

## Health Service Executive

### Lot 3: Literature review to support integrated clinical care programmes in children, older people, and maternity and gynaecological care.

A report for Health Service Executive

Search date: April 2015

Delivery date: September 2015

Executive summary .....	2
Introduction .....	8
Section 1 - systematic review Methods .....	10
Results.....	12
Children .....	13
Maternity and gynaecological care .....	23
Older people.....	34
Section 2 - narrative review of the grey literature .....	60
Section 3 - conclusions and recommendations .....	79
References.....	83

#### Terms of Use

This analysis has been produced by Bazian Ltd for Health Service Executive. It must not be distributed to, or accessed or used by, anyone else without prior written permission from Bazian Ltd. Commercial use is not permitted without prior written agreement from Bazian. Bazian Ltd has taken care in the preparation of this literature search, but makes no warranty as to its accuracy and will not be liable to any person relying on or using it for any purpose.

#### Bazian Ltd

20 Cabot Square, London E14 4QW

Phone: 020 7576 8366

Contact email: [rob.cook@bazian.com](mailto:rob.cook@bazian.com)

## Executive summary

### Introduction

This review aims to inform the work streams of the Health Services Executive's (HSE) Integrated Care Programme. The literature review focuses on patient outcomes and economic effectiveness of integrated care programmes in improving services for children, maternity and gynaecology and older people. A systematic literature and guideline search was performed of databases, grey literature, citations and reference lists for studies published in English from 2000 to 2015. Illustrative case studies were selected to provide insight into some of the approaches which have been assessed. We split the literature review into a systematic review (section 1), and a non-systematic, narrative review of the grey literature (section 2).

### Systematic review (section 1)

#### Methods

The systematic literature and guideline search was performed on databases, grey literature, citations and reference lists for studies published in English from 2000 to 2015. Illustrative case studies were selected to provide insight into some of the approaches assessed.

#### Results

Sixteen systematic reviews were identified that looked at integrated care approaches. Most related to older people<sup>1-16</sup> (n=16) with far fewer on children<sup>17-19</sup> (n=3) or maternity and gynaecology services<sup>20, 21</sup> (n=2).

The reviews were very diverse in terms of their aims, scope, interventions, target populations, risks of bias and outcomes reported. In general review quality was not the main risk of bias. This came from the primary studies within them, which were often rated by the review authors as poor, signalling a high risk of bias, and reducing reliability.

#### Children

Two systematic reviews provided evidence on two different integrated care approaches in children:

- Specialist home-based nursing in children with acute or chronic illness<sup>19</sup>
- Formalising multi-disciplinary teams (MDTs) for inpatient asthma management<sup>17</sup>

There was some evidence to suggest that patient outcomes such as parental anxiety, child behaviour and patient satisfaction significantly improve using specialist home-based nursing in specific settings, but general health outcomes and parental burden of care outcomes did not improve<sup>19</sup>. Formalising MDTs showed no difference in adverse events and provided suggestive evidence for better medicines management in one review<sup>17</sup>. Effectiveness was mixed (See Table 1). Some patient outcomes were reported as improving but lacked statistical validity. Other outcomes did not improve, but it was unclear whether this was real, or because of a lack of statistical power to detect them. Cost effectiveness data was largely absent.

As such the literature base identified is very narrow and not mature enough to make evidence based recommendations relating to effective integrated care approaches for children's services, or their cost effectiveness.

## **Maternity and gynaecological services**

Two systematic reviews looked at integrated care approaches in maternity and gynaecological services<sup>20, 21</sup>:

- Multi-disciplinary teams
- Integrated HIV, maternal and children nutrition services for women with HIV

A third review mainly contributed knowledge to barriers and facilitators of implementation<sup>22</sup>. One review suggested integrating HIV services with other child and maternity services was feasible and could improve outcomes for HIV positive women across a range of settings. A second suggested formalising MDTs could improve outcomes for postnatal women with pre-existing diabetes and cardiac disease evidence, but many outcomes lacked statistical validity (See Table 2). Both reviews were based on literature with a high risk of bias, so provide no firm evidence base to inform the most effective approach. No cost data was identified.

## **Older people**

Sixteen systematic reviews outlined different approaches to integrating care services for older people. This broadly fell into the following overlapping categories:

- Team based working:
  - Multi-disciplinary teams
  - Inter-professional working
  - Integrated teams
  - Team care
  - Collaborative care
- Case management:
  - Case managers
  - System navigators
- Early supported discharge:
  - Teams co-ordinating discharge from hospital and post discharge care at home
  - Teams co-ordinating discharge but care handed over to existing community-based agencies who provided care at home
- Other approaches
  - Miscellaneous

Broadly speaking the evidence base for older people suggests integration approaches are feasible and can yield significant improvements in some patient outcomes in specific settings and populations. However, outcomes rarely improved consistently in a positive direction across the board, and many showed no improvement, painting a mixed picture (See Table 5, 6 and 7). Cost effectiveness was not comprehensively addressed in any review.

## **Narrative review (section 2)**

### **Methods**

In addition to the academically published literature covered in section 1, integrated care is widely discussed by healthcare organisations that can best be described as *thought leaders*. This grey literature was identified through searches in Scopus, Google, Google Scholar and similar search engines; we also searched the websites of specific organisations, such as The King's Fund, the Early

Intervention Foundation and the Canadian Policy Research Network. Supplemental search techniques were also used to track citations and harvest references from relevant studies. From a long list we used a total of 14 articles in this report.

## Results

Most of the grey literature for the three populations of interest was about older people. A smaller body of grey literature was identified on integrating children's services and very little was identified on integrating maternity and gynaecological services so they were merged. Across all three population groups we identified two cross-cutting themes. First, the widespread and consistent recognition that there is a lack of good quality evaluation linking different integrated care approaches to specific outcomes. As such the literature is not able to describe the best way to integrate care, but rather a set of principles and factors linked with success in a variety of scenarios. Second, that structural integration, either within the NHS or between health and social care, is only one factor among many that helps the development of integrated care, it is not sufficient on its own.

For older people the factors linked to integrated care success were relying on multidisciplinary teams, using case managers, sharing information (including electronic medical records), and having a single point of entry and contact for referrals and help to navigate through a health system.

For children's services using integrated teams (many co-located), sharing information and using single combined assessments were also linked to integration success.

## Conclusions

We identified many factors linked with successful integrated care approaches from a variety of contexts. Almost without exception the systematic review evidence and grey literature pointed out gaps in knowledge about what works, how, and in whom, particularly for populations under 65, something mirrored in the grey literature. The evidence base for cost effectiveness of integrated care was similarly limited.

Current review and grey literature evidence suggests integrated care can have a positive impact on many patient outcomes. But success in one place is not guaranteed in another. Success appears context and intervention specific, and has a range of success modifiers.

We observed a tentative trend, particularly in the literature on older people, that patient satisfaction tended to improve in response to more integrated care, even if it did not always lead to improved health outcomes, such as lower mortality. There were no signs of worsening patient outcomes due to integrated care.

Narrower questioning of specific integrated care approaches for specific populations is likely to yield more insight into the elements of effective interventions. This may be achieved with more focused evidence reviews in areas of specific interest.

In the absence of clear direction on what works best, many reviews provided useful insight into barriers and facilitators encountered when implementing integrated care. These provide insight for those at the formative stages of integrated care design, or those wishing to review current practice.

## Recommendations

While it is clear that integrated care does not travel well - every combination of location, population and healthcare system is unique, so needs unique solutions - we consider the following supported by the best evidence available. Recommendations are based on sections 1 and 2.

### **Recommendation 1: Evaluate**

Ensure robust evaluation is an integral part of any integrated care implementation big or small. As a minimum this should gather pre-integration measures of patient outcomes and experience and monitor their change over time. Without this, planners and practitioners will continue to be led by “principles” and “characteristics” rather than more solid measures of impact and outcomes.

### **Recommendation 2: Start small**

Structural or organisational mergers should not be used to instigate integrated care; rather, management should focus on removing barriers (such as differences in financing and eligibility) that make it more difficult for individuals, teams and institutions to integrate care. Clinical or service teams should lead the development of integrated care, and will need ongoing support as they develop and mature.

### **Recommendation 3: Learn from others**

Many organisations have tried integrating care at different levels. They may have recently trodden the path you are about to; and talking to those involved could be a valuable source of learning, insight and support. A range of case studies exist in the academic and grey literature, and while the information in the published forms is often limited, many provide contact information to the programme leads. For example, England has evaluated 16 integrated pilot programmes across the country and has links to a contact for each one<sup>23</sup>.

### **Recommendation 4: Create multidisciplinary teams**

Multidisciplinary teams are the bedrock of many successful examples of integrated care - generalists and specialists working together, from both health and social care. In many case studies, the co-ordination of care was being delivered alongside, rather than by, primary care physicians.

### **Recommendation 5: Consider implementing case management for older people**

Care co-ordination is considered crucial to the success of integrated care, and a dedicated, named staff member can facilitate the care process - personal contact with a named case manager is more effective than telephone support. Case management should focus on specific populations that are not currently supported by the primary care system, and any case management programmes should be evaluated carefully to ensure they are cost effective and are demonstrating improvements in outcomes.

### **Recommendation 6: Implement early supported discharge for older people**

Early supported discharge teams co-ordinate discharge from hospital. They may also co-ordinate post-discharge care at home, or they may hand over post-discharge care to existing community-based agencies. Early supported discharge has been linked to shorter lengths of hospital stay, more people living in their own home, being able to carry out normal daily activities, and cost savings<sup>5</sup>.

## **Recommendation 7: Share information, including electronic health records**

Sharing information was often described as crucial for effective integrated working<sup>24, 25</sup> and a lack of access to shared electronic health records was a common obstacle to integrating services across health and social care. Integrated information systems and structured communication channels appear most important during care transitions, for example from hospital to home, where there is more scope for error. Sharing electronic records was a widespread aspiration but one most have yet to achieve.

## **Recommendation 8: Consider implementing specialist home-based nursing for ill children**

Home-based nursing services improve satisfaction and reduce anxiety, although there is limited evidence for health outcomes or cost effectiveness. If such schemes are implemented they should be done so on a pilot basis and evaluated carefully.

## **Quick links to summary tables**

### **Children**

Table 1 Summary table of systematic review evidence for children (n=3)<sup>17-19</sup>

### **Maternity and gynaecological services**

Table 2 Summary table of systematic review evidence for maternity and gynaecological services (n=2)<sup>20, 21</sup>

### **Older people**

Table 5 Summary of team working intervention patient outcomes (n=8)<sup>1-3, 6, 9, 10, 15, 16</sup>

Table 6 Summary of case management intervention patient outcomes (n=4)<sup>4, 6, 7, 11</sup>

Table 7 Summary of patient outcomes for early discharge planning interventions (n=4)<sup>5, 10, 13, 14</sup>

## Abbreviations List

A&E	Accident and Emergency
ADL	activities of daily living
AE	adverse events
CCI	collaborative care interventions
CI	confidence interval
CM	case manager
COPD	chronic obstructive pulmonary disease
EKG	electrocardiogram
EHS	early home supported discharge
ENT	Ear, Nose and Throat
ESD	early supported discharge
FP	family planning
GP	General Practitioner
IADL	instrumental activities of daily living.
ICPS	integrated care pathways
IDM	integrated disease management
IPW	inter-professional working
ITS	interrupted time series
LUTS	lower urinary tract syndrome
MDT	multi-disciplinary team
MI	myocardial infarction
MNCHN	maternal, neonatal and child health and nutrition services
NICE	National Institute for Health and Care Excellence
NR	not reported
NS	a change in outcome that is not statistically significant
OECD	Organisation for Economic Co-operation and Development
PMTCT	prevention of mother-to-child transmission
Pt	short hand for patient (in evidence tables only)
QoL	quality of life
RCH	reproductive and child health
RCT	randomised controlled trial
RN	registered nurse
SR	systematic review

## Introduction

Ireland faces the same major challenges present in healthcare systems worldwide, namely ageing populations and the increasing disease burden from chronic conditions. There is a need to respond to and meet these challenges, which is demanding for healthcare systems originally set up to respond to acute, episodic care. This challenge has been further compounded by the global economic crisis, which has placed further strain on budgets.

In 2012 the Irish government set out its vision for reforming the health service in 2012-15. This ambitious strategy included a conceptual shift from responsive care to a focus on health and wellbeing (such as preventive services), service reform including moving to integrated care, structural reform such as the introduction of Universal Health Insurance and financial reforms to incentivise efficient and effective care. The Clinical Strategy and Programmes Division (CSPD), established by the Health Services Executive (HSE), is developing five national integrated care programmes in older people, children, women's health, chronic disease prevention and management and patient flow.

2015 is an important year for the HSE as it sees the implementation of the Governance and Organisation Structure for the National Clinical Care Programmes to enable the NCP to act as the design authority for integrated models of care for the health service and the establishment of its Integrated Programmes of Care and Associated Pathways. To support the development of its integrated care programmes, the HSE has commissioned three literature reviews covering integrated care in these settings, focusing on patient outcomes and economic effectiveness.

But what do we mean by integrated care? Integrated care systems are those that ensure the management and delivery of health services (including prevention, diagnosis, care and support) is delivered according to the needs of individual patients, across all levels of the healthcare system. At the heart of integrated health care is coordinated care: the process of managing all of a patient's needs across providers and settings.

The provision of healthcare to users of the system should appear seamless, regardless of which part of the healthcare system they are accessing. Integrated systems are often set up in response to real or perceived fragmentation in the delivery of care by separate health and social services.

Despite these core concepts, a 2011 Nuffield trust report on integrated care in the NHS explained there were some 175 definitions and concepts<sup>26</sup>. Such diversity reflected what one author referred to as "the imprecise hodgepodge of integrated care".

The 2014 Community Healthcare Organisations Report and Recommendations of the Integrated Service Area Review Group highlighted that there is not a single approach to integrated care that fits all circumstances, and that it is important to recognise local challenges in any approach. For example case management is a labour-intensive activity that is not always targeted effectively, and therefore it can be difficult to realise cost-savings.

Our goal in this review is to help the HSE to target those specific integrated care interventions that have been shown to improve patient outcomes and/or are deemed cost-effective. We have divided the literature review into three sections. Section 1 is a systematic review using transparent search, sift and appraisal techniques, while Section 2 is a non-systematic, narrative review of the grey literature. Section 3 contains our conclusions and recommendations.

Section 1 provides an identification, critical assessment and evaluation of relevant clinical and economic literature related to integrated care interventions. Integrated healthcare systems in this work are pragmatically defined as the provision of multidisciplinary interventions at different stages of the care process in two or more different institutional areas. This section aims to describe findings from systematic reviews relating to:

- What are the characteristics and features of frameworks or models of care that incorporate elements of integrated care?
- What is the evidence of models of care within integrated care systems?
- What measurements have been used to evaluate integrated systems?
- What effect have the models of care that contain elements of integration had in delivering successful or unsuccessful patient outcomes?
- What has been the economic effectiveness or viability of integrated models of care?
- What are the possible barriers and facilitators to integrated care?

To provide insight into specific integrated care approaches being assessed, a selection of studies were selected, based on their relevancy to the Irish healthcare system, from the systematic reviews to be described in additional detail as illustrative case studies.

The systematic review does not cover:

- Interventions or systems not explicitly described as integrated care or synonyms such as co-ordinated care
- Interventions or systems not explicitly aimed at improving care for children, older people and women requiring maternity and gynaecological care
- Interventions focussed solely at increasing efficiency within a single level of the health system (as opposed to between 2 or more levels of the health system, i.e. primary, secondary, tertiary, and social care)
- Process outcomes
- Non-systematic reviews, primary studies.
- Reviews focusing on non-OECD/developing countries
- Review published before 2000
- Reviews published in languages other than English

Further details of the scope are provided in Appendix A.

Section 2 is a non-systematic, narrative review of the grey literature published by thought leaders - by which we mean think tanks, not-for-profit research organisations, charitable trusts, non-governmental organisations, key healthcare providers and charities. The narrative review covers the same subject scope as the systematic review.

Section 3 contains our concluding remarks and recommendations for the HSE. Recommendations were drafted after consideration of the weight and reliability of the evidence from both the systematic and grey literature reviews.

## Section 1 - systematic review

## Methods

### Evidence review

Searches were carried out across a range of bibliographic databases including Medline, Embase, Scopus, the Cochrane Library, the Economic Evaluation Database, Joanna Briggs Institute and the Campbell Collaboration to identify systematic reviews published from 2000 onwards in English. To ensure the search would capture qualitative as well as quantitative reviews, we adapted the Scottish Intercollegiate Network's systematic review search filter to include a broader range of review types, such as realist and integrative reviews.

Search strategies combining keywords, synonyms and index headings for the search concepts were developed to maximise the relevance of the search results. Concepts and synonyms for the relevant patient groups were gathered from a variety of sources, such as reports and reviews gathered during the scoping phase of the project. For the first search on patient outcomes and economic effectiveness, terms relating to children, older people, and maternity and gynaecological care were combined with relevant terms such as "improve\*", "optim\*", "reduc\*" and "excess\*" to retrieve articles that discussed the impact of integrated care interventions on those outcomes for the specific patient groups. These were then combined with the modified systematic review filter.

Case studies were identified from the included systematic reviews where possible. Where potential examples found in the included systematic reviews were not suitable as case studies (e.g. from a long time ago or in a context not applicable to Ireland), we undertook additional highly focused searches. These additional searches were carried out in PubMed to identify primary studies and Google to identify grey literature, such as service evaluations.

Information about barriers and facilitators of integrated care was gathered from the included systematic reviews and the studies they contained, identified through a process of reference harvesting and related supplemental search techniques.

The full search approach is included in Appendix B.

After deduplication of search results, 2,388 records remained. After a first sift at title and abstract level to remove clearly non-relevant records, 110 records remained. A more detailed second sift at title and abstract identified 46 potentially relevant papers, for which the full text was obtained. After assessment of the full texts, 21 systematic reviews were identified as relevant and included in the review. Further details and a flow diagram of the search process can be found in Appendix B.

The quality of the evidence identified was rated according to the AMSTAR 11 item checklist, a measurement tool that assesses the methodological quality of systematic reviews. Items assessed include an a priori design, appropriate pooling of results, and likelihood of publication bias. The AMSTAR rating for each study is provided in Table 9 in Appendix C.

For the synthesis of the evidence, the results of the systematic reviews have been grouped according to their model of integrated care. Case studies are summarised in boxes.

## Results

Section 3 details the results from the evidence review alone. Section 7 gives the findings from the grey literature separately.

### Review quality

The methods of the systematic reviews were assessed for risk of bias (quality) using the AMSTAR scale of 0 (worst) to 11 (best). Health Technology Appraisals and Cochrane systematic reviews, regarded as the some of the highest levels of evidence and methodological rigour, scored 8s and 9s in our assessment. Not reporting conflicts of interests for each of the included studies and not explicitly assessing publication bias were some of the more common reasons they did not achieve higher scores. As such we see scores of 8 and above as generally high quality review, scores of 6 to 7 as moderate quality and 5 and below as low quality reviews, with a high risk of bias.

### Study quality

While many reviews scored well for methodological quality, the studies they included typically did not. Included studies were often rated as having a high risk of bias by the respective review teams, many of whom formally assessed individual study quality. The two elements of review quality and included studies quality need to be understood for appropriate interpretation of the results.

### Applicability to Ireland

Assessing applicability to a single country is inherently imprecise if the study originates from elsewhere. Studies from OECD countries and other high income countries have broad applicability to Ireland. However, health and healthcare system delivery, purchasing, organisational structures, and patient pathways in high income countries can differ considerably from Ireland, particularly in the US. They may even differ at a subnational level. These differences should be considered when interpreting the results.

Applicability of the findings of systematic reviews to Ireland were broadly indicated by reporting, where possible, the proportion of studies in the review conducted in high income or OECD countries. Further applicability should be considered on a case by case basis.

### Summary table interpretation

Key patient outcomes and study details are summarised in tables at the start of each section. These employ the following key for ease of interpretation.

- ↑ = statistically significant improvement of outcome
- ↗ = favourable trend or improvements described, but not explicitly linked to a statistical test
- = no statistically significant difference
- ↘ = unfavourable trend or worsening described, but not explicitly linked to a statistical test
- ↓ = statistically significant worsening of outcome

Full evidence tables are given in Appendix D.

## Children

The search identified 3 studies reviewing integrated care for children's services<sup>17-19</sup>. Two systematic reviews sought evidence on models of integrated care, their efficacy and cost effectiveness<sup>17, 19</sup>. Each covered a different intervention type:

- home-based specialist nursing services<sup>19</sup>
- formalising multidisciplinary team working through best practice guidelines<sup>17</sup>

A third provided information mainly on barriers and facilitators to success<sup>18</sup>. These are addressed separately in the sections below.

Table 1 gives summary details of the review quality, integrative care approach and outcomes of each study. Further detail can be found in the Evidence Tables (Appendix D).

Table 1 Summary table of systematic review evidence for children (n=3)<sup>17-19</sup>

Author/date	Quality score	Sample	Population	Integrated care approach	Patient outcomes	Impact	Cost effectiveness	Relevance to Ireland
Parab et al. 2013 <sup>19</sup>	9/11	7 RCTs	Children (range 3 months to 17 years) with acute or chronic illnesses.	Specialist home-based nursing services involving nurse home visits.	“Health outcomes” (not further described)	→	Suggestive that more expensive for providers, savings for families. 1 study found no saving for families.	RCTs from high income countries.
					Parental anxiety, child behaviour, patient satisfaction, parental coping and family functioning.	↑		
					Parental burden of care (n=1) or functional state of children (n=1)	→		
Allen et al. 2009 <sup>17</sup>	7/11	9 RCTs (7 adult, 2 children)	Children going to A&E with acute asthma/wheeze	Formalising MDTs	Adequate course of corticosteroids given post discharge	↗	No evidence identified.	RCTs from high income countries.
			Inpatient paediatric asthma management		Adverse events following discharge	→		
Noyes et al. 2014 <sup>18</sup>  (mainly barriers and facilitators)	5/11	N=34: 15 policy, opinion or best practice, 6 qualitative, 13 primary studies	Children with complex healthcare needs	Conceptualise a health system model of successful transition of children with complex healthcare needs from hospital to home	Unified discharge process gave positive effect on the ability of families to care for their children	↗	No evidence identified.	Studies from high income countries. Contains input from 13 Irish professional experts (unclear impact on review)

## Specialist home-based nursing

### Approach

Parab et al. 2013<sup>19</sup> systematically reviewed specialist home-based nursing services for children with acute and chronic illnesses.

Home-based nursing care approaches aim to substitute acute hospital review and or admission by providing clinical review, support, education and management of the acutely or chronically unwell child in their own home. If the child requires it, they are provided with streamlined access to hospital services. In theory this also provides opportunities to enhance primary care in the community through liaison with general practitioners and links with other community-based health services<sup>19</sup>.

The review identified 7 relevant RCTs. Four of the RCTs were based in Canada, and one each from the UK, US and Australia. These differed in the qualifications of the nurses, their availability, including hours of service and number of visits, and any additional information provided. The variation in home-based approach may partly reflect the diverse needs of the child illness, which included acute leukaemia, chronic stress, and newly diagnosed type I diabetes.

For example, one UK (Merseyside, England) intervention from Parab et al. 2013<sup>19</sup> offered children with acute illness (breathing difficulty, diarrhoea and vomiting or fever) a hospital at home scheme under the care of hospital consultants. Visiting staff qualifications were not reported but children were offered 1-4 visits per day and had access to a phone service 24 hours a day. This was supplemented with patient information booklets detailing possible course of illness, signs and symptoms of potential deterioration, appropriate treatment, and contact information.

### Impact on patient outcomes and cost effectiveness

Parab et al. 2013<sup>19</sup> reported no overall significant improvement in “health outcomes” (not further defined) using home based specialist nursing interventions compared with usual care for children with acute or chronic illness.

However, 3 RCTs it included reported reductions in parental anxiety and improvements in child behaviour. Three showed increases in patient satisfaction and one showed better parental coping and family functioning (Table 1). By contrast, one study found no impact on parental burden of care, and another showed no impact on functional state of children.

Cost effectiveness was not comprehensively addressed in any of the studies included in Parab et al. 2013<sup>19</sup>. Where assessed (2 studies), home care was found to be more expensive for service providers but with substantial savings for the family. By contrast one study showed no cost benefit for the family.

Overall Parab et al. 2013<sup>19</sup> concluded there was insufficient evidence to support the effectiveness of specialist paediatric nurse home visiting for acute and chronic illnesses in reducing hospital admissions and Emergency Department utilisation. Adding, there is suggestive evidence that home care programmes may lead to greater parent satisfaction, improved quality of life and a reduction in the length of hospital stay.

## Strengths and limitations

Parab et al. 2013<sup>19</sup> scored well for review quality (AMSTAR score 9/11) and reported many patient outcomes (See Table 1). It included 7 diverse RCTs from OECD countries (Canada, UK, US and Australia), including cost effectiveness data from studies in Canada and the UK. Despite this it has limitations. For example, most RCTs included were not blinded and were small (sample range 29 to 399), increasing the likelihood of bias and limiting statistical power to detect differences. Publication date is also a potential concern as 4/7 studies were published before 2000, including one published in 1973, reducing relevance to today's healthcare systems.

## Formalising multidisciplinary team working through best practice guidelines

### Approach

Allen et al. 2009<sup>17</sup> reviewed the implementation of integrated care pathways in adults and children across a range of healthcare settings. Integrated care pathways were defined in the review as management technologies that formalise multidisciplinary team-working and enable professionals to examine their roles and responsibilities.

It identified 2 RCTs including children; one looking at children going to A&E with acute asthma or wheeze<sup>27</sup>, a second on paediatric asthma management<sup>28</sup>.

For one UK based RCT on children going to A&E<sup>27</sup>, integration meant introducing best practice guidelines. This aimed to reduce length of stay, improve rate of recovery, improve education to parents, reduce clinical errors and increase knowledge of need for subsequent review in primary care.

Developed by medical, nursing and pharmacy staff, the integrated care pathways incorporated evidence from Cochrane Reviews and the SIGN/BTS asthma guidelines<sup>27</sup>. These were combined chronologically within a single document with all clinical observation and prescribing charts. It included a clinical checklist authorising the discharge of children without waiting for a ward round, supporting nursing role change. Directed education and action plans were also included. Tutorials on the use of the pathway were provided to staff a month before its introduction and to new staff arriving during the course of the study. No further teaching was offered.

The whole acute admissions unit was randomised to either normal documentation or integrated care pathway documentation over a 7-day period<sup>27</sup>. Standard care provided separate documentation for nursing, medical, clinical observation and prescribing charts. There were no prompts within the standard documentation for timing of decisions or discharge and no guidance on education to be provided to parents. A total of 136 went to A&E during the integrated care pathway weeks and 115 in standard care weeks. No information was provided on any differences in the clinical care provided to both groups.

The second US based RCT<sup>28</sup>, integrating inpatient paediatric asthma management, aimed to support adherence to clinical guidelines, augment service coordination and facilitate role change through support for decision-making.

Developed locally by a multidisciplinary team, the integration approach was based on guidelines published by the National Heart, Lung and Blood Institute and included a protocol for weaning off bronchodilators to allow nurses the role of evaluating and modifying nebulised beta-agonist therapy<sup>28</sup>.

All nursing staff were taught how to assess patients with asthma. The control group (n = 55) received usual standard care. In contrast to the integrated care pathway group, control group nurses did not determine whether patients were ready to be weaned from their medications. Integrated care pathway patients (n = 55) received education about the use of an inhaler and spacer, as well as some coordination of post-discharge care from a case management team<sup>28</sup>.

## Impact on patient outcomes and cost effectiveness

Allen et al. 2009<sup>17</sup> reported few patient outcomes originating from just 2 RCTs (See Table 1).

For children going to A&E with acute asthma/wheeze, formalising MDT working increased the proportion of children given an adequate course of corticosteroids after discharge from hospital (statistical significance not reported).

By contrast, there was no significant change in adverse events following discharge for inpatient paediatric asthma management, but the study had insufficient power to determine whether this was significant. Patients in the integrated care group had an average length of stay 13 hours shorter than the control group. In addition, at every dosing interval, the intervention group received less nebulized beta-agonist therapy. Neither RCT looked at cost.

## Strengths and limitations

Allen et al. 2009<sup>17</sup> scored well for review quality (AMSTAR score 7/11) but was less relevant than Parab et al 2013<sup>19</sup> as only 2 of the 9 RCTs included was related to children. One was from the UK, one from the US. The RCT quality was reported to have been appraised, but was not reported in the publication, giving an unclear risk of bias.

## Barriers and facilitators

### Formalising multidisciplinary team working through best practice guidelines

Allen et al. 2009<sup>17</sup> looked at which integrated care pathways were effective, for whom and in what circumstances. While only 2 of the 9 RCTs included were in children, its overall conclusions may have wider applicability so are included below.

Overall it found integrated care pathways were most effective in contexts where patient care trajectories are predictable. Their value in settings in which recovery pathways are more variable was less clear<sup>17</sup>. Integrated care pathways were most effective in bringing about behavioural changes when there are identified deficiencies in services. Their value in contexts where inter-professional working is well established is less certain.

Allen et al. 2009<sup>17</sup> concluded that integrated care pathways are effective in the following circumstances:

- For relatively predictable trajectories of care integrated care pathways can be effective in supporting proactive care management and ensuring that patients receive relevant clinical interventions and/or assessments in a timely manner. This can lead to improvements in service quality and service efficiency without adverse consequences for patients.
- Integrated care pathways are an effective mechanism for promoting adherence to guidelines or treatment protocols thereby reducing variation in practice.
- Integrated care pathways can be effective in improving documentation of treatment goals and communication with patients, carers and health professionals.

- Integrated care pathways can be effective in improving physician agreement about treatment options.
- Integrated care pathways can be effective in supporting decision-making when they incorporate a decision-aide.
- Integrated care pathways may be particularly effective in changing professional behaviours in the desired direction where there is scope for improvement or where roles are new.
- Even in contexts in which health professionals are already experienced with a particular pathway, integrated care pathway use brings additional beneficial effects in directing professional practice.

