002.
35. Taskforce on Quality in Australian Healthcare. The Final Report of the Taskforce on Quality in Australian Healthcare. Canberra: AGPS, 1996.
36. Mathers C, Penn R. Health system costs of injury, poisoning and musculo-skeletal disorders in Australia 1993-94. Canberra: Australian Institute for Health and Welfare, 1999.
37. Tito F. Compensation and Professional Indemnity in Health Care Final Report. Canberra: AGPS, 1995 November.
38. Runciman W. Iatrogenic Injury in Australia: A report prepared by the Australian Patient Safety Foundation. Adelaide: Australian Patient Safety Foundation http://www.apsf.net.au/, 2001:24.
39. Eisenberg JM Statement on Medical Errors,. *Senate Appropriations Subcommittee on Labor Health and Human Services, and Education December 13.* Washington DC, 1999.
40. Thomas E, Brennan T. Errors and adverse events in medicine: An overview. In: C Vincent, editor. *Clinical Risk Management: Enhancing patient safety.* London: BMJ Books, 2002:33.
41. Haywood R, Hofer T. Estimating hospital deaths due to medical errors: preventability is in the eye of the reviewer. *Journal of American Medical Association* 2001;286:415-20.
42. Thomas E, Studdert D, Brennan T. The reliability of medical record review for estimating adverse event rates. *Annals of Internal Medicine* 2002;136:812-16.
43. McDonald C, Weiner M, Sui H. Deaths due to medical errors are exaggerated in Institute of Medicine report. *Journal of the American Medical Association* 2000;248:93-5.
44. Chassin MR, Galvin RW. The urgent need to improve health care quality: Institute of Medicine National Roundtable on Health Care Quality. *Journal of the American Medical Association* 1998;280:1000-5.
45. Reason JT. *Managing the Risks of Organisational Accidents.* Aldershot, Hampshire, England: Ashgate Publishing Ltd, 1997.
46. Bosk CL. *Forgive and Remember.* University of Chicago Press, 1979.
47. McIntyre N, Popper K. The Critical attitude in Medicine: the need for a new ethics. *British Medical Journal* 1983;287:1919-23.
48. Gorowitz S, MacIntyre N. Toward a theory of medical fallibility. *Journal of Medical Philosophy* 1976;1:51-71.
49. Thomas E, Helmreich RL. Will Airline safety models work in medicine? In: Rosenthal MM SK, editor. *Medical Error. What do we know? What do we do?* San Francisco: Jossey Bass, 2002:227.
50. Rosenthal MM. How Doctors think about medical mishaps. In: Rosenthal MM, Mulcahy L, Lloyn-Bostock S, editors. *Medical Mishaps Pieces of the puzzle.* Buckingham: Open University Press, 1999:143.
51. Walton M. Open Disclosure to patients and their families after medical errors: A literature review: Australian Council on Quality and Safety in Health Care, 2001.
52. Leape LL. Error in Medicine. *Journal of American Medical Association* 1994; 272:1851-7.
53. Hilfiker D. Facing our mistakes. *New England Journal of Medicine* 1984;310:118-22.
54. Sweet MP, Bernat JL. A study of the ethical duty of physicians to disclose errors. *The Journal of Clinical Ethics* 1997;8940:341-8.
55. Harrison B. Review of Adverse Events Identified by the Quality in Australian Health Care Study Categorised as Failure to Act on Available Information. Masters of Public Health. University of Sydney, 1999.
56. Bailey J. Time for change in traditional working practices? *British Medical Journal* 1995;310:788.

57. Feinstein AR. System, supervision, standards, and the 'epidemic' of negligent medical errors. *Archives of Internal Medicine* 1997;157:1285-9.
58. Daugherty SR, Baldwin DC, Rowley BD. Learning, satisfaction, and mistreatment during medical Internship: A national survey of working conditions. *Journal of the American Medical Association* 1998;279:1194-9.
59. Australian Council for Safety and Quality in Health Care. Lessons Learned from the Inquiry into Obstetrics and Gynaecological Services at the King Edward Memorial Hospital 1990-2000. Canberra: Australian Council for Safety and Quality in Health Care, 2002.
60. Beecham L. Too many junior doctors are working too long hours. *British Medical Journal* 2000;320:7226:63.
61. Olson LG, Ambrogetti A. Working harder - working dangerously? Fatigue and performance in hospitals. *The Medical Journal of Australia* 1998;12:614-17.
62. Doctor X. *Interns*. New York: Harper & Row, 1965.
63. Marion R. *The Intern Blues*: Perennial, 1989.
64. Belkin L. *First do no harm*. New York: Fawcett Crest, 1993.
65. Pekkanen J. *MD Doctors Talk About Themselves*. New York, USA: Delacorte Press, 1988.
66. Klass PA. *A Not Entirely Benign Procedure: Four Years As A Medical Student*: Plume, 1987.
67. Konner M. *Becoming a doctor: A Journey of Initiation in Medical School*: Penguin Books, USA, 1987.
68. Nestok BR. Accuracy of frozen section diagnoses in a teaching hospital. *Archives of Pathology and Laboratory Medicine* 1987;111:897.
69. Johnson JE, Carpender JL. Medical house staff performance in physical examination. *Archives of Internal Medicine* 1986;146:937-94.
70. Wu AW, Folkman S, McPhee SJ, Lo B. Do house officers learn from their mistakes? *Journal of the American Medical Association* 2000;265:2089-2094.
71. Parsons Talcott. *The Social System*. New York: The Free Press, 1951.
72. Goode W. Community within a community: the professions. *American Sociological Review* 1957;25:902-14.
73. Freidson E. *Profession of Medicine*. New York: Harper and Row, 1970.
74. Freidson E. *Professional Dominance*. New York: Atherton Press, 1970.
75. Freidson E. *Doctoring Together: A study of professional social control*. New York.: Elsevier, 1975.
76. Stacey M, Reid M, Heath C, Dingwell R. *Health and the division of labour*. London: Croom Helm, 1976.
77. Fox RA. Training for Uncertainty. In: Merton R, Reader G, Kendall P, editors. *The student physician: Introductory studies in the sociology of medicine*. Cambridge MA: Harvard University Press, 1957:207-241.
78. McKee A. Working and learning in hospitals: junior doctors adrift in fragmented communities. *Learning in Health & Social care* 2002;1:158-69.
79. Paget M. *The unity of mistakes: A phenomological interpretation of medical work*. Philadelphia: Temple University Press, 1988.
80. Shewhart W A. Statistical Method from the Viewpoint of quality Control. In: Deming WE, editor. *Statistical Method from the Viewpoint of quality Control*. Washington DC: The Graduate School of the Department of Agriculture., 1939.
81. Deming W E. *Out of the crisis*. Cambridge: Massachusetts: Center for Advanced Engineering Study., 1986.
82. Juran J M. *Managerial breakthrough*. New York: McGraw-Hill, 1964.
83. Feigenbaum A V. *Total Quality Control: Engineering and management*: McGraw-Hill, 1961.
84. Ishikawa K. *What is total quality control: the Japanese way*. Englewood Cliffs, NJ: Prentice-Hall, 1985.
85. Cassell EJ. Historical perspective of medical residency: 50 years of changes. *Journal of the American Medical Association* 1999;281:1231-3.
86. Fox RA, Training for Uncertainty. In: Merton R RG, Kendall P, editors. The student physician: Introductory studies in the sociology of medicine. Cambridge MA: Harvard University Press, 1957:207-241. Training for Uncertainty. In: Merton R, Reader G, P K, editors. *The student physician: Introductory studies in the sociology of medicine*. Cambridge MA: Harvard University Press, 1957:207-241.
87. Wickens CD, Gordon SE, Liu Y. *An introduction to human factors engineering*. New York: Longman, 1998.
88. Cooper JB, Newbower RS, Long CD, McPeek B. Preventable anesthesia mishaps: a study of human factors. *Quality and Safety in Health Care* 2002;11:277-82.

89. Cooper JB, Newbower R, Long C. Preventable anesthetic mishaps: A Study of Human factors. *Anesthesiology* 1978;49:399-406.
90. Chapanis A, Garner WR, Morgan CT. *Applied Experimental Psychology: Human factors in engineering design.* New York: Wiley, 1949.
91. Weick KE. The Reduction of medical errors through mindful interdependence. In: Rosenthal M, Sutcliffe K, editors. *Medical Error: What do we know? What do we do?* San Francisco: Jossey Bass, 2002.
92. Plsek PE and Greenhalgh T. Complexity science:The challenge of complexity in health care. *British Medical Journal* 2001;323:625-628.
93. Wennberg JE, Barnes BA, Zubkoff M. Professional uncertainty and the problem of supplier-induced demand. *Social Science & Medicine* 1982;16:811-24.
94. Wennberg JE. The paradox of appropriate care. *Journal of the American Medical Association* 1987;258:2568.
95. Chassin M. Is health care ready for six sigma quality? *The Millbank Quarterly* 1998;76(4):565-91.
96. Institute of Medicine. *To Err is Human Building a safer health system.* Washington DC: National Academy Press, 2000.
97. Chassin M, Hannan EL, DeBuono BA. Benefits and hazards of reporting medical outcomes publicly. *The New England Journal of Medicine* 1996;334(6):394-98.
98. Sirio C, Rotondi A. The value of collaboration: Quality improvement in critical care units (editorials). *Critical Care Medicine* 1999;27(9):2034-5.
99. Ternov S. The Human side of medical mistakes. *Error reduction in health care.* San Francisco: Jossey-Bass, 2000:p.98.
100. Rasmussen J. The Definition of human error and a taxonomy for technical system design. In: Ramussen J, Duncan K, Leplat J, editors. *New Technology and Human Error.* John Wiley and sons Ltd, 1987:p 26.
101. Vincent C, Taylor-Adams S. *The investigation of and analysis of clinical incidents:* British Medical Journal Books, 2001.
102. Helmreich RL, Merritt AC. *Culture at work in aviation and medicine.* Aldershot UK: Ashgate, 1998.
103. Reason JT. *Human Error.* New York: Cambridge University Press, 1990.
104. Reason J. The contribution of latent human failures to the breakdown of complex systems. *Philosophical Transactions of the Royal Society of London. Series B Biological Sciences. 1990* 1990;327:475-84.
105. Reason JT, Parker D, Free R. Bending the rules: The varieties, Origins and Management of safety violations. Leiden: Faculty of Social Sciences. University of Leiden, 1994.
106. Reason J. Human error: models and management. *British Medical Journal* 2000;320:768-70.
107. Norman DA. Categorization of action slips. *Psychological Review* 1981;88:1-15.
108. Meringer R. *Aus dem Leben der Sprache.* Berlin: B Behr, 1908.
109. Meringer R, Mayer C. *Versprechen und Verlesen: Eine psychologisch-linguistische Studie.* Amsterdam: John Benjamins. (originally published in 1895), 1978.
110. Turner BA. The organizational and inter organisational development of disasters. *Administrative Science Quarterly* 1976;21:378-97.
111. Turner BA. *Man made disasters.* London: Wykeham Science Press, 1978.
112. Reason JT. *Human Error.* reprinted ed. New York: Cambridge University Press, 1999.
113. Pidgen N. Safety culture: transferring theory and evidence from major hazards industries. *Department of Transport Behavioral Research in Road Safety: Tenth Seminar.* 2001.
114. International Atomic Energy Agency. The Chernobyl Accident: Updating of INSAG-1. INSAG-7: International Nuclear Safety Group (INSAG), 1992:24.
115. Vaughan D. *The Challenger Launch Decision: Risky technology, Culture and Deviance at NASA.* Chicago: Chicago University Press, 1996.
116. Kennedy R, Kirwan B. The failure mechanisms of safety culture. In: Carnino A, Weismann G, editors. *Proceedings of the international topical meeting on safety culture in nuclear installations.* Vienna: American Nuclear Society of Austria, 1995.
117. Zhang H, Weigmann DA, von Thaden TL, Sharma G, Mitchell AA. Safety culture: a concept in chaos? *Proceedings of the 46th Annual Meeting of the Human Factors and Ergonomics Society.* Santa Monica: Human Factors and Ergonomics Society, 2002.
118. Maurino DE, Reason J, Johnson N, Lee RB. *Beyond aviation human factors.* Aldershot UK: Ashgate, 1995.
119. Gault WG. Experimental exploration of implicit blame attribution in the NHS: Grampian University Hospitals NHS Trust, 2004.

120. Millenson ML. Breaking bad news. *Quality and Safety in Health Care* 2002;11:206-7.
121. Gault W. Blame to aim, risk management in the NHS. *Risk Management Bulletin* 2002;7(1):6-11.
122. Berwick D M. Improvement, trust and the health care workforce. *Quality and Safety in Health Care* 2003;12 (suppl 1):i2-i6.
123. Walton M. Creating a 'no blame' culture: have we got the balance right? *Quality and Safety in Health Care* 2004;13:163-4.
124. Perrow C. *Normal Accidents: Living with high-technologies*. 2nd edition ed. Princeton New Jersey: Princeton University Press, 1999.
125. Douglas M. *Risk and Blame: essays in cultural theory*. Routledge, 1992.
126. Strauch B. Normal accidents-Yesterday and today. In: Hohnson CW, editor. *Investigating and Reporting of Accidents*. Washington DC 20594 USA: National Transportation Safety Board, 2002.
127. Leape LL. A systems Analysis Approach to Medical Error. *Journal of Evaluation in Clinical Practice* 1997;3(3):213-22.

Chapter Two: The environment

In this chapter I outline some of the historical and organisational developments that have had an impact on junior doctor employment and training in Australian hospitals. The role the environment plays in mistakes, the impact of hierarchical training structures on education and training, ever-changing health care needs of the population and the workforce needed to deliver care all play a role in health outcomes. The history of junior doctor training and education helps to explain some of the structural problems associated with the medical hierarchy and its impact on supervision and training of junior doctors. Many organisational issues associated with training and education relate to the origins of junior doctor employment and the development of public hospitals. I also summarise the medico-legal challenges because the organisation of training and current attitudes to litigation are important contextual features associated with junior doctors and mistakes.

Hospitals' development

Today hospitals fulfil two principal social purposes: they provide a centralised institutional setting for the provision of specialised medical services and they protect the family from the disruptive effects of caring for the sick at home. [1][2] Early hospitals treated injured soldiers and date back to Roman times.[I] During the Middle Ages hospitals expanded into the monastic centres, looking after monks, religious followers and the poor. The dismantling of monastic infirmaries in England [II] between 1536 and 1539 led to thousands of sick and infirm people being evicted into the streets which in turn led to the birth of non-profit hospitals for the curable and work houses and almshouses for the poo, homeless and incurable.[3]

[I] Hospitium means a place for guests and expanded in meaning during Roman times to also mean 'needing shelter'. In Roman times the military built and controlled hospitals. (1994 The Oxford Medical Companion edited by Walton J Barondess J and Lock S. Oxford University Press

[II] King Henry VIII instigated the dismantling.

It was not until the eighteenth century that doctors gained ascendancy in hospitals. Reports of unsafe practices gave doctors a helping hand in their quest for patient responsibility. Inspecting Europe's hospitals in 1780 John Howard reported surgical mortality was three to five times higher in hospitals than in the home.[4] But the status of doctors remained low into the next century due to competition from quacks and the need for patronage[4][5]. Public debate in England about the role of hospitals came to a head in 1860 when London's consultants successfully lobbied for the rebuilding of St Thomas's Hospital opposite Parliament House.[III]

In the UK 397 hospitals were built between 1851 and 1900, triple the number built between 1801 and 1850[6]. In the US the number of hospitals grew from 170 to about 7000 between 1875 and 1925.[7] Australia's first hospitals mainly treated convicts and the military with doctors also providing free care to settlers and the poor. The first non-government New South Wales hospitals were established by the Benevolent Society in 1821; by the 1880s New South Wales had 38 hospitals.[8] In 2000, 748 public hospitals operated in Australia and 302 private hospitals.[9]

Organisational changes in hospitals were accompanied by a changing medical profession. In the US four distinct groups of doctors emerged during the late nineteenth century[10]. The first comprised 'distinguished' consulting staff who had no regular day-to-day duties. Visiting or attending staff, the second and most important group, supervised treatment. Resident or house-staff (the third group) were young doctors in training who on the instructions of senior doctors carried out the details of treatment. The fourth group comprised dispensary staff (doctors) who saw outpatients. No doctors in any group were paid because of the benefits they received from accessing theatres, patients and services. By 1919 successful lobbying by professional medical associations saw US hospitals transformed into structured hierarchical organisations[10] reflecting the doctors' arrangements.

[III] The alternative was to be built in the country.

In the UK a similar hierarchy developed with the consultant at the pinnacle. London's Guy's Hospital was at the forefront of many of these changes. With advances in clinical medicine, physiology and pathology, the ability to describe clinico-pathological entities now dominated hospital practice.[3] Guy's Hospital created the first 'registrar' position[IV] in 1853. Changing clinical practice required clinicians to pay more attention to hospital patients. This increased workload forced consultants to give junior doctors more responsibility for their patients.

By the beginning of the twentieth century, consultants convinced governing boards that in addition to their responsibilities for patients they should also appoint the medical staff.

The medical structure and hierarchy in Australia mirrored that in the UK except that from the start some doctors were employed as salaried medical officers. By 1947, 14 per cent of medical practitioners were employed in hospitals. This increased to 29 per cent by 1971. Of the 4800 doctors employed in hospitals 19 per cent (912) were interns, 49 per cent (2352) were registrars or residents and 16 per cent (768) were staff specialists.[11] By 1998[12] 15,385 salaried medical officers were employed in public hospitals. The number of Interns and residents (comprising 21 per cent (3165) of this group) appears to have stabilised.

Porter[4] dates the development of medical specialisation with the growth of hospitals in the nineteenth century, and a natural outcome of scientific, institutional and therapeutic developments. Specialist hospitals[V] developed despite ambivalence about their merits[13] and spread to Europe, USA and Australia; all developing along similar lines as the British voluntary teaching hospital. In Australia specialist hospitals emerged in the last half of the

---

[IV] The registrar's job was to make a written report on all hospital cases. Many other hospitals followed suit with similar appointments between 1860 and 1880. See S. Sinclair *Making Doctors: An Institutional Apprenticeship* 1997 Berg.
[V] English hospitals included Moorefield's Hospital (1805 -Ophthalmology), Royal Ear Hospital in Soho (1816), Royal National Orthopaedic Hospitals (1841), Great Ormond Street for Children (1852) and the Throat Hospital in Golden Square (1863).

nineteenth century and were the forerunners of today's children and women's hospitals.[14]

During the nineteenth century doctors transformed hospitals from multipurpose centres[13] (charity work and sheltering the sick and poor) to institutions for the treatment of patients, [VI] medical research and education of medical students.[1] By the twentieth century doctors were the primary providers of medical care.[1]

By 1900 specialisation began to affect hospital organisations: separate departments and research centres emerged with their own medical hierarchies and career paths. These specialties were added onto existing structures without reference to the needs of patients.[4]

This increasing subdivision of medicine into specialties and sub-specialties changed relationships between patients, hospitals and other health providers. The haphazard medicalisation of hospitals resulted in duplication and inefficiencies, a system designed for the work routines of busy clinicians.[15] Medicine, once an individualistic, intuitive and personal enterprise, had by the second half of the twentieth century become a complex inter-dependent and impersonal social service.[3] Yet the system for admitting and treating patients remained essentially unchanged. Patients are still admitted under an individual clinician who usually makes decisions about admission and discharge. While clinicians may 'own' their patients, the day-to-day needs of patients are managed by a hierarchy of nursing staff and medical staff.[15] The roles of the Visiting Medical Officers and/or Consultants have not changed substantially since the nineteenth century:[VII] they still spend most time away from the hospital treating private patients and depend on junior doctors and nursing staff to treat their hospital patients. But their role teaching junior doctors is diminishing.[16]

[VI] By the end of the nineteenth century hospitalised patients came from all socioeconomic classes not just the poor, but it was not until the beginning of the 20th century that occupational distribution was similar to the general population. (Starr P. The Transformation of American Medicine 1982 Basic Books page 159.)

[VII] In 2004 The UK started reforming the hospital system by implementing a consultant-led health service. This requires senior doctors to be present on the wards at all times.

2   Teaching hospitals

Once medical students and trainee doctors could only access patients in teaching hospitals.[VIII] Early teaching hospitals required patients to participate in medical education as a condition of their treatment.[13][IX] The features of the modern teaching hospital can be traced back to the Flexner Report (USA) of 1910[17] and the Haldane Commission of 1911[18] (UK). Today teaching hospitals are usually centres of excellence,[X] with an array of complex technology for diagnosing and treating patients[19] and conducting research. Patients can choose whether or not to participate in medical education.[20]

Medical education and training remain distinctive features of teaching hospitals.[XI] Technology is costly as are the salaries of trainees, supervisors and related overheads.[21][22] But despite significant changes to hospitals and increased costs for teaching hospitals, the organisational structure for doctors in the hospital workforce remains substantially unchanged.[23][24]

The 1988 Report *Australian Medial Education and Workforce into the 21st Century*[25] identified the dichotomy between the training requirements of junior doctors and the provision of 24-hour medical service as a significant issue for teaching hospitals. The report identified three problems. First, the mix of disorders affecting patients in the major hospitals was often inappropriate for training. Second, the method for allocating salaries forced hospitals to use rosters which are not ideal for training or service. For example, night interns and residents who admitted patients at night often had poor supervision and no opportunity to continue their care or obtain the sequential view of treatment outcome. Third, the decreased number of medical graduates caused a major

---

[VIII] Many hospitals involved teaching of students and doctors through seminars, lectures and personal instruction but the term teaching hospital is reserved for hospitals with university affiliations.

[IX] The first teaching hospital in Australia was established in 1883 when Anderson Stuart opened the University of Sydney Medical School with the Royal Prince Alfred Hospital established as the first clinical school.

[X] I say 'usually' because in 2002 The King Edward Hospital in Perth, Western Australia (a teaching hospital) was the subject of a major report outlining inadequate organisational structures and poor patient care.

[XI] There are 28 teaching hospitals in Australia. (Australian Council of Deans)

mismatch between the number of residents posts required for service needs and the number required for training purposes.[25]

Hospitals in developed countries tend to follow the pyramid organisational model which historically has changed little.[26] This model groups individual positions and clusters of positions into a hierarchy (pyramid).[27] The chain of command commences at the top of the pyramid passing down through the organisation via department heads. Specialisation is superimposed onto this model.

Until the 1990s local governance and non-medical hierarchical structures sat along side autonomous clinical hierarchies. Organisational structures today blur these traditional boundaries as a result of clinical governance which attempts to link clinical practice and management.[26] [28] Another problem is the different structures used by professional groups (doctors, nurses, allied health workers and administrators) to organise themselves. Different education, aims, methods and documentation systems create parallel systems of care in which continuity of care becomes a professional issue not an organisational collective concern.[29] [30] Separate professional cultures create more discontinuity and less consistency in patient care. [XII] [31] [32]

3   Medical training in hospitals

Until the nineteenth century, medical education, commonly known as 'medical improvement', involved the acquisition of knowledge by the already 'morally and intellectually disciplined adult'.[33] Rosner [33] identified two types of medical improvement in the nineteenth century. The first involved university study of medicine leading to a doctorate of medicine. Graduates called themselves physicians of internal medicine. The second type of formal training involved the apprenticeship to a surgeon or apothecary.

[XII] When I was Commissioner for the Health Care Complaints Commission I raised with the Colleges the high number of complaints concerning the lack of continuity of care for patients treated by multiply providers with no one talking full responsibility. This was directly related to the development of sub-specialisation in hospitals.

The apprentice was required to enter a legal contract which obliged him[XIII] to serve the surgeon or apothecary (his master) for seven years.[XIV] [34] In return for labour the apprentice was given the opportunity to acquire a set of manual skills. Attending lectures or reading text books was not required: instead they worked as servants as well as prepared for practice.

A Swedish apprentice writing in 1737 said

"The first years are mostly spent doing small tasks and waiting at table...until ...he gradually becomes accustomed to wielding the razor, opening veins, applying plasters and at most bandaging a wound or fracture, and he may, in addition now and then be permitted to see a few operations performed by his master."[35]

Apprentices were sometimes exploited but they were also protected from dismissal during their apprenticeship. On completion of their contract they could practise as a surgeon-apothecary. Sinclair[34] noted that the apprenticeship model guaranteed a level of competence in qualified adults, and it also controlled the number entering the profession.

Students could have an apprenticeship and attend university, depending on their social status and economic support. Informal methods for medical education depended on relationships with various types of practitioners. Bedside teaching was common in both apprenticeship and university training. At the close of the seventeenth century medical students from Leiden University were examining patients in the local hospital and studying case histories.[XV]

The one-on-one apprenticeship model was unsustainable and dissolved as a result of a guild rule that permitted each surgeon to take on only one apprentice.[36] Massive population increases and the impact of the industrial revolution [4] created demand for more places but because of the one

---

[XIII] Women apprentices were very rare.

[XIV] Throughout most of the eighteenth century apprentices in the United Kingdom served seven years.

[XV] At the end of the seventeenth century Hermann Boerhaave (1632-1723) gave clinical lectures on the diagnosis of diseases by their signs to students in a small 12 bed ward of the Caecilia Hospital. He was a Professor of Medicine and Botany at Leiden University.

apprenticeship rule students began searching out other places for opportunities such as hospitals and private schools. Surgeons had no option but to accept multiple apprentices.[36]

Hospitals continued to be the focal point for medical education and training [XVI] because of the ready supply of patients for examination and cadavers for dissection.[37] University-based medical degrees were also becoming the standard qualification and preferred by the public.

The University of Sydney Medical School was established in 1883. The attached clinical school at the Royal Prince Alfred Hospital provided bedside learning for students who were required to spend 6 months 'walking the wards'. Students would buy a ticket which permitted them access to the wards to see different types of patients and also access the ward journals (medical records). Today medical training involves a combination of formal scientific curriculum, scientific investigation and an apprentice relationship with experienced clinicians.[38] Although hospitals have become centres of high technology the method for training doctors continues the apprentice phase known as 'clinical medicine'.

4   Internship

While internship was a universal model around the beginning of the twentieth century, the appearance of a second model known as 'residency' was new. Residency is the period of hospital service after internship for physicians wanting to specialise.[39] Johns Hopkins Hospital, as early as 1890, demanded resident physicians, surgeons and gynaecologists have at least 18 months hospital or equivalent experience.[5] The first medical resident working at the Prince Henry's Hospital in Melbourne was appointed on condition that he forego his first year's salary.[40] This was standard. Most hospitals did not pay their house officers.[5]

[XVI] Their competitors were private medical schools and colleges.

The American Medical Association's Council on Medical Education [41] recommended as early as 1905 that internship become a formal part of medical education, but it was not until 1910 that formal hospital medical training began. Continuous service contracts with attending physicians, and integrating appointments and examination schedules of the medical schools were established, but were not universal. Lectures, conferences, seminars and formal and informal instruction were more common. Flexner[42] estimated in 1925 that about 50 per cent of medical graduates did an internship. The affiliation with the universities provided medical students for teaching as well as opportunities for clinical research.[39]

After World War 1 the changing profile of hospital patients, development of emergency departments, and expanding out-patient clinics created demand for 24-hour medical care[3]. Hospitals met this by employing junior doctors - interns and residents.[XVII] The number of interns employed in US hospitals increased from 28,000 in 1950 to 45,000 by 1960.[43] [44]

US universities believed the additional year in hospital essential for rounding out medical training.[39] Graduating medical students accepted offers of internship because many were ill-prepared to treat patients in private practice without additional hospital experience. As specialisation in US hospitals flourished the attractiveness of standard 'rotating' intern positions diminished. By the 1970s post graduate training programs in the US were linked to specialist residency training.[41] All post graduates are now called residents, reflecting the emphasis and preference for specialist training from the beginning.

Bad working conditions, low or no pay and uneven educational experiences had always been a part of the US junior doctor experience. This led to the formation of the Intern Council of America in 1936. In 1941 this group expanded to include medical students and renamed the Association of Interns

---

[XVII] Before WW1 hospital appointments in the US used the terms 'intern' 'extern' 'house pupil' 'house physician' 'resident' and 'resident physician' : all provided 1-2 years living and working in the hospital but with little or no pay.

and Medical Students (AIMS). Political allegations made by the American Medical Association about AIMS' left wing affiliations during the post war (McCarthy) years saw its demise.[45] Other groups emerged and unionisation crossed borders and emerged in Australia, Canada, and the UK.[45] Campaigns around safe hours and competency based education programs for junior medical officers are now actively pursued in those countries.[xviii]

While there was some early interest (1918) in England for post graduate training [xix] it was not until 1950 that UK graduates were required to undertake a pre-registration year as a House Officer working for one or more consultants.[34] The British Medical Association's Committee on Medical Education lobbied for the introduction of universal post graduate training during World War 1 and recommended in 1934 that newly qualified doctors should not be granted full registration until

"Satisfactory evidence was produced of further clinical experience under supervision and of certain further instruction over a period which would normally extend to nine months and which should in no case be less than six months".[46]

Prior to the English Parliament introducing legislation making pre-registration training compulsory, the Ministry of Health in 1948 ordered that consultants were to be responsible for all in-patient beds and out-patient sessions similar to that at teaching hospitals.[47] Sinclair[34] describes the work arrangement between junior doctors and consultants as an extension of the 'firm' with its origins in the fee paying arrangements medical students historically had with their surgeons or teachers.[xx] Unlike US doctors, the English opted for a twelve month pre-registration period that included six months each in general medicine and general surgery which was to be undertaken in an approved

[xviii] I am on the Curriculum Development Committee for the Postgraduate Medical Council of NSW. This council is designing a curriculum based on core competency modules for Interns. Other countries are also implementing formal curricula for junior doctor training, see Chapter Three.
[xix] Sir George Newman, Chief Medical Officer, prepared a number of reports after a visit to Germany and the United States stating that post graduate education was necessary. He restated the need in 1932 and in 1939 but died before anything was formally adopted.
[xx] Sinclair uses the term 'firm' to describe the hierarchical groups of trained doctors and doctors in training in one specialty. They are headed by consultants who give their name to the firm. See Sinclair S Making Doctors : An institutional apprenticeship 1997 Berg Oxford:197

hospital.[XXI] These posts were to be salaried positions. While internship was not mandated for British doctors until 1953 compulsory internship was introduced in Australia as early as 1930.[XXII]

The obligatory pre-registration training of graduates in hospitals, known as internship, reflects both university and hospital traditions[39] and is today the basic structure in the UK and Australia. Interns wanting to specialise undertake a further several years study as trainees or training fellows. While complaints[XXIII] about the working conditions of interns irrespective of place had been recorded from the beginning[48] modern activism by junior doctors began in the 1970s when American house officers targeted training, levels of pay and hours of work. [39] Similar trends are evident in the UK and Australia. The dual functions of education and service provision even in a time of less technology and complexity was always a potential problem. Today the dual roles of trainee and service provider present a significant tension in hospitals, along with the tension between the ideal world of the university and the apprenticeship traditions.[3 39] Dr Jon Cohen, the chief medical officer for New York City Hospital, acknowledged the problem when he said "*The big culture change is (that) the institutions have to recognize and treat residents as students*"[49]

Many of the problems identified with compulsory pre-registration[XXIV] training in the 1950s remain. The 1944 Goodenough Report which recommended compulsory post graduate training singled out supervision as a major benefit. Poor supervision, inadequate learning opportunities and limited responsibility were major complaints reported in a survey of pre-registration employees done two decades later.[50] Almost all the 1961-2 cohort of pre-registration officers believed they had insufficient time for reflective thinking during their

---

[XXI] As of 2003 the 12 month training period must include 3 months in medicine, 3 months in surgery, and may include up to 4 months in general practice. See Chapter Three which provides additional information about training conditions.
[XXII] Legislation making pre registration year mandatory appeared in the ACT Medical Practitioners Registration Ordinance in 1930 and in the NSW Medical Practitioners Act in 1938.
[XXIII] See the section on reports of internships and residency training in Chapter Three.
[XXIV] Pre-registration is the first year after graduation and the same as internship.

employment[50]. This theme of inadequate teaching (poor learning) and supervision repeats itself through subsequent surveys of pre-registration house appointees.[51]

Medical education today involves three distinct groups: undergraduate or graduate medical students, interns and resident medical officers (junior medical officers) and graduate training (specialty and sub specialty).[52] In Australia educational responsibility for these groups belongs to the university medical faculties, postgraduate medical councils in each state[XXV], and specialist colleges respectively.

Thirty years ago Fraser[53] identified three principal functions of internship. The first was the establishment of the link between the dependence of students and the autonomy of practising clinicians. The second function was the provision of opportunities to independently practise skills and knowledge. The final function was the facilitation of apprenticeships. Roghmann et al[54] narrowed the function of internship to one solely relating to the acquisition of technical skills in handling disease. Yong and Collie[55] were less prescriptive about the intern year observing that it was a period of training in general clinical method and patient responsibility.

The rapid growth of technology in the 1960s and beyond [XXVI] contributed the development of high technology hospitals and increasing costs.[XXVII] Today most large metropolitan teaching hospitals are designed to provide advanced technology and skilled medical, nursing and allied health care. The three main tasks of hospitals outlined in the nineteenth century remain true today: treating patients, medical research and medical education. But Ludmerer[39] points out that that harmony among these functions is illusionary. He doubts

---

[XXV] The Postgraduate Medical Council of NSW was established in 1988. The Council established a dedicated position called Director of Clinical Training (DCT). DCTs were appointed in hospitals to act as advocates for junior medical officers.
[XXVI] Technology includes drugs, equipment, operating theatres, surgical procedures, intensive care units, medical devices and instruments.
[XXVII] In relation to imaging, for example, ultrasound was introduced in the 1960s and successive decades have seen the development of Computerised Tomography (CT) scanners, Magnetic Resonance Imaging (MRI) Positron Emission Tomography (PET).

whether there ever was any integration. The bulk of most hands-on care in acute hospitals is still provided by interns, residents and nursing staff.[56] The dependency of hospitals on junior staff brings into stark contrast these competing functions. While the work of junior doctors and their training demands have been the focus of inquiries[25] the role and work of consultants have also recently come under scrutiny.[57] Technology, specialisation, patient demand, and reduced hours for junior medical officers have had consequences not only for hospital organisations but also the work of consultants. Registrars have largely replaced consultants as the principal trainers of junior doctors.[58] Pressure is mounting on consultants, particularly in the UK, to do more clinical work in the hospitals and to take part in auditing, managing and contracting services.[59] These changes in the work environment have consequences for medical education yet training and education programs for junior doctors have not acknowledged this shift. Many of the problems associated with education of junior doctors in hospitals today can be tracked to the changes in medical practice, developing specialisation and sub specialisation.

For more than a century the apprenticeship/service provider model has endured, despite a number of problems. First, the immediate needs of teaching hospitals often dictate the make up of the physician workforce. Second, the training needs of the interns and residents are often secondary to the need of the teaching hospitals to provide services. Third, most junior doctors do not work in a primary health care setting.[60] Specific concerns about junior medical officer training in Australia include: multiple stakeholders, no accountability framework for medical training, no objective measures for training posts, no reporting of educational outcomes, training roles undervalued by hospitals, inadequate selection and recruitment procedures, training confined to the public system, no clear links between training posts, service needs and workforce planning, inflexible work practices and inadequate training for unstreamed residents.[61]

5   The medico-legal environment

Notwithstanding the complexity of the environment in which mistakes are made, blame and culpability inevitably appear. But an understanding of the underlying factors which contribute to mistakes is not paramount in medical negligence. Injured patients are entitled to explanations about their treatment: patients are entitled to explanations particularly when their claims involve culpability. But in ascribing blame patients (and clinicians) often fail to distinguish negligence from mistakes, natural variations, complications or a bad outcome. Yet in some cases bad outcomes are an inevitable consequence when dealing with the human body.

The current medico-legal environment is a coalescence of three powerful forces: uncertainty in medicine, medical mistakes and patients' desire for compensation. The public interest demands that patients receive appropriate compensation, that professionals are held accountable, and incompetent and unethical practitioners are prevented from practising. The belief that someone must be responsible for a bad outcome facilitates the attribution of blame, encourages the notion that medicine is a perfect science and that mistakes only happen because of someone's culpability.[XXVIII] Under such circumstances community acceptance of the inevitability of some mistakes diminishes. Another factor implicated in the 'blame game' is tort law,[62] the basis of compensation. Tort law requires a determination of blame or fault even though studies show that some juries award damages to injured patients based on sympathy instead of proof of negligence. [63] [64] [65]

The relationship between adverse events and culpability manifests in medical negligence actions, criminal negligence or manslaughter charges. Such community sanctioned mechanisms are believed to hold people accountable for their actions and deter others from similar acts. Some have argued that the tort system is irrational,[66] [67] damaging to the community [68] and inadequate for holding doctors accountable.[69] Lessons from negligence cases rarely are

---

[XXVIII] See Alan Merry and A McCall Smith Errors, Medicine and the Law 2001 Cambridge University Press pp 127-136 for an analysis of culpability and blame.

used to improve care and indefensible decisions are settled confidentially.[69] 'Non-negligent' doctors have also been sued.[70-72]

The first reference to medical negligence was made by Sir William Blackstone in 1768 in *Commentaries on the Laws of England.*[73] He used the term mala praxis[xxix] to describe the relationship between negligence and doctors and defined it as *"injuries ... by the neglect or unskilful management of (a person's) physician, surgeon, or apothecary ... because it breaks the trust which the party has placed in the physician, and tends to the patient's destruction."*[74]

The first reported case of malpractice in the US (1794) concerned Dr Benjamin Rush, who was also a signatory of the Declaration of Independence. He issued a libel suit in response to a malpractice allegation concerning his treatment of yellow fever victims.[75] Few actions reached the courts then because of the difficulties proving cases against practitioners (including quacks), who had varying levels of skill and knowledge.[73] It was not until the mid-nineteenth century that medical negligence became a part of the US legal landscape.

The rise of malpractice in the US happened alongside two non-related developments: a sharp decline in religious fatalism and improved personal health and hygiene.[10 73] Aggressive (and false) advertising at the time helped to create an environment in which the public did not accept 'God's will' in circumstances where many practitioners promoted wondrous treatments.[76] Between 1840 and 1860 malpractice claims increased in the US by 950 per cent.[77] Editors of the medical journals wrote strong editorials about this new problem.[73]

[xxix] The word malpractice is derived from the term mala praxis.

Malpractice litigation in the mid 1800s included many orthopaedic cases easily won by patients.[XXX] Ironically 20 years earlier patients who had their legs amputated due to incompetence had no case for compensation because there were no standards to judge care. Advances in medicine and the declaration of standards had opened the way for patients to demonstrate that their bad outcome was directly related to their surgeon's departure from the standard of care and treatment expected at that time. Many surgeons responded by refusing to fix broken limbs.[76]

Animosity between lawyers and doctors dates from the mid 1800s.[78][79] Mohr[76] described that medico-legal environment at that time: bitterness about ambulance chasing, touting for clients, dismay about the delay in bringing law suits, concern about the scope of negligence (being sued for what they did as well as for what they failed to do). But then physicians' concerns about litigation were not shared by the community generally.

While problems with the tort system have existed for more than a century, medico-legal problems expanded with rapidly developing technology and the rise of the consumer movement in1960s. [XXXI] A report published by the US Department of Health, Education and Welfare in 1973 outlines the events and changes in medicine at that time.

During the 19th century and the first two or three decades of the 20th there was essentially no such thing as a malpractice 'problem' in the United States. On the whole sickness was accepted as a usual and expected thing...The first significant change began in the 1930s. California, then ranking only sixth in population, suddenly surpassed all other states in the number of malpractice suits. Similar jumps were soon noted in Ohio, Texas, Minnesota and the District of Columbia. Thereafter, the number of malpractice suits continued to grow until World War II when the number of cases temporarily declined. In the 1950s litigation increased, in part because of the increasingly availability of medical care for all Americans and the rapid increase in the complexity of medical knowledge. New diagnostic techniques, therapeutic procedures and powerful drugs were developed, all of which were accompanied by new risks to the patient and practice challenges for the physicians.[80]

[XXX] Malpractice law suits come under Tort law initiated by patients seeking compensation for damages. The function of the Tort system is to provide compensation to those injured as a result of another's negligence and to deter future practitioners from negligent actions.
[XXXI] The word 'tort' is drawn from the Latin word for 'wrong'

The 1970s crisis led to several US states reforming the insurance industry and the legal system.[XXXII] Doctors, responding to perceived legal threats, began to practice defensively: ordering tests, undertaking procedures, and providing treatments beyond those immediately indicated clinically as a precautionary measure in case there might be a risk, no matter how remote, of something wrong for which their patients might hold them liable.

The second crisis in the 1980s provided further opportunity for tort reforms; malpractice claims were limited and damages capped.[81] Retrospective analysis of these statutory reforms shows little positive impact.[82]

English law differed to laws in the United States in that "strict liability" applied until the nineteenth century;[83] the person causing the injury was liable whether or not they were at fault. But few actions were initiated because limited remedies were available; many treatments depended on 'nature taking its course'.[84] Horace Smith in his 1880 *Treatise on the Law of Negligence* [84] noted the paucity of actions against doctors and solicitors.

Patients began winning their court cases in the 1940s.[85] But generally medical negligence actions in the UK were the exception rather than the rule until the 1970s.[67] By the 1980s patients' claims had dramatically increased due mainly to the availability of expert opinions to back their claims. Action for Victims of Medical Accidents (UK), formed in 1982, was instrumental in putting patients in touch with experts willing to provide their opinions.

Lochart, [86] writing about malpractice in Australia, said few negligence cases reached the courts before 1980. He favourably compared Australia with other English-speaking countries. Claims reaching court in the 1970s mostly related to 'failure of treatment' cases while in the eighties most claims concerned 'failure to warn or inform'. [XXXIII] The number of claims significantly increased during the 1990s and mainly concerned 'failure to diagnose'.[87] Doctors'

[XXXII] Proposals to limit awards, cap damages, use screening panels, apply alternate dispute resolution methods, use payment schedules and better reporting systems were all debated.
[XXXIII] *Rogers v Whitaker* is the benchmark Australian case that involved failure to warn of risks.

insurers claimed the likelihood of a general practitioner being sued in the 1990s increased from 1 in 160 in 1990 to 1 in 84 in1994.[88]

Whether a litigation crisis exists in Australia has been debated since the early 1990s.[89] Consumers and legal professional bodies point to the lack of data on the number of medical negligence cases and the medical profession and their associations point to the rising number of complaints and claims made. Unpublished 1991 statistics[90] show claim numbers were low throughout the 1980s. Rice[91] estimated the number of medical lawsuits filed to be 0.35 per cent (250 out of 70,000) of lawsuits filed for injuries per annum. The Professional Indemnity Review[92] undertaken in 1991-95 noted that much of the evidence suggesting a litigation crisis was anecdotal and assessment of the current position was difficult without data. The review did not find a pattern across the various jurisdictions of a massive increase in claim numbers. A 1997 Victorian parliamentary inquiry[93] also found no evidence of a claims crisis during the 1990s. But a study in 2002 by Insurance Statistics Australia on behalf of the medical indemnity funds in Australia found that the medical defence organisations at the end of June in 1992 had 485 claims of more than A$500,000.[94]

The current medical indemnity crises, assuming they exist, in the US, the UK and Australia centre on affordability and availability[xxxiv]. Malpractice premiums[xxxv] in these countries have greatly increased. [95-98] Governments in the US and Australia are responding by further reforms to their tort system such as capping damages and screening panels. (The reasons for these increases are complex and not explored in this thesis.)

[xxxiv] The problem of availability relates to medical insurance organisations going out of business. In 2002 United Medical Protection, an Australian based defence organisation went into voluntary liquidation.
[xxxv] For the year 2003 Florida obstetricians' premiums range from $143,000(US) to $203,000(US) per year. In Australia the premiums for obstetricians in New South Wales is $97, 412 (Aust)

The current systems of law in the US, UK and Australia have serious implications for clinical practice. In addition to the high costs[XXXVI] of negligence [99] there are other serious consequences. Obstetricians[XXXVII] are abandoning practice because of legal threats and high insurance premiums,[97] [100] honesty with patients has been compromised by a fear of litigation,[101-105] defensive medicine exposes patients to added risks and increased costs,[69 106] [107] and impacts adversely on the doctor-patient relationship.[108]

6   Reporting and learning from mistakes

The need for medical students, interns and residents to know about medical mistakes and adverse events was recognised in the literature in the early 1980s, coinciding with a malpractice crisis in the US, and again in the late 1990s as part of the safety and quality focus within the health system. The value of incident reporting, recognised as far back as the 1950s, remains important for identifying problem areas - medication errors,[109] patient falls, mis-identification of patients[110] and retained swabs in operations.[111]

While there is a growing literature[112] on the importance of reporting adverse events, few studies address the difficulties doctors have in reporting adverse events.

The blame culture[113-115] in medicine affects interns and residents in terms of how they manage and learn from medical errors including whether or not they discuss them with more senior colleagues.[116] Unlike nurses, medical clinicians tend to under-report medical errors.[115 117-121] The existing methods (mortality and morbidity conferences, peer review and grand rounds) used by doctors for discussing mistakes are often conducted in a 'blame' environment,[116 122-124] which would deter junior doctors from speaking up or reporting. Self-reporting methods have been suggested for improving reporting, including using the 'morning report'[125] to enhance adverse event detection and encouraging self-

---

[XXXVI] In the USA more than US$10 billion is spent on malpractice and legal costs. (WR Brody, President Johns Hopkins University).There are no publicly available data on the frequency, cost (payouts and legal fees) and causes of medical negligence actions in Australia. But the Personal Injury Lawyers Association (Australia) estimates costs to taxpayers are approximately A$4.17 billion annually.
[XXXVII] The main reasons given by doctors for ceasing obstetrics were intention to specialize in gynaecology, fear of litigation, high indemnity costs, family disruption, and long working hours.

reporting of mistakes.[126] But other than the use of the morning report there is no evidence suggesting better ways to encourage reporting or for junior doctors to learn from mistakes.

Given the substantial information available about the inadequate training and the difficulties faced by junior doctors, the dearth of research about junior doctors' experience with mistakes is perplexing, notwithstanding the sensitivity of the topic and medico-legal fears.

7 The present position of junior doctors in Australian hospitals

One of the reasons stated for the reticence of doctors to be open about mistakes is the fear of exposing themselves to complaint or litigation.[127] [128] This perception is valid even though there are doubts about the accuracy of doctors' assumptions about the law and the legal system.[129] Junior doctors are not immune from such medico legal pressures and the 'fear of litigation' culture that pervades many hospital corridors and theatres influences their perceptions of mistakes and litigation risks.

Fear of litigation whether real or perceived remains a barrier to junior doctors understanding and learning from their mistakes. Patients may not be sympathetic to a defence of inexperience if they suffer an adverse event; inexperience is not an antidote for complaints or medical negligence actions involving junior doctors. The current environment treats mistakes as something shameful and to be hidden. While patients need to acknowledge their vulnerability to bad outcomes, doctors also need to acknowledge their fallibility as human beings in the context of uncertainty in medicine. Junior doctors will not be open about their mistakes if they do not see their supervisors or seniors routinely discussing their mistakes without consequence. Yet interns and residents are still expected to make and learn from their mistakes (in the context of their education) but in the context of litigation their role models, senior clinicians and clinical supervisors, express fear of disclosing mistakes.[130]

Endnotes for Chapter Two

1. Cockerham WC. *Medical Sociology*. 7th edition ed. Upper Saddle River New Jersey: Prentice Hall, 1978.
2. Parsons Talcott. *The Social System*. New York: The Free Press, 1951.
3. Knowles JH. *Hospitals doctors and the public interest*. Cambridge MA: Harvard University Press, 1965.
4. Porter R. *The Greatest Benefit to Mankind: A medical history of humanity from antiquity to the present*. London: Harper Collins, 1997.
5. Rosenberg CE. *The care of strangers; the rise of America's hospital system*. Baltimore and London: The John Hopkins University Press, 1987.
6. Institute of Health Services Management UK. *The Hospital Year Book 1935*. London: Institute of Health Services Management UK, 1935.
7. Rosner D. Doing well or doing good. In: Long DE, Golden J, editors. *The American General Hospital: community and social contexts*: Cornwell University Press, 1989.
8. McGrath AG. The History of Medical Organisations in Australia. PhD thesis. University of Sydney, 1974.
9. Duckett SJ. Australian Hospital Services: an overview. *Australian Health Review* 2002;25.
10. Starr P. *The Social Transformation of American Medicine*. New York: Basic Books, 1982.
11. Hospital and Health Services Commission. A Report on Hospitals in Australia. Canberra: Australian Government Publishing Service, 1974:168.
12. Australia Institute for Health and Welfare. Medical Labour Workforce Report. Canberra, 1998.
13. Walton J, Barondess J, Lock S. *The Oxford Medical Companion*. Oxford: Oxford University Press, 1994.
14. Australia Government Publishing Service Canberra. A Report on Hospitals in Australia. Canberra, 1974.
15. Hillman K. The changing role of acute-care hospitals. *Medical Journal of Australia* 1999;170:325-28.
16. Dally P, Ewan C, Pitney WR. Assessment of an Australian medical internship. *Journal of Medical Education* 1984;18:181-86.
17. Flexner A. The Flexner Report on Medical Education in the United States and Canada: The Carnegie Foundation for the Advancement of Teaching, Science and Health Publications Inc., 1910.
18. Haldane Lord. Report of the Royal Commission on university education in London (Haldane Report). London: HMSO, 1913.
19. Levin R, Moy E, Griner P. Trends in specialized surgical procedures at teaching and non teaching hospitals. *Health Affairs* 2000;19:230-8.
20. Neely SK, McIntruff WD. What Americans say about the nation's medical schools and teaching hospitals. Report on Public Opinion Research, Part II. Washington DC: Association of American Colleges, 1998.
21. Iezonni LI, Shwartz M, Moskowitz MA, Ash AS, Sawitz E, Burnside S. Illness severity and costs of admissions at teaching and non teaching hospitals. *Journal of the American Medical Association* 1990;264:1426-31.
22. Taylor DH, Whellan DJ, Sloan FA. Effects of admission to a teaching hospital on the cost and quality of care for Medicare beneficiaries. *New England Journal of Medicine* 1999;340:293-9.
23. Cassell EJ. Historical perspective of medical residency: 50 years of changes. *Journal of the American Medical Association* 1999;281:1231-3.
24. Keenan C. Graduate medical education: where is it heading? *Hospital Medical Staff* 1984;13:15-19.
25. Committee of Inquiry into Medical Education and Medical Workforce. Australian medical education and workforce into the 21st century. Canberra, Australia: Australian Government Publishing Service, 1988.
26. Dwyer J, Leggat SG. Innovation in Australian hospitals. *Australian Health Review* 2002;25(5).
27. Snook ID. Hospitals, what they are and how they work: Aspens Systems Corporation, 1981:17.

28. Havinghurst CC. The structure of hospital-physician Relationships. The interplay of law and policy. In: Yaggy D, Hodgson P, editors. *Physicians and Hospitals.* Durham: Duke University Press, 1985:118.

29. Krogstad U, Hofoss D, Pettersen K. Patients stories about their hospital stay. 'Of course one special physician was responsible for me - what a question'? *Tidsskr Nor Laegeforen* 1997;117:4439-41.

30. Flood BA. The impact of organizational and managerial factors on the quality of care in health care organizations. *Medical Care Review* 1994;51:381- 428.

31. Minzberg H. *The structuring of organizations.* Englewood Cliffs: Prentice-Hall, 1971.

32. Degeling P, Kennedy J, Hill M, Carnegiie M, Holt J. Professional sub cultures and hospital reform. Sydney: The Centre for Hospital Management and Information Systems research, University of New South Wales, 1998:268.

33. Rosner L. The growth of medical education and the medical profession. In: Loudon I, editor. *An Illustrative History of Western Medicine.* Oxford,UK: Oxford University Press, 1997:147.

34. Sinclair S. *Making Doctors : An institutional apprenticeship.* Berg, Oxford UK, 1997.

35. O'Malley CD (editor). *The History of Medical Education.* Berkley and Los Angeles: University of California Press, 1970.

36. Gelfand T. Invite the philosopher, as well as the charitable. Hospital teaching as private enterprise in Hunterian London. In: Bynum W, Porter R, editors. *William Hunter and the eighteenth-century medical world.* Cambridge UK: Cambridge University Press, 1985:146.

37. Trohler U, Prull CR. The Rise of the modern hospital. In: Loudon I, editor. *An Illustrative History of Western Medicine.* Oxford: Oxford University Press, 1997:170.

38. Nelson RA. The Hospital and the continuing education of the physician. In: Knowles JH, editor. *Hospitals Doctors and the Public Interest.* Harvard University Press, 1965:238.

39. Ludmerer KM. *Time to heal: American medical education from the turn of the century to the era of managed care.* New York: Oxford University Press, 1999.

40. Templeton J. *Prince Henry's, the evolution of a Melbourne Hospital 1869-1969.* Melbourne: Robertson and Mullens, 1969.

41. Bynum WF. Pre-registration in historical perspective. *Medical Education* 1997;31:43-48.

42. Flexner A. *Medical education. A comparative study.* New York: The Macmillan company, 1925.

43. American Medical Association. A History on the Council on Medical Education and Hospitals. Chicago: The American Medical Association, 1959.

44. American Medical Association. Medical Education in the United States 1961-62. *Journal of the American Medical Association* 1962;182:735-808.

45. Harmon RG. Intern and Resident Organizations in the United States: 1934-1977. *Milbank Memorial Quarterly/ Health and Society* 1978;56:505.

46. Committee on Medical Education Report. Medical Education Report. *British Medical Journal Supplement* 1934; I:192-208.

47. Stevens R. *Medical Practice in modern England: The impact of specialization and state medicine.* London: Yale University Press, 1966.

48. Medical Board Mount Sinai Hospital. Meeting of 17 May 1921, Minutes, Medical Board, Mount Sinai Hospital. New York: Archives, The Mount Sinai Medical Center New York., 1921.

