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COORDINATION OF CARE WITHIN PRIMARY HEALTH CARE AND WITH OTHER SECTORS: A SYSTEMATIC REVIEW

Gawaine Powell Davies
Professor Mark Harris
Dr David Perkins
Professor Martin Roland
Ms Anna Williams
Ms Karen Larsen
Ms Julie McDonald

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PREFACE

This is a final report of a systematic review that focused on coordination of care within Primary Health Care and between Primary Health Care and other health or health related services.

The review was funded by the Australian Primary Health Care Research Institute (APHCRI), as part of Stream four, and was one of three reviews being undertaken at the same time focusing on integration, coordination and multidisciplinary care.

Ethics approval for this project was obtained from the University of New South Wales Human Research Ethics Committee (067034).

THE RESEARCH TEAM

The review was conducted by the UNSW Research Centre for Primary Health Care and Equity (CPHCE) at the University of New South Wales in association with the University of Manchester (UK).

The research team consisted of Gawaine Powell Davies[1], Professor Mark Harris[1], Dr David Perkins[1], Professor Martin Roland[2], Ms Anna Williams[1], Ms Karen Larsen[1], Ms Julie McDonald[1], and Dr Judy Proudfoot[1].

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1 The UNSW Research Centre for Primary Health Care and Equity

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Centre for Primary Health Care and Equity
School of Public Health and Community Medicine
University of New South Wales
NSW 2052 Australia

T: +61 2 9385 1547
F: +61 2 9385 1513
E: cphce@unsw.edu.au
W: www.cphce.unsw.edu.au

Australian Primary Health Care Research Institute (APHCRI)
ANU College of Medicine and Health Sciences
Building 62, Cnr Mills and Eggleston Roads
The Australian National University
Canberra ACT 0200

T: +61 2 6125 0766
F: +61 2 6125 2254
E: aphcri@anu.edu.au
W: www.anu.edu.au/aphcri

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1. BACKGROUND AND RATIONALE

Coordination of care is a an important issue in a health system where an increasing number of people are seeking complex care, often due to age or chronic conditions, from a health system that is often fragmented and highly specialised. This review addresses the issue through two research questions:

> What strategies have been used to improve coordination of care within primary health care and between primary health care, health and health related services in Australia and other countries with comparable health system?
>
> What is known about the costs and effectiveness of the strategies in different contexts?

METHODS

Studies were sought through the main electronic databases, followed by a limited snowballing exercise, using a wide range of terms combined with 'integration', 'coordination', 'multidisciplinary care' and 'primary health care' to develop both title and key word searches. For primary studies methods were assessed using the Cochrane filter for identifying RCTs clinical trials and evaluated studies, and the Scottish Intercollegiate Guidelines Network (SIGN) filter was used for the systematic reviews. In addition, information was collated on major national and State/Territory integration initiatives and policies through searches of web sites and consultation with key informants and representatives from State Health Departments.

Only studies that focused on coordination of care within primary health care or between primary health care and other services were included. 85 primary studies and 21 previous systematic reviews were selected. The primary studies were assessed for methodological rigour using a published quality checklist (Quality Assessment Tool for Quantitative Studies, Effective Public Health Practice Project) and five studies were excluded from the analysis of effectiveness in question 2.

For question 1, data were extracted by two researchers. The strategies reported in each study were analysed categories developed to describe them in terms of the way they contributed to coordination of care. For question 2, studies were analysed in terms of their strategies and the health, patient satisfaction and economic outcomes that they reported. For each type of outcome the 'significant outcome rate' was computed as the percentage of studies reporting least one statistically significant positive result. The significant outcome rates for strategy types were analysed by clinical issue addressed setting and country. The differential impact of each strategy types was also assessed.

Most of the systematic reviews had approached their topics from a rather different angle from the one taken in this review. Their results were therefore analysed separately and used to confirm or disconfirm findings from the primary studies.

RESULTS

Most primary studies were concerned with one of three areas of health care: chronic diseases (cardiovascular disease, diabetes, asthma, chronic obstructive pulmonary disease and AIDS/HIV - 38.9%), mental health (including substance abuse - 28.2%) and aged care (including palliative care - 17.6%). The greatest number was concerned

with the interface between primary health care and a specialist provider or service (47%). A number of studies also covered the interface between primary health care and hospitals (34.1%). 16.5% of the studies addressed linkages between providers or services located within primary health care.

Nine broad categories of strategy were identified. These are shown in the box below

Main types of strategies for coordinating care: relating to

Communication between service providers (68.2% of studies)

Use of systems to support the coordination of care (58.8% of studies)

Coordinating clinical activities (44.7% of studies)

Support for service providers (43.5% of studies)

Support for patients (20.0 % of studies)

Relationships between service providers (42.3% of studies)

Joint planning, funding and/or management (7% of studies)

Agreements between organisations (3.5% of studies)

The organisation of the health care system (1.2% of studies)

Outcomes were assessed in terms of the percentage of studies reporting health or patient satisfaction outcomes that had significant positive results. In terms of health outcomes, the most successful studies were those addressing *relationships between service providers* (65.5%), *arrangements for coordinating clinical activities* (61.3%) and *use of systems to support coordination* (60.5%). For patient satisfaction, the most successful were those addressing *relationships between service providers* (66.7%), *support for clinicians* (57.1%) *communication between service providers* (54.5%), and *support for patients* (50.0%).

While there were some variations by setting and health issue addressed, in general it was strategies that involved providing systems and structure to support coordination that were the most successful in achieving significant health outcomes, and those that involved communication and support that were most successful in achieving patient satisfaction (although the relationship between service providers was important here too).

OPTIONS FOR POLICY AND PRACTICE

The following opportunities were suggested for supporting successful strategies for coordinating care in Australia.

Supporting coordination of clinical activities

- Developing service networks and arrangements for improve access to allied health and other community based services for early intervention to prevent diabetes and heart disease

Strengthening relationships between service providers

- Strengthening general practice multidisciplinary teams including the role of practice nurses in chronic disease management
- Co-locating general practice and other services, and investing in the systems to support coordination of care between co-located systems
- Strengthening the link between patient and primary health care providers, particularly for those with complex care needs
- Developing stronger networks of service providers

Use of tools, instruments or systems to support coordination of care

- Further developing tools (e.g. common assessments, care plans, decision supports) that can be used by a range of providers across both national and state funded services and integrated in the care provided by different services
- Develop systems for communicating or sharing information between primary health care and other service providers
- Structures, particularly at regional level, which are able to develop the structures and systems to support coordination of care.

2. INTRODUCTION

As the population ages and rates of chronic diseases (and in particular co-morbidities) grow, an increasing number of people are receiving complex regimes of care from a range of different health service providers, often intermittent hospital or specialist care in addition to on ongoing care in the community. Increasing specialisation in health services has tended to increase this complexity. While specialisation may bring benefits in the form of more effective care for specific problems, it creates a counter-balancing need for effective coordination so that people with complex care needs receive care that is comprehensive and continuous and allows them to self manage effectively. As van Raak says:

> These developments call for a careful coordination of services, collaboration of service providers and involvement of patients (WHO 2003 cited in van Raak 2005)

As a result the care of patients does not meet standards set in evidence-based guidelines both in Australia and overseas (Seddon et al 2001). Only 50% of patients receive optimum evidence-based clinical care (Briganti et al 2003).

Coordination is made more difficult by the boundaries that exist within health services. In Australia care are provided from services are provided in different locations, by people with a different professional background working in the private or public sectors and often part of health services that are accountable to different levels of government. Each of these boundaries can complicate the task of coordinating care.

Care coordination is one of the drivers for current concerns about health service integration. This rather imprecise term (Kodner 2002) covers initiatives at the micro (patient and service provider), meso (health service organisation) and macro (health service) levels to enable the different parts of the health care system to work more effectively together to provide efficient and effective health care. These initiatives themselves need to be linked: policy and service development must take account of the realities of service provision, which in turn needs appropriate policies and organisational arrangements to support it.

In Australia the national and state/territory governments all have policies relating to integration and coordination of care. Strategies and programs with a clear aim of improving integration and coordination of care include organisational developments such as the Divisions of General Practice program and the Primary Care Partnerships in Victoria; strategies for specific health issues such as the National Chronic Disease Strategy and the National Mental Health Strategy; funding initiatives to support more comprehensive and coordinated care such as the Medicare Benefits Schedule items for chronic disease management; and programs to support self management. In addition, direct trials of care coordination have been carried out through programs such as the Coordinated Care trials (Commonwealth Department of Health and Aged Care 2001).

