

Evidence:

Does clinical coordination improve quality and save money?

Volume 1: A summary review of the evidence
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June 2011



This research was commissioned and funded by the Health Foundation to help identify where and how improvements in healthcare quality can be made.

The views expressed in this report do not necessarily represent the views of the Health Foundation.

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Foreword

The need to increase value for money in healthcare by improving quality (in particular the quality of patient outcomes) while reducing costs is a challenge facing health services around the world. The NHS is entering a period of financial constraint, with almost no increase in budget for at least the next three years, at a time that demand on services continues to increase at around 7% per year.

In 2009, as the changing financial situation was becoming clear, the Health Foundation commissioned Dr John Ovretveit to undertake a review of the evidence to answer the question, 'Does improving quality save money?'. That review has been hugely influential in showing the lack of evidence to date to demonstrate this and in stimulating debate about the costs of improvement interventions in healthcare and the importance of the implementation approach used in order to realise the benefits in terms of cost savings. It also identified other areas where further review of the evidence would be helpful. One of the most crucial areas identified for study was the role that clinical coordination can play in reducing waste, improving patient outcomes and delivering these at lower costs.

The Health Foundation is now pleased to publish Dr Ovretveit's examination of what the research evidence tells us with regard to clinical coordination and how this can help in the decision making of clinicians and managers as they look at new models and ways to organise services.

The review suggests that there are models of care that improve clinical coordination and have been shown to reduce cost, but attempts to replicate these need very careful consideration. By its nature, coordination is dependent upon the local context, so the opportunities and costs will vary in each different healthcare system and in different settings within the system.

The review summarises and grades the strength of the evidence, so that it is clear which are the most robustly evaluated approaches. However, there are also many good ideas here for better clinical coordination which could be effective, especially if used in conjunction with other approaches to improving care, such as disease management and self-care programmes. The strength of the evidence is weak, as many changes tried to improve coordination have not been well evaluated.

The final section of the report suggests how patients, health service providers, commissioners, regulators and professional organisations could all take some responsibility for improving clinical coordination and thus reducing duplication, waste and thus the overall costs of healthcare.

This review highlights areas in which we need to know more in order to target our improvement efforts, especially to identify which patients are most affected by poor coordination and the factors which are most influential in determining the effectiveness of interventions.

The Health Foundation is pursuing further research into value for money in healthcare across a range of research projects, including macro level health economics analysis, examination of the comparative value of components of care pathways and the extent to which changing the relationship between patients and providers can improve quality and increase value for money in healthcare services. We hope that this work will add to the evidence base to support changes in health services as they address the challenge of continuing to improve quality for patients in a demanding financial climate.

Martin Marshall
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Preface

As healthcare and payments become more fragmented, and resources become fewer, providers tend to focus more on their own tasks, and less on passing on information and adjusting their work to others. Without coordination, specialisation becomes a danger rather than a benefit. Adverse events and poor quality can increase, adding costs and then leading to bureaucracy to enforce procedures that do not solve the problems of under-coordination. Purchasers are able to take an overview and see the waste, but often appear powerless to influence significant changes. Everyone waits for information technology to solve the problems.

Improving coordination is about relationships between people, which is why it is difficult. Changes affect relationships between professionals, who often have set views about others not in their tribe. The changes demand extra time when time is at a premium, and when professionals might not believe the change will benefit either them or patients.

Putting an equal emphasis on saving money as on other dimensions of quality is important because quality improvement needs financial incentives in a tight financial climate to speed and scale up proven improvements. The double benefit of higher quality and lower costs can unite professionals, managers, payers and patients to give the time and energy which has often not been committed for quality improvement on its own. But, as the research shows, the types of changes have to be carefully chosen and made for particular local patients and settings if they are to save money and raise quality.

The future of healthcare is a team enterprise between people. In future, healthcare needs to operate as a value improvement system, which makes the whole healthcare outcome for the patient greater than the sum of the help that each carer provides, and which supports a patient to be independently healthy or more active in their care.

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Chapter 1

Introduction, definitions and summary of findings

1.1 Introduction

It is thought that many adverse patient events and quality problems are caused, partly or wholly, by incomplete communication and collaboration between caregivers. It seems possible that improving coordination would benefit patients and could save time and reduce costs. In some organisations, changes to improve coordination are already being made, but what is the evidence that these are likely to be effective and can help us choose and carry out the most needed improvements?

The review of research which is summarised here set out to answer the following questions:

- Is there evidence of problems in clinical coordination, and what are the costs to different parties?
- Are there effective coordination solutions, and if so, what do they cost?
- Are there coordination solutions which pay for themselves or save money, and which also improve patient outcomes?

This summary is based on: Does clinical coordination improve quality and save money? – a review of the evidence.¹ The review found that improving coordination can sometimes save resources and also improve quality. But much depends on which improvement is used, how it is implemented, and features of the health system, such as financing arrangements.