49. Abelson R. Limits on residents' hours worry teaching hospitals. *The New York Times* 14 June 2002.

50. Hutton PW, Williams PO, Graves JC, Graves V. The Pre-registration house-appointment. *Lancet* 1964(i):34-40.

51. Christie RA. The pre-registration house appointment. A survey in Manchester. *Medical Education* 1980;14:210-3.

52. Doyle AE. The Clinician Viewpoint. *Medical Journal of Australia* 1985;142:262.

53. Fraser J. The Pre registration year and the undergraduate curriculum. *Royal Society of Medicine* 1973;66:29-31.

54. Roghmann K, Pizzo P, Graham E, Graham D, Guyer B, Harris P. The Paediatric Internship as a teaching technique: a comparison of learning experiences in five hospitals. *Pediatrics* 1975;56:239-45.

55. Yong NK, Collie J. The Internship Programme Unpublished report reproduced in Proceedings of a Seminar on Intern Training in New South Wales edited Garrick C

Dowsett J and Andrews G: Health Commission of New South Wales and the Centre for Medical Education Research and Development University of New South Wales, 1979:5.

56. Smith J. Consultants of the future. *British Medical Journal* 1995;310:953-4.

57. Moss F, McNicol M. Rethinking consultants: Alternative models of organization are needed. *British Medical Journal* 1995;310:925-8.

58. McKee M and Black N. Does the current use of junior doctors in the United Kingdom affect the quality of medical care? *Social Science and Medicine* 1992;34:549-558.

59. Roberts J. Rethinking consultants: specialists in the United States: What lessons? *British Medical Journal* 1995;310:724-7.

60. Dilemmas around the junior workforce and the indentured service/apprenticeship model for graduate medical education in the United States. 5th International Medical Workforce Conference; November 2000; Canberra. Australian Medical workforce Advisory Committee Commonwealth Department of Health and Aged Care 2001.

61. Dillemmas in junior medical officer training. 5th International Medical workforce conference; November 2000; Canberra. Australian Medical Workforce Advisory Committee Commonwealth Department of Health and Aged Care. 2001 Canberra papers.

62. Merry A, McCall Smith A. *Errors, Medicine and the Law.* Cambridge: Cambridge University Press, 2001.

63. Brennan TA, Sox CM, Burstin HR. Relation between negligent adverse events and the outcomes of medical-malpractice litigation. *New England Journal of Medicine* 1996;335:1963.

64. Localio AR, Lawthers AG, Brennan TA, et al. Relation between malpractice claims and adverse events due to negligence: results of the Harvard Medical Practice Study III. *New England journal of Medicine* 1991;325:245-51.

65. Taragin MI, Willett LR, Wilczek AP, Trout R, Carson JL. The influence of standard of care and severity of injury on the resolution of medical malpractice claims. *Annals of Internal Medicine* 1992;117:780-4.

66. Danzon PM. *Medical Malpractice: Theory, evidence and public policy.* Cambridge Mass: Harvard University Press, 1985.

67. Rosenthal MM. *Dealing with medical malpractice: the British and Swedish experience.* London: Tavistock Press, 1987.

68. Kessler D. A system gone bad: Hoover Institute Hoover Digest 2000 No.1 http://www-hoover.stanford.edu/publications/digest/001/Kessler.html, 2000.

69. Walton M. *The Trouble with Medicine: Preserving trust between patients and doctors.* Sydney: Allen and Unwin, 1998.

70. Hiatt H, Weiler P. No-fault medical coverage would cure many ills. *The Boston Globe* 1999;5.

71. Mello M, Brennan TA. Deterrence of medical errors: Theory and evidence for malpractice reform. *University of Texas Law Review* 2002;80:1595-1637.

72. Drimmer J. My malpractice ordeal is over-after only 26 years. *Medical Economics* 1989(2):50-2.

73. Mohr JC. *Doctors and the law : Medical jurisprudence in nineteenth-century America.* Baltimore: John Hopkins University Press, 1993.

74. Blackstone W. *Commentaries on the laws of England, Vol.3.* Oxford, England: Clarendon Press, 1768.

75. Sandor AA. The history of professional liability suits in the United States. *Journal of the American Medical Association* 1957;163:459-66.

76. Mohr J C. American Medical Malpractice Litigation in Historical Perspective. *Journal of the American Medical Association* 2000;283(13):1731-7.

77. Deville KA. *Medical malpractice in Nineteenth-century America: Origins and Legacy.* New York: New York University Press, 1990.

78. Elwell JJ. *A Medico-legal treatise on malpractice and medical evidence, comprising the elements of jurisprudence.* New York: JS Voorhies, 1860.

79. McClelland M. *Civil Malpractice.* Chicago, ILL: WB Keen Cooke, 1873.

80. US Department of Health Education and Welfare. Report of the Secretary's Commission on Medical Malpractice Publication No. (DS). Washington DC: US Department of Health Education and Welfare, 1973:73-88.

81. Marchev M. The medical malpractice insurance crisis: Opportunity for state action: National Academy for State Health Policy, USA, July 2002.
82. The effects of law on health care. Building a new system of medical justice; October 29 2002; Washington DC. AEI-Brookings Joint Center for Regulatory Studies and Common Good.
83. Fleming JG. *The law of torts*. 6th edition ed. Sydney: The Law Book Company, 1983.
84. Hawkins C. *Mishap or malpractice?* London: Blackwell Scientific Publications, 1985.
85. Medical Defence Union. Annual Report Medical Defence Union. London, 1948:17-18.
86. Lochart MR. Medical Malpractice in Australia. In: Taylor JL, editor. *Medical Malpractice*. Bristol: John Wright & Sons, 1980:198.
87. Recent developments in medical litigation. Medical negligence Crisis or beat up?; May 1996; BLEC Books Business Law education centre Melbourne.
88. Keaney M. Is litigation increasing? *Medical Journal of Australia* 1996;164:179.
89. Danzon PM. The "crisis" in medical malpractice: A comparison of trends in the United States, Canada, the United Kingdom and Australia. *Journal of Law Medicine and Health Care* 1990;18:48-58.
90. Sappideen C. Look before you leap: reform of medical malpractice liability. *Sydney Law Review* 1991;523.
91. Rice S. *Some doctors make you sick: the scandal of medical incompetence*. London: Angus and Robertson, 1988.
92. Taskforce on Quality in Australian Healthcare. The Final Report of the Taskforce on Quality in Australian Healthcare. Canberra: AGPS, 1996.
93. Law Reform Committee Legal Liability of Health Service Providers. Law Reform Committee Legal Liability of Health Service Providers Final report. Melbourne: Parliament of Victoria, May 1997.
94. Insurance Statistics Australia Limited. Medical Indemnity Claims report: An analysis of claims trends for Australian medical defence organisations from 1992 to 2002 focussing on key speciality groups and large individual losses. Sydney, September 2002.
95. Brody WR. Is the legal system killing healthcare? New York: Common Good at the Manhattan Institute, February 2003.
96. Rosenblatt RA. Tort reform and the obstetrics Crisis: the case of the WAMI states. *Western Journal of Medicine* 1991;154:693-9.
97. Mac Lennan AH, Spencer MK. Projections of Australian obstetricians ceasing practice and the reasons. *The Medical Journal of Australia* 2002;176:425-28.
98. Meikle J. Hugh rise in medical negligence. *The Guardian* 2002 June 3, .
99. Ranson SB, Dombrowski M, Shephard R, Leonardi M. The economic cost of the medical-legal tort system. *American Journal of Obstetrics and Gynecology* 1996;174:1903-10.
100. Manuel BM. Professional liability-a no-fault solution. *The New England Journal of Medicine* 1990;322:627-32.
101. Institute of Medicine. *To Err is Human Building a safer health system*. Washington DC: National Academy Press, 2000.
102. Leape L. Can we make health care safe? *A Report from the National Coalition of Health Care and the Institute for Health Care Improvement.*: Institute for Health Care Improvement, available at www.ihi.org), February 2000.
103. Wu AW. Handling hospital errors: Is disclosure the best defense. *Annals of Internal Medicine* 1999;131:971.
104. Liang BA. The adverse event of unaddressed medical error: Identifying and filling the holes in the Health-care and Legal systems. *Journal of Law, Medicine and Ethics* 2001;29:347.
105. Gostin LA. Public health approach to reducing error: medical malpractice as a barrier. *Journal of the American Medical Association* 2000;283:1742.
106. Kessler D, McClellan M. Do doctors practice defensive medicine? *Quarterly Journal of Economics* 1996;3:353-54,386.
107. Bovbjerg RR, Tancredi LR, Gaylin DS. Obstetrics and malpractice: evidence on the performance of a selective no-fault system. *Journal of the American Medical Association* 1991;265:2836.
108. Studdert DM, Brennan T. No fault compensation for medical injury. The prospect for error prevention. *Journal of American Medical Association* 2001;286:217-23.

109. Cullen DJ, Bates DW, Small SD, Cooper JB, Nemeskal AR, Leape LL. The incident reporting system does not detect adverse drug events: a problem for quality improvement. *Joint Commission Journal on Quality Improvement* 1995;21:541-8.
110. Chassin MR, Becher EC. The wrong patient. *Annals of Internal Medicine* 2002;136(11):826-33.
111. Secker-Walker J, Taylor-Adams S. Clinical incident reporting. In: Vincent C, editor. *Clinical Risk Management*. London: British Medical Journal Books, 2001:422.
112. Institute of Medicine. *Patient safety: Achieving a New Standard for Care*. Washington DC: National Academies Press, 2003.
113. Reason JT. *Managing the Risks of Organisational Accidents*. Aldershot, Hampshire, England: Ashgate Publishing Ltd, 1997.
114. Leape LL. Error in medicine. *Journal of the American Medical Association* 1994;272:1851-1858.
115. Vincent E SN, Crowley-Murphy M,. Reasons for not reporting adverse incidents:An empirical study. *Journal of Evaluation in Clinical Practice* 1999;5:13-21.
116. Wu AW, Folkman S, McPhee SJ, Lo B. Do house officers learn from their mistakes? *Journal of the American Medical Association* 1991;265(16):2089-94.
117. Lawton R PD. Barriers to incident reporting in a health care system. *Quality in Health Care* 2002;11:15-18.
118. Penson RT, Svendsen SS, Chabner BA, Lynch TJ, Levinson W. Medical mistakes: A workshop on personal perspectives. *The Oncologist* 2001;6(1):92-9.
119. Mizrahi T. Managing medical mistakes: Ideology, insularity and accountability among internist-in-training. *Social Science and Medicine* 1984;19:135-46.
120. Novack DH, Detering BJ, Arnold R, Forrow L, Ladinsky M, Pezzullo JC. Physicians' attitudes towards using deception to resolve ethical problems. *Journal of the American Medical Association* 1989;26(20):2980-6.
121. Applegate WB. Physician management of patients with adverse outcomes. *Archives of Internal Medicine* 1986;146(11):2249-2252.
122. Orlander JD, Barber TW, Fincke BG. The morbidity and mortality conference:the delicate nature of learning from error. *Academic Medicine* 2002;77:1001-6.
123. Berwick DM. You cannot expect people to be heroes. *British Medical Journal* 1998;316:1738.
124. Wachter RM, Katz P, Showstack J, Bindman AB, Goldman L. Reorganizing an academic medical service:impact on cost,quality,patient satisfaction and education. *Journal of the American Medical Association* 1998;279:1560-5.
125. Welsh CH, Pedot R, Anderson RJ. Use of the morning report to enhance adverse event detection. *Journal of General Internal Medicine* 1996;11:454-60.
126. O'Neil AC, Petersen LA, Cook E, Francis Bates DW, Lee TH, Brennan TA. Physician reporting compared with medical -record review to identify adverse medical events. *Annals of Internal Medicine* 1993;119(5):370-6.
127. Vincent C, Stanhope N, Crowley-Murphy M. Reasons for not reporting adverse incidents: an empirical study. *Journal of Evaluation in Clinical Practice* 1999;5:13-21.
128. Baylis F. Errors in medicine: Nurturing truthfulness. *The Journal of Clinical Ethics* 1997;8(4):336-41.
129. Kapp M. Legal anxieties and medical mistakes. *Journal of General Internal Medicine* 1997;12:787-88.
130. Walton M. Open Disclosure to patients and their families after medical errors: A literature review: Australian Council on Quality and Safety in Health Care, 2001.

Chapter Three: What do we know? Literature review

Introduction

In the introductory chapter I outlined some theories about human error developed by human factors researchers and cognitive psychologists. The literature reviewed in this chapter is primarily concerned with mistakes in health care. The literature shows that interns' and residents' direct experiences of medical mistakes are under-researched with few published studies. The studies involving junior doctors are mainly about education and training, hours of work and working conditions. These provide important information about the training, experience and the work environment of junior doctors. The first two years of junior doctors' training has also been the subject of many government enquiries and reports about hospitals generally and the medical workforce in particular. While there are references to the potential for errors, few studies and none of the inquiries directly address junior doctors' experience of adverse events.

In this chapter I show that while much of the literature on junior doctors highlights workplace issues and problems (inadequate knowledge, inexperience, inadequate training and education, poor supervision, fatigue and stress), detailed investigation of the actual experiences of interns and residents with mistakes has not been undertaken. This gap in research means that programs designed to reduce the number of adverse events in hospitals may fall short because they fail to take into account the experience of interns and residents with mistakes. We do not know the types of mistakes they make, why they make them or what the junior doctors think will help them avoid mistakes. An analogous situation would arise if pharmacists were not asked about medication errors as a step in designing programs to manage and minimise adverse events arising from medication errors. It would be inconceivable that pharmacists would not be included in developing or designing programs to reduce medication errors.

I have included in this literature review any randomised and non-randomised controlled studies, observational studies, descriptive studies, analytical articles, opinions, case studies, protocols, autobiographical accounts and books. I searched MEDLINE (1966- December 2004) PsycINFO (1984- December 2004) CINAHL (1982 to December 2004) Sociological Abstracts (1963 to December 2004), EMBASE, Expanded Academic ASAP International 1980 - December 2004. I also searched The National Reference Center for Bioethics Literature (NRCBL), Kennedy Institute of Ethics, Georgetown University, Washington, DC, USA, on its bibliographic databases.[i] I assessed the studies and references to be included using a methodology developed by the US Preventive Services Task Force (1996)[1] plus the additional rating to cover protocols on disclosure developed by organisations.

The literature on junior doctors and medical mistakes is all Level III and IV[ii] evidence, comprising descriptive studies, reports, opinions of respected authorities, protocols and standards.

This literature review is in five sections. First I review the articles that directly studied junior doctors and their experience of mistakes. I then review the literature outlining the ethical responses to mistakes. The third section is a review of all the studies and articles on junior doctors such as training and education, knowledge and experience, supervision, fatigue and stress. While these studies do not directly study the association or relationship with mistakes, they are important because they show the potential vulnerabilities of junior doctors to make mistakes. The fourth section is a brief review of the role communication plays in mistakes involving junior doctors. The final section is a review of all the inquiries and major reports about junior doctors.

---

[i] The databases are maintained by the NRCBL with support from the National Library of Medicine and the National Human Genome Research Institute, both at the U.S. National Institutes of Health).

[ii] Level I evidence is randomised controlled trials, Level II-1 is non-randomised controlled trials, Level II-2 is a well designed cohort or case controlled analytic study from more than one research centre/group and Level II-3 is evidence obtained from multiple time series with or without intervention. (See Eisenberg John M. What does evidence mean? Can the law and medicine be reconciled? *Journal of Health Politics, Policy and Law*;2001;26(2):369-81.)

1   literature on junior doctors' experience with medical mistakes

The disciplines of medicine, anthropology and sociology have studied doctors' experiences of medical mistakes. Anthropological and sociological literature on doctors' mistakes mainly concentrates on the use of language, and the characterisation of the medical profession and culture. These studies, like mine, accept errors as a given and explore the emotional responses and the social context within which errors occur. But none examine the underlying causes of medical mistakes involving interns and residents.

The medical literature on junior doctors and mistakes includes studies examining frequency of mistakes,[3-5] types of errors,[6][7] responses to mistakes, [8][9] problems faced by junior doctors,[10][11][12] experience of mistakes,[13][14] competency[15] and prevention of errors.[16]

The literature on doctors and mistakes according to the level of experience of the health care providers giving the care and treatment is in its infancy. My study is only concerned with junior doctors and excludes mistakes by more senior clinicians. Common sense suggests that level of experience is a relevant consideration in mistakes. My study includes level of experience (knowledge and/or skill) as one of a number of factors that may be involved in mistakes.

Fourteen studies (all qualitative) were found that concerned junior doctors and their direct experience of mistakes. But only three studies[8][12][14] involved interviewing junior doctors about mistakes. Unlike my study none of these involved interviewing the doctors about the underlying factors or causes of mistakes.

A 1973 Australian article by Bates was one of the first to connect patient safety with junior doctors.[11] Bates, a sociologist, did not plan to examine medical errors; the junior doctors themselves raised their fears of making mistakes in the context of preparedness for hospital practice. Ninety-five resident medical officers from 16 hospitals[iii] in New South Wales were interviewed in groups or individually. Their main concerns related to inexperience in performing basic procedures such as suturing, intravenous injections, putting in drips and taking blood. Many reported they were required

to perform these procedures on patients without prior instruction or training. The study provided no data on mistakes, and we do not know whether the self-doubts about the junior doctors' skills resulted in any mistakes. The residents reported a reluctance to call for help which Bates attributed to their fear of being seen as 'incompetent'. One resident in a peripheral hospital said '*It's quite possible to go right through the year making mistake after mistake and not knowing about it.*'[11] This telling remark highlights the importance of finding out the experience of junior doctors and what they think about mistakes. Bates suggests that errors by junior doctors were more easily identified in teaching hospitals because of better supervision, while errors made by junior doctors in peripheral hospitals may go undetected because of inadequate supervision.

But Bates' study, like others below, makes assumptions about the training and work environment for junior doctors which are questionable. If there is no attempt to investigate the underlying causes of mistakes by junior doctors whether located in the personal, patient or system domains, it is difficult to be conclusive about junior doctors' reactions to mistakes. Bates did not investigate mistakes either separately or in relation to supervision. She makes no reference to the need for better understanding of medical mistakes.

The first study to examine the direct relationship between adverse events involving junior doctors was a UK study published by Steel et al in 1981.[3] This medical record review study found that if a patient suffered a complication it was likely to have occurred either during their admission when the accuracy of house officer's assessment of the patient's clinical condition was a factor or from a house officer's incorrect diagnosis. The study showed a strong correlation between major complications and house officers' inaccurate assessments.[3]

Because this study relied on the medical records for information about adverse events, associated factors such as working conditions or time pressures would not have been considered.

Recent studies on the reliability of medical record review have suggested there is poor inter-reliability among physicians trying to identify adverse events

---

[iii] My study hospital was included in Bates' study.

using this method.[17] [18] A significant factor appears to be the reliability of the doctors' judgements about whether an adverse event occurred in the first place. My study avoids this problem because I rely on the informants and not a medical record review to identify mistakes. One study comparing the effectiveness of house staff physicians reporting adverse events with retrospective medical record review found that doctors' reporting of adverse events uncovers as many adverse events as does a record review and is less costly.[19]

One of the first studies to use the interview method to ask junior doctors about their mistakes was undertaken by Mizrahi [13] in 1984, but she studied the coping mechanisms of junior doctors, not the underlying causes or factors associated with, or contributing to, their mistakes. This US study was part of a larger longitudinal study on the impact of graduate medical socialisation of interns on the doctor-patient relationship.[12] In-depth interviews were conducted with 74 house staff over a three-year period. Mizrahi found that one half of the house officers questioned said they had made serious, sometimes fatal, mistakes during their internship. [13]

Mizrahi found that internists used three methods for handling mistakes: denial, discounting and distancing. Denial occurred when mistakes were redefined as non-mistakes. Because Mizrahi observed senior residents deny mistakes she thought that the defence of 'denial' was entrenched in the discipline of medicine.[13] Discounting occurred when interns, unable to deny a mistake because of the gravity of the situation, tried to discount their responsibility and exonerate themselves. Externalising the blame to the bureaucracy, superiors, subordinates, or colleagues as well as blaming the patient or the disease was common. [13] Mizrahi believed distancing mechanisms were used when denial and 'blaming others' failed. Interns practised distancing when they made a direct admission of 'guilt' by invoking norms of professional behaviour conduct; 'I did everything I could.' These responses, she argued, were used by interns to protect themselves from the repercussions of serious mistakes and to lessen their sense of guilt and responsibility. This study assumed that mistakes were mainly caused by the actions of individuals.

The second half of Mizrahi's study concerned interns' attitudes to accountability. She concluded that interns believed mistakes were a matter of

opinion and that no one was able to (or should be able to) judge them for their actions and decisions.[13] This study did not say whether the interns saw their supervisors as adjudicators or arbiters. This study helps us to understand the possible responses interns and residents have after mistakes and provides insights into doctors' attitudes to mistakes. The knowledge we now have about human error and the underlying systemic factors substantially alters the context in which mistakes involving doctors can be analysed.

Paget's 1984 book [20] on medical mistakes is based on in-depth interviews of 40 US physicians either in residency training or in medical practice. While junior doctors were not her focus she explored physicians' emotional responses to their own and others' mistakes. Paget thought mistakes in medicine inevitable and did not seek to establish their causes or underlying factors. Paget concluded that medicine was a process of discovery; an 'error-ridden' activity.

Studies have also focussed on specific activities known to be associated with mistakes. Lesar et al's study [21] in 1990 reported prescribing errors in a US teaching hospital (Albany Medical Center). They found first year post graduate residents had a higher error rate (4.25 per 1000 orders) than other prescribing classes. Why this was the case was not explored. The study was not concerned with underlying causes other than the time, place and the prescriber status of the person making the error. The frequency of prescribing errors is now well documented but strategies to improve junior doctors prescribing other than using computerised order entry with decision support are yet to be described.

Another US study about mistakes by Wu et al [8] in 1991 involved an anonymous survey study of 254 (45 per cent return rate) internal medicine house officers on an internal medicine training programs located in three large academic tertiary care hospitals. Sixty-eight per cent were junior residents. This study categorised mistakes into errors of diagnosis (33 per cent), prescribing (29 per cent), evaluation (21 per cent), communication (five per cent) and procedural complications (11 per cent).[8] House officers were asked to describe their most significant medical mistake, their response to it, the subsequent events and what they attributed the mistake to. There were no questions about the events leading up to the mistake.

Wu selected three factors to describe the causes of mistakes: - inexperience, job overload and case complexity.[8] The house officers in Wu's study usually attributed mistakes to more than one cause, but once the causes were identified there was no further inquiry or analysis of the underlying factors. For example, 51 per cent (58) reported a cause of the mistake as 'too many other tasks'. There was no discussion of why there were too many tasks or any of the organisational or system problems associated with overwork or fatigue. The premise of both Mizrahi's and Wu's studies appears to be that mistakes are inevitable and their underlying causes known. But what is known is unclear. The studies imply that mistakes are caused by individual factors (inadequate knowledge and skill) without explicitly saying so.

House officers in Wu's study discussed the mistake with their supervisor in 54 per cent of cases. The patient (or family) was involved in discussions about the mistakes in 24 per cent of cases.[8] Wu's results showed that in 1989 house officers held themselves solely responsible for mistakes. In 76 per cent of cases the respondents said they 'promised to do things differently the next time.' Sixty-two per cent were self-critical and gave a 'lecture to themselves'. Another 21 per cent said they would apologise or 'make up'. The emotional responses ranged from remorse (81 per cent), anger at themselves (79 per cent), guilt (72 per cent) and inadequate (60 per cent). Twenty-eight per cent feared negative repercussions from the mistake. Since this was an anonymous questionnaire there was no opportunity to question the doctors about why they thought they were responsible or what they thought about the role played by the organisation or system in mistakes.

As with Mizrahi's study, Wu's study shows that mistakes were mainly viewed as a personal responsibility requiring personal solutions. Ninety-eight per cent of house officers identified remediation as the appropriate response to a mistake such as making adjustments to their own practice. Doctors were more likely to make positive changes in their practice if: (1) the doctors were female, (2) the outcomes for the patients were serious, (3) the doctors were inexperienced, and (4) the case was complex and the house officer accepted responsibility and discussed the mistake with seniors.[8] There was a significant correlation between defensive reactions to the mistake and perceptions of job overload and a judgemental institution.

Wu et al recommended that house officers should continue to accept responsibility for their mistakes and also discuss their mistakes with attending physicians. He recommended research about the reluctance of house officers to disclose mistakes to their supervisors.

Calman et al's [10] interview study in 1991 of 'approximately' 200 pre-registration house officers, consultants, registrars, nurses and others from the West of Scotland sought to determine the major problems faced by trainees in their first three years after graduation and whether these problems affected service provision and patient care. This was done by examining intern involvement in a review of all reported critical incidents (adverse events). Of the 200 interviewed, 85 were pre-registration house officers. Informants were asked to provide examples of incidents (mistakes) that had occurred in the recent past. Key words identified from hand written notes were used to categorise responses. The analysis shows that a number of factors were identified as significant in the critical incidents. Personal aspects (degree of personal involvement and need for supervision) rated the highest in terms of the number of key words. The study reported that many junior doctors said they were not listened to and were unsupported by senior clinicians who gave little feedback about their progress. In addition, deficiencies in supervision, poor feedback on performance, inadequate induction and skill in practical procedures and poor organisational skills were identified by junior staff.

A study by Baldwin[4][22] et al documented frequency of errors in a 10 year study of a cohort of over 400 junior doctors in the United Kingdom. During 1993-96, 77 per cent of the 400 junior doctors reported making one or more mistakes in the past month. The respondents ranked their mistakes into one of three grades; minor mistakes in the past month (where the patient suffered no pain or discomfort), moderate mistakes in the past two months (where the patient suffered pain, discomfort, temporary or permanent disability or both) and major mistakes in the past year (where the patient had been endangered or died). Minor mistakes were excluded because the authors said they were too frequent. Their high number does not fully explain why they were not examined because minor mistakes can also be costly to an organisation and inconvenient to patients. The proportion of doctors making moderate and major mistakes by year were: 1993 (moderate 39 per cent, major 43 per cent),

1994 (moderate 44 per cent, major 44 per cent) 1995 (moderate 46 per cent, major 30 per cent) and in 1996 (moderate 24 per cent, major 16 per cent). The main causes of moderate and major mistakes identified by the doctors were ignorance and inexperience. The authors concluded that doctors' increasing knowledge was being outpaced by their increasing autonomy and hence greater opportunity to make mistakes. [4]

The major problem with this study was that the data were extracted from an anonymous survey about doctors' working conditions which included questions about mistakes. There was no opportunity to question the doctors about their experiences of mistakes or elaborate on underlying causes. The definitions for the three categories of mistakes (minor, moderate and major) were problematic because they required the respondents to know the outcomes of their mistakes. Shift work, changing rosters, patient discharges and transfers might stop some doctors knowing they had made a mistake. Outcomes of their mistakes in terms of seriousness or planned treatments for patients might be unavailable. The other difficulty is that we have no idea of the numbers involved; only percentages of doctors reporting mistakes were reported.

In an editorial in the British Medical Journal [23] (2000) nearly a decade after his first study was published, Wu restated the necessity of being open about mistakes, and while he was still concerned that doctors accept responsibility for their mistakes he was less optimistic about this happening because of the blame culture within medicine and the community. Wu appears to maintain that junior doctors owning-up to their mistakes is still the central issue even though he acknowledges the difficult medico-legal environment. Honesty is a professional responsibility and owning-up is just one reaction to mistakes. Unless we examine the multiple factors that contribute to mistakes we miss the opportunity to learn how mistakes can be avoided. There is little evidence that 'trying harder' and 'doing better' reduces adverse events.

An interview study by Pearson et al [7] in 2002 on prescribing mistakes of ten interns from two NSW teaching hospitals concluded that traditional forums for information exchange such as morning hand-over of patients and grand rounds failed to provide adequate 'field experience' in prescribing. The interns identified a variety of positive and negative influences on their prescribing

practice. Registrars had a positive influence while consultants were perceived negatively, being seen as authoritarian, inflexible, and unavailable and 'tending to stick to their old ways'.[7]

Interns' responses to prescribing errors fell into two categories. The first involved the intern being told about the mistake in a non-confrontational manner, being provided with clear explanations of why a prescribing decision was flawed and being guided in the appropriate course of action. The second, described by the interns as 'personal nightmares', involved confrontational communications between the intern and the clinician without clear explanations for better prescribing.[7] Other negative learning factors included time pressures and the structure and organisation of the medical and hospital hierarchies.

2   Ethical responses to mistakes

The quality of ethical responses by interns and residents to mistakes has not been widely studied even though honesty and integrity are commonly considered hallmarks of the medical profession. The public trusts health providers to put the interests of patients first[24][25] and when other interests dominate, public trust is damaged.[26][27][28] Deceiving and avoiding patients who suffer because of medical errors offends two main ethical obligations - respect for autonomy and putting the patient's welfare first.[29] Interns and residents usually have underdeveloped ethical reasoning abilities for managing ethical dilemmas on a day-to-day basis so as they progress in their training they are expected to develop ethical reasoning skills from their supervisors and mentors. Learning how to tell patients and families about medical mistakes depends on exposure to these activities.[30]

The literature [30-38] shows that mistakes are not routinely disclosed to patients or their families and is silent on the issue of junior doctors' communication with patients or their families after adverse events. One could deduce that junior doctors have few opportunities to observe and learn from supervisors about how to communicate adverse events to patients or family members.

The ethical duty to disclose a mistake to patients is clear but the obligation to formally report one's own mistakes to one's colleagues or a supervisor is less

so. Interns' and residents' willingness to report mistakes to their employing organisation have been studied. A 1999 study by Vincent et al [30] in the UK examined why formal reporting mechanisms for adverse events were not used by junior staff. An anonymous questionnaire was given to 209 staff working in an obstetric unit with 198 participating: 42 (84 per cent) doctors and 156 (98 per cent) midwives. Fear that junior staff would be blamed was one of the main reasons given for non-reporting. Other reasons included high workload and judgements that the 'reportable incident' did not need reporting. The study concluded that staff do not report incidents just because the hospital requires they do so but mediate their decision to do so by considering other aspects of the case before deciding to report. Junior midwives were much less likely to know which incidents to report or their reporting responsibilities. High workload and worries about litigation influenced junior doctors not to report.

The authors recommended that there be fewer clearly defined 'reportable incidents'. Modifying the list of 'reportable incidents' may result in improved reporting but we also need to know how mistakes are managed by junior doctors and the barriers to their being reported. We need to understand why junior doctors are reluctant to report mistakes. Because Vincent's study was an anonymous survey of staff working in two obstetric units the authors were not able to explore such questions with them. Staff in obstetric units are also sensitive to mistakes or complications because of their association with birth injuries and medical negligence verdicts. The views of the respondents may not represent the views of junior doctors working in other departments.

Studies[38-41] about the motivations of physicians in their decisions regarding the disclosure of medical errors suggest a variety of reasons for not telling patients. Fear of litigation[41][37] was the most common, while a concern for the patient's right to know the truth of their condition[39] was the main reason for disclosing. More recent studies in 1997[39] and 2000[40] investigated clinicians' responses to disclosing medical mistakes. Sweet and Bernat's study[39] used three fictitious case vignettes involving medical errors. Each vignette was designed to assess whether the physician would tell the patient about the error and the factors most influential in that decision. Surveys were distributed

to 50 medical students, 50 house officers, and 50 attending physicians at Dartmouth (US) Hitchcock Medical Centre, a medium-sized rural academic medical centre. Subjects were randomly selected from a list of 310 attending physicians, 263 house officers, and 310 medical students. Of the 150 surveys mailed 106 were completed (71per cent) consisting of 46 (92 per cent) attending officers, 27 (54 per cent) house officers and 33 (66 per cent) medical students. The results showed that a decision to disclose a medical error involved consideration of the following competing conflicts: personal morality, professional obligation to prevent errors, concern that disclosure would damage their relationship with other colleagues, the patient's right to know the truth and concern that information would cause more suffering for the patient and damage to the patient's confidence in doctors.

Physicians were generally willing to admit errors to patients, but as the severity of the injury increased their willingness to admit errors decreased. Willingness to disclose errors of other treating physicians was far lower than their willingness to admit their own errors. In all three cases physicians who indicated they would tell the patient about the error cited their personal ethic to be truthful and their concern for the patient's right to know the truth of their condition as the most important reasons for disclosure.[39]

A second study using hypothetical cases by Green et al[40] in 2000 showed that even though physicians recognise that lying is morally problematic they would use deception with their patients and third parties. This US study examined whether and in what circumstances, resident physicians would deceive other physicians. Three hundred and thirty surveys were distributed with a response rate of 67 per cent. Two versions of a confidential survey using vignettes were randomly distributed to all internal medicine residents in four US teaching hospitals in 1998. Survey versions differed by introducing slight variations to each vignette in ways the authors hypothesised would influence the respondents' willingness to deceive. The likelihood that residents say they would use deception in response to each vignette was compared between versions.

Most respondents indicated that it was wrong to deceive colleagues, even if no one was hurt or if one was not caught. But many also indicated that under some circumstances they were likely to deceive colleagues. Thirty-six per cent

said they were likely to use deception to avoid discussions with a colleague; 15 per cent would misrepresent a diagnosis in a medical record to protect a patient's privacy; 14 per cent would fabricate a laboratory value to an attending physician; six per cent would substitute their own urine in a drug test to protect a colleague and five per cent would lie about checking a patient's blood to cover a medical mistake.

A difficulty with hypothetical studies is the reliance on what residents said they would do rather than on what they reported doing in actual cases. In carrying out my research I have endeavoured to avoid this weakness by asking the informants questions in relation to their own mistakes, what they think caused the mistakes and what actually happened as a result.

3   Situations in which junior doctors are vulnerable to mistakes.

My study asserts that any comprehensive analysis of mistakes involving junior doctors must take into account the many situations and circumstances that create opportunities for mistakes. In this section I analyse different situations associated with the work of junior doctors. The literature is growing in relation to the activities of junior doctors and the challenges work-related demands pose for them. Knowing how fatigue, stress, poor communication and inadequate knowledge and skill affect junior doctors is important because it helps us understand predisposing characteristics that may be associated with mistakes.

3.1   Training and education

The literature on training and education of junior doctors demonstrates the need to improve the quality, content and delivery of medical education. Inquiries[iv] dating back to early last century have identified the need for enhanced education and training for junior doctors. [42-45] But they rarely discuss its relationship with the potential for iatrogenic injuries.

Statutory and administrative arrangements in North America, the United Kingdom and Australia require doctors in the first two years after graduation to

---

[iv] I discuss these inquiries later in this chapter.

receive in-house (hospital) training and education. Training and education programs, while having a variety of formats, have these aims: provision of a supportive supervised learning environment; opportunities for the consolidation and development of knowledge; development of skills and professional attributes; preparation for eventual independent medical practice; preparation of doctors to assume responsibility for the safe care of patients; and assistance with career planning and life-long learning.

The high service component of junior doctors' roles has been criticised and is partly responsible for the continued low rating by junior doctors [46-50] and senior staff [51] of the quality of the JMOs' educational experience. [52-59] In addition to high service demands, other factors undermining training and education include the increasing role of specialisation in medicine and inadequate reward systems for faculty and clinical teachers. [60 61]

Many studies [62-75] have evaluated the different educational interventions used to prepare interns and residents for independent practice. One postal survey [76] of all interns in NSW teaching hospitals (67per cent response rate, n=195) found that training during the intern year was poor in terms of allocated time and teaching strategies. Interns identified more training in technical skills than interactional skills,[v] and reported inadequate assessment of interactional skill competencies. Only 50 per cent of trainees considered their training for key technical skills (cardiovascular examinations and inserting IV lines) adequate.

Gaps in education programs have been identified [75 77] with many studies [75 44] [72 78-84] supporting the provision of additional skills training for interns and residents. In addition to the consolidation of clinical skills other skills such as teaching, communication, working in multidisciplinary teams, showing compassion, dealing with confidentiality issues, evidence-based practice, quality improvement and interviewing skills [80 81] and patient advocacy have been identified as necessary for producing well-rounded doctors. [83]

How doctors are taught in the hospital environment is gaining attention from medical educators, interns and residents. Teaching requires time commitment by clinical teachers,[85] interactions between senior clinicians and residents,[86 87] bedside teaching with active involvement of the residents, [88] observation and

critical feedback.[76] Methods for teaching junior doctors have been identified in a number of studies,[60 65 89-93] including the value of senior clinicians as role models.[79 83] Other beneficial ways to teach include the use of 'protected time' for formal weekly education sessions, feedback, dry rounds,[vi] critical incident analysis and case discussions with senior clinicians,[vii] and portfolios.[94] Ward rounds, once thought to be crucial for bedside learning, were not seen by the interns as a useful mechanism for learning about clinical signs and symptoms. Videotaped vignettes and role plays[78] have been successfully used in a teacher preparation course to prepare residents for teaching and leadership roles. Well structured and planned morning reports,[95-97] and interactions with teachers[74 98] were both demonstrated to be successful methods for teaching junior doctors.

Even though workforce requirements demand junior doctors to know and learn more 'on the job', opportunities for doing so are diminishing. Patients have shorter hospital stays so there are fewer hours to learn about the patients' conditions. The world-wide trend towards shorter working hours for interns and residents has implications for accessing educational programs and training opportunities.[99 100]

The pressure on junior doctors to provide services is often in conflict with their educational requirements. This conflict is most evident when insufficient time is allocated or when junior doctors fail to access education programs because of their high work load. Few studies investigate this tension.[85 93 101] One US study [101] found that when a sub-set of patients was managed by nurses or physician assistants, this reduced the number of patients per resident and allowed more time for both residents and teachers for education.

Many state, national and international organisations[viii] are reviewing and implementing post graduate junior doctor education programmes designed specifically for the first two years after graduation. But these initiatives do not factor in the high service demands or the time required to acquire the competencies.

---

[v] Clinical competence encapsulates both technical competence and interpersonal skills (interactional skills ensure proficiency in communication, counseling and prevention skills.)
[vi] Dry round is discussion about a case away from the bedside.
[vii] Interns wanted constructive feedback and did not view an 'excessively critical approach' as useful.
[viii] The Postgraduate Medical Council of NSW, Australian Medical Council, General Medical Council UK, Association of American Colleges,

3.2 Knowledge and experience

The lack of experience of interns and residents underpins the requirement that junior doctors be conditionally registered as medical practitioners in their first year of practice. The link between inadequate knowledge and inexperience and medical errors is accepted within medicine as one of the consequences of employing doctors still in training, but the acceptance is implied rather than explicit. Hospitals do not routinely advise patients being admitted that they will be treated by junior doctors starting their professional lives. Nor does the medical hierarchy explicitly acknowledge the vulnerability of junior doctors to mistakes. Training and accrediting bodies do not explicitly acknowledge the vulnerability of junior doctors to errors. The correlation between increasing levels of skill (and knowledge) and decreased errors, seemingly obvious, was established over a decade and a half ago [102] but this evidence has not prompted those responsible for junior doctor training to be more explicit about junior doctor preparedness and the potential for errors.

One of the reasons interns lack confidence when they start work is inadequate training in core clinical skills.[103 104] How junior doctors perceive themselves in the medical and hospital hierarchy may relate to how confident and willing they are to ask for help. This in turn may affect their ability to recognise their limitations. Lack of confidence could be a significant factor in whether a junior doctor seeks help after a mistake. If they are unwilling or lack confidence to ask for help with simple tasks, will they have the confidence to ask for help when they are in trouble? No studies seek to establish from the junior doctors' perspectives the cultural, clinical or environmental factors that promote or inhibit them from seeking appropriate help.

A number of studies[14 73 103 105-111] examine preparedness of medical students for clinical practice but none of them study ill-preparedness for errors. Most reveal many interns have deficiencies in basic clinical skills when they start internship. Inadequate understanding of the crucial signs of acute illness, airway obstruction and basic life support were examples of specific areas where doctors had inadequate knowledge and skills. [112] The potential for junior doctors to learn incorrect techniques was observed to be high in one study.[103] Another study concluded that experience in the first year after medical graduation did not necessarily correct the deficiencies.[112] First-year

trainees often learn from doctors immediately ahead of them, again raising the question of the quality of the learning.

Studies[73][83][112-119] of junior doctors' preparedness for treating patients with particular medical problems indicate inadequate confidence and knowledge in assessing and treating common psychiatric conditions, depression, anxiety and alcohol misuse.[116][120]

3.3 Supervision

The impact of inadequate supervision on quality of care was first noted centuries ago.[ix] But the link between inadequate supervision and medical errors is only now being studied. There is some evidence that the failure to supervise interns and residents makes them more vulnerable to medical mistakes. [4][6][121-124] Poor interpersonal relationships between interns, residents and supervisors have also been identified as factors in errors.[125] The 1987 UK Confidential Enquiry into Peri-operative Deaths[126] disclosed that many operations were undertaken by junior doctors who did not have enough experience to operate safely. They found that 10.4 per cent of deaths following surgery were related to inadequate supervision of junior staff.

Supervision of trainees is a core component of the apprenticeship model underpinning medical education.[127] The supervision process generally involves a professionally qualified person helping the novice to gain insights into their professional practice, and gain wider knowledge and skills. Yet unlike other health related professions (nursing, social work, psychology) there is little written about clinical supervision in peer reviewed literature.[x] Kilminster et al defined supervision as *the provision of guidance and feedback on matters of personal professional and educational development in the context of the trainee's experience of providing safe and appropriate care.*[128] This definition directly links supervision of interns and residents to the safety of patients.

[ix] Concern about supervision was noted at least 350 years ago in the regulations of St Bartholomew's Hospital of 1633 which stated *"That noe Chiurgian be suffered to p'forme the cures in this howse by his Boy or s'vant w'hout his owne ov'sight or care."* (From Keynes GL The Life of William Harvey, Oxford University Press 1966 p.70)
[x] Psychiatry has a well developed literature on supervision, but it specifically relates to psychotherapy and supervision of the therapist providing therapy.

Since there is little information about the actual experience of junior doctors with supervision, the question, 'Who supervises interns and residents?' is difficult to answer. Few studies have explored it. Effective supervisors, irrespective of level of seniority, have these characteristics: demonstrated clinical and professional competence; capacity to teach in the clinical context; ability to set goals; capacity to summarise the clinical encounter; ability to provide on-going feedback; and capacity to assess clinical activity. [129]

The permanent working group of European Junior Hospital Doctors in their policy statement *Postgraduate Medical Training: a European Future* [130] classify supervision into passive and active. Passive supervision *"entails the constant availability - on request and with ease of access - of a senior more competent member of staff to deal with matters beyond the particular trainee's competence."*[130] Active supervision involves *"the regular and consistent attendance of a named specialist to review or examine the work of the trainee in all aspects of his or her job, i.e. admissions and emergency assessment; in-patient care; including procedures and therapies, correspondence and note keeping; discharges; out-patient care; consultation, liaison, and community work; working relations with other staff; organisation of clinical activity."*[130] The policy requires the named supervising specialist to be responsible for organising the process of supervision.

In the UK, university medical faculties oversee the pre-registration year. A Pre-Registration House Officer (PRHO) is required to spend three months in surgery, three months in medicine and may include up to four months in general practice.[77] The GMC requires all interns (PRHO) to be supervised by consultants who are formally designated as the educational supervisors. Their duties include the joint development of a personal plan, learning objectives, assessment of the objectives, evaluation, appraisal and certifying satisfactory service.[131 132] Interns must have available to them at all times a more senior member of staff in an appropriate specialty who can provide cover and help. The arrangements must be explicit and known to both the intern and the supervisor. The GMC expressly prohibits house officers having to rely on help from outside the hospital. The GMC rules also require PRHOs to be given clinical responsibility for some acute admissions as well as experience in the care of patients with chronic illness.[77]

The National Training and Assessment Guidelines for Junior Medical Officers published in 2003 by the Australian Confederation of Postgraduate Medical Education Councils[133] requires hospitals to provide adequate and appropriate supervision. But the document does not say what adequate and appropriate supervision involves. Junior doctors are advised to ensure they are 'adequately supervised' particularly in the first year (internship) in which greater supervision is required. Less direct supervision and more clinical responsibility is recommended for second year doctors (residents). The guidelines provide instructions for hospitals, term supervisors and clinical teachers as to the level and type of supervision.

A few studies have shown ways to improve the quality of supervision for junior doctors. One Canadian study of 20 years ago [134] reported strategies for improving the quality of supervision that remain appropriate today. They suggested screening supervisors' practice for consistency with educational goals, educating supervisors about program goals, setting realistic learning objectives, teaching supervisors to use constructive feedback techniques and developing their skills in assessment and evaluation of performance. Other ways for enhanced supervision include better use of the morning report,[135] case by case supervision,[136] establishment of a 'service chief' system that utilises external experts,[137] use of log books,[138] and using a systems approach program.[139]

A Danish program [93] improved supervision by attaching junior doctors to specialised teams and creating more supervised working situations such as morning rounds being attended by both junior and senior doctors. This saved time for supervision.

In the US major legislative reforms concerning working hours and supervision of junior doctors were prompted by a major finding of inadequate supervision by the high-profile investigation into the death of Libby Zion in 1984.[140][141] Libby Zion was an 18 year old woman with high fever admitted to a university teaching hospital who died shortly after admission to hospital. The Grand Jury's 1986 report of the death concluded:

The most serious deficiencies can be traced to the practice of permitting inexperienced physicians to staff emergency rooms and allowing interns and junior residents to practice medicine without supervision.[140]

The reforms in relation to supervision included closer attending supervision of residents, particularly in hospital emergency departments, 'night float' coverage to relieve busy house officers and fewer numbers of patients under the care of single resident.

Studies [6] [142-144] link diagnostic errors to poor supervision and show that junior staff benefit and errors are minimised when they receive specific training and testing on their abilities before working unsupervised. Supervision is more than case discussion and co-signing medical records. It often requires (depending on the site) direct patient interview and examination by the attending physician. [145] [146]

Data on the ward activities of junior medical staff are minimal but one 1993 survey [147] of interns and residents working in five emergency departments in Boston and Cambridge (Massachusetts) showed that they underestimated the time spent in supervision with the attending physicians. The mean estimated proportion of time junior staff thought they spent in supervision was eight per cent whereas the mean actual proportion was 17 per cent. The study also showed evidence suggesting that when residents are directly supervised, significantly higher rates of compliance with guidelines are shown than for residents acting alone. [148]

A 1995 survey [149] of Norwegian pre-registration interns (104/133) found that 50 per cent of the 'medical' and 65 per cent of the 'surgical' house officers reported they received no introductory information or supervision before starting their hospital duties. Two-thirds said they did not attend any educational programmes and 80 per cent did not receive systematic feedback on their work. Most house officers received no evaluation of their work at the end of the pre-vocational year. [149] In addition to inadequate feedback on performance, [150] pre-registration house officers also perceived a lack of support from senior staff. [10] [98] [151]

The literature also shows that problems with inadequate skills acquisition are related to poor supervision. Many interns learned procedures while unsupervised [152-154] and were judged by supervisors to have poor technique and inadequate mastering of procedures. [155]

3.4   Fatigue

Demands for improved patient safety and intern and resident well-being are driving a number of countries to reform the excessive hours worked by doctors. The connection between sleep deprivation of interns due to long hours and circadian interruption and well-being was made three decades ago[156] yet it is only recently that governments and regulators have been serious about limiting hours.

Attention to the hours of work originally began with campaigns on 'safe hours' for junior doctors,[157] but it is now recognised that trainees[158] and senior clinicians[159] are also affected. Since August 2004 junior doctors in Europe and the UK have been legally required to work 58 hours a week. By 2009 they will be limited to a 48-hour week.[160] The European Court of Justice, [161] which determined the rules, relied heavily on the overwhelming evidence that sleep deprivation, sleep restrictions and unnatural circadian cycles [xi] contribute to cognitive deficits, motor impairments, injuries and errors.[162-167]

Some US and UK residents reported working in excess of 80 hours a week with 100-120 hour weeks reported.[157 168 169] There is strong scientific evidence linking fatigue and performance.[170-173] Increased fatigue, decreased alertness and impaired performance in a variety of psychomotor settings have been associated with poor quality sleep and inadequate recovery.[165 172 174-178]

Studies in the UK and Ireland also show that fatigue can impact on the wellbeing of residents affecting their mood (depression, anxiety, anger and confusion).[156 176 179-183]

Despite the methodological problems[xii] of pre 1990 studies, more recent controlled studies have confirmed the findings that sleep deprivation can negatively impact on clinical performance.[158 172 179 184 185] Fatigue has also been linked to increased risk of medical errors[8 107 176 179 186-193] and motor vehicle accidents.[194-198] A 2004 study by Landrigan et al [199] was one of the first to measure the effects of sleep deprivation on medical errors. They found that interns working in the medical intensive unit and coronary care unit of

---

[xi] Circadian rhythms are the patterns of activity that occur on a 24-hour cycle and are important biological regulators in virtually every living creature.
[xii] Potential confounders such as circadian time of the testing, practice effects, accumulated sleep debt, prior training experience were not examined in the earlier studies.

Brigham and Women's Hospital (Boston US) made substantially more serious mistakes when they worked frequent shifts of 24 hours or more than when they worked shorter shifts. Other studies show that sleep deprivation can have similar symptoms to alcohol intoxication.[164]

The Australian Medical Association's *Safe Hours Working* campaign in Australia sought to cap working hours for doctors and has been a leader to reduce hours for junior doctors. Other organisations have echoed the need for safe hours for junior doctors.[xiii]

3.5   Stress

Stress in junior medical staff has been linked to low morale, depression and burn-out. But these manifestations of stress have not yet been studied to find out if they are factors in mistakes involving junior doctors.

Sources of doctors' stress [xiv] are varied. Psychologists[200] suggest that stress can be categorised into one or more of the following five categories:- job related stress (work overload, under-utilisation, hours of work, shift work, time pressures, repetitive work, physical conditions and level of cooperation); role-based stress (role ambiguity, role conflict, level of responsibility-too much and too little); conflicting demands between work and home (between professional and personal); conflicting relationships (with superiors, subordinates, colleagues); career development (opportunity and choice) and organisational structure and culture (office politics, communications, participation in decision-making, organisational knowledge and trust).

Doctors are prone to mental health problems [48 201-208] particularly depression [203 209-213] in their first post-graduate years as well as in later years.[214-216] While rates of depression and mental health problems among doctors are higher than those experienced by the general population, [217 218] the literature shows that when interns and residents are supported by fellow house officers[219-221] and senior clinicians,[138 222] and are members of well functioning teams,[223] they

---

[xiii] The Australian Council on Safety and Quality and the NSW Health Department have established committees to examine safe hours. I co-chair the NSW Safe Hours Working Party which is responsible for reviewing the work practices and hours of work for all health professionals in the NSW health system.
[xiv] Stress results from an event which produces physical or psychological pain. (See Payne R. Firth-Cozens J. *Stress in health professionals*, Chichester John Wiley and Sons, 1987.

are less likely to feel isolated and suffer stress. [xv] Performance is also affected by stress.[207 224-226] Stress as a cause of mistakes and mistakes as a source of stress have not been well researched. My study seeks to elicit from interns and residents the role of stress as a factor in mistakes as well as their personal response to mistakes.

There is strong evidence indicating that inadequate sleep[219 227-229] contributes to stress and depression rather than the number of hours worked.[218] Other stressors identified in the literature include financial status, educational debt[214 230] and term allocation. [231] Studies in the UK and the US [47 232 233] identify emotional pressure, demands from patients, interruptions, time pressure and interferences with social life as main factors associated with job stress. But these did not study the relationship with mistakes. One UK study found that while doctors acknowledged to researchers they were stressed they found it difficult to be open about it to their colleagues because they think they ought to be able to manage because they 'are doctors'.[234] My study builds on this by seeking to find out who doctors talk to about their problems and whether they are adequately supported in the workplace.

3.6 Work environment and organisation

Hospitals are complex organisations[235 236] comprising many autonomous units and departments, each having different work routines, structures, culture and modus operandi.[237] Hospitals organise the work of junior doctors using a roster system which means they are rotated through different departments and hospitals. This makes familiarity with the environment difficult. A report published by the British Medical Association[238] identified work environment along with long hours as major contributors to stress among doctors. Unfamiliar environments have been identified as a precursor to errors[158 239] and when coupled with the inexperience of junior medical officers are thought to lead to medical errors.[121 216 229 239-242] The extent to which junior doctors think that unfamiliar environments cause them to make mistakes has not previously been studied.

[xv] Well functioning teams have also been associated with better patient outcomes and a reduction in errors.

Experience in other industries tells us that standardising work processes reduces the opportunities for mistakes.

The influential report *Crossing the Quality Chasm*[236] identified organisational factors for reform because it recognised that the way work is organised is a common feature in system failures.[125 243 244] Firth-Cozens[218] observed that 'whole organisations' can be stressed as well as the individuals who work in them. The level of care offered in hospitals, the availability of specialised services and the access to senior staff also impacts on the quality of care offered patients. In addition work satisfaction that derives from an organised and predictable work place is a known factor favourably impacting on performance.[218 245 246]

The tasks of junior doctors are many, varied and unpredictable. They are dependent on many interconnecting factors and relationships. These multiple factors have the potential to compromise delivery of safe care.[247] For example, doctors who routinely practice beyond their level of knowledge and experience may have different attitudes to their work, their colleagues and their patients from those who are routinely supervised. As we saw above, stress also leads to lower morale, poorer work performance and dissatisfaction. [48 215 248 249]

The situation in which errors occur is relevant for understanding whether any extenuating or unusual circumstances are contributing. Change-overs of shift, shift work, nights, overtime or equipment or technology failure all increase opportunities for errors.[250-252] The extent to which these activities are associated with mistakes involving junior doctors has not previously been investigated. The role of equipment and technology failure in errors is well established and falls broadly into two categories - the malfunctioning of equipment or technology as a result of a design fault or a failure of a component and when the user causes a malfunction.[253-255] User error has been also identified as a significant factor in most preventable medical device-related incidents.[254 256] But while the above studies have been associated with mistakes generally, their relationship with mistakes involving junior doctors has not previously been studied.