These developments include a broad mix of elements being implemented across the macro, meso and micro levels. While these are all needed, their effectiveness depends ultimately on the way in which health care is provided at the level of patient and provider the patient care team (Wagner 2000). As Robinson has commented:

> Most concerns relating to linkages are addressed from the perspective of the macro policy environment rather than having a focus on what actually makes linkages work at the micro level of practice; that is, while much has been written outlining concerns with linkage at the level of inter-governmental relations and the fragmentation of services, little research has been carried out which aims to flesh out strategies that practitioners in the field might employ to develop more collaborative relationships among groups of service providers at local level (Robinson 1998)

This review was originally intended to range more broadly across different levels of integration, but in the process of development the focus was limited to coordination of care between service providers. The original research questions were:

1. what is meant by integration, coordination and multidisciplinary care in relation to health and health related services?

2. what strategies have been implemented to improve integration and coordination within primary health care (PHC) and between PHC, health and health related services in Australia and other countries with comparable health system?

3. what is known about the costs and effectiveness of the strategies in different contexts?

These were modified to:

1. what strategies have been used to improve coordination of care within primary health care and between primary health care, health and health related services in Australia and other countries with comparable health system?

2. what is known about the costs and effectiveness of the strategies in different contexts?

The original intention was to measure the effectiveness of strategies in terms of their impact on coordination and continuity of care. However for most studies the information available in this area was too limited and heterogeneous to be used as the basis for analysis. We therefore analysed effectiveness in terms of health, patient satisfaction and economic outcomes.

'Comparable countries' for the purposes of this review are the United States, Canada, the United Kingdom, the Netherlands and New Zealand.

This report has four main sections. The first outlines the methods used in the review, including the selection of studies and the way these were analysed. The next section identifies the strategies for coordinating care that are described in these studies, and develops a framework for drawing these strategies into main types. The third section reviews evidence from these studies about the impact of care coordination strategies on health outcomes, patient satisfaction and costs. The final section discusses these results and considers their implications for Australian health policy.

3. METHODS

PRIMARY STUDIES

SEARCH STRATEGY

The search strategy was developed in consultation with a UNSW Biomedical Librarian and key informants and through a process of testing and refinement to identify the relevant databases and the combinations of terms that were most sensitive for identifying relevant studies.

The strategy involved searching for primary studies through electronic databases followed by a limited snowballing exercise. In addition, information was sought on major national and State/Territory integration initiatives and policies through searches of web sites and consultation with key informants and representatives from State Health Departments.

Most of the primary research studies were identified through electronic databases. These included ABI Global (Proquest), Australasian Medical Index (AMI), CINAHL, Campbell Collaboration, APAIS, EMBASE, Global Health, Health and Society, Medline, PsychINFO, Social Science Index and the Cochrane Collaboration database. The search was conducted during February and March 2006.

Studies were also identified by snowballing from the reference list of a very comprehensive “Rapid Appraisal Review” (Singh 2005). The list of studies included in the rapid appraisal was reviewed and any articles that had not been retrieved by the electronic database searches were reviewed.

SEARCH CRITERIA

A wide range of terms were combined with ‘integration’, ‘coordination’, ‘multidisciplinary care’ and ‘primary health care’ to develop both title and key word searches (appendix 1). Potential search terms were tested in each of the databases to identify subject headings and relevant text word searches appropriate to each database. The search strategy was the run and achieved a “hit rate” of approximately 50%, i.e. at least 50% of the studies retrieved appeared relevant to the topic area of interest based on a review of titles. After a review of a range of methodological filters using Medline as a test database, the Cochrane filter for identifying RCTs clinical trials and evaluated studies was chosen for the primary studies and the Scottish Intercollegiate Guidelines Network (SIGN) filter for the systematic reviews. These were modified and tested in Medline and then used as the basis for developing filters for other databases. All studies were stored using Endnote 7.0.

Inclusion and Exclusion Criteria

Decisions as to whether to include or exclude studies from the review were made at two stages: an initial assessment and a further assessment based on the relevance and main focus of the studies.

Two independent researchers assessed all the studies at each step, with discrepancies either being debated by the team or discussed by the reviewers. The article assessment process was recorded in Excel 2003.

Initial assessment

In the initial assessment two researchers (AW & KL) reviewed the titles and abstracts for inclusion using the following criteria:

- language (studies published in English)
- origin (studies that originated from the suggested comparable countries (Canada, New Zealand, UK, US, Netherlands))
- study design (experimental studies (RCTs and quasi-experimental) and evaluation studies (trials, pilots, intervention studies, controlled before and after, comparative studies).
- evidence that the strategy had been implemented, (the study reported the results of an evaluation study or pilot/trial study).

Studies were excluded if:

- the title of the article indicated no direct relevance to the subject of the review
- the abstract (and/or author) were missing and the title did not indicate that the article was of major significance

Assessment based on relevance and main focus

At this stage the full articles were retrieved for the remaining studies and reviewed simultaneously by two researchers for relevance (KL & GPD) and main focus (AW & DP). Discrepancies either being debated by the team or discussed by the reviewers until agreement was reached.

The *relevance check* involved re-applying the initial inclusion criteria for verification and then assessing the content of the studies for relevance to the research questions. Studies were excluded if they did not meet the original inclusion criteria and or did not involve primary health care or include a component related to integration of health services. Non-experimental studies were also excluded at this stage.

The *main focus check* excluded studies if the intervention did not seek to make care that involved primary health care more continuous or comprehensive, or to increase the linkage between primary health care and other health or health related services.

Excluded studies were audited by a third researcher (GPD or MH). Any discrepancies were resolved by discussion within the team. Studies that were excluded and included are found at appendices 2 and 3 respectively.

Quality Assessment

A published quality checklist (Quality Assessment Tool For Quantitative Studies, Effective Public Health Practice Project[3]), was used to assess the methodological rigor of the included studies (appendix 9). The quality checks were undertaken by two independent researchers (UNSW statistician and a Cochrane researcher). The Cochrane researcher performed the majority of the checks, with the UNSW Statistician checking an overlapping sample of 19% of the dataset to establish reliability. A one-way Anova was used to calculate mean squares of the scores, giving a coefficient of 0.56.

[3] Available from hhtp://www.myhamilton.ca/myhamilton/CityandGovernment/HealthandSocialServices

A cut off was set at a mean score of 2.0 out of 3. Studies scoring less than 2.0 were excluded from question 3 (the effectiveness of strategies) but retained for question 2, which involved creating a typology of strategies used to coordinate care but not an assessment of outcomes.

Data Extraction

A data extraction template was developed for the data required for question 2 and to provide context for question 3 (appendix 10). Two independent researchers (GPD & KL) extracted information from half the studies each and then reviewed the entire set together to check reliability and resolve any queries. Where discrepancies were found, the study was reviewed by both researchers and discussed until agreement was reached. If agreement could not be reached, it was discussed with a third member of the research team (AW or DP)

The findings of each of the studies were extracted separately by a third researcher (AW) into a Word document. KL checked reliability by correlating the extracted data against comparable fields recorded in the Access database. Where discrepancies were found, the study was reviewed by AW and KL.

Where more than one paper was found to report the same study, the main paper was used as the basis for data extraction of reported outcomes for question 3. Outcomes that were reported in other papers (but not the main paper) were added to the record for that study.

Data Analysis

Data were analysed separately for questions one and two.

Question 1

Data for question 1 were derived from full 85 studies. Frequencies were tabulated for country of origin, year of publication and study type. Categories were developed for the clinical issue addressed in the study and its setting. The four categories for the clinical issue were:

- chronic disease (cardiovascular disease, HIV/AIDs, cancer, cardiopulmonary disease);
- mental health (including substance abuse);
- aged care and palliative care; and
- other, which included dermatology, disorders of the locomotor system, blood disorders, referral patterns, and emergency department use.

The categories for setting reflected type of boundaries across which the studies were coordinating care. The four categories were

- between primary health care and specialist providers or services;
- between primary health care and hospital based services, including hospital outreach/follow up, linkages between hospitals and emergency departments;
- within primary health care;
- between primary health care and a residential aged care facility.

The strategies used in each intervention were extracted and identified as an integration strategy (i.e. being intended at least in part to contribute to coordination of care) or a non integration strategy. A content analysis was carried out and categories developed to describe the strategies in terms of their contribution to coordination of care. The strategies used in each study were then mapped to these categories and recorded in the Access database. They were also sub-categorised as to whether the coordination involved primary health care, or was confined to other services (e.g. within hospital

services). Only the former were included in the analyses for questions 1 and 2. The categories were not exclusive: for example, a strategy that was concerned with communication between service providers using a standardized proforma, was coded to under both 'communication between service providers' and 'systems to support the coordination of care'.

Question 2

Analyses for question 2 were based on the 80 studies whose methodology had passed the quality test.