Overall, the question addressed was: which coordination problems cause the most suffering and waste, and which are resolvable at a cost proportionate to the likely savings?

1.2 Definitions

The term ‘coordination’ is used by different researchers to refer to many different activities. This review defined the term in the following ways:

- Clinical care coordination: ordering the care that different providers give to a patient, so that the results are greater than the sum of each provider’s care. It involves two or more providers (individuals or organisations) communicating or collaborating with each other and with the patient, to provide care that takes account of others’ actions.
- Under-coordination refers to incomplete communication or collaboration between two or more caregivers, which results in poor quality, unsafe care and waste.

Full coordination requires communication but also collaboration, the latter involving co-labouring by adjusting our care to take account of what others are providing. Often patients make the connections between services for themselves, but a system can add value by connecting providers for them.

Care coordination is needed in different situations:

- between professionals and services helping one patient within the boundaries of one organisation, such as a hospital

between the boundaries of organisations – most often, when a patient is transferred physically from one organisation to another, but also when professionals in one organisation need patient information, such as medications lists or test results, held by another organisation

- for patients living in the community with chronic illnesses, who may remain relatively independent if the right combined care and expertise is available at the right time to support them.

1.3 What are the main findings of the review?

- The simple answer to the question ‘Does clinical coordination improve quality and save money?’ is ‘Yes, it can.’ However, it depends on which approach is used, how well it is implemented, and on features of the environment in which a provider is operating, including the financing system.
- For a health system or purchaser, most changes for better coordination improve quality and save resources. But only some save more than they cost to make and sustain.
- For a provider some coordination improvements internally will reduce waste and improve quality, and the change can save money, or allow increased income to be generated, but this will depend on how the provider is paid.
- Where better coordination is combined with other changes in how patients are cared for, this also can save money and raise quality. Examples are some models of care to prevent hospital admissions and other chronic care and illness prevention models. The most cost-effective approaches are those that use reliable data to identify the patients most at risk of deterioration, and then ensure that they get the right type of coordinated care and self-care services.

- Changes in payment systems, regulation, professional education and codes of practice are needed to counteract the increasing fragmentation and pressures to neglect coordination. Cost and saving sharing agent (CaSSA) organisations will be needed for situations where one provider gains from another provider’s spending on coordination improvement.
- Savings do not only depend on which type of coordination improvement is used, but also on how effectively the improvement is implemented, and the timescale over which costs and savings are estimated.
- Research shows there are some improvements to coordination that are likely to be effective and reduce costs in most settings and health systems, and also highlights the type of patients and conditions most likely to benefit. The research summarised here gives a useful guide, but decision-makers will need to make their own local assessments of costs and of payback timescale.
- It is possible that those who suffer most from under-coordination are people who are poor, vulnerable and/or members of minority ethnic groups. Ethically, there is an argument that those most in need are given attention. But it also makes economic sense – avoidable deterioration of their health is likely to result in high costs for public systems. The needs of these groups have been neglected in research as well as within healthcare systems.

Chapter 2

Review methods

2.1 Overview of review methods

Chapter 1 contains some of the conclusions from a systematic review and synthesis of evidence, which was carried out in 2010. The following five steps were taken to carry out the review.

Literature search

- **Broad scan.** Defining the objectives and search terms, finding and noting literature on the subject.
- **Narrowing the focus on previous reviews.** Identifying and selecting previous reviews, and assessing these for answers to the review questions.
- **Opening out inclusion.** Adding high-quality non-review studies to provide additional evidence, grading each piece of evidence by strength (see 2.2).
- **Opening inclusion further.** Adding other research of acceptable, but weaker, evidence strength to fill in the evidence gaps, using a snowball approach to identify relevant studies.
- **Reviewing and synthesising.** Combining the evidence to answer the questions, noting the degree of certainty. Identifying unanswered questions and priorities for research, and developing recommendations supported by the evidence.

2.2 How was the evidence graded?

A grading system was used to indicate how strong each piece of evidence was. Each of the study findings shown later, and in the full report, has E1, E2, E3, E4 next to it, to show the degree of certainty of the statement. The codes are explained in the box below.

Evidence grading system

E1 Strong evidence of results. Consistent findings of results in two or more randomised controlled trials (RCTs).

E2 Moderate evidence. Consistent findings of results in two or more scientific studies of acceptable quality.

E3 Limited evidence. Only one study giving results, inconsistent findings of results of several studies, or studies of results that show perceptions if they were collected and analysed according to accepted scientific methods using an appropriate study design.

E4 Very low strength of evidence. Very low strength of evidence. Any estimate of effect is very uncertain. One or more studies with very severe limitations, or expert opinion.

2.3 What were the challenges?

Limited evidence

We know more about the problem than about the solution. There is a growing body of research which shows the costs and consequences of under-coordination. But there is less strong evidence about the effectiveness and costs of changes to improve coordination. This is a useful finding from the review because it shows which type of research is most needed.

