Article:

Baxter, S.K. orcid.org/0000-0002-6034-5495, Johnson, M., Chambers, D. et al. (3 more authors) (2018) Understanding new models of integrated care in developed countries: a systematic review. Health Services and Delivery Research, 6 (29). ISSN 2050-4349

https://doi.org/10.3310/hsdr06290

HEALTH SERVICES AND DELIVERY RESEARCH

VOLUME 6 ISSUE 29 AUGUST 2018
ISSN 2050-4349

Understanding new models of integrated care in developed countries: a systematic review

Susan Baxter, Maxine Johnson, Duncan Chambers, Anthea Sutton,
Elizabeth Goyder and Andrew Booth

DOI 10.3310/hsdr06290

NHS
National Institute for
Health Research

Understanding new models of integrated care in developed countries: a systematic review

Susan Baxter,* Maxine Johnson, Duncan Chambers, Anthea Sutton, Elizabeth Goyder and Andrew Booth

School of Health and Related Research (ScHARR), University of Sheffield, Sheffield, UK

*Corresponding author

Declared competing interests of authors: Andrew Booth is a member of the National Institute for Health Research Complex Review Research Support Unit funding board.

Published August 2018
DOI: 10.3310/hsdr06290

This report should be referenced as follows:

Baxter S, Johnson M, Chambers D, Sutton A, Goyder E, Booth A. Understanding new models of integrated care in developed countries: a systematic review. *Health Serv Deliv Res* 2018;**6**(29).

Health Services and Delivery Research

ISSN 2050-4349 (Print)

ISSN 2050-4357 (Online)

This journal is a member of and subscribes to the principles of the Committee on Publication Ethics (COPE) (www.publicationethics.org/).

Editorial contact: journals.library@nihr.ac.uk

The full HS&DR archive is freely available to view online at www.journalslibrary.nihr.ac.uk/hsdr. Print-on-demand copies can be purchased from the report pages of the NIHR Journals Library website: www.journalslibrary.nihr.ac.uk

Criteria for inclusion in the *Health Services and Delivery Research* journal

Reports are published in *Health Services and Delivery Research* (HS&DR) if (1) they have resulted from work for the HS&DR programme or programmes which preceded the HS&DR programme, and (2) they are of a sufficiently high scientific quality as assessed by the reviewers and editors.

HS&DR programme

The Health Services and Delivery Research (HS&DR) programme, part of the National Institute for Health Research (NIHR), was established to fund a broad range of research. It combines the strengths and contributions of two previous NIHR research programmes: the Health Services Research (HSR) programme and the Service Delivery and Organisation (SDO) programme, which were merged in January 2012.

The HS&DR programme aims to produce rigorous and relevant evidence on the quality, access and organisation of health services including costs and outcomes, as well as research on implementation. The programme will enhance the strategic focus on research that matters to the NHS and is keen to support ambitious evaluative research to improve health services.

For more information about the HS&DR programme please visit the website: http://www.nets.nihr.ac.uk/programmes/hsdr

This report

The research reported in this issue of the journal was funded by the HS&DR programme or one of its preceding programmes as project number 15/77/10. The contractual start date was in August 2016. The final report began editorial review in August 2017 and was accepted for publication in November 2017. The authors have been wholly responsible for all data collection, analysis and interpretation, and for writing up their work. The HS&DR editors and production house have tried to ensure the accuracy of the authors' report and would like to thank the reviewers for their constructive comments on the final report document. However, they do not accept liability for damages or losses arising from material published in this report.

Published by the NIHR Journals Library (www.journalslibrary.nihr.ac.uk), produced by Prepress Projects Ltd, Perth, Scotland
(www.prepress-projects.co.uk).

NIHR Journals Library Editor-in-Chief

Professor Tom Walley Director, NIHR Evaluation, Trials and Studies and Director of the EME Programme, UK

NIHR Journals Library Editors

Professor Ken Stein Chair of HTA and EME Editorial Board and Professor of Public Health, University of Exeter Medical School, UK

Professor Andrée Le May Chair of NIHR Journals Library Editorial Group (HS&DR, PGfAR, PHR journals)

Dr Martin Ashton-Key Consultant in Public Health Medicine/Consultant Advisor, NETSCC, UK

Professor Matthias Beck Professor of Management, Cork University Business School, Department of Management and Marketing, University College Cork, Ireland

Dr Tessa Crilly Director, Crystal Blue Consulting Ltd, UK

Dr Eugenia Cronin Senior Scientific Advisor, Wessex Institute, UK

Dr Peter Davidson Director of the NIHR Dissemination Centre, University of Southampton, UK

Ms Tara Lamont Scientific Advisor, NETSCC, UK

Dr Catriona McDaid Senior Research Fellow, York Trials Unit, Department of Health Sciences, University of York, UK

Professor William McGuire Professor of Child Health, Hull York Medical School, University of York, UK

Professor Geoffrey Meads Professor of Wellbeing Research, University of Winchester, UK

Professor John Norrie Chair in Medical Statistics, University of Edinburgh, UK

Professor John Powell Consultant Clinical Adviser, National Institute for Health and Care Excellence (NICE), UK

Professor James Raftery Professor of Health Technology Assessment, Wessex Institute, Faculty of Medicine, University of Southampton, UK

Dr Rob Riemsma Reviews Manager, Kleijnen Systematic Reviews Ltd, UK

Professor Helen Roberts Professor of Child Health Research, UCL Great Ormond Street Institute of Child Health, UK

Professor Jonathan Ross Professor of Sexual Health and HIV, University Hospital Birmingham, UK

Professor Helen Snooks Professor of Health Services Research, Institute of Life Science, College of Medicine, Swansea University, UK

Professor Jim Thornton Professor of Obstetrics and Gynaecology, Faculty of Medicine and Health Sciences, University of Nottingham, UK

Professor Martin Underwood Director, Warwick Clinical Trials Unit, Warwick Medical School, University of Warwick, UK

Please visit the website for a list of editors: www.journalslibrary.nihr.ac.uk/about/editors

Editorial contact: journals.library@nihr.ac.uk

Abstract

Understanding new models of integrated care in developed countries: a systematic review

Susan Baxter,* Maxine Johnson, Duncan Chambers, Anthea Sutton, Elizabeth Goyder and Andrew Booth

School of Health and Related Research (ScHARR), University of Sheffield, Sheffield, UK

*Corresponding author s.k.baxter@sheffield.ac.uk

Background: The NHS has been challenged to adopt new integrated models of service delivery that are tailored to local populations. Evidence from the international literature is needed to support the development and implementation of these new models of care.

Objectives: The study aimed to carry out a systematic review of international evidence to enhance understanding of the mechanisms whereby new models of service delivery have an impact on health-care outcomes.

Design: The study combined rigorous and systematic methods for identification of literature, together with innovative methods for synthesis and presentation of findings.

Setting: Any setting.

Participants: Patients receiving a health-care service and/or staff delivering services.

Interventions: Changes to service delivery that increase integration and co-ordination of health and health-related services.

Main outcome measures: Outcomes related to the delivery of services, including the views and perceptions of patients/service users and staff.

Study design: Empirical work of a quantitative or qualitative design.

Data sources: We searched electronic databases (between October 2016 and March 2017) for research published from 2006 onwards in databases including MEDLINE, EMBASE, PsycINFO, Cumulative Index to Nursing and Allied Health Literature, Science Citation Index, Social Science Citation Index and The Cochrane Library. We also searched relevant websites, screened reference lists and citation searched on a previous review.

Review methods: The identified evidence was synthesised in three ways. First, data from included studies were used to develop an evidence-based logic model, and a narrative summary reports the elements of the pathway. Second, we examined the strength of evidence underpinning reported outcomes and impacts using a comparative four-item rating system. Third, we developed an applicability framework to further scrutinise and characterise the evidence.

Results: We included 267 studies in the review. The findings detail the complex pathway from new models to impacts, with evidence regarding elements of new models of integrated care, targets for change, process change, influencing factors, service-level outcomes and system-wide impacts. A number of positive outcomes were reported in the literature, with stronger evidence of perceived increased patient satisfaction and improved quality of care and access to care. There was stronger UK-only evidence of reduced outpatient appointments and waiting times. Evidence was inconsistent regarding other outcomes and system-wide impacts such as levels of activity and costs. There was an indication that new models have particular potential with patients who have complex needs.

Limitations: Defining new models of integrated care is challenging, and there is the potential that our study excluded potentially relevant literature. The review was extensive, with diverse study populations and interventions that precluded the statistical summary of effectiveness.

Conclusions: There is stronger evidence that new models of integrated care may enhance patient satisfaction and perceived quality and increase access; however, the evidence regarding other outcomes is unclear. The study recommends factors to be considered during the implementation of new models.

Future work: Links between elements of new models and outcomes require further study, together with research in a wider variety of populations.

Study registration: This study is registered as PROSPERO CRD37725.

Funding: The National Institute for Health Research Health Services and Delivery Research programme.

Contents

List of tables

List of figures

List of boxes

List of supplementary material

Report Supplementary Material 1 Papers excluded at full-paper review

Report Supplementary Material 2 Extraction tables

Supplementary material can be found on the NIHR Journals Library report project page (www.journalslibrary.nihr.ac.uk/programmes/hsdr/157710/#/documentation).

Supplementary material has been provided by the authors to support the report and any files provided at submission will have been seen by peer reviewers, but not extensively reviewed. Any supplementary material provided at a later stage in the process may not have been peer reviewed.

Glossary

Clinical Commissioning Groups Clinically led statutory NHS bodies that are responsible for the planning and commissioning of health-care services for their local area.

Effect size A way of quantifying the difference between two groups by calculating the size of the difference. Customarily, an effect size of ≤ 0.2 is considered to be a small effect size, 0.5 is considered to be a medium effect size and ≥ 0.8 is considered to be a large effect size.

Governance The system through which NHS organisations are accountable for continuously improving the quality of their services and safeguarding high standards of care.

Integrated care pathway An outline of anticipated care provided by different professionals, placed in an appropriate time frame, to help a patient with a specific condition or set of symptoms move progressively through clinical care.

Multidisciplinary team A group of health-care workers who are members of different disciplines and who each provide a specific service to a patient.

***p*-value** The probability value is customarily used to indicate whether or not research results are statistically significant. A p-value of < 0.05 means that there is a < 5% chance that the results of the study occurred by chance alone.

Risk ratio The probability of an event taking place.

List of abbreviations

A&E	accident and emergency
CCG	Clinical Commissioning Group
CI	confidence interval
COPD	chronic obstructive pulmonary disease
DES	Directed Enhanced Service
ED	emergency department
GP	general practitioner
ICP	integrated care pathway
IT	information technology
LES	Local Enhanced Service
MDT	multidisciplinary team
MeSH	medical subject heading
NIHR	National Institute for Health Research
PCT	primary care trust
POPP	Partnership for Older People Project
PRISMA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses
RCT	randomised controlled trial
SD	standard deviation

Plain English summary

New models of integrated care aim to make services more streamlined and encourage different services to work together better. This study looked for research literature on new models of care in a systematic way, and brought together the findings into an overall summary.

We found that new models of care could include many different types of activities. We looked at all of the different outcomes to find areas in which research was more or less in agreement regarding how new models might make a difference to the delivery of services. We found weaker agreement that discharge planning and the flow of care may be improved, that staff would be more likely to share expertise with colleagues and that differences in practice may be reduced. However, more staff time may be required.

Factors that may influence the success of new models include levels of patient and staff engagement, professional roles, workforce stability, the provision of training to staff, effective leadership, resources available, information technology, organisational culture, the policy context and organisational procedures.

We identified three outcomes in which the research was more in agreement: (1) that new models may increase patient satisfaction, (2) that staff believe that the quality of care is improved and (3) that new models may increase patient access to services. There was some suggestion that patient waiting time and the number of outpatient appointments may be reduced. The research studies did not agree regarding outcomes such as length of stay in hospital, numbers of admissions and appointments and whether new models might increase or reduce the cost of health-care provision.

Scientific summary

Background

In order to support the development and introduction of new care models in the NHS, a rigorous and systematic review of the international evidence is needed. A diverse range of models that are rooted in local communities have been developed, and there is now a need to understand the complex pathways from new models of care to longer-term impacts, and how models might work in different contexts.

Objectives

The study had the following objectives:

- to carry out a systematic review of the international literature on new models of integrated care
- to use a logic model method to outline interventions, mechanisms, outcomes and impacts from new models of integrated care
- to develop a framework that details factors that may have an impact on the generalisability or applicability of the research literature, and to use this framework to evaluate models of care reported.

Methods

The study combined established systematic reviewing methods for the identification of literature with innovative methods of analysis and synthesis to examine mechanisms of change and the applicability of international evidence to local contexts.

Search strategy and data sources

A systematic search of health, medical and social care databases was undertaken between September 2016 and May 2017 to identify UK and international studies published from 2006 onwards. We searched from 2006 as a previous review is available that included studies published up to this year. Search terms included a combination of medical subject heading and free-text terms, with the search strategy led by the information specialist on the team. Electronic databases that were searched included MEDLINE, EMBASE, The Cochrane Library, PsycINFO, Science Citation Index, Social Sciences Citation Index, and Cumulative Index to Nursing and Allied Health Literature. Other iterative searching techniques were also employed, including citation searches of a key review and hand-searching of the reference lists of primary studies and other reviews.

Study selection

The following inclusion and exclusion criteria were used to set the parameters of the review:

- Target population – patients receiving a health-care service and staff delivering services.
- Target interventions – we defined new models of care as changes to service delivery that aim to increase integration and co-ordination.
- Control/comparators – the review examined interventions with comparator groups (such as care networks) and those with no comparator.

- Outcome measures – we included studies with any outcome related to the delivery of services (effectiveness or efficiency) or that reported an impact on the delivery of patient care or on staff delivering services.
- Study design – we included systematic reviews, randomised and non-randomised controlled trials, observational studies and qualitative work reporting the views of service users or staff delivering services.
- Other criteria – we included studies from any country that is a member of the Organisation for Economic Co-operation and Development, as these developed countries are of most relevance to UK health systems. We examined studies published in English; however, we considered translation if any key international papers were identified.

Data extraction

Studies that met the inclusion criteria were read in full and a data extraction was completed for each. We particularly aimed to extract data relating to factors that might influence the applicability of study findings and reported associations to inform the development of the logic model.

Assessment of quality

Our approach to the consideration of individual study quality and risk of bias in individual studies was based on the established hierarchy of study design, together with the use of a range of checklists designed for each study type.

Strength of evidence

Our evaluation of the strength of evidence used comparator labels for rating (stronger vs. weaker); therefore, the strength of each element was relative. Owing to the nature of the interventions, there were few examples of studies that were able to achieve the 'gold standards' of blinding and randomisation and, therefore, provide the highest level of evidence. By adopting a relative evaluation, however, we were able to provide information regarding areas in which there were stronger rather than weaker signals in the data 'noise'.

Data synthesis

We used several methods to synthesise the findings from the included studies. These included narrative synthesis, tabulation, use of a logic model framework, and considering the findings in terms of strength of evidence and applicability.

Results

Our systematic review of new models of integrated care identified 267 documents that met the inclusion criteria, which were examined and synthesised. The literature included studies from the UK, other European countries and North America, and encompassed empirical work with designs including quantitative evaluations of interventions/initiatives, and qualitative data related to staff or patient perceptions of barriers and enablers.

We identified a diverse range of elements, which we grouped into (1) those relating directly to patient care, (2) those with a focus on intervening at an organisational or system level, (3) those with a focus on changing the way that staff are employed or work together and (4) those that have a focus on reconfiguring financial, commissioning or governance aspects of health service provision. Within this typology, different types of intervention elements were described: joint assessment; integrated care pathways (ICPs); agreed referral criteria; care/case co-ordination; joint review/discharge; integrated information technology (IT) systems and patient record sharing; new services, care groupings or units; transferring services from hospitals to the community; multidisciplinary teams (MDTs) and team meetings; relocating staff; changing employment conditions; joint commissioning; financial integration; and organisational integration. Many studies examined multicomponent, highly complex initiatives that were only described briefly by authors. Few studies identified cause–effect or associational linkages between individual elements of new models of care and service outcomes and system impacts.

The introduction of ICPs was the most commonly occurring element, either as a ‘stand-alone’ intervention or as part of a more complex package. This was closely followed by the MDT element, which was also a frequently described component of UK and international studies. The greatest number of elements described by authors was nine, and the least was only one; interventions typically included four–six elements. In general, the UK interventions contained more elements than those reported from non-UK countries. There were more examples of interventions described as including a case manager/case co-ordinator in the international literature than in the UK literature, and the UK literature had more studies in which authors described integrated care pathways/plans as an element.

Target areas for change that were described in the studies encompassed changing the model of care to one that was more holistic and/or patient centred; changing the organisational culture; developing shared values, beliefs and priorities among staff and organisations; changing relationships between staff; changing relationships between organisations; developing trust; developing mutual understanding; and improving communication between staff. Although these areas were commonly described as targets/aims, few quantitative evaluations measured any change in these target areas. Qualitative data similarly provided evidence of the perceived importance of these changes for improved working practice and service delivery, but provided limited and equivocal findings regarding whether or not interventions had led to improvements in these areas.

The elements of new models of integrated care offered the potential to effect change at multiple levels: at a process level (changing the way services were delivered), at a service outcomes level (changing resource usage, quality of care or staff satisfaction) or at a system impact level (changing use of hospital-based services, use of primary care and community services, overall use of health-care services and cost of delivering health care). We therefore adopted a systems approach, using a logic model to analyse the data related to these elements of the pathway from the interventions reported, through process changes, to service outcomes and then system-wide impacts.

We grouped the process changes described in the literature into four categories: (1) patient role change, (2) change in care provision, (3) change in information and (4) organisational change. We examined data from the UK and international intervention studies for evidence of effect on processes and examined the qualitative literature for data related to perceptions of change. We also examined the literature for reports of relationships or associations between particular intervention elements and specific outcomes.

There was surprisingly little UK or international evidence regarding the effect of integrated care initiatives on service user roles or relationships. The very limited evidence available provided inconsistent findings regarding whether or not service users perceived any change or had greater knowledge or involvement in services.

Regarding our second grouping, ‘change in care provision’, there was weaker evidence that discharge planning may be improved (possibly associated with elements of case conferences and/or joint/streamlined assessment), and also weaker evidence that there may be an improvement in the timeliness/flow of care provided (possibly associated with elements of ICPs and/or joint/streamlined assessment). There was also weaker evidence regarding interventions leading to reduced variance in practice and a negative impact in terms of adding to the practitioner time burden.

There was inconsistent evidence regarding any effect on information sharing and the accuracy/completeness of record keeping. There was a weaker indication of increased knowledge sharing between staff. The evidence regarding change in organisational processes as a result of new models of care was also inconsistent, with reporting of considerable challenges in achieving system change beyond the improvement of organisational relationships.

We identified four types of factors that were reported to influence the implementation and outcomes of new models of integrated care: (1) patient related, (2) workforce related, (3) organisation and system related and (4) management/leadership related. The factors that appeared to have a stronger potential influence were the perceived focus of the initiative (patient focused vs. organisationally or financially motivated), the level of patient engagement, staff professional identity, staff professional role boundaries, power and hierarchies within staff groups, the stability of the workforce, the provision of training to staff, levels of engagement among staff [particularly general practitioners (GPs)], having local leaders/champions and effective leadership, the resources available, the compatibility of IT systems, the clarity of the vision for change, the prevailing organisational culture, the policy context in which the initiative was sited, and the commissioning and governance policies and procedures.

Studies evaluated new models of care through an extensive variety of outcomes. We categorised these outcomes into those related to use of resources, those related to quality of care, and the outcomes for staff work experience. We identified three outcomes in which there appeared to be stronger evidence of effect: (1) that new models of integrated care may lead to increased patient satisfaction, (2) that new models are perceived to increase the quality of care and (3) that new models of care may increase patient access to services. There was some indication in the UK studies that patient waiting times and outpatient appointments may be reduced, and that patient wishes at the end of life are met. The evidence was inconsistent overall regarding the effect on the number of clinician contacts, number of GP appointments, length of stay in hospital, unscheduled admissions, scheduled admissions, readmissions, attendance at an accident and emergency (A&E) department, outpatient appointments, and staff working experience. There was very limited evidence available regarding prescribing, access to resources across services, time spent in A&E departments, numbers of incidents or complaints or the identification of unmet need. The evidence was inconsistent regarding system-wide impacts on hospital services, primary care and community services, overall health-care usage and the cost of health-care provision.

Conclusions

The review confirms the high level of complexity that is inherent in implementing and evaluating new models of integrated care. A systems perspective is needed to best understand elements of implementation, and how these individual elements may lead to outcomes and impacts. The review identified a multitude of factors that may influence implementation and outcomes. The evidence indicates that new models of care may increase patient satisfaction and perceived quality of care and improve access to services. There is also some indication of a positive effect on waiting times and achieving patient preferences. The evidence for other outcomes and impacts is inconsistent or limited in quantity.

Recommendations for health care

- There is stronger evidence that new models of integrated care may increase patient satisfaction, and may lead to improvements in the accessibility of services and the perceived quality of care.
- The evidence is currently unclear regarding other outcomes for services, or for the health-care system as a whole, including the impact on service usage and costs.
- An extensive number of factors are reported to influence the implementation and outcomes from new models of integrated care, which need to be considered and addressed, when possible, at all stages of the introduction of new models.
- New models of integrated care act at a whole-system level, with a need to consider incentives and outcomes across the whole system.
- There is currently little evidence regarding the impact of new models of care on patients beyond the evaluation of patient satisfaction, and there is some suggestion that outcomes for carers may differ from those for patients.

- New models of integrated care may offer more potential in certain patient populations such as those described as having 'complex needs', although there is limited evidence related to differential effects in specific clinical conditions.
- There is some evidence that interventions such as ICPs, MDTs and case management implemented in isolation may achieve change in processes, but they should form part of multicomponent initiatives in order to improve service delivery outcomes.

Recommendations for research

- There is a need for research to more clearly link particular elements of new models of care to outcomes.
- There is a need for further research to examine outcomes at a process level to add to the knowledge regarding intervention–outcome links; in particular, greater examination regarding process change outcomes in terms of patients (such as understanding of treatment), practice (flow of care and duplication), exchange of information (extent and accuracy), time spent engaged in tasks, and organisational changes (commissioning, governance and budgetary).
- Much of the current research evidence comes from studies of older adults. There is a need for further research to explore the potential for new models of care to have an impact on the care for other patient groups.
- In the UK, in particular literature focuses on outcomes and influences related to the workforce, whereas the potential effect on patient and carer experiences (beyond levels of satisfaction) is under-researched.
- There is a need to further explore particular challenges of new models of care in rural areas, and potential differential effects in varying subgroups such as those from socioeconomically deprived communities.
- We have developed and used an applicability framework to guide analysis of the findings of the review. This framework has the potential to be a useful tool for other studies to guide the analysis of results.

Study registration

This study is registered as PROSPERO CRD37725.

Funding

The National Institute for Health Research Health Services and Delivery Research programme.

Chapter 1 Introduction and background

Rationale

It has been argued that the growing financial and service pressures in the NHS cannot be tackled without transforming how health and social care are delivered. The NHS *Five Year Forward View*[1] sets out a view on how services need to change and what models of care will be required in the future, with a common thread being the need to break down barriers between services through greater integration of care.[2] It is proposed that there should be new networks of provider organisations (organised horizontally as multispecialty community providers or vertically as primary and acute care systems), which form the bedrock of provision.[3] Thirty-seven 'vanguard sites' have been identified to develop and test new models of care, including enhanced health in care homes and new approaches to urgent and emergency care as well as multispecialty community providers and primary and acute care systems. The rationale underpinning the development of the vanguard sites programme is to evaluate a small number of different models while allowing flexibility in the way that models are implemented to meet local needs.

A study by The King's Fund[4] highlighted that change was needed at a whole-system and governance level, with the development and rapid implementation of integrated models of care requiring resources and expertise from across the local health system. This primarily qualitative work analysed five case study sites that have developed more integrated models of care. The significant barriers to implementing changed systems included a lack of clarification of roles and responsibilities, competition for funding and challenges in engaging primary care providers. The authors of this work also highlighted that 'one size does not fit all', with different models developed at each of the case study sites. Common themes regarding the requisite types of changes included delivering more care beyond the hospital walls, changing the future size and shape of acute hospitals, an increased role in prevention and population health and new organisational models with local partners.

Other studies[5] have similarly reported that cultural and structural barriers have proved difficult to overcome in the drive to provide integrated care. A key challenge is to create an environment of collaboration between all providers, including primary and secondary care providers.[3] Authors have highlighted the need for greater understanding regarding how integrated care can be best delivered, and a requirement for further clarity regarding how new models of integration may have an impact on patient outcomes.[6]

It has been suggested that models from the USA, such as Accountable Care Organizations, may be useful frameworks from which the NHS can learn. However, it is important to consider the difference in contexts before implementing the same models in different areas.[5] The NHS vanguard sites have been encouraged to develop new models of care by adapting systems to local needs and configurations.[7] However, commentors note that although individual models should be rooted in local communities and have a 'local resonance', it is important to identify simple standard approaches and products that can be replicated across the country.[7]

The proposed study intended to add to the existing body of knowledge by providing a critical summary of the international literature on new models of care. The review of the literature aimed to provide knowledge regarding key ingredients of care models and identify best practice and areas of learning that may be important in contributing to the success of a programme. It also intended to detail potential outcomes and impacts reported in the literature, which would inform the planned multifaceted approach to the measurement and evaluation of new care models in the NHS.

The proposed methods to synthesise the review findings and add to the body of knowledge were selected to illuminate complex pathways between models of care and long-term health impacts. The work aimed to provide an accessible summary of the literature and inform the logic models being developed within vanguard sites. The proposed study particularly sought to analyse factors related to generalisability and applicability in order to provide key information to commissioners, service managers and practitioners regarding the implementation of care models in their local context. The focus of this element of the work was to support understanding of how care models might be replicated in other local care systems.

Objectives

The proposed study aimed to carry out a rigorous and inclusive systematic review of evidence underpinning new models of health care. It had the following specific objectives:

- To carry out a systematic review of the international literature on new models of health care.
- To use a logic model method to outline mechanisms of change underpinning the introduction and outcomes from new models of health-care delivery, including potential barriers and facilitators.
- To explore how the developed model resonates with the views and experiences of key stakeholders.
- To develop a framework that details factors that may have an impact on the generalisability or applicability of the research literature, and to use this framework to evaluate the models of care reported.

Research questions

The research questions for the study were:

- What can be learned from the international literature regarding the key elements of implementation and the potential impacts of new models of care?
- What are the reported mechanisms of change and outcomes and impacts associated with new models of care?
- How applicable are the findings from the international literature to different local populations and contexts, and how might mechanisms of change operate differently in differing local services?

Changes from the protocol

The study was carried out in line with the protocol.

Chapter 2 Methods

The proposed study combined established systematic reviewing methods for the identification of literature, with innovative methods of analysis and synthesis to examine mechanisms of change, generalisability and the applicability of international evidence to local contexts.

Identification of literature

Search strategy

A systematic search of key health, medical and social care databases was undertaken to identify relevant studies published from 2006 onwards. We searched from this year as a previous review[8] is available that included relevant studies published up to 2006. We were aware (and our scoping review had confirmed) that there was potentially an extensive amount of literature available in the area; we intended that, by including previous systematic reviews, we would capture the main findings from primary studies pre 2006.

Search terms included a combination of medical subject heading (MeSH) (health-care reform, organizational innovation, quality improvement, health priorities, Accountable Care Organizations, delivery of health care and integrated) and free-text [care model(s) and 'new' service delivery model(s), health-care model(s), transformation of service or care, integrated care, integrated health system(s), vanguard(s), accountable care, future-proofing, service redesign and 'five year forward plan'] terms, with the search strategy led by the information specialist on the team. An outline of the search strategy is provided in *Appendix 1*. The search was limited to studies of humans and those that were published in the English language.

Sources searched

Searches were conducted in the following sources between September and October 2016:

- MEDLINE via OvidSP (1946 to September 2016)
- MEDLINE In-Process & Other Non-Indexed Citations, MEDLINE Epub Ahead of Print and MEDLINE without Revisions via OvidSP (2013 to September 2016)
- EMBASE via OvidSP (1974 to September 2016)
- Cumulative Index to Nursing and Allied Health Literature via EBSCO*host* (1981 to September 2016)
- PsycINFO via OvidSP (1967 to September 2016)
- Cochrane Database of Systematic Reviews via The Cochrane Library (2005 to September 2016)
- Database of Abstracts of Reviews of Effects via The Cochrane Library (1994 to April 2015; no longer updated, archive only)
- Cochrane Central Register of Controlled Trials via The Cochrane Library (1898 to September 2016)
- Health Technology Assessment database via The Cochrane Library (1989 to September 2016)
- Science Citation Index via Web of Science (1900 to September 2016)
- Social Sciences Citation Index via Web of Science (1956 to September 2016).

The search process was recorded in detail, with lists of databases searched, date of search, limits applied, number of hits and duplication as per Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.

In addition to standard electronic database searching, other iterative searching techniques were employed, including citation searches of a key review[8] and hand-searching of the reference lists of primary studies and other reviews. We searched for grey literature using reference lists and UK websites including those of The King's Fund [www.kingsfund.org.uk (accessed 3 October 2017)] and NHS England [www.england.nhs.uk (accessed 3 October 2017)]. In May 2017, we conducted a citation search to identify any further literature that might have appeared subsequent to the formal bibliographic searches.

Study selection

Inclusion and exclusion criteria

The following criteria were used to set the parameters of the review:

1. Target population – patients receiving a health-care service and staff delivering services.
2. Target interventions – numerous definitions of integrated care are in common use. In 2011, Shaw *et al.*[9] reported that around 175 definitions and concepts exist. For the purposes of this study, we drew on the work by Shaw *et al.*,[9] which highlighted the importance of delineating integrated care from integration processes, and we defined new models of care as 'changes to service delivery which aim to increase integration and co-ordination'. Examples of potential interventions identified in our scoping search that we aimed to include were:

    i. interventions with a focus on service redesign/reconfiguration, such as those with a single point of access, joint clinics or sessions, integrated care pathways (ICPs) or relocation of services
    ii. interventions with a focus on workforce changes, including changed roles, and provision of further education/training to assist workforce change
    iii. interventions with a focus on the integration of different services or working across service boundaries
    iv. initiatives to encourage greater co-operation between services (e.g. using common assessments)
    v. interventions with a focus on integration of financial strategies
    vi. information systems or other technology to promote new ways of integrated working.

3. Controls/comparators – the review examined interventions with comparator groups (such as care networks) and those with no comparator.
4. Outcome measures – as one of the objectives of the work was to identify and report measures of outcome and impact that have been used in the literature, we made the decision to not specify a priori the outcome measures that would be included. We therefore included studies with any outcome related to the delivery of services (effectiveness or efficiency measures) or that reported an impact on the delivery of patient care or on staff delivering services. These outcomes included quantitative measures, together with views and perceptions of patients/service users, staff and other key stakeholders.
5. Study design – we included systematic reviews, randomised and non-randomised controlled trials, prospective and retrospective cohort studies with and without comparators, and other before-and-after/longitudinal studies. As a result of the increasing recognition that a broad range of evidence is needed to inform the depth and applicability of review findings, the review encompassed both experimental and observational studies, together with qualitative work reporting views of service users or staff delivering services. Descriptive or discursive papers were excluded.
6. Other criteria – we included studies from any of the 35 countries that are members of the Organisation for Economic Co-operation and Development, as studies in these developed countries are of most relevance to UK health systems. We examined studies published in English; however, we considered translation if any key international papers that had abstracts in English were identified.

The screening process

Retrieved citations were uploaded to EndNote [Clarivate Analytics (formerly Thomson Reuters), Philadelphia, PA, USA], and titles and abstracts (when available) of papers were screened by three reviewers against the inclusion and exclusion criteria, with any queries regarding inclusion being discussed by the full team at regular (fortnightly) team meetings. We initially independently blind-screened citations that had been identified in the scoping search ($n = 7256$) to establish the degree of consensus between reviewers. The level of agreement between the reviewers regarding citations that should be included or excluded following independent sifting was > 95%, with differing decisions related to overinclusion (when one reviewer had inappropriately suggested inclusion) rather than excluding potentially relevant studies. Further screening was therefore carried out by a lead reviewer, and other team members checked a sample of the citations.

During the screening process, we developed a coding list for marking and provisionally categorising citations of relevance, distinguishing studies that appeared to report initiatives or interventions from the UK, reported UK-based qualitative data, appeared to be systematic reviews, and intervention and qualitative studies from other countries.

Following screening of the database, full-paper copies of citations that were identified as potentially relevant were retrieved for systematic screening. Papers that were excluded at this full-paper screening stage, and details regarding the reason for exclusion were recorded (see *Report Supplementary Material 1*).

The data collection process

Studies that met the inclusion criteria were read in full and a data extraction was completed for each. A data extraction form was developed using the previous expertise of the review team and trialled on a sample of papers of different study designs by each reviewer. The form was designed to be suitable for all types of primary study design, with a slightly modified version being developed for the extraction of systematic reviews. In privileging higher-quality international studies alongside the UK evidence, we carried out a 'light touch' extraction for non-UK studies that did not have comparator group designs or were qualitative studies. We identified and noted where these studies provided data that supported our findings, or where additional or contradictory data were present.

We particularly aimed to extract data relating to factors that might influence the applicability of study findings and, therefore, included an item specifically on the context of the study, and also another category for data in which an author had identified factors that may influence applicability or generalisability. We also included an element highlighting reported associations, which was intended to inform the development of the logic model. The extraction tables were completed by one reviewer and checked by a second. The completed extraction forms for each study are available in *Report Supplementary Material 2*.

Data items

The extraction form collected data on first author/year, study design, sample size, population characteristics (type of group, condition/department, sex, age and other details reported), context, data collection method, outcome measures, type and details of the intervention, summary of results, main author conclusions, reported associations and potential factors related to applicability. The slightly modified systematic review form included the number of studies included in the review and details of countries and other inclusion criteria. We used a 'light touch' extraction form for the international non-comparator and qualitative studies (examined later in the process than the UK, international comparator and systematic reviews), which detailed author, study design and participants, with a column for recording data supporting the results from the other included studies and a column for data that were additional or contrasted with the other findings.

Risk of bias in individual studies

The critical appraisal of included evidence is considered a key part of the review process, although it remains the subject of debate in the field, with no single recognised tool. There is also variation in views regarding the use of scoring systems and methods for appraising strength of evidence across studies (particularly in qualitative work). The approach to appraisal of risk of bias and quality of evidence in the proposed study needed to take account of the wide range of study types that we were likely to find. This was particularly important given that the most rigorous evidence base [in the form of randomised controlled trials (RCTs)] was likely to be dominated by studies from outside the UK, whereas the most relevant studies to answer our research question would be those derived from the UK.

Our approach to consideration of individual study quality and risk of bias in individual studies was therefore based on the established hierarchy of study design, together with use of a variety of checklists designed for each study type. For studies reporting evaluations of integrated care initiatives using controlled designs, we considered sources of potential bias as recommended by Higgins and Green[10] (selection bias, performance bias, attrition bias, detection bias and reporting bias). For studies using before-and-after (pre–post) designs with no comparator group, and for systematic reviews, we used the two US National Institutes of Health checklists[11] (although we concurred with the Cochrane view[10] that scoring/totalling of individual elements is not recommended as individual items may have differing relative importance).

For qualitative studies, we used the Critical Appraisal Skills Programme checklist.[12] Any concerns regarding study quality were identified and recorded using these checklists (the National Institute of Health checklists and the Critical Appraisal Skills Programme checklist) and fully considered during the synthesis of findings. *Appendix 2* provides the completed study appraisal checklists. International studies of non-comparator group designs were not quality assessed in line with the 'light touch' approach to their inclusion.

Risk of bias and strength of evidence across studies

The summarising of quality and strength of evidence within and across studies is a source of debate in the field of systematic reviews, with the calculation of overall scores discouraged.[10] However, indicating where there is greater strength or confidence in the evidence provides an important indicator for the interpretation of the results of a review.[13] Following assessment of the individual quality and risk of bias of each study, we therefore considered the literature in terms of risk of bias and whether there was a greater or lesser strength of evidence underpinning the outcomes reported.

A key limitation when evaluating the strength of evidence is that a higher number of papers in an area does not necessarily indicate greater strength of evidence; it only indicates that there is a greater amount of research activity. Therefore, it is important that any overall assessment considers not only quality and number of studies, but also considers consistency of the evidence.[14] For this study, we drew on work by Hoogendoorn *et al.*,[14] together with principles from the GRADE (Grading of Recommendations Assessment, Development and Evaluation)[15] and GRADE-CERQual (Confidence in the Evidence from Reviews of Qualitative research)[13] rating schemes, and our work from a previous systematic review with diverse evidence[16] to consider risk of bias and overall strength across studies.

It is important to note that we deliberately used comparator labels for the rating (stronger vs. weaker), therefore strength for each element is relative. Owing to the nature of the interventions, we knew that there were few examples of studies that were able to achieve the 'gold standards' of blinding and randomisation and, therefore, provide strong evidence. However, by adopting a relative evaluation, we were able to provide information regarding where there were stronger versus weaker signals in the data 'noise'.

It is also important to note that we recorded study outcomes in terms of either 'increase', 'reduction' or 'no significant difference', as for many outcomes the perception of whether it is positive or negative depends on the point of view. For example, an increase in service usage may be positive for patients or the service, but may also be negative in terms of costs or detrimental effect on other services. An appraisal of strength of evidence was undertaken by the research team at a series of meetings to establish consensus.

We tabulated the data in terms of outcomes reported and source of the data (comparator study, non-comparator study or systematic review), and applied a rating scale to give an indication of where the evidence was stronger or weaker for each outcome. We separately rated evidence from the UK studies, systematic reviews, international comparator studies and international non-comparator studies and then provided an overall rating across the study types. The rating scale was as follows:

- stronger evidence = generally consistent findings in multiple studies with a comparator group design or three or more systematic reviews
- weaker evidence = generally consistent findings in one study with a comparator group design and several non-comparator studies, two systematic reviews or multiple non-comparator studies
- very limited evidence = a single study is available or perceptions of change only
- inconsistent evidence = inconsistent findings in multiple studies (< 75% of studies report the same outcome).

Summary measures

It had been proposed that a meta-analysis calculating summary statistics would be used if heterogeneity permitted. However, the wide variety of interventions/initiatives included, with the majority of these containing multiple and complex elements, together with the vast range of outcomes measured, counterindicated the calculation of statistical summary measures to compare effectiveness.

Synthesis of results

We used several methods to synthesise the findings from the included studies. These methods included narrative synthesis, tabulation, use of a logic model framework and consideration of the findings within an applicability framework.

The literature on new models of care presents two key challenges for systematic review synthesis methods. The first challenge arises from the increasing recognition that any intervention in health care can be considered to be complex, with individual and organisational factors affecting if and how interventions lead to improved outcomes.[17] Interventions such as new care models, which act at a system or organisational level, or even across organisational boundaries, provide considerable additional complexity because of their multifactorial processes. The new care models programme has been described as being 'complex in its breadth and depth'.[7] This complexity presents difficulties for systematic review methodologies that seek to quantify or report clear intervention outcome effects.

A second challenge to the review and synthesis of this literature comes from the variety of models that have been introduced. This diversity in the type of models may be the result of the development of the models in response to differing local needs and configurations. New models of care may adopt different approaches and organising principles that respond to the local context. This diversity presents challenges for considering how applicable the evidence from varied national and international research may be to a particular local context. Our methods of synthesis were therefore required to overcome these two key challenges, and were also needed to enable the integration of a wide variety of different forms of evidence.

Narrative synthesis

Quantitative studies

Data were synthesised with use of tabulation and graphs, in addition to narrative summary of interventions, outcomes and influencing factors. We initially scrutinised the included effectiveness studies that originated in the UK, before an examination of systematic reviews from any country, followed by international studies with comparator group designs. We anticipated that UK studies would provide evidence of most relevance to the NHS, so these were examined first. We included UK effectiveness studies of any design in the synthesis as data from these were considered to be of most relevance, whereas we focused on international systematic reviews and international primary studies with a comparator design, as these were considered to have more rigour. We completed a 'light touch' analysis of the international non-comparator studies and qualitative studies, whereby we focused on where data echoed the findings from the other studies and aimed to highlight new or dissonant data. In the synthesis, we explored similarities and differences between findings from the UK and those from other countries. Subgrouping and examining characteristics including the age of participants, intervention content and delivery agent were examined where the number of studies permitted. Relationships between studies and outcomes within these typologies were scrutinised. The heterogeneity of the interventions and outcomes precluded summarising the studies via meta-analysis.

Qualitative studies

Qualitative data were synthesised, drawing on thematic synthesis methods[18] to identify recurring perceptions within the data. This method comprised extracting themes reported by authors within the finding sections of studies (which constitute the 'data' for the synthesis) and then comparing the themes across studies. The qualitative papers were read in detail and themes noted by the authors were extracted. When data from different studies described the same view or perception, they were combined into a single theme (e.g. data from different studies describing the influence of staff having different status were categorised within an overarching 'power and status' theme). When data could not be combined into existing categories, additional themes were added. The 'views and perceptions' data form an integral part of the overall logic model data synthesis. In particular, the qualitative data make a specific contribution to the elements of the model that document influencing factors, but are also reported alongside quantitative data outlining measured outcomes, supplementing this evidence with data regarding perceived outcomes.

The use of both qualitative and quantitative data in a single review has potential to shed light on negative trial results, identify social factors, examine issues of implementation and assist in the interpretation of significance and applicability for practitioners and service planners. We intended that our mixed-methods approach to synthesising the data would enable the strengths of each form of evidence to be utilised, in order to understand highly complex interventions and outcomes within health-care systems.

Logic model framework

We employed a logic modelling method to provide a systems perspective to data synthesis. This method, developed by the team,[19] has been used successfully in previous systematic review studies[20,21] and is ideally suited to the analysis of complex, system-based interventions. Logic model methods provide a graphical description of a system and are designed to identify important elements and relationships within that system.[22] They constitute one form of theory-based evaluation as a means of relating hypothesised links between an intervention and its constituent parts to its outcomes and long-term impacts. Logic models examine the processes of implementation, mechanisms of change and participant responses in order to develop hypothesised links or a 'theory of change'.[23] They serve as a tool to represent the causal system of interest, set out proposed causal pathways in the relationship between the intervention and its health-related and other outcomes, and identify potential moderators of that relationship.[22] Outcomes are conceptualised as the end of a chain of intermediate changes that the evaluation process seeks to track, with each intermediate point predicting potential future outcomes.[24] Theory-based approaches focus on assessing the validity of the theory on which an intervention is built and are concerned with opening up the 'black box' of interventions and outcomes to uncover underlying mechanisms.[25] It is argued that without a clear understanding of the assumptions underlying an intervention and how it is supposed to work, evaluators cannot ascertain whether or not it did work and why it did or did not achieve the intended benefits.[26] The key strength of logic models lies in linking complex system processes to system outcomes, and thus guiding the development of strategies and research tools for making system improvements.[27]

We anticipated that a logic model approach to synthesis was well suited to analysing and reporting this literature, as well as examining the mechanisms and impacts underpinning new models of service delivery. This approach to synthesis also resonates with the logic models that the NHS vanguard sites have been developing.

In the logic model method, data from included studies are extracted and analysed to produce elements of a framework that typically comprises an intervention typology, detail regarding the range of outcomes reported, factors that may be influential in the pathway from an intervention to health impacts, and reported associations between elements of the model. The extraction table includes the collection of data regarding associations and outcomes, which facilitates the construction of the framework. Both quantitative and qualitative data underpinned the construction of the elements of the model. The completed model aimed to outline evidence in the literature regarding different models of care, relationships between contextual factors, inputs, processes and outcomes.[22,28] Each element in the model demonstrates the logic or theory of the interventions and portrays 'if–then' relationships in the chain from new models of care to system-wide impacts.

Initially, the logic model synthesis used UK-published literature to develop an initial or 'start' logic model. Following the development of the UK-based logic model, the second phase of the work entailed examination and synthesis of the international (non-UK) literature to add to a further draft of the model and to enable comparisons and contrasts between the identified evidence. Initially, systematic review-level international studies were added to the model alongside the UK evidence, followed by international primary evidence from the more rigorous comparator design studies and then non-comparator studies to explore gaps in the evidence base. The logic model framework was therefore intended to act as a translation tool between findings from the review of the UK evidence and the international literature, and to enable contextually sensitive synthesis of multiple and diverse evidence types.

Applicability framework

In a parallel phase of work, we developed a framework of factors related to applicability and generalisability from examination and synthesis of the included studies. As outlined earlier in *The data collection process*, we had included specific sections on context and applicability in our data extraction form to facilitate identification and synthesis of these factors. The development of the applicability framework was intended to inform our analysis of the data and reporting of the systematic review. We planned to use the framework to evaluate and present the evidence with regard to factors that may influence generalisability and applicability of the international literature to varied local contexts. A recent review[29] of the assessment of applicability during systematic reviews recommended that authors of reviews should consider applicability for at least one target population, setting and context. We aimed to go beyond this recommendation and develop a framework to act as a reporting tool that would be suitable for the complex organisational interventions that we were evaluating.

The terms 'generalisability' and 'applicability' are often considered to be synonymous; however, 'generalisability' (synonymous with external validity) is usually used to describe how relevant the results of a study might be to general sites and populations, whereas 'applicability' typically refers to information regarding the study processes and insights into if and how an intervention may be implemented elsewhere.[30,31] Numerous checklists that include items related to external validity are available, although there is little detail regarding how to report generalisability.[32] The understanding of how evidence (particularly international evidence) is, or is not, applicable to varying local situations and contexts is a key challenge for systematic review synthesis.

In order to develop our applicability framework, we carried out an initial literature review of existing studies using terms such as 'applicability assessment' in MEDLINE, and using Google/Google Scholar (Google Inc., Mountain View, CA, USA). The review was not intended to be a rigorous systematic review but to identify any existing examples of frameworks that we could learn from. We found little literature on applicability frameworks; however, a review in 2011[32] identified 11 assessments of applicability or transferability. None of the methods of assessment were found to be comprehensive, with little evidence regarding their value for systematic reviews. The most well-developed method formed part of a Canadian knowledge translation toolkit,[33] which was a useful model but not sufficiently detailed for our purpose. In the absence of existing tools that would suit our needs, we developed a new framework by identifying elements related to applicability within the data extracted from the included studies. We tabulated all of the references to applicability that had been noted on the extraction for each study in a Microsoft Word 2013 (Microsoft Corporation, Redmond, WA, USA) document, and then, through a process of cutting and pasting, brought similar text together (e.g. text related to population factors and to the type of context). In a process akin to content analysis, we developed categories and subcategories within the framework. Following the development of a succession of drafts, we consulted with users of systematic reviews (see *Stakeholder involvement*) to gain views regarding the clarity of our items. In response to the feedback that was received, we further refined and developed the framework to produce the final version.

During the synthesis, the framework was used as an analysis and reporting tool, guiding examination of the evidence within each element. Studies were grouped and tabulated according to framework elements, with examination and reporting of evidence using these items.

Protocol and registration

A review protocol was developed prior to the commencement of the study. The protocol outlined the research questions and detailed the methods for carrying out the review. The protocol encompassed methods for identifying research evidence, the method for selecting studies, the method of data extraction, the process of assessing the methodological rigour of included studies, and synthesis methods. The protocol was registered with the PROSPERO database number 37725 and was made available on the PROSPERO website [www.crd.york.ac.uk/prospero/display_record.php?RecordID=37725 (accessed 19 February 2018)].