Studies were analysed in terms of their strategies and outcomes. The strategies were coded using the framework developed for question 1. The outcomes were health, clinician satisfaction, patient satisfaction and economic outcomes, but clinician satisfaction was not included in more detailed analyses because of the small number of studies reporting these results. For each study it was recorded which type of outcomes were reported and whether there were any significant findings. For each type of outcome the 'significant outcome rate' was computed as the percentage of studies reporting on the outcome which achieved at least one statistically significant positive result. The significant outcome rates for strategy types were analysed by clinical issue addressed, setting and country, while the differential impact of strategy types was analysed all studies together.

PUBLISHED SYSTEMATIC REVIEWS

SEARCH STRATEGY AND SELECTION OF STUDIES

Reviews were sought using the Cochrane Library (Cochrane Reviews, DARE, HTA and NHE EED) and a list of Key MeSH subject headings. Systematic reviews found in the main search strategy were also included.

The full text of the published systematic reviews were assessed by one researcher (AW) using the same criteria for inclusion and relevance as for the primary research studies. To be included in the study, the systematic reviews had to have a primary health care focus and involve a component of integration. The methodological quality of reviews was not assessed: published systematic reviews were expected to have met satisfactory quality standards.

Information was extracted to support the synthesis of information from the primary studies and related particularly to evidence of effectiveness (question 2). Key information extracted included: article identification, year, title, objectives, core integration related components, findings (provider, service, health outcomes, costs, and patient satisfaction), and limitations to the review and key findings/conclusions.

All the reviews that met the selection criteria were analysed qualitatively to identify the type of integration strategies employed in the studies they reviewed, using the framework derived from the primary studies. This process was used to check the face validity of the framework. The subset of systematic reviews that addressed the main clinical issues in the primary studies (mental health, chronic disease and aged care) was reviewed and information extracted where outcomes were directly matched to strategies in the framework used in this review. This information was then used for triangulation to support the findings within the primary research studies and the synthesis.

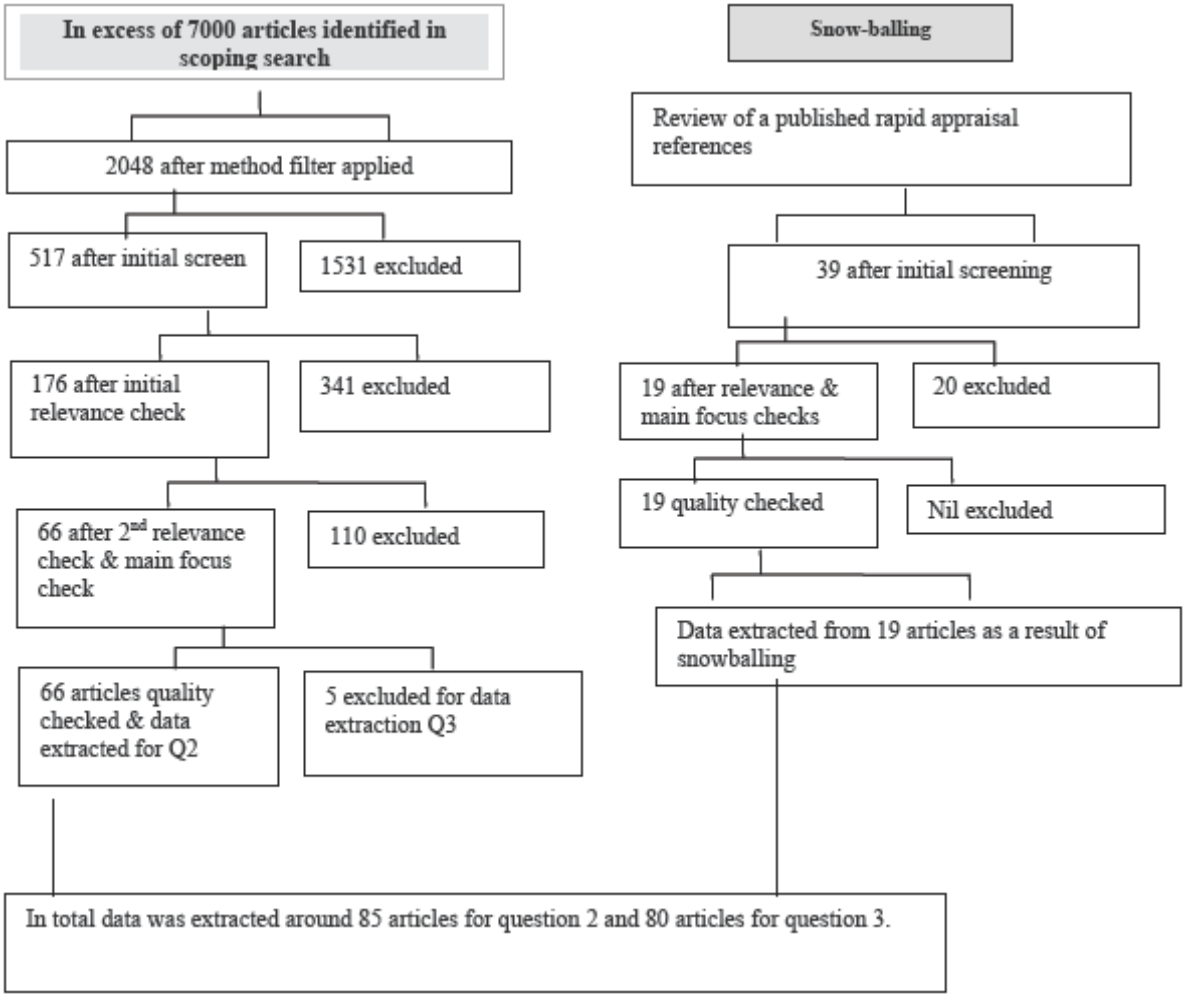
4. OVERVIEW OF INCLUDED STUDIES

PRIMARY RESEARCH STUDIES

DESCRIPTIVE RESULTS

The initial electronic database searches retrieved more than 7,000 articles. After filtering by method 2048 articles were retrieved and checked for relevance, leaving 517 articles. Snowballing added a further 19 articles and the set then checked for their relevance and main focus. This left 85 studies for data extraction and synthesis for question 1. Quality checking removed a further five articles, leaving 80 for question 2.

Figure 1: Selection process for the primary research papers



CHARACTERISTICS OF THE INCLUDED STUDIES

Table 1 shows the characteristics of the experimental studies included for questions 1 and 2.

Table 1: Study characteristics for primary research studies

	Qu 1 (n=85)		Qu 2 (n=80)	
	N	%	N	%
Study types				
Randomized controlled trial	60	70.6	57	71.3
Cluster randomized controlled trial	10	11.8	10	12.5
Multisite randomized controlled trial	4	4.7	4	5.0
Stratified randomized controlled trial	5	5.9	5	6.3
Quasi experimental studies	3	3.7	3	3.8
Prospective cohort study with a nested RCT	1	1.2	1	1.3
Comparative study	1	1.2	0	0
Mixed methods (Survey, RCT and assessment of records)	1	1.2	0	0
Total	85	100.3	81	100.2
Studies by health issue				
Chronic disease	33	38.9	30	37.5
Mental health	24	28.2	23	28.8
Aged and palliative care	15	17.6	15	18.8
Other	13	15.3	12	15.0
Total	85	100	80	100.1
Studies by setting				
Between PHC and a specialist or specialist service	40	47.0	38	47.5
PHC/hospital	29	34.1	28	35.0
Within primary health care	14	16.5	12	15.0
Between PHC and a residential aged care facility	2	2.4	2	2.5
Total	85	100	80	100.0
Studies by country				
United States	39	45.9	36	45.0
Australia	17	20.0	16	20.0
United Kingdom	17	20.0	16	20.0
Netherlands	6	7.0	6	7.5
New Zealand	3	3.5	3	3.8
Canada	3	3.5	3	3.8
Total	85	100	80	100.1

All the studies were RCTs or quasi experimental studies, with a variety of design characteristics.

The majority addressed one of three health issues: chronic diseases (cardiovascular disease, diabetes, asthma, chronic obstructive pulmonary disease and AIDS/HIV - 38.9%), mental health (including substance abuse - 28.2%) and aged care (including palliative care - 17.6%). The "other" category included referrals (in general), issues relating to medication, dental health, dermatology, blood disorders, use of emergency departments, the locomotor system and cancer.

Studies were grouped according to the setting within which they were coordinating care. The greatest numbers were concerned with the interface between primary health care and a specialist provider or service (47%). A number of studies also covered the interface between primary health care and hospitals (34.1%). These included 13 studies with hospital outreach or follow up, four studies that were concerned with linkages between primary health care and emergency departments and two that involved linkages between primary health care, hospital, and/or health related service. 16.5% of the studies addressed linkages between providers or services located within primary health care: for example GPs and community pharmacists. In addition two studies involved linkages between primary health care and residential aged care facilities.

Almost half (45.9%) of the studies were conducted in the United States. An equal number of studies were conducted in Australia and the United Kingdom (20%). Few studies were selected from the Netherlands, New Zealand or Canada.

