AUSTRALIAN PRIMARY HEALTH CARE
RESEARCH INSTITUTE

RESEARCH CENTRE FOR PRIMARY HEALTH CARE
AND EQUITY AT
THE UNIVERSITY OF NEW SOUTH WALES

UNIVERSITY OF MANCHESTER

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

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September 2006

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].

ACKNOWLEDGEMENTS

The research team would particularly like to acknowledge the support provided to the project by a number of key informants both within Australia and internationally who provided input into the focus of the review and comments on the emerging results. These include:

Ms Karen Peters, NSW
Mr Peter Waxman, VIC
Ms Sylvia Barry, VIC
Mr Bruce Whitby, SA
Ms Caroline Langston, WA
Ms Megan Cahill, ACT
Mr Rod Meldrum, Tasmania
Ms Victoria Rigney, Tasmania
Ms Sonia Lillico, Tasmania
Ms Lenora Lippman, Victoria
Ms Libby Kalucy, SA
Ms Eleanor Jackson-Bowers, SA
Ms Miriam Keane, SA
Dr Ingrid Muir, Netherlands
Dr Dennis Kodner, US
Dr Jackie Cumming, NZ
Ms Louise Lapierre, Canada
Dr Peter Bower, UK

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2 National Primary Care Research & Development Centre, University of Manchester

The team would also like to thank the following people for their contributions:

Mr Steve Kennedy (UNSW Biomedical Library)
Mr Upali Jayasinghe (CPHCE Statistician, UNSW)
Ms Danielle Wheeler (Quality Checks)
Ms Nicola Madden and Ms Sarah Ford (UNSW administrative assistance)
Mr John Humphries (Monash University)
Dr Terri Snowden (Royal Australian College of General Practitioners)
Ms Rachel Yates (ADGP)
Ms Chrissy Arthur (ACT DGP)
Mr Michael Kakakios
Ms Ann Maree Liddy (QDGP)
Ms Jan Newland (ANSWD)
Mr Harold Lomas, Mr Peter Halladay and Ms Piroska Wenzel (Australian Government Department of Health and Ageing)

The research reported in this paper is a project of the Australian Primary Health Care Research Institute, which is supported by a grant from the Australian Government Department of Health and Ageing under the Primary Health Care Research, Evaluation and Development Strategy. The information and opinions contained in it do not necessarily reflect the views or policies of the Australian Government Department of Health and Ageing.

Suggested citation:
Powell Davies G, Harris M, Perkins D, Roland M, Williams A, Larsen K, McDonald J. Coordination of care within primary health care and with other sectors: A systematic review. Research Centre for Primary Health Care and Equity, School of Public Health and Community Medicine, UNSW 2006.

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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.

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.

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
- 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 standardised 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.