Allen et al. 2009<sup>17</sup> concluded that integrated care pathways are not effective in the following circumstances:

- Integrated care pathways are less effective in bringing about service quality and efficiency gains in variable patient trajectories.
- Integrated care pathways are less effective in bringing about quality improvements in circumstances in which services are already based on best evidence and multidisciplinary working is well established.
- The benefits of integrated care pathways may be greater for certain patient subgroups than others.
- Integrated care pathways may need supporting mechanisms to underpin their implementation and ensure their adoption in practice.
- Integrated care pathway documentation can introduce scope for new kinds of error.

Based on the 7 adult and 2 child RCTs Allen et al. 2009<sup>17</sup> made recommendations for future practice. While they are only partially based on evidence directly relevant to children, the broad conclusions may still be useful to consider:

- Given the costs of their development, service providers should restrict integrated care pathways use to those areas where there are clearly identified deficiencies in existing care provision and/or where change is required.
- Prior to integrated care pathway development, developers should seek to specify how they wish to change practice, and which of the generative mechanisms are necessary for this purpose.
- The evidence suggests that the integrated care pathways will change practice. It is imperative therefore, that the directions for action embedded in the tool are based on best practice or evidence.
- Integrated care pathways can be usefully deployed to make best practice guidelines available to staff in a form which is useable in daily practice.
- In cases where care is more variable, integrated care pathways need to have greater degrees of in built abstraction. Moreover, it is important that staff are supported in exercising professional judgement in those cases when adherence to the pathway is not in the individual patient's interest.
- Integrated care pathway developers should consider carefully the target patient population and identify any subgroups for whom it may not be appropriate.

## Transition from hospital to home

Noyes et al. 2014<sup>18</sup> conducted a qualitative systematic review to identify components of a successful transition of children with complex healthcare needs from hospital to home. The review included input from 13 Irish professional experts, and included studies from high income countries only.

It identified seven success factors for children transitioning from hospital to home:

- Effective health and multiagency agreements and funding arrangements
- Robust clinical governance quality and safety policies
- Effective discharge planning procedures
- Appropriate effective home care package
- Key worker individually tailored family support and education
- Accessible accommodation equipment and transport
- Ongoing hospital/community interface.

Crossing all of these elements was the concept of feedback communication loops. They were described as being largely absent from interventions assessed by Noyes et al. 2014<sup>18</sup> but the review team reported they were crucial for process improvement and identifying best practice.

Barriers to effective discharge planning cited in the review included:

- Lack of joined up thinking
- Poor management
- Lack of coordinated approach to undertaking assessments and addressing complex social and psychological issues
- Lack of inter-agency planning
- Lack of discharge guidelines and streamlined processes.

Noyes et al. 2014<sup>18</sup> suggested children's services in hospital had been very dynamic in responding to the latest advances in medical interventions and nursing care advancements that keeps children alive, but service delivery and organisational response to enable these children to live at home have been far less dynamic and, in many cases, static.

Noyes et al. 2014<sup>18</sup> note the transition process from hospital to home is susceptible to positive and negative impact from different contexts and modifiers including:

- Change of staffing
- Professional relationships
- Quality of leadership
- Introduction of new policy
- New funding arrangements
- Wider economic stability
- Mental health and wellbeing of parents
- Geographical distance.

### **Strengths and limitations**

Noyes et al. 2014<sup>18</sup> sought to identify components of successful transition of children with complex healthcare needs from hospital to home. It did not score well for methodological quality (AMSTAR score 5/11) reducing the reliability of its findings. Furthermore, it included studies with a high risk of bias (opinion pieces, discussion articles, best practice guides) in terms of assessing effectiveness, but the grey literature documents included were a good source of barriers and facilitators to success. This study consulted a panel of 13 Irish experts, as well as those based internationally, to help clarify key

concepts, develop review questions and set review parameters. This may have increased the relevance of the review focus to the Irish healthcare system but this is unclear.

## Metrics used to measure outcomes

### Patient outcomes:

- Adverse events following hospital discharge
- Child behaviour (if related to a medical condition)
- Child given appropriate medicines post discharge e.g. asthma medicines
- Family functioning
- Functional state of children
- Health outcome rating scales
- Parent, child and referrer satisfaction with care
- Parent, child, carer satisfaction surveys
- Parent/carer anxiety
- Parent/carer coping
- Parental/carer burden of care for children
- Patient satisfaction
- Physical and mental health of children
- Quality of life of children and their carers
- Rating of ability of families/carers to care for their children

## Gaps in the evidence

Overall, there was a lack of relevant systematic reviews evaluating integrated care approaches in children. We identified 3 reviews<sup>20-22</sup>, but they did not provide enough detail to tell us how different integrated interventions work, or what contexts and mechanisms were able to produce the best patient outcomes.

All three systematic reviews identified specific evidence gaps relating to their research objective.

For hospital to home discharge processes Noyes et al. 2014<sup>18</sup> indicated that RCTs and cohort studies are needed to test different transition interventions and implementation strategies to improve outcomes for children with complex healthcare needs and their families. They also called for more primary research to identify useful clinical indicators and outcome measures that accurately capture desired outcomes at different time points.

Parab et al. 2013<sup>19</sup>, in relation to home-based nursing care, called for further trials measuring health, satisfaction, service utilisation and long-term costs.

Allen et al. 2009<sup>17</sup> made a number of research recommendations about integrated care pathways (ICPs):

- Primary research is necessary to provide stronger evidence of the active ingredients of ICPs, their generative mechanisms and interrelationships.
- Evaluations of ICPs should specify the ingredients of the intervention, including processes to support development, implementation and sustainability as well as details of the ICP artefact.
- Evaluations of ICPs need to be underpinned by clarity as to the purposes of the intervention.

- Evaluations of ICPs must include theoretically informed outcome and process measures which take into account the perspective of all relevant stakeholders and the wider system effects of the intervention.
- Evaluations of ICPs should include theoretically informed process outcomes in order to develop understanding of ICP use in practice so that the reasons for behavioural change or its absence are understood.
- Evaluations of ICPs should provide adequate information on the ‘control’.
- Evaluations of ICPs should provide adequate information on the local context, taking care to identify critical success factors.
- Researchers should aim to produce realistic evaluation of ICPs which seek to develop an explanation (and therefore a theory) about how the intervention in question works in particular situations/contexts, by exploring the relationship between context, mechanism and outcome.

## Case study 1: Substituting community children’s nursing services for inpatient care

**Context:** A major reconfiguration of secondary services which involved a reduction in the numbers of overnight paediatric units and development and expansion of Community Children’s Nursing Team (CCNTs) to provide care at home for children with acute conditions.

**Aim:** To compare children’s pathways to and through Community Children’s Nursing Team care, and NHS costs, before and after relocation of inpatient services and extension of a paediatric Emergency Department and Observation and Assessment Unit (ED/OAU).

**Setting:** A densely populated urban area. The percentage of the population living in the most deprived quintile of the Indices of Multiple Deprivation 2007 (45.9%) was ‘significantly worse’ than the England average (19.9%).

**Population:** Children referred to CCNT care.

**Intervention:** A CCNT was expanded to support parents to care for their children at home and to provide an alternative to inpatient care. The CCNT was closely integrated with the ED/OAU to enable early referral and to promote continuity of care. The community children’s nurses rotated into the ED/OAU, where they took on the role of base nurse in the observation and assessment area during the late shift. This formed part of the training to provide the CCNT with the necessary skills for caring for children with acute conditions. Additional training and organisational arrangements included coordination across hospital and community services in the use of a Paediatric Early Warning Score, standardisation of clinical and operational pathways for the management of a range of common acute conditions by the ambulance service, acute provider sites and CCNTs.

**Method:** Routinely collected data on activity and staffing were provided by the CCNT. Parents completed questionnaires about their child’s use of healthcare services and satisfaction with care before service reconfiguration (n=221) or after (n=210). The cost of service use was compared before and after reconfiguration.

**Outcomes:** Healthcare service use and associated costs, satisfaction with CCNT care.

**Results:** The mean number of services used before referral to the CCNT reduced from 2.8 to 1.6, and the proportion using only one service increased from 26% (n=58) to 61% (n=128).

Inpatient admission during CCNT care reduced from 6% (n=13) to 2% (n=4), and ED attendance from 37% (n=79) to 16% (n=31). CCNT care was rated 'excellent' or 'very good' by 85% of respondents both before and after reconfiguration.

**Cost:** Post reconfiguration, the average cost of CCNT care reduced from £79 to £59, and the average overall NHS cost of care for children referred to the CCNT reduced from £271 to £121 (2008/9 prices). These data indicate a considerable fall (25%) in the cost of CCNT care, and a sharp fall (55%) in the average overall NHS cost of care.

**Author conclusion:** A CCNT provided an alternative to hospitalisation when acute general paediatric services were reconfigured to substitute for a relocated hospital. Children's pathways to CCNT care were shortened. The average cost of CCNT care and overall NHS cost were lower following reconfiguration. Satisfaction remained high throughout.

**Research funding:** Department of Health Policy Research Programme

**Source:** Callery et al. 2014<sup>29</sup>

## Conclusion

There is a clear lack of relevant systematic review level evidence assessing the merits of different integrated care approaches in children or their cost effectiveness.

The three included reviews provided little meaningful cost data, and process outcomes were typically more prevalent than patient orientated outcomes. While two of the three reviews scored high for methodological rigour, the primary studies included in them had significant risks of bias, diminishing their reliability. As such the evidence base for integrative care approaches for children appears weak, small and inconclusive.

The limited evidence base painted a mixed picture of impact on patient outcomes (See Table 1). There was some evidence that outcomes such as parental anxiety and coping may significantly improve in some interventions and settings<sup>19</sup>. Other patient outcomes were reported as improving but lacked statistical validity. Some outcomes did not improve, such as parental burden of care, but it was unclear if the studies had enough statistical power to detect real differences in these cases.

The literature base is not mature enough to make evidence based recommendations relating to effective integrated care approaches, or their cost effectiveness, in children.

However, the barriers and facilitators identified in Allen et al. 2009<sup>17</sup> and Noyes et al. 2014<sup>18</sup> do provide direction and learning opportunities for those considering integrated care approaches at the formative stages of planning. They provide contexts where integrative care approaches may be more likely to work, those where it is unclear, and those where there is less likelihood of success.

Key metrics to measure impact should include the child, their families or carers and include mental as well as physical health where relevant.

## Maternity and gynaecological care

Two systematic reviews assessed integrated care in maternity and gynaecological care<sup>20, 21</sup>. The two main approaches to integrated care were:

- Multidisciplinary teams
- Integration of HIV/AIDS services with maternal, neonatal and child health, nutrition, and family planning services

While both reviews scored high for review methodological quality (AMSTAR score 8 and 9/11) the primary studies included in each had a high risk of bias. These reviews were supplemented by a qualitative integrative review discussing collaboration and integrated services for perinatal mental health, from a healthcare professional perspective<sup>22</sup>.

Table 2 gives summary details of the quality, approach and outcomes of each study. Further detail can be found in the Evidence Tables (Appendix D).

Table 2 Summary table of systematic review evidence for maternity and gynaecological services (n=2)<sup>20, 21</sup>

Author/date	Quality score	Sample	Population	Integrated care approach	Patient outcomes	Impact	Cost effectiveness	Relevance to Ireland
Lindegren et al. 2012 <sup>21</sup>	9/11	N=20 papers on 19 studies: 2 cohort, 2 non-randomised trial, 15 other observational	Women and families, 15/19 studies in sub-Saharan Africa	Integration of HIV/AIDS services with maternal, neonatal and child health, nutrition, and family planning services	Pregnancy rates	↑*	No evidence identified.	Limited relevance, most studies sub-Saharan Africa. Potentially very different service configurations.
					Child recovery from malnutrition	↑		
Bick et al. 2014 <sup>20</sup>	8/11	N=19, 10 opinion papers, 6 guidelines, 1 SR, 2 other.	Postnatal women with pre-existing diabetes and cardiac disease	MDT	Obstetric complications, still births, premature births and infants born with heart disease	↗	No evidence identified.	High income countries studied.
					Maternal anxiety	↗		

\* Improvement here signals a lowering of pregnancy rates in the target population

## Multidisciplinary teams

### Approach

Bick et al. 2014<sup>20</sup> sought to determine the most appropriate multi-disciplinary team (MDT) models of care to manage complex medical conditions (pre-existing diabetes and cardiac disease) in pregnant or postnatal women. They aimed to describe any models of care found with reference to membership structure, process, referral pathways, and working practices. Few studies matched this aim.

The review found no studies had evaluated models of management of pregnant or postnatal women with pre-existing diabetes and cardiac disease<sup>20</sup>. Studies that were included referred to cardiac disease, and only to management and pregnancy outcome in single site settings. These were described as providing a low level of evidence because of a risk of bias from use of retrospective designs. None of the studies referred to women's experiences of care or impact on their psychological and other aspects of their physical health and well-being or health professionals' experiences of MDT care<sup>20</sup>.

Bick et al. 2014<sup>20</sup> included a UK retrospective cohort study (Greutmann et al. 2010<sup>30</sup>) describing the outcomes of 76 pregnancies which continued beyond 24 weeks gestation in 47 women with congenital heart disease and residual haemodynamic right outflow tract lesions. This included women attending a joint cardiology/obstetric clinic in one tertiary referral centre in London. This was referred to by the authors as a 'specialist MDT' including a cardiologist, an obstetrician, an anaesthetist, a haematologist and a clinical nurse specialist.

All women were seen by a Grown Up Congenital Heart disease (GUCH) cardiologist at 14-16 weeks gestation, with follow up during pregnancy planned on an individual basis depending on complexity and risk. A detailed labour and birth plan was developed for all women following discussion with the MDT at 32-34 weeks gestation. Details of which members of the MDT were involved in the follow up of women after 14-16 weeks gestation, or how the team worked together (e.g. whether they had formal meetings, and if these included the women as well) were not reported.

For diabetes, Bick et al. 2014<sup>20</sup> cited The CEMACH (now CMACE, Centre for Maternal and Child Enquiries) national enquiry into diabetes in pregnancy as highlighting the importance of women having access to a pre-conception service with a MDT to minimise the risk of foetal malformation. It recommended that MDTs should include as a minimum, an obstetrician, diabetes physician, diabetes specialist nurse, diabetes midwife and dietician<sup>20</sup>.

Bick et al. 2014<sup>20</sup> said NICE guidance for diabetes in pregnancy and the Australasian Diabetes in Pregnancy Society consensus guidelines for the management of type 1 and type 2 diabetes in pregnancy recommended that women planning pregnancy should be offered pre-conception care and advice to raise awareness of potential problems. NICE diabetes guidance recommended a structured education programme, with pregnant women offered immediate contact with a joint diabetic and antenatal clinic, but there was no clear definition of what the structure or membership of such a clinic should be or how often it should meet<sup>20</sup>.

A second UK primary study include in the Bick et al. 2014<sup>20</sup> review (Curtis et al. 2009<sup>31</sup>) undertook a retrospective study of 177 pregnancies in 155 women with cardiac disease who attended a high risk pregnancy clinic in a tertiary referral centre in the South West of England to assess if care provided met standards derived from an amalgamation of guidelines including the European Society of Cardiology (ESC) consensus opinion document and CEMACH (now CMACE, Centre for Maternal and

Child Enquiries), both of which included recommendations about MDT care. No details of the current MDT model of care implemented at the unit were described.

Curtis et al. 2009<sup>31</sup> concluded that pregnancies among women with cardiac disease were increasing and for the most part recommended management standards were met, although suboptimal MDT management in some cases was identified when compared against guideline recommendations

### **Impact on patient outcomes and cost**

Bick et al. 2014<sup>20</sup> reported positive patient outcomes for obstetric complications, still births, premature births, infants born with heart disease and maternal anxiety (See Table 2). Although improvements were reported, they were not quantified or explicitly linked to statistical tests, so their magnitude or statistical significance is not clear. It did not provide any evidence on costs.

Despite national and international policy and guideline recommendations for MDT management for women with pre-existing diabetes or cardiac disease, the review found no evaluations of different structures or working practices of MDT teams or impact on maternal or infant outcomes<sup>20</sup>. Limited or no evidence informed other areas of the review.

The review provides basic information on some MDT models, but with little detail, comparison, or direct link with patient outcomes. Consequently, the review authors concluded there was a lack of primary evidence to inform structure or working practices of MDTs or beneficial impact on maternal and infant outcomes or healthcare resources<sup>20</sup>.

### **Strengths and weaknesses**

Bick et al. 2014<sup>20</sup> reviewed the best type of multidisciplinary team to use to manage complex medical conditions during and after pregnancy. It also scored high for review quality (AMSTAR score 8/11) but, of the 19 studies included, most had a high risk of bias due to their design. For example, 10 were opinion pieces and 6 were guidelines. Two retrospective studies from the UK were the most relevant. All were from high income countries but some (particularly the US and Singapore) have markedly different healthcare systems to Ireland, reducing applicability. Studies included pregnant or postnatal women with pre-existing diabetes and cardiac disease, study size ranged from 0 to 4,252.

## **Integration of HIV/AIDS services with maternal, neonatal and child health, nutrition, and family planning services**

### **Approach**

Lindgren et al. 2012<sup>21</sup>, a Cochrane systematic review of 20 studies, described 6 approaches that had been taken to integrate HIV services with maternal, neonatal and child health, nutrition (MNCHN), and family planning (FP) services:

- antenatal care services adding antiretroviral therapy (ART) for eligible pregnant women
- antenatal care services integrating prevention of mother-to-child transmission of HIV (PMTCT) service
- child malnutrition services adding HIV testing
- post-abortion care adding HIV testing
- HIV treatment/secondary prevention adding family planning services
- HIV counselling and testing adding family planning services

The majority of primary studies (15/19) in the review were from sub-Saharan Africa, reducing their relevance to Ireland, but one by Coyne et al. 2007<sup>32</sup> was from, Slough in the UK.

This non-random serial cross-sectional study<sup>32</sup> described running a “one-stop clinic” for HIV-positive women, offering sexually transmitted infection screening, cervical cytology, pre-conception counselling and family planning. It was set-up in response to an audit showing that the sexual and reproductive health needs of the HIV-positive female clients were not being met, so a specific clinic was started to provide sexual and reproductive health services to these women.

The integrated clinic was staffed by providers trained in both sexually transmitted infection management and family planning.

### **Impact on patient outcomes and cost effectiveness**

While acknowledging lack of rigorous evidence, Lindegren et al. 2012<sup>21</sup> concluded integration of HIV/AIDS and MNCHN-FP services was feasible to implement across a variety of integration models, settings and target populations, and can improve a variety of health and behavioural outcomes.

Nearly all studies included in the review reported positive post-integration effects on key outcomes including contraceptive use, antiretroviral therapy initiation in pregnancy, HIV testing, and quality of services (See Table 2).

However several studies also reported mixed effects or no effects, showing either that there were multiple measures of an outcome that showed inconsistent results, or there was no statistically significant difference in the outcome associated with the intervention<sup>21</sup>.

Only a few studies reported change in health outcomes, specifically pregnancy rates and recovery from malnutrition, but all showed improvements in these outcomes<sup>21</sup>. Of the two studies that reported on pregnancy outcomes, both found the number of pregnancies decreased after integrated FP-HIV services were introduced<sup>21</sup>.

One study found that staff workload was higher in clinics that provided integrated services; this was the only potentially negative outcome identified. This study showed that average staff workload was higher in clinics that provided both reproductive and child health services and prevention of mother-to-child transmission services when compared to those that provided reproductive and child health services alone. However the significance of this difference was not reported and there was a wide range in staff workload across clinics<sup>21</sup>.

The impact of these integration strategies on incidence of infant HIV infection, STI incidence, unintended pregnancy, stigma, women’s empowerment, cost or cost-effectiveness was not measured<sup>21</sup>.

The one study from the UK, Coyne et al. 2007<sup>32</sup>, reported improvement across all process outcomes measured, including receipt of cervical cytology, recording of method of contraception, recording of sexual history, and offering of STI screen. The use of condoms as the only means of contraception declined. The authors interpret this as better provision of more reliable contraceptives. Importantly, this study performed no statistical tests, so we don’t know if improvements are statistically significant or meaningful to the patient or responsible healthcare professional.

The study authors recommended that clinics looking after HIV positive people need to have local care pathways to address their sexual health needs. They would propose their integrated clinic model as an effective means of providing this service to women with HIV<sup>32</sup>.

## Strengths and weaknesses

Lindegren et al. 2012<sup>21</sup>, a Cochrane systematic review, looked at integration of HIV/AIDS services with maternal, neonatal and child health, nutrition, and family planning services. The review scored high for review quality (AMSTAR score 9/11) but the 19 primary studies within it, including no RCTs, had a high risk of bias as most (15) were observational. Direct applicability to Ireland was also limited as most studies were based in sub-Saharan Africa (15 of 19), including the 3 reporting extractable health outcomes. The rest were based in the UK, US, Ukraine and Haiti. All interventions targeted women (7 also included men or couples) and study size ranged from 60 to over 13,000.

## Perinatal mental health services

### Approach

Mayors et al. 2013<sup>22</sup> performed an integrative review to synthesise qualitative research related to professional's perceptions and experiences of working in collaboration and integrated models of perinatal care for women with mental health problems. As part of their discussion about different definitions of collaborative care, they highlighted a number of different approaches to integrated care:

- Designated link worker
- Having a common manager across services
- Multi-disciplinary managed and coordinated networks and steering committees
- Perinatal multidisciplinary teams
- Structured multidisciplinary peer supervision
- Co-location of services
- Inclusion of the non-governmental and voluntary sectors

Myors et al. 2013<sup>22</sup> outlined a difference of opinion about the level of collaboration needed in maternity services. They cited some sources saying intensive collaboration between primary health professionals is essential as this is where the majority of women with perinatal mental health problems will present. On the flip side others said the majority of mothers do not need tightly integrated perinatal services. Some suggested women and families with multiple and complex needs benefit most from intensely integrated care. Identified benefits include better access, assessment and treatment, and preventing confusion and disengagement which can occur with multiple uncoordinated services.

These views were outlined in the discussion, and were not directly based in evidence from any of the primary studies analysed in the review itself<sup>22</sup>. As it did not produce specific patient outcomes it is not included in the summary table.

## Barriers and facilitators

### Integrating HIV/AIDS services

Lindegren et al. 2012<sup>21</sup> noted a number of factors that either promoted or inhibited the success of integrating HIV/AIDS services with maternal, neonatal and child health, nutrition, and family planning services.

The most important success factors across studies were:

- stakeholder, staff and local community support
- adequate investment in staff training and supervision
- simple and inexpensive interventions added to existing services

Additional facilitating factors included:

- on-site provision of family planning
- flexibility of clinic in rescheduling appointments
- male partner involvement
- rapport between health providers and clients
- integrated electronic patient record systems

Inhibitory factors included:

- additional referral waiting times
- user cost fees
- lack of knowledge of effective family planning options, particularly for HIV-infected women
- staff turnover
- cost and logistics of commodity procurement and supply

The UK primary study, Coyne et al. 2007<sup>32</sup>, from Lindegren et al. 2012<sup>21</sup>, outlined facilitators for setting up a dedicated sexual and reproductive health clinic in HIV-positive women - a family planning clinic integrated with a nearby HIV clinic. Facilitators included how the integrated clinic ran alongside the general GU medicine and HIV clinics, using a single set of notes, ensuring that at every visit sexual health issues could be addressed. Inhibiting factors were not reported.

Late booking in pregnancy, language barriers, and non-attendance at appointments were cited by Bick et al. 2014<sup>20</sup> as potential barriers to effective management of complex medical conditions in pregnant or postnatal women with pre-existing diabetes and cardiac disease. However it wasn't clear how widespread these issues were.

## **Perinatal mental health services**

Myors et al. 2011<sup>22</sup> identified eight facilitators around “making collaboration and integrated care happen” in perinatal mental health services:

- funding and resources for collaboration
- shared vision, aims and goals
- pathways and guidelines
- continuity of care
- building relationships and trust
- role clarity
- training and education of staff
- support to work in new ways

These elements emerged from a review of 14 studies documenting views of health professionals working in collaborative or integrated models of perinatal care for women with mental health problems<sup>22</sup>. All professionals worked with women, infants and families in the perinatal period, but perinatal mental health was not the core focus for many.

## Metrics used to measure patient outcomes

Patient outcomes identified from Lindegren et al. 2012<sup>21</sup> and Bick et al. 2014<sup>20</sup>:

- accurate diagnosis of a cardiac problem or recognition of the severity of the problem
- adequate postpartum follow-up (e.g. an out-patient clinic within six months of giving birth)
- adequate preconception care (e.g. pre-conception advice, contraceptive advice, provision of higher dose folic acid, appropriate screening and management of diabetes complications and MDT involvement)
- adherence to treatment
- adverse events
- child recovery from malnutrition
- condom use
- documented discussion about plans for care during pregnancy
- documented pre-conception counselling
- frequency of pre-conception advice
- HIV incidence
- HIV testing
- infants born with heart disease
- maternal anxiety
- morbidity
- mortality
- obstetric complications
- pregnancy rates
- premature births
- quality services
- speed of identification of adverse events
- stigma
- still births
- unintended pregnancy
- women's empowerment

## Gaps in the evidence

Bick et al. 2014<sup>20</sup> reported that, despite widespread promotion of MDT models of care for pregnant and postnatal women with pre-existing diabetes or cardiac disease - a prominent example of complex medical conditions- there was a lack of primary evidence to inform structure, working practices, beneficial impact on maternal and infant outcomes or healthcare resources. Adding, primary research into if or how MDT models of care improve outcomes for women with complex pregnancies is urgently needed.

High risk pregnancies among women with pre-existing diabetes or cardiac disease were selected as the primary focus for the review for several reasons<sup>20</sup>; there is a high prevalence of pre-existing diabetes in pregnancy; recommendations for MDT management have been available for some time; and more women with diabetes are becoming pregnant; maternal adverse outcomes from cardiac disease are high and medical issues are complex. As both conditions are also associated with adverse perinatal outcomes, they are medical complications of importance to women, obstetricians, midwives, and primary and secondary care physicians. As such there was an expectation that they would have been the focus of research into MDT management, however this was not the case<sup>20</sup>.

The two UK studies from Bick et al. 2014<sup>20</sup> had arguably the most applicability to Ireland but described different models of care for women with cardiac disease. It was unclear if the models described were standard within these centres, how often the MDT members met, if meetings took place without the woman being present, how communication about a woman's case was shared between the members of the team or how team 'hierarchies' operated. Levels of communication across primary and secondary care sectors and with other maternity providers were also not described.

Lindegren et al. 2012<sup>21</sup> indicated that significant evidence gaps remain. Rigorous research comparing outcomes of integrated with non-integrated services, including cost, cost-effectiveness, and health outcomes such as HIV and STI incidence, morbidity and mortality are greatly needed to inform programs and policy.

Myors et al. 2013<sup>22</sup> said the potential negatives of integration need to be considered.

## Case study 2: The Devon and Torbay Perinatal Health Team, NHS England 2015<sup>33</sup> .

**Target population:** Pregnant women. In the three years since 2011/12, 5,698 (25%) of the 22,715 women who gave birth needed the service.

**Context:** In 2011-12 South Devon and Torbay Clinical Commissioning Group (CCG) was paying around £750,000 providing services for women who had not been able to access locally commissioned perinatal care and had escalated to needing more serious interventions such as stays in intensive care, medium secure units, admissions to antenatal wards or mental health units or more regular visits to the GP because of mental health problems during or after pregnancy.

To improve local services and prevent a repeat of this cost escalation the CCG commissioned Devon and Torbay Perinatal Health Team.

**Intervention:** All women who give birth in the three acute hospitals in Devon and Torbay are asked by midwives about their mental health and those who report concerns or are at risk are referred to the 10 strong Devon and Torbay Perinatal Health Team.

The team can take a number of actions: direct them to services or information, see them for a check-up to discuss medium level concerns, or in more serious cases, refer them for specialist care.

The service is run by Devon Partnership NHS Trust and in place at Torbay Hospital, Royal Devon and Exeter and North Devon District Hospital.

All the midwives in Devon and Torbay have an induction and mandatory training carried out by the perinatal team to make sure they are comfortable asking initial questions which open a conversation about mental health.

The perinatal team helps women from the pregnancy planning stage through to post-natal support and make sure they are monitored closely during pregnancy.

The perinatal team also worked with families from Devon and a local film maker to make a film to break down stigma and support others going through perinatal mental health issues. It has been

viewed more than 5000 times in more than 40 countries, including countries with little or no mental health care.

**Outcomes:** No robust evaluation was presented. But anecdotal reports from health professionals and women directly involved in the scheme were positive<sup>33</sup>.

The Devon and Torbay Perinatal Health Team has identified, supported or signposted thousands of women who needed mental health support.

Dr Geraldine Strathdee, NHS England's Director for Mental Health, said: "This initiative has made a huge difference to women's lives in Devon, Torbay and Exeter and it is fantastic to see such a successful example of integrated physical and mental health care, one of the Five Year Forward View priorities. Adding: "This type of service is not seen in every area of the country but it could be replicated in other areas where more women, their partners and children could benefit. Commissioning Programmes like this are changing lives and are a key part of our evolving NHS."

Dr Jo Black, a consultant perinatal psychiatrist who heads up the scheme across the region's three hospitals, said: "We're picking up that one third of women are concerned about their mental health - this can be women who have never disclosed their problems before, people with pre-existing disorders or even survivors of sexual abuse in childhood.

**Cost:** The new team initially cost around £150,000 for four members of staff. The following year, the CCG were delighted with the success of the scheme, with dramatically reduced costs and better outcomes for women and families.

**Challenges:** One of the challenges the team faced was getting upfront commissioning as evidence of savings is often from reduced urgent care admissions or other areas which can be harder to quantify.

**Source:** NHS England News update on a thriving community perinatal scheme<sup>33</sup>

## Conclusion

There is a lack of evidence to inform the best approaches to integrated care for maternity and gynaecological services, although a number of possible barriers and facilitators were identified for consideration in the formative stages.