SYSTEMATIC REVIEWS

39 systematic reviews were initially retrieved. Data were extracted from 21 that met the selection criteria. Table 2 shows the clinic issue or focus of these reviews.

Table 2: Number of Reviews by health issue or focus of the review

Clinical Issue / Focus of Review	No. Reviews	%
Mental Health	8	34.8
Aged Care	3	13.0
Chronic Disease	3	13.0
Referrals	2	8.7
GP-Specialist Interface	1	4.3
Outreach Clinics	1	4.3
Behaviour of Primary Care Physicians	1	4.3
Hospital-Community Interface	1	4.3
Vulnerable Populations	1	4.3
Total	21	100

As with the primary studies, mental health, aged care and chronic diseases (included heart disease and diabetes) were the most common issues addressed (14 studies). Outcome data associated with relevant strategies were extracted from these 14 as they related to the main health issues addressed in the primary research studies. The remaining 7 studies addressed a diverse range of other clinical or health care issues. found. The majority of the reviews were completed between 2000 and 2006

5. WHAT STRATEGIES HAVE BEEN IMPLEMENTED

RESULTS FROM THE PRIMARY STUDIES

The strategies used in the primary studies were extracted and analysed qualitatively. Twenty seven different strategies were identified, falling into nine broad types. These are shown in Table 3, where the strategy types are in the highlighted rows and the detailed strategies below them. It should be noted that these are not exclusive: most studies used several strategies. Lists of the studies using each type of strategy are found in Appendix 4.

Table 3: Breakdown of Individual Strategies that relate to the Nine Broad Categories

Strategy/strategy type	No of studies	%
Communication between service providers	58	68.2
Case conference involving PHC	30	35.3
Other communication within PHC/between PHC and other providers	30	35.3
Systems to support the coordination of care	50	58.8
Shared care plan used by PHC clinicians	27	31.8
Decision support shared by PHC clinicians and other clinicians	23	27.1
Pro formas used by PHC clinicians	11	12.9
Patient held record used for PHC care	7	8.2
Information or communication systems used by PHC clinicians	5	5.9
Shared records used by PHC clinicians	3	3.5
Register of patients used to support PHC	3	3.5
Coordinating clinical activities	38	44.7
PHC consultations coordinated with those from other providers in/outside PHC, including joint consultations	31	36.5
Shared assessment	14	16.5
Priority access to a health service	4	4.7
Support for service providers	37	43.5
Support/supervision for PHC clinicians	28	32.9
Joint training/training on collaboration involving PHC	12	14.1
Reminders for PHC clinicians	3	3.5
Facilitating communication	2	2.3
Relationships between service providers	36	42.3
Co-location between PHC and other service providers	21	24.7
Case management	15	17.6
Multi disciplinary team (MDT) involving PHC	9	10.6
Assigning a patient to a particular PHC provider	3	3.5
Support for patients	17	20.0
Joint patient education/relating to sharing care involving PHC	8	9.4
Reminders for taking part in PHC care	8	9.4
Assistance for patients for in accessing care from PHC	4	4.7
Joint planning, funding and/or management	7	8.2
Joint funding including a PHC provider/service	0	0
Joint management involving PHC provider/service	3	3.75
Joint planning involving PHC provider/service	6	7.5
Organisational agreements	3	3.5
Formal agreement involving PHC organisation	3	3.5
The organization of the health care system	1	1.2
Change to funding arrangements impacting on PHC	1	1.2

Communication between service providers

This was the most common strategy type, and was used in 62.8% of studies. Communication was defined as *case conferencing* if it involved making decisions about a patient's care and *other communication* if it involved merely the exchange of information. These were equally common. To be counted, the communication had to involve at least one primary health care provider.

Systems to support coordination of care

This was found in 58.8% of studies. The most common types were a *shared care plan* and *shared decision support.* In some cases *proformas* were used*:* for example a standard form for communication or referral. A smaller number of studies reported information systems to support coordination of care, including *shared records, patient held records, information systems* and *registers.* To be included, these needed to be used to coordinate care within primary health care or with other parts of the health system.

Coordinating clinical activities

44.7% of studies reported using this type of strategy. It included *coordinating consultations* between service providers, either as joint consultations or with some pre-determined relationship between them: for example alternating consultations between specialist team and general practitioner, or a patient having a consultation with a pharmacist before seeing a primary care physician. *Shared assessments* could be conducted jointly, or in some cases an assessment carried out in another service was used as the basis for primary health care. A few studies had arrangements for *priority access to a health service:* either from primary health care to a specialist service (if care was too complex for primary health care) or to a primary health care service.

Support for service providers

Just under half of all studies included strategies relating to support for service providers. The most common was *support or supervision* for primary health care clinicians, often from specialist services with which they were sharing care *Training* was included if it was joint training or training directly related to collaborative care. A very small number of studies also included *reminders for clinicians* – for example that they were due to see a patient – or *facilitating communication* between primary health care and other service providers.

Support to patients

This was included in only 20.0% of studies. It included *joint patient education* between primary health care and other service providers, or education relating to sharing care, *reminders* for taking part in primary health care and *assistance in accessing primary health care* – for example by having emergency department staff make a phone call to set up a follow up GP appointment rather than simply make a referral

Relationships between service providers

42.3% of the studies included at least one strategy that concerned the relationship between service providers. Co-location between PHC and other service providers was the most common, followed by case management. Only nine studies reported primary health care being involved in multidisciplinary team care. Three studies *assigned patients to particular primary health care providers*, for example to improve access to primary health care for people being treated for substance abuse.

Joint planning, funding and/or management

Few studies implemented strategies related to planning, funding and management. Six used joint planning that involved a primary health care provider or service and only three studies used joint management that involved a primary health care provider or service.

Organisational arrangements

Three studies employed a formal agreement involving a primary health care organization in creating linkages with primary health care.

Organisation of the health care system

One study included changes to funding arrangements impacting on primary health care services: this was one of the Australian Coordinated Care Trials.

The following tables show the distribution of the main strategy types across health issues, countries and settings. For lists of studies by health issue see Appendix 6.

Table 4: Use of Strategies by health Issue

Strategies relating to..	Mental health n = 21		Chronic disease n = 33		Aged care n = 15		Other N = 16	
	N	%	N	%	N	%	n	%
Coordinating clinical activities	3	14.3	23	69.7	6	40	6	37.5
Communication between service providers	17	80.9	21	63.6	12	80	8	50
Support for service providers	12	57.1	18	54.5	3	20	4	25
Support for patients	2	9.5	13	39.4	0	-	2	12.5
Systems to support coordination of care	10	47.6	24	72.7	5	33.3	11	68.6
Relationships between service providers	14	66.6	12	36.4	6	40	4	25

All three main health issues had a strong emphasis on communication between service providers. Aged care programs had the lowest reported numbers of strategies for providing support to clinicians or patients and the use of systems to support coordination of care. Studies addressing chronic disease management or aged care programs used strategies related to coordinating clinical activities more often then other studies. Mental health studies were involved in support for clinicians and the relationship between service providers more frequently, whereas chronic disease studies more often used strategies targeting the organization of clinical activities, support for patients and the use of tools, instruments or systems to support provision of care.

Table 5: Use of Strategies by Country

Strategies relating to..	US (n = 39) %	Aust (n = 17) %	UK (n = 17) %	Canada (n = 3) %	NZ (n = 3) %	Neth (n = 6) %
Coordinating clinical activities	18 46.1%	7 41.1	6 35.3	1 33.3	2 66.7	4 66.7
Communication between service providers	32 82.1%	13 74.5	7 41.2	2 66.7	2 66.7	2 33.3
Support for service providers	17 43.6%	6 35.3	10 58.8	33.3	1 33.3	2 33.3
Support for patients	5 12.8%	5 29.4	5 29.4	33.3	1 33.3	0 0
Systems to support coordination of care	23 59.0%	10 58.8	11 64.7	0 0	2 66.7	4 66.7
Relationships between service providers	27 69.2%	3 17.6	4 23.5	1 33.3	1 33.3	0 0
Service planning, funding and management	2 0.5%	3 17.6	2 11.8	0 0	0 0	0 0
Organisational agreements	0 0%	1 5.9	2 11.8	0 0	0 0	0 0

Studies in all countries had high frequencies of coordinating clinical activities, communication between service providers and support for clinicians. US based studies were more likely to include the relationship between service providers than those from other countries. Only Australia and the US had studies that used service planning/funding/management, organizational agreements or aspects of the organization of the larger health system. See Appendix 7 for lists of studies by country

Table 6: Strategies by Setting

	Studies involving primary health care and:									
Strategies relating to..	PHC n=14		Hosp (in patient) N =29		Specialist service n = 40		RACF N=2		Total N=85	
	n	%	n	%	n	%	n	%	N	%
Coordinating clinical activities	12	85.7	15	51.7	11	27.5	0	-	38	44.7
Communication between service providers	12	85.7	20	69.0	25	62.5	1	50.0	58	68.2
Support for service providers	5	35.7	11	37.9	21	52.5	0	-	37	43.5
Support for patients	4	28.6	10	34.5	3	7.5	0	-	17	20.0
Systems to support coordination of care	11	78.6	17	58.6	22	55.0	0	-	50	58.8
Relationships between service providers	7	50.0	9	31.0	20	50.0	0	-	36	42.4

Communication between service providers was common across all settings, as was the use of systems to support coordination of care (except residential aged care facilities, which involved only two studies). See Appendix 5 for lists of studies by settings.