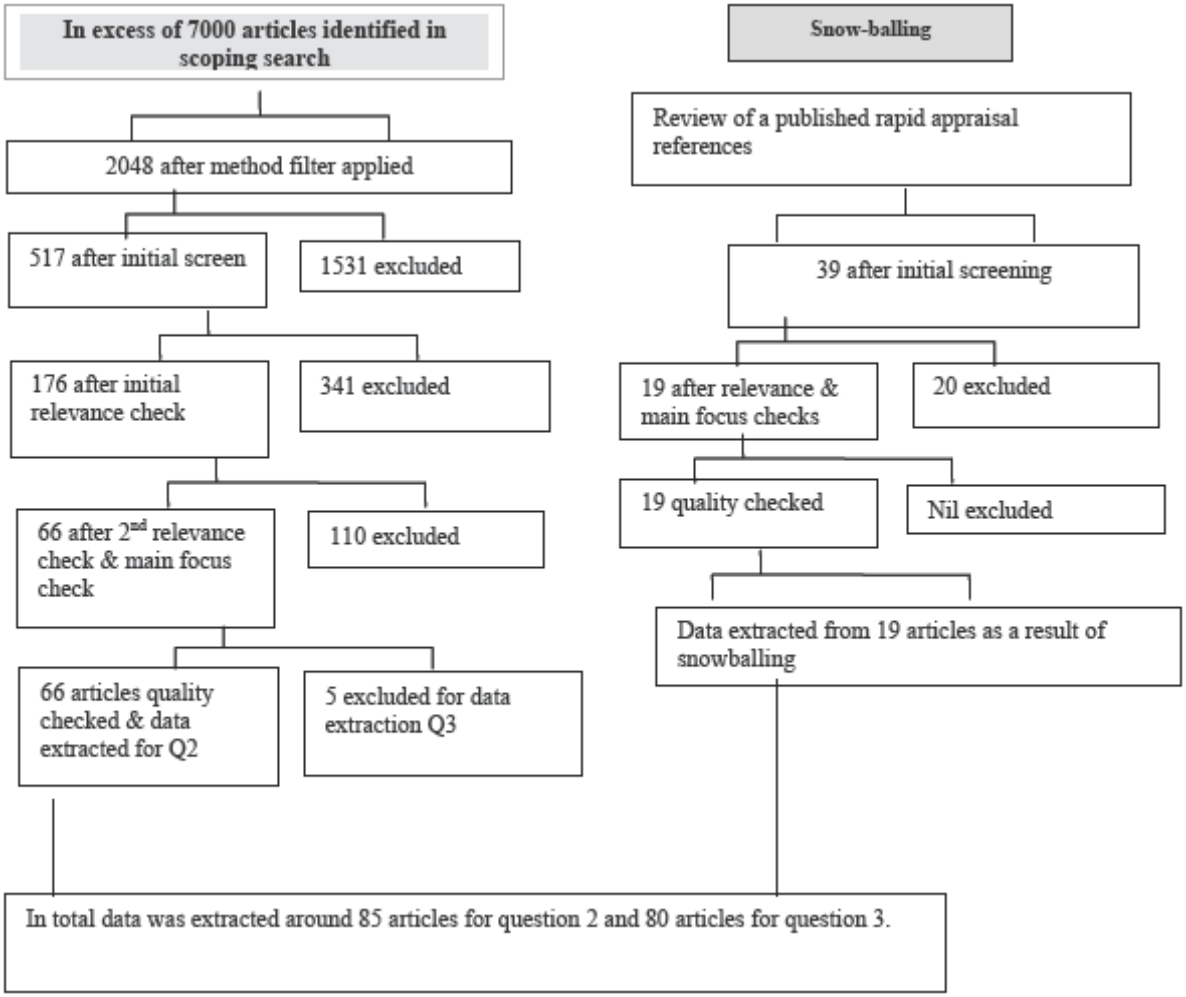
OVERVIEW OF INCLUDED STUDIES

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				
Randomised controlled trial	60	70.6	57	71.3
Cluster randomised controlled trial	10	11.8	10	12.5
Multisite randomised controlled trial	4	4.7	4	5.0
Stratified randomised 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

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 organisation 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 organisation 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 organisation 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, organisational agreements or aspects of the organisation 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.

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 randomised 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 specialised 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, **standardised protocol to optimise 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, standardised 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 hospitalisation (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)

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 specialised 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 organisations, 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, computerised 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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APPENDICES

Appendix 1: Literature Search Strategies

Table A: Search terms electronic databases

ABI Global (Proquest)	(General practi* or Family practi* or Prima* care or Primar* health or Community W/1 (hea* or care or ment*)) AND (Integrat* or Coord* or (Co ord*) or Continuity or Collaborat* or multidisciplinary or interprofessional or interdisci* or inter disci*) AND (LA(english)) AND PDN(>1/1/1995) AND PDN(<12/31/2006) AND YR(1995-2006) AND LA(English) In Citations and abstracts
AMI	((General ! (practi* or physician*)) or (Family ! (practi* or physician*)) or (Primary ! (care or medic* or health or practi*)) or (Community ! (health or medic* or care or practi* or physician* or nurs* or rehabilitation or mental)) or (Community based ! (clinic* or nurs* or health or rehabilitation or medic* or service* or primary or care or mental)) or (Home ! (health or care or medic* or nurs*)) AND ((Integrat* or (Coord* or (Co ord*)) or Bound* span* or (Continu* !3 (care or service*)) or Collaborat* or ((Multi disciplinary) or multidisciplinary) or (Interdisciplinary or (inter disciplinary)) or (Interprofessional or (Inter professional)) or Primary secondary !2 interface or Comprehensive ! (health or medic* or care or service*) or Seamless) AND (Managed care or Shared care or Case management or Care management or Clinical path* or Critical path* or (Postdischarge or (post discharge)) or Post acute or Post hospital or Organiz* !2 care or Organiz* !2 delivery or Governance) AND (LA=english and PY=1995-2006)**Systematic review filter** AND ((meta analy*) or metaanal* or (systematic* !4 (review* or overview*)) or (search* strateg*) or (selection criteria*) or PT=(meta analysis)) NOT (PT=(editorial or historical article or comment or letter or case reports) **RCT filter** AND ((randomi?ed control* trial*) or (controlled clinical trial*) or (random* allocat*) or (clin* !25 trial*) or ((singl* or doubl* or trebl* or tripl*) !25 (blind* or mask*)) or random* or (comparative stud*) or (follow up stud*) or (interrupted time) or (time series) or (intervention stud*) or (evaluat*))
APAIS	((General ! (practi* or physician*)) or (Family ! (practi* or physician*)) or (Primary ! (care or medic* or health or practi*)) or (Community ! (health or medic* or care or practi* or physician* or nurs* or rehabilitation or mental)) or (Community based ! (clinic* or nurs* or health or rehabilitation or medic* or service* or primary or care or mental)) or (Home ! (health or care or medic* or nurs*))) AND ((Integrat* or (Coord* or (Co ord*)) or Bound* span* or (Continu* !3 (care or service*)) or Collaborat* or ((Multi disciplinary) or multidisciplinary) or (Interdisciplinary or (inter disciplinary)) or (Interprofessional or (Inter professional)) or Primary secondary !2 interface or Comprehensive ! (health or medic* or care or service*) or Seamless) AND (Managed care or Shared care or Case management or Care management or Clinical path* or Critical path* or (Postdischarge or (post discharge)) or Post acute or Post hospital or Organiz* !2 care or Organiz* !2 delivery or Governance) AND (PY=1995-2006) **Systematic reviews filter** AND ((meta analy*) or metaanal* or (systematic* !4 (review* or overview*)) or (search* strateg*) or (selection criteria**)) RCT filter** AND ((randomi?ed control* trial*) or (controlled clinical trial*) or (random* allocat*) or (clin* !25 trial*) or ((singl* or doubl* or trebl* or tripl*) !25 (blind* or mask*)) or random* or (comparative stud*) or (follow up stud*) or (interrupted time) or (time series) or (intervention stud*) or (evaluat*))