The review wanted to go beyond reporting that there is a lack of strong evidence. It aimed to report evidence which could be useful, whilst showing the uncertainties about this evidence. To decide practical action, the reader will need to ask two questions:

- ‘How certain are these findings for the study situation?’ An indication of this is given by the gradings of E1 to E4 described previously. Reviews of many studies may consider the same interventions in many settings, but often the interventions are not exactly the same, and might not be carried out in typical settings.
- ‘How certain can we be that these findings might also apply in our service or area?’ This requires the reader to consider:
 - the costs and effort to implement the change locally
 - how much the conditions under which they would implement the change affect both implementation and the results. For example, the study may show savings in the USA but the UK financing system might result in higher costs for a provider.

The following were some of the limitations of the research which are relevant for practical decisions.

Poor study design

Where studies were poorly designed, it was not possible to judge if the results were due to the change that the study evaluated or some other factor. Even with well-designed studies it is not certain that the same results would be achievable within a different type of health system.

For example, a study site may have more resources than another organisation to help implement the change.

Implementation and context evidence

Most studies were about the efficacy of a change to how patients were treated – a ‘clinical intervention’. But results elsewhere depend on the ‘implementation intervention’ used in these other places to make this change – the methods, resources and time others use to achieve the same change. Results elsewhere depend on ‘implementation enabling interventions’ which change the environment to help implementation, such as a change to financing, or regulations requiring coordination. There is little research to help decision makers and implementers to choose and plan these latter two non-clinical interventions.

Scope of the review

Other limitations were that the review did not cover the emerging evidence about coordination between providers and patients or carers, and how they related and communicated. Neither did it consider costs and savings beyond the health system. Because some changes, such as disease management, include changes other than coordination (for example teaching and supporting patients in self-care), the review includes these as ‘coordination plus’ changes. This is the term used in the review for interventions that involve improved coordination as the primary change, but also included other changes.

Incomplete economic assessments

Another challenge for the review was that studies often state the ‘waste savings’ in money terms, but they do not take full account of all ‘spend costs’ on the improvement, or of some stakeholders’ costs, especially those of patients and relatives. Also most do not consider the costs and efforts of the ‘second implementation stage’ needed to secure gains for the organisation’s budget. This ‘second cash change’ involves extra costs and effort to close beds, or save on staff or materials, or to increase production to use the capacity released by the improvement. Many reports show ‘theoretical savings’ rather than evidence of impact on end of year budgets through actual ‘cash savings’.

Chapter 3

Findings

3.1 Evidence about coordination

Some of the evidence about coordination is presented below in terms of:

- findings about under-coordination, the consequences, costs, and which patients it most affects (what is the problem?)
- findings about which changes improve coordination, and what the benefits might be (what are the solutions and their results?).

3.2 Evidence of under-coordination

There is a limited amount of strong evidence of harm or poor-quality outcomes caused directly or solely by under-coordination. This is because the link between under-coordination and patient outcomes is often not direct. There are research challenges in establishing how far such outcomes have been influenced by under-coordination compared to other factors.

There is more evidence of intermediate poor-quality care resulting from under-coordination (for example, patient test results not being available at the time of consultation).

Although direct causality is often hard to establish, overall the increasing amount and pattern of evidence suggests that many patients suffer harm or receive sub-optimal care as a result of under-coordination.

Examples of reported evidence

- 70% of the analyses of reported serious hospital adverse events found communication failure as the main or contributing cause.²
- Key clinical information was not available one-third of the time in either written or oral handovers.³
- 40% of medication errors were thought to result from inadequate medication reconciliation in handovers during admission, transfer, and discharge of patients.⁴ Of these errors, about 20% were believed to result in harm.⁵
- 70% of UK GPs reported late discharge summaries ‘often’ or ‘very often’, and of these 90% reported it ‘compromised clinical care’ and 68% reported it ‘compromised patient safety’. One summary arrived 11 years late, and many were incorrect, illegible, with unknown acronyms, and no patient name or diagnosis or changes in medication.⁶

3.3 Evidence of the cost of under-coordination

Evidence of the cost of under-coordination is limited because few studies have included costings. It is also not strong evidence because most of the costings have been made in studies where the link between under-coordination and patient outcomes is likely, but not proven.

Examples of reported estimates

- US\$9bn (9% of US hospital Medicare payments) could have been avoided by better coordination. A study of rehospitalisation within 30 days for elderly Medicare patients estimated avoidable hospitalisation as costing \$17.4bn out of a total \$103bn (2004), 50% of which was thought to have been preventable by better coordination.⁷
- US\$25–50bn was the estimate of the costs of a lack of care coordination (6% of estimated US healthcare waste), due to inefficient communication between providers, including lack of access to medical records when specialists intervene, leading to duplication of tests and inappropriate treatments.⁸ This study also assessed inadequate care for preventable conditions to account for a further \$25–50bn spent annually on hospitalisations that would be less costly to treat with better patient access to timely care.