Only two relevant systematic reviews informed what works<sup>20, 21</sup>. One review suggested integrating HIV services with other child and maternity services was feasible and could improve outcomes for HIV positive women across a range of settings. A second suggested formalising MDTs can improve outcomes for postnatal women with pre-existing diabetes and cardiac disease evidence, but lacked statistical validity. Both reviews were based on literature with a high risk of bias, so provide no firm evidence base to inform the most effective approach.

The lack of review level evidence to inform the best integrative care approach may reflect an immature research area. In such a case decision makers may be forced to critically consider the assumed benefits of integrated care. Furthermore, widespread and methodologically robust evaluations of a range of integrative care approaches are unlikely to materialise in the next few years. Decision makers may have to consider weaker sources of evidence, such as case studies and

expert insight, or commission more focussed evidence reviews identifying best practice in specific populations or disease categories.

Integrated care interventions are often complex and context dependent interventions so piloting an integrative service locally might be the most pragmatic way forward. Producing a widely available and robust evaluation of the intervention pilot would not only help those implementing it, but would help others learn from their experience, helping fill the large evidence gap in this area.

## Older people

Sixteen reviews assessed effectiveness of integrated care approaches in older people<sup>1-16</sup>.

As noted in the introduction, researchers use many different terms to define and label integrated care approaches and the evidence base for older people was no exception. The evidence was diverse, but split broadly into two camps. Those choosing a label based on the main approach to integrated care, such as multidisciplinary team working or case management; and those choosing one based on the overall integrated service objective, such as early supported discharge or service coordination.

The categories nearly always overlapped. For example, Larsen et al. 2006<sup>10</sup> described an early supported discharge approach using a multidisciplinary team for older adults who had experienced a stroke. We describe the models as they are described in the reviews. To unpick them, and diffuse them into many discreet categories, risks losing any potentially important synergies of the multi-faceted interventions and may be too reductionist.

The main overlapping approaches identified in the 16 reviews were:

- Team based working:
  - MDTs
  - Inter-professional working
  - Integrated teams
  - Team care
  - Collaborative care
- Case management:
  - Case managers
  - System navigators
- Early supported discharge:
  - Teams co-ordinating discharge from hospital and post discharge care at home
  - Teams co-ordinating discharge but care handed over to existing community-based agencies who provided care at home
- Other approaches

Tables 5 to 7 give summary details of the quality, approach and outcomes of each study within these categories. Further detail can be found in the Evidence Tables (Appendix D).

## Team based working

### Approach

#### *MDTs*

Collet et al. 2010<sup>2</sup> reviewed eight studies, including four RCTs, looking at approaches to integrating psychiatric and nursing home care for nursing home residents, so called Double Care Demanding patients. In all the main approach was a MDT - comprising at least four disciplines, up to a max of six. In all primary studies this included a certified psychiatric nurse, and in six of the eight studies, a psychiatrist and psychologist were included. In five of the eight studies a physician was part of the MDT; this could be a geriatrician, an internist or a general physician.

The MDT intervention included a comprehensive assessment of the psychiatric disorders or severe behaviour disorders in the nursing home residents, including patient history. All studies also included

individualised treatment plans with integrated tailored psychosocial, nursing, medical and pharmaceutical interventions. Individual or group psychotherapy was offered in three studies and four provided training and education for nursing staff to improve their understanding of problem behaviour<sup>2</sup>.

### **Inter-professional working**

Trivedi et al. 2013<sup>16</sup> reviewed 37 RCTs on models of inter-professional working for community dwelling older people with complex and multiple health needs. These were defined as having one or more of the following characteristics:

- A shared care plan that involved joint decision making by an inter-professional /MDT.
- A shared protocol or documents (e.g. care pathways) that involved joint input from an inter-professional /MDT
- Face to face team meetings or routine team communications about individuals’ care plans.

The approaches taken in the literature boiled down into three key approaches, summarised in Table 3, including an example of these principles applied to a chronic care model. The same three approaches were identified in Goodman et al. 2012<sup>6</sup>, after reviewing 59 studies (37 RCTs) describing “integrated team” models in primary and community care for community dwelling older people with multiple health and social care needs.

**Table 3 Summary of three inter-professional working approaches identified in Trivedi et al. 2013<sup>16</sup>**

Case Management (CM)	Collaboration	Integrated team
<ul style="list-style-type: none"> <li>• Key worker assumed leadership role</li> <li>• Coordinating care, reporting back to professionals</li> <li>• Addressed patient needs in a co-ordinated manner</li> <li>• Professionals usually came from the same organization (e.g. Managed care) but involved other community agencies.</li> </ul>	<ul style="list-style-type: none"> <li>• Different professionals worked together on a patient by patient basis</li> <li>• Usually came from different organizations.</li> <li>• Established methods of working together</li> <li>• Although there is no designated key worker role as in the CM model, members assumed lead roles</li> </ul>	<ul style="list-style-type: none"> <li>• Most professionals came from same organization.</li> <li>• Unlike the CM model, IPW relied on an acknowledged team</li> <li>• Worked almost exclusively with one another dedicated to a particular function (e.g. hospital outreach), joint care planning.</li> <li>• Medical professional(s) were within the team (with or without a clear leadership role) or work alongside the team but outside the organization.</li> <li>• Model did not preclude a case manager</li> </ul>
Chronic care example		
<ul style="list-style-type: none"> <li>• Intensive CM, trained key worker</li> <li>• Structured, extensive communication routes</li> <li>• Formalizing CM’s role, inter-organisational agreements,</li> <li>• Multi-professional support, protocols, joint care plans, regular case meetings</li> <li>• Well coordinated community</li> </ul>	<ul style="list-style-type: none"> <li>• GPs and service co-coordinators (trained) conducted joint assessment and care plans, communicated to service providers</li> <li>• Systematic clinical improvement for protocols</li> <li>• Empowered patients (Partners in health care approach)</li> <li>• Culturally appropriate, good access, support by trained specialists</li> </ul>	<ul style="list-style-type: none"> <li>• Enhanced role of nurses for CM, care planning by trained coordinator</li> <li>• Joint review by geriatrician and IP team, referral to GP if required</li> <li>• Facilitating better access.</li> <li>• GEU based teams and GPs designed, reviewed, implemented care plans</li> <li>• SCC model had trained teams across three counties and joint care planning with physicians</li> <li>• Established team for psycho-geriatric</li> </ul>

<p>based teams, physicians involved,</p> <ul style="list-style-type: none"> <li>• Patients/families involved in care plans.</li> <li>• Mobilize resources flexibly and facilitate transitions into community (SIPA)</li> </ul>	<ul style="list-style-type: none"> <li>• Extensive co-ordination through inter-agency multi-site networks, joint budgets</li> <li>• Advanced key workers</li> <li>• Shared care with GP/physician, prior training</li> <li>• Nurse managed care, close liaison with professionals, carers' training</li> </ul>	<p>care had extra doctor as key worker.</p>
--	--	---

Goodman et al. 2012<sup>6</sup> noted the integrated team model was viewed as distinct from the collaborative and case management models, but recognised some studies had used a mixture of the three<sup>6</sup>.

Tieman et al. 2007<sup>15</sup> qualitatively reviewed five systematic reviews on MDT, coordinated and integrated care models in primary care for older people with chronic (diabetes, COPD, stroke), palliative care, and frail older populations. The review identified case conferences, care planning and team approaches, overlapping significantly with those described in Trivedi et al. 2013<sup>15</sup>.

### **Team care**

Kane et al. 2011<sup>9</sup> reviewed 144 publications (104 on RCTs) on “team care” interventions for older people with multiple, chronic, or complex care needs. They found team composition varied by health problem, and highlighted a wide variation in team composition, organisation and effectiveness (See Table 4).

In some cases a second discipline was simply added to existing practice to complement the physician<sup>9</sup>. The most common pairing was case managers, who assume responsibility for managing a specific problem, and pharmacists, who review and improve drug management<sup>9</sup>. In other cases there is full commitment to integrating care across and interdisciplinary group. Kane et al. 2011<sup>9</sup> highlight different types of team integration:

- Parallel - practitioners work in the same setting, but independently. Roles are formally defined within one’s scope of practice.
- Consultative - expert advice is shared between practitioners via a personal contact, letter or referral note
- Collaborative - patient is seen independently by each practitioner. Practitioners informally share information concerning the treatment of a particular patient on a case-by-case basis.
- Coordinated - administrative structure stimulates collaboration. Patients’ files are shared between practitioners. Liaison between practitioners is ensured by a managers/coordinator.
- Multidisciplinary - a leader is in charge of the planning of patient care. Each practitioner carries out treatment independently according to his/her expertise. Formalised extension of the coordinated model.
- Interdisciplinary - planning of patient care is decided by a group of practitioners, via regular face-to-face meetings. Extension of the multidisciplinary model.
- Integrative - non-hierarchical holistic collaboration of practitioners. Practitioners and patient contribute to patient care. Extension of interdisciplinary model.

Table 4 Team types by health issue

Target	Composition
Disability, frailty, geriatric conditions	Primary care physician and geriatrician, geriatric nurse, clinical psychologist, psychiatrist, social worker, caregiver, dietician
Chronic diseases/multi-morbidity	Primary care physician, geriatrician, nurse, clinical pharmacist, physiotherapist, occupational therapist, social worker, rehabilitation physician
Depression	Case manager, mental health consultant added to primary care, may include training for primary care.
Medication management	Pharmacist added to primary care
Stroke	Physical therapist, occupational therapist, speech pathologist, nurse, dietician, physician (specialist and/or primary care)
Blood pressure	Pharmacist, primary care physician, sometimes a nurse
Congestive heart failure	Team composition varies: cardiologist and nurse team is the most common; may also include primary care physician, physical therapist, dietician or pharmacist.
Diabetes	Team composition varies: A physician (primary or specialised) and nurse at the core, dietician or community worker may be added or substituted for the nurse.

Source: Kane et al. 2011<sup>9</sup>

### **Collaborative care**

Team membership in Kane et al. 2011<sup>9</sup> was broadly in line with that described in Chang-Quan et al. 2009<sup>1</sup>. Chang-Quan et al. 2009<sup>1</sup> reviewed three RCTs using “collaborative care interventions” for older people with depression, defined as approaches to integrating mental health and primary care services for this group. One involved an MDT comprising a depression care manager, GP, psychiatrist and liaison GP providing depression treatment over 12 months.

The description of a typical MDT for stroke patients was consistent between Kane et al. 2011<sup>9</sup> and Larsen et al. 2006<sup>10</sup>. Larsen et al. 2006<sup>10</sup> reviewed seven RCTs of early home supported discharge (EHSD) interventions using an interdisciplinary team to plan, co-ordinate and deliver care for older people recovering from a stroke. EHSD was described as a multidisciplinary team including physiotherapists, occupational therapists, speech therapists, physicians, nurses and social workers. The team plans, co-ordinates and delivers care at home through regular meetings. EHSD includes one pre-discharge home visit, a visit on the day of discharge and regular post-discharge home visits to review the patient-held recovery plan.

Davies et al. 2011<sup>3</sup> evaluated 17 studies on the different integrated approaches between care homes and other health care services identifying 10 broad models of integration:

- Multidisciplinary case conferences
- Multidisciplinary consultation & collaboration
- Multidisciplinary team meetings
- Multidisciplinary Care
- Multidisciplinary Training
- Collaborative working using integrated care pathways
- Care home support team
- Link nurses in care homes
- District nurses supporting care home staff
- Champions identified in care homes

The authors' described a great deal of variation in how health care services and care homes worked together and the frequency of contact. For example, whilst some studies involved weekly multidisciplinary team meetings, monthly meetings were more common<sup>3</sup>.

All the studies potentially increased care home staff access to health care professional's support and advice, with 15 out of 17 involving care home staff in multidisciplinary interventions or joint working. Care home staff were involved in multidisciplinary meetings and in some studies their opinions were sought, but they were led by health care professionals, with health care orientated and defined goals<sup>3</sup>.

Staff training was an integral part of all studies bar three; only a few studies consulted with care home staff on their perceived training needs. The range of training input varied from as little as 3 hours to 7 seminars or continuous training and support<sup>3</sup>.

### **Impact on patient outcomes and cost effectiveness**

Table 5 summarised the range of patient outcomes extracted from the diverse team working interventions.

The overall impact of the interventions is not easy to pool as they differed in terms of their target populations, team members involved, the role of the team within and across health and social services, how often they met, and whether the teams were the main intervention, or part of a wider integrative approach involving, for example, patient education or case management alongside.

In the three higher quality reviews<sup>2, 3, 6</sup> (AMSTAR score 8 or above) the patient impact was mixed; some patient outcomes improved significantly, others did not, or painted a mixed picture of impact for different outcomes (Table 5). None of the high quality reviews highlighted negative outcomes associated with the interventions. However, their data included no cost information, despite seeking cost data as part of their search strategies.

Davies et al. 2011<sup>3</sup> (AMSTAR score 9/11) found that multidisciplinary care, collaborative working and district nurse support for older people in care homes had either mixed effects (improvement in one outcome but no effect or negative effect in another outcome), or no effect when compared with the control group.

Table 5 Summary of team working intervention patient outcomes (n=8)<sup>1-3, 6, 9, 10, 15, 16</sup>

Author/date	Quality score	Sample	Population	Integrated care approach	Patient outcomes	Impact	Cost effectiveness	Relevance to Ireland
Davies et al. 2011 <sup>3</sup>	9/11	N=17, 10 quantitative studies, 2 process evaluations, 1 mixed methods study, 4 qualitative studies	Older people in care homes	Various, including multidisciplinary care, collaborative working and district nurse support	The majority of studies showed that the intervention had either mixed effects (improvement in one outcome but no effect or negative effect in another outcome), or no effect when compared with the control group.	→	Insufficient information to evaluate cost	High income countries studied.
Goodman et al. 2012 <sup>6</sup>	8/11	N=59, 37 RCTs, 8 non randomised control trials, 14 systematic reviews	Community dwelling older people with multiple long-term conditions	Various: 1) Integrated team model, 2) case management model, 3) collaboration model	Mortality	→	Was intended but was not feasible	High income countries studied.
					Patient satisfaction	↑		
Collet et al. 2010 <sup>2</sup>	8/11	N=8, 4 RCTs, 3 prospective case series, 1 retrospective cohort	Nursing home patients requiring combined psychiatric and nursing home care	Multi-disciplinary teams (MDT)	General psychiatric symptoms (especially depression and agitation or aggression)	↑	Not reported	High income countries studied.
					Global functioning (cognitive and functional status)	↑		
Trivedi et al. 2013 <sup>16</sup>	7/11	37 RCTs	Older people with complex and multiple needs	Inter-professional working (IPW)	Patient satisfaction, health/functional outcomes, care giver burden	↗	Mixed evidence on service use/costs.	RCTs from high income countries

Author/date	Quality score	Sample	Population	Integrated care approach	Patient outcomes	Impact	Cost effectiveness	Relevance to Ireland
Chang-Quan et al. 2009 <sup>1</sup>	7/11	3 RCTs	Older people with depression	Collaborative care interventions (CCIs) integrating mental health and primary care	Depression symptoms, suicidal ideation.	↑	CCI patients had higher outpatient costs, but greater depression free days	High income countries studied
Kane et al. 2011 <sup>9</sup>	5/11	N=144 (type unclear)	Older adults	Team care	Mortality, morbidity (including function, symptoms, laboratory tests), quality of life, hospitalisation/A&E, cost.	→	Mixed	Unclear
Tieman et al. 2007 <sup>15</sup>	4/11	5 SRs	Chronic (diabetes, COPD stroke), palliative and frail older people.	MDTs, coordinated and integrated care in primary health sector.	Coordination appears to improve outcomes e.g. case conferencing improving medication appropriateness. Trend showing the more disciplines involved the more outcomes improve.	↗	Integrated approaches may not necessarily reduce costs	Studies likely to be from high income countries.
Larsen et al. 2006 <sup>10</sup>	4/11	7 RCTs	Older adults who had experienced a stroke	Early home supported discharge (EHSD) using an interdisciplinary team to plan, co-ordinate and deliver care	Death or institutionalisation, change in Barthel Index, length of hospital stay	↗	Cost of intervention off-set by savings in inpatient/nursing home days	Similar countries to Ireland

Goodman et al. 2012<sup>6</sup> (AMSTAR score 8/11) pooled findings from three models: integrated team model, case management model, and collaboration model, to integrate care in older people with multiple long term conditions. It found no improvement in mortality but a significant increase in patient satisfaction.

By contrast using an MDT to provide nursing home residents with combined psychiatric and nursing home care in Collet et al. 2010<sup>2</sup> (AMSTAR score 8/11) improved general psychiatric symptoms (especially depression and agitation or aggression) and global functioning (cognitive and functional status).

The two reviews of moderate review quality (AMSTAR score 7/11) reported positive impacts on patients<sup>1, 16</sup>.

One of these, Chang-Quan et al. 2009<sup>1</sup>, reviewed collaborative care interventions (CCI) from three RCTs recruiting 3,930 older people with depression. They reported collaborative care intervention was better than usual care for improving depression scores at all follow-up periods, but this difference was only of statistical significance at three to four months, not at 12 months. Pooled analysis of two RCTs indicated a statistically significant decrease in suicidal thoughts from baseline for collaborative care intervention (OR 0.52, 95% CI 0.35 to 0.77) but not for usual care.

The remaining reviews were of poorer quality (AMSTAR score 5/11 or less) so are less reliable, but nonetheless were some of the few that included cost data, albeit in little detail.

Of the 19 studies describing an integrated team model in Trivedi et al. 2013<sup>16</sup>(Table 3), many showed improved health, functional ability, reduced caregiver burden, user satisfaction and process measures, including quality of care (Table 5). Evidence about service use and costs was mixed but around half the studies showed reduced hospital or nursing/care home use. The same review looked at 11 studies describing collaboration (Table 3). Three of the 11 focused on acute care, four described chronic care, three preventive home-based care and one outpatient care. Around half reported improved health / functional outcomes; most detecting improved process measures and patient / user satisfaction, with mixed evidence on service use / costs<sup>16</sup>.

Though it did not include a robust assessment of cost effectiveness, Tieman et al. 2007<sup>15</sup> suggested integrated approaches to care might not necessarily reduce costs from a service provider perspective. Several studies it analysed indicated service use increased, potentially reflecting unmet need being tapped. Long term cost impact was unclear.

This was mirrored by Kane et al. 2011<sup>9</sup> who also reported mixed cost effectiveness, for example positive cost effectiveness results were seen in 46% of studies. Larsen et al. 2006<sup>10</sup> was the only team intervention review to report favourable cost effectiveness overall, reporting cost savings from the provider perspective. The average cost of an early home supported discharge intervention for stroke rehabilitation was \$1340 per patient, with cost savings in inpatient and nursing home days of \$1480 to \$140 per patient. Larsen et al. 2006<sup>10</sup> recommend that cost savings be calculated over five years, especially with regards to the nursing home or long term care facility cost savings, deeming one year as insufficient.

## Strengths and weaknesses

Eight reviews covered different forms of team based working (Table 5). Though many scored high for review quality, the primary studies within them had at a generally high risk of bias. For example, the review attracting the highest review quality score (9/11, Davies et al 2011<sup>15</sup>) included 17 studies. Just four were RCTs. The remaining literature was at a much higher risk of bias, including two process evaluations and qualitative research. The evidence base covered diverse older populations including those living independently in the community, those in care homes with chronic or complex conditions, and those discharged from hospital due to stroke.

Few reviews identified any data on cost effectiveness. In those that did there was little detail and the data did not seem widely generalisable.

## Case management

### Approach

Eklund et al. 2009<sup>4</sup> described case management as the coordination of various system components for a successful outcome, entailing an assessment of the persons long-term care needs followed by recommendations for care, monitoring and follow up. Five core case manager activities were described:

- assessment
- planning
- linking
- monitoring
- advocacy

This aligned with the description put forward in Huntley et al. 2009<sup>7</sup> as:

*“a collaborative process of assessment, planning, facilitation, care coordination, evaluation, and advocacy for options and services to meet an individual’s and family’s comprehensive health needs through communication and available resources to promote quality cost-effective outcomes”.*

There were two main approaches, case management initiated in the community and those initiated in the hospital.

### **Community initiated case management**

Eklund et al. 2009<sup>4</sup> reviewed nine RCTs looking at integrated and coordinated interventions targeting frail elderly people living in the community. All studies were based around patient assessment by a case manager with or without team and individualised patient plans. Initial management in all studies was by the case manager, either face to face or by phone. In five of the nine studies the case manager cooperated with a team. In 1 article the clients were involved in the planning of care plans after initial assessment. Intervention varied from 3 months to 669 days. The availability of the case manager varied from 24 hour on call service to weekdays, to daytime only<sup>4</sup>.

A systematic review by Huntley et al. 2013<sup>7</sup> identified five RCTs of case management of older people initiated in the community. Few patient outcomes were reported. The most patient centric - length of hospital stay - did not differ significantly. One of the studies involved a GP making an initial

assessment which was communicated to the geriatric unit. The GP then made home visits every 2 months, the results of which were discussed at weekly multidisciplinary (MDT) meetings<sup>7</sup>.

Huntley et al. 2013<sup>7</sup> described the main approaches and roles to community initiated case management from the literature they reviewed:

- ‘Guided care’ community-based nurses. GPs monitoring symptoms, adherence etc. Provided enhanced access to community services and self-care.
- Nurse completed a comprehensive assessment of community-dwelling older people, developing a care plan with the GP, the patient, the family, caregivers and other health professionals. Follow-up visits and phone calls.
- Nurse case manager does a comprehensive assessment over several early visits post hospital discharge, co-ordinates all health care providers and supports patients in transition from hospital to home.

As described in Table 3, Goodman et al. 2012<sup>6</sup> and Trivedi et al. 2013<sup>16</sup> characterised case management interventions for community dwelling older people with multiple health and social care needs. These involved medical and non-medical professional staff and co-ordination by a case manager to address the needs of a client. Typical case management approaches included:<sup>6</sup>

- a key worker assuming a leadership role
- coordinating care, reporting back to professionals
- addressing patient needs in a coordinated manner
- professionals (usually) from the same organisation (e.g. managed care) but involved in other community agencies.

### ***Hospital initiated case management***

Huntley et al. 2013<sup>7</sup> also identified six RCTs assessing case management initiated in hospital or on discharge. Interventions were grouped into a number of similar integrative approaches:

- Advanced practitioner nurse (initiated in hospital) - visits prior to and following discharge. Focused on medication and symptom management, diet, activity, sleep, medical follow-up and emotional status.
- Specialised team of geriatric health professionals (initiated in hospital) - assessment in hospital, a home visit while the patient was hospitalised, post-discharge the team provided treatment not otherwise available via home-care, follow-up visits for the first 3 months then a 12 month telephone follow-up.
- District nurse visited patients on the day of discharge, physicians completed an assessment and compiled a treatment plan. Weekly MDT care planning meetings. Physicians available for routine and emergency visits, and available via phone for primary care staff. 24 hour telephone service.
- MDT initial assessment, home visits by GPs, continual monitoring and co-ordination of care as needed based on feedback from home visits.

### ***System navigators to help healthcare transitioning***

Manderson et al. 2012<sup>11</sup> analysed nine RCTs describing “system navigators” providing one to one support for chronically ill, elderly patients as they transition across healthcare settings or providers.

Navigation roles will often focus on a specific setting, disease, population or role<sup>11</sup>. Disease-specific navigation programmes include those conceived for patients with stroke, gastrointestinal disease, total hip replacement and cardiac disease. Population-centred navigation roles include those focused on the 'working poor' and those with intellectual disabilities. Role-focused navigation is are those for which the primary focus is on brokerage or advocacy on behalf of the client, and clinical models where clinical interventions and management drive its effectiveness. Case managers feature prominently in this category however; others specifically focus on empowering patients to manage their own conditions by providing access to information and resources<sup>11</sup>.

Nine different position titles were used in the studies documented in this review; qualifications for the positions appear to relate to the goals of the study and type and severity of the patient's condition. Some system navigators start immediately after admission to hospital, others post-discharge; the duration of the interventions ranged from 1 to 18 months<sup>11</sup>.

Navigator role services responsibilities care planning, coordination of care, phone support home visits, liaison with medical and community services, and patient and caregiver education; but all required navigators to advocate for the patient and broker access to appropriate care as they transitioned across settings or providers<sup>11</sup>.

Some navigators were assigned unique responsibilities, such as a budget to purchase community services, such as occupational therapy, on behalf of their patients. Caregiver involvement was acknowledged as an important aspect of these interventions; all but one of the studies (n = 9) provided caregivers with education and support in the navigation intervention. Most navigation roles were supported by either physician mentors or were part of a multidisciplinary team, which in one study was considered an important precursor for success in navigation roles for chronically ill, older adults<sup>11</sup>.

### **Impact on patient outcomes and cost effectiveness**

Table 6 summarises the impact of the case management interventions on patient outcomes.

Goodman et al. 2012<sup>6</sup>, Eklund et al. 2009<sup>4</sup> and Manderson et al. 2012<sup>11</sup> reported at least one positive impact on patient outcomes although, Huntley et al. 2009<sup>7</sup>, Goodman et al. 2012<sup>6</sup>, and Manderson et al. 2012<sup>11</sup> also reported no changes in other outcomes.

Huntley et al. 2013<sup>7</sup>, the highest quality review, reported mainly process outcomes. However, length of stay is arguably of value from a patient perspective and outcomes for this were mixed. Case management initiated in hospital or on discharge reduced length of stay for older people in three RCTs, the remaining did not report this data.

Five of the 11 RCTs in Huntley et al. 2013<sup>7</sup> presented cost-outcome descriptions; none offered full economic impact assessments or cost effectiveness. The majority of studies indicated cost savings could be made from a provider point of view, but with little quantification. Savings were associated with shorter length of stay in hospital, and fewer hospital admissions and readmissions. One study reported lower total costs in the case management group. One study reported a 20% decrease in total hospital costs. One study reported significantly lower hospital utilisation costs and total costs in the intervention group. One US study reported cost savings of \$1800 per capita per year of follow-up<sup>7</sup>.

**Table 6 Summary of case management intervention patient outcomes (n=4)<sup>4, 6, 7, 11</sup>**

Author/date	Quality score	Sample	Population	Integrated care approach	Patient outcomes	Impact	Cost effectiveness	Relevance to Ireland
Huntley et al. 2009 <sup>7</sup>	9/11	11 RCTs	Older people, mixed community dwelling and hospitalised	Case management in hospital, primary care and community settings	Unplanned, emergency or unscheduled hospital admissions/ readmissions, length of hospital stay	→	Lower total and hospital costs	OECD countries
Goodman et al. 2012 <sup>6</sup>	8/11	N=59, 37 RCTs, 8 non Randomised control trials, 14 systematic reviews	Community dwelling older people with multiple long-term conditions	Case management model (7RCTs)	Mortality	→	Was intended but was not feasible	High income countries studied.
					Patient satisfaction	↑		
Eklund et al. 2009 <sup>4</sup>	8/11	9 RCTs	Frail elderly people living in the community	Case management	Medication use	↑	4 studies reported costs, 1/4 in favour of intervention	High income countries studied.
					Activities of daily living (ADL)	↑		
Manderson et al. 2012 <sup>11</sup>	4/11	9 RCTs	Chronically ill, elderly patients transitioning across healthcare settings or providers.	System navigators providing one to one support	Days in hospital, home care episodes, ADL, IADL	↑	Net cost savings per patient, lower hospital costs, lower total costs (hospital, intervention, community services)	High income OECD countries but none from UK.
					Physical QOL (mixed)	→		
					Physical functioning, bodily pain, general health and vitality, mortality	→		
					Overall QoL, depressive symptoms, adherence to self-care, patient satisfaction, independent living , ratings of care	↑		
					Social functioning, mental health, satisfaction with care, caregiver burden	→		

Goodman et al. 2012<sup>6</sup> also reported a mixed impact of case management interventions from seven RCTs. It found no change in mortality but increases in patient satisfaction.

Eklund et al. 2009<sup>4</sup> found case management of frail elderly people living in the community increased appropriate medication use and ability to carry out activities of daily living. Cost effectiveness was not robustly assessed. But out of the four studies reporting costs one came out in favour of the intervention (unclear if remaining showed no effect or higher costs for intervention).

The review concluded there is a lack of evidence about how integrated and coordinated care affects the caregiver<sup>4</sup>.

System navigators providing one to one support to chronically ill, elderly patients transitioning across healthcare settings (Manderson et al. 2012<sup>11</sup>) reported mixed effect on patient outcomes. Of the nine navigator programmes identified five reported positive economic outcomes, two reported higher satisfaction with care for providers and patients and five reported increased patient quality of life or functionality.

Some outcomes, such as activities of daily life, overall quality of life, depressive symptoms, patient satisfaction improved. But others, such as caregiver burden showed no improvement, or in the case of physical quality of life, showed mixed results depending on the study<sup>11</sup>. This was also the case for ratings or care. These were shown to significantly improve in some primary studies included in the review but not others. The review did not provide enough detail to ascertain the possible reasons behind this. This review identified evidence suggesting cost savings may occur in some circumstances. But the basis of the study cost calculations were not clear. The review ultimately concluded the cost impact of system navigators is unclear<sup>11</sup>.

Overall Manderson et al. 2012<sup>11</sup> concluded there was some evidence that integrated and coordinated care guided by a navigator, using a variety of interventions such as care plans and treatment goals, is beneficial for chronically ill older adults transitioning across care settings. But there is a need to further clarify and standardise the definition of navigation, as well as a need for additional research to assess the effectiveness and cost of different approaches to the health system<sup>11</sup>.

Trivedi et al. 2013<sup>16</sup> included four RCTs using a case management model. They described chronic care, one palliative care and two preventive homecare with mixed evidence of effect. Four showed some improvement in health outcomes, most improved patient satisfaction, with mixed evidence for service use and costs.

## **Strengths and weaknesses**

Manderson et al 2012<sup>11</sup> scored low for review quality (AMSTAR score 4/11). While only RCTs were included, study quality not assessed, giving an unclear risk of bias. Intervention heterogeneity in this study also made pooling results impractical. All studies were from high income OECD countries but none from UK.