Campbell Collaboration	{integrat} or {coord} or {continuity} or {multidisc} or {interprofess} or {interdisc} or {collaborat} or {shared} or {joint}AND {primary care} or {primary health} or {general practi} or {family practi} or {family physician} or {community care} or {community health} or {community mental} AND year=1995-2006
CINAHL	((General adj (practi$ or physician$)).tw. or (Family adj (practi$ or physician$)).tw. or (Primary adj (care or medic$ or health or practi$)).tw. or (Community adj (health or medic$ or care or practi$ or physician$ or nurs$ or rehabilitation or mental)).tw. or (Community based adj (clinic$ or nurs$ or health or rehabilitation or medic$ or service$ or primary or care or mental)).tw. or Community aged care.tw. or (Home adj (health or care or medic$ or nurs$)).tw. or Primary Health Care.sh. or Family Practice.sh. or Community health nursing.sh. or Community mental health nursing.sh. or Community health services.sh. or Community Health Centers.sh. or Community Mental Health Services.sh. or Physicians, Family.sh. or Home health agencies.sh. or Home health care.sh. or Rehabilitation, community based.sh.) AND ((integrat$ adj10 (care or service$ or health)).tw. or (coord$ or co ord$).tw. or bound$ span$.tw. or (Continu$ adj3 (care or service$)).tw. or collab$.tw. or (Multi disciplinary or multidisciplinary).tw. or (Interdisciplinary or inter disciplinary).tw. or (Interprofessional or Inter professional).tw. or (Primary secondary adj2 interface).tw. or (Comprehensive adj (health or medic$ or care or service$)).tw. or multiinstitutional systems.sh. or shared services, health care.sh. or interinstitutional relations.sh. or collaboration.sh. or health care delivery, integrated.sh. or medical record linkage.sh. or cooperative behavior.sh. or continuity of patient care.sh. or multidisciplinary care team.sh. or interprofessional relations.sh.) AND (managed care.tw. or care management.tw. or shared care.tw. or case management.tw. or clinical path$.tw. or (critical path$.tw. or (postdischarge or post discharge).tw. or post acute.tw. or post hospital$.tw. or (organi$ adj2 care).tw. or (organi$ adj2 delivery).tw. or governance.tw. or "Health and welfare planning".sh. or managed care programs.sh. or managed care information systems.sh. or clinical information systems.sh. or disease management.sh. or patient care plans.sh. or critical path.sh. or transitional programs.sh. or (shared adj3 care).tw. or joint plan$.tw. or (intersectoral adj (network$ or collab$)).tw. or collaborative link$.tw. or regional network$.tw.) AND english.lg (limit to yr="1995 - 2006")RCT Filter AND (exp Random Sample/ or Randomi?ed control$ trial$.tw. or Random assignment/ or Random$ allocat$.tw. or Allocat$ random$.tw. or Clinical Trials/ or clinical trial.pt. or (clin$ adj25 trial$).ti,ab. or ((singl$ or doubl$ or trebl$ or tripl$) adj25 (blind$ or mask$)).ti,ab. or random$.ti,ab. or STUDY DESIGN/ or COMPARATIVE STUDIES/ or PROGRAM EVALUATION/ or exp Evaluation Research/ or follow up stud$.tw. or Time Series/ or interrupted time.tw. or time interrupted.tw. or time series.tw.)Systematic Reviews filter AND (Meta analysis/ or meta-analy$.tw. or metaanal$.tw. or systematic review.pt. or (systematic$ adj4 (review$ or overview$)).tw. or search$ strateg$.tw. or selection criteria$.tw. or "SYSTEMATIC REVIEW"/) AND (case study.pt. or editorial.pt. or letter.pt. or commentary.pt. or historical material.pt.)

Cochrane	(In Title, Abstract or Keywords = ((General NEXT (practi* or physician*)) OR (Family NEXT (practi* or physician*)) OR (Primary NEXT (care or medic* or health or practi*)) OR (Community NEXT (health or medic* or care or practi* or physician* or nurs* or rehabilitation or mental)) OR (Community based NEXT (clinic* or nurs* or health or rehabilitation or medic* or service* or primary or care or mental)) OR "Community aged care" OR (Home NEXT (health or care or medic* or nurs*))) OR (In MeSH = (primary health care OR family practice OR Community health nursing OR Community medicine OR Community Health Centers OR Community Mental Health Services OR Physicians, Family OR Home care agencies OR Home care services))) AND (In Title, Abstract or Keywords = ((integrat* OR (coord* or co ord*) OR "bound* span*" OR (Continu* NEAR/3 (care or service*)) OR collab* OR (Multi disciplinary or multidisciplinary) OR (Interdisciplinary or inter disciplinary) OR (Interprofessional or Inter professional) OR (Primary secondary NEAR/2 interface) OR (Comprehensive NEXT (health or medic* or care or service*))) OR (in MeSH = (exp interprofessional relations OR multi institutional systems OR Interinstitutional relations OR Delivery of health care, integrated OR Medical Record Linkage OR Cooperative behavior OR Continuity of patient care))) AND (in Title, Abstract or Keywords = ("managed care" OR "care management" OR (shared NEAR/3 care*) OR "case management" OR "clinical path*" OR "critical path*" OR (postdischarge or post discharge) OR "post acute" OR "post hospital*" OR (organi* NEAR/2 care) OR (organi* NEAR/2 delivery) OR governance) OR (In MeSH = (Reimbursement, Incentive OR Regional health planning OR Health planning OR Community health planning OR Health systems plans OR Managed Care Programs OR Disease management OR Patient care team OR Patient care management OR Patient Care planning))) [limit1995 to 2006]
EMBASE	((General adj (practi$ or physician$)).tw. or (Family adj (practi$ or physician$)).tw. or (Primary adj (care or medic$ or health or practi$)).tw. or (Community adj (health or medic$ or care or practi$ or physician$ or nurs$ or rehabilitation or mental)).tw. or (Community based adj (clinic$ or nurs$ or health or rehabilitation or medic$ or service$ or primary or care or mental)).tw. or Community aged care.tw. or (Home adj (health or care or medic$ or nurs$)).tw. or exp Primary Health Care/ or general practice.sh. or community medicine.sh. or community care.sh. or general practitioner.sh. or home care.sh.) AND ((integrat$ adj10 (health or care or service$)).tw. or (coord$ or co ord$).tw. or bound$ span$.tw. or (Continu$ adj3 (care or service$)).tw. or collab$.tw. or (Multi disciplinary or multidisciplinary).tw. or (Interdisciplinary or inter disciplinary).tw. or (Interprofessional or Inter professional).tw. or (Primary secondary adj2 interface).tw. or (Comprehensive adj (health or medic$ or care or service$)).tw. or integration.sh. or exp COOPERATION/ or interdisciplinary communication.sh.) AND (managed care.tw. or care management.tw. or shared care.tw. or case management.tw. or clinical path$.tw. or critical path$.tw. or (postdischarge or post discharge).tw. or post acute.tw. or post hospital$.tw. or (organi$ adj2 care).tw. or (organi$ adj2 delivery).tw. or governance.tw. or health care organization.sh. or health care planning.sh. or managed care.sh. or disease management.sh. or clinical pathway.sh. or (shared adj3 care).tw. or joint plan$.tw. or (intersectoral adj (network$ or collab$)).tw. or collaborative link$.tw. or regional network$.tw.) AND english.lg (limit to yr="1995 - 2006") RCT filter AND ((randomized controlled trial/ or randomization/ or 54 or 55 or Clinical Trial/ or clinical study/ or (clin$ adj25 trial$).ti,ab. or ((singl$ or doubl$ or