Overall, the evidence suggests that there is a high but unquantified cost to:

- under-coordination of patient medications between providers
- inadequate handovers, transfers and collaboration between shifts, professions and services
- patients whose hospitalisation could be prevented by service coordination and support
- no access or delayed access to services arising from poor coordination, and resulting in higher emergency or acute care costs.

It is possible that the cost consequences of these and other types of under-coordination could amount to 5% of total healthcare costs, and that 3% could be reduced by interventions and new models of care, of which possibly 1% would pay for themselves. Research is needed to test this and similar hypotheses about the costs of under-coordination.

3.4 Patient groups that would benefit most from improved coordination

In survey responses, many patients say they experience poor coordination and are concerned that, when they are ill and least able, they have to work hard to connect different providers.

Patients with long-term or chronic conditions often need help from a number of providers, and say that coordination improvements are necessary. There is some evidence that more patients in the last stages of life want the option to die without pain and with support at home, and would benefit from coordinated help to do this. No research has considered this question comprehensively and systematically, by looking across the full range of patient groups and comparing which groups suffer most from under-coordination.

From the perspective of purchasers or funders, coordination improvements are most necessary for people who are at risk of being hospitalised or of using other health-service resources that could be avoided through better coordination – especially patients with asthma, diabetes, heart disease, mental health problems and other long-term conditions, often in combination with low income and poor living conditions.

It is possible that people who are poor and vulnerable suffer the most from failures of a health system to ensure coordinated care. It is notable that there is little research on this subject.

3.5 Findings about coordination improvements

This section presents evidence about changes and interventions to improve coordination that have been reported in the research. These can be divided into the following three categories, ranging from the simplest to the most complex.

Changes and interventions revealed in the research

- **Sequential coordination**, sometimes termed handover or handoff.
- **Parallel coordination**, also known as co-working.
- **Indirect influences on provider relations** including interventions to encourage both internal and external coordination

Many interventions combine one or more of these changes, and may also include other changes, in a coordination plus intervention (see table 4.1).

Evidence of coordination that improves quality and saves money

Strong evidence of cost and quality improvement

All the interventions that were very likely both to save money and to reduce suffering caused by under-coordination were inter-organisational improvements, or were carried out within integrated systems. Spreading this type of change widely would require changes to financial systems in order to give incentives and to share costs and savings between different providers.

Examples with the strongest evidence

- Some disease management programmes targeted at severely and moderately ill asthma, diabetes or heart failure patients at risk of preventable hospitalisation. Team-based models possibly provide greater value improvement than nurse-based models (E1)⁹ and for depression in primary care (E1).¹⁰ Many UK disease management models vary from US models in that they do not provide intensive home nursing, and have been found not to be a value improvement.¹¹
- Multidisciplinary teams for patients with heart failure, giving follow-up with specialist heart failure nurses and patient caregiver education (E2).¹²
- Some discharge planning programmes with support, for older patients with congestive heart failure (E2).¹³
- Nurse-led and team post-hospital interventions for congestive heart failure patients (E3),¹⁴⁻¹⁶ but only if started before or soon after discharge, focusing on high-risk patients, and using face-to-face encounters with nurse care managers rather than telephone-only contact (E3).¹⁷
- Team coordination for stroke patients giving early coordinated discharge from hospital and providing post-discharge care and rehabilitation at home (E3).¹⁸
- The transitional care model for older patients with complex needs leaving hospital (E3)^{19,20} and for other patients (E3).²¹

Almost certainly cost more than they save:

- Discharge planning which only gives an assessment of a patient's needs to a post-discharge service (E3).²²

Less strong evidence of cost and quality improvement

There were a number of interventions that may save money and reduce avoidable suffering caused by under-coordination.

Examples with less strong evidence

- Some disease management programmes for heart failure patients in the general population (E2),²³ and for older people (E2),²⁴ and diabetes patients in the general population (E2).^{25,26}
- Community mental health teams carefully targeted for patients with severe mental illness (E2).²⁷
- Some assertive community treatment for mental health patients if effective and well-specified models are followed and patients are carefully selected (E2)²⁸ and (E1).²⁹
- Some case-management approaches for patients with severe mental illness carefully targeted to particular patients (E1),³⁰ and (E1),³¹ but questioned by Marshall et al (E1).³²
- Some carefully targeted case management approaches for older people with congestive heart failure (E1).³³
- Disease management with multidisciplinary teams and specialised clinics for patients with coronary heart disease in the general population (E1),¹⁶ especially those with telephone follow-up or a home-based component (E1).³⁴
- Some specialist outreach clinics (E3).³⁵
- Some handover systems if carefully co-developed with users and using a number of methods to implement (E3).³⁶
- Some approaches to medication reconciliation can reduce errors, may reduce adverse drug events and are likely to save extra costs and suffering caused by such events, if carefully co-designed with users. Specially designed computer-based systems are more effective than electronic medical record (EMR) add-ons (E4).³⁷

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- Some clinical pathway approaches can reduce in-hospital complications and improve documentation, and give lower length of stay, with likely cost savings (E3), but the evidence from studies is conflicting.³⁸⁻⁴⁰

The evidence to date is that these coordination changes probably cost more than they save:

- some disease management for rheumatoid arthritis patients (E3)⁴¹
- UK virtual wards, without careful patient targeting.⁴²

Coordination value improvements that look promising

There are a number of changes where there is little or no evidence, but which hold promise both for saving money and suffering from under-coordination.