Patient and public involvement

We formed a project-specific public involvement advisory group for the duration of the work, with 10 members drawn from across England. Group members were recruited via our meetings with patient advisory groups during the development of the study proposal, from members of advisory groups linked to the local NHS trusts and from advertising on the People in Research website [www.peopleinresearch.org (accessed 25 September 2017)]. We intended for the advisory group to have varied participants in terms of characteristics such as age, sex, health conditions, disability, experience of health care and geographical region. We were successful in achieving this, and our group included both retired and employed people, those with health conditions/disabilities and those with no particular health concerns, and people from the south east, west, central and north-west regions of England, in addition to those who were local to Yorkshire.

The group met three times during the project: in the second month, the seventh month and the 11th month. The involvement of public advisors was facilitated by reimbursement for time and travelling expenses, use of teleconferencing for those unable to attend in person and ensuring that any documentation was sent several weeks in advance of meetings. At the first meeting, the group finalised the wording of the *Plain English summary* for the NIHR website; discussed experiences of the integration of care, terminology and understanding of the study; and considered areas or issues of most interest to the public. At the second meeting, the intermediate findings were discussed, including formats for making the findings understandable (such as types of visual representations) and potential areas to highlight for a public audience. At the third and final meeting, discussion included the content of the *Plain English summary*, maximising meaningful messages in the report for lay readers and suggestions for disseminating the findings of the study so as to reach the wider public.

Stakeholder involvement

We accessed knowledge and expertise from stakeholders during the study at key points in the process, including consultation regarding items for the applicability framework and regarding the logic model and findings of the review. We held individual and group meetings to discuss the applicability tool with managers, clinicians, researchers and commissioners during its development, which formed the basis of several iterations. In particular, this consultation informed the grouping of items and the terminology to be used.

In the later stages of the study, we convened a workshop that was attended by 15 delegates, including researchers, NHS staff, commissioners and managers, to explore how the findings of the study resonated with experiences; where the analysis should focus, including key questions to explore; and to discuss the draft logic model and applicability framework. Feedback regarding the draft model was positive, with agreement that it was coherent and provided a clear summary of a highly complex area. Suggested areas of focus had already been identified within our draft applicability framework, although delegates suggested that differentiating interventions with more than three elements and interventions with three elements or fewer may be helpful, as it had been reported that organisations could best cope with a maximum of three elements of change at one time. Workshop attendees also suggested distinguishing between studies in which patient satisfaction was patient-reported and those in which it was staff reported, and to explore whether or not complex conditions compared with non-complex conditions were possible to identify in the analysis.

In the last month of the study, we also provided a seminar for 18 primary care staff members, including researchers and general practitioners (GPs), in which we outlined the findings of the study and sought input regarding the clarity of our approaches to synthesis and key questions for the analysis to explore. Feedback regarding the clarity of the logic model was very positive, and attendees found the strength-of-evidence reporting to be helpful and clear. The group were particularly interested in the results for particular patient subgroups, and commented that outcomes for patients seemed to be under-reported in the literature. Other comments related to the data on organisational and financial change, which were perceived to be of interest by stakeholders.

In the last month of the study, we presented the work to 25 commissioners and senior practitioners; the model and findings were discussed, and feedback on the logic model and presentation style was sought. The group appreciated the clarity of the strength-of-evidence indicators and the wide extent of the review. Further clarity regarding the source of the finding in relation to perceived improved quality (staff or patients) was suggested, and feedback regarding the checklist of factors to be considered during the development of initiatives resulted in further refinement. The group identified particular challenges of the evidence for them, including potential conflicts between the vision of new models and required outcomes, which provided helpful input for the study reporting.

Chapter 3 Results

Study selection

From a database of 13,323 unique citations, we included 267 documents in the review. *Figure 1* is a PRISMA flow diagram that illustrates the study selection process.

Type of studies excluded

The lists of studies that were excluded at the full-paper selection stage and reasons for their exclusion are provided (see *Report Supplementary Material 1*). During the study selection process, we encountered particular challenges regarding the definition and reporting of intervention type. The term 'new models of care' lacks a precise definition and was used variously by authors. In particular, many retrieved citations that were excluded during the initial sifting related to clinical care models rather than service delivery models, such as initiatives aiming to enhance patient self-management delivered by a single practitioner.

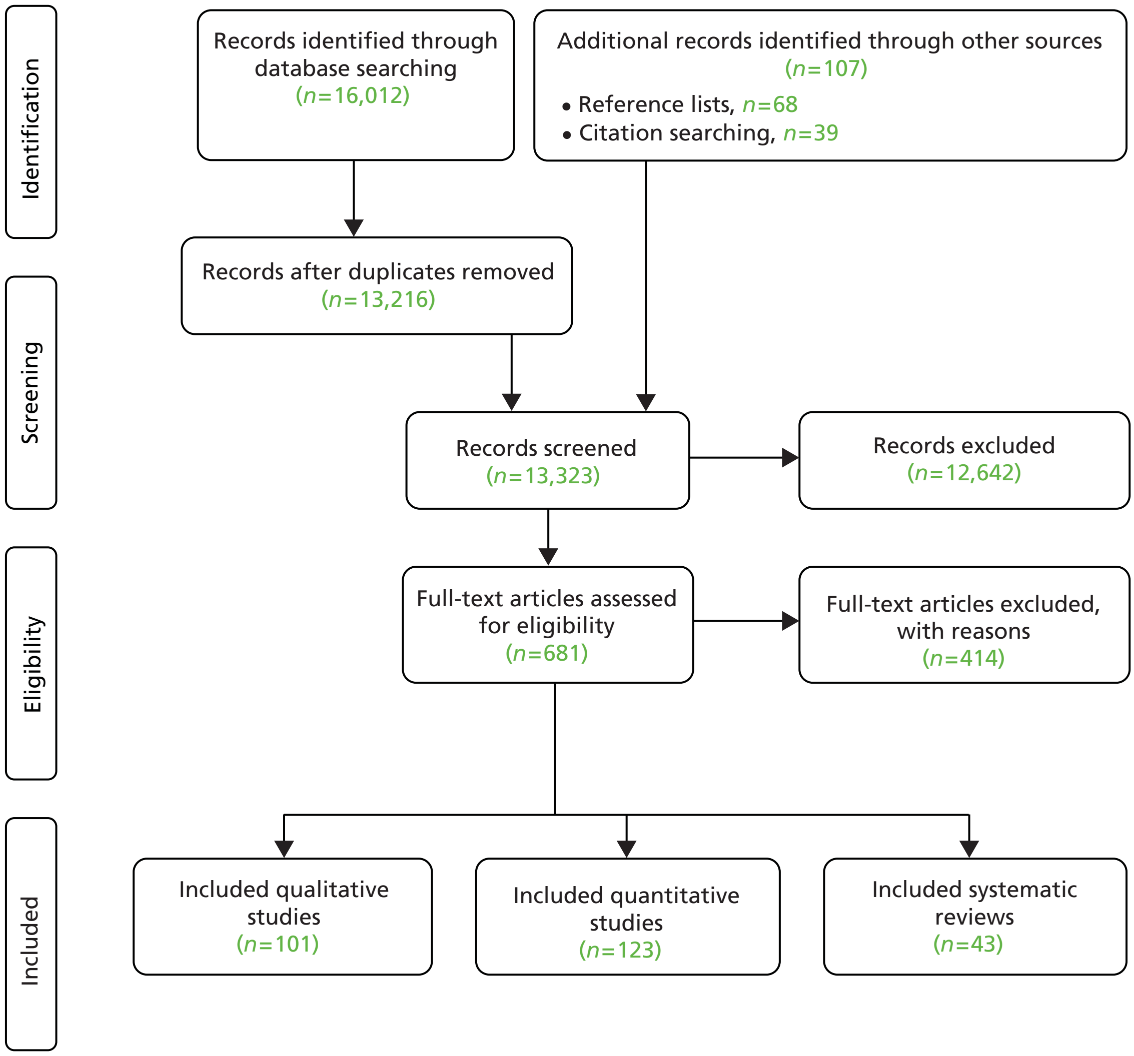

FIGURE 1 The PRISMA flow diagram illustrating the process of study selection.

The term 'integration' was often used to refer to different types of clinical treatments or approaches, rather than integration of service delivery. In addition, the term 'models of care' often described studies examining particular clinical approaches rather than relating to any aspect of integration. Studies describing 'case management' approaches also required careful scrutiny. Such studies often described interventions with a key worker; however, there was no integration between key workers and services, or apparent integration between different services. For other 'case management' studies, enhancing integration between services was the key element of the approach.

In addition to the need for close scrutiny of the 'intervention' parameters of our inclusion criteria, the 'outcomes' inclusion criteria also required careful study selection. The review was focusing on service delivery and care outcomes, rather than clinical outcomes; however, this distinction was not always clear cut and decisions on the inclusion of these documents often required discussion at a team level.

Study characteristics

Of the 267 documents included in the review,[34–299] 54 were UK studies reporting the effectiveness of interventions[34–87] and 64 were qualitative studies from the UK.[88–151] The over-representation of UK literature reflects to some extent the greater inclusion of studies of lower-quality designs from the UK, together with grey literature. It may, however, indicate the attention that has been paid to integration in the NHS, with nationally funded programmes including evaluation components.

We identified and included 43 systematic reviews[8,152–193] and 49 higher-quality studies from outside the UK using comparator group designs.[194–242] In addition, 20 lower-quality non-UK studies (no comparator group)[243–262] and 37 qualitative studies from outside the UK[263–299] were included within a 'light touch' analysis. *Figure 2* provides a summary of the country of origin for the different types of study design.

The majority of the systematic reviews included only papers published in English and/or from developed countries. Four reviews[153,155,157,180] stated that they placed no restriction on country of origin or language.

Within the group of UK studies, several papers and reports originated from the integrated care pilots.[45,101,126] In particular, nine papers[73,74,80,100,115,122,123,134,151] were derived from the work in north-west London. There were four papers[81,87,106,144] that reported on the Partnerships for Older People Project. There were two papers[48,142] on the Evercare programme.

The international primary studies report an array of programmes and initiatives, although there are several studies that are reported in two or three papers. For example, there are two papers on the System of Integrated Care for Older Persons programme.[196,197] In total, 202 unique studies are represented in the set of 267 included papers.

We examined the studies included in the systematic reviews to ascertain the extent to which we may be 'double counting' papers. We observed little overlap between primary studies and reviews because of the publication dates of the reviews, meaning that the majority of their primary studies were published prior to our inclusion period of post 2006. One review,[179] however, had four qualitative papers[126,142,146,147] that we had included and three reviews[182,183,185] each had three papers[8,45,49,87,100,109,125,154,196] in common with ours. Two reviews[177,189] each had two overlapping papers[48,168,196] (the Gravelle *et al.*[48] paper was included in both). Three reviews[181,184,300] each included a single overlapping paper.[108,168,171]

The literature in the review comprised predominantly journal papers, although 12 grey literature reports[34,45,49,80,81,87,134,139,147,151,178,294] were included.

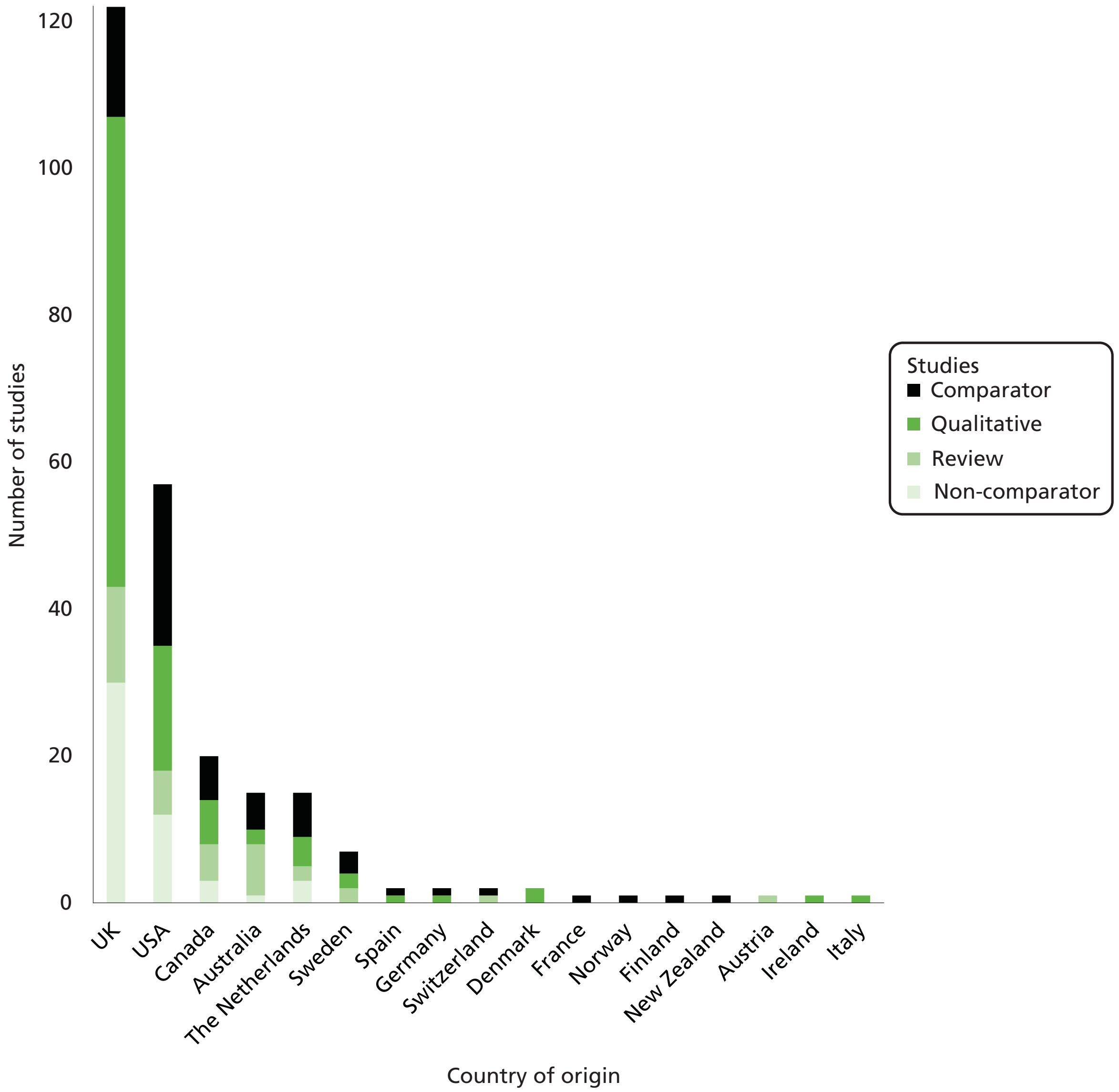

FIGURE 2 Country of origin of the included studies.

Risk of bias within studies

We assessed the methodological quality and risk of bias across the UK studies, international reviews and the international comparator studies using assessment tools that were appropriate to each study design. *Appendix 2* contains these assessments. For the UK literature, 16 studies[39,42,44,45,48,52,54,58,63,74,77,78,81,82,85,86] used higher-quality comparator designs. Of these studies, only two[58,63] had utilised some form of random allocation to condition, and the nature of the intervention precluded allocation concealment within studies. Blinding of participants and personnel was also limited or not possible, with only four studies[44,45,63,86] achieving this. Blinding of outcome assessment had been achieved in five studies.[45,48,52,58,63] The studies fared better with regard to completion of outcome assessment, and reporting was assessed as being accurate for all but one study,[58] which had insufficiently discussed the study limitations. Overall, the studies were all considered to be at risk of potential bias, with none meeting the six criteria for reducing potential sources of bias.

The international comparator studies were rated slightly better in terms of randomisation: 19 studies (reported in 26 papers[194–197,201–206,209,210,214,215,217,220,222,225–227,230,233,234,239,241,242]) had a random allocation, although only nine studies (reported in 14 papers[194,196,197,201–203,205,206,209,210,217,239,241,242]) achieved allocation concealment. As with the UK studies, blinding was problematic because patients were unable to be blinded to their study arm. The incomplete reporting of outcomes data meant that in many cases it was not possible to judge the extent of attrition; for three studies (reported in six papers[201–203,214,223,224]), a large loss to follow-up was reported. Reporting was poor in around one-third of the studies, making it difficult to judge the extent of possible selective reporting. Other limitations included small sample sizes leading to inadequate statistical power, with some concerns regarding the processes of allocation. As with the UK comparator studies, none met all of the criteria for the highest quality.

The quality assessment illustrates the considerable challenges that are inherent in rigorous evaluation of highly complex health-care initiatives such as these, in particular, the difficulties of meeting requirements for randomisation and blinding.

The UK non-comparator before-and-after/longitudinal studies demonstrated similar issues regarding blinding, with only one study[80] clearly reporting that outcome assessors were blinded. The studies were generally considered to have recruited participants who were representative of the population of interest, although it was often difficult to ascertain the recruitment process. Just over half of the included studies clearly reported sample sizes that were sufficiently large enough to have confidence in the findings. Only one-third were judged to have clearly described the intervention and its delivery. None of the studies reported taking measurements at multiple time points prior to the intervention and only just over half used statistical measures (such as *p*-values) to evaluate change over time. The UK qualitative studies were generally of a satisfactory standard, with a minority providing only limited data or containing weak methods sections. Four studies[92,93,110,135] met all of the quality criteria. Fifteen[89,94,95,97–99,107,108,117,120,130,131,134,136,145] of the qualitative studies met all but one of the criteria.

The systematic reviews exhibited variable quality, with none meeting all 11 quality criteria and only three[165,168,189] meeting all except two of the criteria. None of the systematic reviews assessed the likelihood of publication bias, fewer than half considered the quality of studies in their conclusions, around half searched at least two databases and one-third reported that they searched for grey literature.

Synthesis of results

Given the complexity of the interventions, processes and outcomes involved in new models of care, we have summarised the findings of the review using a logic model that sets out the integrated care systems, processes and outcomes identified (*Figure 3*). Through a mixed-methods approach, rather than separating the quantitative and qualitative data into separate sections, we have integrated and drawn on findings from both the studies that evaluated interventions using quantitative or mixed methods ('intervention studies') and studies that examined the views and perceptions of staff or patients ('qualitative studies'), when they provide findings ('evidence') of relevance. Integrating the different types of data in this way may be unfamiliar to those who primarily encounter systematic review findings reported via meta-analyses (statistical summaries), more conventional narrative summaries or qualitative evidence syntheses. However, our focus in the review was the understanding of complex relationships and systems, and using a mixed-methods logic model approach enabled findings from each form of data (quantitative and qualitative) to contribute to an explanation of the pathway. Although we have not separated the data into sections for quantitative and qualitative data within the report, study design and robustness of evidence will be fully outlined as part of the analysis.

In *Figure 3*, progressing from left to right, the model sets out the elements of new models of integrated care as identified by the review, followed by core areas of change within these elements, followed in turn by changes in the process that may result from the intervention elements, and then by factors that may influence implementation and effects, the outcomes that may result from integrated models of care, and finally, data related to system-wide impacts. The model is intended to provide a summary overview of the elements identified in the pathway, from interventions to impacts. In the following sections, we will

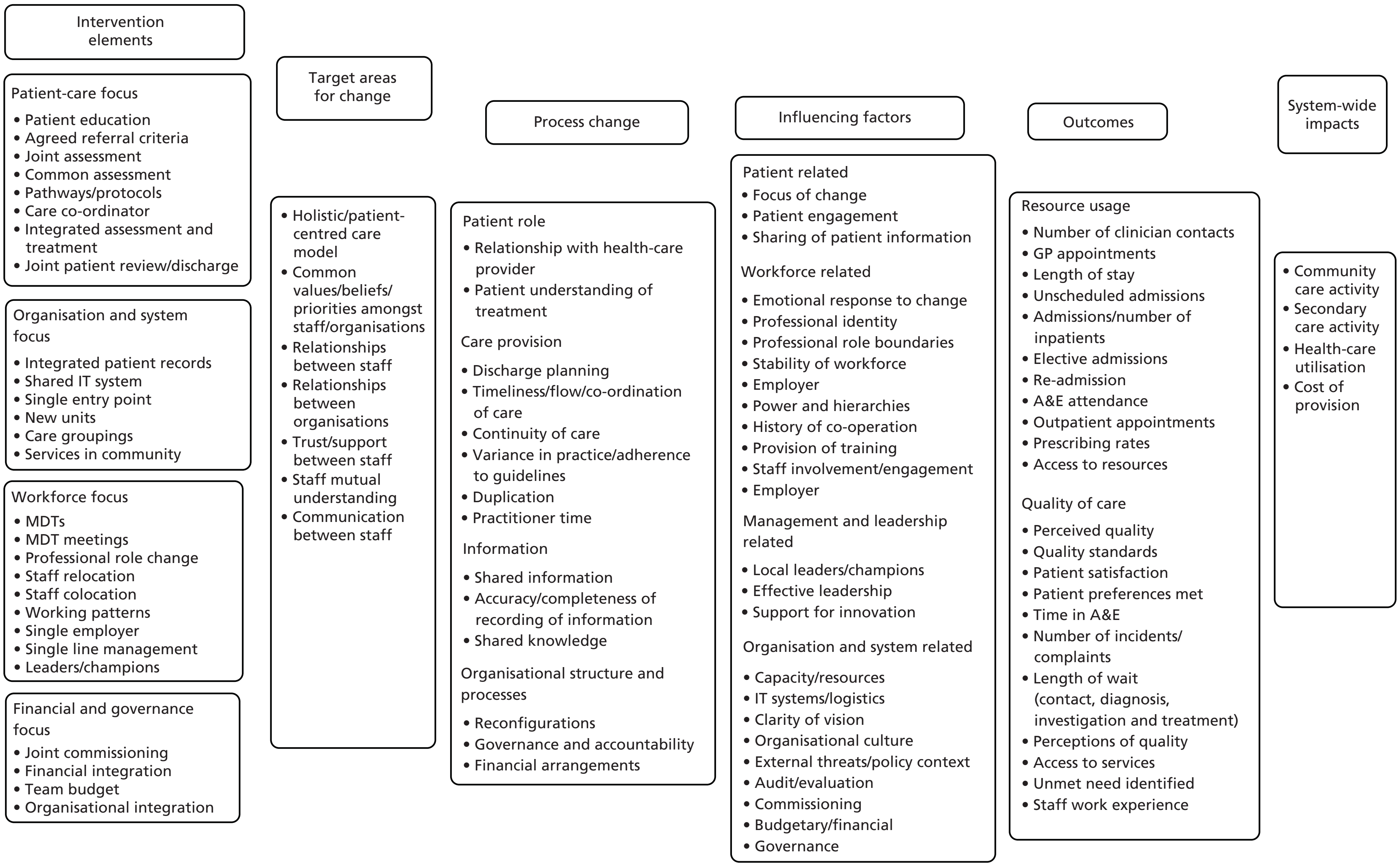

FIGURE 3 Logic model outlining the new models of integrated care.

provide a detailed analysis of the findings in relation to each element of the model. Following a narrative synthesis describing the results of the review in relation to each section of the model, we will examine areas in which the included studies provide stronger or weaker overall evidence.

Elements of the interventions

The evidence regarding elements of integrated care initiatives is derived from both the UK and international intervention studies. The majority of the reported new models of integrated care comprised complex and multielement interventions. The elements can be grouped into four main areas: (1) those with a focus on improving patient care directly, (2) those that focused on making changes to organisations and systems, (3) those that focused on changing how staff were employed and worked (workforce) and (4) those that changed financial and governance aspects. Many studies reported new models that included several of these elements, and it was often challenging to elucidate exactly the form and components of new models because of limited reporting. *Figure 4* provides a summary of the elements of new models of integrated care that are described in the literature.

We acknowledge that itemisation of each identified element is likely to under-represent elements that were contained within the reported interventions. In identifying these elements, we were reliant on authors' descriptions, which could be brief overviews rather than detailed outlines. The interventions that were described as case co-ordination/case management in particular were often described as an overall approach, with little detail regarding precisely the process or systems involved.

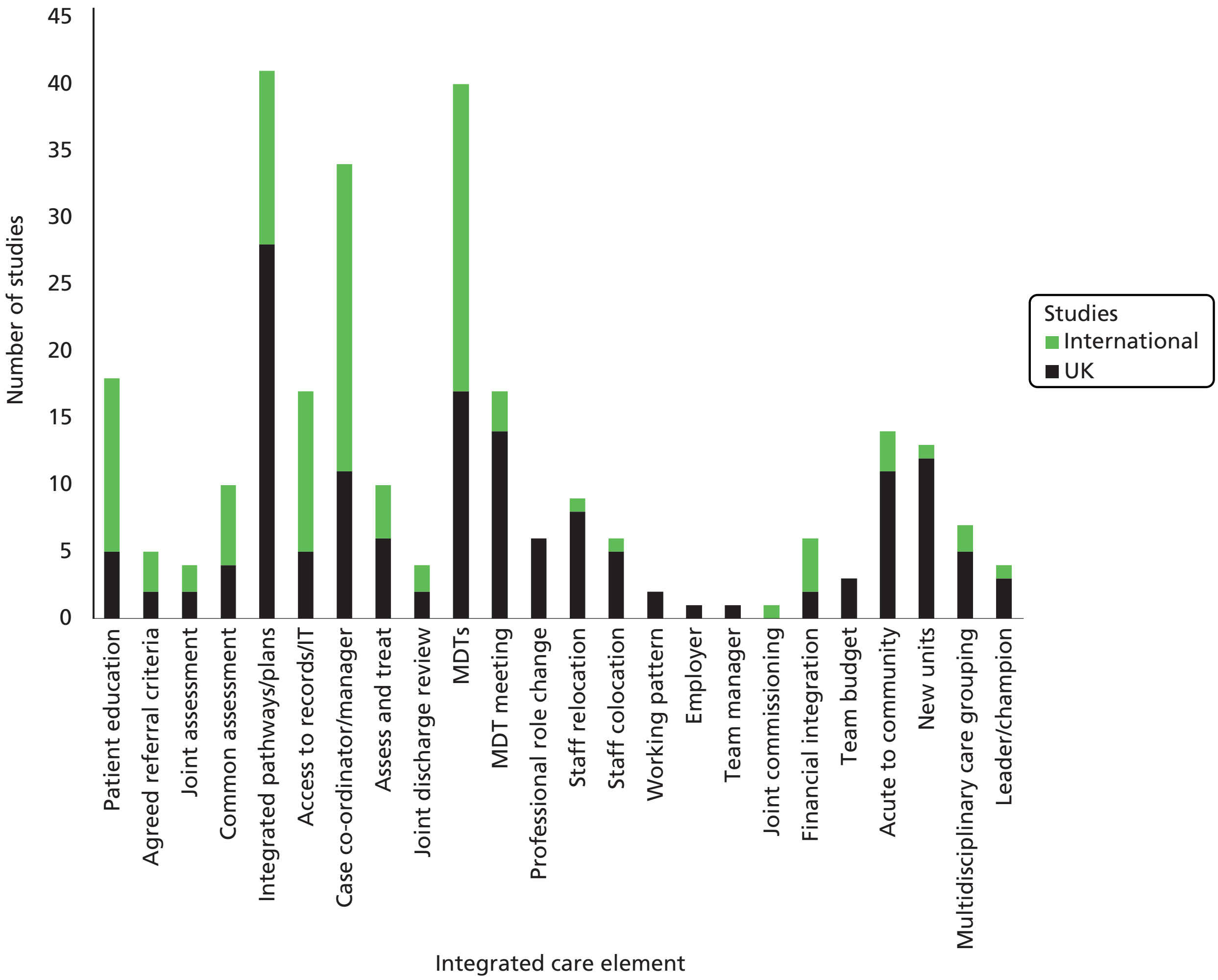

FIGURE 4 Elements of integrated care in the included intervention studies.

The introduction of ICPs was the most commonly occurring element, either as a 'stand-alone' intervention or as part of a more complex package. This was closely followed by multidisciplinary teams (MDTs), which was also a frequently described component of UK and international studies. The greatest number of elements in an intervention described by authors was nine, with the least being only one element. Interventions typically included between four and six elements. In general, the non-UK interventions contained fewer elements than those reported from the UK, although one study (two papers)[227,301] reported seven components and another[211] reported six. The international literature had a greater number of examples of interventions that were described as including a case manager/case co-ordinator, and the UK literature included more studies in which authors described integrated care pathways/plans as an element. There was less description of professional role change and colocation of staff as elements of interventions in the international intervention studies.

The most common identifiable interventions were ICPs, multidisciplinary teams/meetings and the provision of a nominated care co-ordinator or case manager. Many interventions combined two of these elements but only one intervention[217] involved all three. Analysis revealed considerable heterogeneity in terms of details of the interventions, patient and staff groups involved, and outcomes. Studies involving the three principal interventions were categorised as simple if the initiative had only one component (e.g. introduction of an ICP) or complex if additional components (including other common interventions, as mentioned previously) were involved. Summary tables are presented for the UK (*Table 1*) and non-UK (*Table 2*) studies.

Much of the UK literature evaluated simple interventions, typically ICPs. Many of this group of studies evaluated process outcomes rather than service-level outcomes, finding improvements in areas such as staff contact, documentation and decision-making.[56,61,62,85,303,304] Evidence of other effects was limited, with two studies[65,68] indicating a reduction in length of stay, but others[62,80] suggesting little change in outcomes, with one of these[80] suggesting a higher number of admissions in areas with integrated pathways. The findings were also mixed for studies of complex initiatives involving ICPs, although a greater proportion of these studies indicated positive effects than the those concerned with simple interventions.[36,46,47,49,66,74]

Multidisciplinary teams were commonly implemented as part of a larger initiative (often in combination with case management and/or patient education). Only three UK studies[37,50,60] reported simple MDT initiatives and two of these[50,60] looked at process outcomes, reporting mixed results. However, Beacon *et al.*[37] reported that a multidisciplinary primary care team reduced secondary care activity and the number of emergency admissions. The only non-UK study[231] to report on MDT care in isolation found higher total mean costs relative to traditional care in a nursing home setting. In contrast, a number of UK studies reported positive outcomes from more-complex initiatives involving MDTs, including reductions in length of stay and hospital costs;[36] reduced length of stay;[46] reduced numbers of admissions and readmissions;[66] reduced waiting times;[75] reductions in the numbers of inappropriate referrals;[76] and perceived improvements in care and access to services.[84,86] Some studies[81,189] of complex MDT interventions failed to show benefits. Overall, however, there was a tendency for complex MDT interventions to be relatively successful, and this was also observed in the non-UK studies. In two non-UK studies,[217,229] initiatives involving both an ICP and a MDT were successful in reducing costs.

Only one UK study[48] reported on a 'simple' case management initiative, finding no benefit of the intervention using a controlled before-and-after design. One non-UK study[238] reported on 'simple' case management interventions and found process change improvements in care co-ordination. The sample of studies reporting 'complex' case management interventions was considerably larger and the results were correspondingly more challenging to unravel. Most studies reported improvements in one or more outcomes associated with the intervention, but there were also examples in which no effect was detected.[82,195,213,218] In some cases, study authors attributed this to specific factors such as insufficient length of follow-up[195] or possible inappropriate use of the emergency department (ED).[218]

TABLE 1 Summary of UK studies of initiatives involving one or more of the principal interventions (ICPs, MDTs and case management)

		Principal intervention		
Study (first author and year)	**Simple or complex initiative?**	**ICP**	**MDT**	**CM**
Ahmad 2007[35]	C	✓		✓
Bakerly 2009[36]	S		✓	
Beacon 2015[37]	S		✓	
Clarkson 2011[42]	S			✓
Cunningham 2008[44]	S	✓		
Department of Health and Social Care 2012[45]	C	✓		✓
Dodd 2011[46]	C		✓	✓
Graffy 2008[47]	C	✓		✓
Gravelle 2007[48]	S			✓
Ham 2010[49]	C	✓		✓
Harris 2013[50]	S		✓	
Hockley 2010[53]	S	✓		
Huws 2008[54]	S			✓
Jha 2007[55]	S	✓		
Johnstone 2011[56]	S	✓		
Johnstone 2012[57]	S	✓		
Julian 2007[58]	S	✓		
Kent 2006[59]	S	✓		
Lamb 2014[60]	S		✓	
Letton 2013[61]	S	✓		
Levelt 2008[62]	S	✓		
MacLean 2008[64]	S	✓		
Mertes 2013[65]	S	✓		
Ng 2014[66]	C	✓	✓	
Paize 2007[68]	S	✓		
Pettie 2012[70]	S	✓		
Roberts 2012[73]	C	✓	✓	
Roland 2012[74]	C		✓	✓
Rowlandson 2009[75]	S		✓	
Ryan 2007[76]	S		✓	
Smith 2012[79]	S	✓		
Soljak 2013[80]	S	✓		
Steventon 2011[81]	C		✓	
Stokes 2016[82]	C		✓	✓
Tucker 2009[84]	C	✓	✓	
Waller 2007[85]	S	✓		
Wilberforce 2016[86]	C		✓	✓
Windle 2009[87]	C		✓	

C, complex; CM, case management; S, simple.

TABLE 2 Summary of non-UK studies of initiatives involving one or more of the principal interventions (ICPs, MDTs and case management)

		Principal intervention		
Study (first author and year)	Simple or complex initiative?	ICP	MDT	CM
Aiken 2006[194]	S			✓
Battersby 2007[195]	C			✓
Béland 2006;[196] Béland 2006[197]	C		✓	✓
Bird 2007;[199] Bird 2010[198]	C		✓	✓
Boult 2008;[202] Boult 2011;[203] Boult 2013[201]	C		✓	
Brännström 2014[204]	C		✓	
Brown 2012[205]	C			✓
Callahan 2006[206]	C		✓	
Counsell 2007;[209] Counsell 2009[210]	C	✓		✓
Dorr 2008[211]	C	✓		✓
Ettner 2006[212]	C		✓	
Fagan 2010[213]	C			✓
Farmer 2011[214]	C		✓	✓
Gray 2010;[215] Hogg 2009[220]	C		✓	
Hajewski 2014[216]	C		✓	✓
Hammar 2009[217]	C	✓	✓	✓
Hébert 2010[218]	C			✓
Hullick 2016[221]	C		✓	✓
Janse 2014;[223] Janse 2014[224]	C		✓	✓
Martinussen 2012[226]	C		✓	✓
McGregor 2011;[227] Katon 2012[225]	C		✓	✓
Morales-Asencio 2008[228]	S			✓
Olsson 2009[229]	C	✓	✓	
Parsons 2012[230]	C			✓
Paulus 2008;[231] Paulus 2008[232]	S		✓	
Rosenheck 2016[233]	C		✓	
Sahlen 2016[234]	C		✓	
Salmon 2012[235]	C			✓
de Stampa 2014[236]	C	✓		✓
Stewart 2010[237]	C		✓	✓
Taylor 2013[238]	S			✓
Theodoridou 2015[239]	C		✓	✓
van der Marck 2013[240]	C		✓	
van Gils 2012;[302] van Gils 2013[241]	C		✓	
Wennberg 2010[242]	C		✓	✓

C, complex; CM, case management; S, simple.

In summary, ICPs were frequently implemented as 'stand-alone' interventions, with some evidence of improved process outcomes but little evidence of change in service delivery outcomes, and only a slightly more positive indicator regarding effectiveness when included within complex interventions. By contrast, MDTs and possibly case management interventions appeared to be generally more effective when combined as part of a number of different elements (although not as stand-alone elements). However, this analysis should be treated with caution as it does not take account of other possible influences on intervention effectiveness such as the setting and the characteristics of the patient group receiving the intervention.

Target areas for change

We scrutinised the included literature to identify the stated aims for the different intervention elements, with the objective of exploring commonalities of purpose across these varying elements. These areas can be considered the espoused mechanisms of change within the model (active ingredients in the interventions), which were presumed to underpin improvements in health service delivery and patient care. The evidence regarding these target areas for change draws heavily from the UK qualitative studies, although the findings were echoed in international systematic reviews and a small number of UK intervention and international primary studies. The intervention studies (both UK and non-UK) tended to describe these areas as targets for change, but instead reported outcomes at a service and system level (e.g. hospital admissions and quality of care).

Seven target areas for change were identified across the different types of initiative, predominantly related to interpersonal aspects of health-care delivery. The areas were (1) the holistic and patient-centred models of care; (2) common values, beliefs and priorities between staff and/or organisations; (3) relationships between staff; (4) relationships between organisations; (5) levels of trust and support among staff; (6) mutual understanding among staff; and (7) communication between staff. Although these target areas referred to individual elements in the studies, it is important to note that there is considerable interconnectedness between them. For example, achieving a patient-centred model is influenced by values, beliefs and priorities; trust and support will be influential in staff and organisational relationships; mutual understanding will influence relationships; and communication may underpin all of these. The evidence we identified in relation to each of these target areas for change is described in more detail in the following sections.

Holistic and patient-centred models of care

The aim of achieving more holistic or patient-centred care in new models was described most frequently in the UK qualitative studies,[103,111,125,130,134,135,143,144] but was also reported in the included systematic reviews.[160,183,185,190] The aim of patient-centred care was described particularly in studies that were carried out in populations of older adults and in those focusing on end-of-life care, but was also described in interventions for general patient populations. One UK qualitative study of stroke, kidney and sexual health services[111] reported that a patient-centred culture had spread following a modernisation initiative that included integrating services, role changes and new service provision. Other UK qualitative studies[129,135] described achieving holistic care as being an important aim in the introduction of MDTs. A more pragmatic reason for including patient-centred care as a key aim of new models was reported in two systematic reviews.[185,190] These reviews described the importance of a patient-centred focus as a way of involving stakeholders involved in new integrated care initiatives.

Common values, beliefs and priorities

The UK qualitative studies with different settings, patient groups and different intervention types described the importance of developing shared beliefs between staff and between organisations, such as views and beliefs regarding the rationale for, and benefits of, change.[126,134] They highlighted that integrated care initiatives need to achieve similar priorities among organisations[127] and between different individuals.[99] The development of shared views and goals was described as important in the development of a shared identity.[89]

Systematic reviews echoed the importance of goals being aligned within large-scale transformation[157,185] and smaller-scale transformation,[181] with shared understanding of the purpose and vision underpinning reconfiguration. Reviews also described the need to overcome differing levels of commitment, values, beliefs and ways of thinking in multidisciplinary teamworking[171] and when implementing new integrated pathways.[183] A non-comparator international paper[255] evaluating the Program of Research to Integrate the Services for the Maintenance of Autonomy concluded that sharing a common philosophy was the key to implementing the initiative. A qualitative study from the USA,[286] exploring perceptions of an Accountable Care Organization, described how change was presented as a cultural rather than a structural change, with co-ordination and equal partnership rather than integration. The presentation of this as being the priority was perceived to avoid a perception of reduced autonomy and to overcome mistrust among physicians. Another qualitative study from the USA[298] identified alignment of the initiative with organisational priorities as a factor in the success of health-care transformation.

Relationships between staff

The UK studies with various settings and patient groups[60,73,108,111,120,141,145] emphasised the importance of developing enhanced working relationships between staff as part of integrated care. Two UK (cross-sectional) intervention studies[60,73] reported that relationships improved following integrated care initiatives. One UK qualitative study,[145] in contrast, described that on the surface MDT members might appear to have good relationships, but that this could hide an undercurrent of mistrust and criticism. Another UK qualitative study[141] found that, 1 year after the introduction of integrated teams, there was a mixed picture regarding relationships. A further UK qualitative study[111] found that improved interpersonal relationships had not been sustained in the longer term.

Two systematic reviews echoed the need for initiatives to aim to improve staff relationships, if high-quality team performance was to be achieved.[171,193] One additional review[8] of primary care interventions for patients with chronic disease, mental health or aged/palliative care, which focused on relationships between staff or between staff and patients, linked these to a positive effect on health and patient satisfaction outcomes. A non-comparator study from the Netherlands[254] found that relational co-ordination (the interaction between communication and relationships) was positively related to integrated care delivery ($p > 0.05$).

Relationships between organisations

A non-comparator study from Germany[219] reported that, although integration had enhanced staff relationships within the same service, relationships with organisations that were external to the initiative were less satisfactory. This was echoed by a non-comparator study from Canada,[246] which described reform as having a 'territorialising effect'. Collaboration with other organisations in the areas that were external to the network areas decreased (from 15% to 4% for collaboration with other primary care organisations and from 21% to 15% for collaboration with hospitals outside the network). A further qualitative study from Germany[293] also highlights that, although co-operation between staff based in the same organisational grouping was reported as excellent, relationships with other external organisations were less satisfactory. A qualitative study from the USA[287] that explored perceptions of Accountable Care Organizations described them as typically having formed a new relationship or formal partnership between themselves and other health-care providers.

Trust and support among staff

The need for trust and support was described in UK qualitative studies related to MDT interventions, ICP interventions and large-scale integration initiatives in both primary care and hospital settings, and with a range of patient groups including children and older adults. In these studies,[90,91,110,113,127] the need to overcome misunderstanding, tension, and organisational and professional barriers in order to achieve trust was described. Systematic reviews[92,93] described trust as being vital if co-operation between staff was to be achieved. Other systematic reviews also highlighted the importance of achieving trust and support among staff,[162] and the value of processes being put in place to support staff to achieve new ways of working.[184] An Australian qualitative study[90] linked staff having trust in other stakeholders to embracing an integrated health service identity.

Mutual understanding among staff

The UK qualitative studies described increasing staff understanding of each other's roles and skills as a key aim for integrated care interventions. Much of the evidence derives from studies of older adults; however, we also identified studies based in EDs and in primary care mental health and learning disability services. Most of the studies relate to MDT interventions. Papers described limited understanding within a MDT[92] and how collaborative approaches could change a 'blame culture' to one of mutual understanding.[101] One study[90] in particular highlighted a lack of understanding between doctors and other staff, and another[147] described a lack of understanding between staff working in primary care and staff working in hospitals. A further UK qualitative study[121] suggested a link between improved understanding and more-rapid service delivery.

A systematic review[162] similarly reported that there could be a lack of understanding between, and negative perceptions among, different staff groups, including health and social care staff, and another[179] reported that a common understanding was important.

Communication between staff

The improvement of communication between staff was frequently described as a target area for change. Staff communication was outlined as a key part of interventions for a wide range of patient populations [including children, older adults, those receiving end-of-life care, those requiring mental health care and those with chronic obstructive pulmonary disease (COPD)] in both acute and primary care. Regarding whether or not change had been achieved, seven UK intervention studies[35,47,60,61,64,74,83] reported that communication had improved, and one[50] reported that it was unchanged. Two studies (eight papers) [35,47,60,61,64,74,83] that reported an improvement were of a higher-quality comparator design, although they used self-reported data. All of the other intervention studies[35,47,60,61,64,74,83] also used self-reported or subjective measures of communication.

Eight systematic reviews,[161,171,179,181,183,184,191,193] three of which included only UK studies,[161,179,181] echoed the UK effectiveness studies in that communication was a key area for change in integrated care initiatives. Five of these systematic reviews[181,183,184,191,193] concluded that integration (general collaboration, team education, MDTs, multidisciplinary case conferences or multidisciplinary meetings) led to improved communication. Three[161,171,179] linked improved communication to improved team performance, and, as a result of this, enhanced care. None of the reviews were of the highest quality (meeting nine or more appraisal criteria).

One non-UK comparator intervention study from Canada (of reasonable quality)[197] refers to 'communication challenges' that were attributable to case managers with poor communication skills. Another non-comparator intervention study (of reasonable quality) from the USA[205] describes communication between a case co-ordinator and physicians as being a feature of success. A qualitative study from Canada[279] reported that there were perceived views that ICPs enhanced staff communication. A qualitative study from the USA[285] supports the importance of in-person contact between staff, and communication in integrated care.

The UK qualitative studies provide mixed evidence regarding whether or not the target of improved communication was met. Five[94,98,108,125,147] reported perceptions of improved communication and seven[92,113,115,118,141,142,145] reported an 'uneven', 'patchy' or 'limited' effect, communication breakdowns, substantial barriers or medical dominance impeding communication initiatives. A qualitative study from the USA[272] concluded that communication and co-ordination between agencies are important influences that moderate the effectiveness of interventions.

Process changes

Within a systems perspective, the intervention elements and target areas for change have the potential to effect changes in the process of care delivery, which may then lead to outcomes and impacts at a service and whole-system level. We analysed the included literature for evidence regarding any effect of new models of integrated care on the process of care delivery. We grouped the evidence that we identified into the four areas of (1) service user change, (2) change in care provision, (3) change in information and (4) organisational change.

Patient role

Relationship with health-care provider

A qualitative study from the UK,[100] of the North West London Integrated Care Pilot, indicated mixed results regarding whether or not the intervention changed relationships between patients and providers. Although 54% of participants responded positively to a question regarding an improved relationship in the survey evaluation, the study reports that 54% of participants also responded that they had not experienced any changes. Two international qualitative studies[273,279] report more-positive outcomes: that integration of a community worker into a team had improved patient knowledge and engagement,[273] and that an ICP had improved patient involvement.[279]

Patient understanding of treatment

One UK intervention study[59] reported that ICPs were associated with improved patient understanding of treatment and reduced anxiety among patients.

Care provision

Discharge planning

Two UK intervention studies[59,63] reported that discharge planning had improved. The first of these[59] evaluated the introduction of ICPs in hospitals and concluded that there was strong evidence that they improved discharge planning. Nursing discharge planning rose by 20% ($p < 0.01$) and there was a significant increase in general discharge planning, from 33% to 93% of patient records being examined ($p < 0.01$). The second study[63] (which had a comparator group) found that discharge planning for older patients at high risk began within 2 working days of admission in most cases, compared with at the end of a stay or not at all prior to the addition of a social worker to a general practice. One systematic review[191] also concluded that case conferences assisted discharge planning (although it reported mixed evidence regarding care planning for stroke patients).

Timeliness of care and/or patient flow

One UK intervention study[49] reported that timeliness in terms of patient assessment, care packages being put in place and equipment being provided improved (across all of these elements) at three sites adopting a Kaiser Permanente® (Oakland, CA, USA) approach. UK qualitative studies report positive perceptions that integrated care could co-ordinate services more effectively,[98] improve the flow of patients out of hospitals,[101] streamline services,[109] lead to efficient and timely discharge,[116] lead to more-rapid service delivery,[121] increase co-ordination,[124] provide continuous and pro-active care[125] and improve efficiency.[146]

Two systematic reviews suggested improved efficiency and reduced overlap following the introduction of ICPs[184] or collaborative working.[153] Two international comparator studies[214,238] supported this. The first study[214] reported parent perceptions of greater satisfaction with care co-ordination ($p = 0.058$) compared with a control group, with parents reporting that services were more co-ordinated following the intervention (50% prior to the intervention and 80% post intervention; $p = 0.003$). A second study[238] found that, compared with a control group, patients who received a care-co-ordinator intervention were more positive about the co-ordination of care ($p = 0.001$). However, the difference between groups in reporting improved care co-ordination was not significant. An international qualitative study[282] similarly reported perceptions of a positive effect on care timeliness and efficiency. A non-comparative evaluation[257] of a patient-centred medical home found that participants reported improved care co-ordination ($p > 0.001$).

Continuity of care

The international literature highlighted the increased continuity of care that integrated care may provide for patients. Bird *et al.*[198,199] described how a care co-ordination intervention provided continuity of engagement with patients, which allowed care facilitators to better understand the needs of patients and provide a point of contact. The authors of another study[204] attributed frequent visits, continuity of care and ease of access to staff to the ability to deliver structured care at home, thereby reducing hospital usage. A MDT intervention in a psychiatric hospital was similarly described as providing continuity of care.[239] Continuity of care was highlighted as a key change by other international intervention studies.[225,227,238] One UK intervention study[64] evaluating an ICP referred to increased continuity of care following the intervention.