Huntley et al. 2009<sup>7</sup> was a high quality review (AMSTAR score 9/11) of RCTs covering a mixed patient group: community dwelling older people and hospitalised patients due for discharge. It included a wide definition of case management resulting in a high degree of heterogeneity between studies. Publication bias was not assessed but was unlikely as most studies produced non-favourable results. RCTs were from USA, Germany, Denmark, Australia, Sweden and Canada<sup>7</sup>.

Goodman et al. 2012<sup>6</sup> was also a high quality review (AMSTAR score 9/11) of mainly RCTs. Twenty five RCTs were graded as having a high risk of bias, six as medium risk and six as having a low risk of bias. The research included a systematic review, a survey of managers, local strategy review, a consensus event and a series of case studies. Results presented above are from the systematic review only, as only it reported patient outcomes. Studied were from high income countries, some with significantly different healthcare systems than Ireland (USA, Europe, Australasia, Canada, UK and Hong Kong)<sup>6</sup>.

Eklund et al. 2009<sup>4</sup> scored high for review quality (AMSTAR score 8/11) including nine RCTs. However, quality of included studies was generally low. None of the studies fulfilled all quality criteria regarding possible bias as assessed by the review authors. Description of the interventions was also limited. Studies came from high income countries, some with different healthcare systems than Ireland (Canada, USA, and Italy)

## Early supported discharge

### Approach

Fearon et al. 2012<sup>5</sup> reviewed 14 RCTs evaluating early supported discharge services for reducing duration of hospital care for acute stroke patients, including, but not restricted to older people. The researchers were particularly interested in the degree of co-ordination and organisation of the community and hospital services. That is, whether patients received care from a co-ordinated multidisciplinary team with some specialist interest in stroke which met on a regular basis.

They identified three main approaches to early supported discharge<sup>5</sup>.

- Early supported discharge (ESD) team co-ordination and delivery (9 RCTs). The ESD service comprised a multidisciplinary team which co-ordinated discharge from hospital, post discharge care and provided rehabilitation and patient care at home. The multidisciplinary team met on a regular basis to plan patient care<sup>5</sup>.
- ESD team co-ordination (3RCTs). Discharge home and the immediate post-discharge care was planned and supervised by a co-ordinated multidisciplinary team. However, care was subsequently handed over to existing community-based agencies that provided continuing rehabilitation and support at home. These community-based agencies did not usually provide coordinated multidisciplinary team care (i.e. input from a multidisciplinary team which met on a regular basis to plan patient care)<sup>5</sup>.
- No ESD team (2 RCTs). Patients had access to multidisciplinary team care in hospital but this ended at hospital discharge. Their subsequent care was provided by a range of community stroke services which were not planned or provided by a co-ordinated team or were provided by trained healthcare volunteers<sup>5</sup>.

The boundary between the two top approaches was not clear cut but indicates a spectrum of approaches where an ESD team plans and co-ordinates discharge, provides early post-discharge rehabilitation and then hands over care to other community services<sup>5</sup>.

Parker et al. 2002<sup>13</sup> reviewed 71 studies (reporting on 54 RCTs) on discharge arrangements for older people leaving hospital. The main elements of the discharge planning, not-mutually exclusive, were: discharge planning, comprehensive geriatric assessment, discharge support and educational interventions.

They described discharge planning approaches as provider oriented (multidisciplinary teams, new arrangements for providing continuity of care through arrangements for follow-up or case management) or structural (alternative setting or site of service delivery)<sup>13</sup>. No patient orientated interventions were identified (e.g. complaints procedures, participation in governance). The interventions were diverse in their delivery. For example, delivered by MDTs, single-person services or services over the telephone<sup>13</sup>.

Four predominant types of intervention relating to discharge were identified<sup>13</sup>:

- discharge planning protocols
- discharge support schemes
- discharge focused comprehensive geriatric assessment and
- educational interventions.

The authors recognised that this classification of service models was somewhat arbitrary and produced categories which were not mutually exclusive. Therefore, in addition to the analysis of a range of more or less discrete service models, the data were analysed by specific intervention characteristics. That is, whether the intervention was provided by a team, and the site at which the intervention was delivered<sup>13</sup>.

Larsen et al. 2006<sup>10</sup> reviewed seven studies on early home supported discharge (EHSD) in addition to stroke units in stroke rehabilitation for older people hospitalised by stroke and due for discharge. EHSD is a multidisciplinary team including physiotherapists, occupational therapists, speech therapists, physicians, nurses and social workers. The team plans, co-ordinates and delivers care at home through regular meetings. EHSD includes one pre-discharge home visit, a visit on the day of discharge and regular post-discharge home visits to review the patient-held recovery plan<sup>10</sup>.

### ***Individualised discharge planning***

Shepperd et al. 2013<sup>14</sup> reviewed 24 RCTs on individualised discharge planning for older people prior to leaving hospital. The studies aimed to reduce hospital length of stay and unplanned readmission to hospital, and improve the co-ordination of services following discharge from hospital. RCTs compared individualised discharge planning with routine discharge not tailored to the patient. In 19 trials this included some discharge planning, but without a formal link through a coordinator to other departments and services. Interventions were diverse often including patient education. In addition, nine studies included a nurse “discharge planning advocate”, which could imply some overlap with responsibilities of a case manager<sup>14</sup>.

### **Impact on patient outcomes and cost effectiveness**

Table 7 summarises the impact of the early supported discharge interventions on patient outcomes from four reviews.

The highest quality review, Fearon et al. 2012<sup>5</sup> was able to perform a meta-analysis of the studies for some outcomes. From this they found that early supported discharge significantly reduced length of stay by approximately 7 days. Patient outcomes included borderline statistically significant improvements in rates of “death or institutionalisation” after up to a year (OR 0.78, 95% CI 0.61 to 1.00, P = 0.05). This would mean an extra four people living at home out of 100 treated, compared to usual care. It also improved “death or dependency” at the end of follow-up (OR 0.80, 95% CI 0.67 to

0.97) which would mean five people regaining independence for every 100 treated. In addition there were statistically significant improvements in patients' abilities in activities of daily living and their satisfaction with services. The greatest benefits were seen from co-ordinated early supported discharge teams working with stroke patients with mild to moderate disability<sup>5</sup>.

Patient improvements in extended activities of daily living and case fatalities were not significantly improved. There were also no statistically significant improvements in carers' subjective health status, mood or carer satisfaction with services<sup>5</sup>.

Direct and indirect service costs for early supported discharge were between 4% and 30% less than control costs in four studies. One study which just looked at direct costs found early supported discharge was 15% more expensive.

Fearon et al. 2012<sup>5</sup> concluded appropriately resourced early supported discharge services provided for a selected group of stroke patients can reduce long-term dependency and admission to institutional care as well as reducing the length of hospital stay. They reported observing no adverse impact on the mood or subjective health status of patients or carers.

Parker et al. 2002<sup>13</sup> reported no significant change in mortality or physical or cognitive function through joint discharge planning for older adult hospital inpatients. Some process outcomes however did improve. Consequently the authors concluded that the message from these data seems to be that doing something is better than doing nothing. Adding that interventions extending across the hospital-community interface stand a greater chance of having a positive effect on readmission rate. Overall thought they say the evidence from these trials does not suggest that discharge arrangements have effects on mortality or length of hospital stay. This review supports the concept that arrangements for discharging older people from hospital can have beneficial effects on subsequent readmission rates. Interventions provided across the hospital- community interface, both in hospital and in the patient's home, showed the largest effect. Evidence from RCTs is not available to support the general adoption of discharge planning protocols, geriatric assessment processes or discharge support schemes as means of improving discharge outcomes<sup>13</sup>.

Parker et al<sup>13</sup> reflecting on the situation in the UK around 2002 suggested a substantial proportion of trusts now employ discharge planning personnel in line with recommendations endorsed by the British Geriatrics Society, the Department of Health and the Association of Directors of Social Services to the effect that a single named person from within a multidisciplinary team should be responsible for discharge preparation. Based on the evidence they identified, not only would the available trial evidence indicate that single professionals, not teams, are undertaking responsibility for discharge planning, but more fundamentally there is no UK research base to indicate that this is appropriate to the UK system of healthcare delivery. Another recommendation they suggest was made by all three organisations is that patients and carers should be central to the planning of a discharge, but again the studies included in the review do not demonstrate either that patients and carers are included in the process or that outcomes related to their well-being, satisfaction or to the costs they might incur have been considered in a robust manner<sup>13</sup>.

Table 7 Summary of patient outcomes for early discharge planning interventions (n=4)<sup>5, 10, 13, 14</sup>

Author/date	Quality score	Sample	Population	Integrated care approach	Patient outcomes	Impact	Cost effectiveness	Relevance to Ireland
Fearon et al. 2012 <sup>5</sup>	11/11	14 RCTs	Any patient who has been admitted to hospital with stroke	Early supported discharge (ESD)	Case-fatality	→	Estimated costs ranged from 23% less to 15% greater for the ESD group in comparison to controls (7 trials)	High income countries studied.
					Activities of daily living	→		
					Extended activities of daily living	↑		
					Patient satisfaction	↑		
					Carers' subjective health status, mood or carer satisfaction with services	→		
Parker et al. 2002 <sup>13</sup>	9/11	54 RCTs	Older adult hospital inpatients (65 and over).	Joint discharge planning	Mortality at 3, 6 or 12 month after discharge	→	No evidence identified.	Most RCTs from high income countries.
					Physical or cognitive functioning	→		
Shepperd et al. 2013 <sup>14</sup>	9/11	24 RCTs	Hospital inpatients, most aged over 70.	Individualised discharge planning for a patient prior to leaving hospital.	Mortality in elderly patients with a medical condition (usually heart failure), those having surgery, and those recovering from a fall.	→	No evidence identified.	Majority of included studies are in high income countries
					Patient satisfaction	↑		
Larsen et al. 2006 <sup>10</sup>	4/11	7 RCTs	Older adults who had experienced a stroke	Early home supported discharge (EHSD) using an interdisciplinary team to plan, co-ordinate and deliver care	Death or institutionalisation, change in Barthel Index,	↗	Cost of intervention offset by savings in inpatient/ nursing home days	Similar countries to Ireland
					Length of hospital stay	↑		

Shepperd et al. 2013<sup>14</sup> reviewed and meta-analysis of 24 RCTs. It found that structured individualised discharge planning reduced hospital length of stay for people with a medical diagnosis (mean difference length of stay -0.91, 95% confidence interval [CI] -1.55 to -0.27). It also reduced risk of readmissions by 18% for people with a medical diagnosis (risk ratio 0.82, 95% CI 0.73 to 0.92). Three trials in the review found that individualised discharge planning improves patient satisfaction. The impact on health outcomes was uncertain. There was no difference in mortality or rates of discharge from hospital to home for elderly people with a medical condition, people following surgery or people with a mix of medical and surgical conditions. There was little available evidence on overall healthcare costs<sup>14</sup>.

Larsen et al. 2006<sup>10</sup>, reviewed seven RCTs on early home supported discharge for older adults who had experience a stroke. It suggested the interventions generally improved patient and process outcomes such as death and length of hospital stay. While described as improving the outcomes were not explicitly linked to statistical tests, so we cannot be sure they are real differences, or of significant magnitude to be import to patients. In addition they calculated an average cost of the intervention per patient as US \$1340, with cost savings in inpatient and nursing home days of \$1480 - \$140 per patient<sup>10</sup>.

### Strengths and weaknesses

With the exception of Larsen et al. 2006<sup>10</sup> (AMSTAR score 4/11) the review quality was high and based on a large number of RCTs. However, there were significant methodological limitations reducing the reliability and generalisability of the results in each.

For example, Fearon et al. 2012<sup>5</sup>, while the quality of the evidence in general was good, the majority of trials were completed over 10 years ago. In many countries the last decade has seen a significant overhaul of stroke services to enable greater access to hyper-acute therapies, reducing the relevance of the findings to modern day stroke services.

Similarly, despite including 54 RCTs Parker et al. 2002<sup>13</sup> described their sample sizes as generally small and their quality as often poor. A sub-analysis by intervention characteristics (team delivery, site) led to the conclusion: "Interventions provided across the hospital--community interface, both in hospital and in the patient's home, showed the largest effect" but it was unclear if this related to mortality, readmissions, or both. The RCTs included diverse participants and interventions (delivered by MDTs, single-person services and services over the telephone). Only one included a power calculation, and only generic descriptions of patient assessment and coordination of care were given, limiting the analysis of the interventions<sup>13</sup>.

Shepperd et al. 2013<sup>14</sup> was arguably the study with least risk of bias having reviewed 24 RCTs. It excluded RCTs evaluating interventions where discharge planning was not the main focus of a multifaceted package of care but those including an element of patient education to support the discharge planning process were included. This would exclude multifaceted packages where discharge planning not the main feature, which is likely to be many pragmatic trials. Nonetheless this is a strength from the perspective on determining the specific effects of discharge planning, in relative isolation of other co-interventions. In addition this was one of the few trials reporting the RCTs included were of generally at relatively low risk of bias.

We have reservations about the quality of the review by Larsen et al. 2006<sup>10</sup> (AMSTAR score 4/11) which gives an unclear, but potentially high, risk of bias in the review. Similarly it reported including

studies of generally low quality further reducing reliability and confidence in the conclusions and results.

## Other approaches

### Approach, impact, strengths and limitations

Johri et al. 2003<sup>8</sup> was rated a very low quality review (AMSTAR score 3/11). It looked at 12 quasi experimental studies to identify common features of effective integrated care systems and their clinical and cost benefits in community dwelling older people, mainly the physically frail. It identified the following common features.

- A community-based interdisciplinary service co-ordination, with devolved budget, for people being discharged from long-stay hospital services. Based within a geriatric MDT, including case managers with devolved budgets.
- Risk based financing for a nursing home certifiable population to keep them in the community for as long as possible (no further detail provided)
- Capitated managed care framework to combine acute care and long term-care.
- Reorganising the care of frail older people living in the community on a single entry point model with geriatric assessment and case management.
- Community-based case management to help integrate care for elderly frail discharged from long-stay hospital services. Case managers had a devolved budget to help integrate health and social service agencies and sat within a MDT.

The study focused on models integrating acute and long-term care services, including financial mechanisms<sup>8</sup>. It also included what the study team called, “less ambitious models” aimed at integration of medical and social service aspects of long-term care. This provided insight into barriers and facilitators but also outlined and reinforced some of the major approaches to integrated care identified in other sections.

Johri et al. 2013<sup>8</sup> broadly reported a positive impact on patient outcomes across the diverse intervention types. However, the most recent included study was from 2000, and some much earlier. The authors say that none of the models have been successfully implemented on a large-scale.

Mikolaizak et al. 2013<sup>12</sup> was also a low quality review (AMSTAR score 5/11) looking at 12 studies (2 RCTs) examining factors related to non-transportation by ambulance services to emergency departments of older people who have fallen in the community. This included one UK (England) RCT using individualised fall prevention programmes linked to the ambulance service call out, and example of integrating emergency ambulance services with social care, or self-care in the home. The English RCT (following UK fall guidelines) used an individualised fall prevention programme MDT. Patients experienced significantly fewer subsequent falls (incident rate ratio 0.5; 95% CI: 0.4-0.6) and fewer emergency ambulance calls (risk ratio 0.6; 95% CI: 0.4-0.9) than control group receiving standard emergency care. They also scored significantly better on the Nottingham extended activities of daily living scale; and had lower level of fear of falling<sup>12</sup>.

The English study found paramedics spent more time treating non-transporter people, resulting in cost differences<sup>12</sup>. But total case costs were not assessed. The review attempted to summarise ambulance systems that were clinically and operationally heterogeneous, for example use of specialist paramedics receiving different training from regular paramedics. Studies came mainly from the UK (8) but also the US (3) and Australia (1)<sup>12</sup>.

Results from Mikolaizak et al. 2013<sup>12</sup> hinted at a potential blind spot in the care of older people who have fallen, ring an emergency ambulance, but are not admitted to hospital. The review found they are likely to fall again resulting in a hospital admission, so may benefit from interdisciplinary assessment and intervention to prevent further falls. For example, emergency care practitioners, who have extended skills regarding older community-dwelling people who have fallen, can treat and refer appropriate patients to primary care networks thereby offering an alternative to standard ambulance care.

## Barriers and facilitators

Tieman et al. 2007<sup>15</sup> attempted to summarise common findings across five diverse systematic reviews on MDTs, coordinated and integrated care in primary care. This, they said, gave an opportunity to identify issues that were not specific to individual populations or interventions but could perhaps provide more general application within the primary health setting: In brief they observed:

- Coordination does appear to improve outcomes
- More disciplines and or services in the integrated care approach the greater improvement in outcomes for the patient
- Multidisciplinary care comprises two distinct periods of contribution. The first is in designing the intervention, and/or associated information and guidelines. The second is at the point of care delivery. For example, a frail aged MDT review noted the role of geriatric assessment developed by an MDT whereas a COPD review discussed the role of the multi-disciplinary palliative care team inclining the GP in managing patient needs in dyspnoea.
- Many integrated care approaches use evidence based materials such as guidelines, care pathways or algorithms. The strength of the integrated approach may be influenced by the use of the best available evidence to inform needs of care provision.
- Integrated care approaches may not necessarily reduce costs. They may be better at meeting unmet needs stimulating the use of more services, increasing costs.
- Few studies looked at the role of the patient as an active participant in integrated care. While patient satisfaction was often measured, patients care goals were rarely considered. This may be particularly relevant in self-care approaches, or palliative care.
- Interventions may need to be tailored to the particular characteristics of the population and or disease. For example, diabetes patients in the early stages of disease may benefit reminders or calls to improve self-management whereas stroke care patients in the community may require a different approach.
- The effectiveness of integrated care approaches may have been moderated by local factors such as how interventions were introduced and managed. It may be equally important to identify enabling processes of an integrated approach, as well as the approach itself.
- Studies were considerably heterogeneous in terms of study design, population, interventions, measures and outcomes making direct comparisons and appraisal difficult. This heterogeneity also makes applicability to any single country harder to assess.
- Most integrated care interventions were multicomponent. The relative contribution of each component could rarely be assessed.

Johri et al. 2003<sup>8</sup> broadly identified some key common features of an effective integrated system of care having looked at different international systems. Key features were:

- A single entry point system
- Case management

- Geriatric assessment
- Using a MDT
- Use of financial incentives to promote downward substitution.

## **Integrated and inter-professional working**

Davies et al. 2011<sup>3</sup>, identified barriers and facilitators to integrated working between care homes and other health care services. Barriers included:

- difficulty of NHS staff gaining the trust of care homes and NHS cynicism of care home expertise
- lack of access to NHS services
- high staff turnover and lack of access to training
- lack of staff knowledge and confidence
- care homes were professionally isolated
- lack of teamwork in care homes

Facilitators to integrated working were:

- Care homes valued NHS input and training
- “Bottom up” approach to train staff so that all levels of staff are involved
- Health care professionals acting as advocates for care homes in relation to care
- Health care professionals acting as facilitators for sharing good practice and enabling care home staff to network
- Health care professionals promoting better access to services for the care home
- Care home managers supporting staff access to training for example, through establishing learning contracts

Goodman et al. 2012<sup>6</sup> found effective inter-professional working for community dwelling older people with complex, multiple and ongoing needs is more likely to occur when three key features are present:

- a functioning link with wider primary care issues
- a system of communication and evaluation that allows review and input from the older person and carers
- the presence of a recognised and named person in a key worker type role

The review authors’ identified issues they believed should be consideration by commissioners and managers in planning and developing services:

- Mechanisms that preserve and foster network, relationship based service delivery which older people identify as of high importance in effectiveness
- Systems that build on the universality and continuity provided by general practice, noting this is recognised as such by older people
- Systems for recognising key workers (by whatever name) and making these known to the older person and their family carers, particularly at points in transition, escalating ill health or crisis in health
- Evaluation of service delivery from the older person perspective that links process outcomes with overall outcomes over time

- Mechanisms for assisting professionals and service providers that build and maintain networks of relationships, however weak, that are primarily horizontal (i.e. in a geographic area across organisational boundaries) and reflect the perspective of the older person

## Early home supported discharge for stroke patients

Larsen et al. 2006<sup>10</sup> stated that to make early home supported discharge most effective the intervention must:

- Start as soon as the patient is stabilised
- Use a “stepwise” approach, with the patient gradually spending more time at home, until the patient and carers feel that discharge is manageable
- Home-based rehabilitation should continue until community-based care is established
- The hospital’s responsibility for care should extend until a transition plan with community based care is established and completed (around 6 months after discharge)
- Use functional measures that are relevant to all members of the interdisciplinary team members.

A potential barrier cited was the funding mechanisms. The hospital will bear the burden of the cost of early home supported discharge, whereas many of the savings are in other services such as nursing home costs. So there needs to be agreements in place for how such interventions are funded<sup>10</sup>.

## Metrics used to measure patient outcomes

The systematic reviews identified the following metrics for measures the impact of integrated care on patient outcomes:

- activities of daily living, instrumental activities of daily living
- adherence to self-care
- adverse events following discharge from hospital
- appropriate medication use
- bodily pain
- caregiver burden
- carers’ subjective health status, mood or carer satisfaction with services
- functional status
- general health and vitality
- general psychiatric symptoms (e.g. depression, agitation, aggression suicidal ideation)
- global functioning (e.g. cognitive and functional status)
- length of hospital stay
- morbidity
- mortality rate
- patient satisfaction
- physical, mental and social quality of life
- satisfaction with care
- self-care burden
- social functioning

## Gaps in the evidence

No or limited evidence was found in the review in the following areas:

- Identifying best practice for integrating care for specific populations, disease categories or health service transitions.
- Defining the most important characteristics of multifaceted effective integrated services and defining the balance of cost and benefit for different patient and service groups, or health service transition points.
- Few studies incorporated the views of patients, families and carers on the impact of integrated care.
- Few studies looked at the role of the patient or carer as an active part of the integrative approach. Patient satisfaction was often measured but few studies considered the patients goals for care, so were not true “patient centred” approaches.
- An important element of discharge planning is the effectiveness of communication between hospital and community, yet this was not measured in many of studies included in the relevant reviews.
- No studies took place in Ireland, many were in the US. Decision makers need to take into account to take into account the differences in healthcare delivery between these countries.
- Robust cost impact measures were largely absent: both in the initial outlay, and long term cost impact.
- Characterisation and evaluation of different funding models for integrated services were absent, for example navigator roles funded by multiple organisations representing the range of treatments, services and care transitions involved.
- Impact on health inequalities.
- The relative impact of different levels of integration on patient outcomes from micro-scale e.g. close collaboration between care home staff and other health professionals, to macro-scale.

### **Case study 3: Integration of care for older people through community virtual wards in South Devon and Torbay**

#### **Background**

In 2010, Devon Primary Care Trust (PCT) introduced community virtual wards across its GP practices to proactively identify those at high risk of emergency admissions using a predictive risk tool and to manage their care through a multidisciplinary approach. Following the establishment of the shadow South Devon and Torbay CCG, it expanded virtual wards across GP practices in neighbouring Torbay in 2012, building upon the existing model of integrated health and social teams, providing care and support to older people in the community and following discharge from hospital.

#### **Aims and objectives**

Proactive case management and community virtual wards identify people at risk of unnecessary hospital admissions and employ a multidisciplinary approach to address their individual needs across health and social care to prevent crises from occurring. The multidisciplinary team seeks to reduce duplication, improve continuity and the quality of care across providers and ensure that resources in the community are used efficiently by targeting additional services at those most at risk.

#### **Target population**

Following assessment, the virtual ward ‘admits’ people from the local community who are deemed to be at high risk of hospitalisation in the next 12 months. The majority of the virtual ward patient

population are over 65 and are living with at least one long-term condition although a growing number of patients are in their 40s and 50s with mental health illness alongside drug/alcohol misuse.

## Approach to care co-ordination

Predictive modelling is used to support proactive case management of patients by risk-stratifying a population and identifying patients who may be suitable for intervention. The Devon Predictive Model (DPM) combines primary and secondary care data to provide each GP practice with a list of its top 0.5 and 5 per cent of patients most at risk of an emergency admission in the next 12 months. This list is reviewed in the practice and by a multidisciplinary team including professionals from health, social care and the voluntary sector, to choose patients deemed suitable for proactive case management on a virtual ward. Those requiring multidisciplinary input are admitted to the 'ward', where patients receive intensive assessment and care co-ordination from staff in the team, led by a case manager, to provide ongoing care and support in their home. Once their condition has stabilised they are discharged from the virtual ward and continue to receive 'usual' care.

## Results

A retrospective analysis of emergency admissions and lengths of stay across Devon in 2010 and 2011 saw reductions for the highest 0.5 per cent and 5 per cent of patients at risk of an emergency admission. These declines were not sustained in 2012 although virtual wards were not running in all GP practices for the whole year. Community virtual wards in both south Devon and Torbay have demonstrated high virtual bed occupancy and residential home placements have declined as more patients are supported to live at home. No systematic collection of patient experience has taken place. Staff involved in the virtual wards reported improved staff motivation, better communication between care practitioners delivering services and a stronger focus on compliance with medication regimes. In addition, the presence of voluntary sector representation at meetings has led to increased referrals and access to support for carers.

Early evidence on the effectiveness of the virtual ward approach is scarce and as yet there is little evidence that using a risk predictive model to identify and case manage patients at high risk of hospital admissions is effective in reducing rates of emergency bed use or length of stay

## Facilitators

The drive towards health and social care integration, focused on providing person-centred care for older people over the past decade together with the presence of a strong commissioner has enabled the development and expansion of the community virtual ward model across South Devon and later Torbay. Devon PCT piloted the approach and South Devon and Torbay CCG have continued to lead and support integrated models of care. GP engagement with new models of commissioning and provision enabled the model to thrive within primary care. Investing in intermediate care also helped the virtual ward approach as it provided another source of services and equipment in the community. Without this funding, case managers may have encountered difficulties securing care packages and other services to support patients at home. ...we have the virtual ward and we have intermediate care across the patch so that makes life easier from that point of view and more likely that ... we have put in place a system which helps us to make it possible to keep people at home.

The South Devon and Torbay area has benefitted from a long history of partnership working in Torbay between health authorities (commissioners and providers) and the local authority to integrate services for patients. There has also been consistent leadership (the chief executives of the main acute trust and PCT were in post for more than 15 years) in spite of several organisational changes. In

Devon, the PCT and local authority utilised a culture of active GP engagement to pioneer the virtual ward approach in GP practices.

The experience of South Devon and Torbay CCG in developing integrated care suggests that several years are needed to allow the model to mature.

Source: Sonola et al 2011<sup>34</sup>

## Conclusion

Sixteen systematic reviews outlined different approaches to integrating care services for older people. The reviews were very diverse in terms of their aims, scope, interventions, target populations, risks of bias and outcomes reported. In general review quality was not the main risk of bias. This came from the primary studies within it, which were often rated by the review authors as poor, signalling a high risk of bias, reducing reliability.

The reviews covered older people with depression, those living with chronic conditions (diabetes, COPD), palliative care services, the physically frail, those being discharged from hospital because of a stroke, chronically ill elderly patients transitioning across health settings and providers, older people living in nursing or residential care homes, and older people free living in the community.

This diverse and disparate evidence base means there is a lack of consistent reliable evidence to inform the best approaches to integrated care for older people. Despite this a number of possible barriers and facilitators were identified for consideration by integrated care planners in the formative stages.

Broadly speaking the evidence base for older people suggests integration approaches are feasible and have yielded significant improvements in some patient outcomes in a specific settings and populations (See Summary Tables 5, 6 and 7). But outcomes rarely improved consistently in a positive direction across the board, many showed no improvement, painting a mixed picture.

For example, primary studies within the same review topic often reported mixed or contradictory findings. There would be improvement in one outcome, but no effect in another. There was further mixed effects between reviews on the same type of integrative approach. For example, Parker et al. 2002<sup>13</sup> found no improvement in mortality, physical or cognitive functioning using joint discharge planning, whereas, Fearon et al. 2012<sup>5</sup>, investigating early supported discharge, reported improvements in extended activities of daily living and patient satisfaction.

One meta-trend identified was the tendency of subjective outcomes to improve, whereas more objective outcomes showed no significant improvement. One of the clearest examples was patient satisfaction and death. Where reported patient satisfaction almost always improved, whereas mortality did not. This is only an observational trend so needs further research. There were no signs of worsening patient outcomes.

Many integrated approaches were relatively low in intensity. They focused on forming links between existing organisations and improving coordination, rather than full integration, which could involve formally pooling resources, creating new organisations, and developing comprehensive services tailored to the specific needs of a patient group. For example the “team based” approaches typically aimed to improve care coordination and links.

A number of interventions aimed to prevent hospital admissions in older people with complex and or chronic conditions based in nursing homes or their own homes. This represents a somewhat fuzzy potential healthcare transition. Other studies dealt with the more recognisable hospital to home service transition. This included elements of integration between hospital and social care sector, as well as self-care.

Importantly, robust cost effective data was lacking. As such we cannot make any generalisable statements about the cost effectiveness of integrated care approaches. This needs particular consideration in the cases where patient outcomes don't improve. There will almost always be a cost outlay to move towards more integrated care and without good evidence for a positive impact, opportunity costs have to be considered, both in terms of time and resource.

Larsen et al. 2006<sup>10</sup> added another important point. Hospitals will bear the burden of the cost of early home supported discharge services, while many of the savings are in other services such as nursing homes. So there needs to be agreements in place for how such interventions are funded. While this was in relation to early home supported discharge for older adults who had experienced a stroke, it seems a valid point more widely where costs and savings occur in different services.

**Section 2 - narrative review of the grey literature**

## Methods

In addition to the academically published literature covered in section 1, integrated care is widely discussed by healthcare organisations that can best be described as *thought leaders*, by which we mean think tanks, not-for-profit research organisations, charitable trusts, non-governmental organisations, key healthcare providers and charities.

We provide a thematic and narrative review and selection of case studies published in the grey literature by such organisations divided into children and family services and older persons care. This was necessary due to the lack of literature specifically on maternity and gynaecological services, and the strong family and maternal involvement in early years integrated care interventions.