These include:

- better patient–practitioner communication and collaboration
- information technology coordination improvements
- payment schemes for longer episodes of care
- some shared care schemes
- some interventions for more appropriate referrals to hospitals
- some schemes for formal cooperation and liaison
- some sustained disease management
- some specialists located on site in primary healthcare
- some practice-based multidisciplinary interventions.

Chapter 4

Guidance for practice

Part three of volume two (the full report) gives the practical implications for different stakeholders of the evidence presented. Tables 4.1 and 4.2 in this section present some of this analysis.

Table 4.1 provides a way to match a problem to a possible evidence-based solution, as well as giving recommendations about practical local implementation. Table 4.2 (page 14) shows specific patient conditions and the coordination value improvements that may be appropriate for them.

4.1 Guidance A: matching the problem to the solution

Table 4.1 lists:

- **The problem.** This refers to an issue experienced by patients, and avoidable waste, caused by under-coordination.
- **Possible solutions, for which there is some evidence.** Details about the strength about evidence are given in section two of this review.
- **Recommendations.** This column gives specific advice about local action, emphasising the need to adapt and test any solution.

Table 4.1: matching the problem to the solution

Problem	Solution evidence	Recommendations
Generally, for all coordination problems and solutions		
Patient harm, poor quality and wasted time and resources caused by under-coordination. Start by identifying patients most at risk or suffering due to under-coordination.	Evidence about methods and models of care that increase quality and reduce waste, but that cost less to implement than the savings or extra income they bring – either potentially or in the current financing system. Ideally, the evidence will also be about how to make the change, and the costs of making the change, not just whether the change improves quality and reduces costs.	Use the research to identify potential coordination value improvements and then estimate local cost, spend costs, and savings with the current financing system, or use a Return on Investment (ROI) calculator ⁴³ or business case method (for example, Martin et al 2009, ⁴⁴ or Nolan and Bisognano 2006). ⁴⁵ Consider establishing a cost and saving sharing agent (CaSSA) for situations where one provider gains from another provider's spending on coordination improvement.

Table 4.1: matching the problem to the solution

Problem	Solution evidence	Recommendations
Matching patient need to provider coordination		
<p>Referrals: patients who are not referred to a specialist deteriorate and need more costly care, while others are referred unnecessarily.</p> <p>Delays: these often take place before specialist consultation.</p> <p>Inappropriate referrals: inappropriate referrals to specialists cost money and uses appointments needed by other patients.</p>	<p>Co-location: on its own, co-location may not cost less, but it usually gives some quality improvement.</p>	<p>Consider which patients this solution would be most likely to benefit, and estimate costs and savings of co-location and which additional changes are needed and their costs to ensure the effective cross-working made easier by physical proximity then occurs.</p>
	<p>Specialist outreach clinics: some schemes improved patient access (decreased cost, distance and travel time), attendance at clinics, the quality of care (adherence to guidelines and to treatment) and health outcomes, but some cost more than they saved.</p>	<p>If quality alone is important then this is a good option, but estimate the likely reduction of hospital admissions and the costs of avoidable patient deterioration in order to judge whether costs would be saved.</p>
	<p>Telemedicine: remote consultation, patient monitoring, proactive patient reminders or combinations of all these show great promise, and could be a coordinative value improvement if information and communication technologies (ICT) infrastructure investments have already been made.</p>	<p>If someone else will pay for or share the costs of the system (and the high cost of running it), this can be a valuable improvement. Consider how much it would cost you to add video net access to specialists for specific patients, and likely savings. Consider home telemonitoring, if others can share or carry the costs of the system and if you can add the human actions that follow from the monitoring and have to pay only for staff time.</p>
	<p>Changing referral practices: two strategies are effective to reduce high inappropriate referrals by type and by provider:</p> <ul style="list-style-type: none"> – second opinion or enhanced services provided before a referral – guidelines for referrals, with standard referral forms and specialists involved in the education. <p>Other access-improving strategies for reducing delayed or non-referred patients include the two points listed above, but also specialist outreach, financial and transport changes and registers with case follow-up or case-finding personnel.</p>	<p>Identify which referrers or patients have the highest inappropriate referrals, and consider costs and likely effectiveness of these two potential interventions identified (see left).</p> <p>Identify delayed or non-referred patients and their providers, and assess the costs and quality impacts of different interventions, and the likely spend cost and impact of making the change.</p>