Systematic reviews provide a more varied picture regarding whether or not continuity may improve as a result of integrated care. Myors *et al.*[184] described that continuity of care was achieved via a link worker or identified contact. However, another review[160] reported patient perceptions of continuing issues in communication between agencies, resulting in continuity of care being broken. Another review[175] concluded that there were few significant findings in favour of short-term programmes related to continuity of care, although the short-term nature of the programmes may have influenced this finding. A review of nurse-delivered care co-ordination interventions[186] that reported staff perceptions found that they did not think that the programmes fostered increased communication or continuity of care.

A qualitative study from Australia[267] provides a different perspective on continuity by distinguishing three different elements: information continuity, management continuity and relational continuity. The authors reported that continuity of information was important in effective care as it was perceived to reduce repetition and provide shared access to records.

Variance in practice and adherence to guidelines

Reduced variance following the introduction of ICPs was reported by two UK evaluation studies.[56,59] Kent *et al.*[59] found an absolute improvement of 35–40% in the recording of indicators from clinical guidelines and best practice. Another evaluation of an ICP[70] described implementation as standardising decision-making. A general service redesign including the introduction of standardised documentation reportedly ensured consistency between staff.[139]

One systematic review[180] reported that adherence to guidelines improved in 14 out of 19 studies that were examined. Another[184] concluded that pathways and guidelines helped to ensure consistency.

A UK qualitative study of a pathway in palliative care described greater consistency in care.[109] Another study,[97] however, warned that pathways could constrain judgement. Greenhalgh *et al.*[110] found that common guidelines and protocols were difficult and time-consuming to achieve in practice.

Duplication

One UK qualitative study[119] described a perception of reduced duplication following an integrated care initiative. Another[129] reported the perception that working in a fragmented way causes duplication and waste. A systematic review[184] reported that benefits of collaborative working were perceived to include reducing wastage and overlap in staff roles and duties.

Practitioner time and workload

One UK intervention study[60] found evidence of a potentially positive reduction in staff time. This cross-sectional evaluation of MDT working reported that 68% of staff perceived that the average of 2 hours that was spent in meetings each week saved time later. The UK qualitative literature, however, provides few examples of perceptions of integrated care as being time-saving, although one study[109] reported views regarding the use of the Liverpool Care Pathway in hospices. Staff described the pathway as time-saving as it streamlined documentation.

In one study,[105] staff reported concerns regarding potential increases in workload that may result from a Pioneer programme. GPs also expressed concerns that an integrated telephone service may increase their workload.[113] Another study[122] described staff becoming preoccupied with additional administrative burdens, time spent in meetings and completing care plans in an integrated care pilot. Team meetings were described as being long and time-consuming, with another paper,[123] originating from the same integrated care pilot, suggesting that their frequency should be reduced. In a further paper[134] from the same study, views were described as variable, with some staff perceiving meetings as valuable, whereas others expressed concern regarding time and cost. An evaluation of a new integrated GP role in cardiology[137] found that this could distract from other GP work and that the associated administrative tasks had been underestimated. Workload had increased to the point that GPs used their own time for the new role. In another study,[147] staff also reported increasing their working hours to meet patient needs and expectations from secondary care following the introduction of a new MDT model. Additional time required to enter data in unfamiliar systems was also described by staff.[149,150]

One systematic review[153] concurred with these reports of increased time being required, with improved documentation (ICPs) reportedly leading to the 'burden of increased workload'.

In contrast, a non-comparator evaluation of a team-based approach in the USA[243] reported that practitioners, when surveyed, reported that care co-ordination was time-saving (saving at least 30 minutes per month per patient). A qualitative study in the Netherlands,[268] however, echoed the UK literature by reporting that staff perceived that collaborative initiatives were overly time-consuming.

Information change

Shared information

A key purpose of improving communication between staff is to enhance the exchange of patient information. One of the UK intervention studies[64] included outcomes related to the transfer or sharing of information. This survey of staff found that 77% of staff perceived that accessibility of information had improved. The UK qualitative studies provide variance in reported perceptions of the effect of integrated care on the process of information sharing. One study[109] found that staff described the value of knowing what other members of the team were doing following the introduction of ICPs. They also valued having clearly documented decisions that had been made by the family available for all staff to access. Another study[125] of palliative care also described the sharing of written reports to aid collaboration. A third study[143] evaluating pathways in palliative care described benefits from having a structured record, which was especially useful out of hours. It was mentioned, however, that pathways could be used too rigidly by some staff.[143]

A UK qualitative study[139] exploring a variety of initiatives reported that there had been limited progress in information sharing across different sites. Similarly, another study[149] exploring the implementation of a pathway for frail elderly patients and rapid response team described information as being difficult to share because of there being different systems for health and social care. An evaluation of the North West London Integrated Care Programme[151] reported difficulty in putting data sharing agreements in place and achieving operability between different health and social care systems. Staff working in integrated initiatives within community disability services reported concerns regarding the reliability and accessibility of care records, with some groups being unable to access NHS records.[107] Team meetings were perceived to be an important means of sharing information.[107]

A systematic review of models of joint working[160] (which included only UK studies) concluded that there could be difficulty in sharing information and getting access to information (because of incompatible systems). An international qualitative study[267] reported issues regarding confidentiality, multiple and/or incompatible data systems and data ownership (governance). A study in Germany[292] evaluating team meetings found that key information was not available in 4–5% of the cases discussed. A study by Berendsen *et al.*,[268] from the Netherlands, echoed the UK study discussed previously[143] by describing staff views of integrated pathways as being too restrictive.

Accuracy/completeness of recording information

Three UK intervention studies[59,64,70] (none with a comparator design) reported improvements in the accuracy and/or completeness of the recording of information such as initial assessments by staff following the introduction of ICPs in hospital or community settings, although it was noted that some elements of care remained poorly reported (such as disinfection). One UK qualitative study[107] described concerns regarding shared care records being incomplete or out of date.

Systematic reviews of ICPs for stroke and nursing home patients at the end of life[154,173] report an increase in the documentation of rehabilitation aims, communication with patients and carers, discharge notification plans and plans for 'do not attempt resuscitation'. In contrast, a systematic review of teamworking[171] highlighted gaps in communication and documentation. A non-comparator study from the Netherlands[260] of the Liverpool Care Pathway reported that the documentation was more comprehensive than it was before the introduction of the pathway.

Shared knowledge

A perceived increase in knowledge sharing between staff was described in four UK qualitative studies.[106,107,123,132] Three of these papers[107,123,132] explored multidisciplinary teamworking. A systematic review[171] (also of multidisciplinary teamworking) supported this, concluding that the sharing of knowledge may improve team performance. A qualitative study from Canada[279] concurred that staff perceived that there was greater exchange of knowledge (attributable to the use of ICPs).

Organisational structure and processes

Reconfigurations

The UK intervention studies describe several models of organisational reconfiguration. Examples of organisational change include the merging of services delivered in two hospitals;[41] a merger between several partner organisations in primary care;[45] a merger between an acute trust, a primary care trust (PCT) and social care services;[43] integration between hospitals and the community;[49] the formation of partnerships between general practices, which may also include nursing/care homes;[46] new units or reconfigured wards;[71] and services rearranged around health networks.[72] A non-comparator study that explored health-care reforms in Canada[259] reported that there were few changes at a system level but that there were new forms of primary care organisations. This is echoed by a qualitative study from the USA[281] that reported only small process changes following a reorganisation.

A qualitative case study from Sweden,[263] which compared areas of successful integration with areas that were less successful, concluded that none of the successful cases had initiatives focused on management change; all had a focus on improving the quality of services.

Governance and accountability

There are few data directly related to the process of organisational change, beyond one UK intervention study,[87] which described 66% of staff agreeing that two or more statutory organisations could share risks in an effective way, and that strong governance was important. The authors reported that the partnerships that appeared to be the most strengthened were those between health-care services, local authorities and voluntary organisations. The UK qualitative literature provides some insights into the organisational change process. One qualitative study[103] described differences in the way that organisations described and perceived the process of joint commissioning. The authors reported that many sites that were investigated rejected the term 'joint commissioning', preferring terms such as 'integrated commissioning', and that staff struggled to describe how joint commissioning differed from joint working generally, and what it should achieve or what the outcomes should be. The process of putting formal structures in place could be seen as the outcome rather than service improvement.

Challenges regarding changing commissioning were reported in another study.[105] This exploration of Pioneer sites describes many as having an official or nominal lead organisation, with a balance that needed to be achieved between driving change and shared ownership. This study[105] also reported that varied governance arrangements were operating, with many sites choosing to maintain existing arrangements, and a perception that new contracting models were needed. Another study[141] described how new management structures were at an early stage and budgets were yet to be resolved in a reconfiguration of community services. Effective governance was described as a key aspect of integration, with a health and well-being board overseeing the process and a named person having responsibility for the allocation of a pooled budget.[139] In this study of an integrated care community programme,[139] progress was limited in the area of financial and contracting mechanisms.

Further evidence regarding the challenges in changing organisational structures and processes is described by Holder *et al.*[151] This evaluation of the North West London Whole Systems Integrated Care programme describes initial difficulties in relation to data sharing and governance arrangements, payment systems and accountability arrangements, which had led to delayed implementation. It was highlighted that the programme of change was led by NHS commissioners, and the study authors[151] reported that there could be personal agendas operating and confusion regarding alignment with wider plans.

Financial arrangements

One UK qualitative paper[91] provides a detailed description of the management and financial arrangements in multiple Children's Trust Pathfinders, including the formation of joint boards that are responsible for the co-ordination of services (29/31 trusts), a commissioning unit (one Pathfinder) or NHS and local authority managers occupying similar positions in a single organisation. Mechanisms for integrating accounting and budgeting varied between the different sites: via pooling budgets through legal contracts, making formal or informal agreements, or sharing information but keeping budgets separate. Another UK qualitative study[139] described the pooling of budgets as a frequently highlighted area of tension. In contrast, another UK qualitative study[116] reporting views of leaders of integrated care programmes described a perception of there being no debates over budgets. A further UK intervention study[87] reported that there were challenges in moving any cost savings to and from budgets, with an inability to move money from health care to local authority budgets.

A systematic review[165] of review-level evidence in relation to general health system financing, funding allocations, direct purchasing arrangements, organisation of service provision and health service integration concluded that most financial and organisational system-level reforms have inconclusive or negative effects on funding processes. A second systematic review[182] of financial integration across health and social care highlighted the difficulties of achieving financial integration, with a failure to break down service boundaries or take overall control of service use from individual providers. The authors concluded that even when budgets are pooled widely, total resources remain limited. A study by Battersby *et al.*[195] evaluated a change to an outcomes-based funding system, and reported that 2 years was an insufficient amount of time in which to assess its effects. A further systematic review[161] concluded that having a unified budget to cover joint working was important.

Influencing factors

We examined the included studies to identify factors that were reported to act as barriers to, or enablers of, implementation/outcomes of new models of integrated care. We grouped the factors into a four-category typology: (1) those related to patients, (2) those related to the workforce, (3) those related to the organisation and system and (4) those related to finance and governance. The majority of the evidence is drawn from the UK qualitative studies (supplemented by a small number of systematic reviews).

Patient-related factors

Focus of the initiative

Seven UK qualitative studies[99,105,114,122,134,136,139] across a range of conditions and service contexts highlighted the influence of what the focus of the new model of care was (or was perceived to be), and in particular whether the driver was improved patient care, service reconfiguration or cost saving. Individual practitioner and organisation interests in partnership working may be perceived as being prioritised over service user needs, which reduces motivation for staff.[99] A focus of integration on delivering care more efficiently and effectively provides motivation and hope for the initiatives,[105] and alignment of perspectives regarding the purpose of change is important in enabling change or the development of opposition from staff.[114] Initial enthusiasm for the vision of improving care and a willingness to be involved could change to antipathy and withdrawal of involvement if a focus on service efficiency and reorganisation or potential financial gains was perceived.[122] Tension could be created when managerial focus on financial savings contrasted with clinician focus on improved services.[136] One study[139] reported the use of patient case studies to focus change on outcomes for patients, and to break down staff barriers.

Patient engagement in changes

The importance of patients being engaged in the development and implementation of new models of care was emphasised in seven UK qualitative studies,[95,100,105,112,127,134,139] two systematic reviews[185,199] and one international comparator study.[199] The need for engagement to be sustained over time from the development stage through to implementation has been highlighted,[105,199] in addition to the potential for different community groups to have different preferences.[112] A systematic review[157] concluded that the involvement of patients and families raises awareness of their priorities and including these priorities increases the perceived validity and sense of equity of changes. Another systematic review[185] highlighted that patient/community engagement was a core element that is necessary for integrated governance across primary/secondary care. A qualitative study[297] from the USA reported that patients were unsure about the meaning of the term ‘integration’.

Sharing of patient information

Three UK qualitative studies[91,126,151] highlighted that concerns regarding the security and confidentiality of patient data could be a barrier to integrating services. This was a particular challenge in reconfigurations across multiple partners.[126] Ensuring that agreements on information sharing were put in place at an early stage was key to ensuring progress in integration.[151]

Workforce-related factors

Emotional response to change

Two studies[88,196,197] described the need to pay attention to the emotional responses of staff when introducing change. The first of these (a UK qualitative study)[88] described ‘painful feelings’ among staff in health and social care regarding reconfiguration of teams and roles, and the need to support them through periods of uncertainty. The second study (reported in two papers),[196,197] from Canada, reported a lack of adjustment time for personnel as a particular barrier to an integrated care programme for older people.

Professional identity

A key area of uncertainty during change may be adjustment in professional identity. Seven UK qualitative studies[89,90,94,113,128,145,146] with diverse settings and patient groups described professional identity as a key potential barrier to change. New models of care required the development of a shared group identity,[89,90] and there could be concerns regarding a perceived erosion of roles and identities,[94] which required trust and a sense of ownership to overcome.[113] There could also be a privileging of one professional discourse over another.[145]

Professional role boundaries

A large number of studies referred to the challenges of existing professional role boundaries for new models of integrated care. Sixteen UK qualitative studies[88,91,94,96–100,105,108,120,124,126,128,131,144] examining a variety of interventions, different patient groups and locations described how issues regarding professional roles had been encountered. The realignment of roles could be stressful and generate resistance, and needed time to be effective.[88,91] Adequate preparation and supervision were described as important,[94,131] and some role changes had the potential to raise issues of accountability.[96] One study[120] highlighted that resistance to change because of professional boundary changes was not always a barrier, as it could lead to greater professional engagement in the process. Another[146] described initial wariness and friction subsiding over time.

A systematic review exploring teamworking[193] confirmed that blurring and misunderstanding of professional roles can be common in integrated working, and are key barriers that could lead to professional conflict and intractable differences.

Stability of the workforce

Three UK qualitative studies[94,118,126] described a lack of stability of the workforce as a potential barrier to integrated working. Vacancies, staff turnover and use of temporary staff could act as a barrier to continuity of care.[94] Macfarlane *et al.*[128] described a general climate of unwanted externally opposed change with frozen posts and job uncertainty, which led to challenges related to people accepting new roles and retention of staff. One international comparator study[197] reported that resignations of key staff as a result of funding uncertainty was a key barrier to the implementation of a programme.

Employer

One qualitative study[88] highlighted that staff in the same team having different employers could lead to staff having different employment practices and working to differing agendas and priorities. There could be a perceived dominance of health over social care, and hospital over community.[116]

Power and hierarchies

Established hierarchies of power and status constituted a frequently reported barrier to the successful introduction of initiatives in the UK qualitative literature.[91,97,100,103,105,110,115,116,120,132,145,147,305] In particular, MDT meetings were often described as being dominated by medical professionals.[100,115] Individuals with less power were restricted in the changes that they were able to make.[110,120,145] New models of integrated working could, however, facilitate the removal of this barrier. An advantage of an ICP reported in one study[97] was reportedly enabling midwives to deflect medical dominance and pressure. Integrated management was also reported as being helpful to ensure that all professions had equal respect and influence.[116] One systematic review[193] supported the UK evidence, showing that the status of team members was an influencing factor in multidisciplinary working. A qualitative study from Italy[295] described how a more balanced role of medicine was perceived to exist since integration reforms. The traditional distinction between management and professionalism had been eroded, with a new concept of professionalism that incorporated management.[295]

History of co-operation

Five UK qualitative studies[93,105,110,126,133] described history and working relationships between staff and different services as influencing the introduction of new models of integrated working. Previous and ongoing changes could prepare the ground for further change,[93,105] and a history of collaboration was an enabler of integrated working.[110]

Provision of training

The importance of providing adequate training for staff during the introduction of new models of working across different patient groups, types of intervention and contexts was frequently emphasised. Ten UK qualitative studies[91,94,96,116,118,125,128,129,146,148] described training as being essential for changes in role or working practice. A systematic review[162] reported that studies describing higher levels of integration tended to provide staff with ongoing support or training, rather than at periodic intervals. A second systematic review[183] reported that education regarding why and how to use an integrated pathway increased confidence and openness among staff, which then improved communication and collaboration. A third systematic review[185] described training as important to support new ways of working and in aligning cultures, and also as being required to address the need for rigorous evaluation and leadership.

Staff involvement and engagement

A lack of engagement in new models of care by staff was frequently reported in the UK qualitative literature.[100,101,111,113,114,118,120,122,126,127,139,142,147,151] Engagement among clinicians could be variable,[100] with those outside hospitals reported as being less engaged.[100] GPs were reported to be particularly difficult to engage.[113,120,126,142,147]

One UK intervention study[77] compared outcomes following a diabetes mellitus integrated care initiative between fully engaged and less engaged general practices. In the more engaged practices, mean hospital admission rates reduced, with comparable changes not seen in the less engaged practices. International comparator studies[196,197,205] have also noted difficulties in engaging GPs in interventions. One comparator study from Germany[219] described a plan to introduce incentive payments for clinicians. In a UK qualitative study,[134] it was reported that staff were concerned about the incentives offered to GPs to be involved in an integrated care pilot. A qualitative study from Spain[282] highlighted that previous experiences are influential, finding that individuals who lacked experience of collaboration could have negative views of its usefulness.

Management and leadership

Local leaders/champions

The identification of local leaders or champions to drive initiatives forward was described as an enabling factor in nine UK qualitative studies.[91,93,106,117,118,126,128,136,150] Leaders need to have enthusiasm;[91] a strong commitment to implementing lasting change;[126] an ability to take charge, and the time and skills to do so;[106] oversee and motivate other staff;[150] and both ‘hard’ and ‘soft’ skills in transformative change with ‘multiple’ and ‘flexible’ skills. The leader could be a senior member of staff with the support of a facilitator,[118] or clinicians from primary or secondary care,[136] and it was highlighted that additional training in change management for senior staff was beneficial.[128] The non-UK qualitative literature[294] also echoed the importance of the management role in initiatives, with effective leadership described as ‘critical’.

One UK qualitative study[117] described how champions appeared to be beneficial in the early stages of adoption of innovations. However, as projects were rolled out and new stakeholders became involved, there could be a perceived threat to the champions in terms of status and lack of exclusive rights to their work, which could create tensions between their supporters and other staff. The authors[117] concluded that it should not be assumed that champions always have a positive effect; they may be useful at an early stage to lead the vision, but may then need to hand over the implementation to others. A second study[128] also cautioned that although a clinical champion role could work well, it could also be problematic because of personal agendas and problems with back-filling time.

Effective leadership

Having strong and effective leadership was a commonly recurring theme in the UK qualitative literature across different settings, services and patient groups. Fourteen UK qualitative studies[97,100,105,106,118,126–129,133,139,141,145,151] emphasised the importance of this factor in the successful implementation of new models of integrated care. Effective leadership included being an enthusiastic advocator but also challenging and debating with staff.[118] Leaders need to be clear about their own role, build informal networks and have buy-in from staff at a senior level and clear lines of accountability.[127,139] It has been reported that there should be an emphasis on leadership rather than management,[129] which needs to be strong and fair.[133] The need for protected time for senior leadership to devote to specific projects was also emphasised.[139] A lack of leadership was reported to create tensions, questioning of legitimacy and other obstacles.[139] Changes in management staff adversely affected the management of change.[96]

Five systematic reviews[162,179,185,190,193] also emphasised the importance of leadership as an enabler of new models of care. One[185] highlighted that managers need organisational support to develop the ability to make change happen. Another[190] emphasised the need for leadership to have vision, and suggested that physicians should be integrated at all levels, including in leadership roles. A mixed-methods study from Australia[269] reported that although survey data suggested a weak association between management and initiative implementation, qualitative interview data suggested that the commitment of proactive managers could influence the implementation of new initiatives. Non-UK qualitative studies[288,289,294] also describe the critical importance of strong leadership.

Support for innovation

Three UK qualitative studies[89,93,111] highlighted the beneficial staff impact of the promotion of initiatives (e.g. by winning awards or having good publicity)[93] and developing a culture of development and implementation of innovative ideas.[89,111]

Organisation- and system-related factors

Capacity and resources

The UK qualitative literature[92,93,95,98,105,106,114,126–128,134,151] described how the level of funding available and the availability of resources/capacity within organisations could influence implementation and outcomes of varying types of new models of care. Limited funding was perceived to be a significant obstacle to new services[98,114] and to achieving successful transition of care between services.[92] Severe financial restraints were reported by staff[105] and successful outcomes were attributed to the availability of resources by staff participants in one study of an integrated care and support pioneer initiative.[106]

Information technology and logistics

Frustration with information technology (IT) systems was frequently reported in the UK qualitative literature.[72,94,95,100,102,105,107,110,118,124,126,134,146,149] A lack of compatibility between systems used in different services, such as health and social care or general practices and hospitals, was a key barrier to integrated working.[94,95,102] In one study,[100] over half of the clinicians (56%) reported that they were dissatisfied with IT systems.

Three systematic reviews[179,185,190] echoed the importance of adequate IT systems. One[185] described integrated IT as essential infrastructure that enables providers to focus and manage risk, provides accurate and detailed information to inform clinical decision-making, supports change management and allows tracking of high-risk patients and outcomes. A second[190] concluded that other processes within integrated models of care are only possible with computerised information systems that are accessible in any location. International qualitative studies[294,299] echoed the need for better IT to support co-operation.

Clarity of vision

In *Focus of the initiative*, we reported that the perceived target outcomes for new models of care (patient care vs. cost saving) could influence the views of staff regarding new initiatives. UK qualitative studies[72,100,103] highlighted that the clear communication of aims and outcomes was required to ensure that staff fully understood the vision. Dickinson and Glasby[103] described a lack of understanding regarding what joint working meant. Another study[122] outlined a perception of 'being dragged along' by clinicians, and poor communication about the aims leading to a lack of involvement and ownership. This link between communication of the benefits of change and staff involvement was also made by another study.[126] Another study[105] described the challenge of splitting the vision of integrated care into practical activities. The authors reported that staff working in some areas understood the vision less well than others, and that making changes that were meaningful to patients could be difficult. The authors also noted an absence of articulation of the implications of the vision for changing power relationships.

One systematic review[185] supports the need for clarity of vision in service integration. Nicholson *et al.*[185] referred to a shared vision of optimal health care as getting stakeholders 'to the table'. They suggested that having joint board members with directors on each other's boards facilitates shared vision, trust and collaboration. A qualitative study from the USA[288] similarly concluded that there is a need for a clear mission and vision, and a culture that reflects the values and norms of the organisation.

Organisational culture

Eleven UK qualitative papers[91,93,99,110,111,126,127,133,134,139,151] referred to the influence of differing organisational cultures in acting as a potential barrier to implementation and outcomes of new models of integrated care in varying service settings. Barnett *et al.*[93] described organisational culture as 'a critical factor in change', in particular openness and having a fit between organisational values, beliefs and the innovation. Greenhalgh *et al.*[110] similarly described the compatibility of values across organisations as a key factor in enabling change. A 2-year follow-up of this study by the authors[111] found evidence of stakeholders' conflicting interests and values, which had led to lack of sustainability of the service transformation. Another study[127] reported how a particular challenge to change was staff in different organisations working within different care models.

Another study[133] exploring the merger of two NHS trusts described how, although there were differences (one was more entrepreneurial, team oriented and less hierarchical), there were key similarities in culture, such as the emphasis on staff development, working in partnership and overcoming adversity. The authors reported that there could be challenges in preserving desirable cultures in shifting landscapes, but that best practice and goodwill were important.[133] Other studies described the importance of establishing a culture of collaborative working, which required sharing of clear objectives and processes[134] and the need for the alignment of perspectives to enable change,[114] together with the need to lever existing partnerships and the requirement for perseverance.[139] Huby *et al.*[120] outline that good cross-boundary relationships and access to sources of power and political leverage are important for organisational change. In this study of reconfigurations, including new roles for nurses and GPs, a facilitator was the aligning of initiatives with existing organisational priorities.[120] In contrast, another study[151] describes confusion regarding alignment with wider plans, with organisational fragmentation also slowing down implementation.

A qualitative study from Sweden[263] described four organisational culture facilitators: (1) that development is perceived as desirable and appropriate, (2) that there is backing from management, (3) that there is trust between participating organisations and (4) that there is acceptance from the body of physicians in each organisation. A non-comparator intervention study from Australia[248] described culture change as being key in any initiative. A non-comparator study from the USA[253] found that motivational readiness and organisational climate for change were associated with higher odds of co-ordination. Kathol *et al.*[283] also described the need for a culture shift.

Systematic reviews echo the role of organisational culture in new models of care. Suter *et al.*[190] described the need for an organisational culture to match the vision of integrated care. This was echoed by Maslin-Prothero and Bennion,[181] who reported the necessity for the development of a shared culture, including the purpose and vision of change. Boult *et al.*[158] highlight that 'real world' adoption of new models involves having to fit in with existing organisational cultures. A review of working practice between care home staff and health-care staff[162] reported that different working cultures of staff acted as a barrier. A review of teamworking[171] concluded that culture affected change. Organisational culture was also reported to influence the introduction of ICPs.[179]

External threats and policy context

The UK qualitative literature has widely reported the influence of policies and decision-making outside the control of the organisations involved in new models of integrated care. For example, changes in the political landscape, such as devolution in Scotland, could change policies and priorities.[95] Commissioning mechanisms, severe financial restraint, national reorganisation (such as NHS foundation trusts and staff regrading) and conflicting government policies also had an impact on the delivery of initiatives.[105,114,122,128,133,151] One study[114] described how the choice of model that was introduced was dictated by the funding stream. A systematic review of UK literature on integrated health and social care[179] echoed the influence of national policy on the introduction of new models of care. A qualitative study from the USA[265] similarly emphasised the influence of the external environment and need for policies to facilitate change.

Audit and evaluation

Three systematic reviews[157,183,193] highlighted the importance of feedback loops in the introduction and sustainability of new models of integrated care. A review of ICPs[183] concluded that positive feedback from a national audit on service improvements helped sustainability, and that audits that identified areas of need could facilitate change. A review of integrated governance systems[185] emphasised the need for mechanisms of reporting and auditing to be in place. This was echoed in a review of the literature on health integration, which reported that performance monitoring systems should be in place to measure outcomes at different levels. A qualitative study from the UK[101] described how having outcome targets in place for only one area of care (emergency services) meant that there was a lack of incentive for other services (such as community) to improve. Greenhalgh *et al.*[111] describe how the meaning and significance of measures of effectiveness were contested. Roberts *et al.*[139] highlight the importance of taking time out to monitor and reflect on progress. This was seen as important in maintaining focus and momentum. A qualitative study from Ireland[280] highlighted that audit was an important tool in the implementation of new models of care.

Commissioning

The UK qualitative literature describes the challenges of commissioning integrated services. Studies[105,111,114,128] highlight that funding mechanisms could be counterproductive, with conflicts regarding what each stakeholder stood to gain or lose. New models of care were reported to be not embedded in the commissioning process, with new commissioning systems needed, such as outcomes-based commissioning.[105,111] A study of Children's Trust Pathfinder sites[91] noted that NHS organisations and local authority children's services were jointly commissioning a range of services, but GP and hospital services were rarely included. Another study[103] noted that different services had varying ways of describing and perceiving joint commissioning. This study also noted that joining up particular services inevitably creates new boundaries by excluding others.

Greenhalgh *et al.*[111] reported considerable challenges in sustaining structures put in place following organisational change. This 2-year follow-up of a modernisation initiative found that the original programme board and management structures had been dismantled, with their activities either ceasing or being transferred to new structures. The authors highlighted that new models need to be closely linked to the commissioning and business-planning infrastructure if they are to be sustained.

Budgetary and financial factors

Roberts *et al.*[139] found slow progress in developing financial and contractual mechanisms at the different sites they studied. They reported that it was common for the sites to report significant challenges regarding this aspect of new models of care. Some cited a lack of capacity to lead the development of this area, and others found finance and contractual arrangements to be complex and challenging activities. Bespoke external expert help was helpful in enabling progress. Conversations regarding finance were reported to be extremely challenging, particularly when considering moving money from acute to community settings. Many left development of this aspect to later in the process.

Two systematic reviews[185,190] provide further data regarding financial challenges. Suter *et al.*[190] described different service funding as a major barrier to integration, with financing mechanisms requiring pooling of resources and a population focus. Nicholson *et al.*[185] described the need for new financing and a change from an organisation focus to care for a whole population. A qualitative study from the Netherlands[290] highlighted the need to develop incentives for financial collaboration. A US qualitative study[294] reported the need for standard contracts and outcome measures to encourage integration and commissioning between providers, with a requirement to demonstrate improved patient experience and clinical outcomes in regulation of integrated care initiatives. The authors emphasised that the pricing strategy needs to incentivise integration, and bundled payments and local tariffs for particular conditions and pathways should be developed.[294]

Non-UK intervention and qualitative studies[283,284] discussed how payment systems could potentially act as barriers to, or enablers of, new models of integrated care. A comparator study from Germany[219] described a plan to introduce incentive payments for clinicians. A non-comparator study from the USA[252] recommended that GPs should be rewarded for interventions that avoid potentially preventable admissions/contacts. The authors highlighted that current payment schemes focus on physician effort, rather than patient characteristics or outcomes. A qualitative study from the USA[265] described misalignment of reimbursement systems as a barrier to patient-centred medical homes. Another qualitative study from the USA[291] reported that barriers to becoming part of an Accountable Care Organization were predominantly finance related, with legal and regulatory barriers also present.

A qualitative study examining various initiatives in Australia to improve co-ordination[267] noted differences regarding the role of payment systems in different services. In one case study, financial incentives were not perceived as important for involving GPs, who were reported as being most interested in involvement for the benefit of patients. In the second case study, it was perceived that use of an electronic record had been hampered by a lack of incentive payment for doctors. In the third case study, it was reported that a lack of incentive payments made it difficult to attract GPs initially, but efficiency gains overcame this.

A qualitative study from the Netherlands[296] reported that fee-for-service systems lead to inappropriate incentives for non-co-operation, an inability to influence the service, a service that is not patient-centred and inflexibility. The authors described the view among participants that integrated financing was incompatible with the existing financing system, was problematic for patients with comorbidity and lacked evidence. They also noted that integrated financing is challenging when there is a diverse patient population, varying care, differing requirements at points in the pathway of care and a lack of clarity regarding who has principal responsibility for care.

Governance

The need for strong accountability mechanisms and risk sharing across organisations was described by a UK qualitative study.[100] Governance was reported to be an issue in further UK qualitative studies,[105,126,151] with effective governance being a key enabler of integration.[139] One study[105] reported that governance arrangements varied in different Pioneer sites, with many choosing to maintain existing arrangements. A UK intervention study[66] described having clear clinical governance as a key aspect of a new MDT initiative. Strong governance with clearly understood lines of responsibility and accountability was reported as important in another UK intervention study.[87]

Three systematic reviews[181,185,190] describe the importance of clear governance arrangements in new models of working. One[185] recommended that goals and strategies are jointly agreed, with formal agreements put in place to manage deliverables, risk and process. Another[190] concluded that a flatter and more responsive organisational structure facilitates integration, with a need for effect mechanisms of accountability and decision-making. A qualitative study from the USA[274] described that having common objectives, contractual relationships, representation on the board of executives and having a large market share facilitated collaboration.

Outcomes from new models of integrated care

The included literature examined an extensive range of outcomes (effects) following the introduction of new models of integrated care. We grouped these outcomes into three main areas: (1) those related to usage of health-care resources, (2) those related to the quality of care received by patients and (3) outcomes for staff working experience. The group of outcomes to be described in this section relates to effects on individual parts of the health-care system. Outcomes in one part of the system will have a 'knock on' effect on other parts; for example, a reduction in length of hospital stay may increase the need for community care. Evidence related to wide impacts across the whole of a health-care system on community care activity, secondary care activity, health-care costs and health-care utilisation is outlined in *System-wide impacts*.

Resource usage

Clinician contacts

Two UK intervention studies,[44,87] five non-UK comparator studies[158,206,217,218,306] and one non-UK non-comparator study[249] evaluated the number of clinician contacts as an outcome measure. A UK cluster RCT[44] found that clinician contacts in the first 12 hours after admission increased following the introduction of an ICP for children with breathing difficulties in an ED ($p = 0.0004$). In contrast, a community intervention for older adults[87] was reported to have reduced the number of physiotherapy or occupational therapy appointments and led to a 25% reduction in the number of visits to a practice nurse ($p = 0.05$).

Non-UK studies report a range of findings regarding the effect on clinician contacts, with three RCTs or cluster RCTs (two from the USA[158,206] and one from Finland[217]) reporting a reduction in clinician visits ($p = 0.03$ to $p < 0.001$; 1% reduction) following the formation of new teams or standardisation of practice interventions for older adults. In contrast, one Canadian non-RCT study[218] found an increase in health professional, voluntary and home help visits in frail older adults following a case management care plan and standardised assessment intervention. A Swedish RCT[306] similarly reported higher resource use in terms of nurse visits among adults with heart failure following a team and key contact intervention, although the text and the data provided seem contradictory.

A non-comparator study from the USA[249] evaluated an intervention comprising shared electronic records and a messaging system for patients and staff. The study highlights the need to consider system-wide effects resulting from new models of care. Total numbers of patient in-person contacts across all professions reduced by 26% over a 3-year period following introduction ($p < 0.001$) in both primary care (25% reduction) and specialist services (21% reduction). Numbers of ED attendances and urgent care visits increased, ($p < 0.001$) but not by as great an extent as the reduction in patient in-person contacts. However, the number of telephone contacts by patients also increased, resulting in an overall increase of 8% in patient contacts ($p < 0.001$).

General practitioner appointments

Three UK studies[58,63,87] reported the effect of new models of integrated care on GP appointments (rather than all contacts or non-medical clinician contacts). Two studies[63,87] reported a reduction, and one[58] found no significant difference. Julian *et al.*[58] evaluated the effect of a GP-led ICP for women with menstrual problems via a small-scale non-RCT study, and found that there was no significant difference in the number of GP appointments (although it had a positive effect as there was a reduction in the number of hospital appointments).

The first[58] of two studies reporting a reduction in the number of GP appointments had a comparator group design, and evaluated the placing of a social worker in a general practice, together with joint assessments and care packages for the care of older and at-risk patients. The number of GP consultations were reported to have reduced by 3% when comparing the project year to the previous year. A before-and-after evaluation of the Partnership for Older People Projects (POPPs)[87] reported a 10% reduction in the number of GP appointments ($p = 0.009$), a 28% reduction in the number of telephone calls to GPs ($p = 0.014$) and a 25% reduction in the number of visits to a practice nurse ($p = 0.05$) for the case co-ordination type of interventions that had been put in place in some sites.

Length of stay

A large number of UK and international studies evaluated the impact of new models of care on length of stay in hospital. Of the UK studies, five[34,44,61,66,85] reported that length of stay was not significantly different, one[69] reported that it increased and 14[34,36,40,46,49,54,59,63,65,68,71,72,81,87] reported that it had reduced. One additional study[40] found contrasting results, with a reduced length of stay for elective surgery and emergency medical patients ($p < 0.001$), but longer stays for surgical, medical and paediatric emergency cases.

One study reporting no significant difference[66] evaluated the introduction of a children's community outreach team with an integrated pathway and extended hours. The other three studies evaluated ICPs for children with breathing difficulties,[44] gynaecological patients[61] and patients with diabetic ketoacidosis.[85] One study[69] reported an increase in length of stay, but it has very limited reporting and is of very weak quality.

Of the 14 UK intervention studies reporting a reduction in length of stay, four[36,54,63,81] are of a higher-quality controlled before-and-after design; three[54,63,81] of these were carried out in populations of older adults in community settings. The first of these[81] evaluated eight POPPs with older adults in the community (generic workers, integrated teams and out-of-hours services). It reported that the integrated health and social care team project reduced the number of bed-days following emergency admissions (no detailed data). This was in contrast to a signposting service that appeared to increase the number of bed-days. The second study[54] evaluated a case manager role in general practice and found a shorter length of stay in intervention practices than in the control (adjusted relative risk 0.896, relative risk reduction 10.41%, 95% credible limit 0.820 to 0.979; $p = 0.015$). The third study[81] evaluated having a social worker located in a general practice, with joint assessment and packages of care in conjunction with a district nurse. The study found that there was a significant difference in length of stay between patients from the project practice and patients from other practices ($p = 0.02$; mean 31% reduction). The fourth UK comparator study[36] was a cost-effectiveness analysis of a hospital at home service, which found that the mean length of stay in the intervention group was 3.3 days [standard deviation (SD) 3.9 days], compared with 10.4 days (SD 7.7 days) prior to the introduction of the initiative.

The 10 other studies[34,40,46,49,59,65,68,71,72,87] also reporting a reduced length of stay were uncontrolled before-and-after studies. They were carried out in a range of populations and settings encompassing general hospital patients,[59] children in hospital,[68] older adults in hospital and community settings,[49,65,87] older adults and/or people with diabetes mellitus,[72] hospital mental health services,[71] urgent care,[40] patients at the end of life,[34] and adult patients with complex needs.[46]

The intervention elements associated with a reduced length of stay also varied, including MDTs and care managers,[46] whole service redesign with multiple elements,[40,49,71,72] ICPs[59,65,68] and multiple types of intervention, including case management and discharge planning.[87] Two studies[59,65] highlighted a difference in the effectiveness of ICPs for different groups of patients. The first of these[59] found a reduction in length of stay associated with only about half of the conditions in a hospital where ICPs had been introduced, and the second[65] concluded that pathways in a hospital setting were more effective for the older and male patients among those undergoing hip or knee arthroplasty.

Ten systematic reviews[158,168,169,171,172,175,177,180,182,191] included evaluation of length of stay outcomes. Six[158,168,171,172,180,182] concluded that new models of integrated care led to reduced length of stay, and four[169,175,177,191] concluded that findings were inconclusive or that there was no clear impact. The reviews reporting uncertain effects examined studies of older adults in services crossing both acute and community settings,[177,191] hospital services for people with brain injury[175] and hospital mental health services.[169]

The interventions comprised case management and the formation of MDTs. All four studies[169,175,177,191] are from Australia and meet just over half of the quality criteria for systematic reviews. The systematic reviews, which concluded that length of stay was reduced with new models of integrated care, included a range of settings and patient groups, including older adults,[168,171,172] those with any condition[182] and the chronically ill.[180] They included case management interventions in hospital or community settings,[168] MDTs in hospitals and community settings,[171] financial integration[182] and any multidisciplinary intervention.[180] This group of systematic reviews includes one[168] that met all but two quality criteria.

The international comparator studies echo the diversity with regard to length-of-stay outcomes, with two studies, the first in older adults in a community setting[198] and the second with a range of patients in a hospital medicosurgery unit,[216] suggesting a significant reduction of 19.2% in the number of bed-days ($p = 0.001$) and length of stay ($p = 0.31$), respectively. In contrast, two studies (the first in an emergency unit for older adults,[221] the second in a psychiatric hospital[239]) reported no significant difference in length of stay or the number of bed-days in hospital. The first of these evaluations[221] found that both the intervention arm and the control arm had a reduced hospital length of stay, and although the intervention group reduced to a greater extent, this difference was not significant. One of the four studies in this group[239] used randomised allocation to a study arm. The findings are from studies carried out in Australia, the USA and Switzerland. The two studies finding a significant reduction in length of stay[198,216] evaluated co-ordinated assessment and management and case management interventions. The two studies finding no significant difference[221,239] evaluated a multielement co-ordinated case management intervention and a MDT intervention.

Three international non-comparator studies[243,261,307] report divergent findings regarding effect, with two[243,307] indicating reduced length of stay and one[261] indicating increased length of stay in a nursing home. This study[261] is the only one that used length of stay in a nursing home rather than hospital length of stay as a measure.

Unscheduled admissions

Most evidence regarding the effect of new models of integrated care on unscheduled and emergency admissions comes from the UK intervention studies. Four UK studies,[46,48,78,80] including two with a comparator design,[46,78] indicated no effect on the number of unscheduled admissions.[46,48,78,80] Four studies reported in five documents[43,45,74,81,82] indicated a significantly increased number of admissions. Three of these[74,81,82] were of a higher-quality comparator design. The Steventon *et al.*[81] study found that only the intermediate care intervention seemed to be associated with an increase; the health and social care team projects appeared to reduce the number of emergency admissions for a particular high-risk subgroup. Stokes *et al.*[82] reported that the increase was only 0.01 admissions per patient per month, an effect size of 0.03, which is of limited clinical significance.

Intervention studies from the UK have reported a reduction in the number of unscheduled admissions of 22%,[37] a 16.3% decrease in the number of emergency medical admissions and a 3.9% decrease in the number of emergency surgical admissions,[40] 17 admissions for 13 patients,[47] a 2% reduction for multiple admitters,[54,66] a reduction from 935 to 840 admissions in a year for COPD patients,[72] and a significant effect size following a service reconfiguration compared with other hospitals ($p = 0.0002$).[39] None of these studies was of comparator design.

The patient populations and locations for interventions in this group of studies were diverse, including children in primary care,[66] older adults,[47] people with COPD,[72] urgent mental health care in a hospital,[78] and mixed patients in acute and community settings.[74] There was no clear pattern to the effect of different intervention elements. Case manager, MDT and staff relocation interventions were in the no-effect group; MDT and large-scale service reorganisation interventions were present in the group indicating an increase; and MDT, ICPs and role change interventions were in the group of studies reporting reduced admissions.

Findings from UK qualitative studies were also equivocal, with one reporting no perceived difference[100] and one reporting a perceived reduction in length of stay.[106]

Three systematic reviews[168,177,191] together provide unclear evidence, with one suggesting no difference,[168] one suggesting that the effect was unclear[177] and another suggesting a reduction.[191] All three reviews examined interventions for older adults and encompassed case management in hospital and the community,[168] and community integrated care initiatives generally.[177,191] The single international comparator study[236] reported that the risk of having at least one unplanned hospital admission was lower in the intervention group after adjustment (odds ratio 0.39). The single international non-comparative study[243] outlined that unplanned charges (arising from unscheduled hospital admissions or ED interventions) decreased by 51% at 12 months and a cumulative 64% by 24 months.

Non-emergency and scheduled admissions

Eight UK studies reported in nine papers,[39,41,45,46,63,71,74,77,81] including two studies reported in three papers[45,63,74] with comparator designs, indicated a reduction in admissions. Reductions were of 1% in the number of inpatient admissions in gynaecology;[41] 4% in the number of hospital admissions for a range of conditions following service reconfiguration (most of the reduction was reportedly in the case management interventions);[45,74] 15% in the number of admissions for older patients comparing general practices (no reduction pre–post intervention) following relocation of a social worker to a general practice;[63] 31% in the number of admissions for a subgroup of patients from early-engaging practices in a reconfiguration intervention;[83] there was a decrease in standard admissions ratio;[39] a decrease of the number of inpatients from 91% to 35%;[71] a reduction from 19% more admissions than comparable areas to 8.7% more than comparable areas following a multielement initiative;[77] and a reduction in the number of excess bed-days from 520 per 1000 patients in 2007/8 to 232 in 2008/9.[46]

Two evaluations of ICPs[44,80] reported no significant effect on admission rates (1) for children with asthma (comparator design)[44] or (2) for admissions for fractures/falls in the elderly.[80] One of these studies[80] also found indication of an increase in the number of admissions for patients with diabetes mellitus ($p = 0.014$) compared with before the intervention.

Another study[43] reported a slight increase in the number of admissions to a community hospital following a hospital merger. Stokes *et al.*[82] similarly reported a very small increase (of 0.01 admissions per patient per month, effect size 0.03) following a MDT intervention. Another study of older adults[81] also reported a slight increase of 0.64 additional admissions over a 12-month period compared with a control group for a MDT intervention with a support worker and an out-of-hours service. A study by Wilberforce *et al.*,[86] also in older adults, found that more-successful (higher-integration) teams had higher admission rates, and Clarkson *et al.*,[42] another study in older adults, found that integrating services could increase rates of care home admissions (hazard ratio 0.73; $p = 0.12$).

Systematic reviews have reported reductions in numbers of admissions of 24–31% among studies of ICPs,[173] reductions in numbers of nursing home admissions in four of five studies and in hospital admissions in two of three studies of case management,[177] reduced hospital admission in 10 of 17 studies of multidisciplinary interventions,[180] and reduced admission in studies of case conferences.[191] In contrast, one review of patient-centred medical homes[170] concluded that there was no significant effect on admissions.

The evidence from the international literature is mixed, with six comparator studies[201,206,210,211,228,236] evaluating a range of intervention types indicating no significant effect on admissions (all but one[201] of these studies was in older adults). Nine studies[195,199,200,205,207,219,221,222,306] reported a reduction in the number of admissions for patients with a range of conditions; patients included older adults, general groups and those with chronic conditions. One of these studies[195] found that, although admissions rates in one intervention area reduced, in another area they increased. Three international non-comparator studies echo the mixed picture, with two indicating reductions in numbers of admissions[243,251] and one indicating no significant effect.[261]

Readmission

Studies report conflicting findings regarding the effect on readmission rates, with three UK studies reported in four papers[36,38,39,54] (including one study with a comparator group[54]) indicating no significant effect on (1) older at-risk patients,[54] (2) patients originally admitted as emergencies[38,39] or (3) patients with COPD following a hospital at home intervention, service reconfiguration or a case management intervention.[36] Two studies indicated an increase in readmissions,[69,82] although one of these[69] was of very poor quality. The other[82] found only a slight increase in 30-day readmission (effect size 0.03). One UK study of a community outreach team for acutely ill children[66] reported a reduction in the number of readmissions of 17.3%.

International studies carried out in populations of older patients, those with chronic conditions and those in acute care support the lack of evidence of a reduction in numbers of readmissions, with all five international comparator studies (reported in eight papers[201–203,209,210,216,218,221]) suggesting no statistically significant effect. In contrast, two international reviews[171,180] suggested reduced numbers of readmissions, although a third[182] concluded that there was conflicting evidence.

Accident and emergency department attendance

We identified three non-comparator design UK studies[66,74,87] that reported accident and emergency (A&E) (ED) attendance outcomes. Two[66,87] suggested a reduction of 5% and 69% for children and older adults, respectively, following varied interventions. The other[74] reported no change ($p = 0.04$). One review[170] concurred that interventions may lead to a reduction for patients with co-occurring conditions. A meta-analysis was conducted in this study, and found that patient-centred medical homes reduced the number of emergency visits [risk ratio 0.81, 95% confidence interval (CI) 0.67 to 0.98]. A second review[197] found that although A&E attendance fell by 10%, this was not statistically significant.