4   Communication

The role of good communication in the provision of quality health care and the role poor communication plays in sub-standard care are both well documented.[xvi]

But communicating accurate information in a timely way between the multiple health workers (consultants, registrars, nurses, pharmacists, radiologists, medical records and laboratory personnel) is not easy, nor are there standard ways for communicating within hospitals. How successfully junior doctors treat patients often depends on informal communications among staff and their understanding of the work place.[249] Medical mistakes caused by miscommunication, nil or inadequate communication are well known and occur daily in hospitals. [251 257 258] The quality of the communication between patients[33 36 259-263] and other health professionals[264-269] strongly correlates with treatment outcomes. Checklists, protocols and 'care-pathways' are effective for communicating patient care orders.[270]

While teaching communication skills to facilitate better patient-doctor communication is now common in medical education, learning how to communicate in a complex environment such as a hospital has not been included in medical curricula until very recently.[xvii] Junior doctors in most Australian hospitals from their first day of employment are expected to be able to communicate with all professional groups and hospital staff and know the different methods used to communicate information irrespective of the term or the department to which they are allocated. How junior doctors actually experience their induction to the hospital and the wards is relevant to their understanding of the role the system plays in health care services. Their level of understanding will also be an indicator of their appreciation of the role of complexity in the execution of errors.

[xvi] Poor communication is a well known factor in complaints and was nearly always a factor in complaints to the NSW Health Care Complaints Commission.
[xvii] I introduced a session called "Communications in hospitals" into the Sydney Medical Program Year 3 in 2002 after a successful pilot in 2001.

Many post graduate medical training programs here and in the US now include risk-communication skills training in their curricula because they recognised the connection between negligence suits and inadequate communication between physicians and patients or their families.[36 271]

5   Inquiries and reports

In this section I review the conclusions of some of the major reports in Australia, North America and the United Kingdom and Ireland about junior doctors. These reports are important because they help clarify the problems associated with the environment in which interns and residents work. Examining the work of interns and residents from a patient safety perspective is a very recent development in Australia and overseas. Early reports on junior doctors failed to examine the potential risks to patients when treated by inexperienced medical staff. The main focus of these reports was on workforce requirements and the quality, role and function of medical education.

Since the late 1990s, two areas have emerged for attention: safe hours and core competencies for practice. The safe hours campaigns as we saw earlier are still in their infancy and have yet to demonstrate that shorter hours lead to improved morale for doctors and improved safety for patients. Core curricula that identify pre-vocational in-hospital training for interns and residents, as mentioned earlier, are now being developed and implemented in most developed countries.

5.1   Australia

Australia relied on English reports [272-274] for identifying and making improvements in medical education, including the education of junior doctors. It was not until the 1970s that medical education in Australia separated from the auspices of the General Medical Council in the United Kingdom.[275] Early Australian reports mainly about workforce issues, focussed on either the under or over-supply of doctors for the needs of the Australian population. Junior doctors being part of the hospital workforce were included in these

reviews in relation to workforce availability and predictions for future workforce requirements. Even though iatrogenic injuries in the hospitals had been known as early as the 1960s[276][277][278] it was not then thought a significant problem, so the absence of a safety perspective was understandable.

But by the end of the 1970s intern training was undergoing critical analysis with workforce, quality of education and training on the agenda of state health ministers. [xviii] A 1978 report by the Education Research and Development Committee on Medical Education in Australia[275] identified major gaps in postgraduate medical education; namely the lack of continuity between universities and hospitals and the fragmentation between undergraduate, graduate and vocational training. How this affected patient care was never examined. The link between mistakes and inexperience, work environment or work schedules was never made. One explanation may be that detailed information about the role, work and mistakes of interns and residents was not available.

A lack of understanding about the role of junior doctors prompted the Queensland Government in 1979 to commission a study into residency.[279] Five Queensland hospitals[xix] were selected for study using a multifactorial approach. The authors originally intended to examine the day-to-day routines and work loads of interns but they soon realised this could not be done in isolation from their training and development.[xx] The factors selected for examination included work routines, administration, training, professional development and social circumstances. The relationship of these selected factors to increased vulnerability of interns and residents to medical mistakes was not identified or examined.

This study recommended changes in staffing and organisational arrangements, training and assessment, conditions of service and also identified further research areas. The multifactorial approach was innovative for its time. But the authors did not appreciate the importance of the role of medical culture and the organisation of medicine in the training of junior

---

[xviii] Dissatisfaction with the status quo and perceived needs for internship review was the catalyst for a seminar on future directions for internship and mechanisms for its oversight held at Westmead Hospital on 19 April 1979.
[xix] The hospitals were the Royal Brisbane, Princess Alexandra, Ipswich, Southport and Redcliffe.

doctors. For example, the authors recommended a 48 hour week as well as six hours of active learning for interns each week. Reduced hours and quarantined teaching periods are valid reforms but without the support of the medical profession were bound to fail. Twenty-five years on, reduced hours and quarantined teaching are again on the agenda mainly because of governments and professional concerns about doctors' welfare and the need to reduce adverse events.

The Commission of Inquiry into the efficiency and administration of hospitals[xx] (the Jamison Inquiry)[280] did not make explicit reference to the relationship between inexperienced junior doctors and patient safety but it did recommend an immediate review of intern training.[280]

Following Queensland's lead, the New South Wales Department of Health established the Resident Medical Staff Advisory Committee in 1984.[281] This committee was concerned about the structure of internship and examined the various training options for internship. The 12 months pre-registration requirement was endorsed but this report, too, was silent on the possible relationship between adverse events and the involvement of junior doctors. This is not surprising because mistakes in the 1980s were discussed mainly in relation to patient complaints, medical negligence actions or disciplinary investigations by medical boards or employing hospitals.

The Victorian Government established the Joint Advisory Committee on Intern Training in 1986.[282] [xxii] As well as strengthening the educational components of the JMO program it formally recognised for the first time the dual components of service provision and education.

While junior doctors had varied experiences there were common themes in all the states' education programs. They all lacked defined goals for internship and had inadequate accreditation with poor participation. The NSW Medical Board said: "...*if medical education is a continuum, then the internship is its*

[xx] The main focus of the study was internship with the work of residents and registrars included where appropriate.
[xxi] The terms of reference suggested by the Jamison Inquiry covered manpower implications of vocational training, actual and required numbers of training posts in each state, funding of postgraduate training programs, and the service commitments of trainees and length of training programs.
[xxii] Recommendation for mandatory pre registration or internship was first made by VMPF in 1969. It was introduced in Victoria in 1972.

most neglected component because neither Colleges nor Universities are responsible for interns." [282]

The main concerns of these various state committees were hours-of-work. Many clinicians expressed reservations about reduced hours which, while beneficial for reducing intern fatigue, were also thought to be detrimental to the intern gaining experience. It was felt that interns needed to be present when important management decisions were made. In their view learning involved the interns working a minimum 40 hour week, the average being 50 hours per week. The Victorian report indicated that an average 70 hours per week was necessary to obtain appropriate clinical experience. [282]

Focus on the role and education of interns culminated in a national meeting on medical education and medical workforce in 1986. [283] Eleven recommendations came from this workshop concerning supervision, continuity of learning, quality control, more teacher responsibility for content of education, role for universities, systems for detecting stressed interns, and need for broad experience. But interns and residents might be stressed for many reasons, not just hours of work. The role mistakes played in relation to stress, work-based problems, quality of learning, and inadequate educational content was not considered.

The relationship between the training of doctors and the delivery and financing of medical care was acknowledged in the 1988 report Australian Medical Education and Workforce into the 21st Century.(The Doherty Inquiry) [283] [xxiii] Its first term of reference concerned the adequacy of the internship year for producing medical graduates with the appropriate skills and competencies to meet national health care needs. Over 400 submissions were received from the community, including the employers of medical graduates who were critical of the clinical experience and practical skills of medical graduates. [283]
The Sir Charles Gairdner Hospital (Western Australia) submitted:

'Many interns are painfully aware of their inadequacies in this area. Internship is often a stressful experience for this reason, and the ineptitude of interns probably contributes to problems of infection control - interns aseptic technique often leaves a lot to be desired. Interns comment that their acquisition of practical skills is too random, and depends too much

[xxiii] The first recommendation of the Doherty Report was:- 'The Commonwealth Government recognise the close relationship between, on the one hand, how medical care is delivered and financed, and, on the other, how medical practitioners are trained (medical education) and their numbers and distribution (medical workforce)'

on their own initiative as medical students. This is satisfactory for those with initiative, but unsatisfactory for the patients of those without. It is noted that both registrars and senior nursing staff who once used to assist interns in acquiring practical skills, are now often so busy that they are unable to assist when requested. This is not due to increasing numbers of patients, or to any change in the health care scheme, but to technology creep which means that the same number of inpatients in the 1980s generates considerably more work (eg serum theophylline assays, antibiotic assays, ultrasound examinations, etc.) than they would have in the 1960s (when the number of test and treatment options available was comparatively limited). Workloads have changed, so that interns are now tending to learn by experience and experimentation as well as by guidance. This is not a matter of choice; it is a matter of necessity'.[283]

While many of the reports are silent on the relationship between safety of patients and junior doctor inexperience, the employing hospitals were vocal about the position of the junior medical workforce. Submissions to the inquiry confirmed the importance of the internship year for the acquisition of new knowledge, skills and attitudes but the effectiveness of these programs varied. Broad-ranging criticisms of the intern year covered: - lack of appropriate role models in community medicine; case mix of the teaching hospitals; increasing financial and bed constraints. The Australian Postgraduate Medical Foundation [283] also identified deficiencies in policies and administration (goals, preparation supervision, assessment and counselling); implementation (appointment and rotations, clinical experience); and educational programming and vocational guidance.

One of the few submissions to mention the intern year in the context of patient safety was from the Australian College for Emergency Medicine:

"At present interns are required to treat many conditions with which they are unfamiliar, often with inadequate supervision or support, and the A&E term can be very stressful. Errors of judgement are frequent with consequent delays in diagnosis [xxiv] and management of acute conditions".[283]

The Australian Geriatrics Society in its submission to the Doherty Inquiry pointed out that major change had occurred in the latter part of the 20th century but the legacy of the historically based tradition of medical education within acute hospitals remained.[283] Their list of problems included emphasis on curative medicine at the expense of preventative medicine; separation of physical from mental illness; continued focus on high technology medicine in the acute care setting; lack of community involvement and continued

---

[xxiv] When I was the Director of the NSW Complaints Unit I investigated a number of cases concerning errors of diagnoses in the emergency department by interns. In 1988 one case concerning a misdiagnosis of a child who presented to the ED with a history of polycystic kidneys migraine and vomiting resulted in death of the child. The investigation highlighted the use of inexperienced staff in clinical settings. Hospital staffing arrangements in all NSW hospitals changed as a result of this tragic case. (see Department of Health ,Complaints Unit Annual Report 1989)

misapplication of high technology medicine to patients with chronic, disabling or irreversible disease.

A dim picture was painted of the intern year by the Student Initiative in Community Health (SICH):

'Interns spend the majority of their time in a service role, most of it working alone, with little supervision. We are particularly concerned at the lack of guidance given in the appropriate use of diagnostic services which are frequently ordered by the intern. In addition interns are inadequately prepared for their role as "information providers" and patient advocate. Many interns have difficulty working as part of a team and often feel unable to seek help from other staff members due to the hierarchy still existent in hospitals. .....concern must be raised as to the long hours interns are expected to work. Regardless of the planned roster most interns work more than their set hours. All interns report working full days after nights without sleep. This must be to the detriment of the total care of patients and efficiency in the hospital'.[283]

Reduction of hours spearheaded the Australian Medical Association (AMA) campaign for improved working conditions for junior doctors. A 1995 report by the AMA laid the foundations for the Safe Hours national campaign,[xxv] culminating in the AMA *National Code of Practice – Hours of work, shiftwork and rostering for hospital doctors* (1999). [284] [285]

The main AMA industrial agenda was the safety and welfare of doctors. Indirectly patients benefit if their care providers are alert and not affected by fatigue. The AMA code, though, does not refer to the relationship between fatigue of doctors and patient safety.

A subsequent AMA project, the *Work Life Flexibility Project*, [286] which canvassed stakeholder[xxvi] views on junior doctors and their work identified better education and training for improving working conditions for junior doctors. The report repeated the finding of many previous inquiries that interns are ill-prepared for their clinical years with many post graduate year 1 and year 2 doctors suffering 'unnecessary stress'. [xxvii] [286] The relationship between working conditions and adverse events was raised in the context of clinical handovers[xxviii] when it noted that handover could be improved by introducing clinical guidelines.

[xxv] The strategy for the safe hours campaign was approved by the AMA Federal Council in March 1996.
[xxvi] Focus groups were held with the following stakeholder groups:- health professionals, health professional associations, Colleges, governments, consumers, hospital administrators, health services and facilities. (For a full list see Attachment B of the report.workplace@ama.com.au)
[xxvii] Junior doctors were concerned that flexible training and work opportunities be seen as legitimate options and not seen as a lack of commitment to medicine.
[xxviii] The term handover refers to the transfer of information about a patient and their condition between health workers.

Handovers in medicine are ill defined and the literature[287-290] is only now addressing the need for improved handovers in the context of continuity of patient care and patient safety. The identification of particular activities that may expose patients to more risk is a change from traditional methods used to manage junior doctor problems. Instead of focusing on individual junior doctors (work harder, be more attentive and better educated) the focus has moved to their work environment. This refocus from the personal to the system is a step in the right direction. Because my study investigates the underlying factors involved in junior doctors' mistakes, if handovers are a problem then this will become evident when junior doctors select it as a contributing factor. This will take awareness of 'handover as a problem' one step further. Finding out whether handovers, communication and timely availability of consultant and registrar advice are identified by interns and residents as factors in their mistakes will expand our knowledge of handovers as precursors for errors.

The need for better training and education for interns and residents was nationally recognised when the Australian Medical Council (AMC) published national guidelines for interns training and assessment in 1996.[291] These were updated in 2002 by the Confederation of Postgraduate Medical Education Councils.[133] The update covers broad and emerging topic areas[xxix] associated with the dual role of interns and residents as employees and trainees. The most recent AMC guidelines link the potential for mistakes with fatigue and long shifts but do not make the link between mistakes and poor supervision. At the time of writing the Postgraduate Medical Council of NSW was developing a core curriculum [xxx] for interns and residents (PGY1/PGY2).

One of the first Australian reports to make a direct link between safety of patients and the employment of junior doctors in public hospitals was the Inquiry into Obstetric and Gynaecological Services at King Edward Memorial Hospital (Western Australia) 1990-2000.[292] Inadequate supervision of junior medical staff by consultants was identified as a serious problem facing the

---

[xxix] Topic areas include roles and responsibilities of parties involved in medical education, educational and professional development (aims, objectives of first two years, use of diagnostic and consultant services, personal and professional development), skills acquisition, program organisation, resources, supervision, and medical ethics.
[xxx] I am a member of this committee and identifying core competencies and developing a curriculum to match the competencies is a high priority. Work began in February 2003.

hospital. While the Inquiry found that unsupervised junior doctors [xxxi] had major responsibility for assessment and providing care in many complex clinical situations,[xxxii] it also recognised that residents did not have the necessary knowledge and experience to manage complex cases. The analysis showed that errors occurred in 47 per cent of high-risk obstetric cases. More than half the errors were very serious, with failure to recognise a serious and unstable condition and inappropriate omission (failure to do something that should have been done) being the two most common mistakes made by junior medical staff.[292] Junior doctors were also associated with the highest occurrence of clinical errors. Resident doctors made 76 per cent of the total errors associated with high-risk cases and registrars made 65 per cent of the total number of errors. The problem of poor supervision at the hospital had been earlier acknowledged by senior clinicians in 1999 who wrote:

'Low morale at the hospital stems from years of lack of supervision/teaching. Junior staff feel unsupported and over criticised...Residents have been left to their own devices and there is simply little or no supervision for junior registrars.' [292]

The Inquiry identified additional cultural problems such as the reliance on junior doctors to know when supervision was required and reluctance by junior doctors to seek assistance from senior clinicians. It also found systemic management, accountability and organisational problems. These findings support the need for further research. Working backwards from a mistake and analysing it from a number of perspectives will help to isolate with more accuracy those areas or activities that require further examination.

The final Report of the King Edward Inquiry devoted a chapter to education and training of junior doctors and recommended improved clinical training of junior medical staff, skilled clinical teachers, quarantined learning, compulsory attendances of residents at educational meetings and regular performance review. The report also recommended the Western Australian Postgraduate Medical Council actively develop and evaluate a post graduate medical program for residents.

[xxxi] Residents were the most junior doctors employed who were required to have completed their internship.
[xxxii] Secondary analysis of the clinical file review of 372 high-risk complex cases showed that junior medical officers (levels 1- 4 registrars) provided most of the care at the crucial times.(clinical assessment, decision-making or intervention)

To date there have been no obvious demands by governments or professional organisations for state post graduate medical councils to either not allocate or remove junior doctors from working in hospitals failing to meet minimum standards of training and supervision. Even though a hospital is required to be accredited before junior doctors can be allocated to it, there is great reluctance to stop or withdraw doctors from working even when there is evidence of inadequate support, supervision and/or bad conditions. This tension between service provision and quality of the training remains unresolved despite years of comment from earlier inquiries.

Because the relationship between junior medical staff and mistakes is under-researched, there is little information available to help post graduate councils better understand the environment in which interns and residents work. Detailed information about *Intern and Resident factors* (personal and professional factors) *Patient factors* (complexity and severity of the patient's illness, age, gender and language) and *System factors* (type of training, level of responsibility, supervision, scheduling of work and unit cultures) will help identify new areas for curriculum development but also provide a patient centred approach for training and education.

5.2   North America

Many reports on training and education of medical students and doctors identify the Flexner report[293] as a major influence on modern medical training in the United States and Canada. While Flexner was concerned mainly with undergraduate medical education, his reforms concerning the basic sciences have impacted on the education of junior doctors generally. His reform agenda culminated in the 1950s with the implementation of a nationwide system of undergraduate and graduate medical education (based on scientific principles, research and supervised clinical practice) which became standard in US hospitals.[294]

But by mid 1960 specialisation had caused graduate medical education to become fragmented and diffused with little continuity between undergraduate education and vocational training. Consequently The Citizen's Commission on Graduate Medical Education[295] (Millis Report) recommended that internship

be abandoned as a free standing entity and be integrated into residency (vocational training programmes).[xxxiii] However the folly of this was not recognised until1982 when the American Medical Association recommended the re-introduction of a general year of training.

The management of adverse events[xxxiv] is a key challenge facing educators of junior doctors today. Linking design and delivery of residency programs to the core competencies expected of residents is pivotal. The development of core curriculum by the US Accreditation Council for Graduate Medical Education (ACGME)[296] is similar to that being developed in Australia and includes topic areas of ethics, medico-legal issues, communication skills, evidence based medicine and procedural skills. The ACGME requires residents, by the time they have completed training, to be proficient in patient care, clinical science, practice based learning and improvement, interpersonal skills and communication, professionalism, and systems based practice.[296]

The Canadians similarly identified generic core competencies irrespective of the area of specialisation intended by a trainee. [297]

5.3   The United Kingdom and Ireland

Two reports[272 298] published in the 1940s influenced the early development of supervised clinical training in the UK, but it was not until 1953 that compulsory postgraduate training was introduced in Britain. The Goodenough Report (1944) examined several options for a supervised year in clinical practice but finally decided that entry into independent medical practice should be preceded by a compulsory period of approved clinical practice under supervision.[272 xxxv] The General Medical Council agreed in 1946 and amended the Medical Act prohibiting registration until the satisfactory completion of 12 months supervised practice in an approved hospital.[298]

[xxxiii] The Millis Report also said that the focus should not be on producing more specialties but on integrating medical education and practice. The availability of applied technology and the rapid growth in knowledge were cited in the report as factors in the development of specialisations but the report also identified that specialisation had the potential for increased fragmentation in the delivery of health care for the community.
[xxxiv] See Table 1.1 in Chapter One setting out the adverse event rates for different countries.
[xxxv] The recommendation was "every medical student after he has passed his final examinations and before he is admitted to the Medical Register and allowed to take up independent practice shall be required to serve as junior house-officer for a period of 12 month in one or more approved hospitals."

The British Medical Association (BMA) report[298][xxxvi] on the supervised year emphasised that successful internship is highly dependent on the nature of the appointment and the duties assigned interns. Three internship models were canvassed in the BMA report but none were recommended. The first model called the "rotating" internship, involved an intern spending a portion of the year doing medicine, surgery and midwifery with additional periods spent in paediatrics, dermatology or ophthalmology. This model fell short because of the short time spent in each subject, leaving interns with only superficial knowledge.[299] The second model, a "straight" service internship, involved interns remaining in the one area and its subdivisions. This model failed to expose the interns to a sufficient range of experiences. The third model, "mixed" internship, required interns to work in two or three clinical divisions with six months minimum in one of them. The Goodenough Report adopted this last model recommending that interns spend six months in general medicine and six months in general surgery.

The BMA Committee objected to all three models on the grounds they were based on grouping of diseases or methods for treatment and that "they adhere to the compartmental system of medical practice".[298] They also "fail to constitute for the intern an introduction to the intensive and integrated study of a sick person."[298] The Committee argued that if internship is a consolidation of training then it should mirror the medical curriculum and be a continuation of learning for training in a speciality or for general practice and not be regarded as preparation for immediate independent practice.

The BMA proposed a new model based on interns treating 'sick' patients rather than a 'medical' or 'surgical' case. While the BMA 'patient-centred' approach was not accepted, it is worth recounting because it is based on a continuum of care model and has many favourable attributes for patients and interns. In this model the interns are assigned to both in-patients and out-patients on their admission and remain intimately involved with the care of the patients until discharged. The interns take part in all consultations, record the results, order tests, observe and assist with procedures. They are expected to

---

[xxxvi] The BMA were influential in instigating the intern year and first put the idea to the authorities in 1934.

find out about both social background and domestic circumstances and learn about prevention.

The Committee predicted that such a model would improve the quality of patient care because of the presence of interns and their educational requirements. The BMA warned hospitals against allowing internship to degenerate into "*a device for securing cheap resident service for hospitals or for staff.*"[298] This model is one of the first to explicitly recognise the importance of patient safety by designing a training program around the patients' journeys through the hospital. Even though half a century has passed the BMA model for junior doctor training is a landmark for its attention to the work environment of junior doctors.

The UK Royal Commission on Medical Education [273] (1965-8) confirmed the importance of general post graduate training irrespective of any intended streaming into the different specialties. The Royal Commission noted the great dissatisfaction with many of the training posts for junior doctors, including inadequate supervision and the limited time available for study and reflection.[273]

The 1990s saw a shift in focus from formal JMO training programs to examining the work environment and its impact on the health and welfare of junior doctors. A 1997 report [22] by the UK Department of Health (NHS Workforce), cognisant of the growing literature on the role the environment plays in errors, focused on working conditions and impact on the health and welfare of young doctors rather than on their training and educational needs. Work overload[xxxvii], difficulties with combining personal life with a medical career, and angry patients were found to be the most frequent distressing aspects of junior doctors' work.[22]

Since 1997 The General Medical Council[xxxviii] (GMC) has been reforming training and education for medical practitioners in the United Kingdom. New training requirements were outlined in the *New Doctor: Recommendations on General Clinical Training.* [77] In 2002 the GMC followed up with the publication

---

[xxxvii] The respondents reported many psychosomatic symptoms associated with long hours of work but after implementation of the new working conditions for interns (the new deal) these disappeared but doctors were still stressed by the number of menial tasks they had to perform.

[xxxviii] The GMC is the body responsible for defining standards for the pre-registration house officer (PRHO) year and also for ensuring standards are met.

of a report card outlining activity since the release of the clinical training guidelines.[300] Eight key themes underpin junior doctor training. The dual roles of service provision and learning are recognised with the guidelines stipulating that the educational needs of junior doctors are to receive priority. Other key themes include appropriate clinical and educational supervision and attention to junior doctor welfare.

A 2001 report on working hours of junior doctors (NCHD)[xxxix] in Ireland[301] recognised the global trend towards reduced working hours and recommended that junior doctors reduce hours gradually with a limit of 48 hours per week in place by 2010.[xl] The report recommended an increase in the number of consultants to provide a consultant-led service rather than increase the junior doctor ranks. The committee examining hours of work also found that junior doctors were spending about four per cent of their time receiving formal training or studying mainly because consultants had little time to teach and junior doctors were too busy to attend any teaching that was provided. The report concluded that consultants would provide better quality of service with greater continuity of care by being on duty and providing 24-hours-a-day service backed up by NCHD staff working appropriate shift patterns.[149 301] The costs associated with a consultant led service and the world wide shortage of doctors may make this recommendation unworkable.

6   Non fiction accounts of training and education by medical students and junior doctors

Three books have been written by medical students[302-304] and three by junior doctors[305-307] about their early hospital experience. All were published in the 1980s or before with most being still in print with updated prefaces. Themes include hospital hierarchies, the medical culture, professional socialisation, personal responses to suffering and dying and narratives of patient care and treatment. The classic sociological text *Boys in White*[304] in its 6th printing (one of the few with an index) devotes a chapter to student perspectives on internship (in 1955). The authors interviewed 336 students about criteria for

---

[xxxix] In Ireland junior doctors are known as non-consultant hospital doctors (NCHD)
[xl] This is to comply with the European Directive which when adopted into Irish law will require the maximum average working hours for NCHD to be 48 hours per week by 2010.

choosing internships. Eight categories were identified.[xli] Level of responsibility was selected as the most important criterion for 27 per cent of the students followed by teaching (28 per cent) clinical experience (19 per cent) and pay (13 per cent). Students had contact with interns and residents but the most important contact was with residents who were responsible for much of the teaching. Teaching medical students was identified as a significant role for residents along with administration and education.[304]

Discussions about medical mistakes, errors, mishaps or adverse events were not directly canvassed in these books. When they were raised it was mainly in relation to the behaviour or conduct of clinicians and students and not as the main focus, for example; a case where a student who made a diagnosis that his supervisors and other staff missed and the favourable impact on his reputation.[304] In contrast, books written by interns tend to talk directly about medical mistakes. In Doctor X[306] the author explains that the high number of deaths and catastrophes recorded at his hospital are not indicative of any poor standard of care because the cases he selected are the ones he remembered. But he does make generalisations about the hospital organisation and hierarchy and their links with medical mistakes. For example he refers to *'disasters that occur on nights and weekends, as anyone in medicine well knows.'*[306] Marion in his book *Intern Blues* published over 20 years later summarised his internship, *"I somehow survived that year in spite of the fact that I and other interns in my group received negligible guidance from the senior people in the program. I was overworked, overtired, lonely and insecure, often depressed, and conflicted in my own responsibilities, whether admitting an infant with a dangerously high fever or coping with the psychological and physical stresses of dealing with AIDS patients."*[305]

Fear of mistakes from overtiredness was a constant theme in Manion's book particularly during internship. *'I was chronically overtired... and so nervous and scared I was going to accidentally screw up and kill someone, I had trouble sleeping even during the nights I wasn't on call.'*[305]

[xli] The criteria were responsibility, clinical experience, teaching, pay, travel, facilities and working

7 Conclusion

Research about the role and functions of interns and residents in maintaining a safe environment for patients, the impact of the hospital environment on both patients and junior doctors and the organisation of work will increasingly become the foci for policy makers and health service managers. But the experience of junior medical staff and mistakes is still not receiving the attention it deserves. The themes in this literature review (inadequate preparedness for internship, inadequate training and education of interns and residents, poor work routines, sleep deprivation, excessive hours, stress, complex organisational issues, outdated hierarchical structures and unsafe practices) provide overwhelming support for the proposition that junior doctors are vulnerable to errors.

The literature shows that we know very little about how, when and where junior staff experience mistakes. Greater scrutiny of their experience is required so that we might more accurately identify those areas that present the greatest risks to patients.

---

conditions, professional contacts miscellaneous.

Endnotes for Chapter Three

1. Eisenberg John M. What Does Evidence Mean? Can the Law and Medicine Be Reconciled? *Journal of Health Politics, Policy and Law* 2001;26(2):369-81.
2. Eisenberg John M. What does evidence mean? Can the law and medicine be reconciled? *Journal of Health Politics, Policy and Law;*26(2):369-81.
3. Steel K, Gertman PM, Crescenzi C, Anderson J. Iatrogenic illness on a general medical practice service at a university hospital. *New England Journal of Medicine* 1981;304:638-42.
4. Baldwin PJ, Dodd M, Wrate RM. Junior doctors making mistakes. *The Lancet* 1998;351:804-5.
5. Anderson ID, Woodford M, de Dombal FT, et al. Retrospective study of 1000 deaths from injury in England and Wales. *British Medical Journal* 1988;296:1305-8.
6. Guly HR. Diagnostic errors in an accident and emergency department. *Emergency Medicine Journal* 2001;18:263-79.
7. Pearson A, Rolfe I, Smith T. Factors influencing prescribing: an intern's perspective. *Medical Education* 2002;36:781-7.
8. Wu AW, Folkman S, McPhee SJ, Lo B. Do house officers learn from their mistakes? *Journal of the American Medical Association* 1991;265(16):2089-94.
9. Hilfiker D. Facing our mistakes. *New England Journal of Medicine* 1984;310:118-22.
10. Calman KC Donaldson M. The pre-registration house officer year: a critical incident study. *Medical Education* 1991;25:51-59.
11. Bates EM. Unhappiness and discontent: A study of junior resident medical officers. *Medical Journal of Australia* 1973;2:606-612.
12. Mizrahi T. The impact of graduate medical socialization on the doctor-patient relationship [PhD]. University of Virginia, 1983.
13. Mizrahi T. Managing medical mistakes: Ideology, insularity and accountability among internist-in-training. *Social Science and Medicine* 1984;19:135-46.
14. Pearson S, Smith AJ, Rolfe RF, Moulds GM. Intern prescribing for common clinical conditions. *Advances in Health Sciences Education* 2000(5):141-50.
15. McLauchlan CA, Jones K, Guly HR. Interpretation of trauma radiographs by junior doctors in accident and emergency departments: a cause for concern? *Journal of Accident and Emergency Medicine* 1997;14:295-8.
16. Volpp KG, Grande D. Residents' suggestions for reducing errors in teaching hospitals. *New England Journal of Medicine* 2003;348:851-5.
17. Thomas E, Studdert D, Brennan T. The reliability of medical record review for estimating adverse event rates. *Annals of Internal Medicine* 2002;136:812-16.
18. Haywood RA, Hofer TP. Estimating hospital deaths due to medical errors: preventability is in the eye of the reviewer. *Journal of the American Medical Association* 2001;286:415-20.
19. O'Neil AC, Petersen LA, Cook E, Francis Bates DW, Lee TH, Brennan TA. Physician reporting compared with medical -record review to identify adverse medical events. *Annals of Internal Medicine* 1993;119(5):370-6.
20. Paget M. *The unity of mistakes: A phenomological interpretation of medical work.* Philadelphia: Temple University Press, 1988.
21. Lesar TS, Briceland LL, Delcoure K, Parmalee JC, Masta-Gornic V, Pohl H. Medication prescribing errors in a teaching hospital. *Journal of the American Medical Association* 1990;263:2329-2334.
22. Baldwin PJ, Dodd M, Wrate RM. *Young doctors: work, health and welfare. A class cohort 1986-1996.* London: Department of Health Research and Development Initiative on Mental Health of the NHS Workforce, 1998.
23. Wu AW. Medical error: the second victim. *British Medical Journal* 2000;320:726-27.
24. Wu AW, Cavanaugh TA, McPhee SJ, et al. To Tell the Truth: ethical and practical issues in disclosing medical mistakes to patients. *Journal of Internal Medicine* 1997;12:770-75.
25. American Medical Association, http://www.ama-assn.org/. Code of Ethics of the AMA, updated June 1994.
26. General Medical Council. *Good Medical Practice.* London: General Medical Council, 1999.

27. Finkelstein D, Wu AW, Holtzman NA, Smith MK. When a physician harms a patient by medical error: ethical, legal and risk management considerations. *Journal of Clinical Ethics* 1997;8:330-5.
28. Herbert PC, Levin VL, Robertson G, 164(4):509-13. Bioethics for clinicians. *Canadian Medical Association Journal* 2001;164(4):509-13.
29. Herbert P, Hoffmaster B, Glass K, Singer P. Bioethics for clinicians: truth telling. *Canadian Medical Association Journal* 1997;156:225-228.
30. Vincent C, Stanhope N, Crowley-Murphy M. Reasons for not reporting adverse incidents: an empirical study. *Journal of Evaluation in Clinical Practice* 1999;5:13-21.
31. Hingorani M, Wong T, Vafidis G. Patients' and doctors' attitudes to amount of information given after unintended injury during treatment: cross-sectional questionnaire survey. *British Medical Journal* 1999;318:640-1.
32. Vincent C, Young M, Phillips A, et al. Why do people sue doctors? *Lancet* 1994;343(1609):13.
33. Hickson GB, Clayton EW, et al. Obstetricians' prior malpractice experience and patients' satisfaction with care. *Journal of the American Medical Association* 1994;272:1583-7.
34. Hickson GB, Clayton EW, Githens PB, Sloan FA. Factors that prompted families to file malpractice claims following perinatal injuries. *Journal of the American Medical Association* 1992;267:1359-63.
35. Huycke L, Huycke M. Characteristics of potential plaintiffs on malpractice. *Annals of Internal Medicine* 1994;120(9):792-8.
36. Levinson W, Roter D, Mullooly JP, Dull VT, Frankel RM. Physician-patient communication: The relationship with malpractice claims among primary care physicians and surgeons. *Journal of the American Medical Association* 1997;277(7):553-9.
37. Baylis F. Errors in medicine: Nurturing truthfulness. *The Journal of Clinical Ethics* 1997;8(4):336-41.
38. Novack DH, Detering BJ, Arnold R, Forrow L, Ladinsky M, Pezzullo JC. Physicians' attitudes towards using deception to resolve ethical problems. *Journal of the American Medical Association* 1989;26(20):2980-6.
39. Sweet MP, Bernat JL. A Study of the ethical duty of physicians to disclose errors. *Journal of Clinical Ethics* 1997;8940:341-48.
40. Green M, Farber NJ, Ubel PA, Mauger DT, Aboff BM, Sosman JM, et al. Lying to each other: When internal medicine residents use deception with their colleagues. *Archives of Internal Medicine* 2000;160:2317-23.
41. Kapp M. Legal anxieties and medical mistakes. *Journal of General Internal Medicine* 1997;12:787-88.
42. Federated Council for Internal Medicine, Task force on the internal medicine residency curriculum. Report on Graduate Education in Internal Medicine: A Resource Guide to Curriculum Development. USA: Versa Press, 1997.
43. Council on Graduate Medical Education. Preparing learners for Practice in a managed care environment: Washington Health Resources and Services Administration, 1997.
44. Royal College of Physicians and Surgeons of Canada. CanMeds 2000 Project: Skills for the new Millennium: Report of the Societal Needs Working Group,. *Canadian Medical Education for Directions for Specialists Project*, 1996.
45. Pew Health Professionals Commission. Critical Challenges revitalizing the health professions for the twenty-first century.Third Report. San Francisco: Pew Commission, 1995.
46. Hannon FB. A national medical education needs assessment of interns and the development of an intern education and training programme. *Medical Education* 2000;34:286.
47. Allen I. *Doctors and Their Careers*. London: Policy Studies Institute, 1988.
48. Firth-Cozens J. Emotional distress in junior house officers. *British Medical Journal* 1987;295:553-6.
49. Reeve H, Bowman A. Hospital training for general practice:views of trainees in the north-western region. *British Medical Journal* 1989;302:830-2.
50. Charlton BG. Service implications in the Calman Report. *British Medical Journal* 1993;307:338-339.
51. Wilson DH. Education and training of the pre-registration house officers: The consultants' viewpoint. *British Medical Journal* 1993;306:194-6.
52. Lowry S. Medical education:The pre-registration year. *British Medical Journal* 1993;306:196-98.

53. Dally P EC, Pitney WR,. Assessment of an Australian medical internship. *Medical Education* 1984;18:84-92.
54. Calman K. The profession of medicine. *British Medical Journal* 1994;309:1140-1143.
55. Cox K. Planning bedside teaching -1 Overview. *Medical Journal of Australia* 1993;158:280-282.
56. Albanese MA and Mitchell S. Problem-based learning:A review of the literature on its outcomes and implementation issues. *Academic Medicine* 1993;68:52-81.
57. Committee of Inquiry into Medical Education and Medical Workforce. Australian medical education and workforce into the 21st century. Canberra, Australia: Australian Government Publishing Service, 1988.
58. Lowry S. Teaching the teachers. *British Medical Journal* 1993;306:127-30.
59. Paice E, Leaver P. Improving the training of SHOs: GMC doesn't tackle the real difficulty: balancing service and teaching. *British Medical Journal* 1999;318:1022-3.
60. Reynolds PR. Reaffirming professionalism through the education community. *Annals of Internal Medicine* 1994;120:609-14.
61. Peterdorf RG. The evolution of departments of medicine. *New England Journal of Medicine* 1980;303:688-96.
62. Williams C, Cantillon P, Cochrane M. The clinical and educational experiences of pre-registration house officers in general practice. *Medical Education* 2001;35:774-781.
63. Moorhead JC, Adams BE, Aghababian RV, Linder JE, Ling LJ, Niemann JT, et al. An assessment of emergency medicine residency graduates' perceptions of the adequacy of their medical training. *Annals of Emergency Medicine* 1989;18:701-4.
64. Williams JG, Cheung WY. Induction training career counselling and performance review:views of junior medical staff. *Postgraduate Medical Education Journal* 1998;74:411-15.
65. Marks M, Baskin MN, Lovejoy FH, Halfer JP. Intern learning and education in a short stay unit: a qualitative study. *Archives of Pediatrics and Adolescent Medicine* 1997;151:193-9.
66. Wigton RS, Steinman WC. Procedural skills: Training in the internal medicine residency. *Journal of Medical Education* 1984;59:392-400.
67. D'Alessandro DM. Documenting the educational content of the morning report. *Archives of Pediatrics and Adolescent Medicine* 1997;151:1151-1156.
68. De Quadro JR, Rainey C. Is residency training really harmful? *Journal of the American Medical Association* 1997; 278:22-4.
69. Hurley PA, Paterson-Brown S. Senior House Officer training: some myths exposed. *Journal of Royal College of Surgeons of Edinburgh* 1999;44:324-327.
70. Merenstein JH, Preisach P. Orienting interns to being second year residents. *Family Medicine* 2002;34:101-3.
71. Wright SM, Caresse JA. Which values do attending physicians try to pass onto house officers? *Medical Education* 2001;35:941-5.
72. Tasker RC. Training and dealing with errors or mistakes in medical practice procedures. *Archives of Disease in Childhood* 2000;83(2):95-7.
73. Wilson BE. Performance based assessment of internal medical interns: Evaluation of baseline clinical and communication skills. *Academic Medicine* 2002;77:1158.
74. Durbin DR, Giardino AP, Costarino AT. Residents on the transport team: Balancing service and education. *Archives of Pediatrics and Adolescent Medicine* 1996;150(5):529-34.
75. Core Curriculum Working Group. Graduate Medical Education Core Curriculum: Association of American Medical Colleges, 2000.
76. Roche AM, Sanson-Fisher RW, Cockburn J. Training experiences immediately after medical school. *Medical Education* 1997;31:9-16.
77. General Medical Council of the United Kingdom. The New Doctor Recommendations on General Clinical Training. London: General Medical Council (GMC) of the United Kingdom, 1997.
78. De Witt DE, Robins LS, Curtis JR, Burke W. Primary care residency graduates' reported training needs. *Academic Medicine* 2001;76:285.
79. Weingart SN. House officer education and organisational obstacles to quality improvement. *Joint Commission Journal on Quality Improvement* 1996;22:640-6.
80. Chou C LK. Improving residents' interviewing skills by group videotape review. *Academic Medicine* 2002;77:744.
81. Lipkin M, Quill TE, Napodano RJ. The medical interview: A core curriculum for residencies in internal medicine. *Annals of Internal Medicine* 1984;100:277-84.

82. Ury WA, Reznich CB, Weber CM. A needs assessment for a palliative care curriculum. *Journal of Pain and Symptom Management* 2000;20:408-16.
83. Clark PA. What residents are not learning: Observations in an NICU. *Academic Medicine* 2001;76:419-424.
84. Murphy JJ. Current practice and complications of temporary transvenous cardiac pacing. *British Medical Journal* 1996;312:1134.
85. White JA, Anderson P. Learning by internal medicine residents: Differences and similarities by residents and faculty. *Journal of General Internal Medicine* 1995;10:126-32.
86. Bellett PS. How to improve teaching on the hospital wards. *Archives of Pediatric Adolescent Medicine* 1994;148:1023-1028.
87. Rosenblum ND, Nagler J, Lovejoy FH Jr, Hafler JP. The pedegogic characteristics of a clinical conference for senior residents and faculty. *Archives of Pediatric Adolescent Medicine* 1995;149:1023-8.
88. Greenberg LW, Jewett LS. The GPEP Report: A time for change in medical education. *American Journal of Diseases of the Child* 1985;139:1026-7.
89. Wipf JE, Pinsky LE, Burke W. Turning interns into senior residents: preparing residents for their teaching and leadership roles. *Academic Medicine* 1995;70:591-6.
90. Weinholtz D. The socialization of physicians during attending rounds: a study of team learning among medical students. *Qualitative Health Research* 1991;1(2):152-77.
91. Neufeld VR, Maudsley RF, Pickering RJ, Turnbull JM, Weston WW, Brown MG, et al. Educating future physicians for Ontario. *Academic Medicine* 1998;73:1133-48.
92. Gibson DR, Campbell RN. Promoting effective teaching and learning: Hospital consultants identify their needs. *Medical Education* 2000;34:126-30.
93. Hillingsø JG, Parner J, Bulow S, Bardram L. Alterations in the working plan for residents can improve clinical medical training. *Ugeskrit for Laeger* 2001;163:3638-3643.
94. O'Sullivan P, Greene C. Portfolios:possibilities for addressing emergency medical resident competencies. *Academic Emergency Medicine* 2002;9:1305-9.
95. Wenger NS, Shpiner RB. An analysis of morning report: implications for internal medicine education. *Annals of Internal Medicine* 1993;119:395-9.
96. Harris ED. Morning Report. *Annals of Internal Medicine* 1993;119:430-431.
97. Brancati FL. Morning distort. *Journal of the American Medical Association* 1991;266:1627.
98. Hume F and Wilhelm K. Career choice and experience of distress amongst interns:a survey of New South Wales internship 1987-1990. *Australian and New Zealand Journal of Psychiatry* 1993;28:319-327.
99. Rohrich RJ, Persing JA, Phillips LM. Mandating shorter work hours and enhancing patient safety: A new challenge for resident education. *Plastic and Reconstructive Surgery* 2003;111:395-97.
100. Gillard JH, Dent TH, Smyth Pigott PJ, Eaton J. Recent changes in the workload and clinical experience of pre-registration house officers: Experiences over four years in South-West England. *Medical Education* 2000;34:371-3.
101. Abrass CK, Ballweg R, Gilshannon M, Coombs JB. A process for reducing workload and enhancing residents' education at an academic center. *Academic Medicine* 2001;76:798-805.
102. Nestok BR. Accuracy of frozen section diagnoses in a teaching hospital. *Archives of Pathology and Laboratory Medicine* 1987;111:897.
103. Goodfellow PB, Claydon P. Students sitting medical finals: Ready to be house officers? *Journal of the Royal Society of Medicine* 2001;94:516-20.
104. Goldacre MJ, Lambert T, Evans J, Turner G. Preregistration house officers' views on whether their experience at medical school prepared them well for their job: National questionnaire. *British Medical Journal* 2003;326:1011-12.
105. Fox RA, Ingham Clark CL, Scotland AD, Dacre JE. A Study of pre-registration house officers' clinical skills. *Medical Education* 2000;34(12):1007-12.
106. Marel GM, Lyon PM, Barnsley L, Hibbert E, Parise A. Clinical skills in early postgraduate medical trainees: Patterns of acquisition of confidence and experience among junior doctors in a university teaching hospital. *Medical Education* 2000;34:1013-5.
107. Stewart JH, Andrews J, Cartlidge PH. Numbers of deaths to intrapartun asphyxia and timing of birth in all Wales perinatal survey 1993-1995. *British Medical Journal* 1998;316:466-71.
108. Wilkinson TJ, Harris P. The transition out of medical school: A qualitative study of descriptions of borderline trainee interns. *Medical Education* 2002;36:466-71.

109. Moercke AM, Elka B. What are the clinical skills levels of newly graduated physicians? Self-assessment study of an intended curriculum identified by a Delphi process. *Medical Education* 2002;36:472-8.

110. Rolfe IE, Pearson SA, Sanson-Fisher RW, Ringland C, Bayley S, Hart A, et al. Which common clinical conditions should medical students be able to manage by graduation? *Medical Teacher* 2002;24:16-22.

111. Hill J RI, Pearson S,Heathcote A,. Do junior doctors feel that they are prepared for hospital practice? A study of graduates from traditional and non-traditional medical schools. *Medical Education* 2000;32:19-24.

112. Smith GB, Poplett N. Knowledge of aspects of acute care in trainee doctors. *Postgraduate Medical Education Journal* 2002;75:335-9.

113. Cantwell BM, Ramirez AJ. Doctor-patient communication: A study of junior house officers. *Medical Education* 1997;1:17-21.

114. Chen PP, Ma M, Chan S, Oh TE. Incident reporting in acute pain management. *Anaesthesia* 1998;53:730-735.

115. Quan L SR, Kunkel NC, Brownlee CJ,. Evaluation of resuscitation skills in new residents before and after pediatric advanced life support course. *Pediatrics* 2001;108:1359.

116. Williams C, Milton J, Strickland P, Ardagh-Walter N, et al. Impact of medical school teaching on pre registration house officers' confidence in assessing and managing common psychological morbidity:three centre study. *British Medical Journal* 1997;315:917-18.

117. Meuleman JR, Caranasos GJ. Evaluating the interview performance of internal medicine interns. *Academic Medicine* 1989;64:277-9.

118. Jones JM, Sanderson CF, Black NA. Measuring the quality of junior hospital doctors in general practice. *Medical Education* 1992;26:218-27.

119. Magnusson AR, Hedges JR, Harper RJ, Greaves P. First postgraduate year resident clinical time use on three specialty rotations. *Academic Emergency Medicine* 1999;6:939-46.

120. Roy R, Reeves DO, Eric J, Pendarvis BS, RayKimble MD, Faden A. Unrecognized medical emergencies admitted to psychiatric units. *The American Journal of Emergency Medicine,* 2002;18(4):390-3.

121. Baldwin PJ, Newton RW, Buckley G, Roberts MA, Dodd M. Senior house officers in medicine:postal survey of training and work experience. *British Medical Journal* 1997;314:740.

122. Harrison B. Review of Adverse Events Identified by the Quality in Australian Health Care Study Categorised as Failure to Act on Available Information. University of Sydney,Australia, 1999.

123. Kilminster SM, Jolly BC. Effective supervision in clinical practice settings:a literature review. *Medical Education* 2000;34:827-840.

124. Daugherty SR, Baldwin DC, Rowley BD. Learning, satisfaction, and mistreatment during medical Internship: A national survey of working conditions. *Journal of the American Medical Association* 1998;279:1194-9.

125. Reason JT. *Human Error.* New York: Cambridge University Press, 1990.

126. Buck N, Devlin HB, Lunn JN. The Report of a Confidential Enquiry into Perioperative Deaths. London: Nuffield Provincial Hospitals Trust / Kings Fund, 1987.

127. Kemahli S. Clinical teaching and OSCE in pediatrics. *Medical Education Online* 2001;6:10.

128. Cottrell D, Kilminister S, Jolly B, Grant J. What is effective supervision and how does it happen? A critical incident study. *Medical Education* 2002;36(11):1042-9.

129. Goertzen J, Stewart M, Weston W. Effective teaching behaviours of rural family medicine preceptors. *Canadian Medical Association Journal* 1995;153:161-8.

130. Permanent Working Group of European Junior Doctors. Policy Statement on Postgraduate Medical Training - A European Future,Vienna, 1994.

131. General Medical Council of the United Kingdom. The New Doctor Supplement on general clinical teaching in general practice. London: General Medical Council (GMC) of the United Kingdom, 1998.

132. Challis M, Williams J, Batstone G. Supporting pre-registration house officers: The needs of educational supervisors of the first phase of postgraduate medical education. *Medical Education* 1998;32:177-180.

133. Confederation of Postgraduate Medical Education Councils. *National Training Assessment and Guidelines for Junior Doctors*: Australian Government Department of Health and Ageing, 2003.

134. Frisch SR. Increasing the effectiveness of clinical supervision. *Canadian Medical Association Journal* 1984;131:569-72.
135. Parrino TA. The principles and practice of the morning report. *Journal of the American Medical Association* 1986;256:730-3.
136. Oswald N. A house officer in general practice: A different experience. *Medical Education* 1989;23:322-7.
137. Knudson MP. A service chief model for general pediatric inpatient care and residency training. *Pediatrics* 1992;89:601-607.
138. Paice E, Moss F, West G, Grant J. Association of use of a log book and experience as a pre-registration house officer: interview survey. *British Medical Journal* 1997;314:213.
139. Bilodeau A. Improving the supervision of physician-patient relations. Utilization of system's methodology. *Canadian Family Physician* 1997;43:1780-1783.
140. New York Supreme Court New York County. Report of the Fourth Grand jury for the April/May term of 1986 concerning the care and treatment of a patient and the supervision of interns and junior residents at a hospital in New York County. Albany NY New York County. 1986 December 31.
141. Spritz N. Oversight of physicians' conduct by state licensing agencies. Lessons from New York's Libby Zion case. *Annals of Internal Medicine* 1991;115:219-22.
142. Vincent CA. Research into medical accidents: a case of negligence? *British Medical Journal* 1989;299:1150-3.
143. Touquet R, Driscoll P, Nicholson D. Teaching in accident and emergency medicine:10 commandments of accident and emergency radiology. *British Medical Journal* 1995;310:642-5.
144. Holliman CJ, Wuerz RC, Kimak MJ, Burkhart KK, Donovan JW, Rudnick HL, et al. Attending supervision of non-emergency medicine residents in a university hospital ED. *American Journal of Emergency Medicine* 1995;13:259-261.
145. Sacchetti A, Carraccio C, Harris RH. Resident management of emergency department patients: is closer attending supervision needed? *Annals of Emergency Medicine* 1992;21:749-52.
146. Gennis VM, Gennis MA. Supervision in the outpatient clinic: Effects on teaching and patient care. *Journal of General Internal Medicine* 1993;8:378-80.
147. Oddone E, Guarisco S, Simel D. Comparison of house staffs' estimates of their workday activities with results of a random work-sampling study. *Academic Medicine* 1993;68:859-61.
148. Sox CM, Burstin HR, Orav EJ, Conn A, Setnik G, Rucker DW, et al. The effect of supervision of residents on quality of care in five university affiliated emergency departments. *Academic Medicine* 1998;73:776-82.
149. Aarseth O, Falck G, Brattebo G. Do the interns receive the supervision they are supposed to? *Tidsskrift vor Den Norske Laegeforening* 1995;115:2087-90.
150. Wise A RA, Craig M,. Preparing proper doctors: An evaluation of the intern training in Queensland hospitals: University of Queensland, Queensland, Australia, 1990.
151. Nerenz D, Rosman H, Newcomb C. The on-call experience of interns in internal medicine. *Archives of Internal Medicine* 1990;150:2294-7.
152. Wigton RS. Training internists in procedural skills. *Annals of Internal Medicine* 1992;116:1091-3.
153. Falck G, Brattebo G, Aarseth O. Is the training of interns in practical clinical skills adequate? *Tidsskrift vor Den Norske Laegeforening* 1995;115:2091-5.
154. Reynard K, Gosnold JK, Grout P. Assessment initiative in accident and emergency. *British Medical Journal* 1993;306:1273-4.
155. Winkler RL, Scott WE, Copare FJ. Are two (inexperienced) heads better than one (experienced) head? Averaging house officers' prognostic judgements for critically ill patients. *Archives of Internal Medicine* 1990;150:1874-8.
156. Friedman RC, Kornfeld DS, Bigger TJ. Psychological problems associated with sleep deprivation in interns. *Journal of Medical Education* 1973;48:436-41.
157. Daugherty SR BD, Rowley BD,. Learning satisfaction and mistreatment during medical internship:a national survey of working conditions. *Journal of the American Medical Association* 1998;279:1194-1199.
158. Gaba DM. Human error in dynamic medical domains. In: Bogner MS, editor. *Human error in medicine*. Hillsdale NJ: Lawrence Erlbaum Associates, 1994:197-224.
159. Howard SK, Rosekind MR, Katz JD, Berry AJ. Fatigue in anesthesia:implications and strategies for patient and provider safety. *Anesthesiology* 2002;97:1281-1294.

160. Pickersgill T. The European working time directive for doctors in training:we will need more doctors and better organisation to comply with the law. *British Medical Journal* 2001;323:1266.

161. European Court Reports. Judgement of 12 November 1996:Case C-84/94 UK v Council of the EC. 1996:1-5755.

162. Wiliamson AM, Feyer AM. Moderate sleep deprivation produces impairments in cognitive and motor performance equivalent to legally prescribed levels of alcohol intoxication. *Occupational Environmental Medicine* 2000;57:649-55.

163. Feyer AM. Fatigue:time to recognise and deal with an old problem. *British Medical Journal* 2001;322:908-9.

164. Dawson D, Reid K. Fatigue, alcohol and performance impairment. *Nature* 1997;388:235.

165. Taffinder NJ, McManus IC, Gul Y, Russell RC, Darzi A. Effect of sleep deprivation on surgeons' dexterity on laparoscopy simulator. *The Lancet* 1998;352:1191.

166. Poulton E, Hunt G, et al. The performance of junior hospital doctors following reduced sleep and long hours of work. *Journal of Ergonomics* 1981;21:279.