Table 4.1: matching the problem to the solution

Problem	Solution evidence	Recommendations
Communications		
<p>Patients not treated or receiving the wrong treatment: information or responsibility is not clearly passed on by one provider to another.</p>	<p>Handover system: the evidence mostly refers to interventions that are more sophisticated than simply a new handover form, and show the need for careful co-development of the system with users and the importance of adopting a number of interventions. Most studies show higher user satisfaction and better intermediate outcomes. Only one study reported possible loss of patient details.⁴⁶</p>	<p>Find an effective handover system that others have developed, and use this as a basis for developing a system led by local users of the system and senior clinicians.</p> <p>Most manual and computer-based handover systems reduce avoidable harm, but often cost more to make and operate than they save. Much depends on how difficult and costly it is to add a well-tested paper system to a computer system.</p> <p>Systems based on electronic medical record (EMR) only are less effective.</p>
<p>Adverse drug events and medication errors: providers do not know the patient's prior medications, or do not review the full list in relation to the patient's condition.</p>	<p>Medication reconciliation: MedRec reduces errors, is likely to reduce adverse drug events, and is likely to save extra costs and suffering caused by such events enough to pay for the cost of most manual and some computer-based MedRec systems.</p>	<p>Choose a MedRec suited to your service and adapt it and implement it collaboratively, following the examples of others. If it is properly co-implemented with high user involvement, savings are likely to cover costs and this will also help develop a quality and safety culture, which offers other benefits.</p>
<p>Inadequate discharge information: post-hospital providers receive insufficient information to plan the patient's care.</p>	<p>Discharge planning: the spend cost to develop this can be significant, but can reduce provider costs through faster discharge. A discharge care plan on its own has a minimal effect on care following discharge.</p>	<p>Consider simple, low-cost improvement to discharge information designed collaboratively with post-hospital services.</p> <p>Develop any communication change with users, based on proven examples.</p>

Table 4.1: matching the problem to the solution

Problem	Solution evidence	Recommendations
Coordination plus other changes		
Inadequate after-care arrangements: patients are discharged without adequate after-care arrangements and may need readmission.	Discharge planning linked to after-care: evidence suggests that this is more likely than patient needs assessment, or planning by the discharging unit, to reduce preventable readmission and rehospitalisation, costs and clinical deterioration.	Consider whether hospital-based or primary healthcare-based support for older patients with congestive heart failure or stroke patients could be provided, modelled on methods proven elsewhere. Make local costings and plan for how to address the issue of hospitals losing income from readmissions which would be prevented.
‘Lost’ mental health patients: patients become lost in the system or unstable and possibly a risk to others, with high cost of hospitalisation for acute crisis.	Assertive community treatment (ACT): three reviews show that ACT is effective for caring for patients with mental health problems in the community, but whether it is cost saving or saves more than costs is unclear from the research and may depend on how patients are chosen for ACT.	Assess how far it is possible to identify and predict patients likely to require admission that might be prevented by ACT. Assess whether ACT could be built into existing services and be effective at a lower cost than setting up a new ACT service. If local politics are important then this may be a good option, as it is likely to be cost neutral if well implemented, and there may be community resources to help if this is already a high-profile issue.
Inconsistent or delayed mental health treatment: mental health patients in the community experience inconsistent treatment, or cannot access care until breakdown.	Community mental health teams: unclear or no effects on cost and quality outcomes, but a potential value improvement if patients who are at risk of hospitalisation are targeted and wider social costs are considered.	Calculate local costings for models that focus on preventing avoidable admissions. These are popular with users, but with generic models the costs are high compared to any savings.
Slow access to heart specialists: patients with heart failure lack rapid access to and support from specialists.	Multidisciplinary teams and education: teams offering follow-up with specialist heart-failure nurses and patient caregiver education can both be effective for reducing costs and raising quality for patients.	Consider this approach for heart-failure patients, and calculate local cost estimates.
Patient not knowing where to seek help: errors, harm, delays in treatment and waste take place due to patients not knowing who can best help and being too ill to deal with the system, and due to providers having insufficient time to coordinate with others.	Care management: compared to process improvement, this is a lower-cost, lower-risk way to superimpose coordination over existing structures. It can improve value if those patients who can benefit most are targeted to reduce preventable hospitalisation or length of stay. There is strong evidence of improvement to the process of care indicators, but evidence of clinical and cost outcomes is weak.	Consider current hospital costs and quality deficiencies for patients with severe mental illness, and estimate costs and benefits of targeted case management for these patients, and for older people with congestive heart failure.