The breadth of grey literature on integrated care is vast but frequently covers:

- definitions of integrated care
- the levels of integration (micro, meso, macro, organisational, functional, financial)
- their stage of completeness (principle accepted, early progress, embedded good practice)
- the populations they target (whole communities, at risk groups, specific conditions)
- care transitions (primary care to secondary care, hospital to home)
- the impact of the intervention (health outcomes, hospital related outcomes, costs)
- lessons learned from current and past approaches (what can be learned from past to help the future)

Literature was identified through searches in Scopus, Google, Google Scholar and similar search engines; we also searched the websites of specific organisations, such as The King's Fund, the WHO, the Health Foundation and the Commonwealth Fund. Supplemental search techniques were also used to track citations and harvest references from relevant studies. The same subject scope was used as for the systematic review above. Potential documents were assessed for inclusion during the identification process. A final total of 14 documents were identified and used.

Before we discuss in more detail the most frequently described interventions, we provide some insight into two cross-cutting issues discussed by thought leaders consistently across population boundaries.

## Cross cutting themes

The two cross-cutting issues that are discussed by thought leaders are:

- a lack of impact evaluation, and
- structural integration not being enough on its own.

The overt aims of integrated care programmes are usually stated as patient centred, yet the outcomes, if any, most commonly reported are organisational efficiencies and cost. This paradox was found in the evidence review above and is reinforced in the grey literature reviewed here. This brings us to our first and most prominent theme across both children and older person populations.

### Lack of impact evaluation

The most consistently and forcefully communicated message across the spectrum of opinion leaders is the lack of evaluation linking integrated care programmes with tangible changes in outcomes or costs. As such we have relatively little on which to judge the performance of different programmes. In this

void of evidence we instead have many documents outlining “principles” and “characteristics” of success to guide integration approaches.

Case-studies outlining integration approaches are abundant in the literature but suffer from the same frailties. Where they are linked to outcomes or costs, the information typically lacks detail or depth.

We are not blind to the reasons for this, and recognise there are many challenges to measuring the impact of integration. For example, where aims of integration are wide and varied, selecting meaningful success criteria can be difficult. Not everything that matters can be easily measured after all. Where programmes are clearer, the target populations and context frequently differ, making comparisons between interventions and programmes hard. All these reasons, and more, make assessing the impact of integration a challenge; and based on the literature reviewed for this report, one that is not being overcome<sup>35</sup>.

As a result, lack of evaluation and lack of demonstration of impact is a key weakness in the evidence base for integrated care. A serious focus is needed on developing ways to evaluate integrated care performance otherwise this limitation will remain. Funds could be ploughed into ineffective programmes unabated, and the opportunity costs could be severe.

The King’s Fund and others conclude that successful approaches to care co-ordination and integrated care have highly context-specific elements behind their success. So the integration approaches cannot simply be uprooted from one setting and planted in another<sup>36</sup>. Understanding one’s own local context, and how they are similar or different to another’s, is a prerequisite to learning lessons and successfully transferring approaches from other programmes of care, but even then, there are no guarantees<sup>36</sup>.

*“There is a lack of robust evidence on the outcomes that can be achieved through integrating services including those in the early years.*

*The majority of evidence on the effects of integration is qualitative, based on interviews with service professionals. This is mainly focused on processes and ways of working rather than outcomes. There are few robust quantitative studies. Those that do exist do not track the outcomes of integration over a long period of time, even though it is recognised that the results of an integrated service may take time to become apparent.”*

*The Early Intervention Foundation having looked at 20 examples of promising practice and innovation in development with the aim of helping inform local planning<sup>25</sup>.*

## **Structural integration alone not enough**

The second cross-cutting theme was less widespread and forceful as the first, but prevalent nonetheless. In short it implied that structural integration, either within the NHS or between health and social care, is only one factor among many that helps the development of integrated care, it is not sufficient on its own.

A Nuffield Health report drew attention to some potential negative effects of structural integration. For example, the experience of Northern Ireland in integrating health and social care within the same

structure was suggested to have had the unintended consequence of lessening the importance of social care relative to health care<sup>37</sup>.

The King's Fund suggests that even if organisational obstacles are overcome, formidable challenges still remain in realising the anticipated benefits of integrated care structures, including shifting resources from hospitals to the community<sup>37</sup>. From the experience of England, Scotland, Wales and Northern Ireland, they concluded there are no guarantees of integration success relying on structural integration alone<sup>37</sup>.

## Children and family services interventions

### Introduction

We identified very little grey literature focussing on integrated approaches to maternity and gynaecology care, and even less reporting useful outcomes or economic data. However, much of the literature on children included services around birth and supporting the family in the early years, especially mothers. As such we have merged the two populations to create a children and family services section.

*'What is integration? For me, it means not having to repeat myself 30 times to every different person or part of the system'*

*Parent member of Child Health Forum, Early Intervention Foundation 2014<sup>25</sup>*

The discussion around integrating care for children and family services takes a wider, more cross-sectorial view than other groups, partly because children and family services involve many traditionally non-health sectors such as education, social care, child protection services and youth justice.

As was the case overall, the first consistent theme coming from the grey literature was a lack of evaluation linking integration approaches to outcomes or costs, including those in the early years<sup>24, 25, 38, 39</sup>. Furthermore, studies that do exist tend not to track the outcomes of integration over a long period of time despite the fact we know that the impact of an integrated service can take time to come to fruition<sup>25</sup>.

The majority of evidence on the effects of integration appears qualitative, based on interviews with service professionals involved in the different integrated care approaches. The Early Intervention Foundation reports these views tend to describe a range of positive effects, including<sup>25</sup>:

### Processes

- Increased understanding, trust and cooperation between different services
- Better communication and consistent implementation of services
- Less duplication of processes across agencies

### Outputs

- More responsive and appropriate services
- Better access to services or increased user involvement
- More cost-effective

### Outcomes for children and families

- Improved cognitive or school performance
- Improved general physical health
- Enhanced social behaviour
- Improved parenting or family relations

Some studies also report some negative effects of integration. A common example of this is greater anxiety among practitioners about potentially increased workloads or a lack of clarity over their role<sup>25</sup>.

Keeping in mind the weaknesses of the evidence base described above, three common approaches emerge from the grey literature on the integration of children and family services:

1. Integrated teams and co-location
2. Information sharing
3. Universal assessment and single point access

### **Integrated teams and co-location**

Team structures that best support integrated care will vary considerably based on local circumstances<sup>25</sup>. While the grey literature often explicitly says that there is no clear evidence pointing to the best models or features of integrated teams that best improve health outcomes for children and families, a number of approaches have reportedly benefitted the populations they serve<sup>24, 25, 39</sup>.

A 2003 book on the issues and practice of integrating children's services describes some service integrations, such as Sure Start, require the formation of completely new cross-sector teams. In other cases, existing teams may be merged, for example, the children in need team of social services and some pupil support teams in education. Where existing team boundaries are retained, link workers, or other working processes, may be used to obtain greater integration<sup>24</sup>.

Where co-location is implemented it can vary in its degree<sup>24</sup>:

- Fully co-located and structurally integrated. Youth offending teams (YOT) draw staff from a range of different agencies including education, health, police and social care. Some of these staff are seconded and others are in permanent posts.
- Partially co-located and structurally integrated. In some cases full-time integration is not required, with part-time multidisciplinary teams and attachments being used instead.
- Co-located, process integrated. Co-location does not have to involve structural links. Access to a range of services is increased by locating them on the same site as a mainstream service that is frequently used by children and families. With school aged children, this is often the primary or secondary school. In Scotland these co-locations have taken the form of community schools, while in England they are on trial as 'full service' schools.

The 2003 book on integrating children's services advised that all staff, not just those taking on new and extended roles, need training and continuing development to be able to function effectively in a new integrated team service<sup>24</sup>. They recommended setting up regular meetings across service networks to ensure collaborative learning and problem solving - building and developing the team as a whole and the individual therein<sup>24</sup>.

A common approach of integrating teams is to co-locate them. This can be virtual, for example an email network or group that meet through teleconferences, or physical, where teams are located in the same premises such as a children's centre<sup>24, 25, 39</sup>. While there is no robust evaluation data available, qualitative work with local practitioners highlight some advantages of co-locating teams<sup>25</sup>:

- Opportunity for immediate conversations can result in speedy resolutions to issues
- Increased understanding of roles within the team and who to go to for informal advice
- Relationship building and trust in colleagues
- Joint professional ownership of families
- Pooling information to inform service planning, e.g. areas where immunisation rates or attendance at developmental checks are low
- Professional supervision that may be separate to line management
- Opportunities for joint training
- Opportunities for building a shared set of beliefs and practice to develop a shared culture.
- Improves the response to families with more complex needs
- Assist timely information sharing between professionals involved with the same family and gives greater confidence in risk management

Children's centres are frequently described as important to the delivery of integrated services, often providing the base for the delivery of services and co-location of staff<sup>25</sup>. While Children's Centres is the name used in England, Wales and Northern Ireland, it's their function that is important. They bring together help and advice on children and family health, parenting, money, training and employment all under one roof<sup>25</sup>.

Our first case study of how children's centres can work is in the London borough of Islington. The borough uses their 16 children's centres as the hub of their integrated approach<sup>25</sup>.

#### Case study 4: Islington children's centre model of integration

The 16 children's centres are contracted through Service Level Agreements (SLAs) to a mix of providers that includes the LA, schools and the voluntary and community sectors. A key feature has been to support the centres to have well-qualified staff: all have at least one qualified teacher and the majority are also led by teachers. Most of the family support and outreach area managers (FSOAMs) have a social work qualification, and the family support and outreach workers and nursery staff are well qualified.

Each children's centre has its own nursery and up to one third of the early education and childcare places are offered through a priority referral system for children identified by a range of professionals as having particular risk factors. Most of the other places are offered with subsidised childcare, based on income bands, in order to provide affordable childcare and encourage a mixed community within the setting.

A key feature in Islington is priority given to the development of early years staff, with many Children's Centre heads and Family Support Outreach Area Managers having completed the National Professional Qualification in Integrated Centre Leadership.

**Source:** Adapted from the Early Intervention Foundation<sup>25</sup>

Social workers can have a key role to play in integrated team arrangements for children and young people, providing valuable consultation and supporting reflective case discussions. A social worker presence in multidisciplinary discussions enables the early identification of serious concerns and safeguarding issues, which means high risk cases can be escalated quickly. Their expertise can support Early Intervention practitioners work with families that have complex needs to respond to risk in a more confident and less risk-averse manner<sup>25</sup>.

The benefits of integrated teams can be illustrated by a fragmented counterexample. Interviewees and survey participants from local government and the NHS, reflecting on their experience of integrating health and social care in Scotland, said they still felt that they operate to different priorities, different lines of accountability and performance management, and use different language and terminology. These factors were regarded as a hindrance to successful delivery of national and local integration priorities, leading to tensions, confusion and overlap in action<sup>25, 39</sup>.

The degree of integration and its age and maturity varies across locations but there are positive signs that mature models of integration including co-location, such as our second case study of Brighton and Hove, can yield perceived benefits.

#### **Case study 5: Mature model of integration: Brighton and Hove integrated services**

In Brighton and Hove the entire health visiting service for the city has been seconded into the council through a Section 75 agreement, and they work as an integral part of the children's centres service. Children's centres operate as a city-wide service, led by three Neighbourhood Sure Start service managers, two with health visiting backgrounds and one from social work.

The integrated children's centre teams are led by health visitors who supervise outreach workers. In addition, there are specialist city-wide teams offering specific support, for example, breastfeeding coordinators to encourage initiation and sustain breastfeeding in areas of the city where this is low. Traveller and asylum seeker families are supported by a specialist health visitor and early years visitor post. A Citywide Family Nurse Partnership Programme is also managed as part of the service.

This model is believed to have delivered value for money, effective use of resources, and safe, evidenced-based health care delivery. Breastfeeding rates are well above average, and there was also a steady rise in the percentage of children living in the most disadvantaged areas who achieved a good Early Years Foundation Stage Profile score up to 2012. All children's centres were judged to be good or outstanding in the last Ofsted inspection round. One of the centres was judged to be outstanding in every area; inspectors noted that the health-led model played a fundamental part in streamlining services and integrating provision.

Antenatal and post-natal services are delivered directly from this centre. As a result, it reaches 100% of children aged under five years living in the area, and has made an impressive impact on children's welfare and family wellbeing.

**Source:** Adapted from the Early Intervention Foundation<sup>25</sup>

East Ayrshire and Inverclyde localities in Scotland both aimed to integrate health and social care and took different approaches relying to different degrees on integrated and co-located teams.

## Case Study 6: East Ayrshire and Inverclyde integrate health and social care

It was noted by participants in both case study areas that local partners had already made significant progress in: integrating planning, service design and delivery, pooling and aligning budgets, merging management structures (e.g. NHS staff being managed by local authority staff and vice versa) and introducing locality planning and services (e.g. co-located services and 'hub' models) based on community participation and prioritisation, prior to the introduction of the Act. The new legislative requirements were not, therefore, regarded as starting from a blank piece of paper.

Inverclyde's Community Health and Social Care Partnership incorporates children's and family health and social work services and criminal justice social work. Educational Services remain within Council control, but they are involved as partners in the inclusive 'Nurturing Inverclyde' approach via community planning structures. Inverclyde interviewees saw this approach as building logically on existing partnerships and structures while minimising disruption, fragmentation and possible confusion, both to service users and service providers.

In East Ayrshire, Children and Families and Criminal Justice Social Work Services have been included within the Health and Social Care Partnership, with the Council retaining responsibility for Educational Services. This preserves the unity of Social Work Services in East Ayrshire. Arrangements are in place to ensure the continuity of the strong links that exist across Educational and Children and Families Social Work Services, resulting from the previous structure in which Educational and Social Work Services were constituent partners of the Department of Educational and Social Services.

Source: Social Work Scotland<sup>39</sup>

## Information sharing and systems

Sharing information about children and families across health, education and social care at both strategic and operational levels is often discussed as crucial for effective integrated working<sup>24, 25</sup>. The Early Intervention Foundation advises that information sharing systems can:

- Improve communication. Making it easy for front-line staff to find out who does what in each sector, and the processes they use and the response times, if any, to which they work.
- Tackle communication problems. Contacting people when you need them, for example, teachers in the classroom or community nurses when they are out visiting patients, can be a major problem. There is also the need agree a common language for describing the requirements of children and their families that both professionals and service users can readily understand.
- Provide an opportunity to innovate in customer contact. Many children and their carers require advice, guidance or reassurance. They need it when they can make most use of it and preferably without having to book an appointment. Here is a role for customer contact innovations, such as Care Direct and NHS Direct, and education and social care involvement in local authority customer contact centres. They can provide information, guide users to available services and help integrate first contact and continuing responses across sectors. However, to do this effectively will require an integration of both national and local services.

In Scotland, interviews with practitioners involved in integrating health and social care showed that many saw the changes being implemented as an opportunity to improve the gathering and sharing of information and data at both strategic and operational levels<sup>39</sup>. This was seen as an important way to

improve communication, build stronger partnerships, improve knowledge and target services and resources more effectively. However, several interviewees commented on the need for significant investment in better and shared IT systems within and across organisations if aspirations for improved communications and data/information sharing were to work in practice<sup>39</sup>.

One way of supporting integrated working is to establish an information sharing agreement between relevant organisations. The Early Intervention Foundation give the example of forming a high-level partnership agreement at corporate level, and then more detailed agreements between relevant departments such as between health visiting and children centres on live birth data and sharing information on individual needs of a family<sup>25</sup>. Other models may be more suitable to local circumstances.

In England a person's unique NHS Number is being used to link databases from different organisations to facilitate information sharing<sup>25</sup>. A similar common "unique identifier" might be able to unite disparate databases of patient records in other contexts.

Swindon, in England, provides a helpful case study of how an integrated IT system can support care.

#### **Case study 7: Swindon integrated IT system**

Having systems in place to facilitate appropriate information sharing across an integrated team and identify who is working with a family is crucial. In Swindon, the integrated health and early years team has developed an integrated information computer system used by all practitioners in the team which includes health visitors; speech and language therapists; school nurses and family nurse practitioners; alongside educational welfare; educational psychology; targeted mental health; youth engagement workers; and Families First. Social care also has access to the system. The LA recently launched a new integrated IT system using Capita One. This replaces the electronic health record (EHR). On the first screen, information about which services are involved with a family and the number of appointments and contacts there have been with that service can be seen. The information can be accessed by the Early Help team and children's centre staff. However, notes relating to the detail of the appointments are restricted by profession.

**Source:** Adapted from the Early Intervention Foundation<sup>25</sup>

The Early Intervention Foundation found that sharing live birth data between local authorities and children's centres boosted integration and allowed better service planning<sup>25</sup>.

However, it noted that this is not happening in many areas and is creating a significant barrier to integrated working. The Children's Society recently estimated that almost half of local authorities (46.7%) do not routinely share live birth data with children's centres in their area on a monthly basis<sup>25</sup>.

Discussions on information sharing and integration also covered the possibility of establishing information hubs for children and families to access. Customer service centres are one example. Local authorities are increasingly establishing customer contact centres which provide one-stop telephone access to information and advice across the full range of their services<sup>24</sup>.

#### **Case study 8: Islington information sharing**

Islington's First 21 Month Programme recognises good information sharing is key to successful communication. Three areas where sharing of information has been agreed are:

- Midwives now gain consent from women they are booking in to share their details with the children's centres
- Housing and benefits information is routinely shared with children's centres
- Missed immunisation appointments are shared with the children's centre staff to follow up with the families to encourage attendance.

These initiatives enable the children's centre staff to identify those families that may need early or additional support.

**Source:** Early Intervention Foundation<sup>25</sup>

### Case study 9: Warwickshire information sharing

Birth data is shared using the first visit form that health visitors complete at the first baby review. On this form the parents give consent to share the birth data, name and address with local children's centres. The child health department enters the data on the appropriate system and each month an encrypted list is sent to the data lead in the local authority, who sends this out to all the appropriate children's centres. The children's centres then send a 'Welcome Card' with details of all the centre's activities to families. Children's centres have agreed not to visit families unless a referral for services has been made, or the parents go to the centre and register for services. As a double check, midwives and health visitors ask parents to register at the local children's centre.

The local health trust also informs the children's centres about the total number of babies that have been born each month so that they can gauge the number of families not registering in their reach area.

**Source:** Early Intervention Foundation<sup>25</sup>

### Universal assessment and single point access

A number of reports say children and their families complain about the number of overlapping means of assessment used to assess their needs. To this end the Early Intervention Foundation calls for integrated assessments, single assessments that are shared between relevant partners, reducing the need for children and families to give the same information to many different people<sup>25</sup>.

Both early years education and health visitors are required to carry out an assessment of children at two to two-and-a-half, which often happens separately. The Early Intervention Foundation say the creation of a single integrated development check at the age of 2 could be more effective<sup>25</sup>. England has piloted a single review process and the evaluation found it improved both family satisfaction with services and outcomes for children in need of additional support.

The pilots explored different models of delivering an integrated review. Islington for example used a model where both health and early years professionals conduct the review together with the parent and child to provide an integrated and holistic assessment. The review has proved very popular with parents, and there is strong support from practitioners for the concept, despite some practical challenges to overcome<sup>25</sup>.

Warwickshire's pilot focused on integrating the information gathered through the review, rather than integration of the actual review meeting, which were kept separate<sup>25</sup>. It has a weekly 'Family Matters' multi-agency meeting at children's centres involving regular discussions about families with a Child in Need or Child Protection Plan. Packages of support for families are also discussed. All staff that have contact with the parents and children are encouraged to contribute, and know that their observations are important. All team members are open and honest with parents at each stage, and parents know what will be discussed at any meeting of professionals, and why<sup>25</sup>.

A lead health visitor commented<sup>25</sup>:

*"I've had no parent ever say 'no' about information sharing on any subject, as long as we are honest with them and say why (we want to share)."*

A number of systems have developed, or are developing, a 'Single Point of Access' for professionals to refer a child with an identified need or to ask advice. This concept is a common approach although precise models vary. Some provide information hubs and are able to signpost to services, whereas others are part of the delivery model for Early Intervention<sup>25</sup>.

Essex has established an Early Help Hub, which covers all ages. Information, advice and guidance are available to advise practitioners on available services and offers an opportunity to discuss the best course of action including signposting to relevant support. Swindon has also set up a Family Contact Point, which offers a single point of advice for people who have any queries about children and families. A health visitor is always present to help deal with enquiries<sup>25</sup>.

#### **Case study 10: Greater Manchester integrated 8 step universal assessment**

The Early Years New Delivery model, developed in partnership across Greater Manchester, includes assessment at eight key stages in a child's life from pre-birth to five years of age. It is supported by integrated working between midwives, health visitors, early years professionals and schools.

Where assessment at any point indicates the need for additional targeted support, this is followed up by offering evidence based interventions through a whole family approach and supported by assertive outreach from early years professionals.

Examples of interventions used include: the Incredible Years Parenting Courses; Newborn Behavioural Assessment Scale; Video Interactive Guidance; and parent child communication and language interventions. This process seeks to move from multiple non-evidenced based assessments to an integrated and progressive series of assessments timed around crucial child development milestones that identify needs early.

The core pathways are: parent infant attachment; parental mental health; communication and language; social, emotional and behavioural; employment and skills; young parents; special needs and disability; maternal health in pregnancy; domestic abuse; and drugs and alcohol.

**Source:** Early Intervention Foundation<sup>25</sup>

## Older people interventions

### Introduction

Taking lessons from seven international case studies, the King's Fund suggest that integrated care of older people's services, usually those with complex health and social care needs, tend to include a number of core elements, including<sup>40</sup>:

- eligibility criteria for receiving care
- a single point of referral
- a single and holistic care assessment
- a care plan
- a named care co-ordinator (or case manager)
- support from a multidisciplinary team of care professionals.

All seven case study programmes reported improvements in user satisfaction and reductions in utilisation of hospital services and or care homes. But the King's Fund point out there was a general lack of emphasis on systematically measuring the impact and outcomes of integrated services. In many circumstances it was not unclear whether care outcomes improved from a service user perspective. A further issue was the very limited efforts and evidence assessing cost-effectiveness<sup>40</sup>.

However, while acknowledging the limitations of the evidence, the Fund identified eight key messages about providing integrated care for older people with complex needs<sup>40</sup>. They give a useful and representative overview of the broader themes occurring in the grey literature:

1. Integrated care is a process that must be led, managed and nurtured over time. Initiatives often have to navigate and overcome existing organisational and funding silos.
2. There is no single organisational model or approach that best supports integrated care. The starting point should be a clinical/service model designed to improve care for people, not an organisational model with a pre-determined design.
3. Fully integrated organisations are not the end goal.
4. Greater use of ICT is potentially an important enabler of integrated care, but is not a necessary condition.
5. Professionals need to work together in multidisciplinary teams (with clearly defined roles) or provider networks - generalists and specialists, in health and social care. However, patients with complex needs that span health and social care may require an intensity of support that goes beyond what primary care physicians can deliver.
6. Important service-level design elements of care for older people with chronic and multiple conditions include holistic care assessments, care planning, a single point of entry, and care co-ordination.
7. Success is more likely where there is a specific focus on working with individuals and informal carers to support self-management.
8. Personal contact with a named care co-ordinator and/or case manager is more effective than remote monitoring or telephone-based support.

These lessons also closely mirror those derived from their assessment of five UK case studies on co-ordinated care for people with complex chronic conditions a year earlier (2013)<sup>36</sup>.

We look in more detail below at the four most commonly reported approaches to successfully integrating older people's services in the grey literature. They are:

- Case managers and care coordinators
- Information sharing
- Single point of entry and contact
- Multidisciplinary teams

## Case managers and care coordinators

A distinguishing feature of a King's Fund assessment of seven successful international case studies providing integrated care for older people with complex needs was the consistent presence of a named care-coordinator or case manager<sup>40</sup>. This was the common ingredient in a context of otherwise differing approaches.

Similarly, a Canadian Policy Research Network systematic review looking for effective models of integrated care found, at a minimum, successful projects used case management and facilitated access to a range of health and social care services<sup>41</sup>.

The King's Fund looked at the effectiveness of case management of long term conditions and found a mixed picture of impact. Case management improved functional status, or prevented deterioration, and there was weak evidence it reduced admission to hospital, and length of stay in hospital. But no consistent evidence was found in support of case management reducing use of emergency departments and cost data was largely unavailable<sup>42</sup>.

A review by the Canadian Policy Research Network found that successful integrated care required at a minimum case management and facilitated access to a range of health and social care services, which together were associated with reductions in hospital use, increased client satisfaction, quality of life, cost-effectiveness or cost savings<sup>41</sup>. Adding multidisciplinary team working and active physician involvement to the multifaceted approach was also linked to reductions in use of nursing homes or long term care homes<sup>41</sup>.

The core elements of case management are case finding or screening, assessment, care planning, implementation, monitoring and review. They may be the specific job of a 'case manager' or a series of tasks fulfilled by members of a multidisciplinary team<sup>42</sup>. Either way<sup>40</sup> the aim is to develop cost-effective and efficient ways of co-ordinating services to improve quality of life<sup>42</sup>.

The role of care co-ordinator or case manager is much more than navigating people between care providers, and this broad role was considered important in the success of the integration more widely. The typical roles included<sup>36</sup>:

- providing personal continuity of care to the patient/carer and acting as a key point of contact for care
- being the patient's advocate in navigating across multiple services and settings
- providing care directly in the home environment (by case managers with advanced skills)
- ensuring that professionals within the multidisciplinary team are kept informed of the patient/carer's situation
- taking accountability for the provision of care and ensuring that care packages are put in place and delivered
- communicating with the wider network of providers (outside of the core multidisciplinary team) so that information about the patient/carer is shared and any actions required are followed up.

These functions were consistent across five King's Fund assessed UK programmes that co-ordinated care for people with complex chronic conditions, despite differences in the patient group, rural or urban settings, affluent or deprived communities, or dealing with smaller or larger caseloads <sup>36</sup>.

## The difference between care-coordinators and case managers

Care co-ordinators tend to be non-clinicians, for example, health care assistants or social care staff, whose role is to facilitate access to care services as well as provide a key point of contact.

Case managers on the other hand, usually have training and expertise in caring for older people with complex needs. Hence, case managers not only co-ordinate care, they also provide much of it directly.

While the professional background of case managers and care coordinators varied across the seven case studies examined recently by the King's Fund (Australia, Canada, Netherlands, New Zealand, Sweden, UK and US) they were usually based in primary care or the community, and involved coordinating medical and social care, such as home care and supportive housing<sup>40</sup>.

Case management and care co-ordination are well established in the UK and typically work to improve care after discharge from hospital, or avoid hospitalisations by focusing on 'at-risk' individuals in the community, or both<sup>36</sup>. This has reportedly improved the experiences of older people and carers and helped achieve more cost-effective care in some localities. But the King's Fund add two notes of caution. First, the evidence for the effectiveness remains mixed and limited, and success appears highly dependent on the way care co-ordination is implemented locally. Second, while care coordinators often demonstrate improvements in care experiences and outcomes, the evidence they reduce costs and improve cost-effectiveness is limited<sup>36</sup>.

The King's Fund advise that managers and policy-makers should be realistic about the potential financial impact of care co-ordination, and view it primarily as a quality improvement strategy rather than one specifically aimed at cost reduction<sup>36</sup>. They should also be vigilant of new more robust research that has the potential to influence these tentative conclusions.

Nevertheless, the King's Fund suggest that the role of the care co-ordinator was crucial to success of integrated care, adding that co-ordinating care around the needs of patients and carers requires a dedicated staff member to facilitate the process<sup>36</sup>. The Fund found that high-touch personalised care (regular face-to-face contact with patients, home visits and telephone calls) was more important than high-tech care (relying on electronic patient records or telehealth or telecare devices) for case managers and care coordinators.

## Case study 11: Geriant, Noord-Holland province, the Netherlands

Since 2000, Geriant has offered a community-based service to people diagnosed with dementia, 24 hours a day, 7 days a week. The teams include case managers, social geriatricians, psychiatrists, clinical psychologists, dementia consultants, and specialised home care nurses. Case managers act as the focal point for the client and their informal caregivers, co-ordinating services from the team and from other network partners including GPs, hospitals, home care and welfare organisations. For more intensive treatment or observation, clients have access to a 16-bed short-stay clinic

Source: The King's Fund<sup>40</sup>

The Canadian Research Network reiterated a common conclusion across the wider grey literature; that no single element of integrated models of care has been shown to be effective on its own<sup>41</sup>. Similar to the King's Fund, the Canadian Policy Research Network do not advocate case management for frail older people in isolation. Rather, they suggest that it works best as part of a wider programme to integrate care, including good access to primary care services, supporting health promotion and primary prevention, and co-ordinating community-based packages for rehabilitation and re-ablement<sup>43</sup>.

## Case study 12: New Zealand Te Whiringa Ora

Te Whiringa Ora is a collaboration, started in 2011, between a community care organisation and a new merger of three physician practices. The programme began with a focus on chronic respiratory disease and has expanded to include any patient with chronic disease with high health care utilisation. The programme includes assessment, care co-ordination, telephone support and telemedicine monitoring as a tool for self-management. These services are delivered by paired nurse and community based care co-ordinators.

Case managers (registered nurses) and community support workers (kaitautoko) support the process of holistic assessment and care planning. Primary care physicians are informed of care plans but are not directly involved in the process, though the service may gain referrals from them and they may be contacted where GP support is identified<sup>40</sup>.

Source: The King's Fund<sup>40</sup>

## Information sharing

Information sharing includes the use of electronic health records, and the sharing of information both vertically between organisations and horizontally across multi-disciplinary teams.

The King's Fund highlighted how a lack of access to shared electronic health records was a common obstacle to integrating services. It often led to a significant amount of time and effort having to be devoted to keeping multidisciplinary teams informed through regular face to face meetings, calls and home visits<sup>36</sup>. Regular multidisciplinary team meetings were the typical hub of communication and knowledge sharing. This 'low-tech, high-touch' approach was viewed by professionals as both a challenge to be overcome and an asset to be retained. For example, while decision-making and communication could be improved through access to shared health care records, teams recognised and valued how face-to-face communication with colleagues built trust, fostered collaboration and led to more meaningful conversations about the needs of patients with complex conditions. Hence information technology was seen as a tool to improve communication, but personal interactions remained essential<sup>36</sup>.