Five of the international comparator studies also reported that A&E attendance reduced following interventions by 20.8%,[199] by 57%,[200] by 12.2 per 1000 patients annually,[207] from 705 to 396 attendances ($p = 0.03$)[210] and from 20.7% to 3% of patients visiting annually ($p = 0.02$).[237] The interventions included multiple elements of integration, an Accountable Care Organization model and a home-based team (they were delivered to older adult patients in all but two studies[199,200]). One non-comparator international study[244] supported a reduction in A&E attendance in a general population.

Five studies reported in seven papers[194,201–203,217,228,239] evaluated MDTs or integrated home care and found no significant effect on A&E attendance. Only one of the studies[239] was not carried out in older adult patient groups, but in patients with a psychiatric diagnosis instead. Two studies reporting case management interventions in older adults found that the number of visits to an ED increased (odds ratio 1.28; $p = 0.02$;[211] 46% in the control group vs. 32% in the intervention group; $p < 0.001$[218]). The studies report opposing trends, with the first study[211] finding an increase in the second year but not the first, and the second study[218] finding a greater increase in the first year of the intervention.

Outpatient appointments

The UK evidence reports a reduction in outpatient appointments in all four studies outlined in five papers[45,58,67,74,81] of 20–40% (one[74] at the individual patient level only and not when analysed by general practice). The initiatives evaluated included a variety of interventions for a range of conditions. In contrast, one international comparator study of an ICP for older adults found no reduction in outpatient clinic use. This finding was supported by a non-comparator study of all-inclusive care for older adults,[261] which similarly found no significant effect.

Prescribing rates

Few studies examined the effect of new models of integrated care on rates of prescribing. Among UK studies, no difference in prescribing rates is reported in one evaluation of an ICP,[62] whereas a reduction is reported in another.[85] A systematic review[158] found that pharmacy involvement in MDTs led to 'improved prescribing'. 'Improved prescribing' was also reported in an international non-comparator study.[245]

Access to resources

One systematic review examining UK-only evidence[161] suggested a positive effect on access to resources, in that integrated working enabled organisations to access each other's resources (e.g. training). An international non-comparator study[244] described increased access to technical services.

Quality of care

Perceived quality

The outcome of 'quality of care' presented challenges in analysis, as a result of the varied ways in which the construct was defined and considered. Four UK intervention studies[45,64,73,148] reported on staff perceptions of quality of care following service redesign, case management or integrated pathway interventions in hospital or primary care settings for older adults;[45] general caseloads;[73,148] or patients with clostridium difficile infection.[64] All four studies reported that staff-perceived quality of care had improved. One of these[64] reported that 91% of staff perceived improved patient care and treatment following the introduction of a pathway. In other studies, it was found that 54% of staff perceived that patient care had improved,[45] 'more than half' of staff reported improved services[148] and 91% of staff reported that improved relationships would have or had improved patient care.[73]

Four systematic reviews[163,165,182,186] and four international comparator studies reported in seven papers[201–203,213,215,220,235] reported the effect on quality of care in terms of staff or patient perceptions. A review of reviews of organisational and/or financial interventions[165] concluded that there was some evidence of benefit to quality of patient care from interventions including MDTs, case management and provision of primary care in or alongside EDs. The authors highlighted the wide range of measures that were used as indicators of 'quality of care', and commented that some studies did not specify what aspect of quality was measured.[165] The outcomes considered included, most commonly, patient satisfaction, but also aspects that we defined as process improvements (such as continuity or compliance with guidelines), together with clinical outcomes. Another review[163] concluded that there was moderate evidence that comprehensive care approaches could improve patient perceptions of improved care quality. Peikes *et al.*[186] reported that physicians perceived that quality of care had improved following a care co-ordination and lifestyle programme. Mason *et al.*[182] examined the effect of financial integration on quality of care. Studies in this review typically assessed perceived quality using surveys of staff, patients or carers (including aspects that we have identified separately, such as satisfaction and access to care), reporting mixed findings.

One international comparator study reported in three papers[201–203] supported the finding that quality of care was perceived by patients (older with chronic conditions) to have improved. One study evaluating MDTs and shared training in Norway[226] provided contrary findings, reporting no difference in staff-perceived service quality.

Quality standards

Three studies evaluated quality not in terms of perceived quality of care but in terms of whether or not recommended procedures (such as vaccination, screening, prescribing or testing) had been carried out. One[215] found a significant improvement in procedures from before to after the collaborative team intervention ($p = 0.0013$), although the authors concluded that the intervention was not cost-effective. Another study[235] evaluated three general practices that were Accountable Care Organizations. The authors reported percentage point differences between the three practices and comparison groups of 0.7, 2.6 and 4.7, respectively, and that 'the three practices were superior to their comparison group peers on all care quality measures' but they did not provide analysis of statistical significance. They noted that the before–after differences for the practices were not statistically significant, and that in fact the performance of one practice had declined over the time period. Fagan *et al.*[213] evaluated the effect of pay-for-performance incentives for care co-ordination. They concluded that there was either no significant difference between the intervention and comparison groups in rates of screening/testing for diabetes mellitus, or that the improvement was significantly lower for the intervention sites.

Patient satisfaction

A large body of literature reports a positive effect on patient satisfaction following the introduction of integrated care initiatives. Nine UK studies[35,37,43,46,51,58,66,75,83] across a range of conditions and services (including diabetes mellitus, complex needs, children's services, complex and vulnerable patients in primary care, and hospital gynaecology) and following a variety of interventions (including whole-service redesign, MDTs and ICPs) reported increased levels of patient satisfaction. Only two studies[74,78] highlighted less positive outcomes. The first of these[74] noted that following a case management intervention, older patients reported that they were less able to see the GP or nurse that they preferred. A second study evaluating the siting of a psychiatric nurse in an A&E department[78] found no difference in patient satisfaction levels.

Four UK qualitative studies[121,130,138,146] support the finding that interventions including MDTs and service redesign result in increases in patient satisfaction. One qualitative study,[108] however, reports more mixed views of a mental health integrated partnership, and another[119] describes how satisfaction may have been higher with health services but not with social care services.

The systematic reviews support an increase in patient satisfaction, with 11[8,88,160,163,164,170,177,180,188,189,192] concluding that the evidence suggests a positive effect. Four international comparator studies[197,214,228,237] similarly report increased satisfaction among older, acute and paediatric patient populations following service integration, case management and patient-centred medical home interventions. One of these studies[197] highlighted that although patients reported greater satisfaction, this was not shared by carers. This was echoed by another study of carers,[223] which found no impact on satisfaction with care and support services. Another study[209] reports a lack of significant difference following home-based integrated care ($p = 0.31$) and a final study of an integrated care protocol to prevent overuse of acute services[212] reports that patients' satisfaction was at the same level as prior to the intervention.

Meeting patient preferences

Three UK studies of MDTs or ICPs in end-of-life/frail older patients[34,53,144] highlighted that the interventions were able to increase the fulfilment of patient wishes to die outside a hospital setting. The percentage of deaths in a hospital reduced from 15% to 8% in one study,[34] the percentage of home deaths increased from 19% to 23% in another[53] and the percentage of home deaths was 55% in the third study,[144] compared with a national average of 33% (however, the requested hospice placement had only been achieved for 34% of patients in this study).

Time spent in accident and emergency departments

One UK study[44] reported no difference in time spent in A&E for children with asthma following the introduction of an ICP compared with standard care. In contrast, an Australian comparator study[221] found that older adults spent around 45 minutes less in the ED following a new co-ordinated service, although this is of borderline significance ($p = 0.0575$; a reduction from 496.3 minutes to 435.7 minutes).

Numbers of incidents and complaints

One UK non-comparator study[71] reported that the frequency of aggressive incidents among inpatients with mental health and behaviour problems was reduced following the introduction of an integrated assessment and treatment service. Another UK before-and-after study[39] reported that numbers of formal complaints, incident reports and patients leaving before treatment declined following service redesign and the establishment of an integrated emergency assessment unit.

Length of waiting time

One UK study[55] found that following the introduction of an ICP in urology, the time between referral and contact and the time from referral to treatment, both reduced. ICPs were also found to reduce waiting times during the management of inpatients with diabetes mellitus, including reducing time before giving intravenous infusions.[85] The reconfiguration and integration of gynaecological services was found to reduce waiting times for scans ($p = 0.0054$) and getting blood test results, although not for blood testing.[41] Improvements in waiting times for assessment by a social worker were reported in a comparator study evaluating the relocation of a social worker to a general practice.[63] Waiting time for assessment/diagnosis of autism and related disorders in children was reduced from 2 years to 5 or 6 months following the introduction of a multiagency team with a filtering panel and joint assessment.[75]

Five qualitative studies[104,119,131,146,147] supported the finding of a reduction in waiting time. There were perceived reductions in waiting time for allocation to a social worker, admission to a ward, waiting for assessment and waiting for services generally.

In contrast to these positive reports, one systematic review[172] found that the length of wait for surgery for older patients with hip fracture was reduced in only one of three studies analysed. A review of UK literature that was carried out in 2010[181] evaluated speed of delivery following the introduction of integrated health and social care teams. The 18 included papers were reviews, qualitative studies, surveys and one non-RCT. The authors concluded that the speed of response may be quicker, and services may be more responsive, as a result of introducing MDTs.[181] However, the data to support this conclusion are limited, and the quality of the review was assessed as weak (meeting only one of the quality criteria).

One international comparator study[196] reported a reduction in waiting times for nursing home placements among older adults ($p < 0.05$), and another[203] reported no effect on waiting times for appointments among patients with chronic conditions. The two non-comparator studies[258,308] are similarly divergent, with one indicating a reduction in waiting time for cancer testing[258] and another suggesting an increase in referral delay.[308]

Identification of unmet needs

There was no UK evidence from intervention studies in relation to the outcome of the identification of unmet needs. One UK qualitative study[106] reported perceptions of increased unmet needs being identified and more referrals being made in care homes, and another[142] reported the potential for increased referrals being caused by unmet needs being identified. One US systematic review of studies evaluating the Program of Research to Integrate Services for the Maintenance of Autonomy for older adults[188] found that two of the 45 studies reported decreased prevalence of unmet needs in the community ($p < 0.001$). A comparator study,[214] also from the USA, evaluating a medical home/case co-ordination intervention for children with special needs reported that GPs perceived that the programme had identified unmet child and family needs.

Access to services

Five included (non-comparator) UK intervention studies[49,55,73,86,87] reported that access to services in the community and/or specialists/intermediate care had increased. These studies evaluated MDTs, general service redesign or integration of hospital and community services. One UK qualitative study[135] reported perceptions among staff that colocation of health and social care services for older people had enabled access. Two systematic reviews[154,182] also reported that access to services had improved. The first of these[154] reported increased access to clinical assessments and interventions following the introduction of an ICP for stroke patients, and the second[182] concluded that there is largely positive evidence that interventions that integrate financial or resource flows across both health and social care can improve access to care. A systematic review of UK health and social care integrated interventions[161] described the key to successful integration as being the ability of patients to access care at home.

Two international comparator studies reported in four papers[201–204] supported the finding that MDT and multicomponent home care unit interventions improve access to services (for patients with chronic conditions and severe heart failure). Two further comparator studies[95,204] describe the use of domiciliary services increasing as a result of increased access,[195] and the ease of access to staff as being an important enabler of care delivery at home.[204] A non-comparator study evaluating a wide-scale integration model[245] similarly reports improved access to services for patients. Another comparator study evaluating a patient-centred medical home in the USA[257] also reported that patient access to care had improved.

Staff working experience

None of our included UK studies reported staff working experience outcomes. Two systematic reviews (of patient-centred medical homes and MDT interventions)[170,181] concluded that integrated models can improve staff working experience. The first[170] reported that working experience improved to a small to moderate extent, and the second[181] reported that initiatives increased staff job satisfaction. However, an international comparator study from Norway[226] found no effect on staff exhaustion or work engagement. A positive effect on job satisfaction was indicated by a qualitative study from Spain.[282]

System-wide impacts

In this section, we outline evidence related to system-wide impacts across health-care delivery. A systems perspective recognises that outcomes within one part of a system may have a 'knock-on' effect on other elements. In particular, in relation to health services, there are impacts on the elements of community services versus hospital services and health care versus social care. The review identified evidence related to the impact on community care activity, secondary care activity and health-care costs and utilisation.

Community care activity

Three UK studies (in four papers[37,51,76,86]) reported data regarding community care activity following interventions. Hawthorne *et al.*[51] found that the proportion of people with diabetes mellitus receiving their care in primary care settings increased from 48% to 67% over a 6-year period following an extensive service redesign. An evaluation of multidisciplinary community teams[86] found that highly integrated teams provided a broader range of community services, but at a greater cost. The authors reported considerable variation between the teams with regard to the number of patients receiving care. A study of community mental health teams[37,76] found that a gateway worker role to integrate primary care and mental health teams reduced inappropriate referrals. A UK qualitative study[106] reported the perception of increased referrals to allied health professionals in the community following the introduction of a care home support team.

Two systematic reviews provide contrasting findings, with one[189] indicating reduced primary care usage following a case management intervention [utilisation of primary and non-specialist care in the short term was –0.08 (95% CI –0.22 to 0.05; $p < 0.001$) and in the long term was –0.10 (95% CI –0.29 to 0.09; $p < 0.001$)]; the other[182] concluded that there is some evidence for an increase in the usage of community services, but it is unclear regarding the impact on residential care, with some studies reporting a greater likelihood of nursing home admissions in integrated care initiatives. This lack of clarity is reflected in the included international comparator studies, with two indicating increased usage of community services (domiciliary, day care or respite),[195,230] two indicating reduced use of home care or nursing home placements[155,158] and one reporting no significant effect on nursing home placements at 12 months or 18 months following the introduction of a collaborative care model.[206] One non-comparator international study evaluating an Accountable Care Organization[244] found that community care activity increased.

Hospital/secondary care activity

One UK intervention study[37] reported a reduction in secondary care activity of 9% for vulnerable/high-risk patients with an integrated care plan in place. Two UK qualitative studies report perceptions that numbers of referrals to secondary care reduced following service redesign,[91] and following a new GP role.[138]

Two systematic reviews concluded that the evidence regarding the impact on secondary care activity is unclear, with Mason *et al.*[182] reporting no impact in 11 out of 34 studies of integrated financial initiatives and Trivedi *et al.*[192] describing the evidence as 'mixed'. One review[155] described only one integration programme of those evaluated in a single study as appearing to reduce hospital-based services. De Bruin *et al.*[163] reviewed comprehensive care programmes and concluded that there is moderate evidence that comprehensive care can improve (i.e. reduce) inpatient health-care utilisation. In support of this finding, an international comparator study[199] reported a reduction in the use of hospital services by older adults and a non-comparator study[245] reported a reduction in specialist referrals.

Health-care utilisation

Two systematic reviews[164,177] endeavoured to assess the evidence regarding the overall impact of integrated care on health-care utilisation. Eklund and Wilhelmson[164] reviewed co-ordinated and integrated interventions for older adults, and concluded that outcomes related to health-care utilisation significantly favoured the intervention in only five out of nine studies. A review of case managed or integrated programmes[177] reported that good-quality RCT evidence indicates that case management interventions may reduce nursing home admissions and hospital use. However, evidence, mostly from non-randomised trials, indicates that integrated care may increase service use.

Health-care costs

Outcomes that are reported, such as reduced length of hospital stay and reduced admissions, may be expected to have a positive impact on the cost of providing health care. Data regarding the cost of providing health-care services were evaluated in 14 UK intervention studies reported in 15 papers.[34,36,37,42,43,45,46,52,63,67,72,74,77,86,87] Only one of these studies[86] reported increased costs. This study with a comparator group[86] evaluated a multicomponent community intervention (including MDTs, single point of access, and joint care plans for older adults with mental health needs) and found that more-highly integrated teams provided an improved service, but at a 44% greater cost than teams that were not well integrated (monthly cost of £762 per patient in high-integration teams vs. £508 per patient in low-integration teams).

Five studies[34,42,43,45,87] reported no significant impact on costs. The first of these was a before-and-after evaluation of a rapid response team intervention in palliative care,[34] which found that hospital costs (mean cost of inpatient stay for the last 8 weeks of life) did not significantly change (£3066 prior to and £3019 after the programme) and that the costs for patients enrolled in the programme were little different (£3067). There was also no significant difference between the mean cost of patients in the programme and the corresponding mean costs for all end-of-life patients over the previous 2 years. The second study reporting no significant impact was a RCT of a care manager with integrated reporting and assessment for frail elderly patients.[42] The authors reported that there was little difference in health or social care costs, although there was a suggestion of an increase for the most-frail patients and slightly higher informal care costs. In another RCT (in patients with breathlessness due to advanced disease),[52] an integrated palliative care service was found to have no significant impact on formal care costs [6-week mean costs were £1422 in the breathlessness support service group (95% CI £897 to £2101) and £1408 in the control group (95% CI £899 to £2023)]. However, the authors noted that costs varied greatly between individuals.

A before-and-after evaluation of a multicomponent organisational merger[43] compared the estimated impact of reconfiguration with the actual impact. It describes that savings for the NHS trust had been estimated at the outset to be in the region of £0.3M to £12.5M per year. However, the targeted savings were not achieved (the trust ended the year in deficit, although this was not attributed to the intervention). A study evaluating 63 integrated care pilots in England[45] highlighted the importance of evaluating costs across the whole system. The authors reported that cost gains attributable to reductions in emergency admissions were balanced by increased elective and outpatient attendance, with an overall cost-neutral outcome for secondary care costs ($p = 0.36$). However, the authors highlighted a 9% reduction in secondary care costs (£223 per patient; $p = 0.01$) for those pilots that included case management interventions. This finding regarding cost reduction for case management interventions for patients aged > 65 years is reported in the second paper from the study.[74]

An evaluation of the POPPs[87] calculated that a £1.00 additional spend on the projects overall would lead to an approximate £1.20 reduction in emergency bed spend. Spending on hospital-facing projects had a greater saving on emergency bed-day cost than community-facing projects, and larger projects were potentially more cost saving. The overall estimated secondary care cost reduction was £2180.43 per day, with an increase in primary care costs of £14.08 per day and an overall estimated cost reduction of £2166.35 per day. The authors concluded that there was an 80% probability that the programme was cost-effective, comparing project areas to areas with no projects. However, another report evaluating eight of the POPPs[81] seems to provide contrary findings to the main project report. This study concluded that, overall, the interventions did not appear to be associated with a reduction in use of acute hospitals (which would seem to lead to doubt regarding the reported cost savings).

A redesign of services for COPD patients was reported to have led to a reduction in annual costs of admission, from £1772.865 to £1528.080.[72] Another study of services for patients with COPD[36] evaluated a hospital at home service and found that the cost for patients in the integrated care group was £600 less than for patients in the comparator group (£1653 vs. £2256; $p < 0.001$). The additional costs for community nurse specialist visits and emergency contacts were less than the reduction in costs of hospital length of stay.

Another UK intervention paper[37] reported cost savings of 17% (it is unclear how this figure was calculated) following the introduction of integrated teams for vulnerable people, with this saving described as being largely attributable to the reduced numbers of emergency admissions. Another team intervention with case management was estimated to have led to an annual cost saving of £54,111 on hospital beds. Purchasing beds in care homes avoided hospital costs and was estimated to save £33,200 annually.[46] Simmons *et al.*[77] compared cost outcomes for more-engaged general practices with those for less-engaged practices during a multicomponent integrated care initiative for patients with diabetes mellitus. They reported that the monthly tariff paid for hospital inpatient care reduced in practices that were fully engaged with the initiative.

Perceptions of the impact of new models of care on health-care costs in the UK studies were similarly mixed. One study[91] reported staff perceptions that the costs of hiring agency staff were reduced. Another[105] reported scepticism among staff that initiatives were cost saving.

Evidence from systematic reviews also indicates a lack of clear effect regarding costs. Two[155,158] concluded that, in older populations, costs may be reduced. Another,[160] also considering older adult populations, reported some limited evidence of cost reduction. One systematic review[163] reported that there was moderate evidence that comprehensive care can improve health-care costs, although there was insufficient evidence for outpatient costs.

Six reviews[170,180,182,189,191,192] concluded that there was no significant difference or that the effect was uncertain in a range of populations, including older adults, patients with chronic conditions and general populations of patients, for interventions including case management elements, patient-centred medical homes, financial integration and general service redesign.

One international comparator study reported in two papers[215,220] found that the annual cost of providing a family health network programme in Canada was more expensive than usual care (CA$12,923 vs. CA$9222). The authors calculated that, in order to achieve the desired improvement in quality of care, a CA$407 additional spend is required for each 1% increase in quality. The costs of another intervention (team meetings and co-ordination in mental health treatment centres) were also found to be significantly higher, in terms of outpatient mental health and medication costs, than the cost of usual care.[233]

No significant impact on costs was reported in nine papers (seven studies).[195,209,217,231,232,235,240,241,306] The patient groups and services included dermatology, neurology, general populations, older adults, asthma, COPD, cardiac and diabetes mellitus. Initiatives included integrated home care, case management, integrated nursing home care, an accountable care model and multidisciplinary care.

One study reported in two papers[196,197] found that, although community care costs increased, there was a reduction overall following a multicomponent community intervention. Another study evaluating a model of care for older adults in the community[198,199] also found reduced costs (estimated annual savings in emergency attendance/bed-days/admissions of around US$2M at a cost of US$1M to deliver). In another study reported in two papers,[207,208] financial change associated with an accountable care model in primary care led to estimated savings of US$114 per patient, with savings being greater for the most-vulnerable patients. A care manager added to a primary care team was found to have reduced outpatient costs in another study (by US$594 per patient) in patients with depression, poorly controlled diabetes mellitus or coronary heart disease.[225,227] A multicomponent whole-population-based intervention for patients with chronic disease in Germany was reported to have led to a cost saving of 16.9% over 4 years.[219]

A multidisciplinary doctor/nurse practitioner and restructuring model in a hospital was estimated to save US$978 per acute patient.[212] A reconfigured hospital discharge programme for patients aged > 18 years was found to have reduced combined hospital utilisation and outpatient costs by a mean of US$412 per patient.[222] A patient-focused ICP in hospital for patients with hip fracture was reported to have reduced treatment costs (US$9685 per patient post intervention vs. US$15,984 per patient pre intervention).[229] An integrated home care unit in a hospital resulted in lower total health-care costs (US$140,000 in intervention patients vs. US$205,000 in control patients).[234] Savings were reported particularly in emergency care and hospital transport.

A non-comparator study from the USA[252] discussed the potential impact of a new payment system (as part of a patient-centred medical home approach). From data from two group practices in the pilot study, it was estimated that 23% of inpatient admissions would be potentially avoidable, leading to a saving of US$522,564 in averted medical costs.

Strength of evidence across studies

We adopted the four-item rating scale described in *Chapter 2*, *Risk of bias and strength of evidence across studies*, to evaluate the quantity and consistency of evidence for the service delivery outcomes and system-wide impacts reported in the included studies. The ratings were discussed at a whole-team meeting to establish consensus. We assigned individual ratings for the three groups of studies (UK studies, systematic reviews and international comparator studies) before providing an overall rating. We considered each of the groups separately as we were particularly interested in the similarities and differences between the UK evidence and studies from other countries.

The completed ratings are provided in *Table 3*. The outcomes reported by included studies are detailed in the first column, and each individual study is represented by either a plus symbol (+), meaning that the study reported an increase for this outcome, a plus/minus sign (±), meaning that the study reported no change for this outcome, or a minus sign (–), meaning that the study reported a reduction for this outcome. It is important to note that in order to maintain consistency across the data, we have reported increase versus reduction rather than positive versus negative outcomes. For some outcomes, an increase may be positive (e.g. increased patient satisfaction), while for others an increase may be negative (e.g. increased cost or increased length of wait), and for some outcomes it is uncertain whether an increase is positive or negative (e.g. increased access to services may be positive for patients but negative for cost of delivery).

An example of how to read the table is as follows. The first row indicates that two studies from the UK[44,87] reported the outcome ‘number of clinician contacts’: one reported an increase in the number of contacts and one reported a reduction in the number of contacts. Both studies are represented in green font indicating that they had a comparator group design. The evidence was therefore rated as being inconsistent. There were no systematic reviews that reported this outcome. Five non-UK studies of comparator design reported this outcome,[203,204,206,217,218] two found an increase[204,218] and three found a decrease;[203,206,217] therefore, the evidence is rated as being inconsistent. One international non-comparator study[249] reported a reduction; therefore, this evidence was rated as being very limited. Overall, the evidence was rated as being inconsistent.

TABLE 3 Strength-of-evidence ratings for the outcomes reported in the included studies

	UK literature		Systematic reviews		Non-UK comparator studies		Non-UK other studies		
Outcomes	Results	Strength-of-evidence rating	Results	Strength-of-evidence rating	Results	Strength-of-evidence rating	Results	Strength-of-evidence rating	Overall rating
Resource usage									
Number of clinician contacts	+ –	Inconsistent evidence			+ + – – –	Inconsistent evidence	–	Very limited evidence	Inconsistent evidence
Number of GP appointments	+ – –	Inconsistent evidence							Inconsistent UK-only evidence
Length of stay	+ ± ± ± ± ± – – – – – – – – – – – – – – –	Inconsistent evidence	– – – – – – ± ± ± ±	Inconsistent evidence	– – ± ±	Inconsistent evidence	+ – –	Inconsistent evidence	Inconsistent evidence indicating no difference or reduced; one weak UK-only study reporting increase
Number of unscheduled admissions	+ + + + ± ± ± ± – – – – – – –	Inconsistent evidence	± – –	Inconsistent evidence	–	Very limited evidence	–	Very limited evidence	Inconsistent evidence; UK-only evidence reporting increase
Numbers of admissions/ inpatients	+ + + + + ± ± – – – – – – – – –	Inconsistent evidence	– – – – ±	Stronger evidence	± ± ± ± ± ± – – – – – – – – –	Inconsistent evidence	– – ±	Inconsistent evidence	Inconsistent evidence; UK-only evidence of an increase
Readmission	+ + ± ± ±	Inconsistent evidence	– – ±	Inconsistent evidence	± ± ± ± ± ± ± ±	Stronger evidence			Inconsistent evidence; UK-only evidence of increase
A&E attendance	– – ±	Inconsistent evidence	– ±	Inconsistent	+ + ± ± ± ± ± ± ± ± – – – – –	Inconsistent evidence	–	Very limited evidence	Inconsistent evidence; less evidence of an increase

continued

TABLE 3 Strength-of-evidence ratings for the outcomes reported in the included studies (*continued*)

	UK literature		Systematic reviews		Non-UK comparator studies		Non-UK other studies		
Outcomes	Results	Strength-of-evidence rating	Results	Strength-of-evidence rating	Results	Strength-of-evidence rating	Results	Strength-of-evidence rating	Overall rating
Number of outpatient appointments	– – – – – –	Stronger evidence			±	Very limited evidence	±	Very limited evidence	Inconsistent evidence; UK stronger evidence of reduction
Prescribing rates	± –	Inconsistent evidence	–	Very limited evidence			–	Very limited evidence	Very limited
Access to other resources			+ (UK only)	Very limited evidence					Very limited UK-only evidence
Quality of care									
Perceived quality	+ + + +	Stronger evidence of perceived increase among staff	+ + + ±	Stronger evidence regarding perceived quality staff/patients	+ –	Inconsistent evidence			Stronger evidence of perceived improved quality
Quality standards					+ – ±	Inconsistent evidence			Inconsistent evidence
Patient satisfaction	+ + + + + + + + + ± – QQQQ (increased) QQQ (mixed)	Stronger evidence	+ + + + + + + + + + +	Stronger evidence	+ + + + ± ±	Inconsistent evidence			Stronger evidence of improved patient satisfaction
Patient preferences met	+ + +	Weaker evidence							UK-only weaker evidence of positive effect
Time in A&E	±	Very limited evidence	–	Very limited evidence	–	Very limited evidence			Very limited evidence
Number of incidents/complaints	– –	Very limited evidence							Very limited evidence

Outcomes	UK literature		Systematic reviews		Non-UK comparator studies		Non-UK other studies		Overall rating
	Results	Strength-of-evidence rating	Results	Strength-of-evidence rating	Results	Strength-of-evidence rating	Results	Strength-of-evidence rating	
Length of wait (contact, diagnosis, investigation and treatment)	– – – – – QQQQQ (reduced)	Stronger evidence	± –	Inconsistent	– ±	Inconsistent evidence	+ –	Inconsistent evidence	Inconsistent
Access to services	+ + + + + Q improved	Stronger evidence	+ +	Weaker evidence	+ + + + +	Stronger evidence of improved access	+ –	Very limited evidence	Stronger evidence of improved access
Unmet need identified	QQ (increased)	Very limited evidence	+	Very limited evidence	+	Very limited evidence			Very limited evidence
Staff working experience			+ + (UK only)	Weaker evidence	±	Very limited evidence	+	Very limited evidence	Inconsistent evidence
System impact									
Cost of provision	+ ± ± ± ± ± – – – – Q (no change) Q (reduced)	Inconsistent evidence	– – – – ± ± ± ± ± ±	Inconsistent evidence	+ + ± ± ± ± ± ± ± ± ± – – – – – – –	Inconsistent evidence	–	Very limited evidence	Inconsistent evidence
Community care activity	+ + – Q (increased)	Inconsistent evidence	– +	Inconsistent evidence	+ + ± – –	Inconsistent evidence	+	Very limited evidence	Inconsistent evidence
Secondary care activity	– QQ (reduced)	Very limited evidence	– – ± mixed	Inconsistent evidence	–	Very limited evidence	–	Very limited evidence	Inconsistent evidence
Health-care utilisation			± ± (unclear effect)						Inconsistent evidence

–, reduction; +, increase; ±, no change; Q, qualitative study.

Notes

Green font: UK study with comparator group.

Stronger evidence: generally consistent findings in multiple studies with a comparator group design three or more systematic reviews.

Weaker evidence: generally consistent findings in one study with a comparator group design and non-comparator studies, two systematic reviews or in multiple non-comparator studies.

Very limited evidence: single study available or perceptions of change only.

Inconsistent evidence: inconsistent findings in multiple studies (< 75% of studies report the same outcome.

The table depicts an extensive range of outcomes reported in the literature that are associated with new models of integrated care. The evidence was stronger for three outcomes: (1) that integrated care may lead to an increase in patient satisfaction, (2) that quality of care is perceived to improve and (3) that new models of integrated care may increase access. There was stronger UK evidence but inconsistent overall evidence regarding a positive effect on waiting times and outpatient appointments. We found weaker UK-only evidence that there was an increase in care meeting patient preferences.

Evidence regarding effect on the following outcomes was rated as inconsistent: number of clinician contacts; number of GP appointments; length of stay (little evidence of an increase); number of unscheduled admissions; number of admissions (the systematic reviews alone indicated stronger evidence of a reduction); number of elective admissions; readmissions (the international comparator studies alone indicated stronger evidence of no effect); attendance at A&E departments; quality-of-care standards; staff working experience (no evidence of a negative effect); cost of provision; community care activity; secondary care activity (no studies reported an increase); and overall health-care utilisation (systematic review studies only).

The rating of ‘very limited evidence’ (an insufficient number of studies) was given to the following outcomes: prescribing rates, access to other resources, time spent in A&E department, number of incidents/complaints, identification of unmet need and staff working experience.

We also identified strength-of-evidence ratings for the process change data and the influencing factors. (*Tables 4* and *5*). Regarding process changes, there were no elements in which we rated the evidence as stronger. We rated the evidence as being weaker regarding an increase in discharge planning, increase in timeliness/flow/co-ordination of care, increase in practitioner time, increase in knowledge sharing and reduction in variance in practice. We rated the evidence as inconsistent with regard to continuity of care, shared information, accuracy/completeness of recording of information, and organisational systems and processes. We rated the evidence as very limited with regard to patient relationship with health-care provider, patient understanding of treatment and duplication.

With regard to influencing factors, the evidence overall was consistent. The evidence was stronger regarding focus, patient engagement, professional identity, role boundaries, stability of workforce, power and hierarchies, training, staff engagement, local leaders/champions, effective leadership, resources, IT, clarity of vision, organisational culture, policy context, commissioning and governance. There was weaker evidence regarding previous relationships and budgets, and limited evidence regarding concerns with sharing of patient data, emotional response to change, employer and support for innovation.

We incorporated the strength-of-evidence findings into the logic model to develop a data visualisation portraying the elements of the pathway and associated level of evidence (*Figure 5*).

Applicability of the evidence

As part of the work, we aimed to develop an applicability framework, which would provide a structure for reporting the findings of the review with particular consideration of factors that may influence implementation and outcomes for new models of integrated care in different health service contexts. As outlined in *Chapter 2*, we extracted data regarding applicability from the included studies to populate the framework and then used this to scrutinise the data. *Box 1* outlines the seven main applicability questions, and the full framework containing all the items can be found in *Appendix 3*.

In the following sections, we summarise the data from the intervention studies regarding each element of the framework: population factors, organisation and systems factors, financial and commissioning factors, systems leadership, characteristics of health-care services, workforce features and characteristics of the initiatives.

TABLE 4 Strength-of-evidence ratings for process changes reported in the included studies

	UK literature		Systematic reviews		Non-UK comparator studies		Non-UK other studies		
Process change element	Results	Strength-of-evidence rating	Results	Strength-of-evidence rating	Results	Strength-of-evidence rating	Results	Strength-of-evidence rating	Overall rating
Service users									
Relationship with health-care provider	Q (mixed)	Very limited evidence							Very limited evidence
Patient understanding of treatment	Q (improved)	Very limited evidence					QQ (+)	Weaker evidence	Very limited evidence
Care provision									
Discharge planning	+ +	Weaker evidence of improved discharge planning	+	Very limited evidence					Weaker evidence of improved discharge planning
Timeliness/flow/ co-ordination of care	+ QQQQQQQQQ	Weaker evidence of improved flow	+ +		+ ±	Inconsistent	+ Q	Weaker evidence of improved flow	Weaker evidence of improved flow of care
Continuity of care	+	Very limited evidence	+ – – –	Inconsistent evidence	+ + +	Stronger evidence			Inconsistent evidence
Variance in practice	– – – Q (improved) QQ (issues)	Inconsistent evidence	– –	Weaker evidence					Weaker evidence of reduced variance
Duplication	QQ (reduced)	Very limited evidence	–	Very limited evidence					Very limited evidence
Practitioner time	+ Q (reduced) QQQQQQQQQ (increased)	Weaker evidence of increase	+	Very limited evidence			– – Q (increased)	Inconsistent	Weaker evidence of increase

continued

TABLE 4 Strength-of-evidence ratings for process changes reported in the included studies (*continued*)

	UK literature		Systematic reviews		Non-UK comparator studies		Non-UK other studies		
Process change element	**Results**	**Strength-of-evidence rating**	**Results**	**Strength-of-evidence rating**	**Results**	**Strength-of-evidence rating**	**Results**	**Strength-of-evidence rating**	**Overall rating**
Information									
Shared information	+ QQQ (increased) QQQQ (limited)	Inconsistent evidence	Difficult	Very limited evidence			± QQ (issues)		Inconsistent evidence
Accuracy/completeness of recording of information	+ + + Q (concerns)	Inconsistent evidence	+ + –	Inconsistent			+	Very limited evidence	Inconsistent evidence
Shared knowledge	QQQQ (increased)	Weaker evidence of increase	+	Very limited evidence				Q(+)	Weaker evidence of increase
Organisational systems and processes	QQQQQQ (challenges)	Weaker evidence of difficulties in achieving change	± ±	Weaker evidence of no change in funding processes	± ± + +		±	Very limited evidence of no change in systems	Inconsistent evidence regarding change in organisation

–, reduction; +, increase; ±, no change; Q, qualitative study.

Notes

Green font: UK study with comparator group.

Stronger evidence: generally consistent findings in multiple studies with a comparator group design three or more systematic reviews.

Weaker evidence: generally consistent findings in one study with a comparator group design and non-comparator studies, two systematic reviews or in multiple non-comparator studies.

Very limited evidence: single study available or perceptions of change only.

Inconsistent evidence: inconsistent findings in multiple studies (< 75% of studies report the same outcome).

TABLE 5 Strength-of-evidence rating for influencing factors reported in the included studies

	UK literature		Systematic reviews		Non-UK comparator studies		Non-UK other studies		
Outcomes	**Results**	**Strength-of-evidence rating**	**Results**	**Strength-of-evidence rating**	**Results**	**Strength-of-evidence rating**	**Results**	**Strength-of-evidence rating**	**Overall rating**
Patient related									
Focus	QQQQQQQ	Stronger evidence							Stronger UK-only evidence
Patient engagement	QQQQQQQQQQ	Stronger evidence	SR	Very limited evidence	+				Stronger evidence
Concerns with sharing of patient data	QQQ	Weaker evidence							Very limited evidence
Workforce related									
Emotional response to change	Q	Very limited evidence					+	Very limited evidence	Very limited evidence
Professional identity	QQQQQQQ	Stronger evidence							Stronger UK-only evidence
Role boundaries	QQQQQQQQQQ QQQQQQQ	Stronger evidence	SR	Very limited evidence					Stronger evidence
Stability of workforce	QQQQ	Stronger evidence			+				Stronger evidence
Employer	QQ	Very limited evidence							Very limited evidence
Power and hierarchies	QQQQQQQQQ QQQQ	Stronger evidence	SR	Very limited evidence					Stronger evidence

continued

TABLE 5 Strength-of-evidence rating for influencing factors reported in the included studies (*continued*)

	UK literature		Systematic reviews		Non-UK comparator studies		Non-UK other studies		
Outcomes	**Results**	**Strength-of-evidence rating**	**Results**	**Strength-of-evidence rating**	**Results**	**Strength-of-evidence rating**	**Results**	**Strength-of-evidence rating**	**Overall rating**
Prior co-operation	QQQQQ	Stronger evidence							Weaker evidence
Training	QQQQQQQQQQ	Stronger evidence	SR SR SR	Weaker evidence					Stronger evidence
Staff engagement	+ QQQQQQQQQ QQQQQ	Stronger evidence			+ + + +				Stronger evidence
Management and leadership									
Local leaders/ champions	QQQQQQQQQ	Stronger evidence							Stronger UK-only evidence
Effective leadership	QQQQQQQQQ QQQQQQ	Stronger evidence	SR SR SR SR SR	Stronger evidence					Stronger evidence
Support for innovation	QQQ	Weaker evidence							Very limited evidence
Organisation and system									
Resources	QQQQQQQQ QQQQ	Stronger evidence							Stronger UK-only evidence
IT	QQQQQQQQQ QQQQQ	Stronger evidence	SR SR SR	Weaker evidence					Stronger evidence
Clarity of vision	QQQQQQ	Stronger evidence	SR	Very limited evidence					Stronger evidence
Organisational culture	QQQQQQQQQ QQQ	Stronger evidence	SR SR SR SR SR SR	Stronger evidence			Q	Very limited evidence	Stronger evidence
Policy context	QQQQQQQ	Stronger evidence	SR	Very limited evidence					Stronger evidence
Audit/evaluation			SR SR SR	Weaker evidence					

	UK literature		Systematic reviews		Non-UK comparator studies		Non-UK other studies		
Outcomes	**Results**	**Strength-of-evidence rating**	**Results**	**Strength-of-evidence rating**	**Results**	**Strength-of-evidence rating**	**Results**	**Strength-of-evidence rating**	**Overall rating**
Finance and governance									
Commissioning	QQQQQQQ	Stronger evidence	SR SR	Weaker evidence					Stronger evidence
Governance	+ + QQQQQQ	Stronger evidence	SR SR SR	Weaker evidence					Stronger evidence
Budgets	+ QQQ	Weaker evidence	SR	Very limited evidence					Weaker evidence

–, not influential; +, influential; ±, unclear; Q, qualitative studies; SR, systematic review.

Notes

Stronger evidence: consistent findings in > three studies.

Weaker evidence: consistent findings in two/three qualitative studies.

Very limited evidence: single study available.

Inconsistent evidence: inconsistent findings in multiple studies (< 75% of studies report the same outcome).

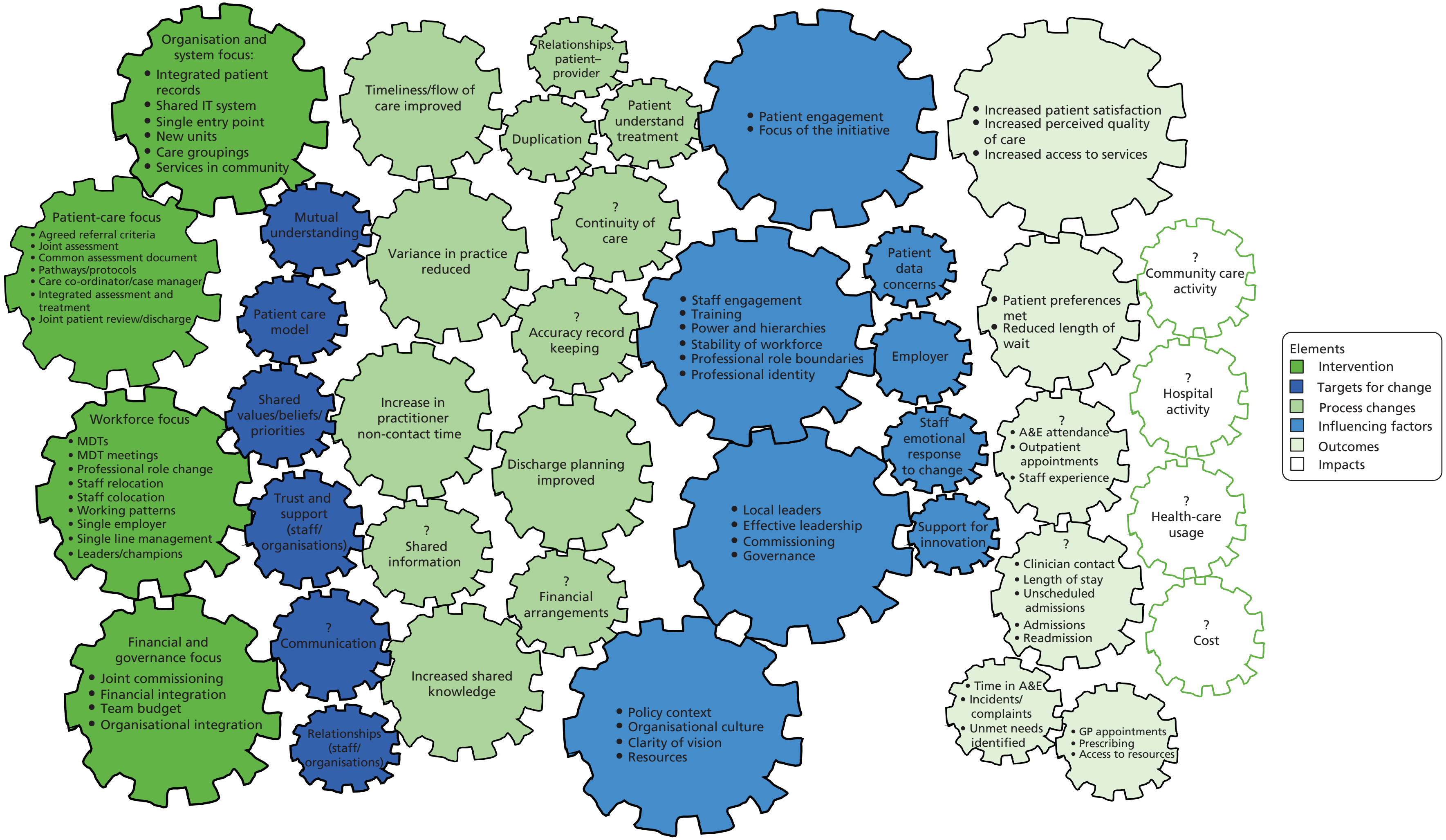

FIGURE 5 Data visualisation illustrating the strength of evidence for elements of the pathway. The larger 'cogs' indicate greater strength and the smaller 'cogs' indicate limited or no evidence. ?, uncertain evidence.

BOX 1 Applicability framework questions

What might the research evidence mean here?

Seven questions to examine the potential applicability and transferability of the evidence

1. How do the findings apply to different types of patients and populations?
2. What organisations and systems is the evidence applicable to?
3. What financial and commissioning processes might influence applicability?
4. What systems leadership elements might influence applicability?
5. What features of service(s) might influence applicability?
6. What features of the workforce might influence applicability?
7. What elements of the initiatives might influence applicability?

Patients and populations

The first area of applicability we examined related to differences in implementation and outcomes for different types of patients.

Patient types and conditions

We examined the studies for data regarding the effect of new models of integrated care on different conditions and patient types, to explore whether or not the evidence might be more applicable to some patient groups than others. One systematic review[170] reported that most studies examined involved the elderly (patient-centred medical home interventions); another[189] reported that studies tend to be in broad populations with frailty, chronic illness or high utilisation rather than with clinical conditions (case management interventions); and another[191] reported that many patients included in the studies had supportive rather than curative needs. *Figure 6* indicates the patient types and conditions (when it was possible to identify them) for the studies included in our review. The largest group was studies of older adults, with only small numbers of studies examining other groups.

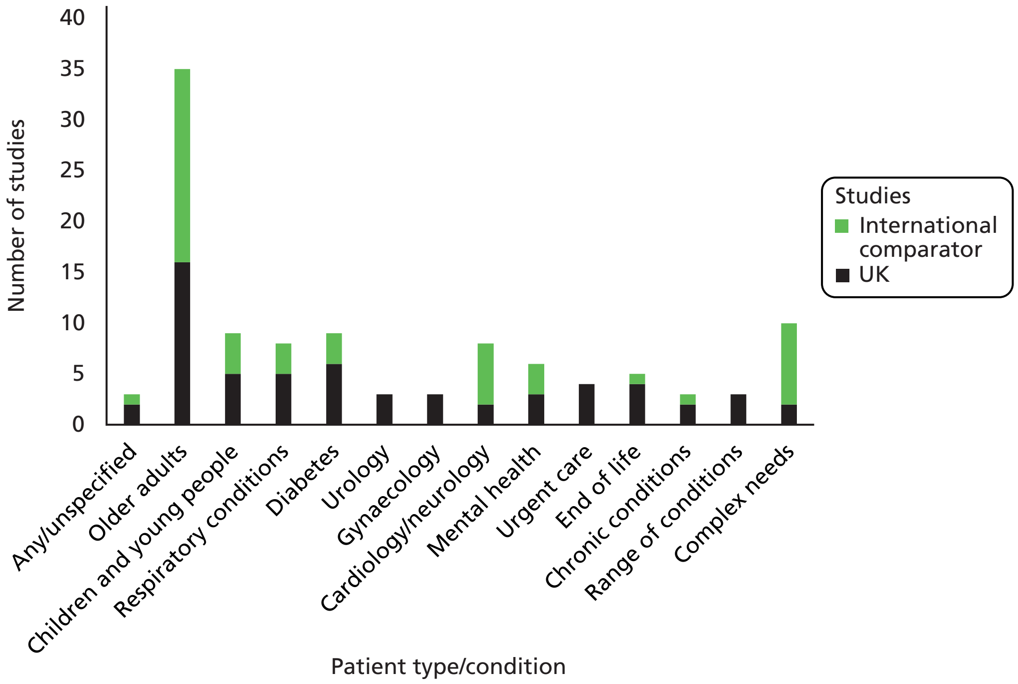

FIGURE 6 Included studies, categorised by patient type or condition.