	trebl$ or tripl$) adj25 (blind$ or mask$)).ti,ab. or random$.ti,ab. or controlled study/ or comparative study.sh. or evaluation studies/ or program evaluation/ or interrupted time.tw. or time interrupted.tw. or time series.tw. or Time Series Analysis/) NOT (animal not human).hw.) Systematic reviews filter AND (Meta Analysis/ or "Systematic Review"/ or meta-analy$.tw. or metaanal$.tw. or (systematic$ adj4 (review$ or overview$)).tw. or search$ strateg$.tw. or selection criteria$.tw.) NOT (Case Report/ or Letter/ or Note/ or Editorial/)
Global Health	((General adj (practi$ or physician$)).tw. or (Family adj (practi$ or physician$)).tw. or (Primary adj (care or medic$ or health or practi$)).tw. or (Community adj (health or medic$ or care or practi$ or physician$ or nurs$ or rehabilitation or mental)).tw. or (Community based adj (clinic$ or nurs$ or health or rehabilitation or medic$ or service$ or primary or care or mental)).tw. or (Home adj (health or care or medic$ or nurs$)).tw. or primary health care/ or general practitioners.sh. or community care.sh. or community health.sh. or community health services.sh.) AND (integrat$.tw. or (coord$ or co ord$).tw. or bound$ span$.tw. or (Continu$ adj3 (care or service$)).tw. or collab$.tw. or (Multi disciplinary or multidisciplinary).tw. or (Interdisciplinary or inter disciplinary).tw. or (Interprofessional or Inter professional).tw. or (Primary secondary adj2 interface).tw. or (Comprehensive adj (health or medic$ or care or service$)).tw. or cooperation.sh. or cooperative activities.sh. or coownership.sh. or coordination.sh. or integration.sh. or integrated systems/ or horizontal integration/ or vertical integration/) AND (managed care.tw. or care management.tw. or case management.tw. or clinical path$.tw. or critical path$.tw. or (postdischarge or post discharge).tw. or post acute.tw. or post hospital$.tw. or (organi$ adj2 care).tw. or (organi$ adj2 delivery).tw. or governance.tw. or (shared adj3 care).tw. or joint plan$.tw. or (intersectoral adj (network$ or collab$)).tw. or collaborative link$.tw.) AND English.lg (limit to yr="1995 - 2006") RCT filter AND (randomized controlled trials/ or random sampling/ or Randomi?ed control$ trial$.tw. or Random$ allocat$.tw. or controlled clinical trial$.tw. or clinical trials/ or (clin$ adj25 trial$).ti,ab. or ((singl$ or doubl$ or trebl$ or tripl$) adj25 (blind$ or mask$)).tw. or random$.ti,ab. or experimental design/ or evaluation/ or follow up stud$.tw. or program evaluation.tw. or interrupted time.tw. or time series.tw. or time series/ or comparative stud$.tw. or evaluat$ stud$.tw.) Systematic review filter AND (meta-analy$.tw. or metaanal$.tw. or (systematic$ adj4 (review$ or overview$)).tw. or search$ strateg$.tw. or selection criteria$.tw.) NOT (editorials/)
Health & Society	((General ! (practi* or physician*)) or (Family ! (practi* or physician*)) or (Primary ! (care or medic* or health or practi*)) or (Community ! (health or medic* or care or practi* or physician* or nurs* or rehabilitation or mental)) or (Community based ! (clinic* or nurs* or health or rehabilitation or medic* or service* or primary or care or mental)) or (Home ! (health or care or medic* or nurs*))) AND (Integrat* or (Coord* or (Co ord*)) or Bound* span* or (Continu* !3 (care or service*)) or Collaborat* or ((Multi disciplinary) or multidisciplinary) or (Interdisciplinary or (inter disciplinary)) or (Interprofessional or (Inter professional)) or Primary secondary !2 interface or Comprehensive ! (health or medic* or care or service*) or Seamless) AND (Managed care or Shared care or Case management or Care management or Clinical path* or Critical path* or (Postdischarge or (post discharge)) or Post acute or Post hospital or Organiz* !2 care or Organiz* !2 delivery or Governance) AND LA=english AND PY=1995-2006 **Systematic review**