The Canadian Policy Research Network similarly indicated that it was helpful to develop systems for communicating or sharing information between primary care and other service providers. Successful projects saw providers joined together by standardised procedures, service agreements, joint training, shared information systems and even common ownership of resources to enhance access to services, provide seamless care and maintain quality.

Integrated information systems and structured communication channels are at their most important during care transitions. An example is during hospital discharge, where specified discharge worker roles, multi-professional care co-ordination teams, and information technology systems improve patient satisfaction and subjective quality of life for older people when compared with standard hospital discharge<sup>43</sup>.

The King's Fund discuss the example of when a new resident moves in to a care home. There needs to be a prompt transfer of clinical information to the care home staff, particularly if a change of GP and/or other health care professional occurs as a result of the move. Community nurses working as case managers could support the move, and serve as a clinical and communication bridge to specialists and other community health services such as pharmacy and mental health teams<sup>43</sup>.

Interestingly, despite intent to do so, none of the seven case studies discussed by the King's fund report had developed fully shared electronic patient records accessible by all professionals involved in patient care. This seemed a widespread goal but one that was challenging to achieve<sup>40</sup>.

### Case study 13: Cornwall and Isles of Scilly

Fifteen organisations from across health and social care, including local councils, charities, GPs, social workers and community service will come together to transform the way health, social care and the voluntary and community sector work together. NHS Kernow (Cornwall and Isles of Scilly Clinical Commissioning Group) is planning to commission an 'end-to-end' integrated frailty pathway from April 2014. In order to achieve this, commissioning intentions have been signalled clearly to providers. Having gained pioneer status, it is hoped that some of the proposed flexibilities in contracting will enable this to happen at scale and pace.

As part of many preparatory steps they are developing an electronic portal to facilitate information-sharing. In addition they have developed a standardised comprehensive geriatric assessment template and a personalised care plan is under development for use across all organisations as a shared assessment.

Source: NHS England<sup>44</sup>

### Single point entry and contact

In order to co-ordinate care for people with complex chronic conditions it is often necessary to encourage referrals from multiple sources, often including patients and family. This is potentially expensive to manage. As a result, successful integrated care systems have often developed a single point of entry for new referrals<sup>36, 40, 41</sup>.

All five programmes studied by King's Fund had mechanisms for filtering cases through to their multidisciplinary teams. The ability to generate referrals from multiple sources was seen as a key aspect of success, and in some cases meant support could be provided to people before they experienced a crisis, avoiding unnecessary hospital admissions. Having a single point of entry also reportedly helped co-ordinate referrals more effectively and provided a single contact point for patients and carers<sup>36</sup>.

The benefits of having a single point of contact were a common theme across the writings of a number of thought leaders. NHS England discussed its usefulness in offering rapid support close to home in a crisis<sup>44</sup>. The single point of access improved access to community services, that link home support with specialist opinion and diagnostics. A simple referral system with a single point of access for frail older people was also recommended to ensure good acute hospital care was available when needed, this also acted as a screen so that referrals were based on need rather than demand<sup>44</sup>.

Patients benefit from having a single point of contact as they feel better supported and listened to. They also find it easier to deal with one person rather than many from different services, and so don't have to repeat themselves to different people - a common source of dissatisfaction<sup>44</sup>.

#### **Case study 14: Sandwell Integrated Care Services Team (ICARES)**

ICARES offers one single point of access, seven days a week, for primary, hospital, mental health or social care professionals or concerned older people or carers. The team incorporates a range of disciplines, including nurse specialists in case management/disease management and nurse practitioners skilled in Hospital at Home interventions, therapists, rehabilitation assistants, social workers, care assistants and night sitters.

It also has easy access to local GPs and to voluntary sector organisations. On receipt of a referral, they assess urgency of need and guarantee to begin assessment and support in the person's own home within three hours of referral (for urgent cases) and within two days (for sub-acute cases). They are then able to arrange 'wraparound' services as required to help the person remain at home, unless hospital admission is necessary. The service also supports care home residents in crisis in the same way.

**Source:** The King's Fund<sup>43</sup>

#### **Multidisciplinary teams**

Multidisciplinary teams are the bedrock of many integrated care approaches and are rarely absent from opinion leader discussion about successful integrated care approaches. Some sources say that multidisciplinary teams working flexibly and communicating effectively with each other are a necessity<sup>40</sup>.

#### **Outcomes**

The King's Fund outlined how multidisciplinary, integrated care programmes are linked to improvements in outcomes; for example, when used as part of comprehensive geriatric assessment and specialist elderly care units and wards<sup>43</sup>. Specifically, the Fund reports evidence that comprehensive, interdisciplinary assessment of older people presenting to hospital improves survival during hospital admission and increases the patient's chance of being able to remain in their own home with less cognitive decline<sup>43</sup>. As such they advise comprehensive assessment should be provided as soon as possible after hospital admission by a skilled, senior member of a multidisciplinary team. This should function to identify reversible medical problems, target rehabilitation goals, and plan all the components of discharge and post-discharge support needs<sup>43</sup>.

Furthermore the Fund says there is good evidence that specialist acute geriatric wards deliver higher-quality care with shorter lengths of stay and lower costs than less specialised operations<sup>40</sup>. And that

comprehensive geriatric assessment is most effective on consultant-led speciality wards with a resident multidisciplinary team<sup>40</sup>.

The Canadian Policy Research Network also concluded that multidisciplinary teams, alongside case management, active physician involvement, access to range of health and social services, were associated with reducing the use of nursing homes and long-term care homes<sup>41</sup>.

### ***Core teams and support teams***

A second King's Fund report looking at seven success stories of integrated care from around the world identified a subtlety; a differentiation between a 'core' multidisciplinary team - undertaking close and ongoing care of older people - and a wider network of care providers who could be drawn on to support care assessments or improve access to a range of services<sup>40</sup>. The nature of the 'core group' differed depending on whether the approach to care focused on care management (direct to service users through multidisciplinary teams) or care co-ordination (indirectly, across networks of care providers to facilitate access and care co-ordination).

### **Case study 15: Midhurst Macmillan Community Specialist Palliative Care Service (England)**

The Midhurst Macmillan service is a community-based, consultant-led, specialist palliative care programme in West Sussex, England, which covers approximately 150,000 people in a largely rural area across three counties. It is jointly funded by the National Health Service (NHS) and Macmillan Cancer Support, with a budget of around £1.2 million per year. The service enables patients with complex needs who are nearing the end of their lives to be cared for at home, and allows them to die in the place of their choosing. The Midhurst service caters for approximately one-quarter of all people needing end-of-life care in the area. Most patients on the caseload have been diagnosed with cancer, although there are an increasing number of referrals for patients with other conditions, including dementia and heart failure.

The service is run by a multidisciplinary team of nurses and palliative care consultants, occupational therapists and physiotherapists, as well as a large group of volunteers. Six staff - all clinical nurse specialists - act as care co-ordinators for patients. They are part of the multidisciplinary team and work in close co-operation with other care providers in the local area to provide palliative care in people's own homes. Other providers include general practitioners (GPs), district nurses, continuing care teams, and volunteers who are recruited and managed by Macmillan Cancer Support.

**Source:** The King's Fund<sup>36</sup>

### ***GP involvement***

The King's Fund says that the range of members of successful MDTs demonstrates the importance of a diverse yet 'dense' community-based network of professionals working closely together. However, general practitioners (GPs) involvement appears to be a special note<sup>36</sup>.

In the evidence they looked at, GPs were not often central to the care co-ordination process and have varying degrees of engagement both within and across integrated care programmes. Addressing potential lack of engagement of GPs is an area planners should be aware of and seek to mitigate. It is an issue that does not appear to be limited to the United Kingdom<sup>36</sup>. The Fund also cautioned that patients with complex needs that span health and social care may require an intensity of support that goes beyond what primary care physicians can deliver<sup>40</sup>.

The Canadian Policy Research Network concluded that the strongest integrated care programs included the active involvement of physicians<sup>41</sup>.

## ***Nurture***

Successful integrated care programmes emphasise the value of team-building and networking within the core multidisciplinary teams providing care<sup>36</sup>. Once established, the teams are not static entities, but rather need to be nurtured in order to function effectively<sup>36</sup>.

While the multidisciplinary teams in many integrated care programmes have moved in the direction of becoming fully integrated community-based models of care - some with separate funding and governance arrangements - the degree of 'vertical integration' with hospitals appears to have remained weak<sup>36</sup>.

Multidisciplinary teams can create links between clinicians in order to share information and raise awareness, develop strategies to avoid unnecessary hospital admissions, and secure early discharge. Most case studies reported these links as important but under-developed. It was also acknowledged that there was a need to develop better relationships between multidisciplinary teams and hospitals, especially when managing effective care transitions from hospital to home<sup>36</sup>.

The Canadian Policy Research Network similarly emphasised the role of multidisciplinary teams in strengthening relationships between service providers. They also noted the important role of practice nurses in such teams. Geriatric screening and multidisciplinary assessment was found to improve communication among providers, and could be implemented without much opposition<sup>41</sup>.

### **Case study 16: Community resource teams in Pembrokeshire (Wales)**

Multidisciplinary community resource teams co-ordinate care for people with long-term illnesses, co-morbidities and frailty. The aim is to enable patients to remain in their homes for as long as possible and to avoid unnecessary hospital admissions. The teams consist of community health care staff, social workers and voluntary sector representatives. There is also input from GPs and specialist nurses, although this varies from team to team. During weekly meetings, team members discuss patients they deem to be at high risk of hospital admission, and a care plan is developed to reduce this risk and improve the patients' health and wellbeing.

Typically, the team member presenting the case will act as care co-ordinator. Patients can also be referred by a professional help desk, which accepts calls from individuals as well as from social workers and GPs. All of the teams have relationships with the secondary and acute sector to co-ordinate care planning when people are discharged from hospital into the community

**Source:** The King's Fund<sup>36</sup>

## Section 3 - conclusions and recommendations

## Conclusion

The scope of this review was broad. Integrated care is a large and diverse topic involving complex multi-faceted interventions targeting a range of health service transitions, across different age groups, in people with varying physical and mental health problems, operating in different healthcare systems around the world.

Most integrated care reviews we identified related to older people (16 of 21). Just three reviews focused on child populations, and two targeted maternity and gynaecological services. This skew towards older people was also strong in the grey literature.

Almost without exception the systematic review evidence and grey literature highlighted a lack of robust evaluation linking different integration approaches to outcomes and costs. As such, significant evidence gaps remain in terms of what works, how, and in whom; particularly for populations under 65 years of age. The evidence base for cost effectiveness of integrated care was similarly limited.

Current review and grey literature evidence suggests integrated care can have a positive impact on many patient outcomes. But the positive impact of one intervention in one place is not guaranteed in another. Success appears context and intervention specific, and is likely to have a range of additional success modifiers.

In older people the evidence suggests integrated care approaches are feasible and have yielded subjective improvements in patient outcomes in a number specific settings and populations (See Summary Tables 5, 6 and 7). But outcomes rarely improved consistently in a positive direction, many showed no improvement, painting a mixed picture.

One trend observed in the literature on older people was a tendency of subjective outcomes to improve, whereas more objective outcomes showed no or little improvement. For example, where reported, patient satisfaction usually improved, whereas measures of mortality did not. Although a tentative link this suggests patients and their carers may benefit or approve of efforts to integrate care, even if they don't always lead to improved health outcomes. There were no signs of worsening patient outcomes due to integrated care, although concerns about larger workloads were voiced by staff involved in delivery.

The main service transition for older people was from hospital to home, often a supported hospital discharge. Integrated care approaches in the community or primary care were generally provided for those with complex medical conditions, aimed at reducing hospitalisation. The most common integrated care approach was using multi-disciplinary working of some kind. A tactic employed across all three population groups.

The evidence base included many integrated approaches that were low intensity, encompassing elements of linkage and coordination, rather than full integration. This reflects efforts towards integrated care that have not reached maturity.

Having the patient at the centre of care is the corner stone of integrated care efforts but the review and grey literature we reviewed did not yet reflect this in terms of reporting patient relevant outcomes with consistency or emphasis.

The thrust of the interventions were often about shortening hospital visits, or preventing unplanned or unnecessary admissions, readmissions and improving patient flow measures within or across care services. This may reflect a dominance of the service provider perspective in the research literature over those focused on the patient perspective. We found little evidence of other integration across service transitions such as general hospital to specialist hospital.

While there was little evidence to suggest integration worsened patient outcomes, we should recognise the potential for integration in one part of a health system to result in fragmentation in another. As such a prudent step would be to engage stakeholders from healthcare providers affected by any proposed service integration programme to ensure that all parties acknowledge the opportunities offered and potential benefits for the wider health system. Without such engagement, integration of services could actually lead to a greater sense of fragmentation. Or as Leutz 1999<sup>45</sup> put it: “your integration is my fragmentation”.

## Recommendations

These recommendations for improving integrated care emerge from the systematic review of the academic literature, and the narrative review of the grey literature published by thought leader organisations. While it is clear that integrated care does not travel well - every combination of location, population and healthcare system is unique, so needs unique solutions - we consider the following supported by the best evidence available.

### Recommendation 1: Evaluate

Ensure robust evaluation is an integral part of any integrated care implementation big or small. As a minimum this should gather pre-integration measures of patient outcomes and experience and monitor their change over time. Without this, planners and practitioners will continue to be led by “principles” and “characteristics” rather than more solid measures of impact and outcomes.

### Recommendation 2: Start small

Structural or organisational mergers should not be used to instigate integrated care; rather, management should focus on removing barriers (such as differences in financing and eligibility) that make it more difficult for individuals, teams and institutions to integrate care. Clinical or service teams should lead the development of integrated care, and will need ongoing support as they develop and mature.

### Recommendation 3: Learn from others

Many organisations have tried integrating care at different levels. They may have recently trodden the path you are about to; and talking to those involved could be a valuable source of learning, insight and support. A range of case studies exist in the academic and grey literature, and while the information in the published forms is often limited, many provide contact information to the programme leads. For example, England has evaluated 16 integrated pilot programmes across the country and has links to a contact for each one<sup>23</sup>.

### Recommendation 4: Create multidisciplinary teams

Multidisciplinary teams are the bedrock of many successful examples of integrated care - generalists and specialists working together, from both health and social care. In many case studies, the co-ordination of care was being delivered alongside, rather than by, primary care physicians.

**Recommendation 5: Consider implementing case management for older people**

Care co-ordination is considered crucial to the success of integrated care, and a dedicated, named staff member can facilitate the care process - personal contact with a named case manager is more effective than telephone support. Case management should focus on specific populations that are not currently supported by the primary care system, and any case management programmes should be evaluated carefully to ensure they are cost effective and are demonstrating improvements in outcomes.

**Recommendation 6: Implement early supported discharge for older people**

Early supported discharge teams co-ordinate discharge from hospital. They may also co-ordinate post-discharge care at home, or they may hand over post-discharge care to existing community-based agencies. Early supported discharge has been linked to shorter lengths of hospital stay, more people living in their own home, being able to carry out normal daily activities, and cost savings<sup>5</sup>.

**Recommendation 7: Share information, including electronic health records**

Sharing information was often described as crucial for effective integrated working<sup>24, 25</sup> and a lack of access to shared electronic health records was a common obstacle to integrating services across health and social care. Integrated information systems and structured communication channels appear most important during care transitions, for example from hospital to home, where there is more scope for error. Sharing electronic records was a widespread aspiration but one most have yet to achieve.

**Recommendation 8: Consider implementing specialist home-based nursing for ill children**

Home-based nursing services improve satisfaction and reduce anxiety, although there is limited evidence for health outcomes or cost effectiveness. If such schemes are implemented they should be done so on a pilot basis and evaluated carefully.

## References

1. Chang-Quan, Dong BR, Lu ZC, et al. Collaborative care interventions for depression in the elderly: A systematic review of randomized controlled trials. *Journal of Investigative Medicine*. 2009;57(2):446-55.
2. Collet J, De Vugt ME, Verhey FRJ, et al. Efficacy of integrated interventions combining psychiatric care and nursing home care for nursing home residents: A review of the literature. *International Journal of Geriatric Psychiatry*. 2010;25(1):3-13.
3. Davies SL, Goodman C, Bunn F, et al. A systematic review of integrated working between care homes and health care services. *BMC health services research*. 2011;11:320.
4. Eklund K, Wilhelmson K. Outcomes of coordinated and integrated interventions targeting frail elderly people: A systematic review of randomised controlled trials. *Health and Social Care in the Community*. 2009;17(5):447-58.
5. Fearon P, Langhorne P. Services for reducing duration of hospital care for acute stroke patients. *Cochrane Database of Systematic Reviews*. 2012(9).
6. Goodman C, Drennan V, Manthorpe J, et al. A study of the effectiveness of interprofessional working for community-dwelling older people. Southampton: National Institute for Health Research, 2012. Available from: [http://www.netscc.ac.uk/hsdr/files/project/SDO\\_FR\\_08-1819-216\\_V01.pdf](http://www.netscc.ac.uk/hsdr/files/project/SDO_FR_08-1819-216_V01.pdf).
7. Huntley AL TR, 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. *Family Practice*. 2013;30:266-75.
8. Johri M, Beland F, Bergman H. International experiments in integrated care for the elderly: A synthesis of the evidence. *International Journal of Geriatric Psychiatry*. 2003;18(3):222-35.
9. Kane RL, Shamlivan TA, McCarthy T. Do geriatric healthcare teams work? *Aging Health*. 2011;7(6):865-76.
10. Larsen T, Olsen TS, Sorensen J. Early home-supported discharge of stroke patients: A health technology assessment. *International journal of technology assessment in health care*. 2006;22(3):313-20.
11. Manderson B, McMurray J, Piraino E, et al. Navigation roles support chronically ill older adults through healthcare transitions: A systematic review of the literature. *Health and Social Care in the Community*. 2012;20(2):113-27.
12. Mikolaizak AS, Simpson PM, Tiedemann A, et al. Systematic review of non-transportation rates and outcomes for older people who have fallen after ambulance service call-out. *Australasian Journal on Ageing*. 2013;32(3):147-57.
13. Parker SG, Peet SM, McPherson A, et al. A systematic review of discharge arrangements for older people. *Health Technology Assessment*. 2002;6(4):1-183.
14. Shepperd S, Lannin NA, Clemson LM, et al. Discharge planning from hospital to home. *Cochrane Database of Systematic Reviews*. 2013(1):CD000313.
15. Tieman J, Mitchell G, Shelby-James T, et al. Integration, coordination and multidisciplinary care: What can these approaches offer to Australian primary health care? *Australian Journal of Primary Health*. 2007;13(2):56-65.
16. Trivedi D, Goodman C, Gage H, et al. The effectiveness of inter-professional working for older people living in the community: A systematic review. *Health and Social Care in the Community*. 2013;21(2):113-28.
17. Allen D, Gillen E, Rixson L. The effectiveness of integrated care pathways for adults and children in health care settings: a systematic review. *JBHI Reports*. 2009;7(3):80-129.
18. Noyes J, Brenner M, Fox P, et al. Reconceptualizing children's complex discharge with health systems theory: novel integrative review with embedded expert consultation and theory development. *Journal of Advanced Nursing*. 2014;70(5):975-96.
19. Parab CS, Cooper C, Woolfenden S, et al. Specialist home-based nursing services for children with acute and chronic illnesses. *Cochrane Database of Systematic Reviews*. 2013(6):CD004383.
20. Bick D, Beake S, Chappell L, et al. Management of pregnant and postnatal women with pre-existing diabetes or cardiac disease using multi-disciplinary team models of care: A systematic review. *BMC Pregnancy and Childbirth*. 2014;14(1).

21. Lindegren ML, Kennedy CE, Bain-Brickley D, et al. Integration of HIV/AIDS services with maternal, neonatal and child health, nutrition, and family planning services. Cochrane Database of Systematic Reviews. 2012;9:CD010119.
22. Myors KA, Schmied V, Johnson M, et al. Collaboration and integrated services for perinatal mental health: An integrative review. Child and Adolescent Mental Health. 2013;18(1):1-10.
23. England N. Integrated Care and Support Pioneer Programme. Annual Report 2014. London: NHS England, 2014. Available from: <http://www.local.gov.uk/documents/10180/6927502/Integrated+Care+Pioneer+Programme+Annual+Report+2014/76d562c3-4f7d-4169-91bc-69f7a9be481c>.
24. McNicholl CMAA. Integrating children's services: issues and practice London: OPM; 2003.
25. Molloy CMA. Getting it right for families: a review of integrated systems and promising practice in the early years. London: Early Intervention Foundation, 2014. Available from: <http://www.eif.org.uk/wp-content/uploads/2014/11/GETTING-IT-RIGHT-FULL-REPORT.pdf>.
26. Shaw S, Rosen R, Rumbold B. What is integrated care? London: Nuffield Trust, 2011. Available from: [http://www.nuffieldtrust.org.uk/sites/files/nuffield/publication/what\\_is\\_integrated\\_care\\_research\\_report\\_june11\\_0.pdf](http://www.nuffieldtrust.org.uk/sites/files/nuffield/publication/what_is_integrated_care_research_report_june11_0.pdf).
27. Cunningham S, Logan C, Lockerbie L, et al. Effect of an integrated care pathway on acute asthma/wheeze in children attending hospital: cluster randomized trial. The Journal of Pediatrics. 2008;152(3):315-20.
28. Johnson K BC, Walker A, Eggleston P. . Effectiveness of a clinical pathway for inpatient asthma management. Pediatrics. 2000;5:10006-12.
29. Callery P, Kyle RG, Weatherly H, et al. Substituting community children's nursing services for inpatient care: A case study of costs and effects. Emergency Medicine Journal. 2014:Online first.
30. Greutmann M, Von Klemperer K, Brooks R, et al. Pregnancy outcome in women with congenital heart disease and residual haemodynamic lesions of the right ventricular outflow tract. Eur Heart J. 2010;31(4):1764-70.
31. Curtis SL M-WJ, Sullivan C, Sellers SM, Trinder J, Scrutton M, Stuart AG:. Current trends in the management of heart disease in pregnancy. International Journal of Cardiology. 2009;133(1):62-9.
32. Coyne KM HF, Desmond N. Sexual and reproductive health in HIV-positive women: a dedicated clinic improves service. . International journal of STD & AIDS. 2007;18(6):420-1.
33. England N. Thousands of women confront mental health issues in thriving community perinatal scheme [Internet]. NHS England. Available from: <http://www.england.nhs.uk/2015/05/13/women-mh/>.
34. Sonola L, Thiel V, Goodwin N, et al. South Devon and Torbay proactive case management using the community virtual ward and the Devon predictive model. London: The King's Fund, 2013. Available from: [http://www.kingsfund.org.uk/sites/files/kf/field/field\\_publication\\_file/south-devon-and-torbay-coordinated-care-case-study-kingsfund13.pdf](http://www.kingsfund.org.uk/sites/files/kf/field/field_publication_file/south-devon-and-torbay-coordinated-care-case-study-kingsfund13.pdf).
35. Ham NCaC. Clinical and service integration. The route to improved outcomes. London: The King's Fund, 2010. Available from: <http://www.kingsfund.org.uk/sites/files/kf/Clinical-and-service-integration-Natasha-Curry-Chris-Ham-22-November-2010.pdf>.
36. Nick Goodwin LS, Veronika Thiel and Dennis L Kodner. Co-ordinated care for people with complex chronic conditions. Key lessons and markers for success. London: The King's Fund, 2013. Available from: [http://www.kingsfund.org.uk/sites/files/kf/field/field\\_publication\\_file/co-ordinated-care-for-people-with-complex-chronic-conditions-kingsfund-oct13.pdf](http://www.kingsfund.org.uk/sites/files/kf/field/field_publication_file/co-ordinated-care-for-people-with-complex-chronic-conditions-kingsfund-oct13.pdf).
37. Chris Ham DH, Marcus Longley and David R Steel. Integrated care in Northern Ireland, Scotland and Wales Lessons for England. London: The King's Fund, 2013. Available from: [http://www.kingsfund.org.uk/sites/files/kf/field/field\\_publication\\_file/integrated-care-in-northern-ireland-scotland-and-wales-kingsfund-jul13.pdf](http://www.kingsfund.org.uk/sites/files/kf/field/field_publication_file/integrated-care-in-northern-ireland-scotland-and-wales-kingsfund-jul13.pdf).
38. Nursing RCoPaCHaRCo. Commissioning a good child health service. London: Royal College of General Practitioners, 2013. Available from: <http://www.rcgp.org.uk/~media/Files/CIRC/Child-and-Adolescent-Health/RCGP-Child-Health-Modelling-Task-Group-April-2013.ashx>.

39. Jim Stephen JL, Emma Young and Vicki Welch. Integrating Health and Social Care in Scotland: Potential impact on children's services. Report two: study findings. . Edinburgh: Social Work Scotland, 2015. Available from: [http://www.celcis.org/media/resources/publications/Integrating\\_Health\\_and\\_Social\\_Care\\_in\\_Scotland\\_Report\\_two.pdf](http://www.celcis.org/media/resources/publications/Integrating_Health_and_Social_Care_in_Scotland_Report_two.pdf).
40. Nick Goodwin AD, Geoff Anderson and Walter Wodchis. Providing integrated care for older people with complex needs. Lessons from seven international case studies. London: The King's Fund, 2014. Available from: [http://cdn.basw.co.uk/upload/basw\\_102418-7.pdf](http://cdn.basw.co.uk/upload/basw_102418-7.pdf).
41. MacAdam M. Frameworks of Integrated Care for the Elderly: A Systematic Review. Ontario: Canadian Policy Reserach Network, 2008. Available from: [http://www.cprn.org/documents/49813\\_EN.pdf](http://www.cprn.org/documents/49813_EN.pdf).
42. Ruth Hutt RRaJM. Case-managing Long-term Conditions What impact does it have in the treatment of older people? London: The King's Fund, 2004. Available from: <http://www.kingsfund.org.uk/sites/files/kf/casemanagement.pdf>
43. David Oliver CFaRH. Making our health and care systems fit for an ageing population. London: The King's Fund, 2014. Available from: [http://www.kingsfund.org.uk/sites/files/kf/field/field\\_publication\\_file/making-health-care-systems-fit-ageing-population-oliver-foot-humphries-mar14.pdf](http://www.kingsfund.org.uk/sites/files/kf/field/field_publication_file/making-health-care-systems-fit-ageing-population-oliver-foot-humphries-mar14.pdf).
44. England N. Safe, compassionate care for frail older people using an integrated care pathway: Practical guidance for commissioners, providers and nursing, medical and allied health professional leaders. Cornwall: NHS England, 2014. Available from: <http://www.england.nhs.uk/wp-content/uploads/2014/02/safe-comp-care.pdf>.
45. WN L. Five laws for intergating medical and social services from the United States and United Kingdom. Milbank Quarterly. 1999;77(1):77-110.

## Appendix A: Scope

The working definition of integrated care in the this review is “the provision of multidisciplinary interventions at different stages of the care process in two or more different institutional areas”. We will pragmatically include any reviews of integrated care approximating this definition, but will note the definitions used if they differ substantially from the above.