Table 4.1: matching the problem to the solution

Problem	Solution evidence	Recommendations
Coordination plus other changes		
Preventable deterioration: patients whose health deteriorates and may need hospitalisation due to lapses in treatment or lack of access to the right specialist during flare ups in their condition.	Disease management: some schemes can prevent unnecessary hospitalisation and may improve quality of care and support. If patients are carefully selected, some disease management schemes may cost less than the cost of care if the patient deteriorates.	Consider seriously for severely and moderately ill asthma, diabetes or heart-failure patients at risk of preventable hospitalisation. Identify those patients most likely to benefit from proven disease management programmes and calculate local cost estimates.
Over-complicated processes: delays, waste and poor quality are caused by complicated processes involving many different steps, which hinder sequential patient coordination and flow.	Patient flow process redesign: there is inconclusive evidence and publication bias in relation to the many interventions grouped under this heading. This is an abstract label referring to many different types of changes. There are some relatively successful examples of value improvement, but only in special circumstances that may not be replicated elsewhere.	Only do this if you have the capability to project manage it well, with sufficient expertise, senior clinician and middle-management involvement, and can consistently progress it over two years. It is a high-risk intervention but with the potential for high gain. Probably the most promising options to consider are integrated pathway models (built by enthusiastic clinicians) that require less radical process reorganisation. Remember that clinicians may need to respond to many different types of patients other than those in the patient flow process redesign.
Preventing unnecessary hospitalisation: patients are hospitalised when this could easily have been prevented.	Some coordination approaches cost less than hospitalisation and are preferred by some patients, and some have been found to result in better clinical outcomes.	Ensure that purchasers or some party takes the lead to identify target patient groups, collect service providers who could cooperate to prevent unnecessary admissions, agree aims, cost and saving sharing objectives, and choose and implement an agreed coordination strategy from the list in this review.

Other potential coordination value improvements that lack strong evidence

- information technology coordination improvements
- payment schemes for longer episodes of care
- shared-care schemes
- interventions for more appropriate referrals
- schemes for formal cooperation and liaison primary healthcare–specialist arrangements
- specialists located on site
- practice-based multidisciplinary interventions.

4.2 Guidance B: matching the patient conditions to solutions

Table 4.2 below gives a way of finding, for a specific patient condition, the coordination value improvements for which there is some evidence, and which could be tested locally.

Table 4.2: matching patient conditions to coordination value improvements

Patient need or condition	Potentially effective coordination value improvements
	<p><i>NB: Effectiveness locally depends on context, implementation and monetising the change.</i></p> <p><i>The E1–E4 gradings refer to the strength of evidence supporting the statement as described in the grading scale, available in 2.2.</i></p>
Asthma	Some disease management programmes targeted at severely and moderately ill patients (E1). ⁹
Diabetes	<p>Some disease management programmes targeted at severely and moderately ill patients (E1)⁹ and for diabetes patients in the general population (E2), (E2).^{25, 26}</p> <p>Possibly certain shared care interventions (E4).⁴⁷</p>
Depression	Some disease management programmes targeted at severely and moderately ill patients (E1). ¹⁰
Heart failure	<p>Some disease management programmes targeted at severely and moderately ill patients (E1)⁹ and for heart-failure patients in the general population (E2).^{25, 26}</p> <p>Multidisciplinary teams giving follow-up with specialist heart-failure nurses, and patient caregiver education (E2).¹²</p> <p>Some discharge planning programmes with support, for older patients with congestive heart failure (E2).¹³</p> <p>Some carefully targeted case management approaches for older people with congestive heart failure (E1).³³</p> <p>Nurse-led and team post-hospital interventions for congestive heart-failure patients (E3),¹⁴⁻¹⁶ but only if started before or soon after discharge, focusing on high-risk patients, and using face-to-face encounters with nurse care managers rather than telephone-only contact (E3).¹⁷</p> <p>Possibly remote patient management in-home monitoring and coaching after hospitalisation for congestive heart failure (E4).⁸</p>
Heart disease in the general population	Disease management with multidisciplinary teams and specialised clinics (E1), ¹⁶ especially those with telephone follow-up or a home-based component (E1). ⁴⁹
Severe mental illness	<p>Some case management approaches targeted to particular patients (E1) Gorey et al 1998,³⁰ (E1) Ziguras and Stuart (2000),³¹ but questioned by Marshall (1998) (E1).³²</p> <p>Possibly assertive community treatment improves quality but lower costs uncertain, (E2) Latimer (1999),²⁸ (E1) Marshall and Lockwood (2000),²⁹ (E1) Ziguras 2000.³¹</p>