RESULTS FROM THE SYSTEMATIC REVIEWS

Studies included in the reviews varied in their interventions, study populations and outcomes of interest. A wide range of integration strategies was used, often in combination with other interventions. Table 7 shows the types of strategies used in the reviews, mapped against the framework from the primary studies.

Table 7: Types of integration strategies used within studies within the reviews

Strategy Category	Mental Health	Aged Care	Chronic Diseases	Referral	GP-Specialist	Outreach Clinics	Behav. PCP	Hosp-Comm.	Vuln. Popns.
Coordinating clinical activities		✓	✓		✓	✓		✓	
Communication between service providers	✓	✓	✓		✓	✓		✓	
Support for service providers	✓			✓					
Support for patients	✓		✓						
Systems to support coordination of care	✓	✓	✓	✓		✓		✓	
Relationships between service providers	✓	✓	✓	✓	✓	✓		✓	✓
Service planning, funding and management		✓							
Organisational agreements		✓			✓				
Organisation of the health care system		✓		✓			✓		

Some reviews (for example the reviews on impact of payment method on the behaviour of primary care providers and on innovative models of health care and quality of care of vulnerable populations) reported little focus on integration of care and correspondingly few integration strategies. However the integration strategies that were reported in the systematic reviews fitted well into this framework.

6. WHAT IS KNOWN ABOUT THE EFFECTIVENESS OF THESE STRATEGIES?

RESULTS FROM PRIMARY STUDIES

Table 8 summarises the outcomes associated with studies using each strategy type. In this and subsequent tables the first column shows the each strategy type and the number of studies in which it was used. In columns 2,4 and 6 the figures in brackets show the number of studies using each strategy type that reported health, patient satisfaction or economic outcomes and the figures outside the brackets show the number of these that had statistically significant positive findings. Columns 3, 5 and 7 (shaded) express this as a percentage.

Many studies reported significant positive findings, but few had significant negative results. The tables in this section show significant positive outcomes only: significant negative outcomes are reported in the text in italics.

Table 8: Studies reporting outcomes and significant positive outcomes by strategy type

	Health outcome		Patient Satisfaction		Economic outcome	
Strategy type	N	%	N	%	N	%
Coordination of clinical activities (N=37)	19 (31)	61.3	4 (12)	33.3	3 (15)	20.0
Communication between service providers (N=56)	26 (47)	55.3	12 (22)	54.5	3 (21)	14.3
Support for clinicians (N=33)	16 (28)	57.1	8 (14)	57.1	1 (12)	8.3
Support for patients (N=19)	6 (17)	35.3	3 (6)	50.0	1 (7)	14.3
Systems to support coordination (N=47)	23 (38)	60.5	7 (19)	36.8	2 (13)	15.4
Relationships between service providers (N=33)	19 (29)	65.5	8 (12)	66.7	2 (12)	16.7
All studies (N=80)	36 (65)	55.4	14 (31)	45.2	5 (28)	17.9

** % = The proportion of studies measuring outcomes (health, patient, economic) that recorded a statistically significant result.

65 of the studies reported health outcomes. For all except patient support strategies the majority reported statistically significant benefits. The strategy type with the highest percentage of significant positive outcomes was relationships between service providers. *One study that implemented strategies to coordinate clinical activities and two studies that used strategies to improve communication between service providers were associated with negative health outcomes*.

31 studies reported patient satisfaction outcomes. Here only half the strategy types reported more than 50% of outcomes as significant. The highest percentage of significant results was associated with relationships between service providers such as co-location of PHC and specialist staff (66.7%), support for clinicians (57.1%) and communication between service providers (57.1%). They were least frequent in studies which used systems to support coordination.. *Significant negative patient satisfaction was reported in one study for each of the strategy types.*

Economic outcomes were measured by only 28 studies. Less than 20% of studies measuring economic outcomes found a significant positive result. One study each implementing strategies to provide tools, instruments or systems to support provision of care and to improve the relationship between service providers reported negative economic outcomes. *Negative outcomes were reported twice each in studies implementing strategies improve communication between service providers and coordinate clinical activities respectively*. A table of studies reporting economic outcomes is found in appendix 15.

Table 9: Studies reporting outcomes and significant positive outcomes by setting

	Health outcome		Pat Satisfaction		Economic outcome	
Setting	N	%	N	%	N	% +ve
PHC (N=12)	7 (12)	58.3	2 (4)	50.0	1 (7)	14.3
PHC/Hospital (N=28)	8 (21)	38.1	3 (10)	33.0	1 (9)	11.1
PHC/Specialist (N=38)	19 (30)	63.3	9 (17)	52.9	4 (11)	36.4
PHC/RACF (N=2)	2 (2)	100	(0)	-	0/ (1)	-
Total (N=80)	36 (65)	55.4	14 (31)	45.2	6 (28)	21.4

** % = The proportion of studies measuring outcomes (health, patient, economic) that recorded a statistically significant result.

Studies focusing on mental health had the highest percentage of significant positive health outcomes (68.4%) and improved patient satisfaction (66.6%) Apart from the 'other' category, the lowest percentages were found in studies concerned with aged and palliative care (46.2%), which also had the lowest percentage of significant patient outcomes (25.0%). *Two studies focused on chronic condition management reported negative health outcomes and two in the same category reported patient dissatisfaction.*

Significantly positive **economic** outcomes were found most commonly in studies concerned with aged care, but again the numbers were small. *A negative economic outcome was reported by one study that had a focus on chronic conditions and two studies that had a focus on aged/palliative care.*

The next two tables present health outcomes by setting and health issue addressed.

Table 10: Health outcomes by strategy type and setting

	PHC (N=12)		PHC-Hospital (N=28)		PHC-Specialist (N=38)	
Strategy type	N	%	N	%	N	%
Coordinating clinical activities	8 (11)	72.7	7 (11)	63.6	5 (9)	55.5
Communication between service providers	6 (11)	54.5	6 (15)	40	13 (20)	65.0
Support for clinicians	1 (4)	25.0	2 (8)	25.0	11 (15)	73.3
Support for patients	3 (6)	50.0	2 (9)	22.2	1 (2)	50.0
Systems to support coordination	6 (9)	66.7	5 (12)	41.6	12 (17)	70.6
Relationship between clinicians	5- (6)	83.3	3 (7)	42.9	11 (16)	68.8

Within primary health care, the highest percentages of significant health outcomes were associated with strategies coordinating clinical activities, using systems to support coordination and relationships between clinicians. Those involving patient support were the lowest.

In the interface between primary health care and hospitals, studies coordinating health care again had a high rate of significant positive outcomes, while outcomes from studies using systems to support coordination and involving support for clinicians were significant in only 25% of the cases.

For integration between primary health care and specialists, the highest percentage of positive outcomes was associated with support for clinicians, the use of tools, and relationships between service providers.

Table 11: Health Outcomes by strategy type and health issue

	Chronic disease (N=30)		Mental Health (N+23)		Aged & Palliative care (N+15)	
Strategy type	N	%	N	%	N	%
Coordinating clinical activities	13 (20)	65.0	3 (4)	75.0	3 (4)	75.0
Communication between service providers	12 (19)	63.2	9 (13)	69.2	4 (11)	36.4
Support for clinicians	5 (13)	38.5	8 (10)	80.0	0 (2)	0
Support for patients	6 (15)	40.0	0	0	0	0
Systems to support coordination	13 (21)	61.9	6 (7)	85.7	2 (3)	66.7
Relationship between clinicians	6 (9)	66.6	10 (14)	71.4	3 (6)	50

Results were similar across health issues except that for mental health, support for clinicians had a high rate of significant outcomes. Communication between service providers and support for clinicians had least significant outcomes for aged and palliative care, although numbers were small for the latter.