167. Cashman JN, Jones H, Skelly AM. Lack of sleep in junior medical doctors. *British Medical Journal* 1989;298:381.

168. Schwartz JB, Dubrow TJ, et al. Guidelines for surgical residents' working hours:intent vs reality. *Archives of Surgery* 1992;127:778-82.

169. Leslie PJ, Williams JA, McKenna C, Smith G, Heading RC. Hours,volume and type of work of pre-registration house officers. *British Medical Journal* 1990;300:1038-41.

170. Van Dongen HPA, Dinges DF. Circadian rhythms in fatigue,alertness and performance. In: Kryger MH, Roth T, Dement WC, editors. *Principles and Practice of Sleep Medicine*. 3rd ed. Philadelphia: WB Saunders, 2000:391-9.

171. Dinges DF, Pack F, Williams K, Gillen KA, Powell JW, Ott GE, et al. Cumulative sleepiness,mood disturbance and psychomotor vigilance performance decrements during a week of sleep restricted to 4-5 hours per night. *Sleep* 1997;20(4):267.

172. Weinger MC, Ancoli-Israel S. Sleep deprivation and clinical performance. *Journal of the American Medical Association* 2002;287:955-7.

173. Rollinson DC, Ratlev NK, Moss M, Killiany R, Sassower KC, Auerbach S, et al. The effects of consective night shifts on neurophysiological performance of interns in the emergency department:a pilot study. *Annals of Emergency Medicine* 2003;41:400-6.

174. Harrington J. Shift work and health:a critical review of the literature. Report to the Medical Advisory Service UK Health and Safety Executive: HM Stationary Office London, 1978.

175. Asken MJ, Rahem DC. Resident performance and sleep deprivation: A review. *Journal of Medical Education* 1983;58:382-8.

176. Samkoff JS JC. A review of studies concerning effects of sleep deprivation and fatigue on residents' performance. *Academic Medicine* 1991;66:687-693.

177. Leung L, Becker CE. Sleep deprivation and house staff performance:an update 1984-1991. *Journal of Occupational Medicine* 1992;34:1153-60.

178. Rosa RR. Extended work shifts and excessive fatigue. *Journal of Sleep Research* 1995;4:51-6.

179. Leonard C, Fanning N, Attwood J, Buckley M. The effect of fatigue,sleep deprivation and onerous working hours on the physical and mental well being of pre-registration house officers. *Irish Journal of Medical Sciences* 1998;176:22-5.

180. Orton DI, Gruzelier JH. Adverse changes in mood and cognitive performance of house officers after night duty. *British Medical Journal* 1989;298:21-3.

181. Hart RP, Buchsbaum DG, et al. Effect of sleep deprivation on first-year residents' response times,memory and mood. *Journal of Medical Education* 1987;52:940-2.

182. Berkoff K, Rusin W. Pediatric house staff's psychological response to call duty. *Journal of Developmental and Behavioural Pediatrics* 1991;12:6-10.

183. Deary IJ, Tait R. Effects of sleep disruption on cognitive performance and mood in medical house officers. *British Medical Journal* 1987;295:1513-16.

184. Nelson C, Dell'Angela K, Jellish WS, Brown IE, Skaredoff M. Residents' performance before and after night call as evaluated by an indicator of creative thought. *Journal of the American Osteopathy Association* 1995;95:600-3.

185. Robbins J, Gottlieb F. Sleep deprivation and cognitive testing in internal medicine house staff. *Western Journal of Medicine* 1990;12:82-6.

186. Jha AK, Duncan BW, Bates DW. Fatigue,sleepiness and medical errors. In: Shojania K, Duncan BW, McDonald KM, Wachter RM, editors. *Evidence report/technology assessment no.43 - Making Health Care Safer: A critical analysis of patient safety*

practices: Prepared by the University of California at San Francisco-Stanford University Evidence-Based Practice Center, 2001.

187. Gander PH, Merry A, Millar MM, Weller J. Hours of work and fatigue-related error:a survey of New Zealand anaesthetists. *Anaesthesia and Intensive Care* 2000;28:178-83.

188. Asch DA, Parker RM. The Libby Zion case: One step forward or two steps backward? *The New England Journal of Medicine* 1988;318:771-5.

189. Green MJ, Mitchell G, et al. Do actions reported by physicians in training conflict with consensus ethical guidelines? *Archives of Internal Medicine* 1996;156:298-304.

190. Rajaratnam S, Arendt J. Health in a 24 hour society. *The Lancet* 2001;358:999-1005.

191. Grantcharov TP, Bardram L, Funch-Jensen P, Rosenberg J. Laparoscopic performance after one night on call. *British Medical Journal* 2001;323:1222-3.

192. Kirkcaldy BD, Trimpop R, Cooper CI. Working hours,job stress,work satisfaction and accident rates among medical practitioners and allied personnel. *International Journal of Stress Management* 1997;4:79-87.

193. Mann FA, Danz PL. The night stalker effect: Quality improvements with a dedicated night-call rotation. *Investigative Radiology* 1993;28:92-6.

194. Steele MT, Ma OJ, Watson WA, Thomas HA Jr., Muelleman RL. The occupational risk of motor vehicle collisions for emergency medicine physicians. *Academic Emergency Medicine* 1999;6:1050-3.

195. Marcus CL, Loughlin GM. Effect of sleep deprivation on driving safety in house staff. *Sleep* 1996;19:763-6.

196. Wendt JR, Yen LJ. The resident by moonlight:a misguided missile. *Journal of the American Medical Association* 1988;259:43-4.

197. Geer RT, Jobes DR, Tew JF, Stepsis LH. Incidence of automobile accidents involving anesthesia residents after on-call duty cycles. *Anesthesiology* 1997;87:A938.

198. Webb WB. The cost of sleep-related accidents: A re-analysis. *Sleep* 1995;18:276-80.

199. Landrigan CP, Rothschild JM, Cronin JW, Kaushal R, Burdick E, Katz JT, et al. Effect of reducing interns' working hours on serious medical errors in Intensive Care Units. *The New England Journal of Medicine* 2004;351:1838-48.

200. Arnold J, Cooper C, Robertson IT. *Work psychology: Understanding human behaviour in the workplace*. 2nd ed. London: Pitman Publishing, 1995.

201. Tyssen R, Vaglum P. Mental health problems among young doctors: An updated review of prospective studies. *Harvard Review of Psychiatry* 2002;10:154-65.

202. Tyssen R, Vaglum P, Gronvold N, Ekeberg O. The impact of job stress and working conditions on mental health problems among junior health officers. A nationwide Norwegian prospective cohort study. *Medical Education* 2000;34:374-84.

203. Bellini LM, Baine M, Shea JA. Variation of mood and empathy during internship. *Journal of the American Medical Association* 2002;287:3143-6.

204. Firth-Cozens J. Depression in Doctors. In: Robertson MM, Kantona E, editors. *Depression and physical illness*. New York: John Wiley, 1997:95-111.

205. Wall T, Bolden RI, Borrill CS, Carter AJ, Golya DA, Hardy GE, et al. Minor psychiatric disorder in NHS staff: Occupational and gender differences. *British Journal of Psychiatry* 1997;171:519-23.

206. Houston DM, Allt SK. Psychological distress and error making among junior house officers. *British Journal of Health Psychology* 1997;2(part2):141-51.

207. Bogg J, Gibbs T, Bundred P. Training job demands and mental health of pre-registration house officers. *Medical Education* 2001;35:590-5.

208. King MB, Cockcroft A, Gooch C. Emotional distress in doctors:sources,effects and help sought. *Journal of the Royal Society of Medicine* 1992;85:605-8.

209. Hainer BL, Palesch Y. Symptoms of depression in residents: A South Carolina family practice research consortium study. *Academic Medicine* 1998;73:1305-10.

210. Clark DC, Salazar-Grueso E, Grabler P, Fawcett J. Predictors of depression during the first 6 months of internship. *Journal of the American Medical Association* 1984;287:3143-6.

211. Hsu K, Marshall V. Prevalence of depression and distress in a large sample of Canadian residents interns and fellows. *American Journal of Psychiatry* 1997;144:1561-6.

212. Reuben DB. Depressive symptoms in medical house officers. Effects of level of training and work rotation. *Archives of Internal Medicine* 1985;145(2):286-8.

213. Valko RJ, Clayton PJ. Depression in the internship. *Diseases of the Nervous System* 1975;36:26-9.

214. Collier VU, McCue JD, Markus A, Smith L. Stress in medical residency: Status quo after a decade of reform. *Annals of Internal Medicine* 2002;136:384-90.
215. Williams S, Dale J, Glucksman E, Wellesley A. Senior house officers' work related stressors,psychological distress and confidence in performing clinical tasks in accident and emergency:a questionnaire study. *British Medical Journal* 1997;314:713-18.
216. Caplan RP. Stress,anxiety and depression in hospital consultants, general practitioners and senior health service managers. *British Medical Journal* 1994;309:1261-3.
217. Weinberg A, Creed F. Stress and psychiatric disorder in healthcare professionals and hospital staff. *The Lancet* 2000;355:533-7.
218. Firth-Cozens J. Stress,psychological problems and clinical performance. In: C V, editor. *Medical Accidents*. Oxford: Oxford University Press, 1993:131-149.
219. Ford CV, Wentz DK. Internship: What is stressful? *Southern Medical Journal* 1986;79:595-9.
220. Davis M. Intern discussion group: A supportive educational experience for junior doctors. *Hospital Medicine* 1999;60:435-9.
221. Brashear DB. Support groups and other supportive efforts in residency programs. *Journal of Medical Education* 1987;62:418-24.
222. Guthrie E, Tattan T, et al. Sources of stress,psychological distress and burnout in psychiatrists: Comparison of junior doctors, senior registrars and consultants. *Psychiatric Bulletin* 1999;23:207-12.
223. Sonnetag S. Work group factors and individual well being. In: West MA, editor. *Handbook of work group psychology*. Chichester: Wiley Publishers, 1996.
224. Cohen S. After effects of stress on performance and social behaviour: A review of research and theory. *Psychological Bulletin* 1980;88:82-108.
225. Campbell DA. The patient burn out and the practice of surgery (Presidential address). *American Surgery* 1999;65:601-5.
226. Felton JS. Burnout as a clinical entity: Its importance in healthcare workers. *Occupational Medicine* 1998;48:237-50.
227. Firth-Cozens J. Individual and organizational predictors of depression in general practicioners. *British Journal of General Practice* 1998;48:1647-51.
228. Jex SM, Hughes P, Storr C, Baldwin DC, Dewit C, Conard S, et al. Behavioral consequences of job-related stress among resident physicians: The mediating role of psychological strain. *Psychological Reports* 1991;69(1):339-49.
229. Smith L. Working time stress and fatigue. In: Vincent C, editor. *Clinical risk management: Enhancing patient safety*. London: BMJ Books, 1995.
230. Pitts J. Career preferences of medical students: Some further answers. *British Journal of General Practice* 1997;47:184.
231. Alagappan K, Steinberg M, Mancherje N, Pollack S, Carpenter K. The psychological effects of a four week emergency medicine rotation on residents in training. *Academic Emergency Medicine* 1996;3:1131-35.
232. Ford GV. Emotional distress in internship and residency: A questionnaire study. *Psychiatric Medicine* 1983;1:143-50.
233. Hurwitz TA, Beiser M, Nichol H, Patrick L, Kozak J. Impaired interns and residents. *Canadian Journal of Psychiatry* 1987;32:165-9.
234. Firth-Cozens J, Morrison LA. Sources of stress and ways of coping in junior house officers. *Stress Medicine* 1989;5:121-6.
235. Degeling P, Sorensen R, et al. *The organisation of hospital care and its effects*. Sydney: Centre for Clinical Governance, University of New South Wales, Australia, 2000.
236. Institute of Medicine. *Crossing the Quality Chasm: A new healths system for the 21st century*: National Academies Press, 2001.
237. Nolan T. Understanding medical systems. *Annals of Internal Medicine* 1998;128:293-8.
238. British Medical Association. *Work-related stress among junior doctors:a report from the BMA cohort study of 1995 medical graduates*. London: British Medical Associate, 1996.
239. Pronovost P, Morlock L, Cassirer C. Creating and maintaining safe systems of medical care: The role of risk management. In: Vincent C, editor. *Clinical Risk Management: Enhancing patient safety*. London: BMJ Books, 2001:69.
240. Firth-Cozens J, Moss F. Hours,sleep,teamwork and stress. *British Medical Journal* 1998;317:1335-6.
241. Galasko CSB, Jackson B. Insecurity about progression is an added stress for senior house officers. *British Medical Journal* 1999;318:534.

242. Luck C. Career focus:reducing stress among junior doctors. In: McDonald R, editor. *Student British Medical Journal.* London: British Medical Journal, 2001.

243. Reason JT. *Managing the Risks of Organisational Accidents.* Aldershot, Hampshire, England: Ashgate Publishing Ltd, 1997.

244. Galletly DC, Muschet NN. Anaesthesia system errors. *Anaesthesia Intensive Care* 1991;19:66-73.

245. Randall CS, Bergus GR, Schlechte JA, Muller CW. Factors associated with primary care residents' satisfaction with their training. *Family Medicine* 1997;29:730-5.

246. Firth-Cozens J, Greenlagh J. Doctors' perceptions of the links between stress and lowered clinical care. *Social Science and Medicine* 1997;44:1017-22.

247. Beecham L. From the junior doctors conference: Hospital life is like a soap opera. *British Medical Journal* 1994;308:1719-20.

248. British Medical Association. *Stress and the Medical Profession.* London: British Medical Association, 1992.

249. Spath PL (ed). *Error reduction in Health Care:A Systems Approach to Improving Patient Safety:* Jossey-Bass, 1999.

250. Baldwin PJ, Dodd M, Wrate RM. Young Doctors' Health: How do working conditions affect attitudes,health and performance? *Social Science and Medicine* 1997;45(1):35-40.

251. Driscoll P, Thomas M, Toquet R, Fothergill J. Risk management in accident and emergency medicine. In: Vincent C, editor. *Clinical Risk Management: Enhancing patient safety:* BMJ Books, 2001:153.

252. Waterhouse JD, Folkard S, Minors D. Shiftwork, health and safety: An overview of the scientific literature 1978-1990. *HSE Contract Research Report No: 31/1992:* Health and Safety Executive, 1992.

253. Cooper JB, Newbower RS, Kitz JR. An Analysis of major errors and equipment failures in anesthesia management: considerations for prevention and detection. *Anesthesiology* 1984;60:34-42.

254. Hyman WA. Errors in the use of medical equipment. In: Bogner MS, editor. *Human Error in Medicine:* Lawrence Erlbaum Associates, 1994:328.

255. Spath PL. Reducing errors through work system improvements. In: Spath PL, editor. *Error reduction in health care.* San Fransisco: Jossey-Bass, 2000:222.

256. Prielipp RC LK, Morell RC,. Ventilator failure in the ICU:Déjà vu all over again. *Anesthesia Patient Safety Foundation Newsletter,* 1998.

257. Leape LL, Bates DW, Cullen DJ, Cooper J, Demonaco HJ, Gallivan T, et al. Systems analysis of adverse drug events. *Journal of the American Medical Association* 1995;274(1):35-43.

258. Hill G. *Risk Management.* London: The Medical Defence Union, 1991.

259. Charles C, Gafni A, Whelan T. Shared decision-making in the medical encounter: What does it mean? (or it takes at least two to tango). *Social Science and Medicine* 1997;44(5):681-92.

260. Britten N, Stevenson FA, Barry CA, Barber N, Bradley CP. Misunderstandings in prescribing decisions in general practice: Qualitative study. *British Medical Journal* 2000;320:484-8.

261. Edwards A, Elwyn G, Mulley AL. Explaining risks: Turning numerical data into meaningful pictures. *British Medical Journal* 2002;324:827-30.

262. Bruster S, Jarman B, Bosanquet N, Weston D, Erens R, Delbanco TL. National survey of hospital patients. *British Medical Journal* 1994;309:1542-6.

263. Edwards A, Elwyn G. Understanding risk and lessons for clinical risk and lessons for communication about treatment preferences. *Quality in Health Care* 2001;10:9-13.

264. Coiero EW, Tombs V. Communication behaviours in a hospital setting; an observational study. *British Medical Journal* 1998;316(7132):673-6.

265. Clinical Systems Group, Centre for Health Information Management Research. *Improving Clinical Communications.* Sheffield,UK: University of Sheffield, 1998.

266. Lingard L, Reznick R, Espin S, Regehr G, DeVito I. Team communications in the operating room: Talk patterns,sites of tension and implications for novices. *Academic Medicine* 2002;77(3):232-7.

267. Gosbee J. Communication among health professionals. *British Medical Journal* 1998;316:642.

268. Parker J, Coeiro E. Improving clinical communication: A view from psychology. *Journal of the American Medical Informatics Association* 2000;7:453-61.

269. Smith AJ, Preston D. Communications between professional groups in a NHS trust hospital. *Journal of Management in Medicine* 1669;10(2):31-9.

270. Amon EA. Communication strategies for reducing hospital error and professional liability. *Obstetrical and Gynaecological Survey* 2002;57(11):713-714.

271. Lefevre FV, Wayers TM, Budetti PP. A survey of physician training programs in risk management and communication skills for malpractice prevention. *Journal of Law, Medicine and Ethics* 2000;28(3):258.

272. Goodenough W. Report of the interdepartmental committee on medical schools: HMSO, London, 1944.

273. Todd AR (chairman). Report of the Royal Commission into Medical Education: HMSO, London, 1968.

274. General Medical Council of the United Kingdom. *Code of Good Practice for Universities and Medical Schools.* London: General Medical Council, 1973.

275. Sheldrake RF, Linke Rd, Mensh IN, et al. Medical Education in Australia: Present Trends and Future Prospects in Australian Medical Schools: Education Research and Development Committee (ERDC), AGPS Canberra, 1978.

276. Barr D. Hazards of modern diagnosis and therapy-the price we pay. *Journal of American Medical Association* 1956;159:1452-6.

277. McLamb J, Huntley R. The Hazards of Hospitalization. *Southern Medical Association Journal* 1967;60:469-72.

278. US Congress House Sub Committee on Oversight and Investigation. Cost and quality of health care: Unnecessary surgery. Washington DC: USGPO, 1976.

279. McAdam NJ. A Study of Residency in Queensland Hospitals. Department of Health, Brisbane, Queensland, Australia, 1979.

280. Jamison JH (chairman). Report of the Commission of Inquiry into the Efficiency and Administration of Hospitals. Canberra, Australia: AGPS, 1981.

281. Department of Health New South Wales. The Internship in New South Wales: Report of the Resident Medical Staff Advisory Committee, 1984.

282. Victorian Medical Postgraduate Foundation (VMPF), the Australian Medical Assoc. (VIC), Department of Health Victoria. Review of the Intern Year in Victoria: Victorian Medical Postgraduate Foundation (VMPF), 1986.

283. Doherty RL (chairman). *Australian Medical Education and Workforce into the 21st Century.* Canberra, Australia: Australian Government Publishing Services, 1988.

284. Australian Medical Association (AMA). AMA Safe Hours Project Outline Phase One - Development of a National Code 1996-1999. Kingston, ACT, Australia: Federal Secretariat, Australian Medical Association, 1999.

285. Australian Medical Association (AMA). AMA National Code of Practice - Hours of Work, Shift Work and Rostering for Hospital Doctors. Kingston,ACT,Australia: Australian Medical Association, 1999.

286. Australian Medical Association (AMA). Opportunities and Impediments to Flexibility: Report on consultations with key stakeholders on flexibility in medical training and work practices. Kingston,ACT,Australia: Australian Medical Association, 2003.

287. Roughton VJ, Severs MP. Junior doctor handover: current practices and future expectations. *Journal of Royal College of Physicians* 1996;30(3):213-4.

288. Bulstrode C. Continuity of care-sacred cow or vital necessity? *British Medical Journal* 1995;310:1144-6.

289. Sutcliffe KM, Lewton E, Rosenthall MM. Communication failures: an insidious contributor to medical mishaps. *Academic Medicine* 2004.

290. BMA Junior Doctors Committee. Making IT work for hospital juniors: Supporting working practices and training within the new contract and the EWTD. London: British Medical Association, 2003.

291. Australian Medical Council. National Guidelines for Intern Training and Assessment. Canberra, Australia: Australian Medical Council, 1996.

292. Douglas N (chairman), Robinson J, Fahy K. Inquiry into Obstetric and Gynaecological Services at King Edward Memorial Hospital Final Report, Vol. 1. Perth, Western Australia, 2001.

293. *Flexner A. The Flexner Report on Medical Education in the United States and Canada: The Carnegie Foundation for the Advancement of Teaching, Science and Health Publications Inc., 1910.*

294. Society for the Teachers of Family Medicine. STFM Task Force Report on Training Residents for the Future. *Journal of Family Medicine* 1986;18:29-37.

295. American Academy of General Practice, Commission on Education. Graduate Training for Family Practice (The Mills Commission Report). Kansas City,Mo,USA: American Academy of General Practice, 1967.
296. Association of American Medical Colleges. Graduate medical education curriculum, 2000.
297. The Royal College of Physicians and Surgeons of Canada. Skills for the New Millenium: Report of the Societal Needs Working Group. *CanMEDS Project 2000.* Ottawa,Canada: The Royal College of Physicians and Surgeons of Canada, 1997.
298. British Medical Association. *The Training of A Doctor: Report of the Medical Curriculum Committee of the British Medical Association.* London: Butterworth and Co. Publishers Ltd, 1948.
299. Allen RB. *Medical Education and the Changing Order.* London, England, 1947.
300. General Medical Council of the United Kingdom. Implementing the New Doctor: The Education Committee's Informal Visits to UK Universities. London, England: General Medical Council, 2002.
301. Hanly D (chairman). The Report of the National Joint Steering Group on the Working Hours of Non-Consultant Hospital Doctors: The Dept of Health and Children, Ireland with The Health Services Employers' Agency and the Irish Medical Organisation, 2001.
302. Konner M. *Becoming a doctor: A Journey of Initiation in Medical School:* Penguin Books, USA, 1987.
303. Klass PA. *A Not Entirely Benign Procedure: Four Years As A Medical Student:* Plume, 1987.
304. Becker HS, Geer B, Hughes EC, Strauss AL. *Boys in White:Student Culture in Medical School.* 6 ed. New Brunswick, USA: Transaction Publishers, 2002.
305. Marion R. *The Intern Blues:* Perennial, 1989.
306. Doctor X. *Intern.* New York,USA: Harper and Row, 1965.
307. Pekkanen J. *MD Doctors Talk About Themselves.* New York, USA: Delacorte Press, 1988.

Chapter Four: Method

Introduction

1   Background to the study

This research project began as a collaborative study with Marilynn Rosenthal, Professor of Sociology, and Director of the Program in Health Policy Studies at the University of Michigan-Dearborn and Kathleen Sutcliffe, Assistant Professor from the University of Michigan Business School. I was invited to collaborate in the study 'Supporting medical residents: A multifactorial study of medical mishaps' because of my work with the New South Wales Ministerial Council on Quality in Health Care[i] and my interest in the role and position of junior doctors in hospitals.

The design of my study is similar to that developed by Rosenthal and Sutcliffe. I use the in-depth interview method and a semi-structured questionnaire (the questionnaire they used, with slight modifications). My study uses different sampling to the Michigan study and includes all departments in the hospital in which interns and residents work instead of just three departments used in the Michigan study[ii].

2   In-depth Interview study method

As explained below, I selected qualitative techniques because I wanted to investigate the interns' and residents' experiences of medical mistakes and explore their perceptions of the associated factors. This required that I question the doctors about mistakes; the causes, the environment in which they occur, their preparedness for managing mistakes and their responses. Taylor and Bogdan define in-depth interviewing as *"repeated face-to-face encounters between the researcher and informants directed toward understanding informants' perspectives on their lives, experiences, or situations as expressed in their own words.*[1] (at p. 77)

---

[i] I was the Deputy Chair of the New South Wales Ministerial Council on Quality in Health Care (2000-2003)
[ii] Departments of Surgery, Medicine and Obstetrics and Gynaecology

I selected this method because doctors work in complex environments, participate in a professional culture, and apply a body of knowledge and skills that has meaning to them. Knowing and understanding what mistakes mean to them, what they think cause them, how they apply their knowledge and skills in avoiding them and how they relate to patients and others in the workplace after experiencing mistakes is essential for better understanding of medical mistakes.

In-depth interviewing has been a key method for data collection in qualitative research since the 1980s.[2] Three types of in-depth interviews are used; structured, semi-structured and unstructured.[1 3] Semi-structured interviews enable the researcher to focus on the issues central to the research question[1]- in my case how junior doctors experienced and perceived medical mistakes. This method, unlike structured surveys or structured interviews, is best for reducing the power imbalance and helping to develop rapport with the informants. It also enabled me to follow a particular line of questioning, elicit information and let the informants tell their stories and give their opinions in their own words. For me to understand how the informants' behaved when they made mistakes I first needed to know what they thought about them and what they thought caused the mistakes. Schultz[4] argues that for us to understand why people behave the way they do we need to understand how they define a particular situation. This method depends on the informants' verbal accounts of their experiences, of their 'social realities.'[5] (at p. 95)

For my in-depth interviews I used a semi-structured questionnaire to guide the interviews because I wanted to see if the informants' shared any experiences or perceptions of mistakes. Flexibility was maintained because I was able to focus on particular aspects of the narratives told by junior doctors and obtain extensive detail about their experiences and views, while also collecting their responses to a standard set of questions about their perceptions of the causes of mistakes. The doctors I interviewed were able to give their accounts of events, expressing their feelings and attitudes towards mistakes, which sometimes led to issues and concerns I had not anticipated in the questions addressed in the semi-structured

questionnaire. Traditional survey methods would have limited the opportunity for deep exploration of the complex phenomena being investigated.

In-depth interviews are useful for sensitive topics [5] [6] or when personal information is being sought. Because of the sensitivity surrounding medical mistakes I wanted to ensure that the doctors felt as comfortable as I could hope to make them about disclosing details to me. I also wanted them to feel free to discuss the aftermath and their feelings associated with the incidents.

The main disadvantage associated with in-depth interviews relates to the dependence of the researcher on the informant's interpretation and presentation of the facts involved in the accounts as being true. I was not present when the mistakes occurred. I have only the evidence of the doctors' accounts that the situations they described actually happened. To minimise this disadvantage I arranged for a sample of the interviews to be independently corroborated by two reviewers who were able to access the medical records to check if the mistake narratives described by informants had been recorded as having occurred. (I describe this process below.)

2.1   Semi-structured questionnaire

The same set of questions for each topic were asked of each doctor interviewed but the time spent on each area and the depth of examination depended on the informant's experiences and perspective. Because the experience of each doctor was different and because I was interested in exploring the causes of mistakes I needed to have a systematic and comprehensive way to limit and manage the information exchanged during the interviews. Using a standard set of questions about each mistake also permitted me to analyse the mistakes with a view to establishing patterns of responses.

Because interviewing permits exploration of complex human perceptions I was also able to probe beneath the doctors' sometimes superficial responses to my questions. When I first asked the doctors if they had ever observed or been

involved in a medical mistake, some initially replied 'no'. After explanation of
the literature on mistakes nearly everyone remembered one or more medical
mistakes which were then explored in discussion. This capacity to engage with
doctors at a personal level triggered memories of mistakes or broke the 'ice' of
the initial reticence to bring up relevant material. Their disclosure was essential
for harvesting their stories, experiences and observations.

3   Previous methods used for studying doctors' experiences of mistakes

A qualitative approach to data collection was also indicated for this study because
the study of medical mistakes involving junior doctors is a relatively new and
under-researched area. The status of knowledge in this emerging area of
research interest has not yet reached a point where there are accepted, validated
standard research questions that are widely acknowledged as suitable for use in
research on safety.

Both qualitative and quantitative methods have been previously used to study
doctors' experiences of medical mistakes. Previous studies of medical mistakes
included hypothetical case vignettes,[7] anonymous surveys for self-completion,[8-11]
focus groups[12] and interviews.[13-15] The use of hypothetical case vignettes is a
common method for engaging doctors in discussions about patient harm and
identifying attitudes and ethical reasoning by doctors about mistakes. The
sensitive nature of the topic and an understandable reluctance to talk about one's
mistakes make it more palatable for doctors if the discussion is about a fictitious
case. Discussions of hypothetical cases permit identification and examination of
factors contributing to mistakes but they cannot examine the medical mistake in
the context of a 'real environment' lived through by each doctor. The lack of
environmental 'context' in hypothetical case studies limits the authenticity of
responses. Discussion and analysis are also limited to and by the facts presented
in the hypothetical case study. Since I wanted to talk with doctors about their
actual perceptions and experiences of mistakes this method was not suitable for
my study.

Anonymous questionnaires or surveys about medical mistakes are useful for ascertaining clinicians' views about the causes of mistakes, how to prevent them, their frequency and how they perceive them but such methods only permit limited exploration of the factors contributing to mistakes compared to face-to-face depth interviews. Some of the informants said that the discussion with me was the first time they had talked about mistakes except for conversations with family and friends. My study overcomes the limitation identified by Wu[9] in an earlier 1989 study in which he was unable to confirm the data provided by the respondents in the anonymous surveys. One way to overcome this deficiency is to question the respondents directly about their mistakes.

The medical profession has only recently begun to develop a language for discussing mistakes.[iii] Adverse event, error, mishap and disclosure while not new terms, are seldom used by many clinicians. Discussions about mistakes usually take place in a blame context (negligence and litigation) leaving many clinicians unpractised in analysing and discussing mistakes from a safety improvement perspective. This meant that I often had to clarify informants' responses and provide context for my questions. Without this opportunity some of the answers would have been superficial and potentially misleading. This was one of the main reasons for my not using anonymous surveys. I wanted to explore interns' and residents' experiences and perceptions about errors and this would not have been possible except face-to-face.[16] Frequently I had to clarify a particular response which would have not been possible had I used anonymous reporting. The potential for misunderstanding was minimised because I was able to seek more information, to check details and clarify answers. I was also concerned that anonymous questionnaires would yield a low response rate because of confidentiality fears and time pressures.

[iii] This has been helped by the increasing use of improvement methods such as Root Cause Analysis, Clinical Practice Improvement enable the detailed examination of mistakes; why and how they happened.

Junior doctors are often swamped with protocols, guidelines, and requests for information.[iv] Attending an interview, while more time-costly, was organised within working hours and with a scheduled time. (Attending the interview also gave them a break from their regular hospital duties.)

Focus groups are useful for facilitating doctors' discussions about medical mistakes. But the presence of others may constrain participants from delving into areas such as quality of supervision, the 'hidden culture' or organisational matters, for fear of offending their employers or other clinicians who may or may not be their supervisors. Confidentiality is not assured in group situations. Doctors may feel inhibited about disclosing their mistakes, talking about feelings of inadequacy or acknowledging their inexperience in front of peers. For these reasons focus groups were not used.

4 Hospital Approval

I have not named the hospital used in the research because of the sensitivities surrounding medical mistakes and adverse events[v]. The current medico-legal environment is a barrier to open discussion about medical mistakes not only for individual clinicians but also for organisations that fear public criticism or legal threat.

When I first discussed this research in March 2000 with the hospital's clinical director and the hospital executive, they were concerned about confidentiality, the reactions of the junior doctors to the questions and possible exposure to litigation. They obtained legal advice from their insurers (the NSW Government Insurance Office) and discussed the research proposal with the hospital executive and clinical training sub-committee. I attended a number of these meetings to explain the research and methodology.

[iv] The Postgraduate Medical Council of NSW surveys all PGY1 and PGY2 years about their hospital experience and training. The return rates are very poor.
[v] An injury that was caused by medical management (rather than the underlying disease) and that prolonged the hospitalisation produced a disability at or before the time of injury or both.

I reassured the hospital that names would not be recorded and that the research would be of no forensic value to any potential litigant. I explained that I did not intend to keep identifying data.

After four months of discussion the research was approved in July 2000 with the following conditions.

- No case studies or vignettes were to be published in medical journals or the press that could identify any junior doctor.
- A status report of the process was to be provided to the Human Research Ethics Committee (HREC) after five junior medical officer interviews
- A status report of the first five investigations into adverse events was to be provided to the HREC.

I have complied with these conditions. I have also agreed to provide the hospital executive with a copy of research articles prior to publication in journals or coverage by the news media.

The concern with which the hospital assessed the research topic reflects the climate of apprehension that operates today in many hospitals. Once the medico-legal concerns were resolved the hospital approved the research. Since the commencement of the project the hospital has invited me to participate in many hospital activities involving junior doctors.

4.1 Ethics Approval

The hospital HREC approved the research on 3 July 2000. In addition to my undertakings about confidentiality, the HREC required that I establish a counselling mechanism for doctors should they become anxious during or after the interview because of the potential stress they experienced in recounting a mistake. I was also to report to HREC if any doctor became distressed as a result of discussing medical mistakes. No doctor did.

4.2   The Advisory Committee

After approval for the research I formed a research advisory committee. Given the nature and sensitivity of the study I wanted to have senior clinicians overseeing the project. Committee members helped spread information about the research. This held a potential two-fold benefit. First, it acted as a prompt for prominent hospital staff to start thinking and talking about medical mistakes. Second, if senior clinicians were seen to support the project, junior doctors may be more willing to be interviewed.

Apart from myself, the committee comprised : -

Director of Medical Services

Director of Clinical Training

Head of the General Clinical Training Committee

President of the Resident Medical Offices Association

Manager of the Quality Assurance Unit

Director of the Quality Assurance Unit

Head of the hospital's Department of Medicine

Head of the hospital's Department of Psychological Medicine

5   Allocation of junior medical officers to hospitals

In 2000 the Postgraduate Medical Council of NSW allocated a total of 32 interns[vi] to the hospital. In addition there were 27 Resident Medical Officer One (RMO1) positions allocated to the hospital.[vii] Hospital internship commenced on Monday 10 January 2000. The clinical year runs for 52 weeks and comprises five terms.

[vi] The total available pool of Interns for New South Wales in 2000 was 476.

6   The Study Population

The study population of junior medical officers (JMOs) comprised interns, RMO1s and unstreamed RMO2s [viii] allocated to and working at a tertiary hospital in Sydney in 2000. The study hospital is the major teaching hospital for an Area Health Service that includes six metropolitan and rural district hospitals. Junior medical officers are rostered to all sites. A total of 114 (interns, RMO1 and unstreamed RMO2) positions were allocated to the Area Health Service in 2000 when the interviews were conducted. The following table describes the type and numbers of JMOs allocated to the Area Health Service.

Table 4.1 Position and number of Junior Medical Officers allocated to the Area Health Service 2000. Provided by the NSW Postgraduate Medical Council

Category	Type	From	Number
Intern	Australian Medical Council.	Overseas graduates.	6
Intern	NSW universities.	NSW.	28
Resident Medical Officer 1	Postgraduate Medical Council quota.	Local/overseas.	29
Resident Medical Officer 1	Outside quota.	Australia/New Zealand/Australian Medical Council graduate.	13.5
Resident Medical Officer 1	Outside quota.	United Kingdom GP exchange.	18
Resident Medical Officer 2	Not in training program.		19.5
Total			114

The Department of Resident Training and Management of the teaching hospital provided the names and contact details of 114 junior doctors who had been allocated to the Area Health Service (including unstreamed RMO2s). But my study population were confined to those doctors working at the tertiary hospital.

[vii] The total available pool of RMO1s for New South Wales in 2000 was 375.
[viii] An intern is a junior medical officer in the first post graduate year (PGY1) of hospital clinical practice.
A resident medical officer 1(RMO 1) is a junior medical officer in their second post graduate year (PGY 2) of hospital clinical practice.
A resident medical officer 2 (RMO 2) is a doctor in their third year of practice in a public hospital.
An unstreamed RMO is a doctor with two years post graduate experience who is not on a College training program.

The Postgraduate Medical Council of NSW [ix] advised that there were 59 junior medical officers allocated to the tertiary hospital at the time I began the interviews (Monday 21 August 2000, one week into term four).

I worked from a list of names provided by the hospital (Interns, RMO1s and unstreamed RMO2s) at the beginning of the term. I also sent 13 additional letters to doctors who were allocated to the peripheral metropolitan hospitals but who were rostered to the tertiary hospital in the following term when the interviews would commence.

A total of 89 junior medical officers were sent introductory letters setting out the research objectives (appendix 1) and inviting them to participate in a semi-structured interview lasting 60-90 minutes. Twenty-four (32%) letters were returned unopened from the departments. The person was either not known, had left the hospital or had returned overseas. The high rate of returned letters indicates that the records of the hospital may not be accurate and that the allocation number recorded by the Postgraduate Council of NSW may have been more accurate.

Table 4.2 Number of doctors contacted and number in final sample population

Letters sent to JMOs rostered at the tertiary hospital/peripheral hospitals.	Letters returned (Left or not known in the department).	Final sample population.	JMOs absent sickness/recreational leave/off site.	Available JMO pool for interview.
89	24	65	17	48
100%	31.6%	68.4%	19.1%	54.9. %

[ix] Postgraduate Medical Council - Final allocation to the tertiary hospital for 2000. Supplied by the Council in 2002 and published in the Sydney Morning Herald in 2000. See http://www.medeserv.com.au/pmc

Figure 4.1 Approaches to junior medical officers (JMOs) and final number of JMOs interviewed-
figures provided by the Department of Resident Training and Management of the tertiary hospital

⊞ letters sent ▪ letters returned ☐ final sample population ▩ JMOs absent ▪ available pool of JMOs
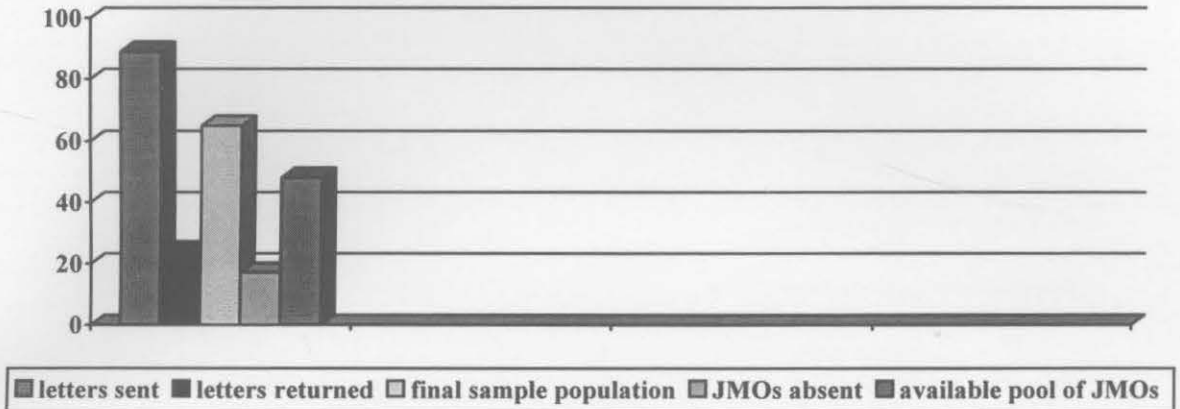
Table 4.3 Approaches to JMOs and final number of JMOs interviewed
Department of Resident Training and Management of the tertiary hospital

Available JMO pool for interview.	JMOs approached for interview.	JMOs refused interview.	JMOs interviewed.
48	33	1	32
100%	69%	3%	67%

Of the pool of doctors available for interview there remained 15 doctors whom I
did not approach for interview. I did not seek to interview them because all the
departments in the hospital had been covered. It was crucial that I cover each of
the departments that junior doctors were allocated because some departments
may have been more prone to mistakes because of the type of patient population
and the availability of experienced staff on the wards. [x] One doctor refused an
interview.

Table 4.4 provides a breakdown of the JMO level of experience and the
departments worked in during the study period. Departments not offering places

---

[x] The sample size for interview studies is usually between 30 and 50 respondents and is smaller
than that used for quantitative studies. (Pope C. van Royen P Baker R. Qualitative methods in
research on healthcare quality. *Quality & Safety in Health Care* 2002;11:148)

for junior doctors were excluded. Time spent in their department at the time of
the interview was relevant to their familiarity with the ward and level of
experience.

Table 4.4 Interns and residents interviewed: position, sex, current rotation, previous experience

Record	Year of training	Age	Sex	Current rotation	Previous rotation experience	Time in rotation
1	intern	36	female	neurology	aged care,	week 3
2	intern	32	male	haematology	emergency, orthopaedics	week 3
3	intern	29	female	aged care & rehabilitation	emergency/orthopaedics	week 3
4	intern	23	male	renal	emergency/relief/geriatrics	week 3
5	intern	24	female	upper GI surgery	general medicine/ orthopaedics	week 4
6	RMO1	28	male	urology	opthopaedics/endocrinology/ nights/general surgery	week 5
7	RMO1	25	female	vascular surgery	nights/emergency dept./peripheral hospital	week 3
8	intern	24	female	orthopaedic	aged care/relief/general medicine	week 4
9	intern	24	female	relief paediatrics	general medicine/general surgery/emergency dept.	week 1
10	intern	25	female	emergency	relief-orthopaedics/general medicine/neurology	week 1
11	RMO1	27	male	colorectal surgery	nights/relief/emergency	week 5
12	intern	35	female	relief	orthopaedics/medicine/geriatrics	week 5
13	RMO 1	26	female	respiratory	peripheral hospital (2)respiratory/HIV	week 5
14	intern	24	male	respiratory	orthopaedics/general surgery (peripheral hospital) emergency dept	week 8
15	RMO1	26	female	neurosurgery	oncology/relief	week 10
16	intern	24	male	orthopaedics	rehabilitation/renal/ colorectal surgery	week 9
17	intern	24	male	neurosurgery	geriatrics/relief(haematology) general medicine (peripheral hospital)	week 10
18	RMO1	26	male	hand surgery	Emergency dept.(peripheral hospital)	week 10
19	RMO2	40	female	haemotology	relief/upper GI surgery	week 9
20	RMO1	25	male	gynaecology	Emergency (peripheral hospital)/intensive care unit/surgery (peripheral hospital	week 2
21	RMO1	27	male	neurology	endocrinology/ophthalmology/ ear nose & throat/ neck and head surgery/emergency	week 2
22	RMO1	25	male	oncology	emergency/rehabilitation/night	week 2

					s/ relief	
23	RMO2	41	female	urology	emergency/respiratory/cardiology	week 2
24	RMO1	27	female	head &neck surgery/ear nose & throat	obstetrics & gynaecology /emergency (peripheral hospital)/urology/relief/nights	week 3
25	intern	28	female	relief-orthopaedics	Upper gastroenterology /emergency (peripheral hospital) /neurology/orthopaedic (peripheral hospital)	week 3
26	RMO1	25	male	relief	medicine (peripheral hospital)	week 3
27	RMO1	25	female	rheumatology &dermatology	cardiothoracic surgery/Intensive care unit/nights/surgery	week 5
28	RMO1	26	female	respiratory	surgery (peripheral hospital) /emergency/relief/Intensive care unit (peripheral hospital)	week 5
29	RMO1	24	male	spinal	gastroenterology/nights/ emergency/medicine (peripheral hospital)	week 4
30	RMO2	26	female	plastic surgery	dermatology-rheumatology/study leave	week 5
31	RMO2	32	female	renal medicine	peripheral hospital /gastroenterology	week 4
32	intern	35	female	geriatrics	surgery/relief/emergency	week 6

Figure 4.2 Position of doctors interviewed

N=32

- interns
- RMO1
- unstreamed RMO2
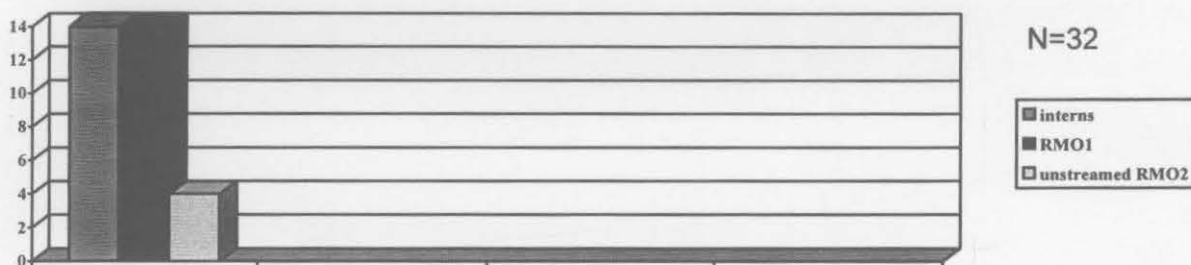
Figure 4.3 Age groups of doctors interviewed.
(19 females and 13 males were interviewed.)

N=32

- 23-25
- 26-30
- 31-35
- 36-40
- 41
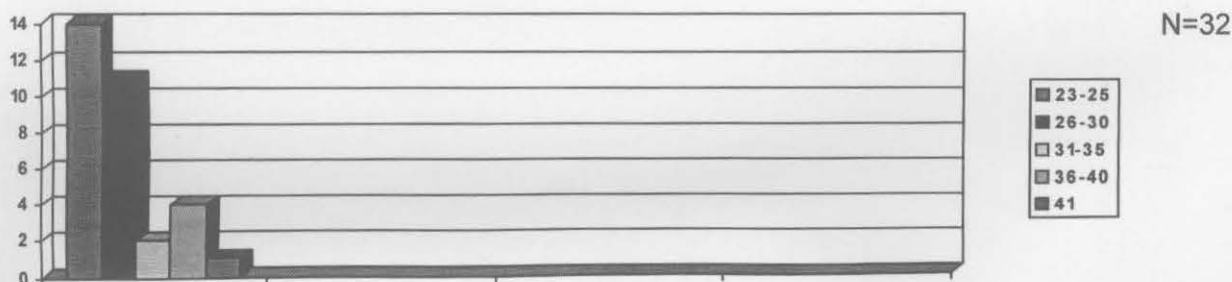
6.1   Location

The study hospital is one of the largest general hospitals in Australia with a bed capacity of about 736. The Emergency Department is a major trauma centre for the region. The hospital provides a range of sub-specialty services in medicine, surgery, critical care, anaesthetics, aged care, mental health, drug and alcohol, obstetrics and gynaecology, neonatology and paediatrics.

In 2000, doctors were allocated to hospitals using criteria based on preference and merit.[xi] I targeted junior medical officers allocated to the teaching hospital but since most interns and residents are rotated across the Area Health Service most of them had experience working in smaller hospitals.

Thirteen of the 32 doctors interviewed described medical mistakes occurring in a peripheral hospital. Mistakes in peripheral hospitals were included in the general analysis of medical mistakes.

Interviews were conducted in the Department of Psychological Medicine, which is part of the main hospital complex. The time of interviews varied according to each doctor's work schedule. Apart from a letter of support for the research project from the president of the Resident Medical Officers Association, there was no incentive or payment made to the junior doctors to encourage them to participate in the interviews.

7   Models for examining adverse events

An in-depth examination of the steps or processes involved in health care and the environment in which the care is provided underpins most models being used or developed to examine adverse events. [17-22]   For example, the US Joint Commission on Accreditation of Healthcare Organizations (JCAHO) requires each member organisation to have a system for identifying sentinel events (serious adverse outcomes) which includes in-depth analysis of errors to

---

[xi] In 2001 the Postgraduate Medical Council of NSW changed its allocation criteria to exclude merit as selection criteria and allocate solely on preferences using a ballot.

determine all the possible underlying causes and factors.[23] JCAHO requires that all factors (patient care processes, organisational management systems and external environment) are considered; not just one or two. Within each of these categories are sub-categories of factors that must be tested to determine whether they are contributing factors.

The US Veteran Affairs National Center for Patient Safety[24] identifies similar factors in their triage process for analysing significant adverse events and near misses: - human factors (communication, training, fatigue, and scheduling), environment and equipment.

English psychologist Charles Vincent's[25] framework for investigating and analysing clinical incidents is not based on analysing the process of the significant adverse event. Instead he builds on the work of Reason focusing on the institutional context, organisational and management factors, work environment, team factors, individual factors, task factors, and patient factors in his analysis of medical mistakes.

My interviewing strategy prompts junior doctors to analyse their mistakes by considering a range of factors known to be associated with mistakes and selecting those factors that are most relevant.

8   The Questionnaire

Rosenthal and Sutcliffe[xii] piloted the questionnaire in Michigan, which formed the basis for the semi-structured interviews. Because the questionnaire was designed for interviewing doctors in US hospitals, I reviewed the questionnaire for context and language. I also asked two Australian experts[xiii] in quality and safety to review the questionnaire to ensure that the terminology was appropriate for the Australian context. I also piloted the questionnaire with two junior doctors who were not from the study hospital. Given the concern about the poor level of disclosure to patients suffering adverse events, I added an additional question

---

[xii] Marilynn Rosenthall and Kathleen Sutcliffe from the University of Michigan designed the questionnaire for a study on medical residents and medical mishaps in 1997.

about whether there was any communication with the patient or family after the mistake was identified and/or acknowledged.

The questionnaire was semi-structured using open-ended questions. I opportunistically asked additional questions when informants had significant things to say about particular areas, such as the medical culture and the position of junior doctors in the medical hierarchy. The questionnaire (appendix 2) covers medical mistakes made and observed, the factors perceived to contribute to the mistakes, understanding of and training in addressing medical errors, and suggestions for improvement in the way hospitals manage medical mistakes. The bulk of the questions focused on interns and residents recounting medical mistakes, either experienced or observed. After each mistake was outlined there was a detailed discussion about their views as to the possible factors that caused, or were associated with, the mistakes.

To encourage doctors to freely discuss medical mistakes, I told them that they could talk about the mistake in the third person if they felt uncomfortable in discussing their own mistakes. All except two interns disclosed their own role in the mistake(s) during the interview.

8.1   Mishap, mistake or error: which word to use?

The terminology used in the medical literature to describe adverse events mainly falls into two categories: errors and adverse events.[26] Errors are distinguished from adverse events because an error may or may not cause harm to patients and adverse events may occur even though there has been no error in care and treatment. However, the terms errors, mishaps and mistakes are often used interchangeably in the health literature.[xiv]

[xiii] The Manager of the Quality Assurance Unit at a major teaching hospital and the Chair of the NSW Ministerial Council on Quality and Health Care who is also an Intensivist reviewed the questionnaire.
[xiv] See Chapter One: for definition of terms.

Rosenthal and Sutcliffe used the word 'mishap' to describe a medical error rather than 'mistake' on the basis that doctors would feel less threatened and be more willing to talk about them. While Rosenthal et al use the word 'mishap' to describe errors [27] it is not commonly used in the quality and safety literature. The Macquarie Dictionary defines mishap as an unfortunate accident.

I did a Medline key word search of the words 'medical mishaps' 'medical mistakes' and 'medical errors'. The following citations reflect their usage.

Table 4.5 Medline Search using medical mishaps, medical mistakes, medical errors (singular and plural) as key words 1966 to December week 3 2002

Search history	results
Medical mishap(s)	17
Medical mistake(s)	77
Medical error (s)	2611

Between January 1997 and December 2002 there were 8 citations found using the word 'medical mishap(s)' as key words. The decreasing use of the word 'mishap' may reflect the willingness of those working in the health system to confront mistakes and errors. Rosenthal et al while using the term 'mishap' acknowledge there is currently no standard terminology for this field of study and that many words are used to describe and refer to mishaps. They prefer mishap because it is less specific than other terms which they think bring broader issues forward for debate.[27]

The doctors I interviewed mostly did not know the precise definitions of terms used to describe errors. I did not challenge the terminology used by the doctors to describe their incidents. In my research the doctors interviewed did not draw any distinction between the words mishap, error and mistake. Even if I used the word 'mishap' in a question the doctors did not tend to mirror my usage. If I used both 'mishap' and 'mistake' in the question the doctors tended to use 'mistake' in their reply. For example

Q   *Have you heard of mistakes or mishaps happening?*

A   *I haven't heard of specific mistakes but I did in other area health services.* (Informant 9)

All three words were used interchangeably by the doctors when describing an adverse event but the word 'mistake' was used more often than either mishap or error. Nineteen doctors used the word mistake and 15 doctors talked about errors. Many doctors switched between words.

The following statements are examples:

"I guess major mishaps are mistakes which you wouldn't want to happen and maybe because of morbidity or fatality to the patient" (Informant 2)

"Most mistakes are simple errors that happen (and) can easily be ironed out." (Informant 4)

"Mistakes are errors to do with patient care." (Informant 9)

"Mistakes and mishaps happen and someone else must be taking care of them." (Informant 14)

"Mishap means a mistake that has gone wrong or not to plan." (Informant 30)

Because a major component of this study is an examination of the factors underpinning medical mistakes involving interns and residents, it was necessary to identify all possible activities and processes that might be associated with errors. Reason argues that understanding of error requires examination of the nature of the task and its environmental circumstances, the mechanisms governing performance and the nature of the individual.[22] The questionnaire needed to be sufficiently broad to ensure that all possible explanations and circumstances were discussed, not just those at the 'sharp' end of the mistake.[xv]

8.2   The questionnaire design

The questionnaire (appendix 2) was developed using categories of known factors associated with workplace mistakes which have previously been identified in other industries. The broad areas covered in the questionnaire are set out below.

[xv] The sharp end of the system refers to the humans present at the time of the error.

(I provide further reasons for the inclusion of these topics in Chapters One and Three.)

8.2.1 *Demographics such as age, year of training, current and previous rotations*

Knowing the doctors' ages and their level of experience[xvi] is relevant for the analysis of the informants' perceptions of medical mistakes because these are known contributing factors in errors.[9] [28-30] Harrison[31] identified inexperience as the single most important factor leading to knowledge-based errors resulting in adverse events. Time spent in a department is also relevant in terms of familiarisation with the ward routine, staff and organisation of work. Because junior doctors are often new to the organisation they may not have sufficient knowledge about the hospital organisational structures, mechanisms for reviewing adverse events or for identifying support structures in the event of a mistake.[8]

8.2.2 *Understanding of medical mistakes*

As I discussed in the introduction, the study of medical mistakes using knowledge from other areas is relatively new. Therefore it is important to gauge the level of knowledge and understanding interns and residents may have about errors and the extent of their knowledge about causation.

8.2.3 *The current working environment, the nature of the work, communication and supervisory arrangements.*

The complexity of the environment[32] is often a precursor in human errors. Whether informants understand the relationship between complexity and the potential for errors is important for identifying gaps in knowledge. Inadequate supervision[33] [34] has also been identified as a factor in medical errors. (Chapter Three contains more detailed discussion about the role inadequate supervision plays in mistakes by interns and residents.)