	filter AND ((meta analy*) or metaanal* or (systematic* !4 (review* or overview*)) or (search* strateg*) or (selection criteria*)) **RCT filter** AND ((randomi?ed control* trial*) or (controlled clinical trial*) or (random* allocat*) or (clin* !25 trial*) or ((singl* or doubl* or trebl* or tripl*) !25 (blind* or mask*)) or random* or (comparative stud*) or (follow up stud*) or (interrupted time) or (time series) or (intervention stud*) or (evaluat*))
Medline	((General adj (practi$ or physician$)).tw. or (Family adj (practi$ or physician$)).tw. or (Primary adj (care or medic$ or health or practi$)).tw. or (Community adj (health or medic$ or care or practi$ or physician$ or nurs$ or rehabilitation or mental)).tw. or (Community based adj (clinic$ or nurs$ or health or rehabilitation or medic$ or service$ or primary or care or mental)).tw. or Community aged care.tw. or (Home adj (health or care or medic$ or nurs$)).tw. or primary health care.sh. or family practice.sh. or Community health nursing.sh. or Community medicine.sh. or Community Health Centers.sh. or Community Mental Health Services.sh. or Physicians, Family.sh. or Home care agencies.sh. or Home care services.sh.) AND ((integrat$ adj5 (care or servie$ or health)).tw. or (coord$ or co ord$).tw. or bound$ span$.tw. or (Continu$ adj3 (care or service$)).tw. or collab$.tw. or (Multi disciplinary or multidisciplinary).tw. or (Interdisciplinary or inter disciplinary).tw. or (Interprofessional or Inter professional).tw. or (Primary secondary adj2 interface).tw. or (Comprehensive adj (health or medic$ or care or service$)).tw. or exp interprofessional relations/ or multi institutional systems.sh. or Interinstitutional relations.sh. or Delivery of health care, integrated.sh. or Medical Record Linkage.sh. or Cooperative behavior.sh. or Continuity of patient care.sh.) AND (managed care.tw. or care management.tw. or (shared adj3 care$).tw. or case management.tw. or clinical path$.tw. or critical path$.tw. or (postdischarge or post discharge).tw. or post acute.tw. or post hospital$.tw. or (organi$ adj2 care).tw. or (organi$ adj2 delivery).tw. or governance.tw. or Reimbursement, Incentive.sh. or Regional health planning.sh. or Health planning.sh. or Community health planning.sh. or Health systems plans.sh. or Managed Care Programs.sh. or Disease management.sh. or Patient care team.sh. or Patient care management.sh. or Patient Care planning.sh. or joint plan$.tw. or (intersectoral adj (network$ or collab$)).tw. or collaborative link$.tw. or regional network$.tw.) AND limit to (english language and yr="1995 - 2006")**Systematic review filter** AND ((meta-analysis/ or meta-analy$.tw. or metaanal$.tw. or (systematic$ adj4 (review$ or overview$)).tw or meta-analysis.pt. or search$ strateg$.tw. or selection criteria$.tw.) NOT (case reports.pt. or letter.pt. or historical article.pt. or comment.pt. or editorial.pt.)**RCT filter** AND ((randomized controlled trial.pt. or controlled clinical trial.pt. or randomized controlled trials.sh. or random allocation.sh. or clinical trial.pt. or exp clinical trials/ or (clin$ adj25 trial$).ti,ab. or ((singl$ or doubl$ or trebl$ or tripl$) adj25 (blind$ or mask$)).ti,ab. or random$.ti,ab. or research design.sh. or comparative study.sh. or evaluation studies/ or program evaluation/ or follow up studies.sh. or interrupted time.tw. or time interrupted.tw. or time series.tw. or intervention studies.sh.) NOT (animals not human).sh.)
PsychINFO	((General adj (practi$ or physician$)).tw. or (Family adj (practi$ or physician$)).tw. or (Primary adj (care or medic$ or health or practi$)).tw. or (Community adj (health or medic$ or care or practi$ or physician$ or nurs$ or rehabilitation or mental)).tw. or (Community based adj (clinic$ or nurs$ or health or rehabilitation or medic$ or service$ or primary or care or mental)).tw. or Community aged care.tw. or (Home adj (health or care or