Table 12: Studies reporting outcomes by number of strategy types used

	Health		Patient satisfaction		Economic	
	N	%	N	%	N	%
No of strategy types						
1 (N=14)	4 (11)	40.0	1 (4)	25.0	2 (4)	50.0
2 (N=17)	8 (13)	61.5	4(8)	50.0	1 (6)	16.7
3 (N=19)	7(13)	53.8	3 (9)	33.3	1 (6)	16.7
4 (N=22)	13 (20)	66.7	6 (8)	75.0	2 (9)	18.1
5 (N=7)	3 (7)	42.9	0 (2)	0	0 (2)	0
6 (N=1)	1(1)	100.0	(0)	-	0 (1)	0
Total	36 (65)	55.4	14 (31)	45.2	6 (28)	21.4

** % = The proportion of studies measuring outcomes (health, patient, economic) that recorded a statistically significant result.

Studies varied in the number of strategy types they reported (Table 13). Apart from one study using six strategies, it was those using between two and four types of strategies that had the highest percentage of significantly positive health outcomes, and those using four strategies of patient satisfaction outcomes.

Table 14 shows the differential impact of each strategies type on outcomes. It compares the outcomes from studies which used each strategy type with those which did not use it. In this table this was calculated without regard for the other strategy types that those studies may have used. This was also calculated separately by comparing groups of studies matched for all other strategy types than the one in question (appendix 14). Results of the two methods of calculation were very similar. For each strategy type the first line shows the results without that strategy type, and the next line shows the results with it included.

Table 13: Differential impact of strategy types on outcomes

	Health		Patient satisfaction		Economic	
Strategy type	N	%	N	%	N	%
✕Systems for supporting coordination (n=33)	13 (27)	48.1	7 (12)	58.3	4(15)	26.7
✓Systems for supporting coordination (n=47)	23 (38)	60.5	7 (19)	36.8	2 (13)	15.4
✕Support for clinicians (n=47	22 (38)	57.9	6 (17)	35.3	5 (16)	31.2
✓Support for clinicians (n=33)	14 (27)	51.9	8 (14)	57.1	1 (12)	8.3
✕Relationship between service providers (n=47)	17 (36)	47.2	6 (19)	31.6	4 (16)	25.0
✓Relationship between service providers (n=33)	19 (29)	65.5	8 (12)	66.7	2 (12)	16.7
✕Communication between service providers COM (n=24)	10 (18)	55.6	3 (9)	33.3	3 (9)	33.3
✓Communication between service providers (n=56)	25 (48)	52.1	12 (22)	54.5	3 (21)	14.3
✕Support for patients (n=61)	33 (48)	68.8	11 (25)	44.0	5 (21)	23.9
✓Support for patients (n=19)	6 (17)	35.3	3 (6)	50.0	1 (7)	14.3
✕Coordinating clinical activities (n=43)	17 (34)	50.0	10 (19)	52.6	3 (13)	23.1
✓Coordinating clinical activities (n=37)	19 (31)	61.3	4 (12)	33.3	3 (15)	20.0

Three strategy types brought higher percentages of significant health outcomes: those related to systems for supporting coordination (71% versus 45%), relationships between clinicians in care (68% versus 46%) and coordinating clinical activities (63% versus 50%). For patient satisfaction outcomes four strategy types were associated with higher percentages of significant outcomes: relationships between clinicians (66.7 versus 31.6%), support for clinicians (57.1 versus 35.3%), communication between service providers (54.5% versus 33.3%) and support and education for patients (50% versus 44%). (33% versus 66%).

RESULTS FROM SYSTEMATIC REVIEWS

REPORTED OUTCOMES ASSOCIATED WITH INTEGRATION STRATEGIES

Table 15 shows the number and types of outcomes reported in the 14 published systematic reviews included in the analysis of the effectiveness of the strategies, grouped by whether outcomes were directly related to an individual integration strategy, to a combination of integration strategies or to a combination of integration strategies together with other components of complex interventions

Table 14: Number of statistically significant outcomes reported by the 14 reviews directly related to the evaluation of integration strategies

Health Issue / Focus of Review	No. Outcomes related to individual integration strategy	No. Outcomes related to combination of integration strategies	No Outcomes related to combination of integration strategy with other intervention
Process / Service / Provider	4	3	14
Health	3	3	7
Patient satisfaction	1	-	1
Economic	1	-	-
Total	9	6	22

Most of the studies within the published reviews involved complex interventions where the impact of the integration strategies could not be separately identified.

A larger number of the outcomes associated with an integration strategy came from the mental health reviews (Table 16). Co-location, case management, multidisciplinary teams and communication between providers were integration strategies which were used individually and in combination.

Table 15: Integration strategies evaluated for mental health

Strategy / Combination of Strategies	Outcome
Communication within PHC/between PHC & other providers	• Primary care physician called at admission discharge 81% versus 40% (p=.04) (Druss 2006)
Co-location between PHC and other service providers	• Relative improvement in physical well being score (p=.02) (Druss 2006) • Pre-post annual cost decrease greater in intervention than control (p=.02) (Druss 2006)
Multidisciplinary team involving PHC	• Reduced disability: 35.4% showing improvement in Barthel index as compared with 19.6% in the control group (p<0.05) (Turner-Stokes 2006)
Case Management	• People receiving case management were approximately twice as likely to be admitted to a psychiatric hospital (Peto odds ratio 1.84, 99% CI 1.33-2.57; n=1300) as patients receiving standard care (Marshall 2006)
Case management, Co-location and communication within PHC/between PHC and other providers	• Greater improvement in SF36 scores in the intervention group (p<.01) (Druss 2006)
Co-location and Multidisciplinary team	• Those in integrated care were more likely to be abstinent than those in usual care (p=.006) (Druss 2006)
Multidisciplinary team and coordinated primary health care consultations	• 69% of participants in the intervention group versus 53% in the control group had a successful linkage to a primary care provider (p<.001) (Druss 2006)
Case Conference, support/supervision for PHC clinician, communication between PHC/between PHC and other providers and shared decision support used by PHC providers	• Meta-analysis of 10 RCTs from the US resulted in an overall effect of RR 0.75 (85% CI 0.07-0.81) of disease management programs on depression severity compared with usual care. (Neumeyer-Gromen 2004)

In the aged care reviews, integration strategies were only found as components of generally complex interventions. Case management and multidisciplinary teams were cited more frequently.

Table 16: Integration strategies evaluated for aged care

Strategy / Combination of Strategies	Outcome
Communication between PHC/between PHC and other providers, proformas used by PHC clinicians, coordinated primary health care consultations, case management (plus medication counseling & review, counseling by clinical pharmacists, clinical measurements, telephone follow up, post discharge visits, dietary & social service consultation, review by geriatric cardiologist, community nurse visits, exercise training)	• Fewer patients randomized to comprehensive discharge planning plus some form of post discharge support experienced a readmission (RR, 0.75; 95% CI 0.64-0.88, p<.001) (Phillips 2004) • Compared with usual care, fewer intervention patients also had a CHF/CVD specific readmission (RR, 0.65; 95% CI 0.54-0.79 p=.06) (Phillips 2004) • Compared with usual care, intervention patients showed a trend towards lower all-cause mortality (RR, 0.87; 95% CI 0.73-1.03 p=.06) (Phillips 2004)
Case management, multidisciplinary team (Plus single entry point system, geriatric evaluation)	• Significant reductions in acute hospital admissions were reported for the group receiving integrated care (Johri 2003)

** Bolded text = integration strategies

Table 17: Integration strategies evaluated for chronic disease

Strategy / Combination of Strategies	Outcome
Multidisciplinary team management in a day hospital	• Deaths decreased (p<.0007) (Duffy 2004) • Functional class worsened in 11% (p<.009) (Duffy 2004) • Readmissions decreased (p=.00001) (Duffy 2004)
Communication between PHC/between PHC and other providers, coordinated primary health care consultations	• Improved QOL (p=.002) (Duffy 2004)
Multidisciplinary team, shared care plan	• Improved QOL (p=.01) (Duffy 2004)
Communication between PHC/between PHC and other providers (plus home visits by nurses who provided education, psychological support)	• Heart failure deaths decreased (p=.033) (Duffy 2004) • LOS HF patients decreases (p=.0051) (Duffy 2004) • HF readmissions decreased (p=.0444) (Duffy 2004)
Nurse led intervention focused on transition from hospital to home (hospital & community nurses)	• Fewer emergency room visits (p=.03) (Duffy 2004)
Case management	• Subgroup that saw a cardiologist had decreased readmissions (p=.03) (Duffy 2004) • Adherence to treatment plan was greater (p<.01) (Duffy 2004) • Increase patient satisfaction (p<.01) (Duffy 2004)
Communication between PHC/between PHC and other providers, visit by study nurse before discharge education & counseling, nurse & pharmacist home visit for self care assessment	• Fewer unplanned readmissions (p=.03) (Duffy 2004) • Fewer hospital days (p=.05) (Duffy 2004) • Fewer emergency room visits (p=.05) (Duffy 2004) (Duffy 2004)
Discharge planning with **multidisciplinary team**	• Fewer unplanned readmissions (p=.03 at 26 weeks, p=.05 at 78 weeks) (Duffy