8.2.4 *Medical mistakes*

Each informant was asked to describe up to three medical mistakes. In addition to the narrative of each mistake they were asked to identify the main factors associated with the mistakes.

This section of the questionnaire listed all known factors found in the literature such as an individual's lack of knowledge or skill, communication, patient's condition, the situation, equipment/technology failure, the work environment, work organisation and existing external factors. Informants were asked to select one or more of these factors and discuss them in relation to the mistake being described. (I further discuss these factors in Chapters One and Three.)

8.2.5 *Patient's condition*

The questionnaire included questions about the conditions of patients (severity of illness, co-morbid disease), demographics and personal circumstances of patients because sicker patients have more treatments and interventions. More treatments also mean greater complications and possibility of errors.

8.2.6 *Near misses*

A near miss is a mistake with no adverse event. Informants were asked about their understanding and knowledge of 'near misses'. Because no patients are hurt by near misses it is thought that clinicians may be more willing to acknowledge them and use the event as a learning opportunity. These questions were included because informants may have been willing to discuss them more freely than mistakes.

8.2.7 *Avoiding mistakes*

This group of questions was designed to elicit the state of junior doctors' general knowledge of strategies for minimising medical errors. Informants' personal strategies for minimising harm to patients were also canvassed. This information

---

[xvi] Post graduate year 1 and 2 (PGY 1 and PGY 2)

helps locate the individual doctor's knowledge of the methods used by the organisation to help prevent errors.[35]

8.2.8 Reporting mistakes

The informants were asked if they reported the mistakes. Most hospitals at the time of the research had policies on adverse event reporting but the extent to which doctors knew about them or reported adverse events was unknown.

8.2.9 Discussion of the mistakes with others

If informants discussed mistakes I wanted to know with whom these were discussed, and the circumstances of these discussions. This information will help better understanding of the emotional and professional impact of mistakes.

8.2.10 Training in error management

Questions about informants' training and education in mistake management may relate to how well informants handle mistakes. It may also help identify gaps and possible areas for improvement.

After these topics were canvassed I asked the JMOs if they could think of any areas not covered. The junior doctors were then questioned about the perceived seriousness of the mistakes and their views about the main contributing factors.

8.2.11 Communicating with the patient and/or family

A JMO's experience of sharing information with patients is an important element of clinical practice. Senior clinicians can be persuasive role models, both positive and negative. The literature shows that some clinicians, although being good doctors in other respects, are not honest with their patients about the causes of errors.[36] Their actions can influence interns' and residents' approaches to patients who suffer adverse events. Ascertaining the JMOs' perceptions about disclosure to patients is relevant to their understanding of the impact of error on patients and their own professional development.

8.3   Short Questionnaire for medical officers who decline an interview

A short questionnaire was designed to elicit reasons for declining an interview.

9   Organising the interview

Prior to my contacting each intern and resident by telephone I sent each of the JMOs a letter plus an information sheet explaining the research. They also received a separate letter signed by the president of the Resident Medical Officers Association encouraging the junior medical officers to participate. Because the hospital executive and the Resident Medical Officers Association supported the research there was publicity throughout the hospital. During the initial telephone conversations many doctors referred to the president of the Resident Medical Association's letter and their own support for the aims of the research. I also addressed two educational forums about the proposed research and the nature of mistakes generally. I arranged interview times to suit the convenience of the doctors. I conducted all the interviews.

I commenced telephoning the doctors whose names were recorded on a hospital list[xvii] which identified the rostering arrangements for doctors for the term beginning 14 August 2000 and 30 October 2000. Doctors are rostered for the term to one of 28 departments including night duty and relief. A term lasts 10 weeks.

During the initial telephone call I explained the nature of the research to the doctors and sought their permission for an interview. I continued contacting doctors and arranging interviews until I had secured interviews with junior doctors who had worked in every department in the hospital in the past six months. The interviews took place over four months. Thirty-two interviews were held during work hours in most instances.

[xvii] The hospital provided me with a list of all the interns and residents working in the Area Health Service and the departments they were allocated for all the terms.

During the first 15 minutes of the interview I explained the study aims and obtained informed consent from the doctors. (See appendix 3 for a copy of the consent form). An independent person witnessed our signatures. I obtained permission to tape all interviews. No doctor asked to terminate the interview. Interview times ranged from 50 to 90 minutes. Some had to be rescheduled because of work demands.

9.1   Confidentiality

The hospital executive and the Human Research Ethics Committee were concerned to protect the identities of doctors who disclosed adverse events. They feared their identities could be discovered from the department associated with the adverse event and the characteristics of the adverse events disclosed. I addressed these concerns by giving all informants a number with no names recorded. The hospital's quality assurance program was used to access and retrieve the medical records. I also agreed that no vignettes would be published capable of identifying an individual. (See appendix 4 for a copy of the Statement of Confidentiality.)

9.2   Transcription of interviews

A stenographer with experience in the health sector transcribed the interviews. I checked all the transcriptions against the taped interviews. Corrections were made. Interviews were saved as Word documents.

10   Organising the data

QSR NUD*IST (Non-Numerical Unstructured Data* Indexing Searching and Theorizing)[xviii] software was used for storing the data which I collated into categories and sub-categories. QSR NUD*IST is a computer package for handling non-numerical and unstructured data in qualitative analysis. While it permits the searching of text and patterns of coding and facilitates theorising about the data I only used the program for coding the data into an index system.[37]

[xviii] QSR stands for Qualitative Solutions and Research, which is a software development company located in Melbourne

This was because I used a semi-structured questionnaire which had already set the topic areas I was examining. In each category I identified a range of activities described by interns and residents. (See appendix 5 for a copy of the headings and sub-categories I developed.)

I then examined each interview and selected passages of text for storing into the appropriate activity. The program trainer acted as an 'auditor' in that she reviewed my coding strategy and framework for coding the data.

I analysed the data by examining the categories and sub-categories I developed. I looked for themes, clusters of responses and patterns relating to responses and perceptions of mistakes. I systematically examined the responses to each mistake using the standardised format set out in the questionnaire.

11   Independent verification of selected cases

One of the main disadvantages of in-depth interviews is the assumption that one's informants provide accurate accounts and are not prone to problems of fabrication or recall bias. To address this concern I sought to independently verify as much as possible the informants' narratives and descriptions of the mistakes described. I advised the interns and residents selected for interview both in correspondence and at the beginning of the interview that the study would involve an independent verification of a selection of medical errors recounted by them.

When the intern or resident described a mistake, I asked him or her to provide me with any identifying data (such as a patient name or bed number) that would enable the quality assurance unit to access the medical record. The majority of informants could not remember patients' names, dates of admission or bed numbers or chose not to volunteer the information. If they had identifying information I switched the tape recorder off and recorded the details on paper. A few contacted me after the interviews with identifying information such as a bed number or name. This information was then used to identify a sample of the mistakes reported by the informants.

11.1 Accessing and retrieving the medical records

A protocol was developed for accessing the medical records to cover both the confidentiality of patients and the informants and to ensure compliance with the hospital requirements for accessing information about adverse events. The hospital has a chart and medical record review process for flagging problems in patient care. This process has qualified privilege and as such is not subject to legal disclosure. A condition of my study was that the independent validation of selected cases would not be discoverable through a legal process. To comply with this requirement I elected to use the existing privileged processes.

11.2 Using identifying data to access the medical records

Eighteen of the 57 mistakes[xix] described were selected for independent validation because there appeared to be sufficient information to enable the patient to be identified. But the data in seven cases did not match any records or there was insufficient identifying information to permit retrieval despite much searching. This may have been due to doctors' concerns about confidentiality causing some doctors to change some of the patient characteristics when describing an adverse event. For example, they may have changed the sex or age of the patient in telling the narrative of the mistake. A final 11 mistakes could be linked with medical records. In each of these 11 cases, the medical records corroborated that the patient as described by the informant existed. The reviewers said that in one case the medical records did not document the adverse event but they confirmed the existence of the patient and all aspects of their hospitalisation.[xx]

A specialist physician (gastroenterologist) with expertise in quality and safety and the manager of the quality assurance program who has postgraduate qualifications separately reviewed the medical records to corroborate the informants' narratives of the adverse events. The junior doctors' narratives of the adverse events were provided to the reviewers. They completed a questionnaire

---

[xix] The informants described a total of 81 mistakes. I examined 57 of these mistakes in-depth. (See Chapter Five)
[xx] Intern 14

for each of the adverse events described by the informants and checked the medical records to confirm or dispute the narratives described by the informants. This was the sole use of the information provided by the reviewers.

Endnotes for Chapter Four

1. Taylor SJ, Bogdan R. *Introduction to qualitative research methods: The search for meanings.* New York: John Wiley and sons, 1984.
2. Collecting data by in-depth interviewing. British Educational Research Association Annual Conference; 1999; University of Sussex Brighton.
3. Britten N. *Qualitative research in health care.* 2nd ed. London: British Medical Journal Books, 2000.
4. Schultz A. *Collected papers, Vol. 1: The problem of social reality.* The Hague: Martinus Nijhoff, 1962.
5. Minichiello V, Aroni R, Timewell E, Alexander L. *In-depth interviewing.* Melbourne: Longman Cheshire, 1990.
6. Lee RM. *Doing research on sensitive topics.* London: Sage publications, 1993.
7. Sweet MP, Bernat JL. A study of the ethical duty of physicians to disclose errors. *The Journal of Clinical Ethics* 1997;8940:341-8.
8. Vincent C, Stanhope N, Crowley-Murphy M. Reasons for not reporting adverse incidents: an empirical study. *Journal of Evaluation in Clinical Practice* 1999;5:13-21.
9. Wu AW, Folkman S, McPhee SJ, Lo B. Do house officers learn from their mistakes? *Journal of the American Medical Association* 2000;265:2089-2094.
10. Novack DH, Detering BJ, Arnold R, Forrow L, Ladinsky M, Pezzullo JC. Physicians' attitudes towards using deception to resolve ethical problems. *Journal of the American Medical Association* 1989;26(20):2980-6.
11. Green M, Farber NJ, Ubel PA, Mauger DT, Aboff BM, Sosman JM, et al. Lying to each other: When internal medicine residents use deception with their colleagues. *Archives of Internal Medicine* 2000;160:2317-23.
12. Penson RT, Svendsen SS, Chabner BA, Lynch TJ, Levinson W. Medical mistakes: A workshop on personal perspectives. *The Oncologist* 2001;6(1):92-9.
13. Levinson W, Roter D, Mullooly JP, Dull VT, Frankel RM. Physician-patient communication: The relationship with malpractice claims among primary care physicians and surgeons. *Journal of the American Medical Association* 1997;277(7):553-9.
14. Newman MC. The emotional impact of mistakes on family physicians. *Archives of Family Medicine* 1996; 5:71-5.
15. Christensen JF, Levinson W, Dunn PM. The heart of darkness: the impact of perceived mistakes on physicians. *Journal of Internal Medicine* 1992;7:424-31.
16. Stacey M, Editor. *Comparability in social research.* London: Heinemann Educational for the British Sociological Association and the Social Science Research Council, 1969.
17. Joint Commission on Accreditation of Healthcare Organizations. *What Every Hospital Should Know About Sentinel Events.* Oakbrook Terrace III: Joint Commission on Accreditation of Healthcare Organizations, 2000.
18. Moray N. Error reduction as a system problem. In: Bogner MS, editor. *Human Error in Medicine.* Hilldale,NJ,USA: Lawrence Erlbaum Associates, 1994:67-91.
19. Vincent C, Taylor-Adams S, Stanhope N. Framework for analysing risk and safety in clinical medicine. *British Medical Journal* 1998;316:1154-7.
20. Ammerman M. *The root cause analysis handbook:a simplified approach to identifying,correcting and reporting workplace errors*: Productivity Inc., 1998.
21. De Rosier J, Stalhandkse S, Bagian JP, Nudell T. Using health care failure mode and effect analysis. *The Joint Commission Journal on Quality Improvement* 2002;27:248-67.
22. Reason JT. *Human Error.* New York: Cambridge University Press, 1990.
23. Joint Commission on Accreditation of Healthcare Organizations. Reporting of medical/health care errors: A Position Statement of the Joint Commission on Accreditation of Healthcare Organizations, 2003.
24. National Center for Patient Safety. NCPS Triage Cards for Root Cause Analysis: National Center for Patient Safety, 2001.
25. Vincent C, Taylor-Adams S. *The investigation of and analysis of clinical incidents*: British Medical Journal Books, 2001.
26. Thomas E, Brennan T. Errors and adverse events in medicine: An overview. In: C Vincent, editor. *Clinical Risk Management: Enhancing patient safety.* London: BMJ Books, 2002:33.

27. Rosenthal MM. How Doctors think about medical mishaps. In: Rosenthal MM, Mulcahy L, Lloyn-Bostock S, editors. *Medical Mishaps Pieces of the puzzle*. Buckingham: Open University Press, 1999:143.

28. Fox RA, Ingham Clark CL, Scotland AD, Dacre JE. A Study of pre-registration house officers' clinical skills. *Medical Education* 2000;34(12):1007-12.

29. Novack DH, Suchman AL, Clark W, Epstein RM, Kaplan C. Calibrating the physician: Personal awareness and effective patient care. *Journal of the American Medical Association* 1997;278(6):502-9.

30. Marel GM, Lyon PM, Barnsley L, Hibbert E, Parise A. Clinical skills in early postgraduate medical trainees: Patterns of acquisition of confidence and experience among junior doctors in a university teaching hospital. *Medical Education* 2000;34:1013-5.

31. Harrison B. Review of Adverse Events Identified by the Quality in Australian Health Care Study Categorised as Failure to Act on Available Information. Masters of Public Health. University of Sydney, 1999.

32. Reason JT. *Managing the Risks of Organisational Accidents*. Aldershot, Hampshire, England: Ashgate Publishing Ltd, 1997.

33. Baldwin PJ, Dodd M, Wrate RM. Young Doctors' Health: How do working conditions affect attitudes,health and performance? *Social Science and Medicine* 1997;45(1):35-40.

34. Guly HR. Diagnostic errors in an accident and emergency department. *Emergency Medicine Journal* 2001;18:263-79.

35. Black N, Thompson E. Obstacles to medical audit: British doctors speak. *Social Science & Medicine* 1993;36(7):849-57.

36. Finkelstein D, Wu AW, Holtzman NA, Smith MK. When a physician harms a patient by medical error: ethical, legal and risk management considerations. *Journal of Clinical Ethics* 1997;8:330-5.

37. Richards L. *Qualitative Solutions and Research NUD*IST Introductory handbook*. Melbourne, 1998.

38. Postgraduate Medical Council of New South Wales. *Internship Directory 2000 Directory of primary allocation centres and application information*. Sydney, 1999 July.

Chapter Five: Results

Mistakes and Factors

1   Overview of the mistakes described

When I first asked the informants to describe a mistake they had experienced or observed, 11 doctors said they could not recall any mistakes, but the 32 informants went on to describe a total of 81 mistakes. This suggests the language used to discuss mistakes is under-developed and poorly understood by junior doctors. They tended to use words such as 'stuff-ups' to describe their mistakes. The following quote captures one resident's view of errors

'I can't think of many significant mistakes that I have been involved in because there may be many that you wouldn't even know about. There are a lot of things that happen that you might not realise have taken place. I would not expect to be told about a mistake unless it was very serious; the mistakes I know about are the ones that have led to significantly bad outcomes to patients. The fact is you move on from mistakes very readily. I remember when someone dies or has had a stroke which is quite devastating, ones that will become good stories in years to come. The other ones like the one that just happened today, there are always little errors, you might write the wrong dose on their med chart or forget to chart something or little things like that. They often happen.' RMO (21)[i]

A number of doctors did not know how to define a 'mistake'; whether a bad outcome or a bad experience fitted the definition for a mistake. One intern[ii] said while she was unsure about whether her example was a mistake it scared her so it was worth mentioning. Her case concerned a delayed response to a patient with high serum potassium. The patient died while the intern was administering treatment. The intern further said in describing a second case of missed diagnosis of pulmonary oedema that she was unsure whether the omission was a mistake or something else but that *'it is not really very good'.*

Most informants said a mistake implied that something had 'gone wrong' or that something happened that should not have happened. While three informants referred to possible factors underpinning errors, most of the answers were couched in terms of the individual responsibility of the doctors (and nurses). A consistent theme involved the identification of individuals

---

[i] The number and position of the informant has been inserted after all quotations to track the data but also allow the reader to follow particular informants' responses. I did not do this when I used quotations to emphasise a particular point. For example on page 140.
[ii] Intern (3)

(nurses and doctors) as having primary responsibility for mistakes. These following quotations reflect the focus on personal responsibility.

'I guess the important thing is to differentiate it (mistake) from bad outcomes and in some cases they are always going to have bad outcomes but there are some things that, things go wrong due to our doing.'

'Someone making a mistake, writing down something, to something being omitted.'

'A doctor being involved as opposed to any other health professional.'

'Someone did wrong that could probably have been avoided.'

'A bad outcome that could have been avoided by appropriate intervention.'

'A compromise of patient care, standard of care expected from either medical staff or nursing staff.'

No one denied that errors occurred in hospitals. Twenty-nine of the 32 (91%) doctors interviewed said that mistakes are common or very common. Sixteen said the mistakes are common, 13 said they are very common with two saying they are uncommon. One resident stated '*I think (mistakes) are a lot more common than people like to admit.*'[iii] Other doctors made similar statements about frequency of mistakes. One intern[iv] who said he did not think mistakes were common clarified his answer '*I am sure there are mistakes, I just personally haven't been involved in them or seen them generally.*' One resident in reply to the question about the frequency of mistakes said:

'Pretty common, I would only be speculating at numbers. They happen all the time, let's be honest. Whether or not there are any outcomes is obviously much less common, because it usually takes more than one mishap necessarily to create a problem. It is the disasters we hear about but not the day-to-day lots of little holes.' RMO1 (29)

There was no response to the question from one interviewee. While no one used blame language about the causes of mistakes and adverse events most feared being blamed for their own mistakes. An exploration of informants' understanding of medical mistakes showed they mostly referred to their limited medical knowledge, the place where the mistake occurred, interactions with other health workers, bad patient outcomes, and ranking of the mistake into minor and serious.

[iii] RMO1(26)
[iv] Intern (9)

2   Total mistakes described by interns and residents

All 32 informants[v] reported at least one medical mistake they had experienced or observed. Interns and residents described a total of 81 mistakes. Of these 69 (85%) directly involved the informants and 12 (15%) were mistakes described by informants who said they were not directly involved. Before the interviews started I told informants they could discuss their mistakes in the third person. The higher-than-expected self-disclosure suggests willingness to disclose mistakes in a safe environment.

Eight of the 32 informants, when asked if they had experienced or observed a mistake in the last six months, at first said they could not remember. As the interview progressed they all recalled mistakes. (Doctors are not required to remember or analyse mistakes within an improvement framework, which may explain the delayed mistake narratives.) Some may have been cautious because of the sensitivity of talking about mistakes. Once reassured of the context for the interview they may have felt more comfortable discussing mistakes. Another trend in the interviews was for informants to describe toward the end of the interview the mistake that concerned them most. This may be because they felt more comfortable.

The 81 mistakes occurred in the metropolitan hospital and district hospitals. Table 5.1 lists the categories of mistakes described by informants. The mistakes comprised four categories: (1) **medication errors** (2) **diagnosis** (3) **treatment** and (4) **patient management**. Mistakes involving incorrect or delayed treatment were the largest category followed by diagnostic mistakes, medication and patient management errors.

---

[v] The informants comprised Interns, RMO1 and RMO2 medial officers. An Intern is a doctor in their first year since graduation. RMO1 is a Resident Medical Officer in their second year. An RMO2 is a Resident Medical Officer Year 2. (3 years since graduation)

Table 5.1: Number and category of mistakes described

Category	Sub-category	Number	Total Number	Percentage
Medication errors	Incorrect drug Incorrect dose (including 2 wrong patients).	10 6	16	20%
Diagnosis	Incorrect/missed diagnosis. Delayed diagnosis.	14 8	22	27%
Treatment	Delay in treatment. Incorrect treatment (including 3 wrong patients).	16 15	31	38%
Patient management	Assortment of monitoring, reporting, discharge, wrong tests.	12	12	15%
TOTAL		81	81	100%

Seven informants identified one mistake each, ten identified two, nine identified three, three identified four and three identified five making a total of 81 mistakes. Fifty-seven (70%) of the 81 mistakes were analysed because the informants remembered sufficient detail to enable examination of the underlying factors involved. (Of these, ten informants identified one each, 13 identified two mistakes, and seven identified three mistakes.) The remaining 24 mistakes not analysed are mistakes described by informants in answer to general questions or had insufficient detail to permit further examination. These mistakes are in italic in Table 5.2. The cases selected for analysis of underlying factors are in standard type face.

Table 5.2: Total Mistakes: position type of mistake, experience
1 Cases described but not analysed in *italics* (24 mistakes)
2 Cases for analysis of factors in standard type face (57 mistakes)

Identifier	Respondent	Number of mistakes described	Types of mistake	Observer or experienced
1	Intern	3	*Incorrect drug provided (beta blocker).* Incorrect diagnosis (missed bowel obstruction). *Delay in treatment (delay in fluid restriction).*	Own experience. Own experience. Own experience.
2	Intern	1	*Incorrect treatment (removal of femoral line).*	Own experience.
3	intern	2	Misdiagnosis (pulmonary oedema). Delay in treatment (high potassium reading).	Own experience. Own experience.
4	intern	5	Incorrect medication given.	Observed.

			Incorrect medication (penicillin when patient allergic).	Observed.
			Unnecessary hospitalisation.	Observed.
			Inappropriate invasive procedures at end of life (nasogastric tube).	Observed.
			Incorrect fluid measures.	Observed.
5	intern	5	*Incorrect dose.*	Own experience.
			Surgical mishap-ileoscopy.	Own experience.
			Incorrect flushing white cell filter.	Observed.
			Incorrect treatment (wrong site chest drain).	Observed.
			No post-operative management plans.	Own experience.
6	RMO1	1	Delayed diagnosis of surgical problem.	Own experience.
7	RMO1	4	Medication not given.	Own experience.
			Medication given to wrong patient.	Own experience.
			Incorrect dose of medication.	Own experience.
			Misdiagnosis (myocardial infarct).	Own experience.
8	intern	2	*Delayed treatment.*	Own experience.
			Lack of monitoring pre-operatively.	Own experience.
9	intern	1	*Delayed treatment (high potassium level).*	Observed.
10	intern	3	Medication given to wrong patient	Own experience.
			Delayed diagnosis (endocarditis and sepsis).	Own experience.
			Delayed treatment.	Own experience.
11	RMO1	3	*Incorrect dose of beta blocker- read 500 for 50 mg.*	Own experience.
			Misdiagnosis of obstructive airways disease.	Own experience.
			Incorrect treatment (no anticoagulants given-pulmonary embolism).	Own experience.
12	intern	3	Delay in treatment and test results.	Own experience.
			Wrong tests and consultation.	Own experience.
			Nil information and delays in management.	Own experience.
13	RMO1	2	Delay in attending cardiac arrest.	Own experience.
			Incorrect dose (gentamycin-kidney failure).	Observed.
14	intern	1	Delay in treatment (dehydration, renal failure).	Own experience.
15	RMO1	2	Delayed diagnosis (broken hip).	Own experience.
			Delayed treatment in ED (renal and cardiac failure).	Own experience.
16	intern	2	*Incorrect medication.*	Own experience.
			Inadequate discharge.	Own experience.
17	intern	2	Wrong diagnosis (no blood gas done).	Own experience.
			Delay in cannula insertion.	Own experience.
18	RMO1	1	Incorrect treatment (premature removal of drain).	Own experience.
19	RMO2	4	Misdiagnosis (fracture).	Own experience.
			Misdiagnosis (too much oxygen).	Own experience.
			Delay in diagnosis (test delay after hours).	Own experience.
			Incorrect treatment (no medication).	Own experience.
20	RMO1	3	Misdiagnosis (pneumothorax).	Own experience.
			Delay in diagnosing (infarct).	Own experience.
			Delay in treatment (stroke).	Own experience.
21	RMO1	4	Delay in treatment (low potassium).	Observed.
			Incorrect treatment (stroke patient).	Observed.
			Incorrect treatment (wrong patient on heparin management).	Own experience.
			Incorrect treatment (anticoagulation medication to wrong patient).	Own experience.
22	RMO1	3	Incorrect medication (aspirin).	Own experience.
			Delayed diagnosis (renal failure).	Own experience.
			Incorrect treatment (defibrillator not available).	Own experience.

23	RMO2	2	Misdiagnosis (tortion of the testes).	Own experience.
			Failure to document history in notes in ED.	Own experience.
24	RMO1	2	Misdiagnosis (of malnutrition).	Own experience.
			Delayed treatment (nil nasogastric feed tube).	Own experience.
25	Intern	2	*Incorrect prescribing (penicillin).*	Own experience.
			Misdiagnosis (ed delay in tests).	Own experience.
26	RMO1	1	Incorrect treatment (patient in atrial fibrillation).	Own experience.
27	RMO1	3	Delayed diagnosis (hypertension and septic shock).	Own experience.
			Delayed treatment (very sick patient- inexperienced dr).	Own experience.
			Incorrect treatment (central line insertion).	Observed.
28	RMO1	5	*Incorrect dose (ACE inhibitor 100 mg instead of 28 mg).*	Own experience.
			Incorrect fluids.	Own experience.
			Misdiagnosis (fistula).	Own experience.
			Incorrect diagnosis (respiratory rate of 40).	Own experience.
			Incorrect treatment (wrong patient).	Own experience.
29	RMO1	3	Delay in diagnosis (spinal patient).	Own experience.
			Delay in treatment (surgery).	Own experience.
			Delay in treatment (high potassium).	Own experience.
30	RMO2	1	Delay in treatment (infected central line).	Own experience.
31	RMO2	3	*Incorrect dose (sotelmol).*	Own experience.
			Misdiagnosis (post operative internal bleed).	Own experience.
			Delay in surgery.	Own experience.
32	Intern	2	*Incorrect treatment (diabetic patient in ED).*	Own experience.
			Delay in treatment (test result delay).	Own experience.

2.1   Examining the underlying factors in the mistakes for in-depth analysis

I discussed 57 mistakes in detail with the interns and residents. The mistakes and the underlying factors that are examined in detail are listed in Table 5.3 below. The underlying factors associated with their mistakes were identified by the informants from a list provided to them. Each was asked to nominate the factors they thought were present at the time of the mistake. (See appendix 2, pages 7 and 8 for a list of the factors).

Table 5.3: 57 Cases for analysis: category of mistake, location, patient condition and patient outcome

Identifier	Position	Type of mistake	Location	Condition of patient – (pre mistake)	Outcome for patient (post mistake)
1	Intern	Incorrect drug given from day of admission to discharge. (Beta blocker given instead of anti depressant.)	Ward-about to be discharged.	Stable.	No adverse outcome.
		incorrect diagnosis (missed bowel obstruction).	Surgical ward in peripheral hospital.	Patient had dementia and fracture of neck of femur. Very sick.	Died.
3	intern	Misdiagnosis (pulmonary oedema).	Ward-intern on overtime.	Surgery two hours previously- Patient for discharge with wheezes in chest.	Extra few days in hospital-discharged.

		Delay in treatment (high potassium reading).	End of overtime shift on ward.	Very sick patient-high potassium level. Very slow breathing.	Died in ICU.
4	intern	Incorrect medication given-given anti hypertension medication instead of calcium tablets.	Emergency Department.	Worsening creatinine level: generally very sick patient with lot of medical problems (cardiac failure, diabetes, coronary and renal impairment).	Returned to previous level of functioning.
		Incorrect treatment (Inappropriate invasive procedures at end of life)	Geriatric Ward.	Terminally ill with end-stage Parkinson's disease. Patient did not want a PEG (percutaneous endoscopic gastrostomy) - pulled out.	Pulled PEG out and bled to death.
		Incorrect fluid measures.	Ward-overtime on night duty.	Patient hyponatremic (122) - on wrong fluids.	Extended length of stay.
5	intern	Wrong treatment (surgical mishap-Ileostomy).	Base hospital.	Pain and no urine output. Showed signs of peritonitis and infection around the ileostomy site.	Return to theatre and additional length of stay.
		Incorrect flushing white cells filter with saline.	Surgical ward on night shift.	Patient had splenectomy and required blood transfusion. Unwell nauseous and fever.	Stable extended length of stay.
		No post operative management plans.	Spinal ward.	Patient with ankylosing spondylitis – slipped fixation.	No permanent neurological defect. Extended length of stay.
6	RMO1	Delayed diagnosis of surgical problem.	Medical ward and ICU.	Patient with infiltrative lung disease. Unwell post - operatively.	Died.
7	RMO1	Medication not given.	Surgical ward.	Very unwell patient with numerous complications post surgery. Infected graft and on long term antibiotics.	No ill effects.
		Medication given to wrong patient. Intravenous antibiotics (right patient, missed out on antibiotics).	Surgical ward-night shift.	Both patients stable and not too unwell.	No adverse outcome.
		Misdiagnosis (myocardial infarct).	Emergency Department.	Sick patient with chest pains.	Not completely bad but not desirable. Survived the infarct. Extended length of stay.
8	intern	Lack of monitoring pre-operatively.	Surgical ward and theatres.	Diabetic patient on nil by mouth. Having pin and plate for hip.	No adverse outcome-surgery completed on day.
9	intern	Delayed treatment (high potassium level).	Surgical ward.	Patient for elective surgery.	Died.
10	intern	Medication given to wrong patient.	Medical ward.	Unwell patient.	No adverse outcome.
		Delayed diagnosis (endocarditis and sepsis).	Peripheral hospital.	Very sick patient.	Heart surgery. Survived. Extended length of stay.
		Delayed treatment.	Ward, ICU.	Elderly patient very unwell.	Unknown to intern.
11	RMO1	Misdiagnosis of obstructive airways disease.	Emergency department in peripheral hospital.	Unconscious came in by ambulance.	Unknown to RMO1.
12	intern	Delay in treatment and test results.	Orthopaedic ward.	Motor vehicle accident victim-Patient with fractured tibia and external fixations, fractured hand – infection.	Clinically stable. Discharged.

		Wrong tests and consultation.	Ward at peripheral hospital.	Patient had chest pain and recent endoscopy-had gastritis.	Discharged.
		Nil information and delays in management.	Ward peripheral hospital.	Patient on warfarin.	Discharged.
13	RMO1	Delay in attending cardiac arrest call (also delay in test ordering)	Peripheral hospital- medical ward Weekend shift.	Very sick patient with chronic airways disease with infected exacerbation.	Died.
		Incorrect dose (gentamycin).	Medical ward.	Patient admitted with normal kidney function.	Acute renal failure. Extended length of stay.
14	intern	Delay in treatment.	Medical ward.	Patient with pneumonia dehydration, renal failure).	Died.
15	RMO1	Delayed diagnosis (broken hip).	Peripheral hospital Emergency Department- medical ward over Christmas.	Complaining of pain, conscious, bit confused and demented.	Extended length of stay in ICU. Transferred to ward.
		Delay in treatment.	Emergency Department.	Sick patient and hypotensive, no urine output Transferred patient with renal failure and cardiac failure.	Extended length of stay Month in ICU on ventilator Returned to ward.
16	intern	Inadequate discharge.	Orthopaedic ward.	Interstate Patient – had surgery for fracture.	Discharged without x-rays and reports.
17	intern	Wrong diagnosis (no blood gas done).	General ward in peripheral hospital.	Very sick elderly patient with pneumonia.	Died in ICU.
		Delay in cannula insertion.	Gastro ward.	Patient with metastases and limited life expectancy - months. Vomiting blood.	Died.
18	RMO1	Incorrect treatment (premature removal of drain).	Ward.	Child patient.	No adverse outcome.
19	RMO2	Misdiagnosis (fracture).	Peripheral hospital Emergency Department	Patient had a fall, nauseous and no neurological symptoms.	No adverse outcome.
		Misdiagnosis (too much oxygen).	Respiratory Ward.	Patient with chest infection and chronic retention of CO2.	Extended length of stay in ICU and ward.
		Incorrect treatment (no medication).	Emergency Department.	Patient with infected exacerbation of Chronic Airways Disease.	Extended length of stay. No adverse outcome.
20	RMO1	Misdiagnosis (tension pneumothorax).	Orthopaedic Ward.	Patient had numerous orthopaedic problems. Hip replacement turned septic. Short of breath.	Arrested. Extended length of stay.
		Delay in diagnosing (acute myocardial infarct).	Spinal ward.	Patient had stents and percutaneous nephrostomy tubes put in. Obstructed urethra.	Extended length of stay. Recovered.
21	RMO1	Delay in admission and treatment (low potassium).	Upper GI Ward.	Elective patient scheduled for surgery.	Died.
		Incorrect treatment (wrong patient on heparin management).	Emergency Department and ward.	Patient had vertebral artery dissection. Had been anti coagulated started on warfarin and heparin infusion.	No harm done.
22	RMO1	Incorrect medication (aspirin).	Peripheral hospital- Emergency Department – Ward.	Patient due for surgery –urinary tract infection.	Surgery proceeded with no adverse outcome.

		Delayed diagnosis.	Emergency Department.	Patient had pneumonia. Renal failure.	Extended length of stay in gastric ward. No adverse outcome.
		Treatment (defibrillator not available).	Rehabilitation Ward.	Elderly Patient rehab after fractures.	Died.
23	RMO2	Misdiagnosis (torsion of the testis). Failure to document history in notes in ED.	Emergency Department.	Young boy in pain.	Delayed surgery. Recovered.
24	RMO1	Misdiagnosis (of malnutrition).	Orthopaedic Ward-weekend.	Post operative due to fractured femur in very unwell patient - vomiting, weight loss, dumping syndrome from previous stomach cancer.	Transferred to ICU. RMO does not know outcome.
		Delayed treatment (nil nasogastric feed tube).	Head and Neck Ward.	Difficult and confused patient with oral cancer had trachea tube.	No food for 4 days. Tube reinserted.
26	RMO1	Incorrect treatment.	Emergency Department Base hospital.	Patient with recent onset stroke having atrial fibrillation.	Extended length of stay.
27	RMO1	Delayed diagnosis (Hypertension and septic shock).	Surgical ward.	Very unwell patient vomiting.	Unknown to RMO.
		Delayed treatment.	Peripheral Hospital Intensive Care Unit.	Patient unwell in pre respiratory arrest situation.	Died.
		Incorrect treatment (Central line insertion into artery).	Peripheral Hospital Intensive Care Unit.	Unwell patient in Intensive Care Unit.	No adverse outcome.
28	RMO1	Misdiagnosis (fistula).	Surgical Ward Peripheral Hospital.	Patient with adhesions to bowel- Post operative surgical complications-in hospital for months.	Extended length of stay. After 3 months transferred to teaching hospital and surgery corrected- discharged home.
		Incorrect treatment. (Wrong patient).	Peripheral Hospital Intensive Care Unit.	Sick patient post cardiac arrest with uncontrollable seizures 2nd patient with perforated duodenal ulcer and fitting.	Died.
29	RMO1	Delay in diagnosis.	Emergency Department- Spinal Ward.	Spinal patient admitted with hypothermia, low platelet count.	Extended length of stay. No adverse outcome.
		Delay in treatment. (surgery).	Spinal Ward.	Patient had thoracic spine fracture.	Extended length of stay.
30	RMO2	Delay in treatment. (infected central line).	Surgical Ward.	Patient had complicated burns and two central lines inserted.	Extended length of stay.
31	RMO2	Misdiagnosis (post operative internal bleed).	Gastro ward.	Patient post operative with abdominal pain.	Died.
		Delay in surgery.	Pre - arranged admission to Renal ward.	Patient had problem with fistula.	Discharged without surgery.
32	Intern	Delay in treatment (test result delay).	Surgical ward.	Patient in accident. Fractures.	No adverse outcome.

3   Overview of factors underlying the mistakes

3.1   Location

The following Tables 5.4 and 5.5 show the places where mistakes occurred.

Table 5.4: Location within hospital of mistakes reported by interns, RMO1s and RMO2s

Metropolitan teaching hospital

Area	Intern	RMO1	RMO2	TOTAL
General Ward	5	1		6
Emergency Department	1	5	2	8
Geriatric ward	1	1		2
Surgical ward	4	3	1	8
Orthopaedic ward	2	2		4
Spinal ward	1	2		3
Medical ward	2	2		4
Gastro ward	1	1	1	3
Renal ward			1	1
Respiratory ward			1	1
Head and neck ward		1		1
Total	17	18	6	41

Table 5.5: Location within hospital of mistakes reported by interns, RMO1s and RMO2s

Peripheral hospitals

Area	Intern	RMO1	RMO2	TOTAL
General ward	4			4
Emergency department	3	3	1	7
Medical ward		1		1
Intensive care unit		3		3
Surgical ward		1		1
Total	7	8	1	16

3.1.1 Mistakes in the teaching hospital

Forty-one (71%) mistakes of the 57 occurred in the teaching hospital:
Emergency Department (eight), surgical ward (six) spinal ward (five) medical ward (four) orthopaedic ward (four) gastro ward (three) respiratory ward (one) rehab and geriatric ward (two) renal ward (one) head and neck ward (one) unspecified ward (six). Informants identified the ED and the surgical wards as very busy terms. The cluster of mistakes in these two areas is therefore not unexpected.

3.1.2 Mistakes in the peripheral hospitals

The remaining 16 (29%) mistakes occurred in the peripheral hospitals. Within this group six occurred in a general medical ward, five in the Emergency Department, three in an Intensive Care Unit and two in a surgical ward (one orthopaedic). The informants said the lack of availability of senior clinicians after hours had an impact on their clinical experience and contrasted to their experience in the teaching hospital where they had more ready access to senior staff.

Three themes emerged from the analysis of location. The first related to the problems associated with inadequate supervision in the peripheral hospitals. The second related to the Emergency Department's role as entry point for many patients and third related to the obtaining out-of-department consultations for patients who require review and consultation from clinicians in other areas of the hospital.

3.1.3 Supervision in the peripheral hospitals

Informants in the peripheral hospitals reported being left alone in responsible positions with insufficient experience and support. Planned teaching commitments of supervisors and scheduled leave for clinical staff were two explanations for this. The five quotations below reflect the general attitude to supervision in district hospitals.

'You are in the country - obviously there is not much staff around.' Intern (5)

'It took place in a peripheral hospital; I was the only person on duty in the Emergency Department and there were no relatives with the patient. She was unconscious. After admission she got intubated and then she went up to the ward.' RMO1 (11)

'I was newly graduated and at a smaller hospital. On overtime there tends to be one intern and one registrar, which makes the workload for an intern high. There is only one junior staff on a weekend and one registrar.' RMO1 (13)

'It was a district hospital. During the holiday period, the nursing homes have a fairly low threshold to send someone to the hospital if they feel that something's wrong. The patient was in the ED for probably half a day. The x-ray was finally done on his hip after 4 days'. RMO1 (15)

'It's intimidating being left in charge at nights. Apart from ringing the consultant there's not a lot of other support. The nurses look to you even though they're experienced.' Intern (8)

Interns and residents also had positive experiences in the peripheral hospitals: increased opportunities for hands-on-learning and being more engaged members of the team. These following quotations express the thoughts of many informants.

'The ICU unit (at the peripheral hospital) encourages residents to do practical stuff, and get experience which we don't get to do very much at (the teaching Hospital) because there are ten registrars before you who are very keen.' RMO1 (27)

'You get more support at a peripheral hospital than at the teaching hospital where you're a lot on your own. At the smaller hospital you help each other out, even with other medical teams. They will always give you a hand if you are out of your depth or whatever.' Intern (25)

3.1.4 The Emergency Department

A number of mistakes occurred in Emergency Departments, which is surprising given the policy of 24-hour cover by experienced clinicians. The need for adequate supervision in the ED is widely recognised. Informants recognised the need for supervision and when they were left unsupervised in the ED referred to the policy not to leave inexperienced doctors unsupervised. One intern and six residents (four RMO1s and two RMO2s) described mistakes in the ED. The ED was identified by informants as very busy, chaotic and where mistakes are likely to happen. They also sourced it as the start of many problems which later manifested on the ward. The following edited quotations give the flavour of some of the attitudes expressed about the ED.

'When I was an intern working in the emergency department a lady came in with chest pains and she received immediate treatment. I initially diagnosed it as unstable angina but it turned out to be a myocardial infarct. It was a misdiagnosis, but we did get the diagnosis in the end but it was delayed which is important in myocardial infarctions.' RMO1 (7)

'As an intern in emergency you get to form your own opinions first and then run things by the registrars and seek their direction. On the wards you are mainly clerking. I'm a lot more like a doctor here. I think this is a better learning environment that the other wards. You have to start thinking for yourself. You don't really have to be concerned that people are going to pick your mistakes before you misdiagnose or not enough experience or whatever but it's up to yourself and you can think as much as you want. There is more opportunity to learn from experience as well as from the other doctors.' Intern (10)

'I think medication errors are common for patients (who) come in through ED.' RMO1 (13).

'A patient was transferred to neurosurgery via our ED from (a town) in western NSW and unfortunately this gentleman arrived in the early hours of the morning where he sat for about 8-9

hours. By the time he got to our ward he was very sick with renal failure and cardiac failure. I felt he had been dumped on our ward by the ED without them sorting anything out in the hours that they had him down there.' RMO 1 (15)

'The emergency department is more prone to transcription errors and failure to follow up on tests. They could also start treatment a lot earlier. They are also very busy.' RMO2 (19)

3.1.5 Out-of-Department Consultations

Problems for JMOs obtaining consultations from other departments and specialty areas in the hospital (referred to as out-of-department consultations) included unavailability of clinicians because they were in theatre, difficulty in convincing other specialists of the urgency, poor responses to junior medical officers' request for consultations, difficulties with coordination of such requests, difficulties recognising the primary responsible clinicians[vi], problems with continuity of care and delays in specialist consults causing problems in patient management and pressure on beds. The following quotations from residents highlight that the problem is not only associated with interns unfamiliar with ward routines, hospital structure and hierarchies.

'We had three registrars at that point and we consulted the surgical registrar and it was difficult to get that surgical registrar to come to review the patient.' RMO1 (6)

'The work environment includes the problem of the teams having to come outside their own area for a consult. This is a difficulty to encounter, because nobody likes to work harder when you don't have to. The hospital requires patients to be looked after in the speciality of the area, so we are getting many specialists (for each patient) and who coordinates it all is a real problem' RMO1 (20)

'With conjoint admissions somebody still needs to take ultimate responsibility for the overall management, somebody needs to call the shots.' RMO 1 (20)

'If somebody performs an operation on a patient they should be following that patient up during the peri and post operative period. I think in practice that doesn't happen. This causes communication difficulties or delays in actually getting some consultations.' RMO1 (29)

'People don't like moving out of their own comfort zone. It gets continually talked about. It is an issue for the NUM of the ward and the nursing staff, because they don't know who to call and they are going through whatever avenues they can. It is on a case-by-case basis rather than looking at prevention.' RMO1 (29)

'Consultants from different specialities have a reputation for not coming to see the patient for a week. Medically it's difficult for us. But we can't do much about that.' RMO1 (29)

[vi] This occurred when many specialists were involved in treating the patient.

3.2 Situation at the time of mistakes

Before I asked each doctor about the possible factors surrounding each of the mistakes I questioned them about the general situation on the ward/area at the time of the mistake. Time of the event (weekends, nights and overtime), the workload and inadequate staff were constant themes. Table 5.6 lists the most significant general features identified by the doctors. All but one doctor talked about the impact of workload on their capacity to attend to all their work demands.

'In a peripheral hospital I was left without proper cover. The registrar was away on study leave and other registrars are meant to cover. The consultant is meant to provide more cover. This didn't happen and essentially we had a very, very sick guy in his fifties. We didn't know what was going on.' Intern (10)

'Mishaps happen when things are busy. And when you are rushing and when you are tired or someone is away. When the registrar is away it makes the chain a bit more broken. There is not adequate back up for when someone is away which creates a busy or an abnormal situation.' RMO1 (29)

Table 5.6: General situation and position of doctors

Situation	Intern factors	RMO1 factors	RMO2 factors	Total factors
Inadequate staffing.	4 (registrar absent/not available) 4 1 (consultant unavailable/not helpful) (total 9)	3 (registrar absent/ not available) 3 1 (consultant unavailable) (total 7)		16
New staff/agency staff.		1		1
Out of normal hours.	6 weekends 3 night duty 2 overtime (total 11)	4 weekends 5 night duty (total 9)	1 weekend 1 night duty (total 2)	22
Holidays/theatres closed.		1		1
Patient Factors (very sick patient) (Language).	6	6	1	13
Discharge process.	2			2
Ward allocation.	1 (patient in different wards)			1
Workload.	6	10	1	17
Inadequate communication about tests, instructions, patient condition.	5	5		10
Emergency Dept. Delay in admission to ward.	1	3		4
Intimidation by consultant.	1			1
Out of ordinary pathway/admission.		1	2	3
	42	43	6	91

3.3 Outcomes of care for the patients

Table 5.3 above sets out the outcome of the care provided to patients. Twenty patients (36%) had an extended stay in hospital, 19 (34%) suffered no

adverse outcome and 13 (23%) died. The outcomes were not known for four (7%). Of the 13 patients who died, a number were very sick with significant co-morbidity. There was no attempt to directly link the death with the mistake, even though in many instances the mistake was seen as a significant factor in the patient's demise. Table 5.7 below describes the number of deaths and the category of mistakes associated with the deaths.

Table 5.7: Position, number of mistakes involving patient deaths, category of mistake reported by interns, RMO1s and RMO2s

Position	Number of mistakes involving deaths	Category of mistake
Interns	6	2- Incorrect diagnosis. 3 - Delay in treatment. 1- Incorrect treatment.
RMO1	6	1- Incorrect treatment. 4 -Delay in treatment. 1- Delayed diagnosis.
RMO2	1	1-Misdiagnosis.
Total	13	13

Nine (69%) of the 13 deaths[vii] involved treatment mistakes (treatment delay (seven) and incorrect treatment (two)). Four involved a problem with diagnosis (two incorrect diagnoses, one misdiagnosis and one delayed diagnosis).

Table 5.8: Position, number of mistakes involved in extended length of stay reported by interns, RMO1s and RMO2s

Position	Number of mistakes involving Extended length of stay	Category of mistake
Intern	6	1- Misdiagnosis. 4- Incorrect treatment. 1- Delayed diagnosis.
RMO1	11	3- Misdiagnosis. 4- Delayed diagnosis. 2- Incorrect treatment. 2 -delayed treatment.
RMO2	3	1- Misdiagnosis. 1- Incorrect treatment. 1- Delayed treatment.
Total	20	20

Ten of the 20 mistakes involving an extended length of stay in hospital related to treatment mistakes and the remaining ten related to diagnostic problems.

[vii] Two doctors reported the same mistakes involving a death. It has been counted only once.

4   Factors perceived as contributing to mistakes

4.1   Overview

The factors described by interns and residents are categorised into four domains: **Junior medical officer factors** (medical knowledge and skill, interpersonal relationships, ability to work in teams, communication skills and power relationships); **Patient factors** (complexity and severity of illness, age, gender, language spoken at home); **System factors** (degree of supervision, organisation of work, work environment, location/situation, hospital) and **External factors** (state laws, regulations, cost containment , professional standards, industrial activity).[viii]

After each doctor finished telling the narrative of the mistake I asked whether any factors listed in Table 5.9 were present. This table sets out the number of times a factor was identified as contributing to the mistake being described. I then grouped the factors into one of the four domains listed above and set out in Table 5.10. At the end of the discussion about all the factors involved in the mistake I asked the doctor to nominate what they saw as the main factor contributing to the mistake. Table 5.11 sets out the informants' choices of the main factors in the mistakes.

Table 5.9: Summary of individual factors, position and the main factor selected by informants.

Factors	Intern	RMO1	RMO2	Total	Main Factor
Junior medical officer factors					
Knowledge and skill	7	13	2	22	18
Communication	12	16	4	32	16
Interpersonal	3	8	1	12	2
Patient Factors					
Patient factors	6	13	2	21	4
System Factors					
Supervision	6	8	2	16	6
Location/situation	16	15	5	36	7
Equipment/technology	0	2	1	3	0
Work environment	4	5	1	10	1
Organisation of work	7	5	0	12	3
Hospital	1	1	0	2	0
External Factors					
Other factors	1	2	0	3	0
Total factors	63	88	18	169	57

[viii] The domains are set out in Chapter Four.

Table 5.10: Factors Domain and position of the informants

Domain	Intern	RMO1	RMO2	Total
Junior medical officer factors	22	37	7	66
Patient factors	6	13	2	21
System factors	34	36	9	79
External factors	1	2	0	3
	63	88	18	169

Table 5.11: Factors Domain and the main factor contributing to mistakes

Domain	Number of Total factors	Percentage of total factors	Main factor	Percentage of main factors
Junior medical officer factors	66	39%	36	63%
Patient factors	21	12%	4	7%
System factors	79	47%	17	30%
External factors	3	2%	0	0%
Total	169	100%	57	100%

Taking all the factors into account the top five factors responsible for mistakes were Location/Situation (36) Communication (32) Knowledge and skill (22) Patient factors (21) and Supervision (16). But when interns and residents were asked to nominate the main factor involved in the mistake a different picture emerges. Knowledge and skill was mentioned most (18) followed by Communication (16) Location/Situation (seven) and Supervision (six) and Patient factors (four).

The 57 mistakes fitted evenly into errors of omission (29) (a failure to do something) and errors of commission (28) (doing the wrong thing or the right thing at the wrong time).

When all the factors were allocated to one of the four domains System factors (79) comprised the largest group followed by junior medical officer factors (66) then patient factors (21) and finally external factors (three). Table 5.12 shows the four domains. When the main factors are grouped into the four domains a different picture emerges. Sixty-three percent of the main factors related to junior medical officer factors ahead of either system factors (30%) or patient factors (7%).

Even though interns and residents identified system factors (47%) most in their general discussion about mistakes when it came to nominating the main factor they overwhelming identified personal (junior doctor) factors as the

main cause. They saw individual responsibility, either through lack of knowledge or skill caused by inexperience, inadequate communication and interpersonal issues as the main causes of mistakes.

Table 5.10 shows that interns, unlike RMO1s and RMO2s, rated system factors (34 of 63 (54%)) most for all factors but as Table 5.12 shows when it came to the main factor they also identified junior medical officer factors most (16 of 23 (70%)). System factors accounted for five of 23 main factors. See Table 5.12 for a breakdown of the domain, position of the informants and their choices of main factors. Table 5.9 shows that RMO1s rated 'junior medical officer' factors most out of all factors (37 of 88(42%)) and also as the main factor but the percentage increased to 57 per cent. Table 5.9 similarly shows that RMO2s rated junior medical officer factors (nine of 18 (50%)) most out of all factors as well as rating it as the main factor in mistakes (four out of the six (67%)). See Table 5.12 below.

Table 5.12: Domain, position of informants and their choice of main factor

Domain	Intern	RMO1	RMO2	Total	Percentage
Junior medical officer factors.	16	16	4	36	63%
Patient factors.	2	2	0	4	7%
System factors.	5	10	2	17	30%
External factors.	0	0	0	0	0%
Total	23	28	6	57	100%

5 Examination of the factors

5.1 Knowledge and Skill

The informants nominated inadequate knowledge and skill as the main cause in 18 of the 57 mistakes (32%). But inadequate knowledge and skill, as causes, comprised only a small percentage of the total factors (22 out of a total 169 factors). Refer to Table 5.9. This table also shows that knowledge and skill comprised 11 per cent of the total factors selected by interns (seven out of 63), 15 per cent of the total factors selected by RMO1s (13 out of 88) and 11 per cent of the total factors selected by RMO2s (two out of 18).

5.2   Supervision

Inexperience was an issue when junior doctors were left in charge of units particularly on overtime or weekends or were requested to perform a procedure for which they had no training. In addition, interns and residents raised inexperience when they were left responsible for very sick patients with insufficient cover from seniors. But even when cover was readily available inexperience by itself remained a factor. One RMO2 [ix] noted that although medical students are not taught how to take blood through a central line, they are required to insert central lines without training and in some cases without supervision. Inexperience was a factor for this intern[x] who described that while she was administering a treatment to a sick patient she was told by the patient's wife that he had stopped breathing. The intern, unsure what to do[xi], left the ward to get the registrar who immediately called an alert and staff rushed to revive him. A pulse was re-established but he died shortly after in the Intensive Care Unit. JMOs saw inexperience as a factor in misdiagnoses particularly when they concentrated on initial diagnoses and failed to look for other presenting symptoms.

'When you find one diagnosis, you tend to concentrate on that and not really look for other things. The ward was busy, so they were happy that I was looking after that patient at that time. I said it is unstable angina because there are changes in the ECG. You can also get changes with a myocardial infarct similar to changes of unstable angina.' RMO1 (7)

'I basically got left dealing with it. We had a very very sick guy in his fifties; we didn't know what was going on' (Intern 10)

Recognising the need for help and asking for it surfaced as distinct issues. Many informants referred to the inevitable situation in which junior doctors do not know what to do. Understandably, interns referred to this more often than RMOs. But both Interns and RMOs referred to the difficulties experienced in accessing senior clinicians or getting timely help.

A central preoccupation of interns was the importance of their ability to recognise very sick patients. The need 'to know' or 'have confirmed' that something was wrong was identified as a significant issue for JMOs

---

[ix] RMO2 (30)
[x] Intern (3)
[xi] The intern did not have the experience or knowledge to know whether to commence resuscitation or not.

requesting help from seniors. Confidence and good communication skills relevant to this task are discussed in sections 5.3 and 5.4.

Competing demands delayed junior doctors requesting assistance. Quick assessments and rushed decisions were associated with mistakes caused by lack of knowledge and skill.