	medic$ or nurs$)).tw. or general practitioners.sh. or exp Primary Health Care/ or home care.sh. or community mental health.sh. or community mental health services.sh. or community mental health centers.sh.) AND ((integrat$ adj10 (care or service$ or health)).tw. or (coord$ or co ord$).tw. or bound$ span$.tw. or (Continu$ adj3 (care or service$)).tw. or collab$.tw. or (Multi disciplinary or multidisciplinary).tw. or (Interdisciplinary or inter disciplinary).tw. or (Interprofessional or Inter professional).tw. or (Primary secondary adj2 interface).tw. or (Comprehensive adj (health or medic$ or care or service$)).tw. or exp COOPERATION/ or integrated services.sh.) AND (managed care.tw. or care management.tw. or case management.tw. or clinical path$.tw. or critical path$.tw. or (postdischarge or post discharge).tw. or post acute.tw. or post hospital$.tw. or (organi$ adj2 care).tw. or (organi$ adj2 delivery).tw. or governance.tw. or managed care.sh. or (shared adj3 care).tw. or joint plan$.tw. or (intersectoral adj (network$ or collab$)).tw. or collaborative link$.tw. or regional network$.tw. or interdisciplinary treatment approach/ or discharge planning/) AND (limit to (english language and yr="1995 - 2006") **RCT filter** AND ((random sampling/ or Randomi?ed control$ trial$.tw. or Random$ allocat$.tw. or Allocat$ random$.tw. or controlled clinical trial$.tw. or treatment outcome clinical trial.md. and random$.tw. or treatment outcome clinical trial.md. or (clin$ adj25 trial$).ti,ab. or ((singl$ or doubl$ or trebl$ or tripl$) adj25 (blind$ or mask$)).ti,ab. or random$.ti,ab. or experimental design/ or empirical methods/ or evaluation/ or program evaluation/ or followup studies/ or comparative stud$.tw. or interrupted time.tw. or time series.tw. or time series/ or time interrupted.tw.) NOT (animal not human).po.) **Systematic Review filter** AND ((meta analysis/ or meta analy$.tw. or meta analysis.md. or metaanaly$.tw. or (systematic$ adj4 (review$ or overview$)).tw. or search strateg$.tw. or selection criteria$.tw.) NOT (editorial.dt. or comment reply.dt. or letter.dt.))
Social Science Index	((General<near>(practi* or physician*)) or (Family<near>(practi* or physician*)) or (Primary<near>(care or medic* or health or practi*)) or (Community<near>(health or medic* or care or practi* or physician* or nurs* or rehabilitation or mental)) or (Community based<near>(clinic* or nurs* or health or rehabilitation or medic* or service* or primary or care or mental)) or (Home<near>(health or care or medic* or nurs*))) AND ((Integrat* or (Coord* or (Co ord*))or Bound* span* or (Continu*<near/3>(care or service*))or Collaborat* or ((Multi disciplinary) or multidisciplinary)or (Interdisciplinary or (inter disciplinary))or (Interprofessional or (Inter professional))or Primary secondary <near/2> interface or Comprehensive<near>(health or medic* or care or service*)or Seamless) AND (Managed care or Shared care or Case management or Care management or Clinical path* or Critical path* or (Postdischarge or (post discharge))or Post acute or Post hospital or Organiz*<near/2>care or Organiz*<near/2>delivery or Governance) AND (py>=1995) AND (english <in> la**) Systematic reviews filter** AND ((meta analy*) or metaanal* or (systematic*<near/4>(review* or overview*)) or (search* strateg*) or (selection criteria*)) **RCT filter** AND ((randomi?ed control* trial*) or (controlled clinical trial*) or (random* allocat*) or (clin*<near/25>trial*) or ((singl* or doubl* or trebl* or tripl*)<near/25> (blind* or mask*)) or random* or (comparative stud*) or (follow up stud*) or (interrupted time) or (time series) or (intervention stud*) or evaluat* or (program evaluation))

Appendix 2: List of Excluded Studies

List of Excluded Primary Research Studies

1. Abu-Samaha, A., Networks of collaboration: challenges to electronic process improvement for health information delivery. International Journal of Health care Technology & Management, 2003. 5(3,4,5): p. 315.
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Appendix 3: List of Included Studies

List of included primary research papers. NOTE: Five papers denoted by ** were excluded from question 3 analysis based on quality assessment.

1. Aiken, L. S., J. Butner, et al. (2006). Outcome evaluation of a randomized trial of the PhoenixCare intervention: Program of case management and coordinated care for the seriously chronically ill. *Journal of Palliative Medicine* 9(1): 111-126.
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Appendix 4: Studies by strategy types used

For further details of any particular study, use the article ID or author and year to locate the study in Appendix 8.

Key for settings:

1 Within primary health care
2 Between primary health care and hospitals/hospital services
3 Between primary health care and specialist services
4 Between primary health care and residential aged care facilities

Key for health issues:

1 Chronic conditions, including diabetes, heart disease, COPD, asthma, AIDS
2 Mental health, including substance abuse
3 Aged and palliative care
4 Other

Note: both positive and negative significant outcomes are reported here

(a) Communication between service providers

Article ID	1st Author	Year	Country	Setting	Health issue
003	Arean, P	2005	US	3	2
005	Bartels, S	2004	US	3	2
009	Bogden, P	1997	US	1	1
010	Borenstein, J	2003	US	3	1
022	Choe, H	2005	US	1	1
027	Crotty, M	2004	Australia	4	3
031	Doughty, R	2002	New Zealand	2	1
033	Druss, B	2001	US	3	3
037	Finley, P	2003	US	3	2
040	Gater, R	1997	UK	3	2
042	Griswold, K	2005	US	3	2
049	Jameson, J	1995	US	1	4
051	Jolly, K	1999	UK	2	1
052	Joubert, J	2006	Australia	2	1
055	Katon, W	1997	US	3	2
056	Katon, W	1999	US	3	2
058	Katon, W	2004	US	3	2
059	Katzelnick, D	2000	US	3	2
060	Koopmans, G	1996	Netherlands	3	4
061	Krein, S	2004	US	1	1
063	Leggett, P	2004	UK	3	4
066	Lin, E	2000	US	3	2
067	Litaker, D	2003	US	1	1
073	McInnes, E	1999	Australia	2	3
074	Meeuwesen, L	1996	Netherlands	3	4
081	Naji, S	1999	UK	2	2
084	Nazareth, I	2001	UK	2	3
086	Nicholson, C	2001	Australia	2	1
095	Preen, D	2005	Australia	2	1