Strategy / Combination of Strategies	Outcome
	2004) • Fewer unplanned days in hospital over 78 weeks (p=.04) (Duffy 2004)
Integrated HF management program among HF clinic (GP, patient & family)	• Significant greater patient satisfaction (Duffy 2004)
Multidisciplinary team providing specialized follow up (nurse-led patient education, home visit by nurse & pharmacist 7 days post discharge) Nurse led patient education, **coordination of home care**, at least 2 home visits, **standardized protocol to optimize medications** & weekly telephone contact	• Reduction in hospital readmissions RR 0.76 (95% CI 0.53-1.08) (McAlister 2001) • Reduction in hospital readmissions RR 0.75 (95% CI 0.47-1.19) with coordination of home care, 2 home visits, standardized protocol, & weekly telephone contact) (McAlister 2001)
Comprehensive discharge planning protocol, gerentological nurse providing education, coordinating care & maintaining telephone contact for 2 weeks	• Reduction in hospital readmissions RR 0.68 (95% CI 0.39-1.17) (McAlister 2001)
Follow up by **a multidisciplinary team**	• Trials that tested follow up by a multidisciplinary team demonstrated a substantial reduction in the risk of hospitalization (RR 0.77, 95% CI 0.68-0.86; test of heterogeneity p>0.50) as compared to other trials (McAlister 2001)
Multidisciplinary team, case management, patient education	• Intervention group had significantly lower HbA1c levels (Renders 2006) • Intervention group had significantly lower rates of hospital admissions (Renders 2006)
Clinical multidisciplinary team, formal integration of services, arrangements for follow up**, communication & case discussion between distant health professionals,** changes to the setting**, changes in medical record systems** & patient education	• Significant improvement in glycemic control (Renders 2006) • Significant decrease in cholesterol level (Renders 2006)

** Bolded text=integration strategies

In those reviews related to chronic diseases, specifically heart disease and diabetes, case management and multidisciplinary care were directly linked to outcomes. Other integration related outcomes that were found employed a combination of integration strategies and were part of complex interventions (Table 17)

7. DISCUSSION

SCOPE OF THE REVIEW

This review has examined how services and service providers coordinate their activities to provide more effective and efficient care for their patients. It has focused on coordination within primary health care or between primary health care and other settings, irrespective of the clinical problem being managed. This differs from most systematic reviews, which generally limit themselves to a particular clinical area or setting (see appendices 11 and 12). This makes it possible to compare approaches across the main areas in which studies were found (chronic disease care, mental health and aged care) and settings (within primary health care, between PHC and hospital or between PHC and specialist services).

The focus has been on coordinating care within primary health care or between primary health care and other parts of the health system. It has included only those elements of patient care which involve a coordinating function. Thus 'patient support' includes only education/support that is provided jointly by more than one provider or is specifically designed to support care that is shared across more than one provider. Other patient education or self management support within a particular service was not included.

As noted in the introduction, this represents one part of what is often referred to as the problem of health service integration. The problems of coordination at the level of service provider are matched by problems of coordinating service planning and policy development at regional, state and national levels and within large vertical integrated health care organisations (such as Health Maintenance Organisations). The policy challenges raised by this review relate to how higher level arrangements within and between organisations, sectors, professions and the health system as a whole can be set to support effective coordination of care.

METHODOLOGICAL ISSUES

To ensure that high quality evidence was used, this review was limited to randomised control trials and used only studies with strong designs to assess the effectiveness of strategies. However this may also have affected the range of settings and issues covered in the selected studies. RCTs tend to focus on health issues considered important enough for a major research investment, mostly with people with complex care needs. The trial itself creates an artificial environment for care and so may not accurately represent 'normal' practice.

We also drew on the results of previous systematic reviews. These provided important insights, although their complex classifications of strategies and their focus on specific conditions limited the how directly they could be compared with our analysis of primary studies.

The studies were drawn from five countries, with the largest number from the United States. Although the requirements of clinical care may be similar in different countries, the way the health services operate will help determine what problems of care coordination need to be addressed. Thus, for example some American studies were trying to coordinate care for uninsured patients, an issue which was much less significant in Australia. There were few rural or remote studies to highlight the

particular problems of coordination and effective strategies in these settings, although one Australian study did involve telemedicine.

The original intention was to measure the effectiveness of strategies in terms of their impact on coordination and continuity of care. However for most studies the information available in this area was too limited and heterogeneous to be used as the basis for analysis. We therefore analysed effectiveness in terms of health, patient satisfaction and economic outcomes. Similarly, we intended to analyse cost effectiveness, but the information available in the studies was very variable. Appendix 15 contains details of the cost information in the different studies

STRATEGIES USED TO COORDINATE CARE

The strategies used in this review were derived from an analysis of the experimental studies and then checked against the strategies reported in the systematic reviews. This ensured that the framework of strategies would be relevant to the studies, but might exclude strategy types not used in these studies. The framework was therefore compared with a framework of strategies for coordinating care developed by Kodner (Kodner 2002) and Freeman's framework for continuity of care (Freeman 2003). The frameworks were broadly comparable for the areas covered in this review. Continuity of care as an outcome was not included, nor were some of the Kodner strategies relating to health system and service organisation or aspects of the organisation of clinical care that did not relate to coordination (Appendix 13). The framework also matched the strategies identified in the systematic reviews analysed for this report.

The analysis identified nine main types of strategy, six at micro (service provider and patient) level, two at meso (health service organisation) and one at macro (health system) level. The remainder of the discussion concerns the micro level, where most of the strategies operated.

These strategies fall into two main groups. The first relates to processes used by clinicians or program staff to coordinate care. These included communication between service providers, support for service providers and support for patients. These varied in formality: for example communication ranged from regular and formal case conferences to an expectation that members of a specialist team would keep the GP informed of patient progress and changes in care.

The second group of strategies related to structural arrangements which were put in place to support these coordinating activities. These included the use of systems to support coordination (for example shared records, pro formas for communication or consistent decision support), structuring the relationship between service providers and/or the roles and responsibilities they had in providing care (co-location, case management, multi-disciplinary teams or assigning a patient to a specific primary health care service provider) and the coordination of clinical activities to promote continuity of care, including shared assessments, joint or coordinated consultations and arrangements for patients to have accelerated access to services.

Most studies used a number of different strategy types. However in some studies only one or two strategies were used. These tended to be studies where the overall task of coordination was relatively simple, either because primary health care played quite a limited role (for example, providing ongoing generalist care and being kept informed of developments in care provided by other services) or because care was being provided relatively independently (for example by Emergency Departments or hospitals and GPs

There was some variation in the types of strategies depending upon the setting of the study and the health issues that it addressed. Thus studies involving mental health were more likely than others to include strategies concerning relationships between service providers or providing support for clinicians, reflecting perhaps the need of primary health care providers for support in an area of care where they may have had limited experience and confidence. Studies relating to aged care were most likely to involve strategies for communication between service providers, perhaps reflecting the need deal flexibly with the multiple health and social problems of older people as they arose.

THE EFFECTIVENESS OF STRATEGIES

Strategies were assessed in terms of outcomes relating to health and patient satisfaction. Some information about costs was reported, but this was often incomplete and only a few studies had robust economic evaluation. The outcomes could generally only be attributed to the combination of strategies used rather than any individual strategy, and other elements of the intervention such as specific therapeutic modalities might also have an impact. Furthermore, although coordination was important in all studies, it was not always the main study factor (which might, for example, have been 'stepped mental health care'). The contribution of specific integration strategies has therefore been assessed in aggregate across studies rather than on a study by study basis.

In the primary studies the most effective types of strategy for improving health outcomes were those which provide the structures to support coordination: strengthening the relationship between service providers, coordinating clinical activities and providing tools or systems to support collaboration (Table 19).

Table 18: Strategies that provide structure to support coordination

Strategy	Specific activities
Coordination of clinical activities	▪ PHC consultations coordinated with those from other providers in/outside PHC, including joint consultations ▪ Shared assessment involving PHC clinician ▪ Arrangements for accelerated access to a PHC service/for PHC patient to non-PHC service
Relationships between service providers	▪ Co-location between PHC and other service providers ▪ Case management ▪ Multi disciplinary team (MDT) involving PHC ▪ Assigning a patient to a particular PHC provider
Systems to support the coordination of care	▪ Shared care plan used by PHC clinicians ▪ Decision support shared by PHC clinicians and other clinicians ▪ Pro formas used by PHC clinicians ▪ Patient held record used for PHC care ▪ Information or communication systems used by PHC clinicians ▪ Shared records used by PHC clinicians ▪ Register of patients used to support PHC

This reflected the findings of the systematic reviews, where significant outcomes were associated predominantly with strategies supporting coordination, particularly multi-disciplinary team care, co-location, co-ordinated primary health care consultations and case management. These strategies involve restructuring the way care is organised to a much greater extent than clinician support activities and communication between providers. This has important implications for the initiatives to improve coordination of care especially within primary care and between it and hospitals.