'I had to do a quick assessment of this woman and my verdict was she is not much worse than she was yesterday. She had a chest drain pulled out about 24 hours before. The post chest drain removal x-ray had been done with no recurrence of the tension pneumothorax, but that was about 6 hours post. I requested a mobile x-ray. I listened to her chest and wasn't clinically convinced that she was any better or worse. I wasn't able to say that this lady had a recurrent tension pneumothorax, which again I probably would be able to do now if I saw her, just on clinical grounds.' RMO1 (20)

Inexperience also affected the ability to carry out orders from senior clinicians. Failure to clarify telephone orders for medications and dosages was reported along with failure to clarify other clinical treatments.

'He wrote down the orders clearly and said that if the patient had abdominal pain she would need to be reviewed overnight. The patient did have pain and was reviewed overnight by a person who was junior. They kept giving the patient morphine but the patient was really bleeding from the ERCP site. If the person had bothered to feel the abdomen she would have felt it to be very sore, had rebound.' RMO2 (32)

Some doctors said they felt intimidated when asking registrars and consultants questions about orders or treatments. One intern,[xii] when told to put a patient on triple therapy antibiotics, began to question the registrar about the therapy but was cut short by the registrar terminating the call. The doctor said she was too embarrassed to ask the nurses and became very flustered when she was attempting to look up the medication in MIMS. She found the correct medication but failed to notice that the patient was allergic to penicillin. Another intern recounted the following experience when requested to give a very sick patient calcium chloride because of his high potassium levels.

The informants recognised the limitations of their knowledge and skill as issues when they were not adequately supervised by more senior staff. For that reason it was surprising that there was not more explicit mention of

---

[xii] Intern (25)

inadequate supervision given that improving the quality of supervision was a common strategy identified by interns and residents in their suggestions for improvement.[xiii]

Junior doctors clearly distinguished the quality and availability of supervision at the metropolitan teaching hospital from that available at the peripheral hospitals. Unavailability of senior staff was an issue in both places but more so in the peripheral hospitals. Generally doctors were more favourable in their comments about supervision at the teaching hospital. Favourable comments included the hospital's policy for not relying on interns in the Emergency Department and night rosters and the availability of doctors on the wards.

This contrasted starkly with their experience in the peripheral hospitals where three of the seven (43%) mistakes occurring in the Emergency Department involved an intern. The remaining four involved three RMO1s and one RMO2. Unfavourable comments were also made about the unavailability of doctors in the peripheral hospitals, for example when residents were left to cover all the hospital by themselves. The absence of ward rounds by consultants and unavailability of registrars also received unfavourable mention. One intern said interns and residents are often left unsupervised in the peripheral hospitals due to registrar unavailability because of teaching and other demands.[xiv]

The Emergency Department of the metropolitan hospital was consistently identified as providing good supervision, even though a number of mistakes were identified as occurring in the ED. One intern identified a mistake in the ED with the remaining seven mistakes being identified by five RMO1s and two RMO2s.

An adjunct to supervision was the willingness or capacity of the interns or residents to ask for advice or help. There was a reluctance to call those

---

[xiii] See Chapter Three: What do we know? A review of the literature. Better supervision is a constant theme in feedback forums from junior medical officers to the Postgraduate Medical Council of NSW.
[xiv] Intern (17)

registrars and consultants who did not respond well to questions. Fear of being seen as incompetent either by the nurses or senior clinicians was frequently mentioned. One resident [xv] said that 'approaching' senior staff was a major issue depending on the unit or department. Junior doctors talked about the stress associated with uncertainty of the significance or seriousness of patients' conditions and whether they needed to make telephone calls to consultants. It appears that a lot of time is spent worrying about the reactions of consultants or registrars. The common wish not to appear 'stupid' was significant. They also worried about the impact on future working relationships and career prospects.

One intern[xvi] noted that experienced clinicians were more willing to help interns while junior registrars were reluctant. This was particularly the case when trying to obtain out-of-department consultations.[xvii] Interns and residents had high praise for a small number of consultants who went out of their way to reassure them of their availability and advise them they should ring at any time.

There was a strong correlation between having regular and predictable ward rounds and junior staff feeling supported and supervised. One RMO1[xviii] said that a department that gave him an instruction to call for assistance or advice at any time was a unique experience. This resident was provided with orientation to the unit, a list of people to call, information about when to call and an outline of the expectations of the RMO1 as part of the health care team. The importance of regular weekly meetings and approachable colleagues underpinned what another resident[xix] called 'supervised autonomy'. He defined this as the capacity to call for help when one is 'out of one's depth' and it is perceived as learning in a safe environment.

[xv] RMO1(11)
[xvi] Intern (16)
[xvii] Intern (16)
[xviii] RMO1(13)
[xix] RMO1(31)

Negative comments were made about supervision when interns' and residents' calls for assistance were either ignored or delayed because of competing demands.

5.3   Interpersonal factors

All the informants spoke about, and recognised the importance of, good interpersonal relationships, particularly with their registrars. A problem with interpersonal relationships only rated as a factor in 12 (8%) out of a total 169 factors and as a main factor in only two mistakes. (Table 5.9) Two main issues were identified with interpersonal factors. The first related to supervision and included the ability of interns or residents to convince clinicians that their assistance was required. This failure to engage other clinicians in 'your' patient's problem was perceived as a personal failing on the part of the person requesting: they lacked skills to convince, or the capacity to present an interesting story.

The ability to get a consultant from another area to attend a patient in a timely manner was also raised in the discussions with difficulties associated in obtaining out-of-department consultations.

The second related to the requirement that interns and residents in addition to doing their own jobs should also look out for their peers. One resident[xx] referred to this as the 'resident code of conduct.' The unwritten code requires that a person completes their tasks before finishing work, not leaving others to complete unfinished tasks. People who are known for not finishing their work will eventually find themselves unsupported.

In conjunction with work demands, two additional matters surfaced. One concerned the demands on 'older' junior doctors who in their forties have young families. Three doctors were overseas trained doctors who, having passed their examinations enabling them to practice, are required to complete a supervised year in a hospital. While they are not interns the hospitals treats

---

[xx] RMO1 (21)

them the same as interns. Hospitals do not make adjustments for doctors with competing family responsibilities. Another matter related to the demands on the workforce generally. One resident observed that having an assertive personality helped in obtaining additional assistance. He said it is very common to work with frustrated or uncooperative people.

'It's a sad reality but we are not just doctors but also workers. If you call somebody up to consult them at 4:30 on a Friday afternoon, they are pissed off because they want to go home at 5pm. There is a pressure on you not to seek assistance from others because potentially they are not going to want to do it.' RMO1 (20)

5.4 Communication

All informants commented on the value of good communication and identified personal relationships as a significant factor in successful communication. Of all the factors, communication was nominated the most and comprised 32 out of a total of169 factors (21%). Table 5.9 sets out the factors and the number of times nominated by the informants. But when it came to the main cause of mistakes, communication dropped to second ranking behind knowledge and skill (16 of 57 (28%)). Both interns and residents identified communication breakdown as a significant factor in mistakes. The communication problems they identified were broad and fitted into the following six categories: communication with other doctors, nurses and patients, methods of communication, documentation, and quality of the communication.

5.4.1 Communication with other doctors

A constant theme in communication was that good communication among doctors not only entailed skills on the part of doctors communicating but also good listening skills in the people receiving the communication. A number of doctors referred to their efforts at communicating problems to particular teams or clinicians but despite their efforts the communications failed to achieve the desired results.

One resident [xxi] working on a medical ward reported how a patient received an open biopsy instead of a bronchoscopic biopsy and another chest biopsy

---

[xxi] RMO1(6)

instead of a muscle biopsy. In addition, the medical registrar failed to convince the surgical team of the need for review of the patient after the procedures. The resident acknowledged there could have been valid surgical reasons for the alternative procedures but this was not communicated to the treating medical team. Although the patient continued to deteriorate the medical team could not convince the surgical registrar and consultant to review the patient nor could they convince them that the problem was associated with post - operative bleeding. It was not until after admission to the Intensive Care Unit and associated scans and tests that the surgical problems were revealed. The resident involved in this case said there may have been lots of 'high level' discussions between the surgical and medical consultants, but they did not 'filter down' to him.

Most interns and residents reported difficulty in asking for help from senior clinicians because requests for assistance were not always well received. One resident [xxii] said it was not uncommon to meet resistance for urgent consults which required the junior doctor to have the strength and tenacity to say to a senior clinician that the situation could not wait. It was acknowledged that such assertiveness might cause offence. Various techniques nominated by the doctors to address this problem included: advising senior clinicians they would document the request in the medical notes and that the clinician refused to attend. Putting requests in medico-legal terms usually worked, in the experience of this resident.[xxiii]

'As an intern or resident it's very scary to speak to a consultant who says you don't really need this now. The only way you can do it is to put it into medico-legal terms. They understand when I say that I am going to document in the notes that I am requesting an urgent CT and you have refused to come in. Those words usually mean they come in and all of a sudden you haven't made yourself a friend and therefore it's a difficult circumstance.' RMO1 (20)

Responding to requests for assistance was mainly viewed by the interns and residents as a personal professional responsibility of patient care. Residents saw it as their responsibility when they failed to order tests for patients because of the difficulties in arranging them either because of the time of day

---

[xxii] RMO1(20)
[xxiii] RMO1(20)

or the location of patients. One resident [xxiv] recounted her failure to obtain an urgent ECG for a patient who was in the Radiology Department. She said the only way she could have obtained an ECG was to wheel the very sick patient around to the Emergency Department. She saw this logistical issue as solely her responsibility rather than being a system problem. The following day the patient did receive an ECG which indicated an infarct.

Unequal power relationships in the medical hierarchy also play a role when junior members think diagnoses or treatments are wrong but fail to raise their concerns with consultants or registrars. In a case involving the placement of a drain,[xxv] even though the registrar agreed with the intern's assessment of a misdiagnosis, the registrar would not contradict the consultant. This was despite the patient's long hospitalisation and complaints about patient management from the patient and his family. This hesitancy to communicate a contrary position with a more senior clinician was not uncommon among junior doctors. Contradicting clinicians becomes more complicated if the specialist concerned practises in the area in which a resident is interested. Obtaining a training position is dependent on reports from senior clinicians. One resident interested in orthopaedics said he was reluctant to raise issues that might affect his future:

'Some consultant orthopaedic surgeons are not that approachable for criticism. You can talk to them about things that go well but you wouldn't want to be saying to the boss that the way you managed that was really bad because he might be the one employing me in 10 years time, so you do have to bear these things in mind.' RMO1 (5)

The hierarchy described by interns and residents had the consultant (the boss) at the top. Seniority directly related to the capacity to give orders. The intern was at the bottom. But lines of authority within the hierarchy were less clear with the appropriate senior person to call or refer to being less obvious to the doctors interviewed.

'The hierarchy can be unclear as to whom to call. It is a matter of trial and error and making phone calls and being totally led through to the appropriate person to call. You have orientation on the first day, but in practice it is not as clear as what they say in orientation.' Intern (8)

[xxiv] RMO1(20)
[xxv] RMO1(28)

The hierarchy was seen by informants as useful for distinguishing the relative inexperience of interns and residents from more senior clinicians. But there was little reference to the importance of 'mentoring' and learning from supervisors that is traditionally associated with the medical hierarchy. Rather it (the hierarchy) was accepted as a 'fact of life' for junior staff. The importance of having consultants who demonstrated leadership, and who were available and approachable were noted to be important factors for a successful term but they were absent in most of the informants' training.

The experience of the hierarchy as a positive factor was variable and highly dependent on the department one worked in. Intimidation and fear were characteristics better describing the consultant - JMO relationship. Examples of poor relationships between JMOs and senior clinicians covered all situations and included weekends and nights as well normal day shifts.

The doctors interviewed were philosophical about their roles in the hospital hierarchy; they saw it as an inevitable part of training to be a doctor.

'You feel like you have been dropped in it somewhat and you are in the deep end and you either sink or swim and you have to make decisions.' RMO 1 (18)

The hierarchy also significantly impacts on how interns and residents respond to mistakes. Negative responses from consultants or supervisors to a clinical concern or query will often shorten communications about those concerns.

'Eventually the consultant rang and I told him that I was bolstering fluids. It is hard to know if someone's sick because you haven't seen much of (his condition). I didn't know what was going on with the patient and I started explaining what was happening to the consultant and he got upset at me and unfortunately he took it out on me. I think he may have said to add another antibiotic or something like that which I did.'   RMO1 (10)

Diagram 5.1 sets out the hierarchical relationship between the junior doctor registrars and consultants as described by the informants. Junior doctors report up the hierarchy any changes in the patient's status, changes in medication, test results and mistakes while they act upon information (orders) from those further up the hierarchy in relation to test results, investigations to undertake, medications to change or chart, and discharge instructions.

Change in status
Change in medication
Test results
Problems with management plan
Mistakes

Diagnosis
Management plan
Tests
Investigations
Medication orders
Discharge Information
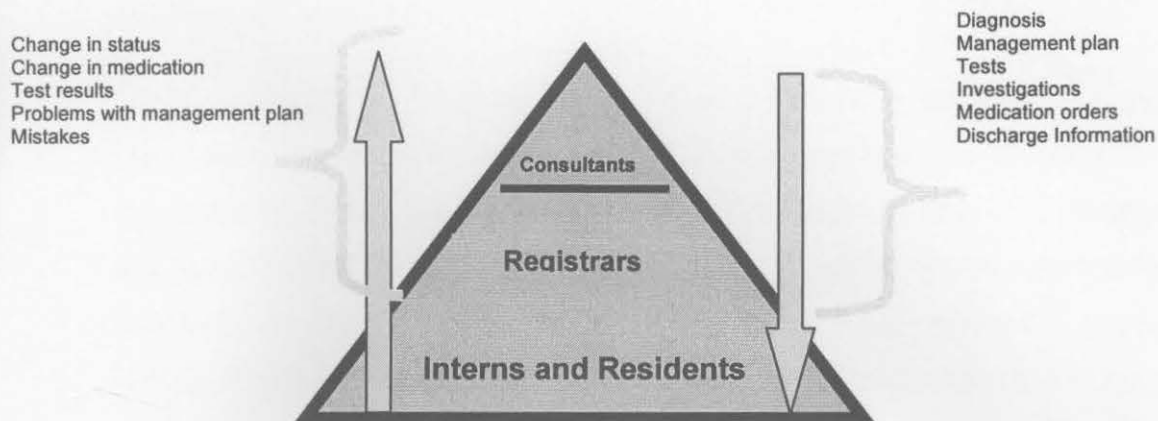
Diagram 5.1: Hierarchical relationships

Registrars were identified by interns and residents as the most significant people in the hospital and medical hierarchy. They were the undisputed first contacts for interns and residents generally and also in the event of problems. Nurses were also mentioned by seven doctors in relation to people they have most contact with during the day. Having a supportive registrar was an important issue for the doctors. One intern summarised the situation in relation to available and approachable registrars.

'In the surgical terms the registrars are operating most of the time but I knew I could always contact them. I have their page number and they would answer and were receptive to my questions. I think it's a matter of luck who you get. Having a supportive registrar makes a huge difference and having an approachable consultant makes a big difference. I've heard about registrars being too busy to be available, or bringing pressure on the interns not to call a certain registrar, and it's difficult if you are told not to call unless it is absolutely necessary. That gives you the message I don't want to be called.' Intern (32)

Interns and residents said that direct contact with consultants occurred during ward rounds and in relation to individual patients.

'My registrar is senior and he gives me flexibility which I like, but he is always there if I need anything and I have no problems in contacting him or my consultants. With this term I usually start with my registrar as my usual port of call because the others tend to be busy, but they all said to me to ring if there are any problems or if my registrar's away. On other terms I have preferred to call the registrar, not that I have had a problem with a consultant in their approach to me, but I know they are busy. If the patient is really sick of course I will call the consultant.' RMO1 (13)

Routine communications about patients usually occurs between registrars and junior staff and the registrars and consultants.

'The consultant's relationship is more linked in with the registrar than with me. When they do a ward round during hours, they will try and identify problems that have arisen and anything they would like organised. If the

consultants aren't there and there is an issue then I speak to the registrar and the registrar then telephones the consultants.' RMO1 (15)

Miscommunications between junior and senior doctors particularly via the telephone were also factors in mistakes. Miscommunications involved medications, wrong dosages, and the wrong patients. In one case involving the wrong patient, the patient died directly as a result of the management plan ordered over the telephone. The consultant thought the resident [xxvi] was talking about a different patient. Both patients were unconscious and having seizures, but were of different nationalities and cultural backgrounds. The telephone call was in the middle of the night. The resident thought she may not have spoken clearly enough. She said:

'I could have been a bit clearer. When you're ringing people up in the middle of the night and waking them up you try to be brief. I think you talk more quickly, and abbreviate things and make everything really succinct about what you want to talk about rather than have a long-winded conversation. That's probably why, if someone gets the wrong patient in his or her head from the beginning, it might not be clarified.' RMO1 (28)

Misunderstanding of the seriousness of a patient's condition was also reported by interns and residents, who with hindsight, realised that they did not fully appreciate the urgency of the instructions when they were made. One intern [xxvii] was asked to get a particular drug and give it to the patient because the patient's potassium was very high. The intern asked the nurses for the drug which was stored off the ward. Neither the intern nor the nurses knew how to prepare the medication nor did the intern know how sick the patient was or how serious a high potassium reading was.

Misunderstanding of instructions occurred particularly on weekends and in circumstances where there was no face-to-face meeting of the treating team. Late evening ward rounds, inadequate documentation, consultant-only ward rounds and lack of clear responsibility were all associated with miscommunications resulting in patient adverse events. Lack of specificity in instructions was also identified, particularly in relation to junior doctors. Many reported the practice of senior clinicians passing on important instructions and

---

[xxvi] RMO1(28)
[xxvii] Intern (3)

information in the corridor or clinics. Relying on memory alone was thought inappropriate.

A few doctors referred to the communication problems they experienced with some consultants. Most experiences were in the context of out-of-hours calls to a consultant, either during the night or on the weekend. One intern[xxviii] working in a peripheral hospital recounted how she, on overtime with insufficient cover (because a registrar was away on study leave), had a sick patient as well as being in charge of an eight bed coronary care unit. The intern was notified about a patient who was 'tachycardic', and unresponsive to treatment. The intern was first on call and unsure about what to do, so she called the emergency doctor. He also was not sure about what to do. The consultant rang in the interim and the intern explained the situation and the treatment she had instigated. The intern was unsure of her actions and wanted someone else to provide an opinion. After she started to explain the patient's condition to the consultant, the consultant informed the intern of the patient's age and implied that she was not looking after the patient appropriately. The intern interpreted his outburst as indicative of the consultant's own guilt for leaving her without cover or supervision. The consultant attended the patient about 20 minutes later. This following quotation from an intern illustrates the awareness of the medical hierarchy among some doctors.

'On a Sunday night (I called) a consultant on call. I explained who I was and before I'd even told the patient's age he said - I don't mean to stop you right there, but are you talking to the appropriate person? He explained he was the consultant. I said I thought I was contacting the person who was on call and he said, 'Have you run this by the registrar?' To me, that was the biggest insult because there was no way I wouldn't run a very sick guy by a registrar. I said 'I have'. He didn't want to hear from an intern.' Intern (10)

The message to interns and residents here is that junior doctors do not talk to consultants. Registrars were unanimously identified as the main contact for clinical problem-solving and education. Consultants were seen as mainly relating to registrars who passed information down the hierarchy.

[xxviii] Intern (10)

5.4.2 Communications with nurses

While general comments about communications with nursing staff were positive two themes emerged in mistakes associated with miscommunication involving nurses. The first theme concerned nurses who did not appreciate the urgency of some cases and the second related to the lack of assertiveness of nurses to ask questions of doctors about treatments or proposed treatments. This was an issue for some doctors in the context that nurses were experienced and probably knew more than junior doctors about patients' conditions.

The lack of information from nurses about the urgency of a matter related to both pager activity and poor communication. Paging doctors without indicating the urgency to attend patients was a frustration for many. One resident remembered receiving a normal page but it turned out to be urgent. *'I wandered up the ward but when I got there I saw full CPR going on a blue patient…The cardiac arrest call was bypassed'.*[xxix] In this case the consultant deviated from his usual practice and asked the nurses to tell the resident; his normal practice was to page the doctor himself and directly provide instructions. The nurses did not pass on this order to the doctor because *'even though he looked a bit off but we didn't want to say anything'.*[xxx]

Doctors reported feeling frustrated by continual paging during overtime and weekends. Nurses who paged for insertion of cannulas and to fulfil fluid orders without any attempt to prioritise matters caused most comment. This was especially a problem in the peripheral hospitals where the *'workload can explode'* for the junior doctors rostered on nights.[xxxi]

One resident[xxxii] when working as an intern in the ED recalled how an experienced nurse failed to query her diagnosis of unstable angina even though the ECG indicated an infarct. She said the nurses were probably aware of her error but also added that everyone was busy and they were

[xxix] RMO1(13)
[xxx] RMO1 (13)
[xxxi] RMO1(13)
[xxxii] RMO1(7)

happy to have someone take charge of the patient who came in as a semi-urgent case.

5.4.3 Communication with patients

The role patients played in mistakes where poor communication was a factor was minimal. There were only a few instances where communication with the patient was identified as a factor in the mistakes. One related to the history provided by the patient and the two other mistakes involved patients with cognitive impairment.

'The better the patient's cognition the better the outcome. We are dealing with in geriatrics and renal medicine and even in emergency downstairs a very aged population, in their eighties and nineties and the more severely cognitively impaired, the more we rely on second hand histories and second hand medication charts. It's hard to make a decision.' Intern (4)

5.4.4 Documentation

Failure to read instructions in the medical notes, failure to document in the medical records, misinterpretation of dosages, unclear written instructions and failure to check medications were all mentioned as factors associated with poor communication. One patient with a collapsed lung, chest infection and chronic CO_2 retention was given 40 per cent oxygen despite a written instruction from the consultant to put him on 29 to 31 per cent of oxygen. The resident[xxxiii] who described this case said that the instructions were clearly stated in the medical records which the nurses failed to read. Many doctors referred to the importance of face-to-face communications to prevent miscommunication. Many did not trust that orders would be followed if they were only written in the notes. One resident said *'If you're lucky sometimes, it will happen.'* [xxxiv]

Another resident[xxxv] adopted a policy of always speaking to the registrar involved even if they had written an order in the record, rather than assuming the notes would be read. Remembering to make notes was an issue particularly when the work environment changed either because of work load,

---

[xxxiii] RMO2 (19)
[xxxiv] RMO1(6)
[xxxv] RMO1 (15)

staff shortages or time pressures. One resident[xxxvi] left in charge forgot to write down an order for anti-coagulation medication resulting in the death of a person. The patient had a pulmonary embolism and died. In this case absenteeism left the resident single-handedly to manage patients.

In another 'time pressured' case, an intern[xxxvii] looking after a post-surgical patient with a wheeze organised a chest x-ray and made a provisional diagnosis of an infection. He appropriately consulted the registrar and consultant who agreed with the plan. The resident ordered the tests but failed to record the plan or the tests in the medical notes because he was busy with other demands. He went onto overtime duty without writing up the case. The next day a colleague advised him that the patient had pulmonary oedema and that he should have written up the notes.

In addition to time pressures another reason for failing to document is inadequate knowledge and skill. Failing to record in the Emergency Department medical records a diagnosis or history of the patient may indicate a lack of knowledge.[xxxviii] Another resident who wrote an unclear instruction in the notes said he realised in retrospect that his order to cease aspirin would have been difficult to see (and read) because he had scribbled all over the medical chart.

Another problem concerned the reluctance to check or change a medication order once written in the notes. One resident said, '*If you write up the wrong medication then people who do not know much about medication will give it. You run into trouble once it is written up - it's Holy Grail and it will keep being given unless there is someone to say 'stop doing it.'* [xxxix]

[xxxvi] RMO! (11)
[xxxvii] Intern (3)
[xxxviii] RMO2(23)
[xxxix] Intern (4)

5.5   Patient factors

Interns identified the patient's condition as a factor in mistakes more than did residents. But overall, patients' conditions did not rate highly as factors in mistakes. Patient factors counted for 21 out of 169 (12%) factors and they only rated four times as the main factor (four out of 57 (7%)). There were no distinguishing features relating to patient conditions except that the patients were very sick and that they had been in hospital for a long time. One patient[xl] on many drugs had his or her drugs recorded on two medication charts. The design of the charts made it difficult for the staff to easily locate all the drugs (intravenous as well as by mouth) to be administered. While the resident identified the patient's condition as a factor they did not identify it as the main factor in that mistake. The failure of the nurse to check the medication chart was the main factor identified.

In all four cases where the patient's condition was nominated as a main factor other factors were also present. These factors were nominated by the doctors but not selected as the main factor, but arguably they are more relevant to the main cause of the mistakes. For example, a moderately cognitively impaired patient with multiple co-morbidity (cardiac failure, diabetes, coronary and renal impairment) was prescribed an anti-hypertension medication instead of calcium. The resident and registrar in the Emergency Department wrote up the wrong medication. The facts as told by the doctor suggest that the communication between the Emergency Department and the patient's general practitioner was the main factor rather than the patient's condition. An intern[xli] inferred that if the patient was in better condition she would have been able to tell the doctors about her medications, not withstanding the complexity of her condition and the large number of drugs she would have been taking.

Another case involved a patient who died from an undiagnosed high potassium level. The Intern[xlii] identified patient condition as the main factor in

---

[xl] RMO1 (7)
[xli] Intern (4)
[xlii] Intern (9)

this case because the resident involved in the matter was working on '*a ward with sick patients*'.

5.6   Location/situation

Taking all factors into account, 'location and the situation at the time of the mistake' was mentioned most (36 out of a total 169 factors (21%)). Within the domain of system problems it again rated the highest accounting for 36 out of 79 factors (46%). But informants only mentioned it seven times (12%) as the main factor in a total 57 mistakes. This suggests that doctors are aware of the impact of working overtime, weekends and their particular vulnerability to error in a busy Emergency Department but do not think that improving or changing the situation will make a significant difference to patient outcomes. Table 5.13 on the next page sets out the position of the doctor and the location and situation at the time of the mistake.

Table 5.13: Position of informant, location of mistake, situation at time of mistake and shift (busy, nights, over time, weekend, and holiday).

	Area	Busy	Night/overtime	Weekend	Holidays
RMO1 15	Emergency Department	1	1	1	
RMO1 15	Emergency Department	1			1
RMO2 23	Emergency Department	1	1		
RMO1 29	Emergency Department	1		1	
RMO2 19	Emergency Department	1			
RMO2 19	Emergency Department	1			
Intern 5	Peripheral Emergence Dept.	1		1	
RMO1 7	Emergency Department	1			
Intern 4	Emergency department	1			
RMO1 11	Peripheral Emergency Dept.	1			
RMO1 22	Emergency Department	1			
Intern 25	Emergency department	1	1		
RMO1 26	Peripheral Emergency Dept.	1		1	
Intern 1	Patient in wrong ward(gastro)	1			
Intern 32	40 patients	1			
Intern 1	Orthopaedic ward	1		1	
RMO1 27	Surgical ward		1		
RMO1 21	Upper GI surgical ward	1	1		
Intern 8	Ward to theatre	1			
Intern 5	Medical ward	1	1		
RMO1 7	Surgical ward	1	1		
Intern 10	Ward	1			
Intern 10	Ward	1		1	
RMO1 22	Rehabilitation ward			1	
RMO1 13	Peripheral hospital	1		1	
RMO1 20	Spinal ward	1			
Intern 14	Medical Ward	1		1	
Intern 3	Ward (unspecified)	1	1		
Intern 3	ward	1			
Intern 16	Ward (discharge)	1			
Intern 17	ward	1	1		
Intern 17	Peripheral hospital	1	1		
RMO1 24	Orthopaedic ward	1	1		
RMO1 24	Head and Neck ward	1		1	
RMO2 30	Surgical ward	1	1		
RMO2 31	Renal ward ((wrong ward)	1			
36		34	12	10	1

5.6.1 The Emergency Department

The Emergency Department was named in 13 of the 36 sites associated with this category (situation and location). Interns and residents used words such as chaotic, busy and stressful to describe the ED. They attributed two underlying causes for the ED situation. The first related to the ED as the point-of-entry for patients and the second related to problems caused by access block. Problems in the ED included lack of documentation (medications, histories and diagnoses), utilisation as a holding bay, lack of consultation, inadequate treatment of nursing home patients, high workload, insufficient staff, incorrect diagnosis, communication problems, failure to attend (peripheral hospital) and delay in transfer to the ward. While all these were mentioned as problems, workload and multiple demands on staff appeared to underpin many of the mistakes in the ED. One resident[xliii] looking after a man transferred from a private hospital (with suspected pneumonia), did not think the situation was critical and ordered blood tests, investigations and administered fluids. The ED got very busy and it was not until many hours later (around 3 am) that the resident looked at the test results and realised the patient was in renal failure. Delay in treatment in the ED, whether caused by workload in the ED or bed shortages in the ward, had implications and flow on effects particularly when the delay was associated with night time and weekends.

'People in the ED knew that he had low blood pressure and that he wasn't passing any urine and I think they should have got the relevant people involved to try and manage that rather than sending him up to the ward on Friday afternoon to be sorted out.' RMO1 (15)

The potential for misdiagnosis, especially by interns and residents, is acknowledged in the ED where their mistakes are often indicative of poor supervision. For example, an intern in her first emergency term who misdiagnosed a myocardial infarct as unstable angina recognised the role of inadequate supervision in her incorrect diagnosis. She said if she had received some help with reading the first ECG than she may not have been so set in her first diagnosis of unstable angina and may have considered other

---

[xliii] RMO1 (22)

diagnoses. But she recognised that in busy situations such as the ED other factors also operate.

5.6.2 'Busyness'

Of the 36 mistakes in which location and situation were factors 'busyness' was identified in all but two of these. 'busyness' is both a cause and effect in events involved in mistakes but the significant majority of discussions about 'busyness' identified 'busyness' as a cause of mistakes. Only a few saw "busyness" as an effect, identifying the following areas: sicker patients in hospital for shorter periods, inadequate staff and working in unfamiliar wards and departments. Most interns and residents assumed that all doctors are busy all the time, thought this the reason when doctors and nurses did not respond in a timely way to requests for help.

See Diagram 5.2 for the five areas that contribute to 'busy' and some of the main consequences of 'busyness' as perceived by the interns and residents interviewed. Thinking time and little time at the bedside with patients were the casualties of being 'too busy'. But not all interns saw 'busyness' as an excuse. Even where 'busyness' was identified as a significant factor, when it came to the main factor, knowledge and skills were rated as more important '*because I don't believe that as a medical practitioner that just being busy is an adequate excuse*'[xliv].

[xliv] RMO1(15)
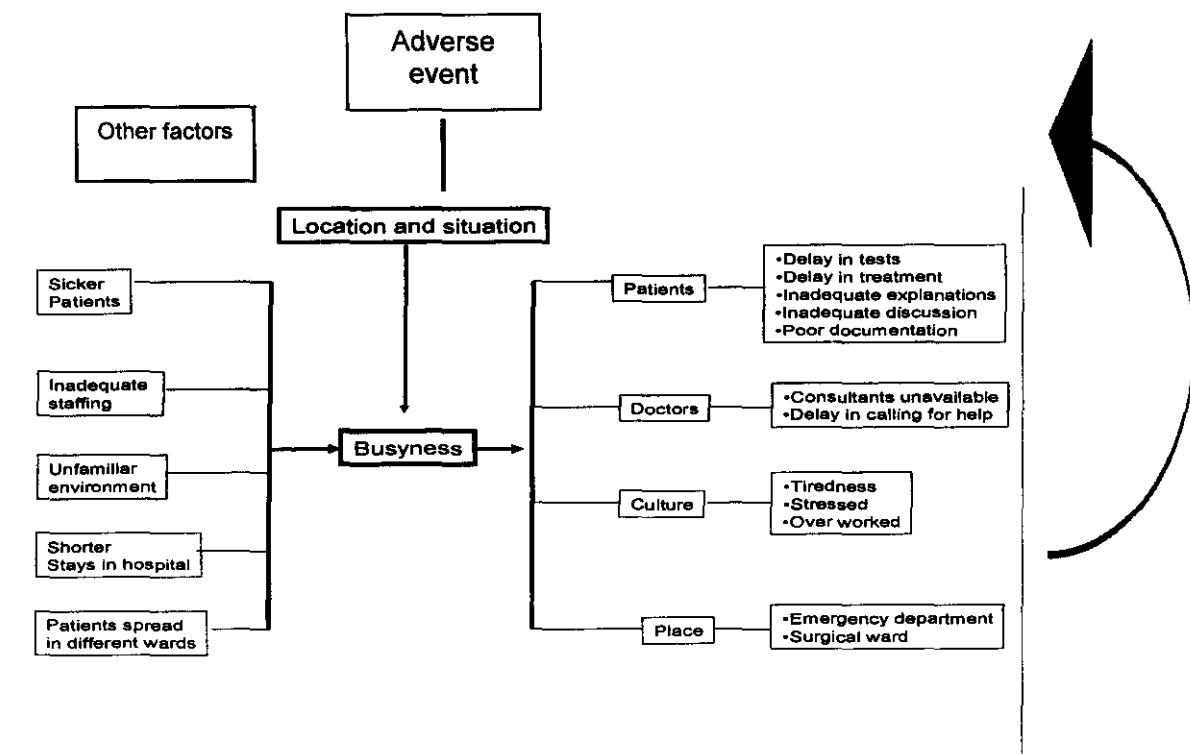
Diagram 5.2: Cause and effect of 'busyness'

5.6.3 Overtime, Nights, and Weekend shifts

Twenty-three mistakes were associated with nights, overtime and weekends. Twelve concerned seven residents and five interns on night shift, 10 concerned six residents and four interns on weekend shifts and one resident during a holiday period.

Overtime and Relief

All interns and residents had experienced working overtime. Overtime usually requires the doctor to work extended hours and not necessarily in the same ward or area. The following observations and problems about overtime were identified by the interns and residents: unfamiliar environment, role of the overtime doctor, back-up, and site (peripheral hospital).

Lack of hospital induction for overtime, no information and inadequate handovers were reported. One intern[xlv] said she had no information about overtime even though she had never previously worked at the hospital and her first-ever shift on commencing work was rostered overtime. In addition to the quality of handovers, inadequate handovers were also associated with the person coming onto overtime duty arriving late due to work demands of the previous day shift. This is related to the strong desire for doctors to complete their work before handing over to the next person.

The role of doctors on overtime determined to some extent the attitudes of the interns and residents to overtime work. One person reported the low expectation of junior doctors on overtime but others referred to a number of problems. First, overtime doctors did not necessarily feel responsible for the patients they saw. Second, there was a reluctance to change treatment during an overnight shift unless critical. Third, 'well' patients tended to be neglected in terms of follow-up because of paging and other work demands. One intern[xlvi] explained that many interns are not good at monitoring fluids or at writing up fluids.

Overtime was viewed as stressful, having multiple demands and things happening at the same time. Work demands included fixing medications and charting problems. One resident[xlvii] said '*I think things are mis-charted a lot and on overtime you are often asked to fix them up.*' Another problem concerned paging and the lack of prioritising for requests in the context of the high volume of repetitive menial tasks. One intern[xlviii] on overtime who was called to see an elderly woman who was admitted to a ward unfamiliar to the intern said she dismissed symptoms as 'nothing' only to find out the next day that she had suffered a 'minor 'stroke.

Supervision during overtime surfaced in reference to available 'back-up'. The medical registrar on duty for the night (M1) was positively mentioned with

---

[xlv] Intern (3)
[xlvi] Intern (4)
[xlvii] RMO 1 (28)
[xlviii] Intern (5)

doctors stressing the importance of the M1 being available and approachable because of the inexperience of junior doctors. One intern said:

'On overtime I don't know a lot of things. I think most interns are the same. If we don't know something, we ring up the registrar and say this is what I think is wrong and this is what I would like to do and is this ok. And if you have forgotten something they tell you but if there is no one to ask I can easily see how a mistake is not picked up'. Intern (17)

The reasons for the failure of 'back- up' related to both personality of the registrars and site in which the overtime is being done. One intern noted that

'Some registrars are fantastic on your overtime and they come around to the wards and they are very approachable. They don't bite your head off if you ask them things. Other people give you the impression that they don't want to be called, even though they're being paid, but they sit there in the TV room all day. I don't know how you can stop that. It's not fair to the people who are nice to make them do overnight if they're nice.' Intern (17)

Nurses and pharmacists were seen as good back-ups; they helped doctors on overtime who were unfamiliar with particular wards. Doctors found it very stressful to work in cardiology out of regular hours; this was particularly true when they did not know the relevant medication protocols. Experienced cardiology nursing staff assisted these doctors by informing them of the protocols dealing with appropriate drugs to be administered after the insertion of a stent. Many cardiology patients return to the wards after hours when the normal treating teams are unavailable. An overtime doctor does not necessarily know what is happening.

There was stark contrast between working overtime at the acute teaching hospital and the peripheral hospitals. Interns reported that working alone in the peripheral hospitals was very stressful particularly when they were responsible for large numbers of patients without (in their view) sufficient back-up. One intern[xlix] on overtime had responsibility for an eight bed coronary care unit. Another intern[l] said that while she was on overtime in a peripheral hospital she had three patient emergencies simultaneously in three different wards. Support systems exist in peripheral hospitals but are thought less accessible or effective than those in the acute teaching hospital.

[xlix] Intern (8)
[l] Intern (14)

The biggest issue for doctors rostered on a relief term was the constantly changing environment and the wide variety of tasks. Coming to terms with the different areas and wards was stressful in all areas but more so in the busier wards where there were 20 to 30 patients. Similar to overtime, a lack of preparation was a factor.

Nights

Working nights for the informants involved covering an average of four to five wards with 75 to 100 patients and was associated with increased opportunities for medical mistakes in the context of a skeleton staff working in essentially a 9am to 5pm business despite the needs for 24 hour medical care. One resident said:

'With the medical handover at a change of shift it is very difficult because medicine is basically a 24 hour business for patients who get 9-5 hospital care. When you're off on weekends and evenings, there is only skeletal staff at those times.' (RMO 21)

The quality of hand-overs from the day shift to the night shift was seen as a significant indicator as to how well night interns or residents would manage their shifts. With reduced staff it was noted that the main task of night doctors was to look after sick patients and not spend time 'sorting' out patients that could be looked after during the day. Other significant features of doing 'nights' is the extent to which tasks ordered during the day are completed by the doctor before they commence on night duty.

'I did 5 lots of nights week on week off and you only want to hear about patients who are unstable and need to be reviewed or who need an investigation done. The hand over really stops within your team at the end of the day and if something needs to be chasing up or needs to be done later on, or you have someone who is very sick and you want the resident to come back later on and check them out for what ever reason...I believe very strongly in the resident code of conduct in as much as you have to do your own job and do you own work and make sure that you look after your fellow residents. Act in an ethical and responsible manner. It is very much a job that what goes around comes around. I think on the end of doing nights you know who is competent and who is slack. It has a very big follow through effect so I think that certainly is one of the major issues here.' (RMO 21)

A range of problems were identified with night time work including inadequate nursing observations, feeling intimidated by the responsibility and paging

difficulties. One resident[li] reported sleeping through a page to attend a patient who had a stroke, low platelet count and possible bleed. The resident slept through the 3.30 am page and text message but responded to the 5 am page.

The difference in knowledge and experience between junior doctors and nurses, particularly in specialised units such as the Intensive Care Unit has the potential to create role confusion. One resident said she wrongly relied on the experience of the nurses when she was working in an Intensive Care Unit because she thought they have more experience in ventilation, intubation, and central lines. Such reliance can be misplaced, especially when agency nurses or nurses unfamiliar with the environment or area are employed.

Being asked to work nights in peripheral hospitals wards in circumstances where residents did not have the skills or knowledge to do so was another concern.[lii]

Weekends

The main problem associated with weekends was the failure to treat, monitor and review patients on Saturday and Sunday, including ordering tests. Tests ordered on Friday afternoon and not done until Monday, and lack of monitoring of fluids, were common examples. One stable patient seen on Friday was noted to be dehydrated on the basis of her blood results. A note was made in the medical record for the resident to review over the weekend. This was not done and by Monday the patient was in acute renal failure. The patient died on Tuesday.[liii]

The availability of back-up in the hospital did not diminish feelings of anxiety when residents or interns were rostered on weekends. One intern explaining her reluctance to call for help during a weekend shift said:-

'There was a Sunday, I was doing a fourteen-hour shift from 8 until 10 at night and you cover the wards. I had been left the day before; the registrar had been sick the day before and told someone they wouldn't come in on the Sunday. Admin is meant to provide locum cover during that time.

[li] RMO1 (20)
[lii] RMO2
[liii] Intern 14

They couldn't find anyone. I turn up on the Sunday and unfortunately had a fourteen hour shift on my own covering the entire hospital. I knew there were people in emergency I could call if something bad happened, but you don't feel you can. I would have no hesitation if something bad happened. If an arrest happened or something in the ward it would take a little longer for someone to come up from emergency if there wasn't a registrar around. It was just the extra stress involved, knowing I would have to bother other people. I spent that day very stressed.' (Intern 10)

Another resident treating a patient with a fracture and serious medical

problems identified the work situation over the weekend as an issue. She said

'The patient was very malnourished and this had been going on for a long time. She had a fracture because she was in the orthopaedic ward. Things hadn't been sorted out. She was admitted to the ward on Friday evening, so over the weekend I don't think people were supporting her very well.' RMO1 (24)

5.7   Equipment/technology

Equipment failures or technology were not identified as factors associated with mistakes. Only one respondent identified an external factor to the hospital as a possible contributing factor. This related to an ambulance strike which impacted on the ability of the hospital to transport patients to another hospital for a CT scan but this factor was not identified by the informant as a main factor in the mistake. This low account for equipment failures may suggest that either there were few equipment failures in these mistakes or that the informants were unaware of them as factors in the mistakes or that they accepted that the design failures of equipment (poorly designed for the intended use) did not rate as a factor in the mistakes.

5.8   The local work environment

The local work environment was not identified as a significant factor underpinning mistakes. Only ten out of the 169 factors related to the work environment and it was only mentioned once as a main factor. In that case[liv] the resident was describing poor management over the weekend in a peripheral hospital raising additional issues of supervision and continuity of care.

Descriptions of the local work environment included difficulty in obtaining out-of-department consultations and the lack of a specialty to coordinate patient

---

[liv] RMO1 (24)

care. A lack of beds and available theatres were also identified as problems. Lack of beds was acutely problematic when patients were put in beds 'available' rather than in wards specifically organised around a particular medical problem. One resident[iv] disagreed with the hospital policy of placing all spinal patients in the spinal ward irrespective of their medical problems. Another intern[lvi] said that aging patients who were not admitted to wards specialising in their particular condition were particularly vulnerable to being 'forgotten about'.

'The work environment includes the problem of the teams having to come across outside their own area for a consult. This is a difficulty because nobody likes to work harder when you don't have to. Even the most altruistic of doctors will want to help but still will get to the end of their tether at the end of the day. The problem is that the hospital requires patients to be looked after by the speciality of the area, so we are getting patient the specialists (from other areas) and who coordinates it all is a real problem.' RMO1 (20)

5.9 The organisation of work

Work organisation comprised 12 out of 169 factors. As a main factor work organisation only concerned three mistakes. Issues associated with work organisation cross over with other factors such as work environment, location and situation. Work organisation was identified as an issue when tests were required out of hours or at the end of the day or when the ward was short staffed. One resident who had difficulty in arranging an urgent ECG for a patient related this to a work organisation and the work practices of the hospital.

6   Near misses

All interns and residents identified a near-miss with most commenting on their frequency saying they were daily occurrences. Medication errors were common examples. One intern noted that it was unrealistic to expect junior doctors to check all drugs.

'You can't expect everyone to know everything. I don't know if it is carelessness. It was not one thing that caused the problem. If you were more careful, you probably would have looked it up, but then you would have to look up every drug you wrote up'. Intern (4)

[iv] RMO1 (29)
[lvi] Intern (1)

The near misses described included communication errors in transmitting the drug information, recharting errors, wrong dosage, and wrong drug. In most cases the intervention of pharmacists prevented the near misses becoming mistakes.

Nurses also played a role in preventing near misses becoming errors. The following steps were taken by interns and residents to prevent near misses turning into adverse events: obtaining second opinions, clarifying information from consultants, other treating clinicians and family members, and requesting checks by nurses and pharmacists. One resident[lvii] said the pharmacist picked up his error when he ordered a patient to be given beta blocker with the dose of 500 mg a day instead of 50 mg. Another resident[lviii] said that while working on a weekend he had two occasions where incorrect doses were recorded in the medical records. The first, an order for an ACE inhibitor for a patient was written as 100mg instead of 1 mg and the second, a patient with diarrhoea and hyponatraemia who had been given an incorrect fluid instead of normal saline. A second year resident reported that she nearly administered 25,000 units of heparin as a bolus dose rather than an infusion. She realised her mistake when she checked the dosage.[lix]

[lvii] RMO1(11)
[lviii] RMO1 (28)
[lix] RMO2 (30)

Chapter Six: Results

Acknowledging and Reporting Mistakes
Responding and Discussing Mistakes
Avoiding Mistakes
Awareness of Mistakes

1   Acknowledging and reporting of mistakes in the hospital

Mistakes can only lead to improvement if doctors acknowledge they occur. I asked each doctor whether or not the mistake they described was discussed within the health care team or with others in the hospital. I refer to this process as acknowledgement. Reporting is different. There can be acknowledgement of a mistake without reporting. Reporting a mistake in my study refers to the formal process in the hospital either by completing an incident form or advising a senior person who has the authority to do something about the mistake.

Eighteen of the 32 informants (seven interns and eleven residents) said they told one or more members of the health care team[i] about the mistake. This involved 23 out of 57 mistakes (40%).The acknowledgement mainly comprised discussions between the junior doctors and either his or her registrar or the nurse unit manager about what steps should be taken to fix the patient's problem caused by the mistake. No informant reported they had subsequent discussions with their supervisors or a member of the health care team about the causes of the mistakes and what they could do to avoid making a similar mistake. The majority of mistakes described by the informants involved no acknowledgment of the mistake to the rest of the treating team. Without acknowledgement it is difficult to discuss the possible causes of the mistakes and what they might do to prevent the same mistakes from happening again.

Ten mistakes (18%) were formally reported to a more senior person. Three of the ten mistakes reported involved a written notification either using a hospital

---

[i] The health care team usually comprised the consultant, registrar, residents and interns. Nurses and other health professionals may be involved depending on the ward.

incident form (two) or through another established mechanism used by the hospital for reporting incidents (one). One of the mistakes reported through the hospital's established reporting mechanisms concerned the death of a man admitted for an elective procedure. The Department head reported the patient's death to the quality assurance committee which conducted an investigation. Another two mistakes were reported to the Coroner. The Coroner's Act requires deaths under certain circumstances to be referred to the State Coroner. The remaining five mistakes that were formally reported involved face-to-face meetings with either a health administrator or a supervisor.

Table 6.1 below sets out the position of the informant, the type of mistake and whether the informant acknowledged or reported the mistake. Most of the mistakes that were acknowledged belonged in the 'informal' category meaning that the case was not formally documented and reported through formal management channels. Informal reporting involves a number of levels: acknowledging the mistake to one's self, acknowledging the mistake to someone else (colleague, nurse or pharmacist) acknowledging to someone in authority (nurse unit manager or registrar), acknowledging someone else's mistakes to someone either informally or formally.

Table 6.1: Summary of position, type of mistake, acknowledgement, reporting and method of reporting mistakes

Identifier	Position	Type of mistake	Acknowledged	Reported	Form of reporting
1	Intern	Incorrect drug. Beta blocker given from day of admission until day of discharge instead of anti depressant.	Not acknowledged.	Not reported.	
		Incorrect diagnosis (missed bowel obstruction).	Not acknowledged.	Not reported.	
3	intern	Misdiagnosis (pulmonary oedema).	Yes. Telephone to another intern.	Not reported.	
		Delay in treatment (high potassium reading).	Not acknowledged.	Not reported.	
4	intern	Incorrect medication. Given anti-hypertension	Yes. During the ward rounds.	Not reported.	

		medication instead of calcium tablets.			
		Incorrect treatment. Inappropriate invasive procedures at end-of-life (nasogastric tube).	Not acknowledged.	Not reported.	
		Incorrect fluid measures.	Not acknowledged.	Not reported.	
5	intern	Wrong treatment. (Surgical mishap - Ileostomy).	Not acknowledged.	Not reported.	
		Incorrect flushing white cells filter with saline.	Yes. NUM talked to the nurse	Not reported.	
		No post-operative management plans.	Not acknowledged.		
6	RMO1	Delayed diagnosis of surgical problem.	Unsure.	Not reported.	
7	RMO1	Medication not given.	Yes. Informally raised with the nurse.	Not reported.	
		Medication given to wrong patient. Intravenous antibiotics (right patient missed out on antibiotics).	Yes. By resident.	Yes.	Incident report.
		Misdiagnosis (myocardial infarct).	Unknown.	Unknown.	
8	intern	Lack of monitoring pre-operatively.	Not acknowledged.	Yes.	Theatre staff report.
9	intern	Delayed treatment (high potassium level).	Not acknowledged.	Unknown.	
10	intern	Medication given to wrong patient.	Not acknowledged.		
		Delayed diagnosis (endocarditis and sepsis).	Not acknowledged.	Yes.	Administration.
		Delayed treatment.	Not acknowledged.	Not reported.	
11	RMO1	Misdiagnosis of obstructive airways disease.	Yes. Senior person informally to resident.	Yes.	Coroner.
12	intern	Delay in treatment and test results.	Yes.	Yes.	Administrative officer responsible for JMO education.
		Wrong tests and consultation.		Unknown.	
		Nil information and delays in		Unknown.	

		management.			
13	RMO1	Delay in attending cardiac arrest call (also delay in test ordering).	Yes. Resident raised issue with the director of nursing and the consultant.	Not reported.	Medical notes.
		Incorrect dose of gentamycin.	Yes. Wrote in the medical records.	Not reported.	
14	intern	Delay in treatment.	Yes. Raised in a team meeting.	Yes.	Unknown.
15	RMO1	Delayed diagnosis (broken hip).	Not acknowledged.	Not reported.	
		Delay in treatment.	Not acknowledged.	Not reported.	
16	intern	Inadequate discharge.	Yes	Not reported.	
17	intern	Wrong diagnosis (no blood gas done).	Yes.	Not reported.	
		Delay in cannula insertion.	Yes. With the registrar.	Not reported.	
18	RMO1	Incorrect treatment (premature removal of drain).	Yes. Informally with registrar.	Not reported.	
19	RMO2	Misdiagnosis (fracture)	Yes. With the ENT registrar.	Not reported.	
		Misdiagnosis (too much oxygen).		Not reported.	
		Incorrect treatment (no medication).		Not reported.	
20	RMO1	Misdiagnosis (tension pneumothorax).		Not reported.	
		Delay in diagnosing (acute myocardial infarct).		Not reported.	
21	RMO1	Delay in admission and treatment (low potassium).	Yes	Yes.	Quality assurance committee.
		Incorrect treatment (wrong patient on heparin management).	Yes Informally with registrar.	Yes	Medical records.
22	RMO1	Incorrect medication (aspirin).	Yes Informally with registrar.	Yes	Incident form.
		Delayed diagnosis.	Yes. To the team.	Not reported.	
		Treatment (defibrillator not available).	No.	Yes.	Coroner.
23	RMO2	Misdiagnosis (torsion of the testis) Failure to document history in	Yes. Letter to the specialist to say	Not reported.	

		notes in ED.	what happened.		
24	RMO1	Misdiagnosis (of malnutrition).		Not reported.	
		Delayed treatment (no nasogastric feed tube).	Not acknowledged.	Not reported.	
26	RMO1	Incorrect treatment.	Not acknowledged.	Not reported.	
27	RMO1	Delayed diagnosis (hypertension and septic shock).	Not acknowledged.	Not reported.	
		Delayed treatment.		Not reported.	
		Incorrect treatment (Central line insertion).		Not reported.	
28	RMO1	Misdiagnosis (Fistula).	Yes. Telephone from registrar to surgeon.	Not reported.	
		Incorrect treatment (wrong patient).	Not acknowledged.	Not reported.	
29	RMO1	Delay in diagnosis.	Yes. But not with the consultants.	Not reported.	
		Delay in treatment (surgery).	Yes. With the team.	Not reported.	
30	RMO2	Delay in treatment (Infected central line).	Not acknowledged.	Not reported.	
31	RMO2	Misdiagnosis (Post-operative internal bleed).	Yes. With the team.	Not reported.	
		Delay in surgery.		Not reported.	
32	Intern	delay in treatment (test result delay).		Not reported.	

One intern said even if there was interest in discussing mistakes it would be difficult because mistakes *'just get lost in the system.'* [ii] He said that the high volume of cases and patient turnover and busy units cause this.

1.1 Why mistakes were not reported

The reasons for not reporting mistakes fell into three categories: ignorance of where to report, type of incident and fear of reprisal. The role of nurses in reporting was raised by a number of doctors to highlight the difference in reporting cultures between the medical and nursing professions. The doctors

---

[ii] Intern (5)

recognised nurses had a formal system in place for reporting incidents. One Intern,[iii] in comparing the different ways nurses and doctors report incidents, said nurses followed a strict documentation process for recording incidents, whereas doctors have no system to report mistakes. He said mistakes are often *'brushed under the rug'* because one does not want to admit fallibility or be seen to be making mistakes.

There appeared to be confusion between writing in the medical records what happened to a patient and formally reporting a mistake to the organisation. A number of doctors reported they did not know how to report and thought that a note in the record constituted 'reporting'. Even though observations were made about the nursing role in completing incident forms this was not seen as a role for doctors. Some informants said they completed forms for needle stick injuries and patient falls but did not think that clinical mishaps fell into a reportable category. The following quotes by an intern and resident describe their experience of reporting:

"I haven't noticed doctors reporting things. I think the nurses get into trouble more. They get blamed and so they have been told they have to cover. You would document in the notes but not fill out a form." (Intern 3)

"Incident reports concern the nursing profession rather than medical profession. I've seen a lot of mistakes made by nursing and medical staff but almost all the mistakes made by medical staff are never reported." (RMO1 (7))

The information gathered from the doctors indicates that formal reporting is not a part of their work routine. Rather, writing in the medical records and informally talking about the mistake to other health workers on the team appears to be the most common method for managing mistakes. Writing in the records, while recording treatment decisions made as a result of the mistake, is not reporting in terms of incident management. Noting a mistake in the medical records assists the health care team in their treatment of the patient but lessons from the mistake may be lost in terms of preventing a repeat of the same mistake. Medical record review may discover the mistake but long after the event.