097	Rabow, M	2004	US	2	3
102	Reuben, D	1999	US	3	3
108	Rothman, R	2005	US	1	1
109	Roy-Byrne, P	2001	US	3	2
110	Rutherford, A	2001	Australia	2	4
111	Samet, J	2003	US	3	2
113	Sellors, J	2003	Canada	1	3
117	Smith, B	1999	Australia	2	1
119	Sommers, L	2000	US	1	3
120	Sorensen, L	2004	Australia	1	4
121	Spillane, L	1997	US	2	4
125	Straka, R	2005	US	1	1
131	Unutzer, J	2002	US	3	2
135	Wade, V	2005	Australia	2	1
141	Wood, K	1994	New Zealand	3	2
144	Caplan, G	2004	Australia	2	3
145	Marks, M	1999	Australia	2	1
146	Brand, C	2004	Australia	2	1
149	Montgomery, P	2003	Canada	2	3
170	Rollman, B	2005	US	3	2
175	Hedrick, S	2003	US	3	2
185	Drummond, N	1994	UK	2	1
193	Hermiz, O	2002	Australia	1	1
196	Kasper, E	2002	US	2	1
198	Leveille, S	1998	US	3	3
204	Naji, S	1994	UK	3	1
205	Naylor, M	1999	US	2	3

(b) Systems to support the coordination of care

Article ID	1st Author	Year	Country	Setting	Health issue
001	Aiken, L	2006	US	3	1
002	Allen, K	2002	US	2	1
003	Arean, P	2005	US	3	2
005	Bartels, S	2004	US	3	2
010	Borenstein, J	2003	US	3	1
022	Choe, H	2005	US	1	1
030	Donohoe, M	2000	UK	3	1
031	Doughty, R	2002	New Zealand	2	1
032	Drury, M	2000	UK	3	4
035	Faber, E	2005	Netherlands	3	4
042	Griswold, K	2005	US	3	2
045	Harris, M	2002	Australia	2	4
049	Jameson, J	1995	US	1	4
050	Jolly, K	1998	UK	2	1
051	Jolly, K	1999	UK	2	1
052	Joubert, J	2006	Australia	2	1
055	Katon, W	1997	US	3	2
056	Katon, W	1999	US	3	2
059	Katzelnick, D	2000	US	3	2

060	Koopmans, G	1996	Netherlands	3	4
063	Leggett, P	2004	UK	3	4
064	Lester, H	2003	UK	3	2
067	Litaker, D	2003	US	1	1
073	McInnes, E	1999	Australia	2	3
074	Meeuwesen, L	1996	Netherlands	3	4
084	Nazareth, I	2001	UK	2	3
095	Preen, D	2005	Australia	2	1
100	Rea, H	2004	New Zealand	3	1
102	Reuben, D	1999	US	3	3
108	Rothman, R	2005	US	1	1
110	Rutherford, A	2001	Australia	2	4
119	Sommers, L	2000	US	1	3
120	Sorensen, L	2004	Australia	1	4
121	Spillane, L	1997	US	2	4
125	Straka, R	2005	US	1	1
131	Unutzer, J	2002	US	3	2
135	Wade, V	2005	Australia	2	1
146	Brand, C	2004	Australia	2	1
152	Smeenk, F	2000	Netherlands	2	3
156	McInnes, G	1995	UK	2	1
170	Rollman, B	2005	US	3	2
175	Hedrick, S	2003	US	3	2
185	Drummond, N	1994	UK	2	1
193	Hermiz, O	2002	Australia	1	1
196	Kasper, E	2002	US	2	1
204	Naji, S	1994	UK	3	1
209	Segal, L	2004	Australia	1	1

(c) Coordinating clinical activities

Article ID	1st Author	Year	Country	Setting	Health issue
001	Aiken, L	2006	US	3	1
002	Allen, K	2002	US	2	1
009	Bogden, P	1997	US	1	1
016	Burns, R	2000	US	2	3
019	Byng, R	2004	UK	3	2
022	Choe, H	2005	US	1	1
031	Doughty, R	2002	New Zealand	2	1
049	Jameson, J	1995	US	1	4
050	Jolly, K	1998	UK	2	1
052	Joubert, J	2006	Australia	2	1
059	Katzelnick, D	2000	US	3	2
061	Krein, S	2004	US	1	1
063	Leggett, P	2004	UK	3	4
067	Litaker, D	2003	US	1	1
073	McInnes, E	1999	Australia	2	3
074	Meeuwesen, L	1996	Netherlands	3	4
086	Nicholson, C	2001	Australia	2	1
095	Preen, D	2005	Australia	2	1

100	Rea, H	2004	New Zealand	3	1
108	Rothman, R	2005	US	1	1
111	Samet, J	2003	US	3	2
113	Sellors, J	2003	Canada	1	3
114	Simon, G	2001	US	3	2
119	Sommers, L	2000	US	1	3
121	Spillane, L	1997	US	2	4
125	Straka, R	2005	US	1	1
133	Vierhout, W	1995	Netherlands	3	4
134	Vlek, J	2003	Netherlands	3	1
135	Wade, V	2005	Australia	2	1
152	Smeenk, F	2000	Netherlands	2	3
156	McInnes, G	1995	UK	2	1
185	Drummond, N	1994	UK	2	1
193	Hermiz, O	2002	Australia	1	1
195	Hughes, S	2000	US	2	3
196	Kasper, E	2002	US	2	1
204	Naji, S	1994	UK	3	1
209	Segal, L	2004	Australia	1	1