There were only limited data regarding the comparison of outcomes for different patient groups. A review by Tieman *et al.*[191] concluded that patients with poorly controlled diabetes mellitus may be priorities for targeting. A mixed-methods UK evaluation of health and social care integration[147] found that it did not reduce length of stay for coronary heart disease patients, but there was a reduction for patients with diabetes mellitus and those with COPD. A UK before-and-after study[59] evaluating ICPs in a teaching hospital and a district hospital found that there were statistically significant reductions in length of stay for only about half of the conditions analysed, with highly significant reductions for varicose vein operations, transurethral prostatectomy and gynaecological abdominal surgery. A positive effect of ICPs on hospital length of stay for hip, but not knee, arthroplasty was found in another UK intervention study.[65]

Interdisciplinary primary care was found to be effective in reducing costs for heart patients only (2/14 studies) in a systematic review.[158] In contrast, a greater reduction in use of hospital services was found for COPD rather than heart failure in an international comparator study.[200] Relational co-ordination and integrated care delivery were significantly higher in integrated geriatric units than in other locations ($p < 0.001$) in another international comparator study.[254]

Several studies indicated that targeting interventions to particular populations may lead to positive outcomes. Authors of an international comparator study[205] reported that care co-ordination programmes can reduce the need for hospitalisation in targeted (chronic conditions) populations. Four of the 11 programmes reduced hospitalisations by 8–33% in high-risk groups (other programmes did not achieve this and one increased expenditure). Similarly, there was a reduction in hospital use in targeted high-risk groups only in a US study of a co-ordinated Medicare intervention.[205] Another study in an Accountable Care Organization in the USA[207] estimated that there were greater cost savings from interventions targeting vulnerable patients. An international comparator study[210] reported that in patients at high risk of hospitalisation, costs were reduced in the third year following implementation (but not earlier), suggesting that savings were made in the longer term.

A further international (non-comparator) study[252] described chronic illness as offering the greatest opportunity for benefit, in terms of cost reduction from improved service co-ordination via a medical home intervention. Dorr *et al.*[211] found that a subgroup of patients with diabetes mellitus and complex morbidities who received a care management intervention had significantly fewer hospitalisations than usual care patients. The authors highlighted that care for diabetes mellitus may have been affected differently by the intervention than care for the other chronically ill older patients. A study from Australia[195] described how changing recruitment criteria so that patients at risk of hospitalisation were included (alongside those with COPD, diabetes mellitus or cardiac conditions) changed a deficit (when compared with usual care) into a benefit in terms of saving on hospitalisation costs. The authors concluded that this indicated that appropriate targeting of interventions was important.

A review of care co-ordination[191] also suggested that interventions may need to be tailored to particular populations and diseases, and may only be required in more-complex conditions. It was suggested in another review[153] that care pathways may be better for more predictable conditions such as acute care, in which care trajectories are more predictable, but were not flexible enough for diverse needs. Tucker *et al.*[84] (a UK intervention study) concluded that ICPs led to integrated care to a greater extent for long-term conditions than for episodic care such as emergency services. In contrast to these recommendations for particular interventions for targeted groups, a study of integrated home care[217] concluded that the approach was suitable for all patient groups, settings and organisations.

We examined the data regarding outcomes and impacts for studies in the two largest subgroups of studies (older adults and populations described as having complex needs) compared with the outcomes and impacts for all studies (*Tables 6* and *7*). The most-commonly reported outcomes in this set of studies were costs, emergency admissions, other admissions, patient satisfaction, length of stay, access and service usage.

TABLE 6 Strength of evidence for studies of older adults compared with all studies

		Older adult studies		
Outcomes	Overall strength of evidence	UK results	International comparator results	Strength of evidence
Number of admissions	Inconsistent	– – – – – – ± ±	± ± ± ± – – –	Inconsistent
Number of emergency admissions	Inconsistent	+ – – ± ±	± –	Inconsistent
Length of stay	Inconsistent	– –	±	Inconsistent
Patient contacts/service usage	Inconsistent	– –	+ – – – – – ±	Inconsistent
Patient satisfaction	Stronger evidence of increase		– +	Inconsistent
Access	Stronger evidence of increase		+ +	Weaker evidence of increase
Costs	Inconsistent	± +	– ± +	Inconsistent

–, reduction; +, increase; ±, no change.

Notes

Green font: UK study with comparator group.

Stronger evidence: generally consistent findings in multiple studies with a comparator group design three or more systematic reviews.

Weaker evidence: generally consistent findings in one study with a comparator group design and non-comparator studies, two systematic reviews or in multiple non-comparator studies.

Very limited evidence: single study available or perceptions of change only.

Inconsistent evidence: inconsistent findings in multiple studies (> 75% of studies report the same outcome).

TABLE 7 Strength of evidence for studies of patients described as having complex needs compared with all studies

		Studies of patients with complex needs		
Outcomes	Overall strength of evidence	UK results	International comparator results	Strength of evidence
Number of admissions	Inconsistent		– – – –	Stronger evidence of reduction
Number of emergency admissions	Inconsistent	±	–	Inconsistent
Length of stay	Inconsistent	–	–	Weaker evidence of reduction
ED use	Inconsistent	–	– –	Stronger evidence of reduction
Patient satisfaction	Stronger evidence of increase	+	+	Weaker evidence of increase
Costs	Inconsistent	–	±	Inconsistent

–, reduction; +, increase; ±, no change.

Notes

Stronger evidence: generally consistent findings in multiple studies with a comparator group design three or more systematic reviews.

Weaker evidence: generally consistent findings in one study with a comparator group design and non-comparator studies, two systematic reviews or in multiple non-comparator studies.

Very limited evidence: single study available or perceptions of change only.

Inconsistent evidence: inconsistent findings in multiple studies (> 75% of studies report the same outcome).

As *Table 6* indicates, there were no clear signals regarding the effect of integrated care initiatives in older adult populations. There was weaker evidence of increased access (as with the strength of evidence across all studies), and only two studies[223,237] reported patient satisfaction, with opposing findings in contrast to the wider literature, indicating stronger evidence of increased satisfaction.

As *Table 7* indicates, the evidence for new models of integrated care for patients described as having 'complex needs' suggests stronger evidence for positive outcomes in terms of reduced numbers of admissions and ED use, and weaker evidence regarding reduced length of stay in contrast to the wider evidence base. It is important to note that the UK findings are from only two studies using non-comparator designs,[37,46] and the eight non-UK studies[195,199,211,214,216,221,236,237] were all identified as having potential sources of bias, including variable patient selection and contamination between groups,[195] self-selected groups,[199] differences in group characteristics,[211] high dropout rates,[214] incomplete data[216] and issues of participant selection.[221]

As numbers were small for the other population groups, we briefly describe the types of intervention used and the outcomes. There were nine studies evaluating interventions in children and young people.[35,44,66,68,75,200,214,226,238] The interventions were (1) ICPs, (2) MDTs, (3) case co-ordinator and (4) multielement. The studies evaluating pathways[35,44,68] reported (1) positive outcomes of improved communication, (2) staff-perceived improved quality and (3) improved patient satisfaction; however, increased staff contact; no difference in ED attendance or admissions; and variable outcomes regarding length of stay (reduced or no difference). The studies evaluating MDTs[66,75,226] reported reduced A&E usage, reduced length of stay, improved patient satisfaction and reduced waiting times, but no difference in staff-perceived quality of care. Multielement interventions[200,214] were reported to have reduced A&E attendance, number of admissions and length of stay and to have increased patient satisfaction. A case co-ordinator was found to have improved co-ordination between services.[238] Three of these studies[44,68,200] were in children with respiratory difficulties. There were four other studies[36,72,194,195] of patients with respiratory conditions (all COPD). For the group of studies of patients with respiratory conditions, the studies evaluating service redesign or multielement interventions[36,72,200] reported reduced length of stay and A&E use, and inconsistent findings regarding admissions and costs. The studies reporting introduction of care pathways[44,68] found perceived improved quality, but no difference in length of stay, use of A&E or admissions. A home-based case management intervention also reported improved perceived quality, but no effect on A&E use.[194] In other studies, ICPs did not have an effect on length of stay or admissions,[80,85] and case co-ordination had no significant effect on care or costs.[85]

We could identify few data regarding outcomes specific to patients with diabetes mellitus. A number of studies included this condition alongside other patient characteristics (such as older adults with or without diabetes mellitus) or patients with or without cardiac conditions or mental health problems. Studies evaluating service redesign for this patient group[51,77] indicated improved satisfaction and reduced numbers of admissions. There were a small number of studies of other identifiable clinical groups such as patients with heart failure or people with mental health difficulties. The available evidence related to a mix of interventions and outcomes, with no clearly identifiable trends.

Level of severity of conditions

Many of the studies of older adults described the patient group as 'frail elderly'. One of these studies[48] also described the patients as being 'high risk'. A study evaluating an intervention for patients with COPD[36] described many patients requiring home support. The interventions in palliative care settings were often in patients with advanced disease.[52,53,56,57,79,194,204,234]

Data regarding differential effects according to disease severity were provided by four studies (five papers).[42,195–197,222] A UK intervention study of integrated assessment[42] reported that for the frailest individuals, there was an indication that the intervention may increase costs. An international study[222] found that the intervention (a hospital discharge programme) was only effective in reducing admissions in those who were particularly at risk of hospitalisation. In contrast, another international comparator study[196,197] found that reduced cost was more likely in patients with severe chronic diseases, with several disabilities or who were living alone. The total duration of hospital stays reduced for patients with the highest number of functional disabilities.

Levels of deprivation

The literature included a number of studies that described their populations as living in areas of deprivation.[43,48,51,63,76,81,82,87,210] Outcomes for this group of studies varied, with some finding positive effects such as reduction in admissions or service usage,[63,87] whereas other found a lack of effect,[48,81,82] increased community services[51] or increased costs.[43,210] Three additional studies[38,80,195] provided data related to levels of deprivation. One study of the North West London Integrated Care Pilot[80] reported that emergency admission rates were higher among patients from deprived areas. An international study[195] reported that patients who were perceived by staff to have benefited most were those who lived in difficult circumstances. A UK study of a hospital ED redesign[38] examined the potential effect of adjusting for deprivation on admissions, but found that this made no difference to the data.

Socioeconomic diversity

There are few data regarding socioeconomic diversity in the included literature. A study from the UK[87] noted that there were few patients from black and minority ethnicity backgrounds in the interventions that were evaluated, and that those involved in the projects tended to be older or recently retired and well educated with generally good health. In contrast, another UK study[50] described the participants as socioeconomically diverse. One international study[196] highlighted that risk profiles of patients included in the study varied according to the society and health system in which the patients lived.

Rural populations compared with urban populations

The included UK literature encompassed studies carried out in urban areas,[38–40,50,52,67,72,73,78–80,82] rural or semi-rural areas[43,47] and varied areas.[202,203] One[43] of the only two studies carried out in a rural area notes that 'moves to consolidate acute services in larger urban units will require new care models for rural and sparsely populated areas'.

Population density

The authors of one study[50] described their intervention as being carried out in a compact high-density region (north-west London). Reports of initiatives in London were reported in a sizeable number of papers.[38–40,50,52,67,72,73,78–80] One of the systematic reviews[190] noted that having geographical coverage of a population in an area was a central element of successfully integrated health care; however, 'this may only be achieved in areas of more dense population and is not possible in rural or remote areas'.

Level of health needs

Only two studies (both UK)[43,54] described the level of health needs in their study populations. The first of these[43] reported taking place in a population that was relatively healthy and long-lived. The second study[54] reported that unplanned admission rates in the area were higher than the national average.

Prevalence of condition

Two studies[50,72] described a higher prevalence than the national average of disease in the population that was included. One reported a high prevalence of diabetes mellitus,[50] and the other reported a high prevalence of COPD.[72]

Other patient characteristics

One international study[198,199] reported that the length of stay following the intervention had increased for older patients but had reduced in younger patients. In contrast, another international comparator study[211] found that although higher hospitalisation rates were associated with higher age for the first year of the study, an evaluation of the second 2 years indicated that the difference was no longer significant. This study[211] reported that higher hospitalisation rates were associated with multiple morbidities.

Features of organisations

Size of organisations

The size of organisations involved in new model initiatives varied greatly; for example, interventions could develop at a day unit,[204] general practice[46,47] or hospital.[44] At the other extreme, initiatives spanned large organisations that were delivering a specific type of care, for example end-of-life care.[34] The size of populations served by organisations, when reported, also varied; for example, a general practice might deliver care for just over 10,000 patients,[46,47] whereas a hospital ED could deliver care to nearly 70,000 patients per year.[38] A study by Harris *et al.*[50] included a range of organisations with a sum patient population of 500,000.

Ways of reporting organisations and their size differ between included papers (with population size reported as total caseload, those with specific conditions, number of attendances, etc.), making applicability comparisons a challenge. However, it is clear that some interventions were small scale and local, whereas others were national or regional with associated funding.

Number and type of organisations

Initiatives were reported to involve from 1 to 59 organisations, with some studies not detailing specific numbers. Many included similar types of organisations working together, for example general practices[54,214] and primary care consortia.[198–200] Harris *et al.*[50] included a large number of different organisations in their study, encompassing primary care, mental health and community health trusts, local authorities and voluntary sector organisations. A broad range of services was provided in organisations, covering populations from children to the frail elderly, as well as some specific conditions and situations.

Historical relationships between organisations

Several studies reported historical relationships between organisations, for example by having links through being part of the same consortium,[198–200] units providing care within the same hospital[39,40,44] or previous referral links.[67] Clearly any previous or existing relationship would provide a basis on which to build collaborations, which could be an advantage.

Geographical proximity of organisations

Organisations in reported initiatives could share the same hospital[44] or be located within the same city,[54,78,194,218] county,[58,59] state[195,206,213] or country.[205] Geographical proximity could have an impact on co-ordination of care as well as structural differences across regions.

Baseline performance of the study organisations compared with the national average

The standard of performance that organisations start at prior to the new model being implemented can also have a bearing on effectiveness results. For example, in one included study,[221] four of the included nursing homes were rated as having a higher level of hospital and emergency care admissions than the national average. This could mean that effectiveness (i.e. measure of hospital admission outcomes) might appear greater following the intervention than in sites where baseline rates are not so high.

The policy environment at the time of the introduction of the initiative

Many initiatives were developed at times when local or national policies were calling for a reduction in health-care costs,[47] waiting times[309] and numbers of hospital admissions,[46,63] as well as improved patient access,[51] choice,[41] streamlined care delivery[50,72] and care that is local[195] and/or organised around the patient.[58,216]

Some policies were based on system ideals whereas others were in response to issues raised by patients/carer or health-care professionals; for example, increasing numbers of people want to die at home[34] and there is a lack of clinical support in nursing homes.[221] A number of initiatives were based on more-specific guidance around a particular condition such as incontinence[55] and pelvic surgery.[61]

Other changes being made concurrently

Although authors of some included papers described evolving interventions, few reported concurrent activity within the organisation(s) being studied. Two studies[66,196,197] included reports of funding change, one being budget cuts;[66] the other study (reported in two papers)[196,197] described an increase in the home care budget. A Spanish study[228] was carried out in the context of a new advanced practice nurse role being established in general practices across the south of the country. Another study reported that work had already begun in the direction of the intervention before it was evaluated.[235] Concurrent change could have an impact on intervention plans, processes or ultimate effects, particularly if the changes are not allowed for in intervention design.

Particular elements of infrastructure or services

One study evaluating a merger between two units in the same hospital[38,40] took place after the necessary extension on the building had been erected. Funding system change had been implemented prior to another initiative being started.[235] One study had a complex care team in place prior to evaluation.[46] There could be differences in rates of progress and costs between interventions that are starting up without any prior infrastructure or previous service delivery that aligns with the new model.

Particular admission routes

Some interventions involved changing existing referral/admission routes. For example, prior to the ICP being implemented, one study[55] reported that primary care referrals were made to a gynaecology department without work-up. Owing to inconsistencies in this process, the initiative changed this to a direct-access nurse-led assessment.[55] Two studies (reported in three papers)[39,40,67] included a change in admission and specialty assessment through the new service. Routes of admission and changes to them could then have an impact on hospital staff and infrastructure/financial planning, particularly if admission rates are likely to alter.

Financial and commissioning processes

Financial and commissioning (planning, monitoring and purchasing of health services) processes differ widely between health systems and between types of organisation (e.g. hospitals and primary care). The UK NHS provides services that are free at the point of use and paid for out of general taxation. Other health systems involve various combinations of insurance (private and not-for-profit) and out-of-pocket payments. Funding of health services is therefore a major factor to be considered in any assessment of the applicability of evidence across different contexts. Financial mechanisms may not transfer easily from one type of health system to another. For example, patient and health professional behaviour may be different in a taxpayer-funded system compared with one funded by insurance with or without co-payments.

Since the 1980s, the NHS has operated on the basis of a ‘purchaser–provider split’, with separate organisations being responsible for the commissioning of health care at different levels. Providers such as hospitals enter into contracts with the commissioners to deliver health services. The Health and Social Care Act 2012 replaced the previous system of commissioning by PCTs and strategic health authorities in England with a system of local Clinical Commissioning Groups (CCGs) supported by a national body (NHS England) with responsibility for specialist services. Responsibility for health is a devolved matter in the UK, which means that Scotland, Wales and Northern Ireland have some differences to the English system. A further complication when considering integration of health and social care is that social care in England is funded by local authorities and is means tested, unlike care provided by the NHS. The existence of separate budgets for health and social care represents a major barrier to efforts to improve integration between the two systems.

Sources of funding

We attempted to assess the source(s) of funding for the initiatives included in the review (UK studies and international comparative studies). This was not always clearly reported and, in particular, it was not always clear what the funding source was for the underlying initiative, as distinct from the funding for the research project evaluating that initiative.

Sources of funding may be classified as national, regional or local. In the UK, some initiatives were supported by the Department of Health and Social Care[42,46] or a NHS National Coordinating Centre.[47] In Scotland, an initiative to develop and implement ICPs in Lanarkshire was supported by the Scottish Executive and subsequently developed by NHS Lanarkshire.[59] As an example of a regional initiative, an ICP working across primary and secondary care was supported by a Trent NHS research and development grant.[58]

At the local level, several initiatives were supported by PCTs, either alone[67,77] or in combination with a provider (a NHS trust).[76] One initiative was supported at the level of the general practice, which funded a practice nurse, whereas funding for a social worker was provided by the practice, social services department and local health authority.[63]

A similar pattern of national, regional and local funding sources was seen in the non-UK comparative studies. In the USA, national organisations involved included the National Institutes of Health and foundations such as the Robert Wood Johnson Foundation and the Commonwealth Fund. Several initiatives were supported by multiple funding sources.[194,204]

Commissioning and budget arrangements

As noted in *Commissioning*, commissioning arrangements in the NHS in England changed during the period covered by this review. A few studies[91,103,223] mentioned the impact of commissioning and budget arrangements on the implementation of new initiatives. Julian *et al.*[58] commented that practice-based commissioning (a precursor to the subsequent system of commissioning by CCGs) and payment by results will change relationships between primary and secondary care. The success of one pilot initiative led the local PCT to incorporate it into its plans for the following year.[67] Other studies acknowledged support from PCTs[47] or CCGs.[66]

Commissioning and budget arrangements reported for non-UK initiatives were often based on fee-for-service[205] or per capita models or a combination of the two.[215,220] Battersby *et al.*[195] reported that funding changed from a fee-for service to an outcomes-based model, whereas another study[196,197] reported that per capita funding was planned but found to be too complex to deliver.

Availability and ring fencing of resources to support initiatives

The UK experienced an increase in spending on the NHS under the Labour Government, from 1997 through to the financial system crisis in 2008/9. This was reflected in some of the UK studies included in the review.[46,63,66] Two studies[77,82] refer to the availability of Local Enhanced Service (LES) and Directed Enhanced Service (DES) payments. However, two studies[35,51] reported that no additional funds were available to support their initiatives. Two studies[66,82] highlighted that the extra resources were not sufficient to cover implementation of the initiative. With regard to ‘ring fencing’ of resources, one UK study[63] stated that there was no formal ring fencing, but that it was expected that spending on health care for the older population would match their 10% share of the social services budget.

Three of the non-UK studies[196,213,235] reported that resources were increased around the time of the introduction of a new initiative. One paper did not provide any further details,[196] whereas the other two mentioned additional bonus payments[213] or fees.[235] One other study[209] noted that resources were not increased, but the authors suggested ways of sourcing extra funding. Incentives for participating in new initiatives are discussed in *Incentives*.

Incentives

In the UK, payments to general practices under schemes such as DES and LES encourage participation in the provision of new services. For example, Stokes *et al.*[82] noted the use of DES payments to support case management. By contrast, a clinical assessment service incorporated disincentives for GPs not using the initiative for > 90% of referrals.[67] Non-financial incentives may also be important, for example, GPs with a special interest in a particular area may be more likely to support new services in that area.

Non-UK studies reported incentives in the form of fees or bonus payments. In an Australian study of a change from a funding-based to an outcome-based model of service delivery,[195] incentives were provided to GPs but not to hospitals, which continued to be funded on a throughput basis. In two US studies, bonuses were paid based on quality of care[213] or meeting performance targets.[235]

Commissioning and finance arrangements are key to the introduction of new integrated care initiatives, but having the appropriate financial arrangements in place does not guarantee success. For example, in a study reported earlier,[213] practices were paid bonuses according to care quality, care co-ordination and call centre management. In practice, ≤ 10% of patient lists enrolled to the initiative, so bonus payments were relatively small.

Systems leadership

Dedicated project manager/managerial leadership roles

Some studies reported that individuals in managerial positions had assumed leadership roles in the initiatives,[46,47,195] whereas others reported that specialists,[70,72] a specialist nurse,[66] a nurse consultant,[221] a medical consultant[55] or a GP with a special interest in the service[67] had taken on leadership for a model.

Leadership in some studies was associated with involvement in the recognition for change and involvement in motivating others. In other cases, it was difficult to identify at which point different managerial roles came into place and, therefore, how much leadership was delegated from those who developed the intervention to those carrying it out.

Managerial or clinical leadership

When reported (see *Dedicated project manager/managerial leadership roles*), most managers and leads held a clinical role, and in some cases leadership was shared between a senior nurse and medical officer.[66,72] Graffy *et al.*[47] reported that a non-clinical manager led the project.

Project champions

Occasionally, a champion was mentioned in respect of driving the intervention forward. Kent and Chalmers[59] reviewed a number of local ICPs as part of their study and found that initiatives were championed by a particular individual. The role of champion could overlap with managerial and lead roles; for example, in one study[46] the GP lead was also described as the project champion. There could be more than one champion involved in multisite interventions; for example, in one study[53] each nursing home had its own champion, and authors reporting an intervention that included a number of general practices[213] anecdotally stated that champions were present within some of the practices.

Awareness of the initiative among patients

As intervention studies that include patient-specific data require informed consent, patients would have been made aware of the initiative through an invitation to participate and information provided as part of the consent process. However, it is not clear from the reported studies to what extent patients understood the reason for, or the process of, the initiatives that they were consented to, given the complexity of many interventions. As described shortly, some studies included patient surveys that may have raised patient awareness of the intervention.

Support for the initiative among patients

As well as consenting patients to interventions, a number of studies sought the views/satisfaction rating of patients (and sometimes carers) about the care they had received during the intervention evaluation. Reported satisfaction survey results were all 'positive' to 'high'.[51,58,59,66,67,78,237,238] One study,[195] however, reported that patient engagement in the intervention was affected by a range of barriers such as access, cost, understanding and motivation.

Types of services

We examined the included intervention studies to explore whether or not there were particular features of the services evaluated which might determine the applicability of the evidence to other health-care services.

The location of the initiative

Although there were large numbers of studies from both primary and acute care, the larger group was of initiatives implemented solely in primary care settings, with 21 of the UK intervention studies[35,37,42,45,47,48,51,53–55,58,63,66,67,72,75,76,79,81,86,87] and 14 non-UK studies[201,206,207,209,211,213–215,223,227,228,230,233,237] evaluating new models in this context. Fifteen UK intervention studies[39–41,44,49,59,61,62,64,65,68,70,71,78,85] were carried out solely in hospital settings, together with nine non-UK studies.[204,212,216,222,228,229,238–240] One UK intervention study[53] and one non-UK intervention study[231] were carried out solely in nursing homes. The other included studies examined initiatives across a range of contexts, or the setting was unclear. Collaborations typically developed between primary care/community/social services (horizontal integration)[34,42,52,71,194,196,197,204,209–211,214,221,223,224,230,237,241] or primary care/community/hospital specialists (vertical integration)[43,198–200,217,218,236] to address complex care needs. Such integration required co-ordination, usually by a named individual (a care co-ordinator or case manager). A common theme was the usefulness of colocation of staff, which allowed face-to-face communication initiatives across locations. Integration between different services clearly poses a challenge to achieving in-person contact.

Some initiatives were implemented in contexts described as a regional centre[68] or a specialist unit.[70,204] Authors did not make links between the context and the initiatives, apart from one study[233] that highlighted that usual care in trial centres may not be representative of normal practice.

We found little reference in the literature to particular elements of new models of care, making it difficult to transfer findings between contexts (although in-home interventions obviously could only be delivered in that setting). Elements such as ICPs, case management and MDTs were introduced in a variety of contexts, including emergency care, other acute services, primary care and social care, with no reports of a specific context having a positive or adverse effect, apart from issues regarding training and retention of staff in social care[53] and the benefits of physical colocation of services.[46]

We explored whether or not there were any particular trends in the data in terms of outcomes for initiatives delivered in particular settings, and found variable findings for each context. For example, in relation to the new models implemented only in a hospital setting, three studies reported in five papers[38–41,71] evaluated whole-service reconfigurations and found reduced numbers of admissions and reduced length of stay. Nine studies[44,59,61,64,65,68,70,85,229] evaluated ICPs with varying outcomes, including reduction or no difference in length of stay, and no difference in admissions or costs. MDTs were reported to have varying impacts on costs and reduced time to readmission.[212,239,240] Care co-ordination initiatives were reported to reduce length of stay but also to have varying impacts on costs, admissions and ED visits.[216,222,228,238]

As a second example, nine non-UK intervention studies (11 papers)[194,201–203,205,210,214,234,237,242,306] examined initiatives that were delivered to patients in their own home. There were no clear signals regarding effectiveness. With regard to A&E usage, the evidence was inconsistent: two studies found a reduction in A&E use[210,237] and one found no difference in A&E use.[194] Two studies reported a reduction in overall hospital use [242,306] and two reported a reduction in overall costs.[234,242] One study reported no effect on admissions.[210] Two studies reported increased patient satisfaction.[214,237] One included UK paper also reports a home-centred initiative (for patients at the end of life).[34] The study found no significant effect on costs or health-care usage.

We looked for any patterns regarding delivery of particular interventions in particular settings. ICPs were developed with the aim of optimising sequential clinical decision-making for a particular condition. Ideally, an ICP is developed and used by a range of clinicians representing the various stages of the pathway. However, included studies show a tendency for ICPs to be tested and reported by representatives from one location (usually either acute services or primary care) with reference to other pathway services. For example, an ICP may be developed in primary care in order to optimise referral decisions,[55,58] whereas, in hospital settings, an ICP would assist in treatment decision-making.[59,61,62,64,229] ICPs could span health-care service boundaries[35] or focus on one setting; for example, in EDs,[44,70] preoperative and postoperative care[65] or end-of-life care in nursing homes.[53] All studies evaluating ICPs (except for one[229]) were published in the UK.

Multidisciplinary teams were reported to draw on a pool of clinicians who could provide the range of expertise required to address complex conditions. The teams practised across a range of locations, for example, at home,[36,47,234,237] in nursing homes,[46] in community clinics,[66] in social services centres,[75] in primary care,[82,201–203] in hospitals[212,240] or in a range of settings.[239] There were no data specifically linking outcomes to location.

Alignment with other initiatives

We searched the included documents for information regarding whether or not other initiatives had already been introduced in the setting being researched, and, if so, whether or not there was alignment between initiatives. We identified few data regarding this in the studies. Offredy *et al.*[67] describe a pilot having been introduced in the 3 months prior to the main service reconfiguration. Another study[46] describes the introduction of the in-home service model being during a period of significant other developments. Two international papers[195,235] mentioned recent changes to funding prior to the initiative.

Standard of existing care

The context in terms of standards of the existing service was reported by a limited number of studies, with some reporting that the new model of care was introduced in services that had particularly high existing standards,[52,227] or were of variable quality and in need of improvement.[55,71,110,128] Initiatives were reported to have been inspired by lack of choice,[34] prolonged waiting times,[55,67] inconsistent referrals[195] and suboptimal care[221] for patients. On the other hand, a UK nursing-home-based initiative showed that study results were positively associated with previous rankings of good care standards.[53]

Authors of a systematic review[153] concluded that care pathways may be less effective when good practice is already being followed and there are existing MDTs, and it may be better to introduce them where there are deficiencies in services. This view was echoed by another review,[189] which suggested that case management might be most effective in settings that need changing, such as poorer-quality community services. The success of an ICP in palliative care was described as depending on aspects of the care structure that were already in place in one UK qualitative study.[125]

Features of the workforce

We examined characteristics of the staff who were involved in implementing the new models of integrated care, in order to explore whether or not there were elements that may influence applicability in other service locations with differing workforces.

Levels of motivation and support

The level of motivation and support for the initiative was not explicitly reported within included papers; rather it was implied, for example, by statements that staff had developed the initiative themselves[70,229] or had been previously concerned about care quality,[221] or that the initiative was being championed[46,53] or had been adopted early by some GPs, a group of whom were committed to the intervention.[237] In some cases, levels of support for the initiative differed between roles. For example, in an initiative that employed mental health nurses in an ED,[78] it was reported that the ED staff were supportive but the mental health nurses were less supportive. In three studies,[55,195,235] it was reported that GPs or specialists were difficult to engage or needed reminders to comply with the protocol. The qualitative literature provided further evidence of lack of engagement, in particular among GPs, and levels of engagement formed one of the factors identified in the logic model, with stronger evidence of its influence.

Employment conditions

Changes in employment conditions for the staff involved in the research were implied by initiatives that were funded differently, creating altered incentives.[235] There were reports of a move from one department to another,[40] changed or extended roles and responsibilities[46,195,216,227] or changed staff rotas.[41] Such details were generally reported only briefly, although it is clear that implementing new models of care will usually entail a degree of change in this area. One UK study[63] detailed that staff had specifically been employed for the project.

Working location

The colocation of staff was a reported element of integrated care, with the aim of bringing together staff from a range of services in order to case manage or co-ordinate care in one place.[40,41,46,196,197] Close communication between non-colocated providers was also mentioned.[236] For each study/intervention, interpretation of the concept of colocation might differ among the settings and aims of the intervention. For example, Boyle *et al.*[40] reported the closure of a medical admissions unit, colocating the staff with those in the ED. The aim of colocation in this intervention was shared responsibility for workload in the ED, whereas colocating social workers, district nurses, GPs and administrators in primary-care-based case management interventions was used to ensure effective communication.[46,196,197]

Specialist staff

There was frequent mention of specialised staff having an important role in initiatives, with the requirement for these staff to be available and to receive additional training when required. Reconfiguration involving additional specialism is also reliant of staff being willing to take on new roles. A UK study examining role change[137] highlighted that the intervention relied on the willingness of GPs and practices to take an interest in cardiology. In cases in which initiatives were condition- or population-specific, specialists in these conditions (e.g. respiratory, dermatology, diabetes mellitus, end-of-life care, geriatric medicine and mental health) were reported to be members of MDTs.[34,36,46,53,77,78,199,236,237,241] Advanced practitioners and clinicians with a special interest (nurses and GPs) were also involved.[46,54,58,63,66,67,221] In addition, descriptions of new models of care include new roles that facilitate integration and co-ordination, such as case managers,[216,218,236] care co-ordinator,[205] family support specialists,[214] discharge community link nurse[34] and home care team.[217,234] New models that were based around particular conditions were therefore more likely to include specialists in those conditions, and integrating care was likely to require new roles to co-ordinate care from different sectors. For example, a study evaluating a specialist home care unit in Sweden[234] highlighted that a range of specialist staff was required in order to operate the new model of care.

Professions involved

The types of profession involved in the included studies varied widely across models, although there was a tendency to bring together professionals from the community, social care, general practice and secondary care in a range of configurations to best improve integration of assessment, treatment, discharge (when applicable) and home/nursing home care. These professionals included consultants, physicians and GPs, district nurses, nurses, nurse assistants, pharmacists, physiotherapists, occupational therapists, dieticians, social workers and practice managers. Some articles did not provide specific details of the professions involved, but used more-generic terms such as 'team of experts'.[240] A comparator study from the USA[212] emphasised that costs of providing new models of integrated care could differ according to the personnel profile, potentially influencing the cost-effectiveness of interventions.

Size of staff group

The size of teams associated with new models was often difficult to ascertain because of limitations in reporting. However, when information was available, teams ranged in size depending on the aims of the model and the setting. Models that aimed to integrate a higher number of professional groups or settings included larger groups. Some models involved linking with other services rather than working with them. There was no indication in the literature regarding optimal numbers of staff required to deliver new models of care; however, one UK evaluation of an ICP reported that a large MDT was required to deliver the service.[65]

Staff training

The need for staff training to enable them to deliver new models of integrated care was emphasised by nine UK studies[34,35,44,46,51,53,54,64,72] and 10 non-UK studies.[194–197,202,203,214,216,221,227] The training and induction outlined was mainly for and/or by nurses and related to new roles or model protocols. Not all included papers reported details of training, although this does not mean that it was not a part of the intervention. One study[53] described the challenge of providing training to nursing home staff because of high levels of staff turnover. Systematic reviews[161,181,183] echoed the importance of providing joint training in how to work effectively together. One[162] emphasised that well-integrated teams tended to have ongoing support or training, rather than training at periodic intervals.

Although reported workforce factors may have played a part in effectiveness of interventions, it is difficult to pinpoint a particular approach that leads to improved outcomes. This is because each effect is embedded within a broader framework of change, elements of which might also have an effect.

Features of the initiatives

We scrutinised the initiatives that were evaluated in the included literature to explore whether or not there were particular features that might influence applicability in terms of implementation and outcomes.

Complexity of initiatives

As outlined in *Elements of the interventions*, the included literature encompassed both single-element initiatives, such as the introduction of an integrated pathway, and multielement whole-service transformations. We examined the data to explore whether or not there may be any difference in applicability of the findings for 'simple' versus 'complex' interventions. *Table 8* summarises the strength of evidence for 'simple' (single-component) and 'complex' (multicomponent) initiatives based on UK studies and non-UK comparative intervention studies.

TABLE 8 Strength of evidence for 'simple' and 'complex' initiatives compared with all studies

Outcome	Overall strength of evidence	UK studies results		International comparator studies results		Strength of evidence by intervention type	
		Simple	Complex	Simple	Complex	Simple	Complex
Number of admissions	Inconsistent	± ± – –	– – +	±	± ± ± ± ± + – – –	Inconsistent	Inconsistent
Number of emergency admissions	Inconsistent	– ± ±	+ + ± ± – – – – –		–	Inconsistent	Inconsistent
Length of stay	Inconsistent	± ± – – –	– – – – – – ± –		± ± – –	Inconsistent	Inconsistent
Patient contacts	Inconsistent	+	+ – – – – ± ±		± ± ± – –	Very limited	Inconsistent
Patient satisfaction	Stronger evidence of increase	+ +	+ + + + + + ±	+	+ + ± ± ± ±	Weaker evidence of increase	Inconsistent
Access to services	Weaker evidence of increase	+	+ +		+ + – ±	Very limited	Inconsistent
Costs	Inconsistent	–	– – – – – + ±	±	± ± ± ± ± ± + + + – – – –	Very limited	Inconsistent

–, reduction; +, increase; ±, no change.

Notes

'Simple' refers to single-component initiatives in the included studies.
'Complex' refers to multicomponent initiatives in the included studies.

The evidence for both types of initiative was generally inconsistent and the strength of evidence was similar to that for the whole group of included studies. Differences were mainly caused by lower strength-of-evidence ratings for the 'simple' initiatives, reflecting the small number of studies in this group.

Full integration compared with partial integration

Full integration refers to the creation of a new organisational model, whereas partial integration is the co-ordination or integration of different sectors or organisations via less formal non-binding links. The majority of UK and international studies evaluated some form of partial integration. There are few examples of initiatives involving full integration in the UK apart from the extensively evaluated project in north-west London.[50,73,79,80] Other settings included Greater Manchester[72] and the Isle of Wight.[75] The limited number of studies of full integration and the diverse outcomes reported in them means that it is not feasible to explore any potential difference in applicability of the evidence between full and partial integration initiatives.

Breadth of reach

Another fundamental characteristic of initiatives is whether or not they are aimed at a broad population or aim to integrate services for a specific, possibly small, patient group. Although some of the initiatives included in this review clearly fell into one group or the other, many were difficult to categorise in this way. In general, ICPs tended to be aimed at managing specific patient groups whose numbers may be either large or small. For example, a pathway developed at a specialist centre for children with pleural empyema was used for just 13 and 18 patients, respectively, in 2 years of evaluation.[68] By contrast, Johnstone *et al.*[56,57] developed and evaluated a pathway to improve quality of end-of-life care across the whole of Wales.

Longevity of the initiative

Evaluations of initiatives may produce different findings depending on the stage at which the evaluation takes place and the length of the evaluation. New initiatives are likely to need time to overcome any initial operating problems, whereas an evaluation that is too short may be unable to detect any beneficial effects that exist.[195] Reports were often unclear in reporting how long the initiative had been operating at the start of the study, and if and how programmes were evolving from earlier changes.

Other specific requirements of initiatives

We looked for comments in study reports that identified other features or conditions required for initiatives to operate effectively. When these were mentioned, they were often very general; for example, 'ability to cross health sector boundaries and use behaviour change skills'[195] and 'ability to target high risk patients';[205] a receptive/supportive context;[49,53] presence of local 'champions';[59,70] and the need for 'pump-priming' and, if necessary, the decommissioning of existing services to allow the development of new ones.[87]

Chapter 4 Discussion

Summary of evidence

Our systematic review of new models of integrated care identified 267 documents that met our inclusion criteria, and these were examined and synthesised. The literature included studies from the UK, other European countries and North America, and encompassed empirical work with a range of designs including quantitative evaluations of interventions/initiatives, and qualitative data related to staff or patient perceptions of change and barriers/enablers influencing outcomes.

We identified multiple elements that constituted new models of integrated care, which we grouped into four categories: (1) those relating directly to patient care, (2) those with a focus on intervening at an organisational or system level, (3) those with a focus on changing the way that staff are employed or work together and (4) those that have a focus on reconfiguring financial, commissioning or governance aspects of health service provision. Within this typology, a wide range of different types of interventions were included: joint assessment, ICPs, agreed referral criteria, care/case co-ordination, joint review/discharge, integrated IT systems and patient record sharing, new services, new care groupings or units, transferring services from hospitals to the community, MDTs and team meetings, relocating staff, changing employment conditions, joint commissioning, financial integration, and organisational integration. Identifying exactly which changes to delivery had been made as part of a new model of integrated care could be challenging, as many studies examined multicomponent, highly complex initiatives that were only described briefly by authors. Few studies identified cause–effect or associational linkages between the individual elements of new models of care and the service outcomes and system impacts.

Diverse anticipated targets for change were described: changing the model of care to one that was more holistic and/or patient-centred; changing the organisational culture; developing shared values, beliefs and priorities among staff and organisations; changing relationships between staff; changing relationships between organisations; developing trust; developing mutual understanding; and, finally, improving communication between staff. Although these areas were commonly described as targets/aims, few quantitative evaluations measured any change in these target areas. Qualitative data similarly provided evidence of the perceived importance of these changes for improved working practice and service delivery, but limited and mixed evidence regarding whether or not interventions had led to improvements in these areas.

The elements of new models of integrated care offered the potential to effect change at multiple levels: at a process level (changing the way services were delivered); at a service outcomes level (changing resource usage, quality of care, or staff satisfaction); or at a system impact level (changing use of hospital-based services, use of primary care and community services, overall use of health-care services and cost of delivering health care). We therefore adopted a systems approach, using a logic model to analyse the data related to these elements of the pathway, from the interventions reported to process changes, service outcomes and system-wide impacts.

We grouped the process changes described in the literature into the categories of service user change, change in care provision, change in information and organisational change. We examined data from the UK and international intervention studies for evidence of effect on processes, and examined the qualitative literature for data related to perceptions of change. We also examined the literature for reports of relationships or associations between particular intervention elements and specific outcomes.

There was surprisingly little UK or international evidence regarding the effect of integrated care initiatives on service user involvement or relationships. The very limited evidence available provided inconsistent findings regarding whether or not service users perceived any change or had greater knowledge of, or involvement in, services.

With regard to our second grouping, change in care provision, there was weaker evidence that discharge planning may be improved (possibly associated with elements of case conferences and/or joint/streamlined assessment), and there was also weaker evidence that there may be an improvement in the timeliness/flow of care provided (possibly associated with elements of ICPs and/or joint/streamlined assessment). There was also weaker evidence regarding interventions leading to reduced variance in practice (possibly associated with ICPs), and a negative impact in terms of adding to practitioner time burden. There was inconsistent evidence regarding the effect of initiatives on continuity of care.

There was inconsistent evidence regarding any effect on information sharing between staff/services and with regard to the accuracy/completeness of record keeping. There was some weaker indication of increased knowledge sharing between staff. The evidence regarding change in organisational processes as a result of new models of integrated care was also inconsistent, with reporting of considerable challenges achieving system change beyond improvement in relationships.

We identified numerous diverse factors that were reported to influence the implementation and outcomes of new models of integrated care. The factors were grouped into (1) those that were patient related, (2) those that were workforce related, (3) those that were management and leadership related and (4) those that were organisation and system related. The factors that appeared to have stronger potential influence were the perceived focus of the initiative (patient focused versus organisational or financially motivated), the level of patient engagement, staff professional identity, staff professional role boundaries, power and hierarchies within staff groups, stability of the workforce, the provision of training to staff, levels of engagement among staff (particularly GPs), having local leaders/champions and effective leadership; resources available, the compatibility of IT systems, the clarity of the vision for change, the prevailing organisational culture, the policy context in which the initiative was sited, and commissioning and governance policies and procedures.

We identified diverse outcomes for new models of integrated care reported in the included literature. We categorised these outcomes into those related to use of resources, those related to quality of care, and outcomes for staff working experience. We identified three outcomes in which there appeared to be stronger evidence of effect: first, that new models of integrated care may lead to increased patient satisfaction; second, that new models are perceived by staff to increase the quality of care; and, third, that new models of care may increase patient access to services. There was stronger evidence of effect from the UK only that patient waiting times and outpatient appointments may be reduced (although the evidence as a whole was inconsistent), and that patient wishes at the end of life are met. The evidence was inconsistent with regard to the effect on the number of clinician contacts, the number of GP appointments, length of stay in hospital, unscheduled admissions, scheduled admissions, readmissions, attendance at an A&E department and staff working experience. There was very limited evidence available regarding prescribing, access to resources across services, time spent in A&E departments, numbers of incidents or complaints or the identification of unmet need.

The evidence was inconsistent regarding system-wide impacts on hospital services, primary care and community services, overall health-care usage and cost of health-care provision. As we had identified the potential for limited effect on outcomes of single-element ICPs or MDT interventions, we removed these from the strength-of-evidence tables, but found that this did not change the grading assigned to any of the outcomes.

What can be learned from the international literature regarding the key elements of implementation and the potential impacts of new models of care?

The review confirms the high level of complexity that is inherent in implementing and evaluating new models of integrated care. A systems perspective is needed to best understand the elements of implementation and how these individual elements may lead to outcomes and impacts. The review identified numerous factors that may influence implementation and outcomes. In *Table 9*, we set out how and where these need to be considered during the design and implementation of new models of integrated care. Two influencing factors we identified (external policy context and capacity/resources available) present particular potential threats to implementation and outcomes outside the control of the initiatives.

TABLE 9 Key influencing factors that may be encountered during implementation

Stage	Areas of influence identified in the literature	Specific barriers/enablers
Planning	Engagement with patients	• Patient level of understanding of the meaning of integration • Clarity of articulation of the vision
	Staff engagement	• Clarity of articulation of the vision • Level of involvement in changes (particularly among GPs) and opportunities for engagement
	Shared understanding/ vision between organisations	• Clarity of articulation of aims and outcomes • Discussion and agreement of financial processes early in the process • Levels of agreement regarding risk and governance • Engagement from top levels of organisations • Fit between the initiative and organisational priorities
	Concerns regarding patient information confidentiality	• Clarity of data sharing processes and agreements • Understanding of data sharing by all parties
	Adequacy of systems for sharing information	• Compatibility of systems • Mechanisms for information sharing
	Equitability of incentives across organisations/ services	• Identification of potential disincentives to change
	Patient groups to target	• Identification of process and service outcomes that require particular change • Development of a clear rationale/vision of the intended effect
	Elements of interventions to introduce	• Development of a clear rationale regarding which elements to include in a model, and what change will be achieved
Implementation	Staff response to change	• Provision of support and training for staff with regard to readiness for change and new ways of working • Effectiveness of leadership from management and champions (in the early phases)
	Professional identity	• Provision of support and joint training that addresses building of mutual trust • Focus of change on potential benefits for patients and positive aspects of development of a new team identity
	Professional role boundaries	• Recognition of the need for changes in roles and boundaries, and challenges to this • Engagement with staff and joint training including changes in roles • Effectiveness of leadership and management to facilitate change
	Stability of workforce	• Close involvement and support from human resources personnel • Recognition and planning for potential threats to stability
	Effective leadership	• Dedicated time for the project is available for managers • Provision of training for change management to managerial staff • Level of commitment from senior managers and at the top levels of the organisation

continued

TABLE 9 Key influencing factors that may be encountered during implementation (*continued*)

Stage	Areas of influence identified in the literature	Specific barriers/enablers
Sustainability	Promotion of initiatives and achievements	• Publicity and recognition of positive change and achievements
	Ongoing audit and feedback	• Provision of feedback loops for performance evaluation that are widely accessible
	Maintaining working practice change	• Provision of ongoing joint training throughout the implementation and beyond
	Maintaining staff engagement	• Provision of regular feedback to staff regarding progress and outcomes • Provision of ongoing opportunities for engagement with staff
	Maintaining patient engagement	• Provision of regular feedback to patients regarding progress and outcomes • Provision of ongoing opportunities for engagement
Evaluation	Evaluation of change in interpersonal/cultural elements	• Inclusion of outcomes related to organisational culture, views/beliefs, relationships, teamworking and communication as indicators of changed processes of care delivery
	Evaluation of process changes alongside service outcomes	• Evaluation of outcomes at a process level including information sharing, speed of delivery and organisational processes
	Evaluation of patient-related outcomes	• Inclusion of evaluation beyond patient satisfaction, such as patient involvement, knowledge of treatment and relationships with providers

As previously outlined, the international literature indicates that evidence is inconsistent with regard to impacts from new models of integrated care. There is no clear evidence regarding whether new models of integrated care are cost neutral, increase costs or reduce costs. The impact on community and hospital-based services was also unclear, although there was no evidence to suggest that new models of care increase use of secondary care.

What are the reported mechanisms of change and the outcomes and impacts associated with new models of care?

We used the data from included studies to develop an evidence-based logic model, which sets out the elements of the pathway from interventions to impacts. The logic model highlights the key role of interpersonal/relational factors in the change pathway, with these aspects being commonly described, but little evaluated, in the literature. The areas of care model, organisational culture, beliefs/values/priorities, relationships between staff and organisations, mutual understanding and communication are important mechanisms of change that may be central to new models of integrated care, and they represent an overall cultural change in health-care delivery.