[iii] Intern (8)

Nurses and doctors on the wards usually do not have responsibility for incident management or ensuring what action should be taken. Rather they are expected to report incidents to a hospital authorised person. One resident[iv] said that while they try to be open with each other about mistakes, the experience is not valued as learning. Work flow[v] also appeared to intrude on discussions about mistakes particularly in the surgical term when time was limited to discuss incidents. In addition the time lag between the mistakes and discussions hampered quality discussions about the events because of faded memories.

The fear of being blamed for a mistake and the problems that might arise as a result (supervisors' reports and diminished career choices) was a significant issue for most interns and residents. One intern succinctly summarised the position felt by most informants:

"There is the underlying feeling that people can be blamed. There is a fine line between an incompetent decision and natural human error. You are not sure that if you did something wrong that someone would be sympathetic towards you. It's always one of blame and you're trying to cover yourself left, right and centre. I've got into the habit of writing in my notes whenever I see someone and my first plan of action is to discuss with x and I'll write it in the notes - for example discussed with ED reg. I haven't seen that in other people's notes even though I know they do it." Intern (10)

1.2   Are there better ways to report mistakes?

The medical culture plays a significant role in the attitude of junior doctors towards reporting. One intern[vi] noted that from the beginning of medical school one is 'indoctrinated' into the hierarchical professional model.

"I think it is indoctrinated in you from the first day of medical school that you've chosen a profession that works by hierarchy. You know you're entering a profession where all those above you have been where you've been now and you've just got to do the hard yards." (Intern 5)

A common theme associated with reporting mistakes was the recognition that reporting and completing incident forms does not necessarily result in improved care. Many were aware of the necessity to report but as one resident[vii] noted, many drug errors are made in the hospital everyday with no drug error sheets completed. Overall, many viewed reporting as cumbersome

---

[iv] RMO1 (7)
[v] Intern (8)
[vi] Intern (5)
[vii] RMO1 (13)

paperwork with few tangible benefits or health care improvement following reporting.

Another barrier to reporting was uncertainty among interns or residents as to whether a mistake had in fact occurred. [viii] There were times when doctors were unaware of the outcomes of their treatment. One resident said about reporting

"It needs to be done in a way where no blame is placed and no one is made to feel guilty, in an anonymous setting which prevents it getting back to the head of a department, scenarios where people can talk about what's to be done (without fear). It's the awareness of the issue. No one formally reports mistakes." RMO1 (15)

1.3   Follow- up on reports

Only four[ix] doctors said there was follow-up after the mistake was reported. Of the four cases reported, only one[x] was subject to a detailed analysis of the underlying factors leading to the mistake. This case concerned a 48-year-old male patient who was admitted for elective surgery. The patient died 8 days after admission. The analysis of this case uncovered the following issues: the admission process by multiple teams, delay in medical admission history and physical examination prior to elective surgery, an abnormal ECG result that was not reported, lack of management of abnormal potassium result and hyperkalaemic cardiac arrest and death.[xi]

[viii] RMO1 (15)
[ix] Intern (3), intern (4), intern (5) ,RMO1 (11)
[x] RMO1(21)
[xi] The RMO1 (21) told the following story about this patient. "A resident was asked to admit a patient who came to the ward as an elective admission in the afternoon. She failed to do that within her shift, and went onto overtime on the same ward that the patient was admitted to. There is no excuse not to admit the patient even if they are on overtime. The patient was sitting on the ward and nothing could be done until the patient was admitted by the doctor. The patient remained sitting on the ward during the evening shift and still nothing was done. The resident handed over to the evening doctor the patient for admission. The evening doctor who started at 10:30 had to do the admission at midnight. He didn't take any blood at the time but put blood forms into the morning - it was an elective admission and he didn't think the patient was unwell until the next day, when he was to have a procedure. The patient had bloods taken early the next morning, and the potassium came back as significantly abnormal. The sister got the message from the lab and she phoned it onto the resident, saying the potassium was 6. The resident said it is probably haemolysed and don't worry about it. The nurse was concerned that wasn't the case (haemolysed is marked as 'haemolysed'). She called the surgical registrar who rushed down to the ward to repeat the blood sample and while he was repeating the blood sample, the patient arrested and subsequently died."

One resident[xii] said that most people try to be open about their mistakes amongst their colleagues. But he clarified the situation when it came to making improvements as a result of a mistake.

"In terms of bringing it up so it becomes a valuable lesson, that's not done. You want to say that we are open with our colleagues about admitting mistakes but nothing more formal goes on". RMO1 (7)

In answer to the question "Are you aware of any efforts to follow up on incident or mistake reports, to make changes or evaluate the changes?" Some residents and interns confused follow-up on reports to prevent the mistake happening again with what action they took after recognising that a mistake had been made. For example, they described the steps they took to assist the particular patient suffering the adverse event rather than what steps were taken to prevent future patients experiencing a similar event.

1.4   Communicating the mistake with the patient or the family

In only seven cases (12%) did the health care providers disclose the mistakes to the patients or their families. The majority of patients or their families were not told of the mistake (39 of the 57 (68%)). Another eight said they did not know if the patient or family was told and three were unsure. In all 13 cases of patient deaths none of the families were told about the role mistakes played in the deaths. Interns and residents had direct knowledge of the absence of family information in 10 cases. The family of one patient who died was told there was a complication rather than an error.[xiii] There were three deaths where it was not known whether the family was told.[xiv] Table 6.2 sets out the patients' conditions and whether or not they or their families were told about the mistakes.

[xii] RMO1(7)
[xiii] RMO1 (6)
[xiv] See Chapter Four (p163) for an analysis of the deaths

Table 6.2: Position of Informant, type of mistake, condition of the patient, outcome and acknowledgement to patient or family

Identifier	Position	Type of mistake	Condition of patient	Outcome for patient	Patient/family informed of mistake
1	Intern	Incorrect drug. Beta blocker given from day of admission until day of discharge instead of anti depressant.	Stable.	No adverse outcome.	Not informed.
		Incorrect diagnosis (missed bowel obstruction).	Patient had dementia and fracture of neck of femur. Very sick.	Died.	Unknown.
3	intern	Misdiagnosis (pulmonary oedema).	Surgery 2 hours previously. Patient for discharge with wheezes in chest.	Extra few days in hospital, then discharged.	Not informed.
		Delay in treatment (high potassium reading).	Very sick patient with high potassium level. Very slow breathing.	Died in ICU.	Not informed.
4	intern	Incorrect medication, given anti hypertension medication instead of calcium tablets.	Worsening creatinine level: generally very sick patient with many medical problems - cardiac failure, diabetes, coronary and renal impairment.	Returned to previous level of functioning.	Yes. Patient told she had been given wrong medication.
		Incorrect treatment. Inappropriate invasive procedures at end of life.	Terminally ill with end stage Parkinson's disease. Patient did not want a PEG (percutaneous endoscopic gastrostomy).	Pulled PEG out and bled to death.	Not informed.
		Incorrect fluid measured.	Patient with hyponatremia on wrong fluids.	Extended length of stay.	Not informed.
5	intern	Wrong treatment (surgical mishap-Ileostomy).	Pain and no urine output. Showed signs of peritonitis and infection around the ileostomy site.	Return to theatre and additional length of stay.	Not informed.
5		Incorrect flushing white cell filter with saline.	Patient had splenectomy and required blood transfusion. Unwell nauseous and fever.	Stable. Extended length of stay.	Not informed.
		No post-operative management plans.	Patient with ankylosing spondylitis -slipped fixation.	No permanent neurological defect. Extended	Not informed about the communication problem.

					length of stay.
6	RMO1	Delayed diagnosis of surgical problem.	Patient with infiltrative lung disease - unwell post operatively.	Died.	Not informed. Told there was a complication.
7	RMO1	Medication not given.	Very unwell patient with numerous complications post surgery. Infected graft and on long term antibiotics.	No ill-effects.	Cannot remember.
		Medication given to wrong patient. Intravenous antibiotics (right patient missed out on antibiotics).	Both patients stable.	No adverse outcome.	Not informed.
		Misdiagnosis (myocardial infarct).	Sick patient with chest pains.	Survived the infarct. Extended length of stay.	Not informed. Told second reading showed diagnosis.
8	intern	Lack of monitoring pre-operatively.	Diabetic patient on nil by mouth. Having pin and plate for hip.	No adverse outcome- surgery completed on day.	Not informed.
9	intern	*This is the same case as 21 and so has not been counted.*			
10	intern	Delayed treatment.	Unwell patient.	Unknown.	Unknown.
		Medication given to wrong patient.	Very sick patient.	No adverse outcome.	Not informed.
		Delayed diagnosis (endocarditis and sepsis).	Elderly very unwell patient.	Extended length of stay.	Not informed.
11	RMO1	Delayed treatment.	Unconscious, came in by ambulance.	Unknown to RMO1. Patient transferred to ICU.	Unknown.
12	intern	Delay in treatment and test results.	Motor vehicle accident victim. Patient with fractured tibia and external fixtures, fractured hand – infection.	Clinically stable. Discharged.	Yes.
		Wrong tests and consultation.	Patient had chest pain and recent endoscopy-had gastritis.	Discharged.	Not informed.
		Nil information and delays in management.	Patient on warfarin.	Discharged.	Not informed.
13	RMO1	Delay in attending cardiac arrest call (also delay in test ordering).	Very sick patient with chronic airways disease with infected exacerbation.	Died.	Not informed.
		Incorrect dose of gentamycin.	Patient admitted with normal kidney function.	Acute renal failure. Extended length of stay.	Unknown.

14	intern	Delay in treatment.	Patient with pneumonia, dehydration, renal failure.	Died.	Not informed. Not told about failure to monitor but told about sepsis and tubing.
15	RMO1	Delayed diagnosis (broken hip).	Complaining of pain. Conscious, confused and demented.	Extended length of stay and discharged.	Not informed.
		Delay in treatment.	Sick patient and hypotensive, no urine output. Transferred patient with renal failure and cardiac failure.	Extended length of stay. Month in ICU on ventilator.	Yes.
16	intern	Inadequate discharge.	Interstate patient – had surgery for fracture.	Discharged without x rays and reports.	Not informed.
17	intern	Wrong diagnosis (no blood gas done).	Very sick elderly patient with pneumonia.	Died in ICU.	Not informed.
		Delay in cannula insertion.	Patient with metastases and limited life expectancy - months. Vomiting blood.	Died.	Not informed.
18	RMO1	Incorrect treatment (premature removal of drain).	Child patient.	No adverse outcome.	Not informed.
19	RMO2	Misdiagnosis (fracture).	Patient had a fall. Nauseous and no neurological symptoms.	No adverse outcome.	Not informed.
19	RMO2	Misdiagnosis (too much oxygen).	Patient with chest infection and chronic retention of CO_2.	Extended length of stay in ICU and ward.	Not informed.
		Incorrect treatment (no medication).	Patient with infected exacerbation of chronic airways limitation.	Extended length of stay. No adverse outcome.	Yes.
20	RMO1	Misdiagnosis (tension pneumothorax).	Patient had numerous orthopaedic problems. Hip replacement turned septic. Short of breath.	Arrested, extended length of stay.	Not informed.
		Delay in diagnosing (acute myocardial infarct).	Patient had stents and percutaneous nephrostomy tubes put in. Obstructive urethra.	Extended length of stay. Recovered.	Not informed.
21	RMO1	Delay in admission and treatment (low potassium).	Elective patient scheduled for surgery.	Died.	Unknown.
		Incorrect treatment	Patient had	No harm.	Unsure.

		(wrong patient on heparin management).	vertebral artery dissection. Had been anti-coagulated. Started on warfarin and heparin infusion.		
22	RMO1	Incorrect medication (aspirin).	Patient due for surgery – urinary tract infection.	Surgery proceeded with no adverse outcome.	Cannot remember.
		Delayed diagnosis.	Patient had pneumonia and renal failure.	Extended length of stay in the gastric ward - no adverse outcome.	Not informed.
		Treatment (defibrillator not available).	Elderly patient in rehab ward after fractures.	Died.	Not informed.
23	RMO2	Misdiagnosis (torsion of the testis). Failure to document history in notes in ED.	Young boy in pain.	Delayed surgery. Recovered.	Yes. By registrar.
24	RMO1	Misdiagnosis (malnutrition).	Post-operative due to fractured femur in very unwell patient - vomiting, weight loss, dumping syndrome from previous stomach cancer.	Transferred to ICU. RMO does not know outcome.	Unknown.
		Delayed treatment (nil nasogastric feed tube).	Difficult and confused patient with oral cancer - had trachea tube.	No food for 4 days - tube reinserted.	Not informed.
26	RMO1	Incorrect treatment.	Patient with recent onset stroke having atrial fibrillation.	Extended length of stay.	Not informed.
27	RMO1	Delayed diagnosis (hypertension and septic shock).	Very unwell patient vomiting.	Unknown to RMO.	Unknown.
		Delayed treatment.	Patient unwell in pre -respiratory arrest situation.	Died.	Not informed.
		Incorrect treatment (central line insertion into artery).	Unwell patient in ICU.	No adverse outcome.	Not informed.
28	RMO1	Misdiagnosis (fistula).	Patient with adhesions to bowel - post operative surgical complications - in hospital for months.	Extended length of stay - 3 mts. transferred to teaching hospital – discharged after surgery.	Not informed.
		Incorrect treatment (wrong patient).	Sick patient post - cardiac arrest with uncontrollable seizures. 2nd patient with perforated duodenal ulcer and	Died.	Not informed.

			fitting.		
29	RMO1	Delay in diagnosis.	Spinal patient admitted with hypothermia, low platelet count.	Extended length of stay.	Not informed.
		Delay in treatment (surgery).	Patient had thoracic spine fracture.	Extended length of stay.	Yes.
30	RMO2	Delay in treatment (infected central line).	Patient had complicated burns and two central lines inserted.	Extended length of stay.	Not informed.
31	RMO2	Misdiagnosis (post-operative bleed).	Patient post-operative with abdominal pain.	Died.	Unknown.
		Delay in surgery.	Patient had untreated fistula.	Discharged.	Not informed.
32	Intern	Delay in treatment (test result).	Patient in motor vehicle accident - fractures.	No adverse outcome.	Yes.

2 Response to mistakes

2.1 Interns' and residents' feelings about the mistakes

All interns and residents talked about their feelings associated with mistakes. Words such as 'upset', 'guilty', 'distraught', 'distressing', 'concerned', 'bad', 'worried', 'awful', 'dreadful', and 'sick in the stomach' were used in response to a question about how they felt when they realised a mistake had been made. In relation to mistakes by others the words used by the interns and residents were 'surprised', 'frustrated', 'irritated', 'angry', and 'disappointed'. They were careful to clarify that while they experienced negative feelings about the mistakes made by others they did not blame people making mistakes because many could visualise themselves making similar mistakes given the circumstances.

The feelings about mistakes were not confined to their having inadequate knowledge or skill. They covered other concerns such as misuse of resources, lack of available support and staff shortages. One intern[xv] was irritated by a mistake associated with an aged patient receiving life-saving treatment against his wishes. The intern said

---

[xv] Intern (4)

"I'm ethically opposed to prolonging a life. Spend the resources on kids in Ethiopia. The same dollar would save a couple of lives as opposed to spending it on unessential operations or on a 98 (year old man) who is going to die in a month anyway. You are making his life more miserable for the last month." (Intern 4)

Another intern[xvi] who misdiagnosed a patient with a bowel obstruction realised that time pressures on her to be in theatre contributed to the mistake. She said she felt 'really upset' because it was her responsibility to pick it up, but at the same time she felt that if more staff were available she would have had more time.

How bad one felt was directly associated with notions of personal responsibility for patients. For example, a resident[xvii] who medicated the wrong patient said she felt 'very guilty' because it was her 'fault'. Her registrar's response to her mistake made her feel worse because she confirmed the mistake and told her she should have identified it earlier. An intern[xviii] who did not provide adequate monitoring of a patient preoperatively said that her mistake made her feel like she 'had not done her job properly' and that one wants to do a good job and do what is best for the patient. She saw her failure as putting the patient at risk. A resident treating a patient who died said his bad feelings were made worse because of his feelings of attachment to the patient. He said:-

"Personally I felt bad because I was a little bit attached with this lady, who I thought was going to be another patient who just comes through. I put every effort into getting her better and getting her seen. I felt a little sad and sad for the husband too." RMO1 (6)

Mistakes were dominated by the feelings associated with them. One resident who described a misdiagnosis of a patient with a tension pneumothorax and a delayed diagnosis of patient suffering an acute myocardial infarct captures the feelings about mistakes in the following statement:-

"I think they (the mistakes he described) had the potential to cause problems. Everyone has their own way of dealing with things. One of the hardest things is an ego blow aside from anything else. You have concern when you have done something wrong that led to a mistake. You doubt your ability as a doctor which is a bad thing. You don't want to be so confident that you think that you can do everything on your own, but that's rarely a problem. I think having too much insecurity and not enough confidence is a bigger problem for junior doctors." RMO1 (20)

[xvi] Intern (1)
[xvii] RMO1 (7)
[xviii] Intern (8)

2.2 Who do Interns and residents talk to and how do they handle their feelings?

Most doctors said that talking to others helped them deal with mistakes. Family members (14/32), registrars (7/32), other junior doctors (7/32) and one administrator helped interns and residents debrief. One resident[xix] said he sought advice from his friends because there was no support in the hospital system. In answer to a general question asking the doctors who they would go to if they had a problem, they all said they would talk to their registrars but when it came to a problem associated with errors or mistakes only seven actually talked to their registrars. Table 6.3 sets out the context for discussions with others about mistakes.

Table 6.3: Position and response to question how handled feelings and who talked to after the mistake.

Position	How handled feelings and who talked to after the mistake.
Intern 1	During the time the patient was having all these problems the wife transferred him to another consultant. The original consultant did show up and I felt he had more concern for the patient. The second one said well he had to die. I just felt that's bad when you get to that point; it might be true but still. I could not talk to anyone about this.
Intern 3	I found out more about the patients to make me understand the background of that patient. I speak to my husband about almost everything that's happening to me. Whether it bothered me or not or annoying me. I speak to my parents as well. I think I speak to family and friends more than other colleagues. I think you're just worried that you want to make sure you're doing the best you can.
Intern 4	What a stupid thing. I find it irritating when people aren't careful. I talk mostly with my girlfriend.
Intern 5	With the spinal case, I was quite frustrated. I once saw someone on overtime because of some tiny symptom they were having and I dismissed it as nothing and the next day it turned out that they'd had a minor stroke. I was feeling very bad about that. I spoke to the registrar. He said 'there was nothing you could have done anyway'. But I felt bad that I hadn't picked that diagnosis. You want your patients to have confidence in what you're doing and you've got to have confidence in yourself. If I felt I couldn't talk with the team, I would look to talking to the DCT (Director of Clinical Training).
RMO1 6	I felt bad. I speak with my partner, she's medical also. I talked about it with the registrar using the 'retrospectoscope'.
RMO1 7	I felt guilty for a while. I talked to my friends, but no one else in the hospital. I talked to my boyfriend and he's medical that also helps.
Intern 8	I felt bad. I talked with my registrar who was present the entire time when the anaesthetist was upset and blaming my registrar.
Intern 9	I would talk to the family and then the registrar. It comes back to the registrar all the time because that's the person you have most contact with. I haven't heard about anyone talking about any mistakes.
Intern 10	I spoke to administration. I had been left the day before without cover because the registrar had been sick. Admin. are meant to provide locum cover during that time. They couldn't find anyone. On the Sunday I unfortunately had a fourteen hour shift on my own covering the entire hospital. It was the extra stress involved, knowing I would have to bother other people. Nothing happened and the consultant came in eventually anyway. I felt quite put out

---

[xix] RMO2 (19)

	by it. I was left with feeling inadequate. I also talked to the registrars.
RMO1 11	I only talked to that one person and my colleagues. But as time goes by and having discussed it with seniors I feel amazingly a lot better.
Intern 12	I felt I was being badly treated and it was humiliating. At the time (of the mistake) my confidence was so poor and I was so scared and could not discuss anything with anyone.
RMO1 13	I spoke to my registrar and family. I didn't do anything else. I talk a lot at home. My registrar made me a cup of tea, which is good because you don't expect that at work. I also remember him telling me don't cry in front of the rest of the ranks which he was referring to the nursing staff.
Intern 14	I discussed it with my registrar and he explained it. I told my girlfriend about it and my flat mate.
RMO1 15	I ranted and raged. Another intern on my team and I spend a lot of time whinging to each other about things that shouldn't happen. Most people talk to family or friends. There are very few people at my level who would discuss it with consultants or heads of departments. Most consultants are not approachable. I would never have a chat to them. I might ask them how are you doing, but that's about it.
Intern 16	If something has happened I will hang around to see if I can help or watch it.
Intern 17	We talked about what happened with each other. I don't talk to my family about these, just on the ward. Only my registrar.
RMO1 18	You could talk to other interns and residents. We all do that to some extent. You would not take it any further because you wouldn't want to get the blame. I think it's a real blame problem. When we talk its mainly informal over a beer. You wouldn't discuss it any further.
RMO2 19	I talked to friends to get some advice. There is no support in the hospital system.
RMO1 20	One of the hardest things is an ego blow aside from anything else. You doubt your ability as a doctor. I talked to friends or other colleagues or friends I went through medical school with.
RMO2 21	The worse one is when someone dies or has a stroke which is quite devastating, ones that will become good stories in years to come. The other ones are little errors. They often happen.
RMO1 22	Other residents.
RMO2 23	My husband or friend.
RMO1 24	I talk to my husband who happens to be a doctor as well and sometimes I talk to my colleagues.
Intern 25	I spoke to other interns about them, and I spoke to my partner who always gets an ear bashing when I get home each day. Definitely the informal way.
RMO1 26	I would speak to my fellow colleagues. And some doctors. If it were a mistake that I made, I would feel a little bit more intimidated speaking to someone more senior about it. I probably would feel more comfortable speaking to one of my colleagues about it.
RMO1 27	I spoke to my friend that's about it.
RMO1 28	The intern on my team, we were able to talk about it. It was really frustrating. I think the registrar felt the same frustration.
RMO1 29	No one formally. Colleagues and friends
RMO2 30	A bit frustrated.
RMO2 31	I've got a very good network of friends, colleagues. I wouldn't really talk to anyone non-medical, and initially I would call a few of my friends. I would talk with my registrar, if I had a good relationship with them. Consultants I don't think so; I am on good terms but not those kinds of terms.
Intern 32	Put myself in the shoes of the person. You feel you are left alone with a lot of patients and you can't work it out from a phone call and prioritize what are the most important things to be done.

2.3   How do interns and residents manage mistakes?

No interns or residents identified an established system to help doctors deal with mistakes. A few[xx] emphasised the absence of any system. The majority said they talked amongst themselves or with their families. Registrars were mentioned as appropriate people to talk with but only if the relationship was good and the registrars were available and sympathetic. One resident[xxi] said in relation to speaking to her seniors that it would depend on the relationship with the boss and who was primarily responsible for the mistake. She said many residents did not speak to people higher up preferring to speak to each other.

Trying to forget about mistakes or shutting them out was another technique used. One intern[xxii] said

"I think people take it to heart and are scared of being seen to be incompetent. Or they are not sure how things could have been done differently. I'm sure that a lot of mistakes you try and forget about and you move on. You take it as your own personal experience." Intern (10)

Two out of 32 doctors said that interns could go to the Director of Clinical Training (DCT), but no doctor had done this. Knowing who to talk to was important. In addition to family and friends peers were also seen to be helpful if approachable because the person concerned knows they are not alone and that such things happen to others. Talking to senior clinicians was seen as beneficial particularly if they disclosed their own experiences. A few noted that it would help break down the myth of infallibility by hearing from senior people about their own mistakes.

2.4   Interns' and residents' suggestions for better handling of mistakes

The ideal method for handling mistakes, according to most interns and residents, was for them to be open and honest in their discussions about their mistakes with appropriate senior clinicians. A discussion with a senior person was important to help them understand why the mistake happened, and how to learn from it. Availability and willingness of senior clinicians were identified by the informants as the main reasons preventing this from occurring. One

---

[xx] Intern (3),RMO1 (7), Intern (9) RMO1(24),
[xxi] RMO1 (27)
[xxii] Intern (10)

intern[xxiii] noted that openness and greater acknowledgement of mistakes might provide better opportunities for discussing them. Another intern said in response to the question - what could have helped him better deal with the mistake: - *"I don't know, no one seemed to care that much. Shit happens on the ward."*[xxiv]

All agreed that disclosing mistakes was hard and they were very concerned about talking to their supervisors and seniors about them. This intern sums up much of the concern:

"The hierarchy is hard to overcome. I can't imagine if I had my consultant surgeon sitting here that I could talk about the things that I've spoken about freely today with him. If they said you were involved in this case and we acknowledge that it went badly then I'd be quite happy to do that but I couldn't bring it up. In some cases to admit errors is to admit negligence and therefore will someone be suing me for this. Who's going to read the information and if the lawyers get their hands on it, then it's serious stuff." Intern (5)

2.5   Training to manage mistakes

The following table identifies the position of the informant and their awareness of training and the type of training in mistake management.

Table 6.4: Position of informant, the presence of training and type of training in mistake management.

Identifier	Position	Training	Type for training/comment
1	Intern	Yes.	Grand rounds and discussion about the medico-legal environment.
2	Intern	No response to question.	
3	intern	No training	
4	intern	No training	
5	intern	No training	
6	RMO1	No training	
7	RMO1	No training	
8	intern	Yes.	A lecture on medico-legal issues.
9	intern	No training	
10	intern	No training	
11	RMO1	No training	
12	intern	No training	
13	RMO1	No training	
14	intern	No training	
15	RMO1	No training	
16	intern	No training	
17	intern	No training	
18	RMO1	Yes.	Communication skills course for dealing with the patient or the family.
19	RMO2	No training	
20	RMO1	No training	

[xxiii] Intern (5)
[xxiv] Intern (14)

21	RMO1	No training	
22	RMO1	Yes.	One interactive session.
23	RMO2	No training	
24	RMO1	No training	
26	RMO1	No training	
27	RMO1	No training	
28	RMO1	No training	
29	RMO1	No training	
30	RMO2	No training	
31	RMO2	No training	
32	Intern	No training	

Only four (13%) doctors said they received training for managing mistakes but the training examples they gave did not specifically relate to instructions for managing mistakes. While there was no specific training in mistakes, other forums discussed mistakes indirectly. For example, death certificate meetings identified by one resident, [xxv] involved discussion about all death certificates written in the previous three months, including the diagnoses and whether any errors were made in the patients' treatments. Morbidity and mortality meetings were also identified as opportunities for discussion about mistakes. One resident[xxvi] gave an example of a consultant who discussed his error during an ERCP (Endoscopic Retrograde Cholangiopancreatography). He did so so that others would learn from his mistake and not repeat it.

A catastrophic mistake in a peripheral hospital led to lunch time meetings to discuss a range of medico legal topics. But the intern[xxvii] who participated in these 'productive' meetings said that he was unaware of other similar programs at the teaching hospital. Fortnightly education forums were mentioned by the interns[xxviii] as an opportunity to raise problems. A sympathetic and available facilitator for these sessions permitted doctors to debrief.

When mistakes[xxix] were included in educational forums they were seen mainly as responses to the difficult medico-legal environment and litigation

---

[xxv] RMO1 (27)
[xxvi] RMO2 (31)
[xxvii] Intern (3)
[xxviii] Intern (3) RMO1 (20) RMP1 (26) RMO1 (27) RMO1(29)
[xxix] Intern (1) Intern (3) Intern (8)

rather than as opportunities to improve the system and prevent mistakes happening.

2.6 Interns' and residents' knowledge of how the hospital manages mistakes

Sixteen informants said they did not think there was anyone in the hospital to take care of mistakes. Of the remaining 15,[xxx] eight said that while they thought there would be someone to take care of mistakes they did not know who. Four were aware of the quality assurance unit in the hospital. Two doctors referred to the good back-up available from senior doctors and one referred to the availability of advisers from the Medical Defence Union.

3   Avoiding Mistakes

3.1   Major ways for avoiding mistakes

Table 6.5 describes the interns' and residents' suggestions for avoiding mistakes. Nineteen doctors said that good communication was a main way to avoid mistakes. They also mentioned having adequate knowledge (six times), supervision (six) and checking (checking). Additional suggestions included adequate back-up, approachable senior staff, permission to ask for help and education. Most of the suggestions concerned changing the immediate working environment of the doctors. The following table lists the suggestions for avoiding mistakes.

Table 6.5: Position of informant and ways of avoiding mistakes

Position	Ways of avoiding mistakes
Intern 1	Extra vigilance, believe the nurses, prioritise work.
Intern 2	(Tape inaudible).
Intern 3	Good communication and knowledge.
Intern 4	Improve patient cognition (sic), management decisions based on accurate information.
Intern 5	Double-checking, communicating with nurses and colleagues.
RMO1 6	Checking, careful attention, communication.
RMO1 7	Systematic approach, adhering to rules and protocols, communication, supervision.
Intern 8	Communication, notification.
Intern 9	Supervision, regular contact with consultants.
Intern 10	Communication, supervision, back-up.
RMO1 11	Communication, approachable registrars and consultants.
Intern 12	Care in writing medication and charts, clear writing, communication, induction program.

[xxx] Intern (2) tape was not audible for this part of the transcript.

RMO1 13	Communication and knowledge.
Intern 14	More time with patients, communication skills, team work, job/task allocation, knowledge about job.
RMO1 15	Knowledge.
Intern 16	Checking, permission to ask for help.
Intern 17	Supervision, approachable senior colleagues, communication.
RMO1 18	Communication, coaching of junior staff, protocols.
RMO2 19	Education, communication.
RMO1 20	Supervision, support for junior doctors.
RMO2 21	Personal responsibility, knowledge, careful attention, good documentation, checks.
RMO1 22	Communication, more staff, checking.
RMO2 23	Reasonable workload, better availability of consultants, communication.
RMO1 24	Better support, more staff, patient-centred care.
Intern 25	Communication, permission to ask for help.
RMO1 26	Careful attention, communication, checking.
RMO1 27	More staff, education to improve knowledge and skills, reporting mistakes.
RMO1 28	Ask for help, communication.
RMO1 29	Avoid working when tired, stop rushing, adequate back-up.
RMO2 30	Avoid rushing, ask for help.
RMO2 31	Keep informed, education.
Intern 32	Communication, team work, job descriptions.

3.2   Methods for avoiding mistakes used by departments/units.

All but two of the 32 doctors were able to identify a method used by various hospital departments to avoid mistakes. Only one said no such methods existed. Availability of experienced people (nurses, registrars, pharmacists), holding meetings (multi-disciplinary, audit, team) doing rounds (daily, consultant led, pharmacist, nurse) following protocols and checking were nominated. Table 6.6 summarises their suggestions. Informants saw trained nurses as playing a key role in minimising and avoiding mistakes. But when asked for examples of methods used, regular meetings with senior colleagues around particular events were most often described: grand rounds, department meetings, case conferences, morbidity and mortality meetings, and discharge planning meetings. One resident[xxxi] described the use of an adverse event to teach about mistakes:-

"In the mortality and morbidity meeting (without using any names) they mentioned a case of delayed treatment, but I didn't realise they were going to bring up my case." RMO1 (7)

[xxxi] RMO1 (7)

Table 6.6: Summary of methods used to avoid mistakes

Having experienced Nursing staff:
• Experienced and trained nurses. • Experienced Nursing Unit Managers. • Regular tests of patients. • Providing information about patients. • Good relationships. • Advocates for patients. • Checking by nurses. • Clinical nurse consultant.
Ward Rounds
• Consultant registrar and head nurse. • Pharmacist - daily medication review. • Morning ward rounds. • With nurses and pharmacist. • With registrars.
Ward orientation
Meetings
• Case conference. • Team meetings. • Multi-disciplinary. • Department meetings. • Audit meetings.
Protocols
Checks
• By Nurses. • By Pharmacists.
Open communication
• Good relationships between allied staff, nurses and medical staff.
Leadership
• Consultant driven. • Available registrar. • Daily meetings with registrars.

3.3   Role of nurses in minimising mistakes

Table 6.6 shows that interns and residents value the role of nurses and thought they had a significant role in patient safety and minimising mistakes. Checking tests and medications, providing patient information and providing specialist advice were identified by the informants.

3.4   Knowledge of hospital-wide methods used to avoid mistakes

Twenty-six doctors identified hospital-wide methods for helping to avoid mistakes. Six doctors said they were unaware of any hospital-wide methods

designed to help them avoid mistakes. Hospital-wide methods identified by informants centred on the availability of back-up clinical support, meetings and education.

Table 6.7: Hospital-wide methods used to help avoid mistakes

Back up staff
• M1 (overtime registrar covering the hospital).
• Policy of not leaving inexperienced people unsupervised.
• Pharmacists.
• Registrars.
• Consultants.
Notices on wards (about)
• On call consultants.
• M1.
• Surgical registrar.
• Other senior staff.
Patient reviews
• By interns and residents.
Quality assurance meetings
• Incident reports.
• Morbidity and mortality meetings.
Good communication
• Handovers.
• Feedback.
Resident medical officer handbook
Education session
• JMO education forums.
• Resident forums.

3.5   Interns' and residents' additional ideas for avoiding mistakes

Additional ideas about avoiding mistakes honed in on personal responsibility, availability of senior staff and hospital organisation. Personal responsibility included the necessity to prioritise and organise work, recognition of one's limitations, routinely requesting help, better communication with administration staff, better note-taking, and better communication with other health care workers via face-to-face contact and in writing. Ideas in relation to senior staff included consultants being more understanding and offering better supervision. Ideas relating to hospital organisation covered resources, system redesign and education and included compulsory morning ward rounds, additional staff, changing the culture of silence about errors to one of openness, immediate notification of medication errors and test results, not allowing interns to be unsupervised and having dedicated senior clinician to assist interns and residents.

3.6 What interns' and residents' think about 'going that extra mile' and still something goes wrong.

The responses set out below in Table 6.8 show that interns and residents are philosophical about the limitations of their own knowledge and experience and the limitations of medicine. Despite their appreciation of the role of uncertainty in medicine and their acceptance of their limited knowledge and experience, most of the informants thought the main cause of bad outcomes related to their level of experience and lack of knowledge. While there was some understanding of the role of the system and the limitations of medicine as factors in the outcomes of care, only five doctors talked about it in relation to the role of medicine.

Table 6.8: Attitude to the inevitability of mistakes

Limitations of their own experience	Limitations of medicine	Limitations of the environment
It doesn't matter how much you try, you're still not experienced. (Intern 4)	If you've done everything you can, and something still goes wrong, than nothing can be helped. (Intern 3)	We are expected work 14 hours without stopping. That is really dangerous. When you push yourself it doesn't work. (intern 1)
Mistakes happen in any profession, which is unavoidable. You can be as careful as you want but sometimes you lapse in concentration and things are going to go wrong. Mistakes are not generally talked about in the medical profession. RMO1 (7)	Part of the job (requires) that you realise that things aren't going to go very well sometimes. You've got to accept that it is part of maturing as a physician - to realise that's what happens sometimes. (Intern 5)	You have this expectation that you should know what to do. It's difficult to call someone else because you don't want to look like a fool. You do not want to look like an idiot and not being sure if you're out of your depth or not. Intern (8)
I think with inexperience, but probably at any level you can feel like you're doing all you can and you are stressed because you can't quite think of anything more you can do. You think would someone else think differently. I'm sure things go wrong with consultants. I'm sure they still get upset about things. Intern (10)	You can try your hardest and sometimes things just don't work out. You can't save everyone; you have to know that you can only try your hardest and get everybody else to try their hardest. RMO1(6)	You work pretty hard. I liked to go to all the operations. That was personal choice, so I didn't get paid any overtime for that, I just thought that during the surgical term, you need to see the operations. It's important to be part of the team and so you work long hours in that particular term. Intern (9)
At times I think what's wrong, how could I have prevented this problem? I take it personally. Intern (12)	Patients aren't textbooks, you can do everything you can possibly conceive and still something else could go wrong which is unforseen and patients' conditions can change. You could do everything within a current assessment and they may not hold and again the situation could change .RMO 1 (21)	I think they (doctors who make mistakes) are very busy or tired or stressed. I think this happens every day. RMO2 (19)

Residents have only so much experience and knowledge. You need to accept limitations so that you know when it's appropriate to call in extra help. A year down the track you can manage and it only takes you 30 seconds. You have limitations and you do all that you can do as a resident but you need a system to back that up when you can't do it. RMO1 (29)	Even the best intern is going to make a mistake, because medicine is like that and things do go wrong. Even if you've done everything and something happens or the patient dies you are still going to ask what happened. Could I have done something different? So even if you're the best doctor in the world you always going to have that. RMO2 (30)	There's a problem with people who are on overtime, they don't feel they have a responsibility for the patient. RMO1 (28) .
Interns and residents don't have as much knowledge as the registrars and they do try and investigate things a little bit further, but in doing so are a bit slower and miss crucial information that the registrars might pick up straight away. Everyone will make mistakes but probably interns and residents are less knowledgeable. Intern (14)		I've been in a situation where you try and ensure that everything goes the way it's planned and it doesn't. You learn to expect it in a way, you work in a system and everything is not always going to go as planned. I think the main thing is to expect it and to identify it and try and do something about it which always doesn't happen. If something does go amiss tell someone that you have done something wrong or tell them that something has happened if it's their fault. RMO1(13)
As an intern you don't have the experience of knowing where the mistakes are likely to come from or what the problems are. It doesn't matter how much work you put in, you may still miss the one thing that someone else who is 40 years older may not have missed. Intern (17)		
It's kind of a pride thing. It's whether you can handle a situation before it goes badly wrong and I think the best doctors are the people who know when it's time to quit, when it's time to ask for help. You have people who cry wolf and ask for help for everything. RMO1 (18)		
We are very tired and we try to think of everything we can do for these patients, but we can still make a mistake such as not calling for help at the right time. RMO1 (24)		
It's why I often say shit happens, I think no one should actually blame himself or herself when something happens, especially when it's not their fault. We still tend to work too long and make decisions without experience. RMO1 (27)		

You try your best and things don't end up being the way you wanted. It can take its toll. Intern (32)		

4 Awareness of medical mistakes

4.1 Attitude to medical mistakes

Interns and residents said they knew other people in the hospital expected them to make mistakes and this was accepted by the medical hierarchy. Inexperience and inadequate knowledge were the two main reasons for this acceptance. But while the hierarchy accepted the fact of mistakes the approach to managing and learning from mistakes was less transparent to the interns and residents. The medical culture did not require interns and residents to document or report mistakes. One intern[xxxii] said that concerns about documentation were not about the failures to document treatment errors but related to poor term assessments. Another factor concerned the lack of restrictions on doctors working while fatigued. One intern[xxxiii] said that mistakes are inevitable because the system expects interns to work 14 hours straight without stopping.

While the inevitability of mistakes was recognised within the closed 'medical' system, their acknowledgement and management was not part of any systematised response. The difference between a system response and an individual response to a mistake concerning a particular patient was not recognised.

In summary, mistakes by doctors were not recognised and managed. The modus operandi after mistakes was to ensure the patient was looked after but with little documentation and discussion and no disclosure to the family if possible.

"I think the atmosphere if there is a mishap is 'hush hush', and make sure the family doesn't know. No one does that actively or rushes to hide things but I think that is the culture and no one is encouraged to report the things, not to blame other people but to prevent it happening in future." RMO1 (17)

[xxxii] Intern (1)
[xxxiii] Intern (1)

4.2 Attitudes to patients

It was common for interns and residents when describing their mistakes to also refer to existing co-morbidities and severity of the patients' illnesses. The process of rationalisation, when there was an adverse outcome, may indicate their fear of being blamed for the mistake or fear a judgement about their role in the patients' demise or extended length of stay in hospital.

"Looking back, he was a very unwell man and was getting unwell for a couple of days. But something was going to go wrong with this man sooner or later any way." Intern (3)

Young patients who suffered an adverse event were distinguished from patients who were elderly and 'expected' to die. One intern[xxxiv] who described a man who died from a missed diagnosis of bowel obstruction rationalised the bad outcome by commenting that the missed diagnosis would not have altered anything because he was a very frail old man.

4.3 Attitude to work routines

Interns and residents saw their daily work routine commencing with and being determined by morning ward rounds with the registrars. Consultants did not as a rule attend these ward rounds. They tended to attend at unscheduled times and not necessarily on a daily basis. This often meant that junior staff participated in supplementary ward rounds. A typical work day for the informants commenced with ward rounds in the morning which established the work for the day and included undertaking investigations, ordering tests, chasing test results, reviewing medications, recharting medications, liaising with nurses and allied health and writing in the medical records. Communications with medical staff were usually face-to-face but instructions to nurses were usually written in the notes.

Interns and residents did not usually have contact with the consultants during the day; rather this was seen as the role of registrars who then relayed information and orders to the junior medical staff. There appeared to be a correlation between consultants who were approachable and who accepted

---

[xxxiv] Intern (1)

calls from junior medical staff and departments which were well organised with regular academic teaching sessions at the beginning of each day. [xxxv]

Table 6.9 summarises the daily routine outlined by interns and residents.

Table 6.9: Work routine(s) described by interns and residents

Position	Activity	Time	Comments
Intern (1)	• Very early ward round (registrar and consultant). • Work through the written instructions with registrar.	morning	• Little time to check on information from the night before. • Consultant writes in notes. • Prepare for discharge as soon as admitted.
Intern (2)	• Ward round. • Ward meeting sometimes (nurses, consultant, registrar, allied health and pharmacy). • Ordering and checking tests results and medications. • Discharges.	8 am	• Meetings to discuss any aspect of care.
Intern (3)	• Ward rounds for most of the day. • End of day undertake the tasks ordered during rounds.	8am	• Very busy. • Very rushed. • Helpful consultants • No time for lunch.
Intern (4)	*Tape inaudible for this section*		
Intern (5)	• Ward rounds with senior RMO and registrar. • Carry out the tasks ordered by registrar until lunch. • Do the admissions in the afternoon and follow up on test results. • Handover to senior RMO or registrar at around 4.30.	7am	• Big team. • Lot of people to talk to.
RMO1(6)	• Ward round with registrar. • Undertake tasks set during rounds. • See new patients. • Discuss patients with nurses. • Follow the registrar on ward or in clinics.	8.30am	• Consultants do not do ward rounds on daily basis. • Consultants ring the registrar and arrange to do a round a number of times a week.
RMO1 (7)	• Ward round with registrar. • Completing tasks (recharting medications, writing in patient notes). • Theatre. • Outpatient clinics.	morning	• We have regular x-ray meetings and a monthly department meeting. • We do not have team meetings where all the professional people get together to discuss the patients. • Very close communication with my registrar directly above me. • My registrar keeps the Fellow and the consultant abreast with the patients: we discuss them in theatre.

[xxxv] RMO1(18)

			•	Sometimes consultants do their own ward round again in the afternoon.
Intern (8)	• Ward round with registrar, nursing unit manager and physiotherapist. • Order tests. • Document notes. • Theatre. • Preadmission clinics.	morning	•	We are easy to contact if there's a problem that arises during the day.
Intern(9)	• Ward round with registrar. • Junior person does ward work.	morning	• •	As a junior person you answer to the registrar. You don't speak to the consultants very often.
Intern (10)	• Emergency ward. • Shift work- get a hand-over • Varied work. • Responsible for setting work agenda.		• • •	Better than ward work where there are multiple demands. Focus on a couple of patients. Better learning environment.
RMO1 (11)	• Ward round with registrar. • Complete tasks set during round • Theatre.	morning	• •	Consultants come in three times a week. Ward is not that busy.
Intern (12)	• Relief term. • Get a list of the patients. • Do rounds on own or with registrar or consultant.	morning	• • •	Unfamiliar patients. I am from a different culture, I found it hard - I don't know their names, sometimes it is difficult to remember their names because it is a different culture. In a relief term it is difficult.
RMO1(13)	• Ward round with registrar. • 2nd ward round later with consultant. • Planned day.	morning	•	Weekly department meeting including allied health.
Intern (14)	• Ward round with registrar. 2nd round with consultants if they attend. • Undertake tasks set for the day.	morning	• • •	There is more of a team. A weekly discharge planning meeting. There is a focus on education.
RMO1 (15)	• Ward round with registrar. • Organise tests. • Sort out problems. Consultants will do ward round during the day.	8am	• • •	The consultants' relationship is with the registrar. We communicate verbally, over the phone, face - to - face, notes in the medical records. If we write something down and it's important.
Intern (16)	• Ward round with registrar or on one's own (if registrar in theatre). • Undertake tasks set during rounds. • Discharge summaries. • Follow up on x-rays.		• • • •	Work for 3 consultants (3 junior staff and 8 specialists). You are working with a specialist who you very rarely see. Also you are working with a specialist who comes fairly regularly and does about 3-4 ward rounds a week as opposed to one a week. Depending on which one you're talking about. The consultants have a mixture of patients they're looking after, their ability to be on

			the ward, (operating in a private hospital somewhere else)
Intern (17)	• Ward rounds with registrar. • Undertake tasks set during round. • 2nd ward round at 5pm at change over. Consultants come occasionally unannounced.	8am	• It's dependent on the personalities as to how we work and communicate. • Interns and residents are not to talk to consults directly. • I've been asked by the registrar who has been in theatres scrubbed, to discuss something with a particular consultant and been told to get the registrar to assess the patient and then get the registrar to call me back.
RMO1(18)	• Academic meeting- lectures, presentations. • Ward round with registrar. • Undertake tasks set during rounds. • Theatre/clinic.	7-7.30am	• There are usually fairly clear instructions on what's to happen to the patients. • The consultants are quite happy to accept calls.
RMO2 (19)	• Look at notes. • Ward round with registrar Irregular consultant rounds (2-3 times a week).	8am	• Regular weekly meetings. • Educational meetings. • Haematology is very difficult. • Consultants are very nice and have good relations and communications with the registrars. • The nurses are quite good.
RMO1(20)	• Read notes. • See the patients on own. • Registrars will also see patients independently. • Clinics.	8am	• Workload light in gynaecology Wednesday morning teaching session at 7:30 - pitched towards the registrars, but the residents are welcome to attend.
RMO1(21)	• Ward round with registrar. • Undertake tasks set. • Do paperwork.	9am	• Different meetings during the week, (teaching for residents from 8 to 9). • I work for three consultants. • One consultant will come around at 8am, another consultant comes three times a week and the third consultant hasn't got any in-patients. • The registrar is fairly available, not always immediately contactable. • The medical side is communicated by conversation and liaison and dealing with health professionals, • Hand over to the medical staff is verbal. • Medicine is basically a 24 hour business but patients get 9-5 hospital care • There is only skeletal staff at weekends and nights.
RMO1 (22)	• Ward round with registrars. • Ward meeting. • Undertake tasks set during rounds. • 2nd round with Consultants is unpredictable.	8am	• Multi disciplinary team meetings. • I report to the registrar who talks to the boss. • In a normal ward job, I talk to the registrar, rather than the boss.
RMO2 (23)	• Quick ward round with registrar. • Registrar leaves orders for the day • Undertake tasks set by registrar. • 2nd ward round with	7.50am	• In emergency, you may not see the consultant who may attend and only talk to the nursing staff about the patient.

	• consultants. • Consult with registrar at 3pm about activity and night instructions.		
RMO1(24)	• Ward round with registrar. • Theatre at 8am. • Clinics in the afternoon. • Sort out patients in between times	7.45am	• High patient turnover. • Face-to-face communication.
Intern (25)	*Tape not clear for this section*		
RMO1(26)	• I do angiograms. • Try and sort out on the ward • Ward rounds around 8:30 - 9am with the registrar until about 11:30. • Work out any jobs from ward round. • The consultants are unpredictable when they attend.	7.30am	• In Relief there are a new set of patients every week. • Every day is the same structure.
RMO1(27)	• Ward round with registrar. • Make a plan for each patient. • Undertake tasks (investigations, checking results, arranging consults from other departments). • Clinics.	8.30am	• Consultants come at different times, so you do a ward round with one of your bosses - there is no standard time. • In rheumatology there is a grand round where all the consultants get together and discuss all the cases on Monday midday. • There are multi-disciplinary team meetings.
RMO1(28)	• Ward round with registrar who sometimes comes in later. • Undertake takes set during rounds. • Meetings-teaching sessions. • Admissions in the afternoon.	morning	• The consultants' offices are on the same floor as the patients. • There is a lot of interaction with the senior clinicians during the day. • I'd usually see one of the consultants every day. • At the peripheral hospitals consultants would come once a week and are difficult for the registrar to contact. • You don't get much preparation for your relief term.
RMO1(29)	• Round on own. • Round with registrar. • Undertake tasks set during rounds. • After lunch chasing test results. • Finnish 5pm.	8am	• In spinal there is more consultant contact. • Weekly multi disciplinary case conference. • Monday ward round is big ward round with two of the consultants and representatives from allied health, physio or the OT, and a representative from the nursing staff. We do this twice a week.
RMO2(30)	• Ward round with registrar. • Theatre. • Discharge summaries. • Sorting out patients. • Chasing results.	7am	• Weekly burns meeting. • Weekly clinic.
RMO2(31)	• Admissions from casualty. In charge of out patient dialysis clinic • Take calls. • Review sick patients. • Organising lists.	morning	• There is one weekly formal meeting for registrars. • Most communication with the nurses.

Intern (32)	• Ward round with registrar. • Undertakes tasks set during rounds.	7am	• Case conference. • Communicate with the registrars and the consultants as well as other health professionals.

Interns and residents nominated a range of work activities and situations that impacted on their attitude to the work place. See table 6.10 for a list of activities that impact on work routines. The effectiveness of ward rounds, hand-overs and joint-admissions raise significant organisational issues for hospital administration but the doctors interviewed appeared to accept that nothing could be done to improve the situation.

Table 6.10: Activities impacting on ward routines

Unprepared for work. • Unfamiliar hospital. • Unfamiliar ward. • Inexperience at procedures.	RMO1 28) RMO 2 (30)
Multiple teams. • Lack of responsibility.	RMO1 (20) RMO 1 (29)
Discharge summaries. • Inadequate. • Delayed.	Intern(3)
Ward rounds. • All day ward rounds. • Ad hoc rounds. • Too fast. • Too much paper work. • Unpredictable.	Intern (1) Intern (3) Intern (12) RMO1(13) Intern(12)
Patients located out of department. • Inadequate care.	Intern (3)
Meetings. • Weekly. • Discharge planning.	RMO1 (13) Intern (14)
Paging. • Nurses. • Allied health. • Communicating results. • To senior staff-out of depth.	RMO1 (20) Intern (8) RMO1 (11) RMO1 (13)
Overtime and weekends. • Unclear role of doctor on overtime. • Less commitment to patients. • Less responsibility. • Failure to write up notes. • Failure to follow instructions.	RMO1 (28) Intern(3) Intern (4) Intern (14)
Hand-over (change-over). • No formal verbal handover. • Unfinished work. • Important to have good communication. • Require face-to-face meeting. • Failure of follow up on instructions. • Inadequate handover between terms. • inadequate communication	RMO1 (7) Intern (3) Intern (10) RMO1 (20) RMO1(13) Intern (14) Intern (16) RMO1(20)

	RMO2 (30)
Tests/investigations. • Too delayed. • Delayed test results. • Timely ordering of tests.	Intern (4) RMO1(21) RMO1(29)
Stereotyping. • Overseas trained doctors.	RMO2(19)
Communication. • Poor communications in surgery. • Importance of good communication between consultants and registrars and junior staff members.	Intern (17) Intern(10)
Relief. • Unsettling. • Long hours. • Unfamiliar patients.	RMO1(16)
Joint admissions. • Spinal admissions. • Continuity of care affected. • Communication difficulties and delays.	RMO1(29)

Paging of interns and residents by nurses was an issue in relation to the need for interns and residents to prioritise and the nurse's request for immediate attention.[xxxvi]

"It's a complaint of a lot of junior staff. You'll get continually paged about cannulas and fluid orders, which can become irritating because they can wait for half an hour or an hour. It's frustrating on overtime shifts in general the way some staff prioritise problems." RMO1 (13)

4.4 Overseas trained doctors

Four informants were trained overseas and were undertaking their 12 months compulsory hospital training. All four said they had communication difficulties with some nurses, registrars and consultants. They talked about their feeling 'not accepted'. They believed that there was a general view in the hospital that overseas trained doctors have inferior knowledge and skills. The following quote explains some of the difficulties from their perspective.

"If the doctor explained to me properly, maybe sometime the accent may be a problem with the different doctors, it takes a while to understand, if they speak to us slowly and explain. They don't know about AMC marks or anything about us, we are like an alien. There is no support within the hospital. No one discusses with me as an overseas doctor how are you feeling and how are you going so far and is there any way we can help you or discuss with the consultant, no support." Intern (12)

[xxxvi] I discussed this in more detail in chapter four.

4.5   Attitude to Adverse Events

Attitudes of interns and residents to mistakes fall into the following categories:- (1) personal responsibility, ('I think that was bad', 'shouldn't have done that', 'more careful', 'sweep under the carpet') (2) rationalisation ('something was going to go wrong with the patient sooner or later', 'the patient was going to die in any event', confounding factors', 'patient had so many problems') (3) inevitability ('can't expect everyone to know everything', 'unfortunate but cannot change', 'unavoidable', 'should not blame people') and (4) personal responses ('irritated', 'frustrated', 'annoyed', 'upset', 'distress', 'easy to be critical in hindsight'). A theme running through most of the comments about mistakes was the importance of not blaming people or conducting 'witch-hunts'.