In cases where care was being shared between PHC and specialist teams, strategies to enhance communication between service providers and support for service providers were also effective. This was especially the case for patients with chronic disease and mental health (but not aged and palliative care). This may reflect the need for agreed approaches to communication between the large number of primary and specialist providers that may be involved in the complex care of patients with chronic diseases or mental illness.

Clinician supports such as supervision and education were found to be most effective in achieving health outcomes in mental health care. This underlines the importance of training and supporting primary care providers to provide mental health care.

Support and education for patients was, overall, the least effective type of strategy for improving health outcomes. However this is not the same as patient education or self management support in its full sense: these strategies related only to joint patient education or education and support to improve service coordination (for example, a nurse discussing with a patient what to discuss at the next appointment with the GP).

A different set of strategies were most effective in improving patient satisfaction: those which supported clinicians, strengthened relationships between clinicians and communication between service providers. Using tools and systems for coordinating service provision was associated with lower rates of patient satisfaction. This suggests that patients respond positively to the relationships and consistency of care between providers. However they may have found that the tools or systems or changes to service delivery (such as care plans) interfered with their perception of how well care was provided and their own relationship with providers. This places emphasis on the importance of engaging consumers in the development of these types of strategies and the need for evaluation of their impact on provider-patient relationships.

RELEVANCE AND IMPLICATIONS FOR AUSTRALIAN POLICY AND PRACTICE

Coordination of care has been identified as a significant problem in Australia, as in other countries with advanced health systems. The areas on which these studies focus – chronic disease, mental health, aged and palliative care and collaboration between primary health care and hospital based services – are all priority areas for integration and are the subject of current initiatives.

Certain aspects of the Australian health care system make integration of care difficult in each of these priority areas. Each involves both Commonwealth and state funded health systems, and chronic disease and mental health in particular involve a combination of publicly and privately funded services. This means that the strategies focusing on structures to support effective coordination – involving relationships between service providers, the coordination of clinical activities and the use of systems and tools – face difficulties at two levels: not only do they need to operate across different parts of the health system, but higher level collaboration is required to build

the systems and capacity that will support collaborative care. This in turn requires something generally taken for granted in these studies: incentives that operate across all sectors to encourage collaborative action. There are, however, a number of Commonwealth/state initiatives which provide an opportunity for concerted action, including the National Chronic Disease Strategy[4] and the recent Council of Australian Governments initiatives, including the Australian Better Health Initiative[5].

The key structural strategies identified in this review that support coordinated care and are associated with improved health outcomes are currently embodied in some of the general practice initiatives at Commonwealth level (Table 20).

Table 19: Strategies that provide structure to support coordination widely used in Australia

Strategy	Specific activities
Coordination of clinical activities	▪ Enhanced Primary Care ▪ Allied health and access to Psychological Services
Strengthening relationships between service providers	▪ Practice nursing ▪ More Allied Health Services program ▪ Some projects involving co-location.
Systems to support coordination of care	▪ Health Assessment in the elderly, Care plans and Team Care Arrangements ▪ Common guidelines for some chronic conditions ▪ Care plan templates

Mental health initiatives such as Better Outcomes in Mental Health have combined structural approaches such as defining roles and supporting referral between GPs and psychologists with clinician support mechanisms such as training of GPs and provision of guidelines etc. However the establishment of more formal relationships involving primary health care such as case management or multidisciplinary teams have not been common, and there has been little co-location of services across primary health care or with more specialized services. Although there are some developments at regional and state level and as part of pilots such as Health Connect, there has been little progress on the use of shared records or information systems.

State initiatives especially those at the interface between primary and hospital care, have given more attention to introducing new models of service provision (such as outreach workers for chronic illness) and to strengthening formal relationships between service providers (although much of this has been at Division rather than practice level). Here too progress has been slow in establishing shared information and communication systems.

[4] http://www.health.gov.au/internet/wcms/publishing.nsf/Content/pq-ncds
[5] http://www.health.gov.au/internet/wcms/publishing.nsf/Content/feb2006coag03.htm

OPPORTUNITIES TO APPLY THE FINDINGS OF THIS REVIEW TO POLICY AND PRACTICE

The results of this review highlight the need to provide better structural supports for coordination of care. This needs support at a number of levels: in policy and programs at national and state levels, in regional and local systems to support care coordination, and in the organisation of provider organizations, including general practices. These directions are broadly consistent with those espoused in the National Chronic Disease Strategy and other national policies.

The following suggestions highlight particular opportunities for developing the strategies found to be most effective in improving health outcomes.

Supporting coordination of clinical activities and service provision

Coordinating service provision can be particularly difficult across system boundaries: between general practice and hospitals or community health, and between generalist and specialist services. There is a long history of attempts to bridge these boundaries including GP-hospital integration programs and shared care programs. Waiting list programs have attempted to facilitate access to services for patients who need them most, and initiatives such as the More Allied Health Services program and Medicare rebates for allied health services have addressed the problem in part by strengthening the links between the general practice and (largely private) allied health service sector in preference to community health, where system differences can make coordination more difficult.

One emerging area in which there is scope for better coordinating provision across services is in the area of prevention and early intervention. The demand for services that is likely to arise from the increasing focus on prevention of diabetes and heart disease is not likely to be met from existing arrangements with the current stock of services, particularly in the area of nutrition and physical activity. New approaches to providing these services and linking them effectively with primary health care will need to be developed through careful collaboration between policy makers, service development organisations such as Divisions of General Practice, professional associations and service providers.

Relationships between service providers

Co-location alone does not guarantee better coordination of care, but it does provide opportunities for improving integration, especially when combined with multi-disciplinary team care and systems for supporting coordination. Co-location occurs to a limited extent, for example with general practitioners within Aboriginal Medical Services and some community health centres in Victoria and multi-purpose services in rural areas. NSW is currently developing integrated primary health care centres which will house both GPs and community health staff, but there are considerable difficulties working across different funding, professional and industrial relations systems. One opportunity is to use current developments to highlight practical barriers to co-location and then to address them in a systematic fashion. There is also an opportunity to use current examples of co-location to test the kinds of systems that are needed to support coordinated care, including patient records, referral information systems and relationships with patients.

As noted above, **multi disciplinary teams** are not common in Australian primary health care, and particularly in general practice. Compared to the UK, Australia has small general practice teams, providing less opportunity for multi-disciplinary care

within the practice and less capacity for developing teams with health workers outside the practice. Opportunities for developing multi-disciplinary care include supporting an increase practice nurse numbers and funding them for liaising with other services as well as providing direct patient services, and encouraging Divisions and state health services to support networks of allied health and specialist service providers. Enhanced roles for practice nurses might also include a role as case manager for people with complex care needs, with the GP providing primary medical care.

Although most people with a chronic illness in Australia get most of their primary care from a single general practice, the **relationship between patients and practitioners** is not as clear as it is in the UK and the Netherlands. There is evidence that GPs can be unsure of how far their responsibility lies in assertively following patients up (Oldroyd et al 2003), and there are reports of patients receiving GP management plans from GPs other than the one who provides their normal chronic disease care. There is scope for experimenting with different arrangements for clarifying and strengthening the **relationship between GPs and patients**, particularly those with a chronic disease or mental illness. This might take the form of a voluntary agreement between patient and doctor which spells out their mutual responsibilities, or some incentives within Medicare payments for continuity of care.

Use of systems to support coordination of care

Systems for supporting coordination of care include shared records, compatible information systems, directories of service providers, standard systems for referral to state health services. There has been considerable activity at local/regional and (in some cases) state level to create the systems that are required. However this often occurs at too low a level in the system, without agreed standards, access to appropriate expertise or commitment across different sectors of primary health care. One example of a successful development is the Victorian GP registry, which provides GP contact details to support local referral directories in the state and private health sectors. There are a number of areas where development work at a state or national level would be beneficial, including standards for clinical management systems to ensure inter-operability, computerized decision support, systems for managing information about referral systems and community health resources.

SUMMARY AND CONCLUSION

This study has reviewed strategies for coordinating care, seen through the lens of experimental studies conducted in five countries. It has developed a framework of strategies which involve clinicians and patients, and includes items relating to communication and support for clinicians and patients and also to strengthening the structures underpinning coordination of care. Combinations of strategy types have emerged as generally more effective than more single strategy types, and those relating to structural support have been shown to contribute most to improving health outcomes.

While much has been done in Australia to support coordination of care, there is still room for greater common understanding between policy makers and clinicians about what is required. This may be achieved by making stronger connections between the micro level of care coordination and higher level policies and programs, and gaining a better understanding of the relationship between them.

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