The review has identified numerous different elements that are subsumed within the label of new models of integrated care, and often form multiple and interlinked initiatives within complex interventions. Included studies highlighted the challenges in identifying cause–effect relationships between new models of integrated care and service delivery impacts.[154,165,198–200] We scrutinised the UK and international interventions literature for evidence of reported associations or cause–effect relationships for specific elements of the model, with the aim of indicating relationships on the pathway model. Although effects of initiatives on service outcomes were widely reported, few studies described which elements of the initiatives may be ‘key ingredients’ that effected change, or they attempted to attribute associational outcomes to different types of integrated care. The intervention elements with more clearly reported associations tended to be ICPs and MDTs (predominantly reported in the UK literature), and case management interventions (predominantly reported in the international literature). Overall, there were very limited data regarding which elements of new models of care lead to which outcomes, and we consider the reported associations outlined in *Table 10* to be hypothetical. The studies reporting each association are referenced. Many associations were only made by authors of a single included study.

The associations described in the literature seem to suggest that the elements of new models of integrated care may act in different ways to create change; for example, ICPs may be particularly effective in reducing variance in practice, improving documentation and improving decision-making, and thus reducing waiting

TABLE 10 Proposed associations reported in the included literature

Element of integrated care		Associated with		
Improved staff relationships	→	Increased patient satisfaction[8]		
Increased staff trust	→	New integrated identity[90]		
Increased staff shared understanding	→	Increased speed of delivery[121]		
Integration	→	Improved communication[181,183,184,191,193]		
Improved communication	→	Improved team performance	→	Enhanced care[161,171,179]
Higher levels of GP engagement in initiative	→	Greater effect on outcomes (cost)[77]		
ICP	→	Reduced variance in practice[56,59,109,184]		
ICP	→	Increased patient involvement[279]		
ICP	→	Increased patient understanding of treatment[59]		
ICP	→	Increased communication[35,65]		
ICP	→	Increased speed of delivery/flow[55,85]		
ICP	→	Improved decision-making[70]		
ICP	→	Improved documentation[56,68]		
ICP	→	Increased continuity of care[64]		
ICP	→	Improved patient understanding of care[59]		
ICP	→	Reduced waiting time for assessment[55,85]		
MDT	→	Increased communication[73]		
MDT	→	Restructured care	→	Reduced costs[212]
Multidisciplinary meetings	→	Improved relationships/ communication[60,61]		
Case conferences	→	Improved discharge planning[191]		
Integrated community team	→	Improved patient knowledge and engagement[273]		
Joint/streamlined assessment	→	Increased accuracy of assessment	→	Reduced admission[42]
Joint/streamlined assessment	→	Increased efficiency	→	Increased quality of care;[38] earlier discharge[63]
Case management	→	Continuity of patient contact/care	→	Reduced hospital use[199,204,205,238]
Case manager	→	Familiarity with local services[230]		
Case manager	→	Shift from unplanned to planned hospital admissions[236]		

times by improving the flow and/or speed of service delivery. ICPs may improve patient understanding of treatment, MDT meetings may be the most effective element for improving relationships and communication, and case management initiatives may particularly act on the outcome of increased continuity of care. However, there is currently little empirical evidence regarding any potential associations between elements, which represents a gap in the literature that is hindering the identification of key ingredients of change in new models of integrated care.

How applicable are the findings from the international literature to different local populations and contexts, and how might mechanisms of change operate differently in different local services?

In our consideration of data regarding applicability, we highlighted the potential for interventions to work in varying ways in different local populations. The data suggest differential effectiveness for new models within different population subgroups, with several studies suggesting the need to target new models on particular groups. Unfortunately, the evidence is unclear regarding which conditions should be targeted, with diabetes mellitus, chronic conditions or 'at-risk' patient groups being suggested, although evidence regarding each of these is limited. One particular group that may offer potential for positive outcomes is those described as having 'complex needs'. The evidence regarding interventions in populations of older adults generally, however, is more variable, with no strong signal regarding the effectiveness of targeting this group. There was limited evidence suggesting that targeting those with the most-severe conditions may be beneficial, and a limited body of work in specific clinical conditions.

The evidence regarding targeting deprived communities was unclear, with reports ranging from describing positive outcomes to reporting a lack of significant effect or increased costs. Studies from non-UK countries were often carried out in diverse communities, and there was little evidence related to potential influences of socioeconomic diversity on outcomes. In the UK, there was a large body of evidence from large urban and densely populated areas, and there was reference to the potential challenges of implementing integration in rural areas. Several of the non-UK studies compared different geographical areas where the same intervention was implemented, with little identification of differences between these sites.

We noted in *Chapter 3*, *Elements of the interventions*, that the elements of interventions varied between the UK and non-UK literature, with a greater proportion of UK interventions focusing on ICPs, and a larger proportion of international studies reporting case management-type interventions. Intervention elements were largely similar across the body of work, apart from financial transformation in systems that operate very differently to the UK. The international literature included more references to whole-population-level interventions, rather than services for particular clinical conditions. Initiatives such as MDTs, ICPs and case management were introduced in a variety of contexts including emergency care, other acute services, primary care and social care, with no reports of a specific context having a positive or adverse effect, thus suggesting that these elements are applicable to varying contexts. In-home interventions and social care settings were described as having some particular challenges, for example, retention and training of staff, availability of specialist staff and local practices having different structures. The assessment of strength of evidence for the UK literature compared with the international literature was different for only one outcome. The evidence of a reduction in length of stay was rated as being stronger for UK studies, whereas it was rated as being weaker across all studies.

The extensive range of influencing factors identified in the review are likely to have considerable importance in the way that mechanisms of change operate in different local contexts. There was evidence of influencing factors related to patients, the workforce, the organisation and systems, together with finance and governance. It is these factors that are likely to influence local differences in implementation and outcomes. Simpler single-element interventions (such as ICPs) may face fewer obstacles to implementation than larger, complex interventions, which are likely to encounter a greater number of influencing factors. However, the evidence indicated that simpler interventions may only have an effect on care process outcomes (rather than service delivery outcomes), and combining them as part of complex multielement initiatives may be required for service and system change.

Limitations

We highlight the challenges inherent in definitions of new models of care, with a lack of agreed definition and clear boundaries to the term. A limitation of this review may be excluding work that could have been of relevance due to lack of clarity of definition. We endeavoured to distinguish between new models of care that are integrated/co-ordinated from those that are not, and this distinction was challenging during the screening and inclusion process. The term 'integration' could be used in a variety of ways, including to describe interventions that related to enhanced care or quality assurance but did not include staff working in new ways. We also drew a distinction between outcomes related to service delivery outcomes and those related to clinical (health) outcomes. We included studies that reported both clinical and service delivery outcomes, but prioritised extracting the service delivery data. We believe that our search terms enabled relevant citations to be retrieved; however, we recognise that indexing can be imperfect and that we may not have identified work of relevance. As a priority topic, work on models of integrated care is constantly being published; however, our searches were required to have a cut-off point in order to complete an extensive extraction and analysis process within the time allocated.

We recognise that a particular limitation relates to the lack of statistical summary (meta-analysis), although we would argue not only that the heterogeneity of interventions and outcomes preclude this type of analysis, but that, in order to understand the complexity of the area, a systems approach is required. The process of summarising strength of evidence used in this review is open to debate and potential criticism. As highlighted in *Chapter 2*, *Risk of bias in individual studies*, reporting strength by number of studies may be challenged, as this indicates primarily the areas in which there has been research activity. In exploring consistency as well as quantity in our strength-of-evidence assessment, we have sought to overcome this limitation to some extent. Linked to this is a potential issue of reporting bias, with studies reporting less-positive outcomes that are potentially under-represented in the review. We highlight the fact that many of the initiatives outlined may only show the true effects after several years of implementation, and there are considerable challenges for studies in endeavouring to measure multidimensional outcomes and impacts. Our attempt to group and evaluate particular outcomes across studies with highly complex interventions and potentially long-term impacts may be viewed as overly simplistic, and we emphasise the need for a systems view of influences and impacts.

Our categorisations and typologies are open to differing interpretations. We are aware of the extensive literature in the field of organisational research, which offers frameworks and theories for classifying different elements of organisational systems. In developing the logic model, we have been influenced by this existing literature, but have endeavoured to be data-driven, working from a bottom-up process rather than imposing a pre-existing framework. We recognise that we have not explored theoretical mechanisms underpinning the change pathway, which may have offered additional insights. The review has focused instead on bringing together what is known about outcomes that may be associated with new models of integrated care, and evidence regarding the process of change.

Unlike many previous reviews, we did not focus on a particular patient group or a particular type of intervention. The approach could therefore be criticised for prioritising breadth over depth. Although we recognise that our conclusions regarding outcomes and impacts are based on highly heterogeneous studies, we would argue that our broad inclusion enabled us to have a sufficient number of studies to examine a wide range of individual outcomes. Having this greater number of included studies has also enabled the study to 'slice' the data in varying ways, such as by differing population features, intervention elements and organisational factors, to explore patterns and trends in the data. It has also provided the opportunity to make comparisons and contrasts between new models of integrated care across these different groupings.

Chapter 5 Conclusions

The term 'new models of care' has been used to refer to a wide range of interventions aiming to address issues of integration across health care and between health and social care. The varying composition of these interventions presents considerable challenges in comparing implementation and outcomes. Our systematic review has described the diverse elements that may be included in new models, and has explored the evidence underlying the outcomes and impacts that may result from the models. We have identified positive changes to the process of care delivery that may result from new models of integrated care: improved discharge planning, improved flow of care, reduced variance in practice and improved sharing of knowledge between practitioners; however, the evidence of change is considered to be weaker rather than stronger. The review also found weaker evidence of a potentially negative impact on practitioner time. The review highlights that the implementation of, and outcomes from, new models of care will be influenced by multiple factors, which may contribute to local variation. We have identified the need to consider and, when possible, address these factors at all stages of planning, implementation, sustainability and evaluation, and we have highlighted the influence of external factors such as resources and policy context.

It is interesting that our review included 11 years of research, with the factors reported as enabling or blocking new models changing little between the earlier and later reported work. Influencing elements reported in the international and UK literature shared many similarities, although it was notable that the UK literature included far greater discussion of influencing factors related to the workforce.

We identified three outcomes in which there appeared to be stronger evidence of effect: first, that new models of integrated care may lead to increased patient satisfaction; second, that new models may increase perceived quality of care (the UK evidence relates to staff perceptions of improved quality only); and, third, that new models of care may increase patient access to services. There was weaker evidence of effect that patient waiting time may be reduced, and weaker UK evidence indicating that patient wishes at the end of life are met more often. These outcomes appear to be interlinked, with improved perceived quality, access and waiting times potentially explaining the reported increased level of patient satisfaction. The evidence was inconsistent or limited regarding other outcomes at a service level, with a lack of clear signals regarding system-wide impacts on hospital services, primary care and community services, overall health-care usage and cost of health-care provision.

Evaluating outcomes and impacts from new models of integrated care presents challenges in determining what a 'good' outcome may be. We highlighted that outcomes may be perceived differently by different stakeholders, and that there may be contradictions in incentives for achieving change. A key contradiction at an organisational level relates to drivers of competition versus drivers of integration. Several studies highlighted that reducing activity in one sector of health care means a reduction in income, and that increased activity may not be followed by transfer of monies between organisations. Another tension relates to cost saving versus providing improved quality of care. Some studies reported that new models of care may improve quality but result in increased spending. A key influencing factor was reported to be the perceived aim of the initiative among staff and patients (whether to enhance care, change for organisational purposes or to reduce costs), and the need to be clear about the vision for the change was also highlighted. This clearly presents a considerable dilemma as a key aim may be cost saving, but the evidence indicates that this may make it less successful because of a lack of engagement among staff. On the other hand, increasing quality of care for patients may come at increased cost for services that are already under financial pressure. There is currently no strong signal that new models of integration may be cost saving, and increasing ease of access may have a detrimental effect on costs and capacity.

Currently, it is problematic to draw linkages between different elements of new models of integrated care and specific outcomes, which may contribute to a perceived lack of clarity regarding the vision for change. There was some suggestion that 'simpler' initiatives, which tended to be more frequently reported in the UK literature, may affect care processes but not service delivery outcomes. Including multiple elements within new models makes identification of the key/active ingredients problematic. However, it seems important to pursue further work in this area to examine which elements of change are or are not required, as reports of increased practitioner time mean that new models are potentially not without adverse effects. Currently, the UK literature in particular has an emphasis on integrating specific care services for patients, whereas reports from the international literature more often include an emphasis on patient education or whole-population health improvement.

A further contradiction noted in the literature concerns notions of patient-centred care versus standardisation of care. Initiatives such as ICPs were reported to reduce variation in practice, although there was also reported caution that they could lead to rigidity. There was surprisingly little UK or international evidence regarding the effect of integrated care initiatives on service users. The very limited evidence available provided inconsistent findings regarding whether service users perceived any change or had greater knowledge of or involvement in services.

Implications for health care

- There is stronger evidence that new models of integrated care may increase patient satisfaction and may lead to improvements in the accessibility of services and the length of patient waiting times.
- The evidence is currently unclear regarding other outcomes for services, or for the health-care system as a whole, including the impact on service usage and costs.
- Numerous factors are reported to influence the implementation and outcomes from new models of integrated care, which need to be considered at all stages of the introduction of new models.
- New models of integrated care act at a whole-system level, with a need to consider incentives and outcomes across the whole system.
- There is currently little evidence regarding the impact of new models of care on patients beyond the evaluation of patient satisfaction and some suggestion that outcomes for carers may differ from those for patients.
- New models of integrated care may offer more potential in certain patient populations, such as those described as having 'complex needs', although there is limited evidence related to differential effects in specific clinical conditions.
- There is some evidence that interventions, such as ICPs, MDTs and case management, implemented in isolation, may achieve change in processes, but that they should form part of multicomponent initiatives in order to improve service delivery outcomes.

Recommendations for future research

- We have identified a need for research to more clearly link particular elements of new models of care to outcomes.
- We have documented a need for further research to examine outcomes at a process level to add to the knowledge regarding intervention–outcome links. In particular, further research could include greater examination regarding process change outcomes in terms of patients (such as understanding of treatment), practice (flow of care and duplication), exchange of information (extent and accuracy), time spent engaged in tasks and organisational changes (commissioning, governance and budgetary).
- Currently, much of the research evidence comes from studies of older adults. There is a need for further research to explore the potential for new models of care to have an impact on the care of other patient groups.

- The UK literature in particular demonstrates a focus on outcomes and influences related to the workforce, whereas the potential effects on patient and carer experiences (beyond levels of satisfaction) is under-researched.
- We have identified a need to further explore particular challenges of new models of care in rural areas, and potential differential effects in varying subgroups such as those from socioeconomically deprived communities.
- We have developed and used an applicability framework to guide analysis of the findings of the review. This framework has potential to be a useful tool for other studies to guide analysis of results.

Acknowledgements

Contributions of authors

Susan Baxter (Senior Research Fellow, University of Sheffield) led the study and took the lead in analysis and report writing.

Maxine Johnson (Research Fellow, University of Sheffield) contributed to the review processes.

Duncan Chambers (Research Fellow, University of Sheffield) contributed to the review processes.

Anthea Sutton (Information Specialist, University of Sheffield) developed the search strategy and carried out electronic database searching.

Elizabeth Goyder (Professor of Public Health, University of Sheffield) provided health service research expertise and advice during the study.

Andrew Booth (Reader, University of Sheffield) provided methodological input to the review processes.

Data-sharing statement

All data requests should be submitted to the corresponding author for consideration. Access to anonymised data may be granted following review.

References

1. NHS England. *Five Year Forward View*. London: NHS England; 2014.
2. Shortell SM, Addicott R, Walsh N, Ham C. The NHS Five Year Forward View: lessons from the United States in developing new care models. *BMJ* 2015;**350**:h2005. https://doi.org/10.1136/bmj.h2005
3. Long T, Khan AM, Chana N. Achieving better value: primary care must lead on population health. *Postgrad Med J* 2015;**91**:59–60. https://doi.org/10.1136/postgradmedj-2015-133264
4. Ham C, Muray R. *Implementing the NHS Five Year Forward View: Aligning Policies with the Plan*. London: The King's Fund; 2015.
5. Ahmed F, Mays N, Ahmed N, Bisognano M, Gottlieb G. Can the Accountable Care Organization model facilitate integrated care in England? *J Health Serv Res Policy* 2015;**20**:261–4. https://doi.org/10.1177/1355819615590845
6. Robertson H. *Integration of Health and Social Care: A Review of Literature and Models – Implications for Scotland*. Edinburgh: Royal College of Nursing; 2011.
7. NHS England. *The Forward View into Action: New Care Models: Update and Initial Support*. London: NHS England; 2015.
8. Powell Davies G, Williams AM, Larsen K, Perkins D, Roland M, Harris MF. Coordinating primary health care: an analysis of the outcomes of a systematic review. *Med J Aust* 2008;**188**(Suppl. 8):65–8.
9. Shaw S, Rosen R, Rumbold B. *What is Integrated Care? An Overview of Integrated Care in the NHS*. London: Nuffield Trust; 2011.
10. Higgins JPT, Green S. *Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0*. The Cochrane Collaboration. 2011. URL: www.cochrane-handbook.org (accessed 20 June 2017).
11. National Heart, Lung, and Blood Institute. *Quality Assessment of Systematic Reviews and Meta-Analyses*. Bethesda, MD: National Institute of Health; 2014.
12. Critical Appraisal Skills Programme. *CASP Qualitative Studies Checklist*. CASP. 2017. URL: www.casp-uk.net/checklists (accessed 20 June 2017).
13. Glenton C, Colvin CJ, Carlsen B, Swartz A, Lewin S, Noyes J, Rashidian A. Barriers and facilitators to the implementation of lay health worker programmes to improve access to maternal and child health: qualitative evidence synthesis. *Cochrane Database Syst Rev* 2013;**10**:CD010414. https://doi.org/10.1002/14651858.CD010414.pub2
14. Hoogendoorn WE, van Poppel MN, Bongers PM, Koes BW, Bouter LM. Physical load during work and leisure time as risk factors for back pain. *Scand J Work Environ Health* 1999;**25**:387–403. https://doi.org/10.5271/sjweh.451
15. Guyatt GH, Oxman AD, Kunz R, Woodcock J, Brozek J, Helfand M, *et al.* GRADE guidelines: rating the quality of evidence–indirectness. *J Clin Epidemiol* 2011;**64**:1303–10. https://doi.org/10.1016/j.jclinepi.2011.04.014
16. Baxter SK, Blank L, Woods HB, Payne N, Rimmer M, Goyder E. Using logic model methods in systematic review synthesis: describing complex pathways in referral management interventions. *BMC Med Res Methodol* 2014;**14**:62. https://doi.org/10.1186/1471-2288-14-62
17. Rees K, Bennett P, West R, Davey Smith G, Ebrahim S. Psychological interventions for coronary heart disease. *Cochrane Database Syst Rev* 2004;**8**:CD002902. https://doi.org/10.1002/14651858.CD002902.pub2

18. Thomas J, Harden A. Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Med Res Methodol* 2008;**8**:45. https://doi.org/10.1186/1471-2288-8-45
19. Baxter S, Killoran A, Kelly MP, Goyder E. Synthesizing diverse evidence: the use of primary qualitative data analysis methods and logic models in public health reviews. *Public Health* 2010;**124**:99–106. https://doi.org/10.1016/j.puhe.2010.01.002
20. Allmark P, Baxter S, Goyder E, Guillaume L, Crofton-Martin G. Assessing the health benefits of advice services: using research evidence and logic model methods to explore complex pathways. *Health Soc Care Community* 2013;**21**:59–68. https://doi.org/10.1111/j.1365-2524.2012.01087.x
21. Blank L, Baxter S, Woods HB, Goyder E, Lee A, Payne N, Rimmer M. Referral interventions from primary to specialist care: a systematic review of international evidence. *Br J Gen Pract* 2014;**64**:e765–74. https://doi.org/10.3399/bjgp14X682837
22. Anderson LM, Petticrew M, Rehfuess E, Armstrong R, Ueffing E, Baker P, *et al.* Using logic models to capture complexity in systematic reviews. *Res Synth Methods* 2011;**2**:33–42. https://doi.org/10.1002/jrsm.32
23. Weiss CH. Theory-based evaluation: past present and future. *New Dir Eval* 1997;**76**:41–55. https://doi.org/10.1002/ev.1086
24. Dyson A, Todd L. Dealing with complexity: theory of change evaluation and the full service extended schools initiative. *Int J Res Meth Ed* 2010;**33**:119–34. https://doi.org/10.1080/1743727X.2010.484606
25. Hansen FH. Choosing evaluation models: a discussion on evaluation design. *Evaluation* 2005;**11**:447–62. https://doi.org/10.1177/1356389005060265
26. Rossi PH, Lipsey MW, Freeman HE. *Evaluation: A Systematic Approach*. Thousand Oaks, CA: Sage Publications Ltd; 2004.
27. Handler A, Issel M, Turnock B. A conceptual framework to measure performance of the public health system. *Am J Public Health* 2001;**91**:1235–9. https://doi.org/10.2105/AJPH.91.8.1235
28. Joly BM, Polyak G, Davis MV, Brewster J, Tremain B, Raevsky C, Beitsch LM. Linking accreditation and public health outcomes: a logic model approach. *J Public Health Manag Pract* 2007;**13**:349–56. https://doi.org/10.1097/01.PHH.0000278027.56820.7e
29. Burford B, Lewin S, Welch V, Rehfuess E, Waters E. Assessing the applicability of findings in systematic reviews of complex interventions can enhance the utility of reviews for decision making. *J Clin Epidemiol* 2013;**66**:1251–61. https://doi.org/10.1016/j.jclinepi.2013.06.017
30. Burchett HE, Mayhew SH, Lavis JN, Dobrow MJ. When can research from one setting be useful in another? Understanding perceptions of the applicability and transferability of research. *Health Promot Int* 2013;**28**:418–30. https://doi.org/10.1093/heapro/das026
31. Wang S, Moss JR, Hiller JE. Applicability and transferability of interventions in evidence-based public health. *Health Promot Int* 2006;**21**:76–83. https://doi.org/10.1093/heapro/dai025
32. Burchett H, Umoquit M, Dobrow M. How do we know when research from one setting can be useful in another? A review of external validity, applicability and transferability frameworks. *J Health Serv Res Policy* 2011;**16**:238–44. https://doi.org/10.1258/jhsrp.2011.010124
33. Buffet C, Ciliska D, Thomas H. *Can I Use this Evidence in my Program Decision? Assessing Applicability and Transferability of Evidence*. Hamilton, ON: National Collaborating Centre for Methods and Tools; 2007.
34. Addicott R, Dewar S. *Improving Choice at the End of Life: A Descriptive Analysis of the Impact and Costs of the Marie Curie Delivering Choice Programme in Lincolnshire*. London: The King's Fund; 2008.

35. Ahmad F, Roy A, Brady S, Belgeonne S, Dunn L, Pitts J. Care pathway initiative for people with intellectual disabilities: impact evaluation. *J Nurs Manag* 2007;**15**:700–2. https://doi.org/10.1111/j.1365-2934.2006.00734.x

36. Bakerly ND, Davies C, Dyer M, Dhillon P. Cost analysis of an integrated care model in the management of acute exacerbations of chronic obstructive pulmonary disease. *Chron Respir Dis* 2009;**6**:201–8. https://doi.org/10.1177/1479972309104279

37. Beacon A. Practice-integrated care teams – learning for a better future. *J Integr Care* 2015;**23**:74–87. https://doi.org/10.1108/JICA-01-2015-0005

38. Boyle A, Fuld J, Ahmed V, Bennett T, Robinson S. Does integrated emergency care reduce mortality and non-elective admissions? A retrospective analysis. *Emerg Med J* 2012;**29**:208–12. https://doi.org/10.1136/emj.2010.108142

39. Boyle AA, Ahmed V, Palmer CR, Bennett TJ, Robinson SM. Reductions in hospital admissions and mortality rates observed after integrating emergency care: a natural experiment. *BMJ Open* 2012;**2**:e000930. https://doi.org/10.1136/bmjopen-2012-000930

40. Boyle AA, Robinson SM, Whitwell D, Myers S, Bennett TJ, Hall N, *et al.* Integrated hospital emergency care improves efficiency. *Emerg Med J* 2008;**25**:78–82. https://doi.org/10.1136/emj.2007.051037

41. Choo T, Deb S, Wilkins J, Atiomo W. Evaluating the impact of the reconfiguration of gynaecology services at a university hospital NHS trust in the United Kingdom. *BMC Health Serv Res* 2014;**14**:428. https://doi.org/10.1186/1472-6963-14-428

42. Clarkson P, Brand C, Hughes J, Challis D. Integrating assessments of older people: examining evidence and impact from a randomised controlled trial. *Age Ageing* 2011;**40**:388–91. https://doi.org/10.1093/ageing/afr015

43. Coupe M. Integrated care in Herefordshire: a case study. *J Integr Care* 2013;**21**:198–207. https://doi.org/10.1108/JICA-01-2013-0001

44. Cunningham S, Logan C, Lockerbie L, Dunn MJ, McMurray A, Prescott RJ. Effect of an integrated care pathway on acute asthma/wheeze in children attending hospital: cluster randomized trial. *J Pediatr* 2008;**152**:315–20. https://doi.org/10.1016/j.jpeds.2007.09.033

45. Department of Health and Social Care (DHSC). *National Evaluation of the Department of Health's Integrated Care Pilots*. London: DHSC; 2012.

46. Dodd J, Taylor CE, Bunyan P, White PM, Thomas SM, Upton D. A service model for delivering care closer to home. *Prim Health Care Res Dev* 2011;**12**:95–111. https://doi.org/10.1017/S1463423610000356

47. Graffy J, Grande M, Campbell J. Case management for elderly patients at risk of hospital admission: a team approach. *Prim Health Care Res Devel* 2008;**9**:7–13. https://doi.org/10.1017/S1463423607000564

48. Gravelle H, Dusheiko M, Sheaff R, Sargent P, Boaden R, Pickard S, *et al.* Impact of case management (Evercare) on frail elderly patients: controlled before and after analysis of quantitative outcome data. *BMJ* 2007;**334**:31. https://doi.org/10.1136/bmj.39020.413310.55

49. Ham C. *Working Together for Health: Achievements and Challenges in the Kaiser NHS Beacon Sites Programme*. Birmingham: Health Services Management Centre, University of Birmingham; 2010.

50. Harris M, Greaves F, Gunn L, Patterson S, Greenfield G, Car J, *et al.* Multidisciplinary group performance-measuring integration intensity in the context of the North West London Integrated Care Pilot. *Int J Integr Care* 2013;**13**:e001. https://doi.org/10.5334/ijic.996

51. Hawthorne G, Grzebalski DK. Service redesign: the experience of Newcastle Diabetes Service 2001–2007. *Pract Diabetes Int* 2009;**26**:19–22. https://doi.org/10.1002/pdi.1323

52. Higginson IJ, Bausewein C, Reilly CC, Gao W, Gysels M, Dzingina M, *et al.* An integrated palliative and respiratory care service for patients with advanced disease and refractory breathlessness: a randomised controlled trial. *Lancet Respir Med* 2014;**2**:979–87. https://doi.org/10.1016/S2213-2600(14)70226-7

53. Hockley J, Watson J, Oxenham D, Murray SA. The integrated implementation of two end-of-life care tools in nursing care homes in the UK: an in-depth evaluation. *Palliat Med* 2010;**24**:828–38. https://doi.org/10.1177/0269216310373162

54. Huws DW, Cashmore D, Newcombe RG, Roberts C, Vincent J, Elwyn G. Impact of case management by advanced practice nurses in primary care on unplanned hospital admissions: a controlled intervention study. *BMC Health Serv Res* 2008;**8**:115. https://doi.org/10.1186/1472-6963-8-115

55. Jha S, Moran P, Blackwell A, Greenham H. Integrated care pathways: the way forward for continence services? *Eur J Obstet Gynecol Reprod Biol* 2007;**134**:120–5. https://doi.org/10.1016/j.ejogrb.2006.07.028

56. Johnstone R, Jones A, Fowell A. Welsh Collaborative Care Pathway Project; 10 years experience of implementing and maintaining a care pathway for the last days of life. *Int J Care Pathways* 2011;**15**:39–43. https://doi.org/10.1258/jicp.2011.010030

57. Johnstone RP, Jones AR, Burton C, Fowell A. Evaluation of the Welsh integrated care pathway (ICP) for the last days of life. *Palliat Med* 2012;**26**:476.

58. Julian S, Naftalin NJ, Clark M, Szczepura A, Rashid A, Baker R, *et al.* An integrated care pathway for menorrhagia across the primary-secondary interface: patients' experience, clinical outcomes, and service utilisation. *Qual Saf Health Care* 2007;**16**:110–15. https://doi.org/10.1136/qshc.2005.016782

59. Kent P, Chalmers Y. A decade on: has the use of integrated care pathways made a difference in Lanarkshire? *J Nurs Manag* 2006;**14**:508–20. https://doi.org/10.1111/j.1365-2934.2006.00707.x

60. Lamb BW, Jalil RT, Sevdalis N, Vincent C, Green JS. Strategies to improve the efficiency and utility of multidisciplinary team meetings in urology cancer care: a survey study. *BMC Health Serv Res* 2014;**14**:377. https://doi.org/10.1186/1472-6963-14-377

61. Letton C, Cheung C, Nordin A. Does an enhanced recovery integrated care pathway (ICP) encourage adherence to prescribing guidelines, accelerate postoperative recovery and reduce the length of stay for gynaecological oncology patients? *J Obs Gynae* 2013;**33**:296–7. https://doi.org/10.3109/01443615.2012.758693

62. Levelt E, Thwaites B, Yadegarfar G. Integrated care pathway for acute coronary syndromes: does it help? *J Integr Care Pathways* 2008;**12**:5–9. https://doi.org/10.1258/jicp.2008.008001

63. Lyon D, Miller J, Pine K. The Castlefields Integrated Care Model: the evidence summarised. *J Integr Care* 2006;**14**:7–12. https://doi.org/10.1108/14769018200600003

64. MacLean A, Fuller RM, Jaffrey EG, Hay AJ, Ho-Yen DO. Integrated care pathway for clostridium difficile helps patient management. *Brit J Infect Contr* 2008;**9**:15–7. https://doi.org/10.1177/1469044608098324

65. Mertes SC, Raut S, Khanduja V. Integrated care pathways in lower-limb arthroplasty: are they effective in reducing length of hospital stay? *Int Orthop* 2013;**37**:1157–63. https://doi.org/10.1007/s00264-013-1829-1

66. Ng SM, Mariguddi S, Coward S, Middleton H. Paediatric community home nursing: a model of acute care. *Br J Nurs* 2014;**23**:209–12. https://doi.org/10.12968/bjon.2014.23.4.209

67. Offredy M, Cleary M, Bland A, Donovan A, Kelshiker A. Improving health and care for patients by redesigning services: the development and implementation of a clinical assessment service in Harrow Primary Care Trust. *Qual Prim Care* 2008;**16**:95–102.

68. Paize F, White E, Heaf LJ, Baillie C, Kenny S, Couriel JM, *et al.* An integrated care pathway for optimizing the investigation and management of pediatric pleural empyema. *J Pediatr Infect Dis* 2007;**2**:77–82.

69. Pearson V, Chant S. Different models of health and social care in Devon – observations and implications for commissioners and providers. *J Integr Care* 2011;**19**:22–6. https://doi.org/10.1108/14769011111164269

70. Pettie JM, Dow MA, Sandilands EA, Thanacoody HK, Bateman DN. An integrated care pathway improves the management of paracetamol poisoning. *Emerg Med J* 2012;**29**:482–6. https://doi.org/10.1136/emj.2011.111922

71. Richings C, Cook R, Roy A. Service evaluation of an integrated assessment and treatment service for people with intellectual disability with behavioural and mental health problems. *J Intellect Disabil* 2011;**15**:7–19. https://doi.org/10.1177/1744629511403563

72. Roberts JA, Maslin TK, Bakerly ND. Development of an integrated chronic obstructive pulmonary disease service model in an inner-city region in the UK: initial findings and 12-month results. *Prim Care Respir J* 2010;**19**:390–7. https://doi.org/10.4104/pcrj.2010.00071

73. Roberts S, Unadkat N, Chandok R, Sawtell T. Learning from the integrated care pilot in West London. *London J Prim Care* 2012;**5**:59–62. https://doi.org/10.1080/17571472.2013.11493376

74. Roland M, Lewis R, Steventon A, Abel G, Adams J, Bardsley M, *et al.* Case management for at-risk elderly patients in the English integrated care pilots: observational study of staff and patient experience and secondary care utilisation. *Int J Integr Care* 2012;**12**:e130. https://doi.org/10.5334/ijic.850

75. Rowlandson PH, Smith C. An interagency service delivery model for autistic spectrum disorders and attention deficit hyperactivity disorder. *Child Care Health Dev* 2009;**35**:681–90. https://doi.org/10.1111/j.1365-2214.2009.00956.x

76. Ryan T, Hatfield B, Sharma I. Outcomes of referrals over a six-month period to a mental health gateway team. *J Psychiatr Ment Health Nurs* 2007;**14**:527–34. https://doi.org/10.1111/j.1365-2850.2007.01122.x

77. Simmons D, Yu D, Wenzel H. Changes in hospital admissions and inpatient tariff associated with a Diabetes Integrated Care Initiative: preliminary findings. *J Diabetes* 2014;**6**:81–9. https://doi.org/10.1111/1753-0407.12071

78. Sinclair L, Hunter R, Hagen S, Nelson D, Hunt J, A&E Mental Health Study Group. How effective are mental health nurses in A&E departments? *Emerg Med J* 2006;**23**:687–92. https://doi.org/10.1136/emj.2005.033175

79. Smith C, Hough L, Cheung CC, Millington-Sanders C, Sutton E, Ross JR, *et al.* Coordinate My Care: a clinical service that coordinates care, giving patients choice and improving quality of life. *BMJ Support Palliat Care* 2012;**2**:301–7. https://doi.org/10.1136/bmjspcare-2012-000265

80. Soljak M, Cecil E, Gunn L, Broddle A, Hamilton S, Tahir A, *et al.* *Quality of Care and Health Outcomes. North West London Integrated Care Pilot Evaluation: Report on Work Programme 3*. London: Imperial College London; 2013.

81. Steventon A, Bardsley M, Billings J, Georghiou T, Lewis G. *An Evaluation of the Impact of Community-based Interventions on Hospital Use. A Case Study of Eight Partnership for Older People Projects (POPP)*. London: Nuffield Trust; 2011.

82. Stokes J, Kristensen SR, Checkland K, Bower P. Effectiveness of multidisciplinary team case management: difference-in-differences analysis. *BMJ Open* 2016;**6**:e010468. https://doi.org/10.1136/bmjopen-2015-010468

83. Tucker H, Burgis M. Patients set the agenda on integrating community services in Norfolk. *J Integr Care* 2012;**20**:232–40. https://doi.org/10.1108/14769011211255267

84. Tucker S, Baldwin R, Hughes J, Benbow SM, Barker A, Burns A, Challis D. Integrating mental health services for older people in England – from rhetoric to reality. *J Interprof Care* 2009;**23**:341–54. https://doi.org/10.1080/13561820902739833

85. Waller SL, Delaney S, Strachan MW. Does an integrated care pathway enhance the management of diabetic ketoacidosis? *Diabet Med* 2007;**24**:359–63. https://doi.org/10.1111/j.1464-5491.2007.02102.x

86. Wilberforce M, Tucker S, Brand C, Abendstern M, Jasper R, Challis D. Is integrated care associated with service costs and admission rates to institutional settings? An observational study of community mental health teams for older people in England. *Int J Geriatr Psychiatry* 2016;**31**:1208–16. https://doi.org/10.1002/gps.4424

87. Windle K, Wagland R, Forder J, D'Amico F, Janssen D, Wistow G. *National Evaluation of Partnerships for Older People Projects. Final Report*. London: Personal Social Services Research Unit; 2009.

88. Allan HT, Brearley S, Byng R, Christian S, Clayton J, Mackintosh M, *et al.* People and teams matter in organizational change: professionals' and managers' experiences of changing governance and incentives in primary care. *Health Serv Res* 2014;**49**:93–112. https://doi.org/10.1111/1475-6773.12084

89. Amador S, Goodman C, Mathie E, Nicholson C. Evaluation of an organisational intervention to promote integrated working between health services and care homes in the delivery of end-of-life care for people with dementia: understanding the change process using a social identity approach. *Int J Integr Care* 2016;**16**:14. https://doi.org/10.5334/ijic.2426

90. Anderson ES, Pollard L, Conroy S, Clague-Baker N. Forming a new clinical team for frail older people: can a group development model help? *J Interprof Care* 2014;**28**:163–5. https://doi.org/10.3109/13561820.2013.853653

91. Bachmann MO, O'Brien M, Husbands C, Shreeve A, Jones N, Watson J, *et al.* Integrating children's services in England: national evaluation of children's trusts. *Child Care Health Develop* 2009;**35**:257–65. https://doi.org/10.1111/j.1365-2214.2008.00928.x

92. Baillie L, Gallini A, Corser R, Elworthy G, Scotcher A, Barrand A. Care transitions for frail, older people from acute hospital wards within an integrated healthcare system in England: a qualitative case study. *Int J Integr Care* 2014;**14**:e009. https://doi.org/10.5334/ijic.1175

93. Barnett J, Vasileiou K, Djemil F, Brooks L, Young T. Understanding innovators' experiences of barriers and facilitators in implementation and diffusion of healthcare service innovations: a qualitative study. *BMC Health Serv Res* 2011;**11**:342. https://doi.org/10.1186/1472-6963-11-342

94. Belling R, Whittock M, McLaren S, Burns T, Catty J, Jones IR, *et al.* Achieving continuity of care: facilitators and barriers in community mental health teams. *Implement Sci* 2011;**6**:23. https://doi.org/10.1186/1748-5908-6-23

95. Bouamrane MM, Mair FS. Implementation of an integrated preoperative care pathway and regional electronic clinical portal for preoperative assessment. *BMC Med Inform Decis Mak* 2014;**14**:93. https://doi.org/10.1186/1472-6947-14-93

96. Bridges J, Fitzgerald L, Meyer J. New workforce roles in health care: exploring the longer-term journey of organisational innovations. *J Health Organ Manag* 2007;**21**:381–92. https://doi.org/10.1108/jhom.2007.02521daa.001

97. Cheyne H, Abhyankar P, McCourt C. Empowering change: realist evaluation of a Scottish Government programme to support normal birth. *Midwifery* 2013;**29**:1110–21. https://doi.org/10.1016/j.midw.2013.07.018

98. Cleland J, Moffat M, Small I. A qualitative study of stakeholder views of a community-based anticipatory care service for patients with COPD. *Prim Care Respir J* 2012;**21**:255–60. https://doi.org/10.4104/pcrj.2012.00008

99. Collins F, McCray J. Partnership working in services for children: use of the common assessment framework. *J Interprof Care* 2012;**26**:134–40. https://doi.org/10.3109/13561820.2011.630111

100. Curry N, Harris M, Gunn LH, Pappas Y, Blunt I, Soljak M, *et al.* Integrated care pilot in north-west London: a mixed methods evaluation. *Int J Integr Care* 2013;**13**:e027. https://doi.org/10.5334/ijic.1149

101. Dattée B, Barlow J. Complexity and whole-system change programmes. *J Health Serv Res Policy* 2010;**15**(Suppl. 2):19–25. https://doi.org/10.1258/jhsrp.2009.009097

102. Dent M, Tutt D. Electronic patient information systems and care pathways: the organisational challenges of implementation and integration. *Health Informatics J* 2014;**20**:176–88. https://doi.org/10.1177/1460458213518545

103. Dickinson H, Glasby J. How effective is joint commissioning? A study of five English localities. *J Integr Care* 2013;**21**:221–32. https://doi.org/10.1108/JICA-04-2013-0012

104. Dodds S, Chamberlain C, Williamson GR. Modernising chronic obstructive pulmonary disease admissions to improve patient care: local outcomes from implementing the Ideal Design of Emergency Access project. *Accid Emerg Nurs* 2006;**14**:141–7. https://doi.org/10.1016/j.aaen.2006.03.006

105. Erens B, Wistow G, Mounier-Jack S, Douglas N, Jones L, Manacorda T, *et al. Early Evaluation of the Integrated Care and Support Pioneers Programme: Interim Report*. London: London School of Hygiene and Tropical Medicine; 2015.

106. Evans S, Means R, Powell J. Making care homes part of the community? An evaluation of the Gloucestershire Partnerships for Older People Project. *Qual Ageing Older Adults* 2013;**14**:66–74. https://doi.org/10.1108/14717791311311120

107. Farrington C, Clare IC, Holland AJ, Barrett M, Oborn E. Knowledge exchange and integrated services: experiences from an integrated community intellectual (learning) disability service for adults. *J Intellect Disabil Res* 2015;**59**:238–47. https://doi.org/10.1111/jir.12131

108. Freeman T, Peck E. Evaluating partnerships: a case study of integrated specialist mental health services. *Health Soc Care Community* 2006;**14**:408–17. https://doi.org/10.1111/j.1365-2524.2006.00658.x

109. Gambles M, Stirzaker S, Jack BA, Ellershaw JE. The Liverpool Care Pathway in hospices: an exploratory study of doctor and nurse perceptions. *Int J Palliat Nurs* 2006;**12**:414–21. https://doi.org/10.12968/ijpn.2006.12.9.21869

110. Greenhalgh T, Humphrey C, Hughes J, Macfarlane F, Butler C, Pawson R. How do you modernize a health service? A realist evaluation of whole-scale transformation in London. *Milbank Q* 2009;**87**:391–416. https://doi.org/10.1111/j.1468-0009.2009.00562.x

111. Greenhalgh T, Macfarlane F, Barton-Sweeney C, Woodard F. ‘If we build it, will it stay?’ A case study of the sustainability of whole-system change in London. *Milbank Q* 2012;**90**:516–47. https://doi.org/10.1111/j.1468-0009.2012.00673.x

112. Griffiths C, Gerressu M, French RS, One-Stop Shop Evaluation Team. Are one-stop shops acceptable? Community perspectives on one-stop shop models of sexual health service provision in the UK. *Sex Transm Infect* 2008;**84**:395–9. https://doi.org/10.1136/sti.2008.030833

113. Haddow G, O'Donnell CA, Heaney D. Stakeholder perspectives on new ways of delivering unscheduled health care: the role of ownership and organizational identity. *J Eval Clin Pract* 2007;**13**:179–85. https://doi.org/10.1111/j.1365-2753.2006.00667.x

114. Hamilton S, Huby G, Tierney A, Powell A, Kielmann T, Sheikh A, Pinnock H. Mind the gap between policy imperatives and service provision: a qualitative study of the process of respiratory service development in England and Wales. *BMC Health Serv Res* 2008;**8**:248. https://doi.org/10.1186/1472-6963-8-248

115. Harris M, Greaves F, Gunn L, Patterson S, Greenfield G, Car J, *et al.* Multidisciplinary integration in the context of integrated care – results from the North West London Integrated Care Pilot. *Int J Integr Care* 2013;**13**:e041. https://doi.org/10.5334/ijic.1146

116. Heenan D, Birrell D. The integration of health and social care: the lessons from Northern Ireland. *Soc Pol Administrat* 2006;**40**:47–66. https://doi.org/10.1111/j.1467-9515.2006.00476.x

117. Hendy J, Barlow J. The role of the organizational champion in achieving health system change. *Soc Sci Med* 2012;**74**:348–55. https://doi.org/10.1016/j.socscimed.2011.02.009

118. Hewison A, Lord L, Bailey C. 'It's been quite a challenge': redesigning end-of-life care in acute hospitals. *Palliat Support Care* 2015;**13**:609–18. https://doi.org/10.1017/S1478951514000170

119. Hu M. The impact of an integrated care service on service users: the service users' perspective. *J Health Organ Manag* 2014;**28**:495–510. https://doi.org/10.1108/JHOM-04-2012-0074

120. Huby G, Harris FM, Powell AE, Kielman T, Sheikh A, Williams S, Pinnock H. Beyond professional boundaries: relationships and resources in health services' modernisation in England and Wales. *Sociol Health Illn* 2014;**36**:400–15. https://doi.org/10.1111/1467-9566.12067

121. Hudson B. Integrated team working: you can get it if you really want it: part I. *J Integr Care* 2006;**14**:13–21. https://doi.org/10.1108/14769018200600004

122. Ignatowicz A, Greenfield G, Pappas Y, Car J, Majeed A, Harris M. Achieving provider engagement: providers' perceptions of implementing and delivering integrated care. *Qual Health Res* 2014;**24**:1711–20. https://doi.org/10.1177/1049732314549024

123. Kassianos AP, Ignatowicz A, Greenfield G, Majeed A, Car J, Pappas Y. 'Partners rather than just providers . . .': a qualitative study on health care professionals' views on implementation of multidisciplinary group meetings in the North West London Integrated Care Pilot. *Int J Integr Care* 2015;**15**:e032. https://doi.org/10.5334/ijic.2019

124. Knowles SE, Chew-Graham C, Coupe N, Adeyemi I, Keyworth C, Thampy H, Coventry PA. Better together? A naturalistic qualitative study of inter-professional working in collaborative care for co-morbid depression and physical health problems. *Implement Sci* 2013;**8**:110. https://doi.org/10.1186/1748-5908-8-110

125. Lhussier M, Carr SM, Wilcockson J. The evaluation of an end-of-life integrated care pathway. *Int J Palliat Nurs* 2007;**13**:74–81. https://doi.org/10.12968/ijpn.2007.13.2.23072

126. Ling T, Brereton L, Conklin A, Newbould J, Roland M. Barriers and facilitators to integrating care: experiences from the English Integrated Care Pilots. *Int J Integr Care* 2012;**12**:e129. https://doi.org/10.5334/ijic.982

127. Lunts P. Change management in integrated care: what helps and hinders middle managers – a case study. *J Integr Care* 2012;**20**:246–54. https://doi.org/10.1108/14769011211255285

128. Macfarlane F, Greenhalgh T, Humphrey C, Hughes J, Butler C, Pawson R. A new workforce in the making? A case study of strategic human resource management in a whole-system change effort in healthcare. *J Health Organ Manag* 2011;**25**:55–72. https://doi.org/10.1108/14777261111116824

129. Manley K, Martin A, Jackson C, Wright T. Using systems thinking to identify workforce enablers for a whole systems approach to urgent and emergency care delivery: a multiple case study. *BMC Health Serv Res* 2016;**16**:368. https://doi.org/10.1186/s12913-016-1616-y

130. McDowell JR, McPhail K, Halyburton G, Brown M, Lindsay G. Perceptions of a service redesign by adults living with type 2 diabetes. *J Adv Nurs* 2009;**65**:1432–41. https://doi.org/10.1111/j.1365-2648.2009.05003.x

131. McKenna H, Richey R, Keeney S, Hasson F, Sinclair M, Poulton B. The introduction of innovative nursing and midwifery roles: the perspective of healthcare managers. *J Adv Nurs* 2006;**56**:553–62. https://doi.org/10.1111/j.1365-2648.2006.04047.x

132. Oborn E, Dawson S, Knowledge and practice in multidisciplinary teams: struggle, accommodation and privilege. *Human Relations* 2010;**63**:1835–57. https://doi.org/10.1177/0018726710371237

133. Ovseiko PV, Melham K, Fowler J, Buchan AM. Organisational culture and post-merger integration in an academic health centre: a mixed-methods study. *BMC Health Serv Res* 2015;**15**:25. https://doi.org/10.1186/s12913-014-0673-3

134. Mastellos N, Gunn L, Harris M, Majeed A, Car J, Pappas Y. Assessing patients' experience of integrated care: a survey of patient views in the North West London Integrated Care Pilot. *Int J Integr Care* 2014;**14**:e015. https://doi.org/10.5334/ijic.1453

135. Petch A, Cook A, Miller E. Partnership working and outcomes: do health and social care partnerships deliver for users and carers? *Health Soc Care Community* 2013;**21**:623–33. https://doi.org/10.1111/hsc.12050

136. Pinnock H, Huby G, Tierney A, Hamilton S, Powell A, Kielmann T, Sheikh A. Is multidisciplinary teamwork the key? A qualitative study of the development of respiratory services in the UK. *J R Soc Med* 2009;**102**:378–90. https://doi.org/10.1258/jrsm.2009.080356

137. Pollard L, Rogers S, Shribman J, Sprigings D, Sinfield P. A study of role expansion: a new GP role in cardiology care. *BMC Health Serv Res* 2014;**14**:205. https://doi.org/10.1186/1472-6963-14-205

138. Pollard LC, Graves H, Scott DL, Kingsley GH, Lempp H. Perceived barriers to integrated care in rheumatoid arthritis: views of recipients and providers of care in an inner-city setting. *BMC Musculoskelet Disord* 2011;**12**:19. https://doi.org/10.1186/1471-2474-12-19

139. Roberts L Cameron G. *Evaluation of the Integrated Care Communities 2 Programme (Incorporating the Integration Discovery Community)*. Evaluation Report. London: OPM Group; 2014.