4.6   Mental preparedness

The majority of interns and residents appreciated the role 'inexperience' played in their preparedness for mistakes. This was counterbalanced by the preparedness to ask for help when one was out of his or her depth or did not feel confident in managing a situation. Balancing the need to gain experience and accept responsibility for patients with preventing harm to patients was also identified. Table 6.11 summarises intern and resident preparedness for mistakes. Most have an understanding that mistakes will be made but their comments reflect poor understanding of the causes of errors and concentrate on their personal responsibility and immediate work place.

Table 6.11: Summary of intern and resident statements about mental preparedness for mistakes

Position	Comments
Intern (1)	• Mistakes will reflect badly on assessments. • Need to document carefully. • Awareness of the impact of tiredness.
Intern (2)	• Nurses are more difficult to communicate with.
Intern (3)	• Scared that would not know things expected of me. • Lot of back-up. • Long working hours.
Intern (4)	• Does not matter how much you try you are still not experienced. • If ethically opposed to a treatment difficult to object. • If one is careful there are sufficient safeguards in the system to protect patients. • Being careful will prevent harm to patients.
RMO1(6)	• You try your hardest.

RMO1(7)	• Tend to concentrate on one thing and forget about the possibility of other diagnoses.
Intern (8)	• There is an expectation that one should know what to do. • Avoid looking like a 'fool' or an 'idiot'. • Try and recognise being 'out of one's depth'.
Intern(10)	• Try and take on board all information and formulate a plan. • Avoid working with out proper cover. • Avoid jumping to conclusions. • You not feel that it is acceptable to call for help from other departments or sections in the hospital. • Being older means a lot more confidence (this was said in relation to graduates of the Sydney medical program). • Maintain focus on the patient. • Try and prevent patient harm due to inexperience.
RMO1(11)	• Need to recognise mistakes and learn from them.
Intern (12)	• Work hard. • Don't repeat mistakes. • Try and not get angry. • Try and understand the family's anger and grief after mistakes.
Intern (14)	• No one seems to care that much.
RMO1(15)	• You need to experience to learn.
Intern (16)	• Cover all your bases. • Prepare for the difficulties in obtaining out of department consults.
Intern (17)	• Prepare to work alone in the peripheral hospitals. • Know when it is time to quit and ask for help.
RMO2(19)	• Accept that you cannot do everything perfect.
RMO1(20)	• Ask for help if unsure.
RMO1(21)	• Ensure appropriate handovers. • Need to understand patients' problems. • Understand that patients react differently. • Read the RMO Handbook. • Unforeseen things can go wrong with patients. • Patients' conditions can change.
RMO1(22)	• Unprepared –did not know what to do.
RMO2(23)	• Not prepared for working while fatigued.
RMO1(24)	• Not prepared because of lethargy.
Intern 25	• Be prepared to be wrong. • Be prepared to accept sole responsibility.
RMO1(26)	• Accept small mistakes occur and move on.
RMO1(27)	• Expect complications. • Patients are not 'guinea pigs'.
RMO1(28)	• Prevent mistakes from happening. • Get tougher. • More resilient (does not hurt as much if something goes wrong). • Maintain objectivity.
RMO1(29)	• Expect to work 'flat-out'. • Expect to miss things.
RMO2(30)	• Expect to be able to do 'everything' the nurses' request. • Expect mistakes. • Expect things to go wrong.
RMO2(31)	• Prepared to ask for help. • Don't work beyond your capacity. • Avoid being 'out of your depth'. • Accept responsibility for the patient.
Intern (32)	• Overwhelming pressure to perform. • Be personally responsible for patients.

5   Limitations of the study

At the time of my study [xxxvii] all state medical graduates were allocated to one of 18 public hospitals for their internships. The Postgraduate Medical Council of NSW allocated interns and Australian Medical Council graduates (trained overseas) to positions. Local medical graduates are given priority for intern placement. All applicants at the time of applying for hospital placement must state a preference for each of the 18 hospitals. Local medical graduates were allocated to a hospital by a computer which matched preferences with ranking on the combined 'order of merit' produced jointly by the Universities of Newcastle, New South Wales and Sydney.[38]

Since the study hospital is a large metropolitan teaching hospital the students selected would be higher in ranking because students to date have preferred allocation to these hospitals. In 2000 the study hospital was in the top six choices of hospitals for local students and in the top 6 hospitals for all students.[xxxviii] Interns at the study hospital may have received better grades which might indicate that the study group was biased toward higher achievement.

Another limitation is that the mistakes described by the doctors are based on their personal experience and observation and might not reflect the views of other health professionals involved in the mistakes. In addition, the current litigious environment and the medical culture which values high standards, sometimes amounting to perfection, may have stopped some doctors from fully disclosing their role in some medical mistakes. They may have failed to mention those mistakes that have been stressful or challenging to them in the past or self-censored significant mistakes for which they feared repercussion.

[xxxvii] Random selection of the preferences nominated by the applicants is the only criteria now used for selection. This came about because the Sydney University Program does not rank students.
[xxxviii] Postgraduate Medical Council of NSW, August 2002 p7.

Some interns and residents may have been influenced in their decision to be interviewed because of my position in a medical faculty[xxxix] and my work in the hospital. I teach in a medical program and sit on a number of safety and quality committees. I also conduct health law and ethics sessions in the junior medical officer education program for the area health service. The informants may have wanted to demonstrate to me their commitment to patient safety.

[xxxix] I am an Associate Professor of Ethical Practice and Chair of Personal & Professional Development Theme Committee for the Faculty of Medicine, University of Sydney.

Chapter Seven: Conclusions, Implications and Recommendations of this study

1   Conclusions

1.1   Conclusions about underlying factors associated with mistakes

This study shows that interns and residents think the main causes of mistakes are those associated with junior medical officer factors: inadequate medical knowledge and skills; poor interpersonal relationships; poor team work; poor or inadequate communication and unequal power relationships between junior and senior staff. While they recognise that poor systems design and bad work practices play a role in mistakes, they do not think these things can be changed. Interns and residents recognise in general terms that multiple factors are associated with mistakes but they have little understanding of how these factors impact on adverse outcomes for patients.

Interns and residents believe their supervisors, registrars and consultants expect them to make mistakes but they were not able to give any specific examples of mistakes which had become a positive learning experience for them. Instead the informants described a consistent lack of opportunity to learn from mistakes; there was no routine method for incorporating mistakes or near misses into supervision and training. This situation reflects traditional views held by the medical profession about mistakes as personal failures rather than being viewed in the context of the wider organisation or system.

Conclusions

While junior doctors generally accept that mistakes occur, they had limited understanding of the nature and causes of the mistakes and the problems of mistakes in the health system. Ultimately they viewed mistakes as primarily the responsibility of individual nurses and doctors. But this did not mean they blamed individuals. Interns and residents did not generally blame individuals for mistakes because they could see themselves making similar mistakes.

1.1.1 Understanding of mistakes

While nearly all the interns and residents interviewed thought mistakes were common or very common they were confused about what constitutes a mistake. For some a mistake implied a catastrophic outcome. Others had difficulties distinguishing mistakes from complications of health care. Mistakes of omission (failure to do something) and commission (doing the wrong thing or the right thing at the wrong time) were not easily classified as mistakes by many of the JMOs. Their uncertainty about whether a mistake had occurred may be linked to the limited understanding of errors by clinicians and hospital managers and an underdeveloped 'mistake' vocabulary for discussing them.

Conclusions

The main method used by interns and residents to talk about mistakes centred on narrative; the description of the events leading to mistakes and the aftermath from their own perspective and those of their patients. The framework used by the informants for mistake analysis is predominantly personal rather than professional.

The language used by the interns and residents focussed on the circumstances and impact of mistakes rather than any multifactorial analysis of mistakes. The general lack of depth in discussions about mistakes suggests an absence of knowledge about errors, hence an absence of any framework to help with such discussions. While they were willing to discuss their mistakes with me in a safe and confidential environment, they indicated their general unwillingness to discuss their mistakes with clinical supervisors and hospital personnel. Such personal discussions do not easily fit into professional discourses.

1.1.2 Knowledge about factors underlying mistakes

Interns and residents identified many factors underpinning mistakes with system factors (supervision, organisation of work, work environment, location and situation) selected more frequently than other categories. Sub-optimal supervision was a constant theme in this study; the perceived success of a term often depended on the quality and availability of supervision.

Conclusions

Interns and residents made minimal demands on clinical supervisors and had relatively low expectations in relation to the quality of their supervision. Well organised departments and units with regular and predictable ward rounds were seen by interns and residents to provide better supervision and enhanced training opportunities.

1.1.3 Categories of mistakes described by interns and residents

Mistakes described by the interns and residents fell into four categories; treatment, patient management, medication errors and diagnoses. The treatment mistakes (delayed treatment and incorrect treatment) category accounted for most of the mistakes described by the junior doctors. This category of mistakes raised issues of timeliness of attendance by registrars and consultants, quality and availability of supervision and personal factors.

Conclusions

The informants identified a range of antecedents to mistakes. The list below highlights the role of the system and organisation in mistakes. The uncertainty surrounding checking instructions from seniors, the lack of time, multiple tasks, and inadequate supervision cannot be remedied by the junior doctors alone. Organisational leadership is required to minimise these situations from occurring.

The following list is a summary of the most commonly expressed antecedents of mistakes reported by those interviewed:-

- a misunderstanding of orders/instructions
- a lack of specificity of instructions
- a lack of opportunity to clarify instructions
- competing demands
- quick assessments
- a lack of assertiveness on the part of junior doctors

- fear and Intimidation (failing to call or question instructions)
- a lack of preparedness
- unavailability of senior staff.

In addition to the above factors the informants identified the following pre-existing conditions that indicated increased opportunities for mistakes;

- requesting and obtaining out-of-department consultations
- treating patients who are allocated to wards not orientated towards the patient's particular condition
- change-overs
- treating patients with multiple problems
- patients admitted to hospital with more than one clinician responsible for their care (joint admissions).
- week-end work, nights, overtime and relief
- Unfamiliar patients, role confusion, delayed tests, inadequate staff, unfamiliar environment, inadequate back-up, and
- high workloads.

More research is needed on these conditions to ascertain how they impact on patient care and alternative methods to avoid adverse events.

1.1.4 Main mistake places

Interns and residents identified three specific places they associated with mistakes; the Emergency Department, the surgical wards and the peripheral hospitals. The Emergency Department (ED) has long been identified as a place where inexperienced staff are vulnerable to errors. Nevertheless interns and residents value the hands-on experience. Supervision in the Emergency Department therefore is crucial both for protecting patients (from incorrect diagnoses) and also to enable junior medical officers to practise diagnostic skills and exercise clinical judgement. The Emergency Department was described by many as chaotic, with a high workload and having multiple demands made on it. There was general acceptance that the elements

described above were inevitable and natural to all emergency departments. The surgical ward was also seen as problematic due to the unavailability of senior staff who were operating. While the informants recognised the high potential for mistakes in these locations the interns and residents did not think that anything could be changed.

Supervision requires a pre-arranged relationship between the trainee (intern or resident) with a senior colleague. Availability and easy access are essential. It includes monitoring the decisions and treatments provided by interns and residents. Most junior doctors had minimal expectations of supervision and interpreted it as the availability of a senior clinician on the ward on a 'needs' basis. They appear to be satisfied with supervision as long as they are able to consult a more senior clinician when they need to confirm an intention or to seek advice. Registrars who regularly checked work were seen as diligent and most helpful but were considered rare.

Conclusions

Even though interns and residents recognise the presence of many system flaws in the peripheral hospitals, emergency and surgical areas, they do not think their susceptibility for mistakes can be lessened. Many times they were able to identify problems such as the absence of senior clinicians, inadequate supervision in peripheral hospitals, insufficient back-up and inadequate on-call arrangements but none saw any hope of change and accepted the current system for all its faults. This was the case even though the junior doctors all described the angst and stress they encountered when poorly supervised or with in sufficient backup.

1.2   Conclusions about the medical structure

The overall uniformity of descriptions by interns and residents of their experiences of clinical medicine and the hospital environment permit general conclusions to be made about the medical structure in the study hospital from their perspective. Most interns and residents discussed the medical hierarchy in terms of their low status and position where junior doctors quickly learn not

to talk to consultants. The quality of the teacher-learner relationship between junior medical staff and consultants was often judged by how approachable and available they were to the JMOs rather than the quality of the teaching.

The impact of the prevailing medical structure on the position and role of junior doctors in the medical hierarchy is not confined to relationships with senior clinicians. It affects work practices as well. Nearly all the interns and residents said they would not record communication problems (about patients) between themselves and senior staff in the medical records. Fear of intimidation from some senior clinicians was frequently mentioned.

Morning ward rounds were identified by all informants as key markers for their daily activities. Interns and residents said consultants did not usually attend daily ward rounds, rather they came at unpredictable hours and days. The interns and residents in my study appeared to mistrust taking instructions from a written order; they preferred face-to-face communications with medical clinicians. But when it came to communicating with nurses they preferred written communication.

Conclusions

The most important relationship for an intern and resident is the one with their registrar because most of their learning and problem-solving involves him or her. But when it came to patient care the informants mentioned their relationships with the nurses as central, particular in relation to avoiding mistakes. The relationship with consultants was not identified as important for learning and was also associated with negative experiences or being 'fobbed off'. Many said they learned early not to disagree or challenge decisions by consultants and registrars.

Even though it was generally recognised that mistakes occur, the interns and residents believed the prevailing medical organisation (culture) did not require them to report mistakes. Instead they used a variety of techniques to manage mistakes. The main method used to explain mistakes, particularly those resulting in bad outcomes for patients, was rationalisation. (The patient was

very sick and would have had a similar outcome even if there was no mistake.)

1.3 Conclusions about acknowledging mistakes to patients and their families

The failure to acknowledge mistakes on the part of JMOs extends not only to their reluctance to complete incident reports but also to report or discuss mistakes with the patients themselves. The failure to make incident reports was partly caused by the general lack of confidence interns and residents had in existing reporting mechanisms. While many expressed general concern about the medico - legal environment, it was not mentioned as a factor for not telling patients or their families about mistakes. There was surprisingly little comment from the informants about failure to inform patients. This could have been associated with their lack of exposure to, or participation in, such discussions with patients or their families or to the relative lack of information provided to patients generally. The failure to provide information about mistakes to patients was therefore not seen as unusual.

Conclusions

The results show that interns and residents do not routinely report mistakes to patients their families, other clinicians or members of the health care team. Most of the patients in this study who suffered an adverse event caused by a mistake were not told about the mistake even when there was a catastrophic outcome.

In addition to interns' and residents' general lack of trust in reporting mechanisms, they generally held the impression that they would be blamed and suffer punitive repercussions if they disclosed their mistakes to the hospital managers, clinical supervisors or patients and families. The preferred method used by most interns and residents for documenting mistakes is the medical record.

1.4 Conclusions about understanding and learning from mistakes

The interns and residents interviewed did not routinely see senior clinicians disclosing their mistakes thus reducing one of the main ways for learning from the mistakes of others. Discussion of mistakes often used blame language, which did not encourage the informants to be open about their mistakes. Most interns and residents limited their discussions about mistakes to their own families and friends because they did not believe the hospital would support them even though the study hospital was a large teaching hospital with established mechanisms for reporting and managing adverse events. Nor was the Director of Clinical Training recognised as a person from whom they could seek assistance.

Conclusions

The study shows that interns and residents tend to worry about their mistakes and their impact on patients. They also worry that mistakes will damage their reputations and future career choices. In addition to a fear of being 'blamed', they also believe that mistakes can be avoided by individual effort; that people who make the effort and have the right experience will be able to avoid future mistakes. The mistakes reported by the informants obviously caused the junior doctors stress and actual harm to patients. Junior doctors were unable to identify any hospital system to help them manage mistakes but stressed they <u>would not</u> generally talk to senior clinicians about their mistakes.

These findings relate specifically to the interns and residents working in a particular metropolitan teaching hospital. Therefore the findings may not apply to the experience of other interns and residents in Australian hospitals. However, because many of the contextual features are similar to all hospitals it may be appropriate to rely on these findings for further research. Research on hand-overs and out-of-department consultations may also be appropriate for research in other hospitals. Other features that hospitals share include the organisation into multiple departments, lack of standarised systems across all departments, the level of complexity in the care of patients and the medical hierarchy.

2   Implications of the study results

The results of this study have implications for medical education, training of interns and residents in New South Wales, hospital organisation in New South Wales and within the medical culture generally.

2.1   Medical education

The results show that junior doctors in my study do not have the background knowledge about the extent of adverse events suffered by patients or an understanding of the broader system challenges facing health care. They report no training either at their undergraduate level or as part of hospital education programs. Recent initiatives of the Australian Council on Quality and Safety in Health Care in association with the Committee of the Deans of Australian Medical Schools[i] (CDAMS) have identified significant gaps in the medical curricula about safety. The Council in collaboration with CDAMS have funded the development of a Patient Safety Education Framework[ii] to identify patient safety competencies for all health workers, not just doctors. This framework will assist medical faculties to develop curricula. Managing and preventing medical mistakes is an important aspect of quality and safety. The skills and knowledge required by junior doctors to avoid and minimise mistakes cannot be divorced from learning their skills and knowledge about clinical medicine.

Learning objectives in quality and safety need to be designed around basic skills acquisition and interdisciplinary learning in areas such as practising patient-centred medicine, practising evidence-based medicine and systems thinking. Learning objectives include the requirement to understand variation, knowledge of prevention strategies and clinical practice improvement tools.

---

[i] Committee of Deans of Australian Medical Schools (CDAMS) is the peak representative body for the Deans of Australia's twelve existing and three prospective medical schools and faculties. CDAMS also works closely with the Deans of medical schools in New Zealand, Fiji and Papua New Guinea, providing a broad focus to the development of undergraduate medical education in the Australasian region. (CDAMS website)

[ii] I am the Director of the project and have developed the Framework that is the basis for curricula and training programs. See http://www.patientsafety.org.au

Medical schools in Australia are only now examining topics about patient safety and interdisciplinary teaching and learning is still novel.

Clinical and faculty staff have little experience of teaching about safety and their knowledge of quality and safety including medical mistakes is limited. This is not surprising since there is also very little research on the topic.

2.2 Training of interns and residents

Interns and residents are employed in hospitals to provide clinical services to patients. At the same time the NSW Medical Board and the NSW Postgraduate Medical Council recognise they are still in training; interns are only conditionally registered. The gap between service delivery requirements by the employing hospitals and the training needs of the junior doctors has created a situation in which patients receive inadequate care by unsupervised junior doctors and junior doctors are not receiving the structured training they require. My results show that the current system which relies upon junior doctors to meet workforce needs but provides inadequate and unstructured training is likely to be associated with on-going problems of medical error in hospitals. The high number of mistakes made and the problems identified by the informants in relation to supervision and the role of consultants shows that the current system is not satisfactory as a training model.

Encouraging interns and residents to be open about their mistakes and to use them for learning will not happen unless there are changes in hospitals and in the medical culture. This will include new standards for supervision and support for junior doctors. A change in attitude and approach to supervision, training and mistakes is required by senior clinicians.

The results of this study have implications for the NSW Postgraduate Medical Council and other state Councils. The Councils accredit hospitals for training interns and first year resident medical officers. While standards have been developed to ensure that junior medical officers receive appropriate supervision and training during these crucial first two years, my results show that the standards are not always being applied. First, The Council needs to

recognise and acknowledge that junior medical officers are involved in mistakes on a regular basis. Making explicit statements about the potential for mistakes will help open up the discussion about them. Acknowledgement that mistakes occur and that steps must be taken to prevent them may also lead to better supervision, or at least discussions about what constitutes 'good supervision'. Other competencies required by junior doctors include management and prevention of medical mistakes and how to disclose adverse events to patients or their families.

In New South Wales, Directors of Clinical Training (DCT) are appointed by the NSW Postgraduate Medical Council. They are responsible for training junior doctors in the hospitals. A potential conflict exists in that the DCT is required to both advocate for junior doctors as well as assess their performance. The consequence of this is that interns and residents are reluctant to disclose mistakes or problems.

2.3   Hospital organisation

Hospitals in New South Wales are making greater efforts to ensure that mistakes are reported, analysed and understood. But most hospitals have been collecting data about incidents for years with little evidence that any improvements in health care have been achieved. Mistakes involving medical clinicians have traditionally been excluded from such collections. For clinicians to be convinced that disclosing mistakes will lead to less adverse events, hospitals will need to establish a systematic approach to mistake management. They will need to demonstrate that openness about mistakes will result in better patient care and system wide improvements rather than 'shame' and 'blame' the individuals involved. A trustworthy system of consistent and regular reporting, evidence of improved health outcomes and effective staff training will need to replace the political, legal and economic drivers that currently appear to determine how mistakes are managed.

Hospitals need to resolve the above mentioned tension between service delivery and training requirements of junior doctors. More research on models for educating junior doctors is required. But in the mean time hospitals need to

explicitly acknowledge the particular vulnerability of junior doctors to mistakes. Hospitals need to seriously examine whether consultants have the time or commitment necessary to be supervisors. The role of registrar as the hospital lynch pin for medical supervision of junior staff and ensuring service delivery requires urgent examination. Whether a consultant led service is appropriate for Australia, as is proposed in the UK or whether dedicated clinical teachers and quarantined learning will reduce the tensions between the learning needs of junior doctors and the service requirements of hospitals are yet to be tested.

Health administrators have largely left the medical profession alone to determine its own work practices and routines within hospitals. The study results suggest that certain hospital conditions, including change-overs and out-of-department consultations, play significant roles in mistakes involving interns and residents. The mistakes associated with these conditions are system wide problems and cannot be fixed by doctors alone. The willingness of medical clinicians to work with medical directors and health administrators is crucial for improving and standardising these activities.

The results show a disturbing lack of information being given to patients and their families when mistakes have been made or after adverse events. Doctors have alone determined whether patients or families are fully informed about the circumstances of their care and treatment. The burden of disclosure of mistakes, bearing in mind the possible medico-legal implications, should be a shared responsibility with the hospital organisation. Doctors require organisational support for full disclosure after mistakes. The Australian Council for Safety and Quality in Health Care (2003) new guidelines on how to disclose mistakes to patients and families after an adverse event will assist doctors to better manage this process.

2.4   Medical organisation
The organisation of health care has changed with greater complexity and increasing technology. The hospital patient population has changed with shorter stays, sicker patients, and more dependency on technology (including

drugs). But the way doctors are trained in hospitals has changed little. The dependence on supervision and bedside experience with patients still underpins junior doctor training, but the role played by consultants in that training has changed. The demands on consultants in terms of their private practices have meant that less time is available for consultants to teach junior doctors. This forces the interns and residents to heavily rely on the registrars for their tuition.

Today not all consultants routinely do daily rounds with junior staff, once a critical factor in training and education. Infrequent attendance on public patients also creates uncertainty in terms of patient instructions and indirectly places more responsibility onto junior medical officers in the first instance. Supervision in these circumstances becomes more important, not less. These arrangements also add pressure on registrars who have become the primary teachers of junior doctors. Registrars[iii] are not trained to teach junior medical staff. Because consultants spend less time on the wards registrars take responsibility for patients and for communicating with consultants about those patients. At the same time they have their own very demanding training and study to undertake.

The informants consistently identified the importance of good communication and relationships with nursing staff as one way to minimise mistakes. Good relationships were seen as 'lucky' if they happened. While most informants identified the registrar as the person they had most contact with, it was the nurses who gave them most help in relation to avoiding mistakes.

3   Recommendations

The following recommendations specifically apply for New South Wales but may also apply to other Australian States and Territories.

3.1   Training and education

Medical schools

[iii] There is no mandatory training for medical clinicians (of any rank) in medical education.

- Medical schools should ensure the medical curriculum incorporates appropriate patient safety competencies.
- Medical schools should explore the role of interdisciplinary educational opportunities for medical and nursing students

Postgraduate medical councils

- Postgraduate medical councils should identify the key safety domains and associated core competencies required for interns and residents.
- Postgraduate medical councils should require hospitals that accept interns and residents to meet standards around quality and safety. These standards should include the following components:-

  (a)   require interns and residents to be included in quality improvement activities

  (b)   train and expose interns and residents in 'open disclosure' to patients and their families

  (c)   teach interns and residents the importance of mistake reporting and incident management

  (d)   introduce support mechanisms for interns and residents who are involved in mistakes causing significant adverse outcomes for patients and their families

  (e)   identify the skills and qualities of an effective supervisor

  (f)   identify the training needs of supervisors.

- Define and describe supervision and the criteria for effective supervision.
- Postgraduate medical councils should design a self-assessment instrument for interns and residents to evaluate their supervision.
- The NSW Postgraduate Medical Council should introduce the role of Clinical Mentor in addition to the role of the Director of Clinical Training (DCT). This will resolve the possible conflict for

the DCT in relation to being both a clinical supervisor (assessor) and support person after mistakes.

Hospitals

- Until new models are developed to manage the tension between service delivery and learning, NSW hospitals should be required to provide protected time for interns and residents to engage in training and education distinct from their service requirements.

- NSW hospitals should review the role and functions of registrars. This activity should include an examination of the teaching and service provision components.

- The NSW Department of Health should review Visiting Medical Officer contracts in teaching hospitals to establish their role and responsibilities in teaching.

3.2   Improving the work place

- Provide an induction program for all interns and residents about 'on call' and the names and numbers and roles of the 'on call' clinicians. Instructions should also include information about what to do if a clinician on call does not respond appropriately.

- All teaching and peripheral hospitals should review the rostering of staff in surgical wards with a view to ensuring one senior clinician is rostered on the surgical wards (non-theatre duty). This will also facilitate timely out-of-department consultations involving pre and post surgical patients.

- All hospitals should educate interns and residents on the mechanisms for reporting, analysing mistakes and how to make improvements.

- All hospitals should create an open culture for the reporting of mistakes by ensuring that all junior doctors know how and when to report adverse events and near misses, and that they can do so without 'shame'.

- All hospitals should ensure all interns and residents are educated about the principles and practice of 'full disclosure' to patients or families of an adverse event.

- All hospitals should establish a mentor program or network/panel of senior clinicians willing to provide guidance and advice to interns and residents (careers, educational matters, clinical problems, interpersonal problems, organisational difficulties)

- All hospitals should establish a regular closed forum for interns and residents to talk about mistakes facilitated by someone trusted and respected by the junior doctors.

3.3 Changing the medical culture

- Colleges should educate trainees and fellows about medical mistakes and encourage senior clinicians to acknowledge and talk about mistakes (their own as well as others) in a safe learning environment.
- Medical schools and colleges should address the role of uncertainty in medicine particularly in the context of the notion that good doctors do not make mistakes.

3.4 Further Research

- More research is required to ascertain if standardising the organisation of wards, the location of medical records, charts, technology and equipment, meetings, ward rounds and communications between team members will reduce adverse

events. All interviewees described the problems caused by unfamiliar protocols, ward routines and environments.

- Research is also required in the areas of hand-overs, out-of-department consultations, joint admissions, patient bed allocation during 'exit block' and paging.
- The nature and quality of supervision as a teaching and learning instrument for supervisors and junior doctors
- Research of the role and functions of registrars in the education and training of junior doctors.
- Research and compare different methods for teaching interns and residents.
- Investigate the different models including new ones for managing service delivery requirements and training and education needs of interns and residents.
- Investigate the effectiveness of mentoring and role modelling as educational methods for interns and residents.
- The place of interdisciplinary learning in health professions
- The role of nurses and their interactions with junior doctors.

Appendix 1   Letter to interns and residents inviting them to participate in the study.

Monday, 17 July 2000

Dear Doctor

I have received approval from The ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯ Human Research Ethics Committee to conduct research into how Interns and Residents handle medical mishaps. The aim of this study is to further understanding of the individual intern's and resident's experience and perception of the causes of medical mishaps. My hypothesis is that there are multiple factors contributing to medical errors, not just the individual. The research will help us to understand the extent to which errors are the result of individual factors versus contextual, organisational, and system factors and their inter relationship. It is hoped that the research will help identify system improvements and improved medical curricula.

This research involves interviewing interns and residents about their perceptions of medical mishaps. It is qualitative and is dependent on receiving as many representations of mishaps as possible. Your involvement is voluntary. This research will not identify any person and names will be destroyed once the interviews have been conducted and adverse events located. Please find attached an information sheet outlining the research project and the confidentiality requirements.

Should you agree to an interview could you please contact me at ⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯⎯ (Monday-Tuesday) or at the University of Sydney Medical Faculty on 93513678 (Wednesday-Friday). My email address is mwalton@gmp.usyd.edu.au The interviews will be scheduled at the end of the day. Each interview will take about one to one and half-hours. A meal will be provided. The interviews will be in the Department of Psychological Medicine

Yours Sincerely

[signature: Merrily Walton]

A/Professor of Ethical Practice
Faculty of Medicine
University of Sydney

Appendix 2   The Questionnaire

COVER SHEET
Residents and Mishaps Study

Filing and coding information

Date: _____   Id Number: _____

Time: _____   Interviewer_____

Place_____   No.of audio tape_____

Date Transcription completed_____

Transcriber_____

Other data

To be coded: _____

Coding completed_____   Attend Educational Session_____

Confidentiality statements attached:

Interviewee; _____
Interviewer: _____

Additional notes:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Background Information on the interviewee

A. Year in residency

B. Speciality

C. Age

D. Gender

E. Other degrees

F. Other work experience

G. What rotation are you currently doing?
                                    Previously?

H. Period in current rotation?

I. Cases
    #1_____

_____

_____

_____

    #2_____

_____

_____

_____

    #3_____

_____

_____

_____

_____

#4

Introduction
"I would like to tell you about this study and how we guarantee anonymity. Let us read and sign a confidentiality statement together.

(Read statement together and include information about how interview data will be analysed and protected)

"We also want to get your permission to audio tape this session. Is that okay with you? Yes_____ NO_____

I.   First question

What do the words "medical mishap" suggests to you?

II.   Describe your typical work day

    A.   What is it like working in your unit?

    B.   Patterns of communication in your unit. How do you communicate with others during the day?

    C.   With whom do you most often have contact?
        If "attending" is not mentioned, ask.)

    D.   Who would you talk to first if you thought something was wrong?

    E   What else do you want to add about your work environment?

III   Mishaps Observed

A   Think about 2 or 3 mishaps you were involved with in the last 2 months (no longer than 6 months ago).
        Let us talk about them one by one.

(Note Cases)

1.

2.

3.

4.

(Make sure the following topics are covered in the cases.
Ask questions if they are not).

B.   Provide more detail on: Where it took place

C.   What was the general situation like?

D.   What was the condition of the patient?

E.   What kind of practitioners were involved

F.   How would you describe the outcome?

G.   How did you communicate with the patient?

H.   How would you categorise this mishap? (All that apply)

(Show the separate list)

Omission
Commission
Diagnosis
Treatment
Rx
Patient management

J   was the mishap acknowledged? If yes, in what form? If no, was anything said? Did it get reported? Was the patient told?
Was the mishap acknowledged to the patient?

K.   What steps were taken to rectify the mishap?

L. What do you think could have been done to prevent this mishap?

IV   Factors associated with this mishap (choose as many as fit)
(Show the list)

A.   Factors: "which are the most important?"

    Practitioners'
    Knowledge
    Skill
    Supervision
    Interpersonal

    Communication

    Patient (eg. Demographics, condition)

    Situation in location (eg. Busy ED middle of the night)

    Equipment/Technology

Work Environment (eg. Sub-unit/speciality routines)

Organisation of Work (eg. Structure/schedule of work)

Hospital

Outside the hospital (state regulation, etc.)

Other

B.   Do you want to provide any more detail on the factors you're chosen?

C.   If you had to choose a single factor as most important, which would you choose?

D.   If one wanted to have a deeper understanding of this situation, whom would you talk to? What would you want to look at?

Now let us go back and talk about another of your cases in the same way.

C.   1   of all the cases you have described, which concerns you the most? Why?

2.   How common do you feel mishaps like these are?

V.   Let's talk about a "near miss"

A.   Can you describe your experience with or observation of a "near miss"?

B.   What in your view specifically prevented this from turning into a mishap?

VI   Avoiding Mishaps

A.   What do you think are the major ways to avoid mishaps in general?

B.   What methods do you think are in place in your unit? In the hospital?

C.   Do you have any additional ideas for avoiding mishaps?

D.   Sometimes residents "go that extra mile" and still something goes wrong. What do you think about that?

VII   Reporting Mishaps

A.   Are all your cases reported?

B.   In what form?

C.   If not. Why (If appropriate)

D.   What would be better ways to report?

E.   Are you aware of any efforts to follow up on mishap reports, make changes? Are the changes evaluated?

VIII   Discussing the mishap with others

A.   How did you feel about the mishaps you described?

B.   How did you handle those feelings?

C. Is there anyone you talked to about the mishap?

D. What do you think are the most common ways residents have for dealing with these mishaps?

E. What could have helped you deal better with these mishaps?

F. Is there anything in your training that helps you think about mishaps?

G. Do you have the sense that someone else is there to take care of mishaps?

IX what else would you like to add concerning any of the subjects we've talked about?

X Closing Comments

1 Reaffirm confidentiality

2. What I will do with the interviews

3. Possibility of inclusion in a second interview

4. Thank you.

Appendix 3   The consent form

Consent Form to participate in a research Project

I, _____

    (name of participant)

of _____   _____   _____

    (street)   (suburb/town)   (state & postcard)

have been invited to participate in a research entitled:
Supporting Interns and Residents: A Multi-Factorial Study of Medical Mishaps.

In relation to this project I have read the Statement of Confidentiality and the Study Information Sheet and have been informed of the following points;

1   Approval has been given by the Human research Ethics Committee (HREC) of the ▒▒▒▒▒▒▒ ospital.

2   The aim of the project is to:
- Further understanding of the individual Intern's and Resident's experience and perception of the causes of medical mishaps.
- To identify and categorise multiple factors correlated with medical errors
- To understand the extent to which errors are the result of individual factors versus contextual, organisational, and system factors and their interrelationship.
- To make recommendations fore the design of interventions to reduce medical mishaps.

<u>**Consent Form to participate in a research Project**</u>

3   Should I develop a problem which I suspect may have resulted from my involvement in this project, I am aware that I may contact-

Dr_____ on _____

(phone and page nos.)

Date:_____   Witness:_____

(please print name)

Signature:_____   Signature:_____

(of participant/volunteer)   (of witness)

Investigator's signature:

4   Should I have any problems or queries about the way in which the study was conducted, and I do not feel comfortable contacting the researcher, I am aware I may contact the Coordinator of research Administration, on 99268106.

5   I can refuse to take part in this project or withdraw from it at any time.

6   After considering all these points, I accept the invitation to participate in this project.

Signature of volunteer_____   Date_____

Signature of Investigator_____   Date_____

Signature of Witness_____   Date_____

Appendix 4　　Statement of confidentiality

Hospital

Telephone:
Facsimile:

Supporting Interns and Residents: A Multi-Factorial Study on Medical Mishaps

Statement of Confidentiality

Associate Professor Walton from the University of Sydney and member of the NSW Ministerial Advisory Committee on Quality is conducting a study to better understand and reduce medical mishaps among Interns and Resident Medical Officers. A goal shared by all. This study will result in peer-reviewed articles in professional journals aimed at raising awareness of the dimensions of medical practice and hospital organization that place residents at greater risk of having mishaps.

Information about medical mishaps in medical practice is being gathered by interviewing a random sample of Interns and Resident Medical Officers at this hospital. The interviews will be approximately one and one half hours in length and is led by the principal investigator Merrilyn Walton. Notes will be taken and if the medical officer agrees, the discussion will be audio-taped. You will be given a number for purposes of identification on the audio- tape and your name will not be recorded.

Your participation is completely voluntary. If we come to a question that you do not want to answer, please skip the question and go onto the next. Your responses will be kept strictly confidential and no personal identification of you will appear on the tapes or the notes. Your name will not be connected with reported findings in any way. Results will remain completely anonymous. No information based on individual interviews will be given to anyone on the staff of this hospital. Information will only be provided in aggregate. The research protocols comply with all the institution's confidentiality requirements.

Supporting Interns and Residents: A Multi-Factorial Study of Medical Mishaps

During the study all notes, interview tapes and observation records will be kept in a locked cabinet in the Principal investigators office. The second part of the research requires a clinician and an expert in organisational management to examine medical records. They will be required to sign a statement obliging them to maintain confidentiality. Any lists used for recruitment purposes will be destroyed after the interviews are completed. The audiotapes will be immediately destroyed once the research is completed.

Please note that medical records accessed for the second stage of the study will be accessed under the protection of ██████ and will have privilege attached to that process.

This study has the approval of the ████ Human Research Ethics Committee (HREC).

STATEMENT OF NON-DISCLOSURE BY INTERVIEWEE, INTERVIEWER, AND CLINICAL AND ORGANISATIONAL EXPERTS.

In order to encourage open and honest interviews and at the same time protect the anonymity of the interviewee we ask you that:

1. Report all events using the third person. Report on your personal experiences as if they happened to another person. Do not identify others by name if incidents involving them are described.
2. We both pledge our commitment to not discuss any part of the interviews or case study material to anyone not connected with the research. Any information divulged or uncovered in the case studies must remain confidential.

████████ Hospital

Supporting Interns and Residents: A Multi-Factorial Study of Medical Mishaps

Please sigh below that you will not repeat any information reported in this interview to anyone outside this room.

Interviewee's name (print)_____

Interviewee's signature_____

Interviewer's name _____

Interviewer's signature_____

Witness_____

Date_____

Appendix 5   Headings and sub-headings developed to assist analysis

```
(F)  Free Nodes
     (F 1)   themes
     (F 1 1)   attitude to AE
     (F 2)   awareness of mistakes
     (F 3)   overseas trained cultural aspects
     (F 5)   business
     (F 6)   mental preparation
Index Tree
     (1)   Base data
     (2)   Adverse events
          (2 1)   attributions
               (2 1 2)   tasks
               (2 1 3)   response to mistake
                    (2 1 3 1)   patient told
                    (2 1 3 2)   patient not told
                    (2 1 3 3)   unknown
                    (2 1 3 4)   family told
                    (2 1 3 5)   no one to tell patient died
                    (2 1 3 6)   family not told
               (2 1 4)   possible alternatives
               (2 1 5)   deeper understanding
                    (2 1 5 1)   failure to monitor
                    (2 1 5 2)   talk to admin
                    (2 1 5 3)   talk to DCT or RMO
               (2 1 6)   emotional response
               (2 1 15)   cause of mistake
                    (2 1 15 1)   infiltrated lung disease
                    (2 1 15 2)   failure to give medication
                    (2 1 15 3)   delayed diagnosis
                    (2 1 15 4)   mistaken identity
                    (2 1 15 5)   poor communication
                    (2 1 15 6)   overflow from ward
                    (2 1 15 7)   wrong dose of medication
                    (2 1 15 8 information
                    (2 1 15 9)   delay in response to emergency
                    (2 1 15 10)   failure to do tests
                    (2 1 15 11)   incorrect dosage medication
                    (2 1 15 12)   delay in admission to ward
                    (2 1 15 13)   wrong medication
                    (2 1 15 14)   failure to diagnose fracture
                    (2 1 15 15)   failure to diagnose tension pneumothorax
                    (2 1 15 16)   misdiagnosis of infarct
                    (2 1 15 17)   failure to wake to page
                    (2 1 15 18)   failure to monitor and delay in admission
                    (2 1 15 19)   failure to give CPR
                    (2 1 15 20)   incorrect administration of heparin
                    (2 1 15 21)   failure to monitor BP and pulse over night
                    (2 1 15 22)   failure to monitor in ICU
                    (2 1 15 23)   delay in tests for haematological problem
                    (2 1 15 24)   no indication of date for surgery
                    (2 1 15 25)   delay in surgery
          (2 2)   what could have been done
               (2 2 1)   something
               (2 2 2)   nothing
               (2 2 3)   don't know
          (2 3)   factors
               (2 3 1)   knowledge
```

```
                    (2 3 2)   skill
                    (2 3 3)   supervision
                    (2 3 4)   interpersonal
                    (2 3 5)   communication
                    (2 3 6)   patient condition
                    (2 3 7)   external factors
            (2 4)   near miss
            (2 5)   system fault
            (2 6)   outcome of adverse events
                    (2 6 1)   patient died
                    (2 6 2)   unknown outcome
                    (2 6 3)   extended length of stay
                    (2 6 4)   no harm to patient
                    (2 6 5)   good outcome
                    (2 6 6)   poor outcome
                    (2 6 7)   survived
            (2 7)   organisation response
            (2 13)  type of mistake
                    (2 13 1)   medication error
                    (2 13 2)   incorrect information on chart
                    (2 13 3)   clinical error
                    (2 13 4)   incorrect diagnosis
                    (2 13 5)   delay in treatment
                    (2 13 6)   treatment against wishes
                    (2 13 7)   incorrect fluids
                    (2 13 8)   surgical mishap
                    (2 13 9)   incorrect treatment post surgery
                    (2 13 10)  failure to monitor fluids oxygen pre surgery
                    (2 13 11)  no information
                    (2 13 12)  failure to monitor hydration
                    (2 13 13)  failure to provide x rays on discharge
                    (2 13 14)  central tension pneumothorax
                    (2 13 15)  misdiagnosis infarct
                    (2 13 17)  wrong patient
                    (2 13 18)  delay in removing infected central line
  (3)   Places
            (3 1)   district hospital
            (3 2)   teaching hospital
            (3 3)   ward
                    (3 3 1)   aged care
                    (3 3 2)   opthopaedics
                    (3 3 3)   different wards
                    (3 3 4)   renal medicine
                    (3 3 5)   spinal
                    (3 3 6)   upper GI
                    (3 3 7)   medical ward
                    (3 3 8)   cardiology
                    (3 3 9)   urology
                    (3 3 10)  gastro
                    (3 3 11)  head and neck
            (3 4)   clinic
            (3 5)   hospital
            (3 6)   ICU
            (3 7)   emergency ward


  (4)   Activities
```

```
(4 1)   ward round
(4 2)   hand overs
(4 3)   follow up
        (4 3 1)   failure to follow up
(4 4)   shift work
(4 5)   supervision
(4 6)   communication
        (4 6 1)   face to face
        (4 6 2)   telephone
        (4 6 3)   via medical records
        (4 6 4)   written on board
        (4 6 5)   ease of
        (4 6 6)   difficult
        (4 6 7)   pager
        (4 6 8)   failure to communicate
        (4 6 9)   no one to communicate with
        (4 6 10)  good communicators
        (4 6 11)  importance of
        (4 6 12)  common language
        (4 6 13)  misinformation
        (4 6 14)  with the right person
        (4 6 15)  nurse reports
        (4 6 16)  written down
        (4 6 17)  discouraged
        (4 6 18)  failed to read notes
        (4 6 19)  not written clearly
        (4 6 20)  miscommunication
(4 7)   work routine
        (4 7 1)   week end
        (4 7 2)   nights
        (4 7 3)   different wards
        (4 7 4)   overtime
        (4 7 5)   work independently
        (4 7 6)   department meetings
        (4 7 7)   busy times
        (4 7 8)   preparing for surgery
        (4 7 9)   public holiday
        (4 7 10)  end of day
        (4 7 11)  relief
(4 8)   discharge
(4 9)   documentation
        (4 9 1)   failure to document
        (4 9 2)   handwriting
        (4 9 3)   inadequate
        (4 9 4)   failure to follow
        (4 9 5)   legal safeguard
        (4 9 6)   insufficient time
        (4 9 7)   accurate
(4 10)  reporting mistakes
        (4 10 1)  no reporting
        (4 10 2)  outcome of reporting
        (4 10 3)  report written
        (4 10 4)  professional responsibility
        (4 10 5)  independent person
        (4 10 6)  uncertainty of
        (4 10 7)  discussed with team
        (4 10 8)  QaRNS
```

```
                      (4 10 9)   recorded in medical notes
                      (4 10 10)   incident report completed
                      (4 10 11)   role of registrar
               (4 11)   steps to fix mistake
               (4 12)   out of dept consultation
               (4 13)   meetings
                      (4 13 1)   multidisciplinary
                      (4 13 2)   interns and residents
                      (4 13 3)   department meeting
                      (4 13 4)   M and M meetings
                      (4 13 5)   grand rounds
               (4 14)   questioning
               (4 15)   debriefing
               (4 16)   back up
               (4 17)   referrals
               (4 18)   medical record review
               (4 19)   education of staff
               (4 20)   ordering tests
               (4 21)   fluids
               (4 22)   writing medications up
               (4 23)   pharmacy review
               (4 24)   checking identity
               (4 25)   clerical work
               (4 26)   taking bloods
               (4 27)   incidence reports
               (4 28)   checking medical records
               (4 29)   checking test results
               (4 30)   write in weekend book
               (4 31)   following protocols
               (4 32)   clinic work
               (4 33)   following orders
               (4 34)   CPR
               (4 35)   checking medications
               (4 36)   joint admissions
      (5)   People
               (5 1)   registrar
               (5 2)   consultants
               (5 3)   rmo 1
               (5 4)   rmo 2
               (5 5)   intern
               (5 5 1) role description
               (5 6)   hospital administrator
               (5 7)   nurses
               (5 8)   director of nursing
               (5 9)   allied health
               (5 10)   patients
               (5 11)   family members
               (5 12)   general practitioner
               (5 13)   lab staff
               (5 14)   technicians
               (5 15)   pharmacist
               (5 16)   resident
               (5 17)   M1
               (5 18)   patient representative
               (5 19)   friends family of doctor
               (5 20)   multi disciplinary
               (5 21)   anaesthetist
```

```
        (5 22)   ambulance officer
        (5 23)   director of clinical training
        (5 24)   medical defense advisers
        (5 25)   cardiology
        (5 26)   pre intern
        (5 27)   coroner
        (5 28)   clinical nurse specialist
        (5 29)   ward clerk
        (5 30)   locum at peripheral hospital
  (6)   Work environment
        (6 1)    predictable
        (6 2)    resources
        (6 3)    stressful
        (6 4)    very busy
        (6 5)    unpredictable
        (6 6)    pressure on beds
        (6 7)    culture
        (6 8)    good
        (6 9)    inadequate staffing
        (6 10)   supportive
        (6 11)   long hours
        (6 12)   career
        (6 13)   cooperate
        (6 14)   confusing
        (6 15)   competing interests
        (6 16)   blame
        (6 17)   unsupported
        (6 18)   hierarchical
        (6 19)   variability
        (6 20)   well organised
        (6 21)   multiple teams with responsibility
        (6 22)   unprepared
  (7)   Training
        (7 1)    no training
        (7 2)    education seminars
        (7 3)    grand rounds
        (7 4)    mortality and morbidity meetings
        (7 5)    induction
        (7 6)    ward education lectures
        (7 7)    communication skills
        (7 8)    newsletters with reported mistakes
  (8)   Definition of mishap
        (8 1)    outcome focused
        (8 2)    relates to bad outcome
        (8 3)    potential for harm
  (9)   Behaviours
        (9 1)    availability
        (9 2)    supportive
        (9 3)    unsupportive
        (9 4)    stressed
        (9 5)    tiredness
        (9 6)    concern
        (9 7)    pleasant
        (9 8)    uncertainty
        (9 9)    slowness
        (9 10)   open
        (9 11)   denial
```

```
      (9 12)   careful
      (9 13)   feeling bad
      (9 14)   cooperative
      (9 15)   casual
      (9 16)   approachable
      (9 17)   not available
      (9 18)   organise
      (9 19)   thinking for yourself
      (9 20)   abusive
      (9 21) ` blame
      (9 22) asking for help
      (9 23) confidence
      (9 24) humiliation
      (9 25) multiple demands
      (9 26) irritating
      (9 27) uncooperative
      (9 28) complaining
      (9 29) unpredictable
      (9 30) panic
      (9 31) avoiding
      (9 32) inexperience
      (9 33) fearful
      (9 34) organised
      (9 35) insecurity
      (9 36) careless
      (9 37) reminding
      (9 38) calm
      (9 39) angry
      (9 40) learning
      (9 41) intimidated
      (9 42) communicate more clearly
      (9 43) frustration
      (9 44) autonomy
(10) Patient condition
      (10 1) chronic condition
            (10 1 1) vertebral artery dissection
      (10 2) acute condition
            (10 2 1) bowel obstruction
            (10 2 2) pulmonary edema
            (10 2 3) nasogastric tube
            (10 2 4) cancer
            (10 2 5) acute post operative pain
            (10 2 6) infection
            (10 2 7) myocardial infarction
            (10 2 8) pin and plate operation
            (10 2 9) endarcarditis
            (10 2 10) septic shock
            (10 2 11) unconscious
            (10 2 12) pulmonary embolism
            (10 2 13) injuries motor vehicle accident
            (10 2 14) cardiac arrest
            (10 2 15) renal failure
            (10 2 16) fracture
            (10 2 17) pneumonia
            (10 2 18) infected chronic airflow limitation
            (10 2 19) complicated orthopaedic problems
            (10 2 20) septic nephrostomy tube
```

```
                    (10 2 21) urinary tract infection
                    (10 2 22) tortion of the testes
                    (10 2 23) dumping syndrome with stomach cancer
                    (10 2 24) complications from drain
              (10 3) stable condition
              (10 4) no adverse effects
              (10 5) critical condition
              (10 6) fracture
              (10 7) confused
(20) Questions
        (20 1) position
        (20 2) planned specialty
        (20 3) age
        (20 4) sex
        (20 5) other degrees
        (20 6) cob
        (20 7) other work experience
        (20 8) current rotation
        (20 9) period in rotation
        (20 10) other rotations
        (20 11) define mishap
        (20 12) typical work day
        (20 14) patterns of communication
        (20 15) how communicate
        (20 16) most contact
        (20 17) contact with consults
        (20 18) talk first
        (20 19) other work environ
        (20 20) M1
        (20 21) M1 about
        (20 23) M1 where
        (20 24) M1 situation
        (20 25) M1 patient condition
        (20 26) M1 practitioners
        (20 27) M1 outcome
        (20 28) M1 communicate Pt
        (20 29) M1category
        (20 30) M1 omission
        (20 31) M1 commission
        (20 32) M1 diagnosis
        (20 33) M1 treatment
        (20 34) M1 Rx
        (20 35) M1 pt management
        (20 36) M1acknowledged
        (20 37) M1 acknowledge how
        (20 38) M1 not acknowledge
        (20 39) M1 reported
        (20 40) M1 was patient told
        (20 41) M1Family told
        (20 42) M1 rectify
        (20 43) M1 prevent
        (20 44) M1 factors assoc
        (20 45) M1 main category
        (20 46) M1 knowledge
        (20 47) M1 skill
        (20 48) M1 supervision
        (20 49) M1 interpersonal
```

```
(20 50)  M1 communication
(20 51)  M1 patient factors
(20 52)  M1 location
(20 53)  M1 equipment
(20 54)  M1 work environ
(20 55)  M1organisation
(20 56)  M1hospital
(20 57)  M1 non hospital
(20 58)  M1 other factors
(20 59)  M1 more factors
(20 60)  M1 main factor
(20 61)  M1 greater understanding
(20 62)  M1 what look at
(20 63)  M2
(20 64)  M2 about
(20 66)  M2 where
(20 67)  M2 situation
(20 68)  M2 patient condition
(20 69)  M2 practitioners
(20 70)  M2 outcome
(20 71)  M2 communicate Pt
(20 72)  M2category
(20 73)  M2 omission
(20 74)  M2 commission
(20 75)  M2 diagnosis
(20 76)  M2 treatment
(20 77)  M2 Rx
(20 78)  M2 pt management
(20 79)  M2acknowledged
(20 80)  M2 acknowledge how
(20 81)  M2 not acknowledged
(20 82)  M2 reported
(20 83)  M2 was patient told
(20 84)  M2Family told
(20 85)  M2 rectify
(20 86)  M2 prevent
(20 87)  M2 factors assoc
(20 88)  M2 main category
(20 89)  M2 knowledge
(20 90)  M2 skill
(20 91)  M2 supervision
(20 92)  M2 interpersonal
(20 93)  M2 communication
(20 94)  M2 patient factors
(20 95)  M2 location
(20 96)  M2 equipment
(20 97)  M2 work environ
(20 98)  M2organisation
(20 99)  M2hospital
(20 100) M2 non hospital
(20 101) M2 other factors
(20 102) M2 more factors
(20 103) M2 main factor
(20 104) M2 greater understanding
(20 105) M2 what look at
(20 106) M3
(20 107) M3 about
```

```
(20 109) M3 where
(20 110) M3 situation
(20 111) M3 patient condition
(20 112) M3 practitioners
(20 113) M3 outcome
(20 114) M3 communicate Pt
(20 115) M3category
(20 116) M3 omission
(20 117) M3 commission
(20 118) M3 diagnosis
(20 119) M3 treatment
(20 120) M3 Rx
(20 121) M3 pt management
(20 122) M3acknowledged
(20 123) M3 acknowledge how
(20 124) M3 not acknowledged
(20 125) M3 reported
(20 126) M3 was patient told
(20 127) M3Family told
(20 128) M3 rectify
(20 129) M3 prevent
(20 130) M3 factors assoc
(20 131) M3 main category
(20 132) M3 knowledge
(20 133) M3 skill
(20 134) M3 supervision
(20 135) M3 interpersonal
(20 136) M3 communication
(20 137) M3 patient factors
(20 138) M3 location
(20 139) M3 equipment
(20 140) M3 work environ
(20 141) M3organisation
(20 142) M3hospital
(20 143) M3 non hospital
(20 144) M3 other factors
(20 145) M3 more factors
(20 146) M3 main factor
(20 147) M3 greater understanding
(20 148) of most concern
(20 149) why concerned
(20 150) how common
(20 151) near miss
(20 152) prevent near miss
(20 153) how prevent mishaps
(20 154) methods in unit
(20 155) methods in hospitals
(20 156) ideas for avoid mishaps
(20 157) extra mile
(20 158) were reported?
(20 159) how reported
(20 160) why not reported
(20 161) better ways to report
(20 162) follow up
(20 163) changes made
(20 164) how feel
(20 165) how handle
```

```
(20 166) who talk to
(20 167) ways for residents
(20 168) what would help
(20 169) training to help
(20 170) someone to take care of
(20 171) other comments
```