Table 4.2: matching patient conditions to coordination value improvements

Patient need or condition	Potentially effective coordination value improvements <i>NB: Effectiveness locally depends on context, implementation and monetising the change.</i> <i>The E1–E4 gradings refer to the strength of evidence supporting the statement as described in the grading scale, available in 2.2.</i>
Older patients with complex needs leaving hospital	Transitional Care Model (TCM) (E3), Naylor et al 1999, ¹⁹ and 2004, ²⁰ (and for other patients (E3) Coleman et al 2006). ²¹
Older patients in the general population	Some disease management programmes (E2). ²⁴
Stroke	Team coordination giving early coordinated discharge from hospital and providing post-discharge care and rehabilitation at home (E3). ¹⁸
Hospital patients	Some handover systems, if carefully co-developed with users and using a number of methods to implement (E4). Some approaches to medication reconciliation (E4). Some clinical pathway approaches (E3). Some rapid response teams (or medical emergency teams, or critical care outreach teams).
Many types of patient in primary care	Some specialist outreach clinics (E3). ³⁵ Possibly specialists located on site in primary healthcare – especially mental health workers (E3). ⁵⁰ Possibly schemes for formal cooperation and liaison arrangements to involve and link UK primary medical practitioners with specialist teams, especially those targeting high-risk patients (E2). ⁵¹ Possibly tele-rehabilitation interventions in the community (E4), ⁵² and remote patient management (E4). ⁴⁸

Chapter 5

Conclusions and recommendations

5.1 Conclusions

When time and money is short, coordination can suffer, especially if the extra time to communicate is unpaid. The systems needed to support professionals and care workers to coordinate their clinical care are often absent or badly designed, and may be expensive to introduce and maintain. However, there is growing evidence of the avoidable suffering and costs caused by under-coordination.

This review found evidence that better coordination of providers' care can save money and improve quality for patients. But it depends on which way is used to coordinate, and how well the approach is implemented. Savings depend on whose perspective we take and how providers are paid – often providers spending the money on better coordination do not make savings.

Many changes for better care coordination have not been well evaluated, so it is important to consider promising as well as proven changes. Also, a change found to have little effect in one place may work somewhere else – no evidence does not mean that a change cannot save money and raise quality.

There is evidence also that better coordination combined with other changes can save money and raise quality. These include: models of care to prevent hospital admissions (some disease management, case management, and multidisciplinary team-based approaches) and other chronic care and illness prevention models.

The most cost-effective approaches are those that use good data to identify the patients most at risk of deterioration, which make efforts to reach these patients, and effectively coordinate the right type of care and self-care services.

These clinical interventions need implementation interventions such as a training programme or changes to computer systems. Many of these methods for implementing coordination changes have not been evaluated. Local results will depend on how well it is implemented, which often involves adaption and local testing and revision.

The success of local implementation, in turn depends on interventions to enable implementation, and whether the financial, regulatory, and cultural environment helps or hinders coordination improvement. The analysis in the review also found changes in payment systems, regulation, professional education and codes of practice are needed to create environments to encourage coordination. These changes are needed to counteract the increasing fragmentation and pressures to neglect coordination.

It is possible that those who suffer most from under-coordination are people who are poor, vulnerable and/or from ethnic minorities. The avoidable deterioration of their health is likely to result in high costs for public systems. Researchers have neglected these groups, perhaps even more than health providers have.

5.2 Recommendations

The recommendations below are further detailed in the analysis and conclusions of the full review report: Volume 2.

Patients are advised to consider how well a service connects with others when choosing a service. Do not assume that providers have the correct information (especially information about medications), ask them to say what they have written in their notes, and ask them to coordinate with others providing care, while ensuring the data remains secure. Some indications about how well providers coordinate care can be found from safety and quality measures reported on public websites.

Practitioners and provider organisations can use the research to choose interventions that could save money and raise quality, and work to adapt them for local conditions and test if they do so. Responsibility and accountability for coordination should be more clearly defined in work descriptions, contracts and other policies and procedures.

Purchasers and regulators need to identify which problems cause the most suffering and waste, and which of those it is most cost-effective to reduce. Actions which help others to make improvements include revising payment systems to incentivise effective coordination and working out ways to share costs and savings between stakeholders using costs and savings spreading agencies (CaSSAs). Regulators can speed up changes by setting standards and assessing performance – especially for coordination between different services.

Professional associations have a leadership role locally and nationally to counteract the pressures which are making it more difficult and costly for their members to collaborate with others in providing care for patients. This role can include emphasising the importance and ethics of communication and collaboration within professional roles, providing training, publicising evidence of costs, safety and clinical consequences of poor coordination, peer audit and peer education, developing specific coordination roles with the profession and lobbying for changes in payment systems and support systems to promote coordination.

Researchers and research funders have neglected this important subject – priorities are to discover:

- Which patients are most affected by under-coordination, and how it affects them, their families and the health and welfare system as a whole?
- How under-coordination affects poor and vulnerable patients?
- Which combinations of conditions are most common within multiple morbidity, and how should care be best coordinated and treated?
- Which research designs best link outcomes to good or bad coordination?
- Where effective interventions are proven, in which circumstances are they more or less effective, and how can they be best spread widely and more quickly?
- Develop theories about how effective interventions do and do not work in different settings.

More recommendations for each group, informed by the research review, are given in the full report.¹

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ISBN 978-1-906461-28-7

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