	Inclusions	Exclusions
<b>Population</b>	All children, older people and women requiring maternity and gynaecological care treated in a healthcare system	None
<b>Intervention</b>	Integrated care interventions or systems explicitly put in place to improve care for children, older people and women requiring maternity and gynaecological care	<ul style="list-style-type: none"> <li>Interventions or systems not explicitly described as integrated care or synonyms such as co-ordinated care</li> <li>Interventions or systems not explicitly aimed at improving care for children, older people and women requiring maternity and gynaecological care</li> <li>Interventions focussed solely at increasing efficiency at a single level of the health system (as opposed to two or more levels of the health system, i.e. primary, secondary, tertiary, and social care)</li> </ul>
<b>Comparisons</b>	<ul style="list-style-type: none"> <li>Traditional ‘non-integrated’ healthcare systems</li> <li>Integrated healthcare systems that have not put in place particular interventions to improve care for children, older people and women requiring maternity and gynaecological care</li> <li>Non-integrated healthcare systems pre-intervention (for “before and after” studies)</li> </ul>	
<b>Outcomes</b>	<ul style="list-style-type: none"> <li>Patient outcomes e.g. survival, symptoms, patient satisfaction (prioritised outcome)</li> <li>Economic outcomes (prioritised outcome)</li> </ul>	Process outcomes other than specific outcomes focussed on care for children, older people and women requiring maternity and gynaecological care
<b>Study design</b>	Systematic reviews	Non-systematic reviews Primary studies
<b>Setting</b>	OECD/developed countries	Non-OECD/developing countries
<b>Other</b>	Published from 2000 onwards English language	

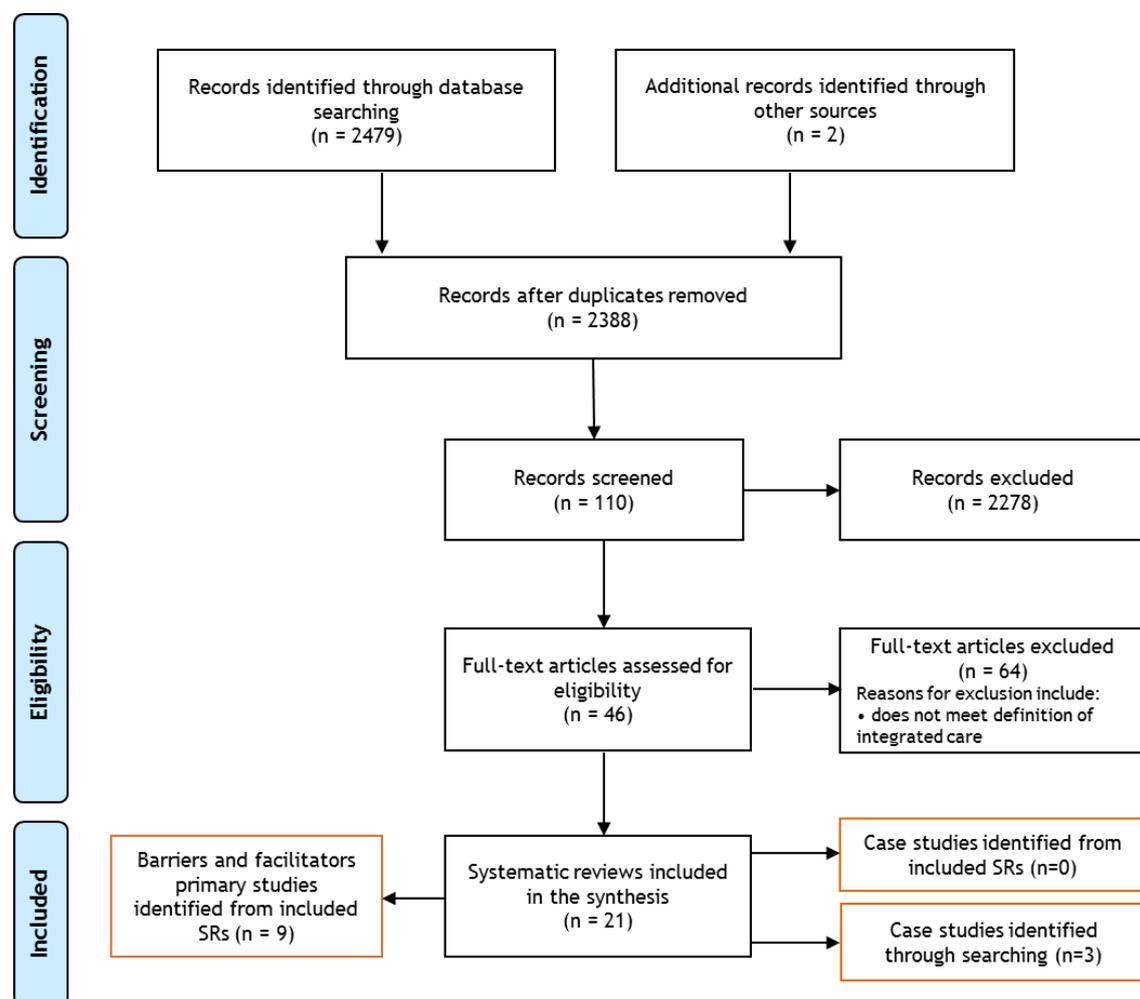
## Appendix B: Search Approach

### Embase.com search strategies

- 1 (integrat\* NEAR/3 (care OR delivery OR pathway\* OR team\* OR service\* OR system\* OR network\*)):ab,ti
- 2 ((health OR social OR medical) NEAR/3 (service\* OR system\*)):ab,ti AND integrate\*:ab,ti
- 3 icp:ab,ti AND integrated:ab,ti
- 4 'integrated health care system'/exp
- 5 ('delivery system' OR 'delivery-system' OR 'delivery systems' OR 'delivery-systems') NEAR/3 (reform\* OR organi?ed)
- 6 'critical pathway':ab,ti
- 7 'clinical pathway'/exp
- 8 ((coordinated OR 'coordinated' OR 'co-ordinated' OR multidisciplinary OR 'multi disciplinary' OR 'multi-disciplinary' OR interdisciplinary OR 'inter disciplinary' OR 'inter-disciplinary' OR interagency OR 'inter agency' OR 'inter-agency' OR 'multi agency' OR multiagency OR 'multi-agency' OR collaborative OR partnership) NEAR/3 (care OR delivery OR pathway OR team OR service\* OR system\* OR work\* OR collaborat\*)):ti
- 9 1 OR 2 OR 3 OR 4 OR 5 OR 6 OR 7 OR 8
- 10 child\*:ab,ti OR pediatri\*:ab,ti OR paediatric\*:ab,ti OR neonat\*:ab,ti OR infant\*:ab,ti OR infancy:ab,ti OR youth\*:ab,ti OR adolescen\*:ab,ti OR 'young people':ab,ti OR 'young person':ab,ti OR 'young persons':ab,ti OR teenage\*:ab,ti OR juvenile:ab,ti OR schoolchild\*:ab,ti OR pupil\*:ab,ti
- 11 'child'/exp OR 'adolescent'/exp OR 'juvenile'/de
- 12 older:ab,ti OR elderly:ab,ti OR aged:ab,ti OR geriatric\*:ab,ti OR gerontology:ab,ti OR frail\*:ab,ti
- 13 'elderly care'/exp OR 'geriatrics'/exp OR 'geriatric patient'/de
- 14 matern\*:ab,ti OR gynecolog\*:ab,ti OR gynaecolog\*:ab,ti OR obstetric\*:ab,ti OR antenatal:ab,ti OR 'ante natal':ab,ti OR prenatal:ab,ti OR 'pre natal':ab,ti OR postnatal:ab,ti OR 'post natal':ab,ti OR perinatal:ab,ti OR 'peri natal':ab,ti OR mother:ab,ti OR pregnan\*:ab,ti OR 'mother and child':ab,ti
- 15 'obstetric patient'/de OR 'gynecology'/de OR 'maternal care'/exp OR 'prenatal care'/exp OR 'prenatal period'/exp OR 'postnatal care'/exp OR 'postnatal period'/exp OR 'perinatal care'/exp OR 'perinatal period'/exp
- 16 10 OR 11 OR 12 OR 13 OR 14 OR 15
- 17 9 AND 16
- 18 'systematic review'/de OR 'review'/de OR 'meta analysis'/de
- 19 systematic\*:ab,ti OR narrative\*:ab,ti OR integrative:ab,ti OR thematic:ab,ti OR qualitative\*:ab,ti OR 'mixed-method':ab,ti OR 'mixed method':ab,ti OR 'mixed-methods':ab,ti OR 'mixed methods':ab,ti AND (review\*:ab,ti OR synthesis\*:ab,ti OR 'systematic review':ab,ti) OR metasynthesis:ab,ti OR 'meta synthesis':ab,ti OR metaethnography:ab,ti OR 'meta ethnography':ab,ti OR 'meta-ethnography':ab,ti OR 'realist review':ab,ti OR 'critical review':ab,ti
- 20 (search\* NEAR/1 (hand OR manual)):ab
- 21 'reference lists':ab OR bibliography\*:ab OR cancerlit:ab OR cochrane:ab OR embase:ab OR psychlit:ab OR psyclit:ab OR psychinfo:ab OR psycinfo:ab OR cinahl:ab OR cinhal:ab OR 'science citation index':ab OR bids:ab
- 22 (relevant NEXT/1 journals):ab
- 23 18 OR 19 OR 20 OR 21 OR 22
- 24 'data extraction':ab OR 'selection criteria':ab

25 review:it  
 26 24 AND 25  
 27 letter:it OR editorial:it  
 28 'animal'/de NOT ('animal'/de AND 'human'/de)  
 29 27 OR 28  
 30 23 OR 26  
 31 30 NOT 29  
 32 17 AND 31  
 33 32 AND (2000:py OR 2001:py OR 2002:py OR 2003:py OR 2004:py OR 2005:py OR 2006:py OR 2007:py OR 2008:py OR 2009:py OR 2010:py OR 2011:py OR 2012:py OR 2013:py OR 2014:py OR 2015:py) AND [english]/lim

## PRISMA Flow Diagram for the systematic review (section 1)



## Appendix C: AMSTAR quality ratings

Table 8 AMSTAR score 11 to 8 (n=11)

Criteria	Fearon 2012	Lindgren 2012	Huntley 2009	Davies 2011	Parab 2013	Shepperd 2013	Parker 2002	Bick 2014	Goodman 2012	Collet 2010	Eklund 2009
Was an a priori design provided?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Was there duplicate study selection and data extraction?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Was a comprehensive literature search performed?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Was the status of publication used as one of the inclusion criteria?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Was a list of studies (included and excluded) provided?	Y	Y	Y	N	Y	Y	Y	N	N	N	N
Were the characteristics of the included studies provided?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Was the scientific quality of the included studies assessed and documented?	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y
Was the scientific quality of the included studies used appropriately in formulating conclusions?	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y
Were the methods used to combine the findings of studies appropriate?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Was the likelihood of publication bias assessed?	Y	N	N	N	N	N	Y	N	N	N	N
Was the conflict of interest included?	Y	N	Y	Y	N	N	N	N	N	N	N
Total score (range 0 [worst] to 11[best])	11	9	9	9	9	9	9	8	8	8	8

Table 8 continued... AMSTAR score 7 or below (n=10)

Criteria	Chang-Quan 2009	Allen 2009	Trivedi 2013	Kane 2011	Noyes 2014	Mikolaizak 2013	Larsen 2006	Tieman 2007	Manderson 2012	Johri 2003
Was an a priori design provided?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Was there duplicate study selection and data extraction?	N	N	N	Y	N	Y	N	Y	N	N
Was a comprehensive literature search performed?	Y	Y	Y	Y	N	Y	N	Y	Y	?
Was the status of publication used as one of the inclusion criteria?	N	Y	Y	N	N	N	N	Y	N	N
Was a list of studies (included and excluded) provided?	Y	Y	N	N	Y	N	Y	N	N	Y
Were the characteristics of the included studies provided?	Y	Y	Y	N	Y	Y	Y	N	Y	Y
Was the scientific quality of the included studies assessed and documented?	?	Y	Y	CA	Y	N	N	N	N	N
Was the scientific quality of the included studies used appropriately in formulating conclusions?	?	N	Y	N	N	N	N	?	N	N
Were the methods used to combine the findings of studies appropriate?	Y	Y	Y	Y	?	Y	Y	N	Y	?
Was the likelihood of publication bias assessed?	Y	N	N	N	Y	N	N	N	N	N
Was the conflict of interest included?	Y	N	N	Y	N	N	N	N	N	N
Total score (range 0 [worst] to 11[best])	7	7	7	5	5	5	4	4	4	3

Y: yes, N: no, ?: unclear, CA: can't answer

## Appendix D: Evidence Tables

Table 9 Evidence table on maternity and gynaecological care (n=2)<sup>20, 21</sup>

Study	Participants	Integrated care approach	Key findings/outcomes	Applicability and limitations	Other comments
<p><b>Bick et al. 2014<sup>20</sup></b></p> <p><b>Systematic review</b></p> <p><b>Quality: 8/11</b></p> <p><b>Review aim:</b> Determine the most appropriate multi-disciplinary team (MDT) models of care to manage complex medical conditions during and after pregnancy.</p>	<p><b>Number of studies:</b> 19</p> <p><b>Study types:</b> qualitative and quantitative Opinion papers: 10 National guidelines: 6 SR: 1 (Cochrane review) Retrospective cohort: 1 Retrospective case study: 1 RCTs/quantitative studies: 0</p> <p><b>Participants:</b> pregnant/ postnatal women with pre-existing diabetes and cardiac disease, study size ranged from 0 to 4,252. Age and demographics NR.</p> <p><b>Countries:</b> UK, Canada, USA, Netherlands and Singapore.</p>	<p>MDTs</p> <p><b>Primary outcome:</b> Models of MDT care management and their outcomes.</p> <p><b>Secondary outcomes:</b> models that prompt appropriate and timely referral and their outcomes.</p> <p>Barriers to identifying pre-existing diabetes and cardiac disease, and how these might be overcome.</p> <p>Using ICT to support decision making.</p> <p>Economic costs and benefits of MDTs.</p>	<p><b>Models of integrated care:</b> MDTs described, often in little detail, and often not associated with patient outcomes.</p> <p><b>Patient outcomes:</b> 1 UK retrospective study in women with cardiac disease described maternal and foetal outcomes as “good” referring to obstetric complications, still births, premature births and infants born with heart disease (no statistical comparison). An opinion piece reporting on above study suggested integration helped reduce women’s anxiety and provided continuity of care by midwifery staff, but provided no evidence to support this.</p> <p><b>Cost effectiveness:</b> No evidence identified on impact of MDT working on healthcare resources.</p>	<p><b>Limitations:</b> Low level of evidence with high risk of bias (opinion pieces and guidelines).</p> <p>Lack of primary evidence to inform structure or working practices of MDTs or beneficial impact on maternal and infant outcomes or healthcare resources.</p> <p><b>Applicability to Ireland:</b> Studied high income countries, some with different healthcare systems than Ireland.</p>	<p>Provides basic info on some MDT models, but with little detail or comparison.</p> <p><b>Barriers and facilitators:</b> Y</p> <p><b>Case studies:</b> N</p> <p><b>Evidence gaps:</b> Y</p>

Study	Participants	Integrated care approach	Key findings/outcomes	Applicability and limitations	Other comments
<p><b>Lindegren et al. 2012<sup>21</sup></b></p> <p><b>Systematic review</b></p> <p><b>Quality: 9/11</b></p> <p><b>Review aim:</b> Integration of HIV/AIDS services with maternal, neonatal and child health, nutrition, and family planning services</p>	<p><b>Number of studies:</b> 20, reporting on 19 interventions.</p> <p><b>Study types:</b> Stepped wedge†: 1 Prospective cohort: 2 Non randomised trial: 2 Other observational: 14</p> <p><b>Participants:</b> all adults eligible, all interventions targeted women (7 also included men or couples), study size ranged from 60 to over 13,000.</p> <p><b>Regions/ countries:</b> Sub-Saharan African (15), Haiti (1), UK (1), US (1), Ukraine (1).</p>	<p>Integration of HIV/AIDS services with maternal, neonatal and child health, nutrition (MNCHN), and family planning (FP) services</p> <p>10 integrated HIV services into existing MNCHN-FP programs</p> <p>7 integrated MNCHN-FP services into existing HIV programs</p> <p>1 integrated new MNCHN-FP and HIV services simultaneously</p> <p>1 integrated both MNCHN-FP into HIV services and HIV into MNCHN-FP services.</p>	<p><b>Models of integrated care</b> 6 described.</p> <p><b>Overall:</b> HIV and MNCHN-FP service integration was found to be feasible across a variety of integration models, settings and target populations.</p> <p><b>Patient outcomes:</b> Only 3 studies reported health outcomes (mostly process outcomes). 2 of 2 studies reported lower pregnancy rates after service integration (FP-HIV). One other (prospective and retrospective cohort) reported improvements in child recovery from malnutrition after opt out HIV testing added to community child malnutrition services.</p> <p><b>Cost effectiveness:</b> no studies found.</p>	<p><b>Limitations</b> Risk of bias generally high, mainly due to lack of blinding. Only one study reported negative outcomes, potentially signalling publication bias.</p> <p><b>Applicability to Ireland:</b> Limited, most studies sub-Saharan Africa, including the 3 reporting health outcomes.</p>	<p>No meta-analysis due to heterogeneity</p> <p>One study reported negative outcomes (average staff workload was higher in clinics that provided RCH and PMTCT services, vs RCH alone).</p> <p><b>Barriers and facilitators:</b> Y</p> <p><b>Case studies:</b> N.</p> <p><b>Evidence gaps:</b> Y</p>

† involving a sequential roll-out of an intervention to a community over a time period

Table 10 Evidence table on children (n=3)<sup>17-19</sup>

Study	Participants	Integrated care approach	Key findings/outcomes	Limitations	Comments
<p>Allen et al. 2009<sup>17</sup></p> <p><b>Systematic review</b></p> <p><b>Quality:</b> 7/11</p> <p><b>Review aim:</b> effectiveness of integrated care pathways: what works, for whom, in which circumstances?</p>	<p><b>Number of studies:</b> 9</p> <p><b>Study types:</b> 9 RCTs</p> <p><b>Participants:</b> Adult services (7), paediatric services (2). Summary demographics NR. Sample size range 64 to 251 (1 study NR).</p> <p><b>Adults</b></p> <ol style="list-style-type: none"> <li>fractured neck of femur</li> <li>undergoing laparotomy with intestinal or rectal resection.</li> <li>hip and knee arthroplasty</li> <li>patients with heart failure</li> <li>stroke patients undergoing specialist rehabilitation.</li> </ol> <p><b>Children</b></p> <ol style="list-style-type: none"> <li>(2-16 years) admitted to the Emergency Department (ED) with acute asthma/wheeze</li> <li>inpatient paediatric asthma management</li> </ol> <p><b>Countries:</b> UK (4), Italy (1), USA (2), Australia (2).</p>	<p>Integrated care pathways (ICPs)<sup>‡</sup> described as healthcare technologies formalising multidisciplinary team-working, enabling professionals to examine their roles and responsibilities.</p> <p>Interventions had multiple aims: coordination (4) increasing service efficiency (7) supporting practice change (1) improving patient outcomes (1) ensuring adherence to best practice guidelines (4) reducing practice variation (1) improving service quality (1) and supporting role change (2).</p> <p>Several were supported by additional interventions: education and training of staff (5), monitoring of staff compliance (4) and a dedicated coordinator role (3).</p>	<p><b>Models of integrated care:</b> 7 described.</p> <p><b>Patient outcomes:</b></p> <ol style="list-style-type: none"> <li>inpatient and outpatient complications NS, readmissions lower in ICPS, but NS.</li> <li>Complications, pain, patient satisfaction; NS. QoL significantly worse at discharge, NS 10 day post op.</li> <li>Mobilised earlier (sitting out of bed, ambulation), complications NS.</li> <li>Lower mortality, lower outcome variation.</li> <li>More died after discharge NS. Improved faster. Good recovery or residual disability at 26 weeks NS, QoL, anxiety and depression up to 26 weeks NS.</li> <li>improvement in adequate course of corticosteroids given post discharge.</li> <li>AEs following discharge, NS.</li> </ol> <p><b>Cost effectiveness:</b> no studies found.</p>	<p><b>Limitations:</b> study quality appraised but not reported. Diverse child and adult populations.</p> <p><b>Applicability to Ireland:</b> RCTs are from high income countries.</p>	<p>No meta-analysis due to heterogeneity</p> <p><b>Barriers and facilitators:</b> Y</p> <p><b>Case studies:</b> N</p> <p><b>Evidence gaps:</b> Y</p>

<sup>‡</sup> Definition of an ICP developed by the European Pathway Association (EPA): 1) An explicit statement of the goals and key elements of care based on evidence, best practice and patient expectations 2) Facilitation of communication, coordination of roles, and sequencing of activities of the multidisciplinary care team, patients and their relatives 3) The documentation, monitoring, and evaluation of variances and outcomes 4) The identification of the appropriate resources

Study	Participants	Integrated care approach	Key findings/outcomes	Limitations	Comments
<p>Noyes et al. 2014<sup>18</sup></p> <p><b>Systematic review (qualitative)</b></p> <p><b>Quality:</b> 5/11</p> <p><b>Review aim:</b> identify components of successful transition of children with complex healthcare needs from hospital to home. Find barriers and facilitators of success.</p>	<p><b>Number of studies:</b>34</p> <p><b>Study types:</b>                      Policy/guidelines 6                      Opinion/discussion/best practice 9                      Service/Education 6                      Qualitative 2                      Mixed methods 2                      Qualitative 9</p> <p><b>Participants:</b> children with complex healthcare needs</p> <p><b>Countries:</b> UK, Australia/New Zealand Northern Ireland, and USA.</p>	<p>Conceptualise a health system model of successful transition of children with complex healthcare needs from hospital to home.</p>	<p><b>Models of integrated care:</b>                      Identified 7 success factors, all required for an effective integrated care pathway.</p> <p><b>Patient outcomes:</b> 2 studies included children’s view: they expressed desires to be at home, and frustration that the process took too long. Organising process of discharge and follow up care as a continuous unified process with a communication feedback loop had a direct positive effect on the ability of families to care for their children (no stats/citation)</p> <p><b>Cost effectiveness:</b> NR.</p>	<p><b>Limitations:</b>                      Studies were of low quality. They searched for trials of discharge interventions/models but found none.</p> <p><b>Applicability to Ireland:</b>                      High, included input from 13 Irish professional experts. Studies restricted to high income countries.</p>	<p>Qualitative reviews, detail on barriers and facilitators.</p> <p><b>Barriers and facilitators:</b> Y</p> <p><b>Case studies:</b>N</p> <p><b>Evidence gaps:</b> Y</p>

Study	Participants	Integrated care approach	Key findings/outcomes	Limitations	Comments
<p>Parab et al. 2013<sup>19</sup></p> <p><b>Systematic review</b></p> <p><b>Quality:</b> 9/11</p> <p><b>Review aim:</b> To evaluate specialist home-based nursing services for children with acute and chronic illnesses.</p>	<p><b>Number of studies:</b> 7</p> <p><b>Study types:</b> 7 RCTs comparing specialist home-based nursing interventions compared with standard care (including hospital admission).</p> <p><b>Participants:</b> children (range 3 months to 17 years) with acute or chronic illnesses, n=840 (range 29 to 399). Illnesses were paediatric illness with breathing difficulty, diarrhoea and vomiting or fever; newly diagnosed type I diabetes, chronic haematological illnesses.</p> <p><b>Countries:</b> Canada (4), UK (1), US (1), Australia (1).</p>	<p>Home-based nursing care substituting acute hospital review and/or admission by providing clinical review, support, education and management of the acutely or chronically unwell child in their own home. Aims to prevent unnecessary hospital admissions.</p> <p><b>Outcomes:</b> utilisation of health care, physical and mental health, parent child and referrer satisfaction, QoL, adverse health outcomes and costs.</p>	<p><b>Models of integrated care:</b> specialist home-based nursing.</p> <p><b>Patient outcomes:</b> NS differences in health outcomes (n=2), reduction in parental anxiety and improvement in child behaviours (n=3), increase in patient satisfaction (n=3), better parental coping and family functioning (n=1), no impact on parental burden of care (n=1) or functional state of children (n=1).</p> <p><b>Cost effectiveness:</b> not comprehensively addressed by any of the included studies. Home care more expensive for service providers but with savings for the family (n=2). 1 study showed no cost benefit for the family.</p>	<p><b>Limitations:</b> Interventions differed in respect to nurse qualifications and their availability, including hours of service and number of visit. Most not blinded so performance and detection bias risks possible. Some studies have small size, limiting statistical power.</p> <p><b>Applicability to Ireland:</b> studies came from high income countries. 3 cost effectiveness studies came from Canada (2) and UK (1).</p>	<p>No meta-analysis because of heterogeneity. 4/7 studies pre 2000, including one in 1973.</p> <p><b>Barriers and facilitators:</b> N</p> <p><b>Case studies:</b> N</p> <p><b>Evidence gaps:</b> Y</p>

Evidence table older people (n=16)<sup>17-19</sup>

Study	Participants	Integrated care approach	Key findings/outcomes	Limitations	Other comments
<p>Collet et al. 2010<sup>2</sup></p> <p><b>Systematic review</b></p> <p><b>Quality:</b> 8/11</p> <p><b>Review aim:</b> To identify models and outcomes of integrated care for Nursing home patients requiring combined psychiatric and nursing home care, called Double Care Demanding (DCD) patients.</p>	<p><b>Number of studies:</b> 8.</p> <p><b>Study types:</b> RCTs: 4 Prospective case series: 3 Retrospective cohort: 1</p> <p><b>Participants:</b> Nursing home patients suffering from either somatic illness of dementia combined with psychiatric care and nursing home care. Sample sizes ranged from 15 to 164. Average age varied from 71 to 83 years of age.</p> <p><b>Regions/ countries:</b> USA (5), Australia (2), UK (1).</p>	<p>Multi-disciplinary teams (MDT)</p> <p>Certified psychiatric nurses were part of the multi-disciplinary team in all 8 studies.</p> <p>In 6 of the 8 studies, a psychiatrist and psychologist were part of the MDT</p> <p>In 5 of the 8 studies a physician was part of the MDT; this could be a geriatrician, an internist or a general physician</p>	<p><b>Models of integrated care</b> 8 described; all similar, based around patient assessment and individualised patient plans.</p> <p><b>Overall:</b> 7 studies reported positive effects on reducing agitation and physical aggression at the last follow-up after intervention.</p> <p><b>Patient outcomes:</b> 3 of the 4 RCTs found a decrease in general psychiatric symptoms (especially depression and agitation or aggression) and improvement in global functioning (cognitive and functional status). Remaining RCT found no significant difference.</p> <p>The 4 non-controlled trials found an increase in global functioning among 53-90% of patients receiving the intervention</p> <p><b>Cost effectiveness:</b> not reported</p>	<p><b>Limitations</b> Authors reported that all of the studies had several methodological shortcomings and small sample sizes.</p> <p>Most of the studies were in the USA; only one study was in Europe (UK)</p> <p>All of the studies were aimed at the reduction of severe neuropsychiatric behaviour in a group of DCD nursing home patients with dementia</p> <p><b>Applicability to Ireland:</b> Studied high income countries, some with different healthcare systems than Ireland.</p>	<p>No meta-analysis</p> <p><b>Barriers and facilitators:</b> N</p> <p><b>Case studies:</b> N</p> <p><b>Evidence gaps:</b> Y - the authors report that “the most striking outcome of our review is that there were only few intervention studies of DCD nursing home patients”</p>

Study	Participants	Integrated care approach	Key findings/outcomes	Limitations	Other comments
<p><b>Davies et al. 2011<sup>3</sup></b></p> <p><b>Systematic review</b></p> <p><b>Quality: 9/11</b></p> <p><b>Review aim:</b> evaluate the different integrated approaches to health care services supporting older people in care homes, and identify barriers and facilitators to integrated working</p>	<p><b>Number of studies:</b> 17</p> <p><b>Study types:</b> Quantitative studies: 10 Process evaluations: 2 Mixed methods study: 1 Qualitative studies: 4</p> <p><b>Participants:</b> 11 studies in nursing homes, 5 in residential homes, 1 in a combination of both. Study participants included residents, relatives, care home staff both residential and nursing, and health professionals including general practitioners, district nurses, nurse specialists, pharmacists, psychiatrists and psychologists</p> <p><b>Regions/ countries:</b> UK (9), Australia (5), USA (2), Sweden (1).</p>	<p>Multidisciplinary case conferences (2)</p> <p>Multidisciplinary consultation &amp; collaboration (4)</p> <p>Multidisciplinary team meetings (1)</p> <p>Multidisciplinary Care (3)</p> <p>Multidisciplinary Training (1)</p> <p>Collaborative working using integrated care pathways (2)</p> <p>Care home support team (1)</p> <p>Link nurses in care homes (1)</p> <p>District nurses supporting care home staff (1)</p> <p>Champions identified in care homes (1)</p>	<p><b>Models of integrated care</b> 10 described.</p> <p><b>Overall:</b> The majority of studies showed that the intervention had either mixed effects (improvement in one outcome but no effect or negative effect in another outcome), or no effect when compared with the control group.</p> <p><b>Patient outcomes:</b> positive outcomes reported in single studies: 1) Change in Medication Appropriateness Index; 2) Normal bowel patterns; 3) Dependency (Barthel index); 4) Geriatric depression scale; 5) Proportion of residents with non recommended hypnotics or acceptable hypnotics; 6) Pain relief; 7) Mean treatment costs</p> <p>Negative outcome was reported in a single study: 1) Proportion of residents with acceptable antidepressant</p> <p><b>Cost effectiveness:</b> insufficient information to evaluate cost</p>	<p><b>Limitations</b> Limited conclusions due to small number of studies, heterogeneity, poor quality, small size and low level of detail.</p> <p>Majority of studies were only integrated at the micro-level.</p> <p><b>Applicability to Ireland:</b> Studied high income countries, some with different healthcare systems than Ireland</p>	<p>No meta-analysis due to heterogeneity</p> <p>Interventions sorted into 3 levels based on care model 1) patient/micro, 2) organisational/ meso and 3) strategic/macro</p> <p>“Outcome measures reflected the priorities of health care professionals rather than residents and care home staff.”</p> <p><b>Barriers and facilitators:</b> Y (main doc)</p> <p><b>Case studies:</b> Y (main doc)</p> <p><b>Evidence gaps:</b> Y (main doc)</p>

Study	Participants	Integrated care approach	Key findings/outcomes	Limitations	Other comments
<p>Eklund et al. 2009<sup>4</sup></p> <p><b>Systematic review</b></p> <p><b>Quality:</b> 8/11</p> <p><b>Review aim:</b> to study integrated and coordinated interventions targeting frail elderly people living in the community, their outcome measurements and their effects on the client, caregiver and healthcare utilisation</p>	<p><b>Number of studies:</b> 9</p> <p><b>Study types:</b> 9 RCTs</p> <p><b>Participants:</b> Frail elderly people (65 years or older) living in the community. Number of participants ranged from 164 to 3079. Most studies had a mean age of 81 or 82 years of age</p> <p><b>Regions/ countries:</b> Canada (5), USA (3), Italy (1).</p>	<p>Case management</p> <p>Initial management in all studies was by case manager (CM), either face to face or by phone. In 5 of the studies the CM cooperated with a team</p> <p>In 1 article the clients were involved in the planning of care plans after initial assessment</p> <p>Assessment was used to create a care plan</p> <p>Intervention varied from 3 months to 669 days</p>	<p><b>Models of integrated care</b> 9 models described, all similar, based around patient assessment by CM with/without team and individualised patient plans.</p> <p><b>Overall:</b> 7 studies reported at least 1 outcome measurement significantly in favour of the intervention; 1 reported no difference; 1 reported in favour of the control</p> <p><b>Patient outcomes:</b> When focusing on the client, five of the studies showed a positive effect in at least one outcome area.</p> <p>The most positive results were in medication use.</p> <p>6 studies reported on activities of daily living (ADL). 2 studies reported in favour of the intervention, 4 reported no effect</p> <p><b>Cost effectiveness:</b> 4 studies reported costs, and 1 of these was in favour of the intervention</p>	<p><b>Limitations:</b> Quality of included studies was low. None of the studies fulfilled all quality criteria regarding possible bias.</p> <p>Description of the interventions was limited</p> <p><b>Applicability to Ireland:</b> Studied high income countries, some with different healthcare systems than Ireland</p>	<p>No meta-analysis due to heterogeneity</p> <p><b>Barriers and facilitators:</b> N</p> <p><b>Case studies:</b> N</p> <p><b>Evidence gaps:</b> Y - the authors report that there is still a need for intervention studies targeting integrated care for the frail elderly, to include valid outcome measures and be transparent in reporting healthcare costs.</p>