140. Rothera I, Jones R, Harwood R, Avery AJ, Fisher K, James V, *et al.* An evaluation of a specialist multiagency home support service for older people with dementia using qualitative methods. *Int J Geriatr Psychiatry* 2008;**23**:65–72. https://doi.org/10.1002/gps.1841

141. Scragg T. An evaluation of integrated team management. *J Integr Care* 2006;**14**:39–48. https://doi.org/10.1108/14769018200600023

142. Sheaff R, Boaden R, Sargent P, Pickard S, Gravelle H, Parker S, Roland M. Impacts of case management for frail elderly people: a qualitative study. *J Health Serv Res Policy* 2009;**14**:88–95. https://doi.org/10.1258/jhsrp.2008.007142

143. Sleeman KE, Koffman J, Bristowe K, Rumble C, Burman R, Leonard S, *et al.* 'It doesn't do the care for you': a qualitative study of health care professionals' perceptions of the benefits and harms of integrated care pathways for end of life care. *BMJ Open* 2015;**5**:e008242. https://doi.org/10.1136/bmjopen-2015-008242

144. Smith N, Barnes M. New jobs old roles – working for prevention in a whole-system model of health and social care for older people. *Health Soc Care Community* 2013;**21**:79–87. https://doi.org/10.1111/j.1365-2524.2012.01089.x

145. Stuart K. Collaborative agency to support integrated care for children, young people and families: an action research study. *Int J Integr Care* 2014;**14**:e006. https://doi.org/10.5334/ijic.1171

146. Syson G, Bond J. Integrating health and social care teams in Salford. *J Integr Care* 2010;**18**:17–24. https://doi.org/10.5042/jic.2010.0132

147. Thiel V, Sanola L, Goodwin N, Kodner D. *Developing Community Resource Teams in Pembrokeshire, Wales. Integration of Health and Social Care in Progress*. London: The King's Fund; 2013.

148. Tucker H. Discovering integrated care in community hospitals. *J Integr Care* 2013;**21**:336–46. https://doi.org/10.1108/JICA-10-2013-0038

149. Waterson P, Eason K, Tutt D, Dent M. Using HIT to deliver integrated care for the frail elderly in the UK: current barriers and future challenges. *Work* 2012;**41**(Suppl. 1):4490–3. https://doi.org/10.3233/WOR-2012-0750-4490

150. Wilson R, Baines S, Cornford J, Martin M. 'Trying to do a jigsaw without the picture on the box': understanding the challenges of care integration in the context of single assessment for older people in England. *Int J Integr Care* 2007;**7**:e25. https://doi.org/10.5334/ijic.186

151. Holder H, Gaskins M, Wistow G, Smith J. *Putting Integrated Care into Practice: The North West London Experience*. London: Nuffield Trust; 2015.

152. Alexander JA, Bae D. Does the patient-centred medical home work? A critical synthesis of research on patient-centred medical homes and patient-related outcomes. *Health Serv Manage Res* 2012;**25**:51–9. https://doi.org/10.1258/hsmr.2012.012001

153. Allen D, Gillen E, Rixson L. Systematic review of the effectiveness of integrated care pathways: what works, for whom, in which circumstances? *Int J Evid Based Healthc* 2009;**7**:61–74. https://doi.org/10.1111/j.1744-1609.2009.00127.x

154. Allen D, Rixson L. How has the impact of 'care pathway technologies' on service integration in stroke care been measured and what is the strength of the evidence to support their effectiveness in this respect? *Int J Evid Based Healthc* 2008;**6**:78–110.

155. Béland F, Hollander MJ. Integrated models of care delivery for the frail elderly: international perspectives. *Gac Sanit* 2011;**25**(Suppl. 2):138–46. https://doi.org/10.1016/j.gaceta.2011.09.003

156. Bélanger E, Rodríguez C. More than the sum of its parts? A qualitative research synthesis on multi-disciplinary primary care teams. *J Interprof Care* 2008;**22**:587–97. https://doi.org/10.1080/13561820802380035

157. Best A, Greenhalgh T, Lewis S, Saul JE, Carroll S, Bitz J. Large-system transformation in health care: a realist review. *Milbank Q* 2012;**90**:421–56. https://doi.org/10.1111/j.1468-0009.2012.00670.x

158. Boult C, Green AF, Boult LB, Pacala JT, Snyder C, Leff B. Successful models of comprehensive care for older adults with chronic conditions: evidence for the Institute of Medicine's 'Retooling for an aging America' report. *J Amer Geriatr Soc* 2009;**57**:2328–37. https://doi.org/10.1111/j.1532-5415.2009.02571.x

159. Butler M, Kane RL, McAlpine D, Kathol RG, Fu SS, Hagedorn H, Wilt TJ. Integration of mental health/substance abuse and primary care. *Evid Rep Technol Assess* 2008;**173**:1–362.

160. Cameron A, Bostock L, Lart R. Service user and carers perspectives of joint and integrated working between health and social care. *J Integr Care* 2014;**22**:62–70. https://doi.org/10.1108/JICA-10-2013-0042

161. Cameron A, Lart R, Bostock L, Coomber C. Factors that promote and hinder joint and integrated working between health and social care services: a review of research literature. *Health Soc Care Community* 2014;**22**:225–33. https://doi.org/10.1111/hsc.12057

162. Davies SL, Goodman C, Bunn F, Victor C, Dickinson A, Iliffe S, *et al.* A systematic review of integrated working between care homes and health care services. *BMC Health Serv Res* 2011;**11**:320. https://doi.org/10.1186/1472-6963-11-320

163. de Bruin SR, Versnel N, Lemmens LC, Molema CC, Schellevis FG, Nijpels G, Baan CA. Comprehensive care programs for patients with multiple chronic conditions: a systematic literature review. *Health Policy* 2012;**107**:108–45. https://doi.org/10.1016/j.healthpol.2012.06.006

164. Eklund K, Wilhelmson K. Outcomes of coordinated and integrated interventions targeting frail elderly people: a systematic review of randomised controlled trials. *Health Soc Care Community* 2009;**17**:447–58. https://doi.org/10.1111/j.1365-2524.2009.00844.x

165. Footman K, Garthwaite K, Bambra C, McKee M. Quality check: does it matter for quality how you organize and pay for health care? A review of the international evidence. *Int J Health Serv* 2014;**44**:479–505. https://doi.org/10.2190/HS.44.3.d

166. Genet N, Boerma WG, Kringos DS, Bouman A, Francke AL, Fagerström C, *et al.* Home care in Europe: a systematic literature review. *BMC Health Serv Res* 2011;**11**:207. https://doi.org/10.1186/1472-6963-11-207

167. Homer CJ, Klatka K, Romm D, Kuhlthau K, Bloom S, Newacheck P, *et al.* A review of the evidence for the medical home for children with special health care needs. *Pediatrics* 2008;**122**:e922–37. https://doi.org/10.1542/peds.2007-3762

168. Huntley AL, Thomas R, Mann M, Huws D, Elwyn G, Paranjothy S, Purdy S. Is case management effective in reducing the risk of unplanned hospital admissions for older people? A systematic review and meta-analysis. *Fam Pract* 2013;**30**:266–75. https://doi.org/10.1093/fampra/cms081

169. Hussain M, Seitz D. Integrated models of care for medical inpatients with psychiatric disorders: a systematic review. *Psychosomatics* 2014;**55**:315–25. https://doi.org/10.1016/j.psym.2013.08.003

170. Jackson G, Powers BJ, Chatterjee R, Bettger JP, Kemper AR, Hasselblad V, *et al.* The patient-centred medical home: a systematic review. *Ann Intern Med* 2013;**158**:169–78. https://doi.org/10.7326/0003-4819-158-3-201302050-00579

171. Johansson G, Eklund K, Gosman-Hedström G. Multidisciplinary team, working with elderly persons living in the community: a systematic literature review. *Scand J Occup Ther* 2010;**17**:101–16. https://doi.org/10.1080/11038120902978096

172. Kammerlander C, Roth T, Friedman SM, Suhm N, Luger TJ, Kammerlander-Knauer U, *et al.* Ortho-geriatric service – a literature review comparing different models. *Osteoporosis Int* 2010;**21**:S637–46. https://doi.org/10.1007/s00198-010-1396-x

173. Kinley J, Froggatt K, Bennett MI. The effect of policy on end-of-life care practice within nursing care homes: a systematic review. *Palliat Med* 2013;**27**:209–20. https://doi.org/10.1177/0269216311432899

174. Kuhlmann AS, Gavin L, Galavotti C. The integration of family planning with other health services: a literature review. *Int Perspect Sex Reprod Health* 2010;**36**:189–96. https://doi.org/10.1363/3618910

175. Laver K, Lannin NA, Bragge P, Hunter P, Holland AE, Tavender E, *et al.* Organising health care services for people with an acquired brain injury: an overview of systematic reviews and randomised controlled trials. *BMC Health Serv Res* 2014;**14**:397. https://doi.org/10.1186/1472-6963-14-397

176. Loader BD, Hardey M, Keeble L. Health informatics for older people: a review of ICT facilitated integrated care for older people. *Int J Soc Welfare* 2008;**17**:46–53. https://doi.org/10.1111/j.1468-2397.2007.00489.x

177. Low LF, Yap M, Brodaty H. A systematic review of different models of home and community care services for older persons. *BMC Health Serv Res* 2011;**11**:93. https://doi.org/10.1186/1472-6963-11-93

178. MacAdam M. *Frameworks of Integrated Care for the Elderly: A Systematic Review*. Ottowa, ON: Canadian Policy Research Network; 2008.

179. Mackie S, Darvill A. Factors enabling implementation of integrated health and social care: a systematic review. *Br J Community Nurs* 2016;**21**:82–7. https://doi.org/10.12968/bjcn.2016.21.2.82

180. Martínez-González NA, Berchtold P, Ullman K, Busato A, Egger M. Integrated care programmes for adults with chronic conditions: a meta-review. *Int J Qual Health Care* 2014;**26**:561–70. https://doi.org/10.1093/intqhc/mzu071

181. Maslin-Prothero SE, Bennion AE. Integrated team working: a literature review. *Int J Integr Care* 2010;**10**:e043.

182. Mason A, Goddard M, Weatherly H, Chalkley M. Integrating funds for health and social care: an evidence review. *J Health Serv Res Policy* 2015;**20**:177–88. https://doi.org/10.1177/1355819614566832

183. McConnell T, O’Halloran P, Porter S, Donnelly M. Systematic realist review of key factors affecting the successful implementation and sustainability of the Liverpool Care Pathway for the dying patient. *Worldviews Evid Based Nurs* 2013;**10**:218–37. https://doi.org/10.1111/wvn.12003

184. Myors KA, Schmied V, Johnson M, Cleary M. Collaboration and integrated services for perinatal mental health: an integrative review. *Child Adol Ment Health* 2013;**18**:1–10. https://doi.org/10.1111/j.1475-3588.2011.00639.x

185. Nicholson C, Jackson C, Marley J. A governance model for integrated primary/secondary care for the health-reforming first world – results of a systematic review. *BMC Health Serv Res* 2013;**13**:528. https://doi.org/10.1186/1472-6963-13-528

186. Peikes D, Chen A, Schore J, Brown R. Effects of care coordination on hospitalization, quality of care, and health care expenditures among Medicare beneficiaries: 15 randomized trials. *JAMA* 2009;**301**:603–18. https://doi.org/10.1001/jama.2009.126

187. Smith E, Ross FM. Service user involvement and integrated care pathways. *Int J Health Care Qual Assur* 2007;**20**:195–214. https://doi.org/10.1108/09526860710743345

188. Stewart MJ, Georgiou A, Westbrook JI. Successfully integrating aged care services: a review of the evidence and tools emerging from a long-term care program. *Int J Integr Care* 2013;**13**:e003. https://doi.org/10.5334/ijic.963

189. Stokes J, Panagioti M, Alam R, Checkland K, Cheraghi-Sohi S, Bower P. Effectiveness of case management for ‘at risk’ patients in primary care: a systematic review and meta-analysis. *PLoS One* 2015;**10**:e0132340. https://doi.org/10.1371/journal.pone.0132340

190. Suter E, Oelke ND, Adair CE, Armitage GD. Ten key principles for successful health systems integration. *Healthc Q* 2009;**13**:16–23. https://doi.org/10.12927/hcq.2009.21092

191. Tieman J, Mitchell G, Shelby-James T, Currow D, Fazekas B, O’Doherty L, *et al.* Integration, coordination and multidisciplinary care: what can these approaches offer to Australian primary health care? *Aust J Prim Health* 2007;**13**:56–65. https://doi.org/10.1071/PY07024

192. Trivedi D, Goodman C, Gage H, Baron N, Scheibl F, Iliffe S, *et al.* The effectiveness of inter-professional working for older people living in the community: a systematic review. *Health Soc Care Community* 2013;**21**:113–28. https://doi.org/10.1111/j.1365-2524.2012.01067.x

193. Xyrichis A, Lowton K. What fosters or prevents interprofessional teamworking in primary and community care? A literature review. *Int J Nurs Stud* 2008;**45**:140–53. https://doi.org/10.1016/j.ijnurstu.2007.01.015

194. Aiken LS, Butner J, Lockhart CA, Volk-Craft BE, Hamilton G, Williams FG. Outcome evaluation of a randomized trial of the PhoenixCare intervention: program of case management and coordinated care for the seriously chronically ill. *J Palliat Med* 2006;**9**:111–26. https://doi.org/10.1089/jpm.2006.9.111

195. Battersby M, Harvey P, Mills PD, Kalucy E, Pols RG, Frith PA, *et al.* SA HealthPlus: a controlled trial of a statewide application of a generic model of chronic illness care. *Milbank Q* 2007;**85**:37–67. https://doi.org/10.1111/j.1468-0009.2007.00476.x

196. Béland F, Bergman H, Lebel P, Clarfield AM, Tousignant P, Contandriopoulos AP, Dallaire L. A system of integrated care for older persons with disabilities in Canada: results from a randomized controlled trial. *J Gerontol A Biol Sci Med Sci* 2006;**61**:367–73. https://doi.org/10.1093/gerona/61.4.367

197. Béland F, Bergman H, Lebel P, Dallaire L, Fletcher J, Contandriopoulos AP, Tousignant P. Integrated services for frail elders (SIPA): a trial of a model for Canada. *Can J Aging* 2006;**25**:5–42. https://doi.org/10.1353/cja.2006.0018

198. Bird S, Noronha M, Sinnott H. An integrated care facilitation model improves quality of life and reduces use of hospital resources by patients with chronic obstructive pulmonary disease and chronic heart failure. *Aust J Prim Health* 2010;**16**:326–33. https://doi.org/10.1071/PY10007

199. Bird SR, Kurowski W, Dickman GK, Kronborg I. Integrated care facilitation for older patients with complex health care needs reduces hospital demand. *Aust Health Rev* 2007;**31**:451–61. https://doi.org/10.1071/AH070451

200. Bird SR, Noronha M, Kurowski W, Orkin C, Sinnott H. Integrated care facilitation model reduces use of hospital resources by patients with pediatric asthma. *J Healthc Qual* 2012;**34**:25–33. https://doi.org/10.1111/j.1945-1474.2011.00143.x

201. Boult C, Leff B, Boyd CM, Wolff JL, Marsteller JA, Frick KD, *et al.* A matched-pair cluster-randomized trial of guided care for high-risk older patients. *J Gen Intern Med* 2013;**28**:612–21. https://doi.org/10.1007/s11606-012-2287-y

202. Boult C, Reider L, Frey K, Leff B, Boyd CM, Wolff JL, *et al.* Early effects of 'Guided Care' on the quality of health care for multimorbid older persons: a cluster-randomized controlled trial. *J Gerontol A Biol Sci Med Sci* 2008;**63**:321–7. https://doi.org/10.1093/gerona/63.3.321

203. Boult C, Reider L, Leff B, Frick KD, Boyd CM, Wolff JL, *et al.* The effect of guided care teams on the use of health services: results from a cluster-randomized controlled trial. *Arch Intern Med* 2011;**171**:460–6. https://doi.org/10.1001/archinternmed.2010.540

204. Brännström M, Boman K. Effects of person-centred and integrated chronic heart failure and palliative home care. PREFER: a randomized controlled study. *Eur J Heart Fail* 2014;**16**:1142–51. https://doi.org/10.1002/ejhf.151

205. Brown RS, Peikes D, Peterson G, Schore J, Razafindrakoto CM. Six features of Medicare coordinated care demonstration programs that cut hospital admissions of high-risk patients. *Health Aff* 2012;**31**:1156–66. https://doi.org/10.1377/hlthaff.2012.0393

206. Callahan CM, Boustani MA, Unverzagt FW, Austrom MG, Damush TM, Perkins AJ, *et al.* Effectiveness of collaborative care for older adults with Alzheimer disease in primary care: a randomized controlled trial. *JAMA* 2006;**295**:2148–57. https://doi.org/10.1001/jama.295.18.2148

207. Colla CH, Lewis VA, Kao LS, O'Malley AJ, Chang CH, Fisher ES. Association between Medicare Accountable Care Organization implementation and spending among clinically vulnerable beneficiaries. *JAMA Intern Med* 2016;**176**:1167–75. https://doi.org/10.1001/jamainternmed.2016.2827

208. Colla CH, Wennberg DE, Meara E, Skinner JS, Gottlieb D, Lewis VA, *et al.* Spending differences associated with the Medicare Physician Group Practice Demonstration. *JAMA* 2012;**308**:1015–23. https://doi.org/10.1001/2012.jama.10812

209. Counsell SR, Callahan CM, Clark DO, Tu W, Buttar AB, Stump TE, Ricketts GD. Geriatric care management for low-income seniors: a randomized controlled trial. *JAMA* 2007;**298**:2623–33. https://doi.org/10.1001/jama.298.22.2623

210. Counsell SR, Callahan CM, Tu W, Stump TE, Arling GW. Cost analysis of the Geriatric Resources for Assessment and Care of Elders care management intervention. *J Am Geriatr Soc* 2009;**57**:1420–6. https://doi.org/10.1111/j.1532-5415.2009.02383.x

211. Dorr DA, Wilcox AB, Brunker CP, Burdon RE, Donnelly SM. The effect of technology-supported, multidisease care management on the mortality and hospitalization of seniors. *J Am Geriatr Soc* 2008;**56**:2195–202. https://doi.org/10.1111/j.1532-5415.2008.02005.x

212. Ettner SL, Kotlerman J, Afifi A, Vazirani S, Hays RD, Shapiro M, Cowan M. An alternative approach to reducing the costs of patient care? A controlled trial of the multi-disciplinary doctor-nurse practitioner (MDNP) model. *Med Decis Making* 2006;**26**:9–17. https://doi.org/10.1177/0272989X05284107

213. Fagan P, Schuster A, Boyd C, Marsteller J, Griswold M, Murphy S. Chronic care improvement in primary care: evaluation of an integrated pay-for-performance and practice-based care coordination program among elderly patients with diabetes. *Health Serv Res* 2010;**45**:1763–82. https://doi.org/10.1111/j.1475-6773.2010.01166.x

214. Farmer JE, Clark MJ, Drewel EH, Swenson TM, Ge B. Consultative care coordination through the medical home for CSHCN: a randomized controlled trial. *Matern Child Health J* 2011;**15**:1110–18. https://doi.org/10.1007/s10995-010-0658-8

215. Gray D, Armstrong CD, Dahrouge S, Hogg W, Zhang W. Cost-effectiveness of anticipatory and preventive multidisciplinary team care for complex patients: evidence from a randomized controlled trial. *Can Fam Physician* 2010;**56**:e20–9.

216. Hajewski CJ, Shirey MR. Care coordination: a model for the acute care hospital setting. *J Nurs Adm* 2014;**44**:577–85. https://doi.org/10.1097/NNA.0000000000000129

217. Hammar T, Rissanen P, Perälä ML. The cost-effectiveness of integrated home care and discharge practice for home care patients. *Health Policy* 2009;**92**:10–20. https://doi.org/10.1016/j.healthpol.2009.02.002

218. Hébert R, Raîche M, Dubois MF, Gueye NR, Dubuc N, Tousignant M, PRISMA Group. Impact of PRISMA, a coordination-type integrated service delivery system for frail older people in Quebec (Canada): a quasi-experimental study. *J Gerontol B Psychol Sci Soc Sci* 2010;**65B**:107–18. https://doi.org/10.1093/geronb/gbp027

219. Hildebrandt H, Schulte T, Stunder B. Triple Aim in Kinzigtal, Germany: improving population health, integrating health care and reducing costs of care – lessons for the UK? *J Integr Care* 2012;**20**:205–22. https://doi.org/10.1108/14769011211255249

220. Hogg W, Lemelin J, Dahrouge S, Liddy C, Armstrong CD, Legault F, *et al.* Randomized controlled trial of anticipatory and preventive multidisciplinary team care: for complex patients in a community-based primary care setting. *Can Fam Physician* 2009;**55**:e76–85.

221. Hullick C, Conway J, Higgins I, Hewitt J, Dilworth S, Holliday E, Attia J. Emergency department transfers and hospital admissions from residential aged care facilities: a controlled pre–post design study. *BMC Geriatr* 2016;**16**:102. https://doi.org/10.1186/s12877-016-0279-1

222. Jack BW, Chetty VK, Anthony D, Greenwald JL, Sanchez GM, Johnson AE, *et al.* A reengineered hospital discharge program to decrease rehospitalization: a randomized trial. *Ann Intern Med* 2009;**150**:178–87. https://doi.org/10.7326/0003-4819-150-3-200902030-00007

223. Janse B, Huijsman R, de Kuyper RD, Fabbricotti IN. The effects of an integrated care intervention for the frail elderly on informal caregivers: a quasi-experimental study. *BMC Geriatr* 2014;**14**:58. https://doi.org/10.1186/1471-2318-14-58

224. Janse B, Huijsman R, Fabbricotti IN. A quasi-experimental study of the effects of an integrated care intervention for the frail elderly on informal caregivers' satisfaction with care and support. *BMC Health Serv Res* 2014;**14**:140. https://doi.org/10.1186/1472-6963-14-140

225. Katon W, Russo J, Lin EH, Schmittdiel J, Ciechanowski P, Ludman E, *et al.* Cost-effectiveness of a multicondition collaborative care intervention: a randomized controlled trial. *Arch Gen Psychiatry* 2012;**69**:506–14. https://doi.org/10.1001/archgenpsychiatry.2011.1548

226. Martinussen M, Adolfsen F, Lauritzen C, Richardsen AM. Improving interprofessional collaboration in a community setting: relationships with burnout, engagement and service quality. *J Interprof Care* 2012;**26**:219–25. https://doi.org/10.3109/13561820.2011.647125

227. McGregor M, Lin EH, Katon WJ. TEAMcare: an integrated multicondition collaborative care program for chronic illnesses and depression. *J Ambul Care Manage* 2011;**34**:152–62. https://doi.org/10.1097/JAC.0b013e31820ef6a4

228. Morales-Asencio JM, Gonzalo-Jiménez E, Martin-Santos FJ, Morilla-Herrera JC, Celdráan-Mañas M, Carrasco AM, *et al.* Effectiveness of a nurse-led case management home care model in primary health care. A quasi-experimental, controlled, multi-centre study. *BMC Health Serv Res* 2008;**8**:193. https://doi.org/10.1186/1472-6963-8-193

229. Olsson LE, Hansson E, Ekman I, Karlsson J. A cost-effectiveness study of a patient-centred integrated care pathway. *J Adv Nurs* 2009;**65**:1626–35. https://doi.org/10.1111/j.1365-2648.2009.05017.x

230. Parsons M, Senior H, Kerse N, Chen MH, Jacobs S, Vanderhoorn S, Anderson C. Should care managers for older adults be located in primary care? A randomized controlled trial. *J Am Geriatr Soc* 2012;**60**:86–92. https://doi.org/10.1111/j.1532-5415.2011.03763.x

231. Paulus AT, van Raak AJ. The impact of integrated care on direct nursing home care. *Health Policy* 2008;**85**:45–59. https://doi.org/10.1016/j.healthpol.2007.05.014

232. Paulus AT, van Raak AJ, Maarse HJ. Is integrated nursing home care cheaper than traditional care? A cost comparison. *Int J Nurs Stud* 2008;**45**:1764–77. https://doi.org/10.1016/j.ijnurstu.2008.05.005

233. Rosenheck R, Leslie D, Sint K, Lin H, Robinson DG, Schooler NR, *et al.* Cost-effectiveness of comprehensive, integrated care for first episode psychosis in the NIMH RAISE Early Treatment Program. *Schizophr Bull* 2016;**42**:896–906. https://doi.org/10.1093/schbul/sbv224

234. Sahlen KG, Boman K, Brännström M. A cost-effectiveness study of person-centered integrated heart failure and palliative home care: based on a randomized controlled trial. *Palliat Med* 2016;**30**:296–302. https://doi.org/10.1177/0269216315618544

235. Salmon RB, Sanderson MI, Walters BA, Kennedy K, Flores RC, Muney AM. A collaborative accountable care model in three practices showed promising early results on costs and quality of care. *Health Aff* 2012;**31**:2379–87. https://doi.org/10.1377/hlthaff.2012.0354

236. de Stampa M, Vedel I, Buyck JF, Lapointe L, Bergman H, Béland F, Ankri J. Impact on hospital admissions of an integrated primary care model for very frail elderly patients. *Arch Gerontol Geriatr* 2014;**58**:350–5. https://doi.org/10.1016/j.archger.2014.01.005

237. Stewart M, Sangster JF, Ryan BL, Hoch JS, Cohen I, McWilliam CL, *et al.* Integrating physician services in the home: evaluation of an innovative program. *Can Fam Physician* 2010;**56**:1166–74.

238. Taylor A, Lizzi M, Marx A, Chilkatowsky M, Trachtenberg SW, Ogle S. Implementing a care coordination program for children with special healthcare needs: partnering with families and providers. *J Healthc Qual* 2013;**35**:70–7. https://doi.org/10.1111/j.1945-1474.2012.00215.x

239. Theodoridou A, Hengartner MP, Gairing SK, Jäger M, Ketteler D, Kawohl W, *et al.* Evaluation of a new person-centered integrated care model in psychiatry. *Psychiatr Q* 2015;**86**:153–68. https://doi.org/10.1007/s11126-014-9310-x

240. van der Marck MA, Munneke M, Mulleners W, Hoogerwaard EM, Borm GF, Overeem S, Bloem BR, IMPACT study group. Integrated multidisciplinary care in Parkinson's disease: a non-randomised, controlled trial (IMPACT). *Lancet Neurol* 2013;**12**:947–56. https://doi.org/10.1016/S1474-4422(13)70196-0

241. van Gils RF, Bosmans JE, Boot CR, Rustemeyer T, van Mechelen W, van der Valk PG, Anema JR. Economic evaluation of an integrated care programme for patients with hand dermatitis. *Contact Derm* 2013;**69**:144–52. https://doi.org/10.1111/cod.12095

242. Wennberg DE, Marr A, Lang L, O'Malley S, Bennett G. A randomized trial of a telephone care-management strategy. *N Engl J Med* 2010;**363**:1245–55. https://doi.org/10.1056/NEJMsa0902321

243. Berry LL, Rock BL, Smith Houskamp B, Brueggeman J, Tucker L. Care coordination for patients with complex health profiles in inpatient and outpatient settings. *Mayo Clin Proc* 2013;**88**:184–94. https://doi.org/10.1016/j.mayocp.2012.10.016

244. Blewett LA, Owen RA. Accountable care for the poor and underserved: Minnesota's Hennepin Health model. *Am J Public Health* 2015;**105**:622–4. https://doi.org/10.2105/AJPH.2014.302432

245. Brawer PA, Martielli R, Pye PL, Manwaring J, Tierney A. St. Louis Initiative for Integrated Care Excellence (SLI(2)CE): integrated-collaborative care on a large scale model. *Fam Syst Health* 2010;**28**:175–87. https://doi.org/10.1037/a0020342

246. Breton M, Pineault R, Levesque J-F, Roberge D, Da Silva RB, Prud'homme A. Reforming healthcare systems on a locally integrated basis: is there a potential for increasing collaborations in primary healthcare? *BMC Health Serv Res* 2013;**13**:262. https://doi.org/10.1186/1472-6963-13-262

247. Brokel JM, Harrison MI. Redesigning care processes using an electronic health record: a system's experience. *Jt Comm J Qual Patient Saf* 2009;**35**:82–92. https://doi.org/10.1016/S1553-7250(09)35011-4

248. Callaly T, von Treuer K, van Hamond T, Windle K. Forming and sustaining partnerships to provide integrated services for young people: an overview based on the headspace Geelong experience. *Early Interv Psychiatry* 2011;**5**(Suppl. 1):28–33. https://doi.org/10.1111/j.1751-7893.2010.00237.x

249. Chen C, Garrido T, Chock D, Okawa G, Liang L. The Kaiser Permanente Electronic Health Record: transforming and streamlining modalities of care. *Health Aff* 2009;**28**:323–33. https://doi.org/10.1377/hlthaff.28.2.323

250. Cohen E, Lacombe-Duncan A, Spalding K, MacInnis J, Nicholas D, Narayanan UG, *et al.* Integrated complex care coordination for children with medical complexity: a mixed-methods evaluation of tertiary care-community collaboration. *BMC Health Serv Res* 2012;**12**:366. https://doi.org/10.1186/1472-6963-12-366

251. Epstein AM, Jha AK, Orav EJ, Liebman DL, Audet AM, Zezza MA, Guterman S. Analysis of early Accountable Care Organizations defines patient, structural, cost, and quality-of-care characteristics. *Health Aff* 2014;**33**:95–102. https://doi.org/10.1377/hlthaff.2013.1063

252. Fuller RL, Clinton S, Goldfield NI, Kelly WP. Building the affordable medical home. *J Ambul Care Manage* 2010;**33**:71–80. https://doi.org/10.1097/JAC.0b013e3181c9fca9

253. Guerrero EG, Aarons GA, Palinkas LA. Organizational capacity for service integration in community-based addiction health services. *Am J Public Health* 2014;**104**:e40–7. https://doi.org/10.2105/AJPH.2013.301842

254. Hartgerink JM, Cramm JM, Bakker TJ, van Eijsden RA, Mackenbach JP, Nieboer AP. The importance of relational coordination for integrated care delivery to older patients in the hospital. *J Nurs Manag* 2014;**22**:248–56. https://doi.org/10.1111/j.1365-2834.2012.01481.x

255. Hébert R, Veil A, Raîche M, Dubois MF, Dubuc N, Tousignant M. Evaluation of the implementation of PRISMA, a coordination-type integrated service delivery system for frail older people in Québec. *J Integr Care* 2008;**16**:4–14. https://doi.org/10.1108/14769018200800041

256. Kautz CM, Gittell JH, Weinberg DB, Lusenhop RW, Wright J. Patient benefits from participating in an integrated delivery system: impact on coordination of care. *Health Care Manage Rev* 2007;**32**:284–94. https://doi.org/10.1097/01.HMR.0000281629.30149.b1

257. Khanna N, Shaya F, Chirikov V, Steffen B, Sharp D. Dissemination and adoption of the advanced primary care model in the Maryland multi-payer patient centered medical home program. *J Health Care Poor Underserved* 2014;**25**(Suppl. 1):122–38. https://doi.org/10.1353/hpu.2014.0066

258. Ouwens MM, Hermens RR, Termeer RA, Vonk-Okhuijsen SY, Tjan-Heijnen VC, Verhagen AF, *et al.* Quality of integrated care for patients with nonsmall cell lung cancer: variations and determinants of care. *Cancer* 2007;**110**:1782–90. https://doi.org/10.1002/cncr.22986

259. Pineault R, Borgès Da Silva R, Prud'homme A, Fournier M, Couture A, Provost S, Levesque JF. Impact of Québec's healthcare reforms on the organization of primary healthcare (PHC): a 2003–2010 follow-up. *BMC Health Serv Res* 2014;**14**:229. https://doi.org/10.1186/1472-6963-14-229

260. Veerbeek L, van Zuylen L, Swart SJ, van der Maas PJ, de Vogel-Voogt E, van der Rijt CC, van der Heide A. The effect of the Liverpool Care Pathway for the dying: a multi-centre study. *Palliat Med* 2008;**22**:145–51. https://doi.org/10.1177/0269216307087164

261. Weaver FM, Hickey EC, Hughes SL, Parker V, Fortunato D, Rose J, *et al.* Providing all-inclusive care for frail elderly veterans: evaluation of three models of care. *J Am Geriatr Soc* 2008;**56**:345–53. https://doi.org/10.1111/j.1532-5415.2007.01538.x

262. Wedel R, Kalischuk RG, Patterson E, Brown S. Turning vision into reality: successful integration of primary healthcare in Taber, Canada. *Healthc Policy* 2007;**3**:80–95. https://doi.org/10.12927/hcpol.2007.19175

263. Ahgren B, Axelsson R. Determinants of integrated health care development: chains of care in Sweden. *Int J Health Plann Manage* 2007;**22**:145–57. https://doi.org/10.1002/hpm.870

264. Ahgren B, Nordgren L. Is choice of care compatible with integrated health care? An exploratory study in Sweden. *Int J Health Plann Manage* 2012;**27**:e162–72. https://doi.org/10.1002/hpm.2104

265. Alexander JA, Cohen GR, Wise CG, Green LA. The policy context of patient centered medical homes: perspectives of primary care providers. *J Gen Intern Med* 2013;**28**:147–53. https://doi.org/10.1007/s11606-012-2135-0

266. Anderson JK, Bonner A, Grootjans J. Collaboration: developing integration in multipurpose services in rural New South Wales, Australia. *Rural Remote Health* 2011;**11**:1–7.

267. Banfield M, Gardner K, McRae I, Gillespie J, Wells R, Yen L. Unlocking information for coordination of care in Australia: a qualitative study of information continuity in four primary health care models. *BMC Fam Pract* 2013;**14**:34. https://doi.org/10.1186/1471-2296-14-34

268. Berendsen AJ, Benneker WH, Schuling J, Rijkers-Koorn N, Slaets JP, Meyboom-de Jong B. Collaboration with general practitioners: preferences of medical specialists – a qualitative study. *BMC Health Serv Res* 2006;**6**:155. https://doi.org/10.1186/1472-6963-6-155

269. Birken SA, Lee SY, Weiner BJ, Chin MH, Schaefer CT. Improving the effectiveness of health care innovation implementation: middle managers as change agents. *Med Care Res Rev* 2013;**70**:29–45. https://doi.org/10.1177/1077558712457427

270. Brousselle A, Lamothe L, Sylvain C, Foro A, Perreault M. Integrating services for patients with mental and substance use disorders: what matters? *Health Care Manage Rev* 2010;**35**:212–23. https://doi.org/10.1097/HMR.0b013e3181d5b11c

271. Camden C, Swaine B, Tétreault S, Carrière M. Going beyond the identification of change facilitators to effectively implement a new model of services: lessons learned from a case example in paediatric rehabilitation. *Dev Neurorehabil* 2011;**14**:247–60. https://doi.org/10.3109/17518423.2011.577049

272. Carter WC, Lee SY, Thomas KC, Morrissey J. Managed care, inter-agency linkages, and outpatient substance abuse treatment. *Adm Policy Ment Health* 2006;**33**:122–31. https://doi.org/10.1007/s10488-005-0010-6

273. Collinsworth A, Vulimiri M, Snead C, Walton J. Community health workers in primary care practice: redesigning health care delivery systems to extend and improve diabetes care in underserved populations. *Health Promot Pract* 2014;**15**(Suppl. 2):51–61. https://doi.org/10.1177/1524839914539961

274. Costich JF, Scutchfield FD, Ingram RC. Population health, public health, and accountable care: emerging roles and relationships. *Am J Public Health* 2015;**105**:846–50. https://doi.org/10.2105/AJPH.2014.302484

275. DeMiglio L, Williams A. Factors enabling shared care with primary healthcare providers in community settings: the experiences of interdisciplinary palliative care teams. *J Palliat Care* 2012;**28**:282–9.

276. Donnelly C, Brenchley C, Crawford C, Letts L. The integration of occupational therapy into primary care: a multiple case study design. *BMC Fam Pract* 2013;**14**:60. https://doi.org/10.1186/1471-2296-14-60

277. Fagnan LJ, Dorr DA, Davis M, McGinnis P, Mahler J, King MM, Michaels L. Turning on the care coordination switch in rural primary care: voices from the practices – clinician champions, clinician partners, administrators, and nurse care managers. *J Ambul Care Manage* 2011;**34**:304–18. https://doi.org/10.1097/JAC.0b013e31821c63ee

278. Gaboury I, Bujold M, Boon H, Moher D. Interprofessional collaboration within Canadian integrative healthcare clinics: key components. *Soc Sci Med* 2009;**69**:707–15. https://doi.org/10.1016/j.socscimed.2009.05.048

279. Hadjistavropoulos HD, Dunn-Pierce T, Biem HJ. Provider perceptions of implementation of integrated care pathways for patients with chronic heart conditions. *Can J Cardiovasc Nurs* 2008;**18**:20–6.

280. Hogan C, Barry M, Burke M, Joyce P. Healthcare professionals' experiences of the implementation of integrated care pathways. *Int J Health Care Qual Assur* 2011;**24**:334–47. https://doi.org/10.1108/09526861111139179

281. Hroscikoski MC, Solberg LI, Sperl-Hillen JM, Harper PG, McGrail MP, Crabtree BF. Challenges of change: a qualitative study of chronic care model implementation. *Ann Fam Med* 2006;**4**:317–26. https://doi.org/10.1370/afm.570

282. Jové AM, Fernández A, Hughes C, Guillén-Solà M, Rovira M, Rubio-Valera M. Perceptions of collaboration between general practitioners and community pharmacists: findings from a qualitative study based in Spain. *J Interprof Care* 2014;**28**:352–7. https://doi.org/10.3109/13561820.2014.898621

283. Kathol RG, Butler M, McAlpine DD, Kane RL. Barriers to physical and mental condition integrated service delivery. *Psychosom Med* 2010;**72**:511–18. https://doi.org/10.1097/PSY.0b013e3181e2c4a0

284. Kilbourne AM, Greenwald DE, Bauer MS, Charns MP, Yano EM. Mental health provider perspectives regarding integrated medical care for patients with serious mental illness. *Adm Policy Ment Health* 2012;**39**:448–57. https://doi.org/10.1007/s10488-011-0365-9

285. Kilbourne AM, Irmiter C, Capobianco J, Reynolds K, Milner K, Barry K, Blow FC. Improving integrated general medical and mental health services in community-based practices. *Adm Policy Ment Health* 2008;**35**:337–45. https://doi.org/10.1007/s10488-008-0177-8

286. Kreindler SA, Larson BK, Wu FM, Carluzzo KL, Gbemudu JN, Struthers A, *et al.* Interpretations of integration in early Accountable Care Organizations. *Milbank Q* 2012;**90**:457–83. https://doi.org/10.1111/j.1468-0009.2012.00671.x

287. Lewis VA, Colla CH, Schoenherr KE, Shortell SM, Fisher ES. Innovation in the safety net: integrating community health centers through accountable care. *J Gen Intern Med* 2014;**29**:1484–90. https://doi.org/10.1007/s11606-014-2911-0

288. Lukas CV, Holmes SK, Cohen AB, Restuccia J, Cramer IE, Shwartz M, Charns MP. Transformational change in health care systems: an organizational model. *Health Care Manage Rev* 2007;**32**:309–20. https://doi.org/10.1097/01.HMR.0000296785.29718.5d

289. Lyngsø AM, Godtfredsen NS, Frølich A. Interorganisational integration: healthcare professionals' perspectives on barriers and facilitators within the Danish healthcare system. *Int J Integr Care* 2016;**16**:4. https://doi.org/10.5334/ijic.2449

290. Minkman MM, Ligthart SA, Huijsman R. Integrated dementia care in the Netherlands: a multiple case study of case management programmes. *Health Soc Care Community* 2009;**17**:485–94. https://doi.org/10.1111/j.1365-2524.2009.00850.x

291. Ortiz J, Bushy A, Zhou Y, Zhang H. Accountable Care Organizations: benefits and barriers as perceived by rural health clinic management. *Rural Remote Health* 2013;**13**:2417.

292. Ottevanger N, Hilbink M, Weenk M, Janssen R, Vrijmoeth T, de Vries A, Hermens R. Oncologic multidisciplinary team meetings: evaluation of quality criteria. *J Eval Clin Pract* 2013;**19**:1035–43. https://doi.org/10.1111/jep.12022

293. Ruppert D, Stegbauer C, Bramesfeld A, Bestmann B, Szecsenyi J, Gotz K. 'Hope dies last . . .' – cross-sectoral cooperation in integrated care. *Psychiatr Prax* 2016;**9**:9.

294. Rosen R, Mountford J, Lewis G, Lewis R, Shand J, Shaw S. *Integration in Action: Four International Case Studies*. London: Nuffield Trust; 2011.

295. Tousijn W. Integrating health and social care: interprofessional relations of multidisciplinary teams in Italy. *Current Sociol* 2012;**60**:522–37. https://doi.org/10.1177/0011392112438335

296. Tummers JF, Schrijvers AJ, Visser-Meily JM. A qualitative study of stakeholder views on the effects of provider payment on cooperation, quality of care and cost-containment in integrated stroke care. *BMC Health Serv Res* 2013;**13**:127. https://doi.org/10.1186/1472-6963-13-127

297. Walker KO, Labat A, Choi J, Schmittdiel J, Stewart AL, Grumbach K. Patient perceptions of integrated care: confused by the term, clear on the concept. *Int J Integr Care* 2013;**13**:e004.

298. Wang MC, Hyun JK, Harrison M, Shortell SM, Fraser I. Redesigning health systems for quality: lessons from emerging practices. *Jt Comm J Qual Patient Saf* 2006;**32**:599–611. https://doi.org/10.1016/S1553-7250(06)32078-8

299. Wodskou PM, Høst D, Godtfredsen NS, Frølich A. A qualitative study of integrated care from the perspectives of patients with chronic obstructive pulmonary disease and their relatives. *BMC Health Serv Res* 2014;**14**:471. https://doi.org/10.1186/1472-6963-14-471

300. Addicott R. Challenges of commissioning and contracting for integrated care in the National Health Service (NHS) in England. *Aust J Prim Health* 2016;**22**:50–4. https://doi.org/10.1071/PY15067

301. Katon W, Unützer J, Fan MY, Williams JW, Schoenbaum M, Lin EH, Hunkeler EM. Cost-effectiveness and net benefit of enhanced treatment of depression for older adults with diabetes and depression. *Diabetes Care* 2006;**29**:265–70. https://doi.org/10.2337/diacare.29.02.06.dc05-1572

302. van Gils RF, Boot CR, Knol DL, Rustemeyer T, van Mechelen W, van der Valk PG, Anema JR. The effectiveness of integrated care for patients with hand eczema: results of a randomized, controlled trial. *Contact Derm* 2012;**66**:197–204. https://doi.org/10.1111/j.1600-0536.2011.02024.x

303. Johnston B, Buchanan D, Papadopoulou C, Sandeman G, Lord H. Integrating palliative care in lung cancer: an early feasibility study. *Int J Palliat Nurs* 2013;**19**:433–7. https://doi.org/10.12968/ijpn.2013.19.9.433

304. Macfarlane DP, Voigt D, Mackie A, Brennan G. Introduction of an integrated care pathway improves management of diabetic ketoacidosis. *Diabetic Med* 2011;**28**:191.

305. Anderson A, Chojnacka I. Benefits of using the Liverpool Care Pathway in end of life care. *Nurs Stand* 2012;**26**:42–50. https://doi.org/10.7748/ns2012.04.26.34.42.c9066

306. Brännström M, Boman K. A new model for integrated heart failure and palliative advanced homecare – rationale and design of a prospective randomized study. *Eur J Cardiovasc Nurs* 2013;**12**:269–75. https://doi.org/10.1177/1474515112445430

307. Cohen E, Bruce-Barrett C, Kingsnorth S, Keilty K, Cooper A, Daub S. Integrated complex care model: lessons learned from inter-organizational partnership. *Healthc Q* 2011;**14**:64–70. https://doi.org/10.12927/hcq.0000.22580

308. Brewah H. Integrated health care for patients with motor neurone disease. *Br J Nurs* 2013;**22**:1182–8. https://doi.org/10.12968/bjon.2013.22.20.1182

309. Oliver R, Thakar R, Sultan AH, Phillimore A. Urogynecology triage clinic: a model of healthcare delivery. *Int Urogynecol J Pelvic Floor Dysfunct* 2009;**20**:913–17. https://doi.org/10.1007/s00192-009-0878-x

Appendix 1 Search strategy

MEDLINE, MEDLINE In-Process & Other Non-Indexed Citations, Epub Ahead of Print, MEDLINE without Revisions via OvidSP

Search strategy

1. (care adj1 model*).ti,ab.
2. new.ti,ab.
3. 1 and 2
4. (model* adj1 service delivery).ti,ab.
5. (model* adj1 (healthcare or health care or health-care)).ti,ab.
6. (transform* adj1 (service* or care)).ti,ab.
7. ("integration of care" or integrated care).ti,ab.
8. (integrated system* and health).ti,ab.
9. (vanguard* and (health or service*)).ti,ab.
10. accountable care.ti,ab.
11. (future proof* or future-proof* or futureproof*).ti,ab.
12. (reform* adj (health or service* or care or healthcare)).ti,ab.
13. (service* adj1 redesign*).ti,ab.
14. "five year forward view".ti,ab.
15. ((health or healthcare or service*) adj reform*).ti.
16. or/3-15
17. *Health Care Reform/
18. *Organizational Innovation/
19. *Quality Improvement/
20. *Health Priorities/
21. *Accountable Care Organizations/
22. *"Delivery of Health Care, Integrated"/
23. (og or td).fs.
24. or/17-22
25. 23 and 24
26. (health service* or healthcare or health care or model*).ti,ab.
27. 25 and 26
28. 16 or 27
29. limit 28 to english language
30. limit 29 to yr="2006-Current"

Search filters

- To retrieve systematic reviews, the following search filter was combined with (AND) line 30 of the above search strategy: Scottish Intercollegiate Guidelines Network (SIGN). Search Filters: Systematic Reviews. Available from www.sign.ac.uk/assets/search-filters-systematic-reviews.docx (accessed 5 July 2017).
- To retrieve UK primary studies, the following terms were combined with (AND) line 30 of the above search strategy: exp Great Britain/ OR (Britain or british or wales or welsh or Scottish or scots or Scotland or England or English or Birmingham or leeds or London or Liverpool or Manchester or Glasgow or Edinburgh or Cardiff or Belfast or UK or GB or aberdeen).ti,ab,in,hw.

EMBASE via OvidSP

Search strategy

1. (care adj1 model*).ti,ab.
2. new.ti,ab.
3. 1 and 2
4. (model* adj1 service delivery).ti,ab.
5. (model* adj1 (healthcare or health care or health care)).ti,ab.
6. (transform* adj1 (service* or care)).ti,ab.
7. ("integration of care" or integrated care).ti,ab.
8. (integrated system* and health).ti,ab.
9. (vanguard* and (health or service*)).ti,ab.
10. accountable care.ti,ab.
11. (future proof* or future-proof* or futureproof*).ti,ab.
12. (reform* adj (health or service* or care or healthcare)).ti,ab.
13. (service* adj1 redesign*).ti,ab.
14. "five year forward view".ti,ab.
15. ((health or healthcare or service*) adj reform*).ti.
16. or/3-15
17. *Health Care Reform/
18. *Organizational Innovation/
19. *Quality Improvement/
20. *Health Priorities/
21. *Accountable Care Organizations/
22. *"Delivery of Health Care, Integrated"/
23. (og or td).fs.
24. or/17-22
25. 23 and 24
26. (health service* or healthcare or health care or model*).ti,ab.
27. 25 and 26
28. 16 or 27
29. limit 28 to embase
30. limit 29 to english language
31. limit 30 to yr="2006-Current"

Search filters

- To retrieve systematic reviews, the following search filter was combined with (AND) line 31 of the above search strategy: Scottish Intercollegiate Guidelines Network (SIGN). Search Filters: Systematic Reviews. Available from: www.sign.ac.uk/assets/search-filters-systematic-reviews.docx (accessed 5 July 2017).
- To retrieve UK primary studies, the following terms were combined with (AND) line 31 of the above search strategy: exp Great Britain/ OR (Britain or british or wales or welsh or Scottish or scots or Scotland or England or English or Birmingham or leeds or London or Liverpool or Manchester or Glasgow or Edinburgh or Cardiff or Belfast or UK or GB or aberdeen).ti,ab,in,hw.

Cumulative Index to Nursing and Allied Health Literature via EBSCO*host*

Search strategy

S1 TI (care n1 model*) OR AB (care n1 model*)
S2 TI new OR AB new
S3 S1 AND S2
S4 TI (model* n1 service delivery) OR AB (model* n1 service delivery)
S5 TI ((model* n1 (healthcare or health care or health-care))) OR AB ((model* n1 (healthcare or health care or health-care)))
S6 TI ((transform* n1 (service* or care))) OR AB ((transform* n1 (service* or care)))
S7 TI (("integration of care" or integrated care)) OR AB (("integration of care" or integrated care))
S8 TI ((integrated system* and health)) OR AB ((integrated system* and health))
S9 TI ((vanguard* and (health or service*))) OR AB ((vanguard* and (health or service*)))
S10 TI accountable care OR AB accountable care
S11 TI ((future proof* or future-proof* or futureproof*)) OR AB ((future proof* or future-proof* or futureproof*))
S12 TI ((reform* n1 (health or service* or care or healthcare))) OR AB ((reform* n1 (health or service* or care or healthcare)))
S13 TI (service* n1 redesign*) OR AB (service* n1 redesign*)
S14 TI "five year forward view" OR AB "five year forward view"
S15 S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14
S16 S3 OR S15
S17 (MM "Health Care Reform")
S18 (MM "Diffusion of Innovation") OR (MM "Organizational Change")
S19 (MM "Quality Improvement")
S20 (MM "Accountable Care Organizations")
S21 (MM "Health Care Delivery, Integrated")
S22 MW OG or TD
S23 S17 OR S18 OR S19 OR S20 OR S21
S24 S22 AND S23
S25 TI ((health service* or healthcare or health care or model*)) OR AB ((health service* or healthcare or health care or model*))
S26 S24 AND S25
S27 S16 OR S26

Search filters

- To retrieve systematic reviews, the following search filter was combined with (AND) line S27 of the above search strategy: Scottish Intercollegiate Guidelines Network (SIGN). Search Filters: Systematic Reviews. Available from: www.sign.ac.uk/assets/search-filters-systematic-reviews.docx (accessed 5 July 2017).
- To retrieve UK primary studies, the following terms were combined with (AND) line S27 of the above search strategy: (MH 'Great Britain') OR (Britain or british or wales or welsh or Scottish or scots or Scotland or England or English or Birmingham or leeds or London or Liverpool or Manchester or Glasgow or Edinburgh or Cardiff or Belfast or UK or GB or aberdeen).
- Search results were refined to English language and 2006–16 publication dates.

PyscINFO via OvidSP

Search strategy

1. (care adj1 model*).ti,ab.
2. new.ti,ab.
3. 1 and 2
4. (model* adj1 service delivery).ti,ab.
5. (model* adj1 (healthcare or health care or health-care)).ti,ab.
6. (transform* adj1 (service* or care)).ti,ab.
7. ("integration of care" or integrated care).ti,ab.
8. (integrated system* and health).ti,ab.
9. (vanguard* and (health or service*)).ti,ab.
10. accountable care.ti,ab.
11. (future proof* or future-proof* or futureproof*).ti,ab.
12. (reform* adj (health or service* or care or healthcare)).ti,ab.
13. (service* adj1 redesign*).ti,ab.
14. "five year forward view".ti,ab.
15. ((health or healthcare or service*) adj reform*).ti.
16. or/3-15
17. *Health Care Reform
18. *Organizational Innovation/
19. *Integrated Services/
20. 17 or 18 or 19
21. (health service* or healthcare or health care or model*).ti,ab.
22. 20 and 21
23. 16 or 22
24. limit 23 to english language
25. limit 24 to yr="2006-Current"

Search filters

- To retrieve systematic reviews, the following search filter was combined with (AND) line 25 of the above search strategy: The University of Texas School of Public Health. Search Filters for Various Databases: Ovid PsycINFO (Systematic reviews and meta-analyses). Available from: http://libguides.sph.uth.tmc.edu/search_filters/ovid_psycinfo_filters [accessed 5 July 2017).
- To retrieve UK primary studies, the following terms were combined with (AND) line 25 of the above search strategy: (Britain or british or wales or welsh or Scottish or scots or Scotland or England or English or Birmingham or leeds or London or Liverpool or Manchester or Glasgow or Edinburgh or Cardiff or Belfast or UK or GB or aberdeen).ti,ab,in,hw.

The Cochrane Library (Database of Abstracts of Reviews of Effects, Cochrane Database of Systematic Reviews, Cochrane Central Register of Controlled Trials and Health Technology Assessment)

Search strategy

#1 (care near/1 model*):ti,ab,kw (Word variations have been searched)
#2 new:ti,ab
#3 #1 and #2
#4 (model* near/1 service delivery):ti,ab
#5 (model* near/1 (healthcare or health care or health-care)):ti,ab

#6 (transform* near/1 (service* or care)):ti,ab
#7 (“integration of care” or integrated care):ti,ab
#8 (integrated system* and health):ti,ab
#9 (vanguard* and (health or service*)):ti,ab
#10 accountable care:ti,ab
#11 (future proof* or future-proof* or futureproof*):ti,ab
#12 (reform* next (health or service* or care or healthcare)):ti,ab
#13 (service* near/1 redesign*):ti,ab
#14 "five year forward view":ti,ab
#15 ((health or healthcare or service*) next reform*):ti
#16 {or #3-#15}
#17 MeSH descriptor: [Health Care Reform] this term only
#18 MeSH descriptor: [Organizational Innovation] this term only
#19 MeSH descriptor: [Quality Improvement] this term only
#20 MeSH descriptor: [Health Priorities] this term only
#21 MeSH descriptor: [Accountable Care Organizations] this term only
#22 MeSH descriptor: [Delivery of Health Care, Integrated] this term only
#23 Any MeSH descriptor with qualifier(s): [Organization & administration - OG]
#24 Any MeSH descriptor with qualifier(s): [Trends - TD]
#25 {or #17-#22}
#26 #24 and #25
#27 (health service* or healthcare or health care or model*):ti,ab
#28 #26 and #27
#29 #16 or #28 Publication Year from 2006 to 2016
#30 MeSH descriptor: [Great Britain] explode all trees
#31 (Britain or british or wales or welsh or Scottish or scots or Scotland or England or English or Birmingham or leeds or London or Liverpool or Manchester or Glasgow or Edinburgh or Cardiff or Belfast or UK or GB or aberdeen)
#32 #30 or #31
#33 #29 and #32 – UK primary studies
#34 #29 not #32 - Reviews

Search filters

No search filters were applied to The Cochrane Library searches.

Science Citation Index and Social Sciences Citation Index via Web of Science

#1 TOPIC: (care near/1 model*)
#2 TOPIC: (new)
#3 #2 AND #1
#4 TOPIC: (model* near/1 "service delivery")
#5 TOPIC: (model* near/1 (“healthcare” or "health care” or "health-care"))
#6 TOPIC: ((transform* near/1 (service* or care)))
#7 TOPIC: ((“integration of care” or integrated care))
#8 TOPIC: ((integrated system* and health))
#9 TOPIC: ((vanguard* and (health or service*)))
#10 TOPIC: (accountable care)
#11 TOPIC: ((future proof* or future-proof* or futureproof*))
#12 TOPIC: ((reform* near (health or service* or care or healthcare)))
#13 TOPIC: ((service* near/1 redesign*))
#14 TOPIC: (five year forward view)

#15 TITLE: (((health or healthcare or service*) near reform*))
#16 #15 OR #14 OR #13 OR #12 OR #11 OR #10 OR #9 OR #8 OR #7 OR #6 OR #5 OR #4 OR #3

Search filters

Methodological search filters are not available for Web of Science; therefore, the following approach was used to identify reviews and UK primary studies:

- To retrieve systematic reviews, the following terms were combined with (AND) line #16 of the above search strategy TITLE: ((meta analysis) or (systematic review)) and the search results were refined to 'Review' for document type and the publication years 2006–16.
- To retrieve UK primary studies, the following terms were combined with (AND) line #16 of the above search strategy TS=((Britain or british or wales or welsh or Scottish or scots or Scotland or England or English or Birmingham or leeds or London or Liverpool or Manchester or Glasgow or Edinburgh or Cardiff or Belfast or UK or United Kingdom or GB or aberdeen)) and the search results were refined to 'Article' for document type and the publication years 2006–16.

Appendix 2 Completed quality appraisal checklists

TABLE 11 Quality appraisals: UK RCTs and other studies with comparator groups

	Potential for						
	Selection bias?		Performance bias? (Blinding of participants and personnel)	Detection bias? (Blinding of outcome assessments)	Attrition bias? (Incomplete outcome data assessments)	Potential reporting bias? (Selective reporting)	
First author and year	Random-sequence generation	Allocation concealment					Other sources of bias (comment)
Boyle 2012[39]	NA; anonymised data set	NA	NA	N	N	N	Able to describe associations, not causal links
Clarkson 2011[42]	NA; reanalysis of data from an earlier trial						
Cunningham 2008[44]	N; cluster	N	Y	N/Y	N	N	Many staff failed to complete required documentation
Department of Health and Social Care 2012[45]	NA	NA	Y	Y	Y	N	Service data from intervention sites matched to control areas
Gravelle 2007[48]	NA	NA	N	Y	N	N	Small sample so low power. Definition of high-risk group may be problematic. Used matched controls from other practices in England
Higginson 2014[52]	N	Y	Single blind	Y	N	N	Self-reported primary outcome, short follow-up
Huws 2008[54]	N	N	N (not possible)	N (admissions data)	NA	N	Small number of practices and nurses delivering intervention
Julian 2007[58]	Y; compares different PCTs	N	Not possible	Y	Y	Y; no discussion of study limitations	Some data self-reported diary, only 32% of eligible GPs used the tool
Lyon 2006[63]	Y; compares neighbouring practices	N	Y	Y	N; admissions data	N	Comparative observational study
Roland 2012[74]	NA	NA	N (for hospital data)	N	N	N	Data from both a self-reported questionnaire and hospital routine data. Used matched controls from other areas

	Potential for						
	Selection bias?						
First author and year	Random-sequence generation	Allocation concealment	Performance bias? (Blinding of participants and personnel)	Detection bias? (Blinding of outcome assessments)	Attrition bias? (Incomplete outcome data assessments)	Potential reporting bias? (Selective reporting)	Other sources of bias (comment)
Simmons 2014[77]	N	NA	NA (uses routine data)	N	N	N (only two outcomes)	Only 1 year of data for intervention
Sinclair 2006[78]	NA; crossover design compares period of intervention to no intervention	NA	Not possible	N; data mostly routinely collected patient data	N; routine hospital data	N	The intervention period lasted only 12 weeks
Steventon 2011[81]	N	NA	Not possible	N	N; routine hospital data	N	Most of the data were self-reported
Stokes 2016[82]	NA; anonymised data from a data set, propensity matching, no significant baseline differences	NA	NA	NA	N; data from existing data set	N	Used a difference-in-differences design. Multiple intervention start dates
Waller 2007[85]	NA; all patients in given time frame, small sample, some baseline differences	NA	CD	CD	N; retrospective data from case notes	CD; may have been other service changes in time period	Compares group of patients prior to introduction with a separate group of patients after introduction
Wilberforce 2016[86]	CD; anonymised patient data randomly selected but no details	NA	Y	Y	Y; data for 877 of 960 patients – no explanation for missing data	N	The study is described as observational with two data time points, but compares two forms of teams and conclusions are based on this comparison

CD, cannot determine; N, no; NA, not applicable; NR, not reported; Y, yes.

TABLE 12 Quality appraisals: UK before-and-after/cohort studies

	Quality criteria											
First author and year	Was the study question or objective clearly stated?	Were eligibility/selection criteria for the study population prespecified and clearly described?	Were the participants in the study representative of those who would be eligible for the test/service/intervention in the general or clinical population of interest?	Were all eligible participants who met the prespecified entry criteria enrolled?	Was the sample size sufficiently large to provide confidence in the findings?	Was the test/service/intervention clearly described and delivered consistently across the study population?	Were the outcome measures prespecified, clearly defined, valid, reliable and assessed consistently across all study participants?	Were the people assessing the outcomes blinded to the participants' exposures/interventions?	Was the loss to follow-up after baseline $\leq 20\%$? Were those lost to follow-up accounted for in the analysis?	Did the statistical methods examine changes in outcome measures from before to after the intervention? Were statistical tests done that provided p-values for the pre–post changes?	Were outcome measures of interest taken multiple times before the intervention and multiple times after the intervention (i.e. did they use an interrupted time-series design)?	If the intervention was conducted at a group level (e.g. a whole hospital or a community), did the statistical analysis take into account the use of individual-level data to determine effects at the group level?
Addicott 2008[34]	Y	Y	Y	N	Y	Y	Y	N	NA	Y	N	CD
Ahmad 2007[35]	N	N	Y	CD	N	CD	N	N	NA	CD	N	N
Bakerly 2009[36]	Y	Y	Y	N	CD	Y	Y	N	Y	Y	N	NA
Beacon 2015[37]	Y	N	CD	CD	CD	Y	Y	N	NA	N	N	N
Boyle 2008[40]	Y	NA	Y	NA	Y	Y	Y	N	NA	Y	N	CD
Boyle 2012[38]	Y	NA	Y	NA	Y	Y	Y	N	NA	Y	N	CD
Choo 2014[41]	Y	NA	Y	NA	Y	Y	Y	N	NA	Y	N	CD
Coupe 2013[43]	N	NA	Y	NA	Y	CD	N	N	CD	N	N	NA
Dodd 2011[46]	Y	N	Y	N	N	Y	CD	N	CD	Y	N	CD
Graffy 2008[47]	Y	Y	Y	CD	N	Y	N	N	Y	N	N	N
Ham 2010[49]	Y	Y	Y	CD	Y	N	N	CD	CD	N	N	N; overview of work at a number of sites
Harris 2013[50]	Y	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Hawthorne 2009[51]	Y	NA	NA	NA	Y	CD	CD	N	NA	N	N	NA
Hockley 2010[53]	Y	Y	Y	N	CD	N	Y	N	NA	Y	N	CD
Jha 2007[55]	Y	CD	Y	N	N	CD	Y	N	NA	Y	N	N

First author and year	Quality criteria											
	Was the study question or objective clearly stated?	Were eligibility/ selection criteria for the study population prespecified and clearly described?	Were the participants in the study representative of those who would be eligible for the test/service/ intervention in the general or clinical population of interest?	Were all eligible participants who met the prespecified entry criteria enrolled?	Was the sample size sufficiently large to provide confidence in the findings?	Was the test/service/ intervention clearly described and delivered consistently across the study population?	Were the outcome measures prespecified, clearly defined, valid, reliable and assessed consistently across all study participants?	Were the people assessing the outcomes blinded to the participants' exposures/ interventions?	Was the loss to follow-up after baseline ≤ 20%? Were those lost to follow-up accounted for in the analysis?	Did the statistical methods examine changes in outcome measures from before to after the intervention? Were statistical tests done that provided *p*-values for the pre–post changes?	Were outcome measures of interest taken multiple times before the intervention and multiple times after the intervention (i.e. did they use an interrupted time-series design)?	If the intervention was conducted at a group level (e.g. a whole hospital or a community), did the statistical analysis take into account the use of individual-level data to determine effects at the group level?
Johnstone 2012[57]	Y	Y	Y	N	Y	CD	Y	N	NA	N	N	NA
Kent 2006[59]	Y	NA	Y	NA	Y	CD	Y	N	NA	Y	N	CD
Letton 2013[61]	Y	CD	Y	CD	CD	CD	Y	N	NA	Y	N	CD
Levelt 2008[62]	Y	Y	Y	N	CD	N	Y	N	NA	Y	N	N
Mertes 2013[65]	Y	Y	Y	Y	Y	CD	Y	N	NA	Y	N	N
Ng 2014[66]	Y	CD	Y	Y	Y	CD	Y	N	NA	N	N	N
Paize 2007[68]	Y	Y	Y	CD	N	N	Y	N	NA	N	N	N
Pettie 2011[70]	Y	Y	Y	Y	Y	N	Y	N	NA	Y	N	N
Richings 2011[71]	Y	Y	Y	N	N	CD	Y	N	CD	N	N	N
Roberts 2010[72]	Y	Y	Y	Y	Y	CD	Y	N	NA	Y	N	N
Soljak 2013[80]	Y	Y	Y	CD	Y	CD	Y	Y	CD	Y	N	Y
Tucker 2012[83]	Y	NA	Y (patients)	NA	N	CD	Y	N	NA	N	N	NA
Windle 2009[87]	Y	Y	Y	N	Y	N	CD	N	Y	Y	N	Y

CD, cannot determine; N, no; NA, not applicable; Y, yes.

TABLE 13 Quality appraisals: UK cross-sectional studies

	Quality criteria									
First author and year	Was the research question clearly stated?	Was the study population clearly specified and defined?	Was the participation rate of eligible persons $\geq 50\%$?	Were all the subjects selected or recruited from the same or similar populations (including the same time period)? Were inclusion and exclusion criteria for being in the study prespecified and applied uniformly to all participants?	Was a sample size justification, power description, or variance and effect estimates provided?	For exposures that can vary in amount or level, did the study examine different levels of the exposure as related to the outcome?	Were the exposure measures (independent variables) clearly defined, valid, reliable and implemented consistently across all study participants?	Were the outcome measures (dependent variables) clearly defined, valid, reliable and implemented consistently across all study participants?	Were the outcome assessors blinded to the exposure status of participants?	Were key potential confounding variables measured and adjusted statistically for their impact on the relationship between exposure(s) and outcome(s)?
Lamb 2014[60]	Y	Y	Y; 54%	Y	N	NA	NA	NA; survey of staff	NA	NA; non-comparative
MacLean 2008[64]	Y	N	N	N	N	NA	NA	NA; staff survey	NA	NA; non-comparative
Offredy 2008[67]	N	N	CD	CD	N	CD	CD	CD; limited data	N	N
Pearson 2011[69]	Y	N	CD	CD	N	CD	CD	Y	CD	N
Roberts 2012[73]	Y	Y	Y	Y	N	NA	N	N	N	N
Rowlandson 2009[75]	Y	Y	All eligible	Y	N	NA	NA	Few data on main outcome – timing of referral	NA	NA; non-comparative
Ryan 2007[76]	Y	Y	CD	Y	N	NA	NA	Potential for inconsistent recording of information	NA	NA; non-comparative
Smith 2012[79]	N	N	CD	N	N	NA	NA	N; missing data	NA	NA; non-comparative
Tucker 2009[84]	Y	Y	Y (72%)	Y	NA; all eligible	NA	NA; survey of views	N; no reporting of survey development	NA	NA; non-comparative

CD, cannot determine; N, no; NA, not applicable; Y, yes.

TABLE 14 Quality appraisal: non-UK RCTs and other studies with comparator groups

	Potential for						
	Selection bias?		Performance bias? (Blinding of participants and personnel)	Detection bias? (Blinding of outcome assessments)	Attrition bias? (Incomplete outcome data assessments)	Potential reporting bias? (Selective reporting)	
First author and year	Random-sequence generation	Allocation concealment					Other sources of bias (comment)
Aiken 2006[194]	Y	Y	N	CD	N	N	
Battersby 2007[195]	Y	NA	NA	CD	CD	Y	Some health-care professionals cared for patients in both groups; variable patient selection
Béland 2006;[196] Béland 2006[197]	Y	Y	NA	Y	N	CD	Inadequate statistical power ($n = 1230$, where $n = 1270$ was calculated to detect differences of 25% hospital and 50% nursing home utilisation; some contamination likely
Bird 2010;[198] Bird 2007[199]	N (dummy control)	N	NA	Y	NA	CD	Self-selected groups, cannot establish cause–effect
Bird 2012[200]	N (dummy control)	N	NA	Y	NA	CD	As above
Boult 2013;[201] Boult 2008;[202] Boult 2011[203]	Y (cluster)	Y	NA	Y	Y	N	Inadequate statistical power; incomplete follow-up (frail elderly population)
Brännström 2014[204]	Y	N	NA	N	N	N	Small samples ($n = 36$ in each group), in one setting; intervention group had higher mean age than control
Brown 2012[205]	Y	Y	CD	Y	N	N	Inadequate statistical power
Callahan 2006[206]	Y (cluster)	Y	Until recruitment	Y	Y (but not outcomes relevant to our review)	N	Small samples ($n = 84$ in intervention group, $n = 69$ in control group) therefore inadequate statistical power

continued

TABLE 14 Quality appraisal: non-UK RCTs and other studies with comparator groups (*continued*)

	Potential for						
	Selection bias?						
First author and year	Random-sequence generation	Allocation concealment	Performance bias? (Blinding of participants and personnel)	Detection bias? (Blinding of outcome assessments)	Attrition bias? (Incomplete outcome data assessments)	Potential reporting bias? (Selective reporting)	Other sources of bias (comment)
Colla 2016;[207] Colla 2012[208]	CD	CD	CD	CD	N	N	High degree of heterogeneity
Counsell 2007;[209] Counsell 2009[210]	Y	Y	Researchers blinded	CD	N	N	Multiple outcome measures and testing
Dorr 2008[211]	N	N	N	N	CD	CD	Differences in referral rates among physicians
Ettner 2006[212]	NA	NA	N	CD	N	N	Patients form own control group; self-reported data
Fagan 2010[213]	NA	N	CD	N	Y	N	Lack of data from comparator practices
Farmer 2011[214]	Y	CD	CD	CD	Y	N	Self-reported data; high dropout rate
Gray 2010;[215] Hogg 2009[220]	Y	CD	N	N	N	N	Small sample
Hajewski 2014[216]	N	NA	N	N	Y	CD	Some data sets not available at follow-up (incomplete data recording of complex data)
Hammar 2009[217]	Y	Y	Y (low-risk patients); N (higher risk for researchers recruiting)	N	N	N	Higher number of participants recruited to intervention group than control group
Hébert 2010[218]	N	N	N	N	CD	N	Overall sample identified randomly
Hildebrandt 2012[219]	N	N	N	N	CD	Y	Selective and limited reporting

First author and year	Potential for					Potential reporting bias? (Selective reporting)	Other sources of bias (comment)
	Selection bias?		Performance bias? (Blinding of participants and personnel)	Detection bias? (Blinding of outcome assessments)	Attrition bias? (Incomplete outcome data assessments)		
	Random-sequence generation	Allocation concealment					
Hullick 2016[221]	N	N	N	CD	CD	N	Selection of participants on basis of number of ED attendances
Jack 2009[222]	Y	Partial	Y	CD	N	N	Sample may be younger than other studies Self-reported data
Janse 2014;[223] Janse 2014[224]	N	N	N	CD	Y	N	Small sample size; large loss to follow-up; large number of statistical tests carried out
Martinussen 2012[226]	N	N	N	N	N	CD	Pretest measures not carried out; course was voluntary; self-reported measures
McGregor 2011;[227] Katon 2010[225]	Y	NR	Personnel blinded, blinding of patients not possible	Y	Y	CD/unclear	
Morales-Asencio 2008[228]	N	N	N	N	CD	CD	
Olsson 2009[229]	N	N	N	N	Y	CD	
Parsons 2012[230]	Y (cluster)	N	N	N	CD	CD	Practices randomised before participants identified
Paulus 2008;[231] Paulus 2008[232]	N	N	N	N	NA	CD	
Rosenheck 2016[233]	Y (cluster)	N	CD (blinding of patients not possible)	Y	CD	CD	Practices randomised before participants identified

continued

TABLE 14 Quality appraisal: non-UK RCTs and other studies with comparator groups (*continued*)

	Potential for						
	Selection bias?						
First author and year	Random-sequence generation	Allocation concealment	Performance bias? (Blinding of participants and personnel)	Detection bias? (Blinding of outcome assessments)	Attrition bias? (Incomplete outcome data assessments)	Potential reporting bias? (Selective reporting)	Other sources of bias (comment)
Sahlen 2016[234]	Y	NR	N	N	CD	N	Described as 'open evaluation'; separate methods/protocol paper lists outcomes
Salmon 2012[235]	N	NA	NA	NA	NA	CD	Study uses mainly administrative data
de Stampa 2014[236]	N	N	N	N	CD	CD	
Stewart 2010[237]	N	N	N	N	N	CD	
Taylor 2013[238]	N	N	NA	N	NA	N	Small number of outcomes
Theodoridou 2015[239]	Y	Y	N (not possible)	N	N	CD	Allocation independent of trial personnel
van der Marck 2013[240]	N	N	CD	CD (wording unclear)	Y	CD	
van Gils 2013[241]	Y	Y	N (not possible)	Y	CD	CD	
Wennberg 2010[242]	Y	Y	Y	CD	CD	N	

CD, cannot determine; N, no; NA, not applicable; NR, not reported; Y, yes.

TABLE 15 Quality appraisals: systematic reviews

First author and year	Quality criteria										
	Were the research question and inclusion criteria specified a priori?	Were there at least two data extractors and was there a procedure for disagreements?	Were at least two databases searched? Did the report include years, databases and keywords? Was there consultation and reference list checking?	Did the review include a search for grey literature?	Was a list of included and excluded studies provided?	Were the characteristics of included studies provided in an aggregated form such as a table?	Was the quality of included studies assessed?	Was the quality of included studies accounted for in the conclusions?	Were the methods used to combine data appropriately? Do the authors refer to the extent of heterogeneity?	Was the likelihood of publication bias assessed?	Was the source of support included for the review and each included study?
Alexander 2012[152]	Y	CD	N	N	N	N	Y	N	N	N	N
Allen 2009;[153] Allen 2008[154]	Y	CD	Y	Y	Y	Y	Y	Y	Y	N	N
Béland 2011[155]	Y	Y	Y	CD	N	Y	Y	N	N	N	N
Bélanger 2008[156]	Y	CD	Y	N	N	Y	CD	N	N	N	N
Best 2012[157]	Y	Y	Y	Y	Y	Y	CD	N	N	N	N
Boult 2009[158]	Y	Y	N	CD	N	Y	CD	N	N	N	N
Cameron 2014;[160] Cameron 2014[161]	Y	Y	N	CD	N	N	Y	N	N	N	N
Davies 2011[162]	Y	Y	Y	Y	N	Y	Y	Y	Y	N	N
de Bruin 2012[163]	CD	Y	Y	N	N	Y	Y	Y	Y	N	N
Eklund 2009[164]	CD	Y	N	N	N	Y	Y	Y	Y	N	N
Footman 2014[165]	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
Huntley 2013[168]	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N
Hussain 2014[169]	CD	CD	N	N	N	Y	Y	Y	Y	N	N
Jackson 2013[170]	Y	Y	N	N	Y	Y	Y	Y	Y	N	N
Johansson 2010[171]	Y	U	N	N	N	N	N	N	NA	N	N
Kammerlander 2010[172]	Y	Y	Y	N	Y	Y	N	N	Y	N	N
Kinley 2013[173]	Y	Y	Y	Y	N	N	Y	Y	Y	N	N
Kuhlmann 2010[174]	Y	Y	Y	N	N	Y	CD	N	Y	N	N

continued

TABLE 15 Quality appraisals: systematic reviews (*continued*)

	Quality criteria										
First author and year	Were the research question and inclusion criteria specified a priori?	Were there at least two data extractors and was there a procedure for disagreements?	Were at least two databases searched? Did the report include years, databases and keywords? Was there consultation and reference list checking?	Did the review include a search for grey literature?	Was a list of included and excluded studies provided?	Were the characteristics of included studies provided in an aggregated form such as a table?	Was the quality of included studies assessed?	Was the quality of included studies accounted for in the conclusions?	Were the methods used to combine data appropriately? Do the authors refer to the extent of heterogeneity?	Was the likelihood of publication bias assessed?	Was the source of support included for the review and each included study?
Laver 2014[175]	Y	Y	Y	N	N	Y	Y	Y	Y	N	N
Loader 2008[176]	Y	CD	CD	CD	N	N	N	N	CD	N	N
Low 2011[177]	Y	Y	Y	N	N	N	N	Y	N	N	N
MacAdam 2008[178]	Y	CD	Y	Y	N	Y	N	N	Y	N	N
Mackie 2016[179]	N	CD	CD	N	N	N	Y	Y	N	N	N
Martínez-González 2014[180]	Y	Y	Y	N	Y	Y	Y	Y	N	N	N
Maslin-Prothero 2010[181]	Y	CD	N	N	N	N	N	N	N	N	N
Mason 2015[182]	Y	Y	Y	Y	N	N	N	N	N	N	N
McConnell 2013[183]	Y	CD	Y	Y	N	N	Y	Y	N	N	N
Myors 2013[184]	N	CD	N	CD	N	Y	N	N	N	N	N
Nicholson 2013[185]	CD	Y	Y	Y	N	Y	Y	N	N	N	N
Stewart 2013[188]	Y	CD	Y	Y	N	Y	N	N	N	N	N
Stokes 2015[189]	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	N
Suter 2009[190]	N	CD	CD	N	N	N	Y	N	N	N	N
Tieman 2006[191]	Y	Y	Y	Y	Y	N	Y	Y	N	N	N
Trivedi 2013[192]	Y	Y	Y	N	N	N	Y	Y	N	N	N
Xyrichis 2008[193]	Y	CD	Y	N	N	N	N	N	NA	N	N

CD, cannot determine; N, no; NA, not applicable; NR, not reported; Y, yes.

TABLE 16 Quality appraisals: UK qualitative studies

First author and year	Quality criteria									
	Is there a clear statement of the aims?	Is a qualitative methodology appropriate?	Was the research design appropriate to address the aims?	Was the recruitment strategy appropriate?	Were the data collected in a way that addressed the issue?	Was there consideration of the relationship between researcher and participants?	Were ethics issues taken into consideration?	Was data analysis sufficiently rigorous?	Was there a clear statement of findings?	How valuable is the research? (Comments)
Allan 2014[88]	Y	Y	Y	U	Y	N	U	Y	Y	Explores emotional and practical impact of change on staff and managerial perceptions; linked to relevant literature
Amador 2016[89]	Y	Y	Y	Y	Y	Y	U	Y	Y	Provides insight into factors involved in integrated working of visiting staff and care home staff; relates to existing literature
Anderson 2014[90]	Y	Y	Y	U	Y	N	U	U	Y	Reporting of methods is brief; useful data on experiences of newly formed teams; limited reference to literature
Bachmann 2009[91]	Y	Y	Y	U	Y	U	Y	U	Y	Reports evaluation of integrated child services; some details of methods lacking
Baillie 2014[92]	Y	Y	Y	Y	Y	Y	Y	Y	Y	Well-reported study assessing staff and patient issues around vertical integration for care transitions; relates findings to existing literature
Barnett 2011[93]	Y	Y	Y	Y	Y	Y	Y	Y	Y	Well-reported study assessing innovation diffusion across organisations with links to literature
Belling 2011[94]	Y	Y	Y	Y	Y	U	Y	Y	Y	Unpublished survey of continuity of care; lacks quotations to back up themes
Bouamrane 2014[95]	Y	Y	Y	Y	Y	U	Y	Y	Y	Detailed and lengthy reporting of e-form portal for integrated pathway; relates findings to previous literature
Bridges 2007[96]	Y	Y	Y	U	Y	Y	N	Y	Y	Action participation research examining innovation and role shift; relates findings to theoretical literature
Cheyne 2013[97]	Y	Y	Y	Y	Y	U	Y	Y	Y	Study of change in care delivery; no quotations supplied but good analysis representations

continued

TABLE 16 Quality appraisals: UK qualitative studies (*continued*)

	Quality criteria									
First author and year	**Is there a clear statement of the aims?**	**Is a qualitative methodology appropriate?**	**Was the research design appropriate to address the aims?**	**Was the recruitment strategy appropriate?**	**Were the data collected in a way that addressed the issue?**	**Was there consideration of the relationship between researcher and participants?**	**Were ethics issues taken into consideration?**	**Was data analysis sufficiently rigorous?**	**Was there a clear statement of findings?**	**How valuable is the research? (Comments)**
Cleland 2012[98]	Y	Y	Y	Y	Y	U	Y	Y	Y	Reports on new community service; findings not related to existing literature
Collins 2012[99]	Y	Y	Y	Y	Y	U	Y	Y	Y	Reports on partnership working with some reference to previous work
Curry 2013[100]	Y	Y	U	Y	Y	U	U	Y	Y	Mixed-methods study reporting lessons learned from integrated care pilot; lacks quotations from qualitative methods
Dattée 2010[101]	Y	Y	Y	Y	Y	U	N	Y	Y	Identifies issues when change is implemented in complex systems; limited reference to existing literature in discussion
Dent 2014[102]	Y	Y	U	U	Y	N	N	U	Y	Assesses use of electronic ICPs; methods not clear; limited reference to existing literature in discussion
Dickinson 2013[103]	Y	Y	U	U	U	N	U	U	Y	Study of joint commissioning for services; many details of method lacking or brief
Dodds 2006[104]	Y	Y	Y	Y	Y	U	Y	U	Y	Evaluation of new COPD pathway; lacks quotations from qualitative data
Erens 2015[105]	Y	Y	Y	Y	Y	U	Y	Y	Y	No comments
Evans 2013[106]	Y	Y	Y	U	U	N	N	U	Y	Refers to report for details
Farrington 2015[107]	Y	Y	Y	Y	Y	U	Y	Y	Y	Well-reported service evaluation of knowledge transfer issues in learning disability
Freeman 2006[108]	Y	Y	Y	Y	Y	U	Y	Y	Y	Evaluation of partnership intervention
Gambles 2006[109]	Y	Y	Y	U	Y	N	U	Y	Y	Explores staff perceptions of care pathway
Greenhalgh 2009[111]	Y	Y	Y	U	Y	U	N	P	Y	Realist evaluation of modernisation initiative; no quotations but good visuals of analysis
Greenhalgh 2012[110]	Y	Y	Y	Y	Y	Y	Y	Y	Y	Well-reported evaluation of modernisation initiative

	Quality criteria									
First author and year	Is there a clear statement of the aims?	Is a qualitative methodology appropriate?	Was the research design appropriate to address the aims?	Was the recruitment strategy appropriate?	Were the data collected in a way that addressed the issue?	Was there consideration of the relationship between researcher and participants?	Were ethics issues taken into consideration?	Was data analysis sufficiently rigorous?	Was there a clear statement of findings?	How valuable is the research? (Comments)
Griffiths 2008[112]	Y	Y	Y	U	Y	U	U	Y	Y	Assessment of acceptability of one-stop shop for sexual health services; some details not reported
Haddow 2007[113]	Y	Y	U	Y	Y	U	Y	Y	Y	Evaluation of nurse-led telephone advice service (NHS 24)
Hamilton 2008[114]	Y	Y	Y	Y	Y	U	Y	Y	Y	Well-reported assessment of issues encountered when organisations develop and reconfigure respiratory services
Harris 2013[115]	Y	Y	Y	Y	U	U	U	U	U	Assessed communication regarding multidisciplinary groups; no quotations, not really qualitative
Heenan 2006[116]	Y	Y	Y	Y	U	U	U	U	Y	Study of key issues in health and social care integration; lacks detail in places
Hendy 2012[117]	Y	Y	Y	Y	Y	Y	U	Y	Y	Well-reported study of the role of champions with good reference to literature
Hewison 2015[118]	Y	Y	Y	Y	Y	U	U	Y	Y	Redesign of end-of-life pathway
Hu 2014[119]	Y	Y	Y	U	Y	U	U	Y	Y	Study of integration programme; method detail lacking in places
Huby 2014[120]	Y	Y	Y	Y	Y	U	Y	Y	Y	Assesses professional boundaries associated with health-care change
Hudson 2006[121]	Y	Y	U	Y	Y	U	U	Y	Y	Action research approach
Ignatowicz 2014[122]	Y	Y	Y	U	Y	U	Y	Y	Y	Clear presentation of staff perceptions of their engagement in integrated care
Kassianos 2015[123]	Y	Y	Y	Y	U	Y	Y	Y	Y	Staff views of MDT meetings in integrated care
Knowles 2013[124]	Y	Y	Y	Y	U	Y	U	Y	Y	Study of issues in implementing collaborative care; discussion lacks reference to previous literature
Lhussier 2007[125]	Y	Y	Y	Y	Y	U	U	U	Y	Evaluation of end-of-life pathway; lacking some details in methods section

continued

TABLE 16 Quality appraisals: UK qualitative studies (*continued*)

First author and year	Quality criteria									
	Is there a clear statement of the aims?	Is a qualitative methodology appropriate?	Was the research design appropriate to address the aims?	Was the recruitment strategy appropriate?	Were the data collected in a way that addressed the issue?	Was there consideration of the relationship between researcher and participants?	Were ethics issues taken into consideration?	Was data analysis sufficiently rigorous?	Was there a clear statement of findings?	How valuable is the research? (Comments)
Ling 2012[126]	Y	Y	Y	U	U	U	U	Y	Y	Evaluation of integrated care pilots; details brief but reader directed to associated paper
Lunts 2012[127]	Y	Y	Y	U	Y	U	U	Y	Y	Assesses middle manager perceptions of integrated care; method section brief
Macfarlane 2011[128]	Y	Y	Y	U	Y	U	U	Y	Y	Realist review of human resource issues in an innovative programme; no quotations but good analysis visuals
Manley 2016[129]	Y	Y	Y	U	Y	U	Y	Y	Y	Reports enablers of delivering patient-centred transitional care
McDowell 2009[130]	Y	Y	Y	Y	Y	U	Y	Y	Y	Unpublished study of new diabetes care service delivery
McKenna 2006[131]	Y	Y	Y	Y	Y	U	Y	Y	Y	Well-reported exploration of manager perceptions of innovative roles
Oborn 2010[132]	Y	Y	Y	U	Y	Y	U	Y	Y	Analyses knowledge translation processes across occupational boundaries; well discussed, lacking some method details
Ovseiko 2015[133]	Y	Y	Y	U	Y	N	Y	Y	Y	Detailed presentation of findings, in particular related to organisational culture; limited discussion of findings in relation to other literature/policy
Pappas 2012[134]	Y	Y	Y	Y	Y	Y	N	Y	Y	Part of London evaluation
Petch 2013[135]	Y	Y	Y	Y	Y	Y	Y	Y	Y	Provides detailed outline of the study findings and implications
Pinnock 2009[136]	Y	Y	Y	Y	Y	Y	U	Y	Y	Interprets the findings with regard to other studies and provides key conclusions
Pollard 2014[137]	Y	Y	Y	U	Y	N	U	N	Y	Mixed-methods study with limited reporting of qualitative data; extensive discussion section

First author and year	Quality criteria									
	Is there a clear statement of the aims?	Is a qualitative methodology appropriate?	Was the research design appropriate to address the aims?	Was the recruitment strategy appropriate?	Were the data collected in a way that addressed the issue?	Was there consideration of the relationship between researcher and participants?	Were ethics issues taken into consideration?	Was data analysis sufficiently rigorous?	Was there a clear statement of findings?	How valuable is the research? (Comments)
Pollard 2011[138]	Y	Y	Y	U	Y	N	U	Y	Y	The aims of the study were to investigate integrated care; however, most of the data relate to patient care and referral
Roberts 2014[139]	Y	Y	U	U	N	U	U	N	N	Main purpose of the paper was to evaluate the support provided
Rothera 2008[140]	Y	Y	Y	U	Y	U	Y	Y	Y	Evaluation of a new service model compared with usual care
Scragg 2006[141]	Y	Y	Y	U	Y	N	U	N	Y	Explores staff perceptions and provides insight into process of change
Sheaff 2009[142]	Y	Y	Y	Y	U	U	N	N	Y	Described as a case study methodology; limited data presented
Sleeman 2015[143]	Y	Y	Y	U	Y	N	U	Y	Y	Provides a model to summarise the themes; clearly identifies contribution of the study findings
Smith 2013[144]	Y	Y	Y	U	Y	N	U	Y	Y	Evaluates the initiative and describes the implication of the findings
Stuart 2014[145]	Y	Y	Y	U	Y	Y	Y	Y	Y	Provides findings in context of other models and theories
Syson 2010[146]	Y	Y	Y	U	Y	N	U	Y	Y	Brief details regarding methods for this pilot study but clear presentation of data; very brief consideration of other literature or implications
Thiel 2013[147]	Y	Y	Y	Y	Y	U	N	Y	Y	No comments
Tucker 2013[148]	Y	Y	Y	U	Y	N	U	Y	Y	Discusses implications fully
Waterson 2012[149]	Y	Y	Y	U	Y	N	U	U	Y	Brief paper that provides limited detail of methods; discusses study in context of future work needed
Wilson 2007[150]	N	Y	U	U	U	N	U	N	N	Few data provided and limited detail of methodology
Wistow 2015[151]	Y	Y	U	Y	N	U	N	N	Y	Limited presentation of data; predominantly description

N, no; U, unclear; Y, yes.

Appendix 3 Applicability reporting framework

[redacted]

Funded by NIHR

WHAT MIGHT THE RESEARCH EVIDENCE MEAN HERE?

Seven questions to examine potential applicability and transferability of the evidence

1. How do the findings apply to different type of patients and populations?
2. What organisations and systems is the evidence applicable to?
3. What financial and commissioning processes might influence applicability?
4. What systems leadership elements might influence applicability?
5. What features of services/s might influence applicability?
6. What features of the workforce might influence applicability?
7. What elements of the initiatives might influence applicability?

1. HOW DO THE FINDINGS APPLY TO DIFFERENT TYPES OF PATIENTS AND POPULATIONS?
What type of conditions were included?
What was the level of severity of these conditions?
Was the level of deprivation in the study populations particularly higher/lower than the national average?
Was the level of socio-economic diversity in the study populations particularly high/low?
Was the research carried out in particularly rural or urban areas?
Was the research carried out in particularly compact or geographically spread regions with high or low populations/density?
Were the levels of health needs in the research populations higher/lower than the national average?
Was the prevalence of a condition particularly low or high in the populations researched?
2. WHAT ORGANISATIONS AND SYSTEMS IS THE EVIDENCE APPLICABLE TO?
What was the size of the organisations in the studies (e.g. population served, size of catchment area, number of patients, turnover, range of services)?
Was the initiative within one, or across different organisations?
What type of organisations were involved e.g. health/social care/private/voluntary?
Was there a historical relationship/existing alignment between the services and/or organisations?
What was the geographical proximity of services (such as multiple hospitals)?
Was the baseline performance of the study organisations higher/lower compared to the national average?
What was the policy environment at the time of introduction of the initiative, were there particular drivers/levers for this change?
Were other changes being made con-currently?
Was there audit/an evaluation loop in place?
Were there particular elements of infrastructure in place within the organisations studied, such as existing shared IT systems?

Did the organisations studied have other relevant services in place (e.g. having an intermediate care team)
Did the organisations studied have particular admission routes (e.g. Medical/surgical GP-referred patients admitted via A&E)
3. WHAT FINANCIAL AND COMMISSIONING PROCESSES MIGHT INFLUENCE APPLICABILITY?
What was the source of funding for the initiative, was it ring fenced?
What were the commissioning/budget arrangements in the organisations studied?
Were available resources reduced/increased around the time of introduction?
Were there incentives for organisations to be included?
Any other key elements of transactability or financial viability?
4. WHAT SYSTEMS LEADERSHIP MIGHT INFLUENCE APPLICABILITY?
Was there a dedicated project manager/managerial leadership role, was leadership from managerial or clinical staff?
Was there a project champion?
Was there engagement and support for the initiative amongst patients?
5. WHAT FEATURES OF SERVICES MIGHT INFLUENCE APPLICABILITY?
What was the location for the initiative (specialist versus non-specialist unit, outpatients versus inpatients, acute versus community, vertical or horizontal integration)?
Had other initiatives already been introduced in the setting researched, was there alignment between initiatives?
Was the care or service in the locations studied, of a particularly poor or good standard?
6. WHAT FEATURES OF THE WORKFORCE MIGHT INFLUENCE APPLICABILITY?
What level of motivation/support for the initiative was there amongst the workforce in the research?
What was the level of willingness to change/take part amongst the workforce in the research?
What were the employment conditions for the staff involved in the research (e.g. same/different employers, type of contract, employed for the project or transferred)?
What was the working location of staff involved in the research (e.g. co-location in same office, same site, travelling between sites)?
Was there a requirement for specialist staff (e.g. GPwSI)?
Which professions/staff roles were involved in the initiatives reported?
What size of staff group was involved (for example small or large MDTs)?
What training was required/provided?
7. WHAT ELEMENTS OF THE INITIATIVES MIGHT INFLUENCE APPLICABILITY?
What were the components of the interventions reported - was it simple or with multiple elements?
Was the integration full or partial?
Was the intended reach narrow or broad (e.g. inclusion criteria, number and type accepted/not accepted into initiative)?
How long had the initiative been in place?
Are there specific requirements that must be in place?

EME
HS&DR
HTA
PGfAR
PHR

Part of the NIHR Journals Library
www.journalslibrary.nihr.ac.uk

Published by the NIHR Journals Library