Study	Participants	Integrated care approach	Key findings/outcomes	Limitations	Other comments
<p>Fearon et al. 2012<sup>5</sup></p> <p><b>Systematic review</b></p> <p><b>Quality:</b>11/11</p> <p><b>Review aim:</b> evaluate early supported discharge services for reducing duration of hospital care for acute stroke patients</p>	<p><b>Number of studies:</b> 14 (1957 patients)</p> <p>Study types: 14 RCTs</p> <p><b>Participants:</b> Any patient who has been admitted to hospital with a clinical diagnosis of stroke (defined as an acute focal neurological deficit caused by cerebrovascular disease).</p> <p>Average patient age in the trials ranged from 66 to 80 years.</p> <p><b>Regions/ countries:</b> Australia (1), Norway (4), Thailand (1), Northern Ireland (1), Denmark (2), England (3), Canada (1), Sweden (1).</p>	<p>Researchers were particularly interested in the degree of co-ordination and organisation of the community and hospital services (i.e. whether patients received care from a co-ordinated multidisciplinary team with some specialist interest in stroke which met on a regular basis)</p> <p>Early supported discharge (ESD) team co-ordination and delivery (9 trials)</p> <p>ESD team co-ordination (3 trials) (subsequent care was handed over to existing community-based agencies)</p> <p>No ESD team (2 trials) (multidisciplinary team care in hospital but this ended at hospital discharge)</p>	<p><b>Models of integrated care:</b> 3 described.</p> <p><b>Overall:</b> The ESD group showed significant reductions in the length of hospital stay equivalent to approximately seven days.</p> <p><b>Patient outcomes:</b> No significant difference in case-fatality between the ESD team and conventional services (14 trials)</p> <p>No significant difference in the ADL scores of survivors (9 trials)</p> <p>Increase in extended ADL scores among survivors (9 trials)</p> <p>ESD service patients were significantly more likely to report satisfaction with outpatient services or services in general (5 trials)</p> <p><b>Cost effectiveness:</b> Estimated costs ranged from 23% less to 15% greater for the ESD group in comparison to controls (7 trials)</p>	<p><b>Limitations</b> Although the quality of the evidence in general was good, the majority of trials were completed over 10 years ago. In many countries the last decade has seen a significant overhaul of stroke services to enable greater access to hyper acute therapies.</p> <p>There is insufficient evidence to draw conclusions on ESD services for patients living in a more dispersed rural setting.</p> <p><b>Applicability to Ireland:</b> Studied high income countries, some with different healthcare systems than Ireland</p>	<p><b>Barriers and facilitators:</b> N</p> <p><b>Case studies:</b> Y</p> <p><b>Evidence gaps:</b> Y</p>

Study	Participants	Integrated care approach	Key findings/outcomes	Limitations	Other comments
<p>Goodman et al. 2012<sup>6</sup></p> <p><b>Systematic (realist) review</b></p> <p><b>Quality:8/11</b></p> <p><b>Review aim:</b> to study the effectiveness of inter-professional working (IPW) in primary and community care for older people with multiple health and social care needs.</p> <p>To investigate impact of contextual factors and professional role identities on sustainability and effectiveness</p>	<p><b>Number of studies:</b> 59</p> <p><b>Study types:</b> RCTs: 37 (reported in 66 papers) Non-RCTs: 8 (reported in 10 papers) Systematic reviews: 14</p> <p><b>Participants:</b> Community dwelling older people with multiple long-term conditions</p> <p><b>Regions/ countries:</b> USA, Europe, Australasia, Canada, UK and Hong Kong</p>	<p>Integrated team model (19 studies): an established multi-professional team whose recognised members have organisational links with one another</p> <p>Case management (7 studies): medical and non-medical professional staff and co-ordinated by a case manager to address the needs of a client</p> <p>Collaboration model (11 studies): professionals involved in providing care to clients may come from different organisations but they work together to achieve a specific outcome for a client</p> <p>Some studies used hybrid models of care</p>	<p><b>Models of integrated care:</b> 3 described.</p> <p><b>Patient outcomes:</b> Integrated team model (19 RCTs): many showed improved health/functionality, user satisfaction and reduced caregiver burden. Mixed evidence on service use/costs. No overall effect on mortality</p> <p>Case management (7 RCTs): Four RCTs showed some improvement in health outcomes, most showed improved patient satisfaction. Mixed evidence for service use/costs. No effect on mortality</p> <p>Collaboration model (11 RCTs): Around half reported improved health/functional outcomes; most detected improved service user satisfaction. Mixed evidence on service use/costs. No overall effect on mortality</p> <p><b>Cost effectiveness:</b> Was intended but was not feasible</p>	<p><b>Limitations</b> 25 RCTs were graded as having a high risk of bias, 6 as medium risk and 6 as having a low risk of bias</p> <p>Selection of papers was judged on the process of IPW, not the name of descriptor given to the study. Consequently different models of care may mean very different processes of IPW</p> <p><b>Applicability to Ireland:</b> Studied high income countries, some with different healthcare systems than Ireland</p>	<p>Full study included a systematic review, a survey of managers, local strategy review, a consensus event and a series of case studies. These results are from the systematic review only.</p> <p><b>Barriers and facilitators:</b> N</p> <p><b>Case studies:</b> Y</p> <p><b>Evidence gaps:</b> N</p>

Study	Participants	Integrated care approach	Key findings/outcomes	Limitations	Other comments
<p>Chang-Quan et al. 2009<sup>1</sup></p> <p><b>Systematic review</b></p> <p><b>Quality:</b> 7/11</p> <p><b>Review aim:</b> To determine the effectiveness and feasibility of collaborative care interventions in treating depression in older people.</p>	<p><b>Number of studies:</b> 3 (reported across 20 papers)</p> <p><b>Study types:</b> RCTs/quantitative studies: 3 (multicentre)</p> <p><b>Participants:</b> All adults 60 years or older, with a primary diagnosis of depression (with or without physical comorbidities). Study size ranged from 598 to 1801.</p> <p><b>Countries:</b> UK, US.</p>	<p>Collaborative care interventions integrating mental health and primary care services.</p> <p>1 involved an MDT comprising a depression care manager, GP, psychiatrist and liaison GP providing depression treatment over 12 months.</p> <p>1 delivered proactive depression treatment in primary care over 12 months. [no further details]</p> <p>1 co-located mental health and substance abuse services with primary care. Liaison between mental health clinicians and GPs.</p> <p><b>Primary outcome:</b> depression symptom level, suicidal ideation.</p> <p><b>Secondary outcomes:</b> cost-effectiveness, ratio of dropout, components of depression treatment.</p>	<p><b>Models of integrated care:</b> Various models, not well described.</p> <p><b>Patient outcomes:</b> Pooled results of three studies indicate CCI was superior to usual care in terms of depression rating and remission rates. CCIs significantly decrease suicide ideation, compared with usual care. One study showed effects persisted to 24 months' follow-up. One study showed CCI superior to usual care in patients with co-morbidities.</p> <p><b>Cost effectiveness:</b> One study reported cost-effectiveness. CCI patients had 107 more depression free days over 24 months. CCI outpatient costs were \$295 higher over 24 months. In patients with diabetes, CCI patients had 115 more depression-free days and outpatient costs were \$25 higher than usual care.</p>	<p><b>Limitations:</b> Few studies suitable for inclusion. Significant heterogeneity between studies (used a random-effects model).</p> <p><b>Applicability to Ireland:</b> Studies based in UK/US.</p>	<p><b>Barriers and facilitators:</b> N</p> <p><b>Case studies:</b> Y</p> <p><b>Evidence gaps:</b> Y</p>

Study	Participants	Integrated care approach	Key findings/outcomes	Limitations	Other comments
<p>Huntley et al. 2009<sup>7</sup></p> <p><b>Systematic review</b></p> <p><b>Quality:</b> 9/11</p> <p><b>Review aim:</b> To determine the effectiveness of case management in reducing unplanned hospital admissions and readmissions in elderly people</p>	<p><b>Number of studies:</b> 11</p> <p><b>Study types:</b> RCTs: 11</p> <p><b>Participants:</b> All older people (65 years and over). Mix of community dwelling and hospitalised patients due for discharge. Studies ranged in size from 142 to 850.</p> <p><b>Countries:</b> USA, Germany, Denmark, Australia, Sweden, Canada,</p>	<p>Case management involves assessing, planning, co-ordinating and reviewing the care of individuals. Case management can be based in hospital, primary care or community settings.</p> <p><b>Primary outcome:</b> unplanned, emergency or unscheduled hospital admissions; unplanned, emergency or unscheduled hospital readmissions</p> <p><b>Secondary outcomes:</b> length of hospital stay</p>	<p><b>Models of integrated care:</b> 7 models described.</p> <p><b>Patient outcomes:</b> No statistically significant reduction in unplanned hospital admissions or readmissions compared with usual care, in case management initiated in hospital or community settings</p> <p><b>Cost effectiveness:</b> One study reported lower total costs in the intervention group.</p> <p>One study reported a 20% decrease in total hospital costs.</p> <p>One study reported significantly lower hospital utilisation costs and total costs in the intervention group.</p> <p>One study reported cost savings of \$1800 per capita per year of follow-up in the intervention group.</p>	<p><b>Limitations:</b> Wide definition of case management means high degree of heterogeneity between studies. Publication bias was not assessed as most studies were non supportive so publication bias unlikely.</p> <p><b>Applicability to Ireland:</b> Included trials from OECD countries only</p>	<p><b>Barriers and facilitators:</b> N</p> <p><b>Case studies:</b> N</p> <p><b>Evidence gaps:</b> Y</p>

Study	Participants	Integrated care approach	Key findings/outcomes	Limitations	Other comments
<p>Johri et al. 2003<sup>8</sup></p> <p><b>Systematic review</b></p> <p><b>Quality:</b> 3/11</p> <p><b>Review aim:</b> To identify common features in effective integrated care systems and their clinical and cost benefits</p>	<p><b>Number of studies:</b> 12 (covering 7 models)</p> <p><b>Study types:</b> Quantitative studies: 12 (2 randomised)</p> <p><b>Participants:</b> Elderly people, mainly physically frail, community dwelling. Study size ranges from 101 to 16,574.</p> <p><b>Countries:</b> UK, USA, Italy, Canada</p>	<p><i>Various models</i></p> <p><b>Primary outcome:</b> Rates of hospitalisation, long-term care institutionalisation, utilisation and costs, impact on process of care and health outcomes.</p> <p><b>Secondary outcomes:</b> Costs, institutionalisation rates, non-acute service use (physiotherapy, vaccines etc.), acute service use, mortality, morale, patient satisfaction, depression, independence measures, prescription utilisation, length of hospital stay, functional measures, long term care facility use</p>	<p><b>Models of integrated care:</b> Various</p> <p><b>Patient outcomes:</b> Mostly positive.</p> <p>One study experienced slow enrolment growth.</p> <p>One study found that the S/HMO model was not superior for healthy and acutely ill patients. Patients with impairments were less well served by the intervention. Long term outcomes worse than standard care.</p> <p>One study found that patients made less use of home support hours.</p> <p><b>Cost effectiveness:</b> Mixed. Several studies found lower costs (e.g. fewer hospital days) or extra costs in certain areas balancing out over the whole system. One found no evidence of cost savings.</p>	<p><b>Limitations:</b> The most recent included study was from 2000. Authors state that none of the models have been successfully implemented on a large-scale</p> <p><b>Applicability to Ireland:</b> OECD countries.</p>	<p><b>Barriers and facilitators:</b> Y</p> <p><b>Case studies:</b> N</p> <p><b>Evidence gaps:</b> N</p>

Study	Participants	Integrated care approach	Key findings/outcomes	Limitations	Other comments
<p>Kane et al. 2011<sup>9</sup></p> <p><b>Systematic review</b></p> <p><b>Quality:</b> 5/11</p> <p><b>Review aim:</b> to investigate the effectiveness of healthcare teams in delivering care to older adults</p>	<p><b>Number of studies:</b> 144</p> <p><b>Study types:</b> National guidelines: 2 SR: 9 (+ 9 non-systematic reviews)</p> <p>Cohort study: 1 Retrospective cohort: 1 RCTs/quantitative studies: 49 (including 1 non-randomised) - also state they had 104 reports of RCTs</p> <p><b>Participants:</b> Older adults includes: geriatric patients (including disability and frailty support), chronic diseases/multi-morbidity, depression, stroke, blood pressure, chronic heart failure, diabetes.</p> <p>Countries: NR</p>	<p>Team care of various kinds, including interdisciplinary and multidisciplinary teams, co-ordinating teams and collaborative teams.</p> <p><b>Primary outcome:</b> mortality, morbidity (including function, symptoms, laboratory tests), quality of life, hospitalisation/A&amp;E, cost.</p>	<p><b>Models of integrated care:</b> Various team types described.</p> <p><b>Patient outcomes:</b> Positive results - mortality in 3% of studies, morbidity etc. in 51% of studies, QoL in 42% of studies, hospitalisation/A&amp;E in 25% of studies.</p> <p><b>Cost effectiveness:</b> positive results in 46% of studies</p>	<p><b>Limitations:</b> RCTs were of fair quality. Lack of detail about the interventions and comparators. Did not include inpatient teams.</p> <p><b>Applicability to Ireland:</b> Unclear</p>	<p><b>Barriers and facilitators:</b> N</p> <p><b>Case studies:</b> Y</p> <p><b>Evidence gaps:</b> Y</p>

Study	Participants	Integrated care approach	Key findings/outcomes	Limitations	Other comments
<p>Larsen et al. 2006<sup>10</sup></p> <p><b>Systematic review</b></p> <p><b>Quality:</b> 4/11</p> <p><b>Review aim:</b> To investigate the effectiveness of Early home supported discharge (EHSD) in addition to stroke units in stroke rehabilitation</p>	<p><b>Number of studies:</b> 7</p> <p><b>Study types:</b> RCTs/quantitative studies: 7</p> <p><b>Participants:</b> Older adults (mean age: 70 and over), hospitalised following a stroke and due for discharge. Study sizes ranged from 82 to 1,108 people.</p> <p><b>Countries:</b> UK, Canada, Sweden (may be more, these were the only ones named)</p>	<p>EHSD is a multidisciplinary team including physiotherapists, occupational therapists, speech therapists, physicians, nurses and social workers. The team plans, co-ordinates and delivers care at home through regular meetings. EHSD includes one pre-discharge home visit, a visit on the day of discharge and regular post-discharge home visits to review the patient-held recovery plan.</p> <p><b>Primary outcome:</b> death or institutionalisation, change in Barthel Index, length of hospital stay, intensity of home rehabilitation.</p>	<p><b>Models of integrated care:</b> See previous column.</p> <p><b>Patient outcomes:</b> EHSD was effective in improving all outcomes, but not significantly. Length of stay was reduced significantly.</p> <p><b>Cost effectiveness:</b> Average cost of the intervention per patient is \$1340, with cost savings in inpatient and nursing home days of \$1480, i.e. \$140 per patient.</p>	<p><b>Limitations:</b> Studies were of low quality.</p> <p><b>Applicability to Ireland:</b> Named countries are applicable</p>	<p><b>Barriers and facilitators:</b> Y</p> <p><b>Case studies:</b> Y</p> <p><b>Evidence gaps:</b> N</p>

Study	Participants	Integrated care approach	Key findings/outcomes	Limitations	Other comments
<p>Manderson et al. 2012<sup>11</sup></p> <p><b>Systematic review</b></p> <p><b>Quality:</b> 4/11</p> <p><b>Review aim:</b> describe existing navigator models relevant to chronic disease management for older adults and to investigate the potential impact of each model</p>	<p><b>Number of studies:</b> 9</p> <p><b>Study types:</b> 9 RCTs; supplemented with qualitative study on patients perspectives in some cases.</p> <p>Studies focusing on cancer, mental health, children or homeless people were excluded.</p> <p><b>Participants:</b> older transitioning between healthcare services (majority hospital to home, 2 primary care, 1 post stroke services delivered in the home). Patients were at high risk of negative outcomes due to multiple chronic illnesses in 5 studies, others were condition focused: heart disease (2), stroke (2), hip fracture (1).</p> <p><b>Countries:</b> 6 US, 2 Canada, 1 Australia</p>	<p>System navigators who assist chronically ill, elderly patients one-on-one as they transition across healthcare settings or providers.</p> <p>Some start immediately after admission to hospital, others post-discharge; the duration of the interventions ranged from 1 to 18 months.</p> <p><b>Main outcomes:</b> describe existing navigator models; investigate the potential impact of each model; and synthesise the findings to identify common elements.</p> <p>Economic, psychosocial, and functional outcome categories defined.</p>	<p><b>Models of integrated care:</b> “Care transitions” model, “Guided Care” model</p> <p><b>Patient outcomes: functional:</b> significant improvements in hospital days (3), home care episodes (1), ADL and IADL (1)</p> <p>Mixed for physical QoL: one improved another NS.</p> <p>NS improvement in physical functioning, bodily pain, general health and vitality (1) or mortality (1)</p> <p><b>Psychosocial:</b> Significant improvements in overall QoL (2), depressive symptoms, adherence to self-care (1), pt satisfaction (1), independent living (1), ratings of care (1). NS effect on social functioning, mental health, satisfaction with care (1) or caregiver burden (1).</p> <p><b>Cost savings</b> per patient (1), lower hospital costs (1), lower total costs - including hospital, intervention community services(1)</p>	<p><b>Limitations:</b> all RCTs but study quality not assessed, unclear risk of bias. Intervention heterogeneity makes pooling difficult.</p> <p><b>Applicability to Ireland:</b> High income OECD countries but none from UK.</p>	<p>No meta-analysis.</p> <p><b>Barriers and facilitators:</b> N</p> <p><b>Case studies:</b> N from UK, potentially US case studies here</p> <p><b>Evidence gaps:</b> Y</p>

Study	Participants	Integrated care approach	Key findings/outcomes	Limitations	Other comments
<p>Mikolaizak et al. 2013<sup>12</sup></p> <p><b>Systematic review</b></p> <p><b>Quality:</b> 5/11</p> <p><b>Review aim:</b> review evidence on non-transportation rates and outcomes for older people who have fallen after ambulance service call-out</p>	<p><b>Number of studies:</b> 12</p> <p><b>Study types:</b> Prospective cohort: 5 Retrospective cohort: 4 RCT: 2 Historical control trial: 1</p> <p><b>Participants:</b> older people who have fallen, an emergency ambulance response has been called, but they not transported to an emergency department.</p> <p>10 studies included only 60yr olds or over, mean age 77. 2 studies included all ages, subgroup analysis of older people (age NR).</p> <p>Study size range 70 to 3018.</p> <p><b>Countries:</b> 8 UK, 3 US, 1 Australia.</p>	<p>Includes pathways of care for older people who have fallen but are not transported to an ED after the emergency ambulance response.</p> <p><b>Outcomes:</b></p> <ul style="list-style-type: none"> <li>• non-transportation rates</li> <li>• outcomes following non-transportation</li> <li>• outcomes from alternate care pathways for non-transported older people who have fallen.</li> </ul>	<p><b>Models of integrated care:</b> individualised fall programme through MDT, paramedic practitioners in the community.</p> <p><b>Patient outcomes:</b> one English RCT (following UK fall guidelines) used an individualised fall prevention programme MDT: pts experienced significantly fewer subsequent falls (IRR 0.5; 95% CI: 0.4-0.6) and fewer emergency ambulance calls (RR 0.6; 95% CI: 0.4-0.9) than control group receiving standard emergency care; scored significantly better on the Nottingham extended activities of daily living scale; had lower level of fear of falling</p> <p><b>Cost effectiveness:</b> one UK study found paramedics spent more time treating non-transporter people, resulting in cost differences. Total case costs not assessed.</p>	<p><b>Limitations:</b> ambulance systems clinically and operationally heterogeneous, for example use of specialist paramedics, different training from regular paramedics.</p> <p><b>Applicability to Ireland:</b> Mainly UK studies, including 2 RCTs.</p>	<p><b>Barriers and facilitators:</b> N</p> <p><b>Case studies:</b> Y</p> <p><b>Evidence gaps:</b> Y</p>

Study	Participants	Integrated care approach	Key findings/outcomes	Limitations	Other comments
<p>Parker et al. 2002<sup>13</sup></p> <p><b>Systematic review</b></p> <p><b>Quality: 9/11</b></p> <p><b>Review aim:</b> systematically review discharge arrangements for older people.</p>	<p><b>Number of studies:</b> 71</p> <p><b>Study types:</b> 71 articles reporting on 54 RCTs</p> <p><b>Participants:</b> older adult hospital inpatients (65 and over). In hospital for variety of reasons: surgery, emergency admissions, general medical patients, rehabilitation, stroke. Some NR.</p> <p>Discharge from day hospitals, outpatient settings, nursing homes and other settings not providing acute or high technology care was excluded.</p> <p><b>Countries:</b> 10/54 RCTs in UK, 23 US, 6 NR, 4 Canada, 2 each for; Denmark and Hong Kong, 3 each for Australia and Sweden, 1 Netherlands.</p>	<p>Joint discharge planning for older people leaving hospital.</p> <p><b>Outcomes extracted:</b> model of discharge arrangement, study quality, range of outcomes reported, mortality, length of stay and readmission, physical function, mental function, use of services, costs, satisfaction, and quality of life</p> <p>Discharge planning was generally provider oriented (multidisciplinary teams, new arrangements for providing continuity of care through arrangements for follow-up or case management) or structural (alternative setting or site of service delivery). No patient orientated interventions were identified (e.g. complaints procedures, participation in governance).</p>	<p><b>Models of integrated care:</b> 4 identified: discharge planning, comprehensive geriatric assessment, discharge support and educational interventions (not mutually exclusive)</p> <p><b>Patient outcomes:</b> overall no significant effect was seen on mortality at 3 months (10 trials), 6 months (14 trials) or 12 months after discharge (14 trials). None of the four intervention types were shown to have major effects on mortality. No consistent effects were seen on physical or cognitive functioning.</p> <p>Concludes: Evidence from RCTs is not available to support the general adoption of discharge planning protocols, geriatric assessment processes or discharge support schemes as means of improving discharge outcomes.</p> <p><b>Cost effectiveness:</b> No studies found.</p>	<p><b>Limitations:</b> Sample sizes generally small, quality often poor.</p> <p>Diverse participants and interventions (delivered by MDTs, single-person services and services over the telephone) between studies. Only one included a power calculation. Only generic descriptions of patient assessment and coordination of care, limiting the analysis of the interventions.</p> <p><b>Applicability to Ireland:</b> Most studies were from high income countries.</p>	<p>Beneficial effects on readmission rates. Sub-analysis by intervention characteristics (team delivery, site) led to conclusion: "Interventions provided across the hospital--community interface, both in hospital and in the patient's home, showed the largest effect (unclear if this related to mortality, readmissions, or both).</p> <p><b>Barriers and facilitators:</b> N</p> <p><b>Case studies:</b> N</p> <p><b>Evidence gaps:</b> Y</p>

Study	Participants	Integrated care approach	Key findings/outcomes	Limitations	Other comments
<p>Shepperd et al. 2013<sup>14</sup></p> <p><b>Systematic review</b></p> <p><b>Quality: 9/11</b></p> <p><b>Review aim:</b> To determine the effectiveness of planning the discharge of individual patients moving from hospital.</p>	<p><b>Number of studies:</b> 24</p> <p><b>Study types:</b> 24 RCTs</p> <p><b>Participants:</b> 16 studies older people with medical condition, 4 pts with a mix of medical and surgical conditions; 1 from acute psychiatric ward, 1 from psychiatric ward and elderly ward ; 2 studies following up those admitted following a fall (n=110 pts). 14 studies recruited people over 70, 8 under 70, 2 under 50 (psychiatric hospital).</p> <p>n=8,098 hospital inpatients total.</p> <p><b>Countries:</b> 9 US, 3 Canada, 3 NR, 2 France, England, Scotland, NI, Netherlands, Denmark, Australia, Taiwan.</p>	<p>Individualised discharge planning for a patient prior to leaving hospital.</p> <p>Aiming to reduce hospital length of stay and unplanned readmission to hospital, and improve the co-ordination of services following discharge from hospital.</p> <p>RCTs compared this with routine discharge not tailored to the pt. In 19 trials this included some discharge planning, but without a formal link through a coordinator to other departments and services.</p> <p><b>Primary outcomes:</b> readmission and length of stay.</p> <p>Patient outcomes were secondary.</p>	<p><b>Models of integrated care:</b> structured discharge planning including assessment, planning, implementation and monitoring phases (monitoring phase not always included).</p> <p><b>Patient outcomes:</b> The impact on health outcomes is uncertain. For elderly patients with a medical condition (usually heart failure) there was no statistically significant difference between groups for mortality (RR 0.99, 95% CI 0.78 to 1.25, five trials). This was also the case for a trial recruiting surgical and medical patients and 1 relating to falls. In three trials, patients allocated to discharge planning reported increased satisfaction.</p> <p><b>Cost effectiveness:</b> little evidence on overall healthcare costs.</p>	<p><b>Limitations:</b> trials excluded if evaluating interventions where discharge planning was not the main focus of a multifaceted package of care: would exclude some multifaceted packages where discharge planning not the main feature.</p> <p>Interventions typically included an element of patient education to support the discharge planning process.</p> <p><b>Applicability to Ireland:</b> Majority of included studies are in high income countries.</p>	<p>Meta-analysis where appropriate. All RCTs, majority judged as low risk of selection bias and for primary outcome.</p> <p>Evidence from only one trial that health care services outside a secondary care setting have become involved in discharge planning - suggests limited integration.</p> <p><b>Barriers and facilitators:</b> N</p> <p><b>Case studies:</b>N</p> <p><b>Evidence gaps:</b> Y</p>

Study	Participants	Integrated care approach	Key findings/outcomes	Limitations	Other comments
<p>Tieman et al. 2007<sup>15</sup></p> <p><b>Systematic review</b> (Qualitative)</p> <p><b>Quality:</b> 4/11</p> <p><b>Review aim:</b> approaches to coordinated and multidisciplinary care and their applicability to Australia.</p>	<p><b>Number of studies:</b> 5</p> <p><b>Study types:</b> 5 incorporating 142 papers.</p> <p><b>Participants:</b> 1 SR on each population: chronic (diabetes, COPD stroke), palliative and frail older populations. Summary demographics NR.</p> <p><b>Countries:</b> NR, described as including only those with comparable health systems, example: Australia, New Zealand, Canada, UK, and USA.</p>	<p>MDTs, coordinated and integrated care in primary health sector.</p> <p><b>Primary outcome/aim:</b> identify common themes in the 5 individual SRs.</p>	<p><b>Models of integrated care:</b> 3 put forward as offering potential benefit: case conferences, care planning and team approaches.</p> <p><b>Patient outcomes:</b> coordination appears to improve outcomes e.g. case conferencing improving medication appropriateness. Trend showing the more disciplines involved the more outcomes improve.</p> <p><b>Cost effectiveness:</b> Most studies suggest integrative approaches may not necessarily reduce costs (provider perspective). Several studies indicate service use increases, potentially reflecting unmet need being tapped. Long term cost impact unclear.</p>	<p><b>Limitations:</b> Authors say many studies describe practice changes rather than effectiveness or outcome improvement. Review doesn't provide full picture of planned and unintended consequences of interventions. Quality of underlying studies, and reviews, unclear.</p> <p><b>Applicability to Ireland:</b> Likely mainly high income countries included. Review discussed findings in relation to Australian primary health care system.</p>	<p>This was a summary of 5 SRs, attempting to give common themes across reviews; reported high level findings.</p> <p><b>Barriers and facilitators:</b> Y</p> <p><b>Case studies:</b> N</p> <p><b>Evidence gaps:</b> Y</p>

Study	Participants	Integrated care approach	Key findings/outcomes	Limitations	Other comments
<p>Trivedi et al. 2013<sup>16</sup></p> <p><b>Systematic review</b></p> <p><b>Quality: 7/11</b></p> <p><b>Review aim:</b> identify the models of Inter-professional working that provide the strongest evidence base for practice with community dwelling older people.</p>	<p><b>Number of studies:</b> 37</p> <p><b>Study types:</b> 37 RCTs</p> <p><b>Participants:</b> older people with complex and multiple needs, no summary demographics reported.</p> <p><b>Countries:</b> Almost half US, remaining: Europe (inc UK), Australasia, Canada, Hong Kong.</p>	<p>Inter-professional working (IPW)</p> <p>Defined as having 1 or more of the following:</p> <ol style="list-style-type: none"> <li>1. A shared care plan that involved joint decision making by an inter-professional /MDT.</li> <li>2. A shared protocol or documents (e.g. care pathways) that involved joint input from an inter-professional /MDT</li> <li>3. Face to face team meetings or routine team communications about individuals' care plans.</li> </ol> <p>Objectives: describe IPW models, how they are organised, and their outcomes.</p>	<p><b>Models of integrated care:</b> 3 IPW models identified.</p> <p><b>Patient outcomes:</b> case management model (n=7): 4 showed improvement in health outcomes, most improved patient/user satisfaction.</p> <p><b>Collaborative model (n=11):</b> -half reported improved health /functional outcomes; most detecting improved process measures and pt/user satisfaction.</p> <p><b>Integrated team model (n=19):</b> many showed improved health/functional ability, reduced caregiver burden, user satisfaction</p> <p><b>Cost effectiveness:</b> mixed evidence on service use/costs.</p>	<p><b>Limitations:</b> 25 studies high risk of bias, 6 medium risk, 6 low risk. Many had short term follow up, high rates of attrition. Rigorous evaluations reported as scarce, especially of UK based interventions.</p> <p>The search excluded disease specific studies because particular features of conditions may shape regimens, resources and care pathways.</p> <p><b>Applicability to Ireland:</b> Only high income countries included.</p>	<p>Differences in local contexts raise questions about the applicability of the findings and their implications for practice</p> <p><b>Barriers and facilitators:</b> N</p> <p><b>Case studies:</b> N</p> <p><b>Evidence gaps:</b> Y</p>