(d) Support for service providers

Article ID	1st Author	Year	Country	Setting	Health issue
003	Arean, P	2005	US	3	2
009	Bogden, P	1997	US	1	1
010	Borenstein, J	2003	US	3	1
029	Dey, P	2002	UK	3	2
030	Donohoe, M	2000	UK	3	1
035	Faber, E	2005	Netherlands	3	4
037	Finley, P	2003	US	3	2
042	Griswold, K	2005	US	3	2
050	Jolly, K	1998	UK	2	1
051	Jolly, K	1999	UK	2	1
052	Joubert, J	2006	Australia	2	1
055	Katon, W	1997	US	3	2
056	Katon, W	1999	US	3	2
058	Katon, W	2004	US	3	2
059	Katzelnick, D	2000	US	3	2
061	Krein, S	2004	US	1	1
066	Lin, E	2000	US	3	2
080	Modell, M	1998	UK	3	4
084	Nazareth, I	2001	UK	2	3
086	Nicholson, C	2001	Australia	2	1
096	Premaratne, U	1999	UK	3	1
100	Rea, H	2004	New Zealand	3	1
113	Sellors, J	2003	Canada	1	3
120	Sorensen, L	2004	Australia	1	4
131	Unutzer, J	2002	US	3	2
135	Wade, V	2005	Australia	2	1
146	Brand, C	2004	Australia	2	1

152	Smeenk, F	2000	Netherlands	2	3
156	McInnes, G	1995	UK	2	1
170	Rollman, B	2005	US	3	2
175	Hedrick, S	2003	US	3	2
185	Drummond, N	1994	UK	2	1
204	Naji, S	1994	UK	3	1

(e) Relationships between service providers

Article ID	1st Author	Year	Country	Setting	Health issue
001	Aiken, L	2006	US	3	1
003	Arean, P	2005	US	3	2
005	Bartels, S	2004	US	3	2
009	Bogden, P	1997	US	1	1
016	Burns, R	2000	US	2	3
022	Choe, H	2005	US	1	1
029	Dey, P	2002	UK	3	2
033	Druss, B	2001	US	3	3
037	Finley, P	2003	US	3	2
040	Gater, R	1997	UK	3	2
050	Jolly, K	1998	UK	2	1
051	Jolly, K	1999	UK	2	1
055	Katon, W	1997	US	3	2
056	Katon, W	1999	US	3	2
058	Katon, W	2004	US	3	2
059	Katzelnick, D	2000	US	3	2
066	Lin, E	2000	US	3	2
097	Rabow, M	2004	US	2	3
108	Rothman, R	2005	US	1	1
109	Roy-Byrne, P	2001	US	3	2
111	Samet, J	2003	US	3	2
113	Sellors, J	2003	Canada	1	3
114	Simon, G	2001	US	3	2
119	Sommers, L	2000	US	1	3
121	Spillane, L	1997	US	2	4
131	Unutzer, J	2002	US	3	2
137	Weisner, C	2001	US	3	2
141	Wood, K	1994	New Zealand	3	2
146	Brand, C	2004	Australia	2	1
170	Rollman, B	2005	US	3	2
195	Hughes, S	2000	US	2	3
196	Kasper, E	2002	US	2	1
209	Segal, L	2004	Australia	1	1

(f) Support for patients

Article ID	1st Author	Year	Country	Setting	Health issue
002	Allen, K	2002	US	2	1
009	Bogden, P	1997	US	1	1
022	Choe, H	2005	US	1	1
032	Drury, M	2000	UK	3	4
042	Griswold, K	2005	US	3	2
049	Jameson, J	1995	US	1	4
051	Jolly, K	1999	UK	2	1
061	Krein, S	2004	US	1	1
081	Naji, S	1999	UK	2	2
095	Preen, D	2005	Australia	2	1
100	Rea, H	2004	New Zealand	3	1
115	Sin, D	2004	Canada	2	1
117	Smith, B	1999	Australia	2	1
125	Straka, R	2005	US	1	1
145	Marks, M	1999	Australia	2	1
146	Brand, C	2004	Australia	2	1
156	McInnes, G	1995	UK	2	1
185	Drummond, N	1994	UK	2	1
193	Hermiz, O	2002	Australia	1	1

(g) Joint funding, planning and/or management

Article ID	1st Author	Year	Country	Setting	Health issue
010	Borenstein, J	2003	US	3	1
019	Byng, R	2004	UK	3	2
050	Jolly, K	1998	UK	2	1
069	Llewelyn Jones, R	1999	Australia	4	2
108	Rothman, R	2005	US	1	1
209	Segal, L	2004	Australia	1	1

(h) The organisation of the health care system

Article ID	1st Author	Year	Country	Setting	Health issue
209	Segal, L	2004	Australia	1	1

Appendix 5: Studies by setting

For further details of any particular study, use the article ID or author and year to locate the study in Appendix 8.

Key for health issues:

1 Chronic conditions, including diabetes, heart disease, COPD, asthma, AIDS
2 Mental health, including substance abuse
3 Aged and palliative care
4 Other

(a) Within primary health care

Article ID	1st Author	Year	Country	Health issue
009	Bogden, P	1997	US	1
022	Choe, H	2005	US	1
049	Jameson, J	1995	US	4
061	Krein, S	2004	US	1
067	Litaker, D	2003	US	1
108	Rothman, R	2005	US	1
113	Sellors, J	2003	Canada	3
119	Sommers, L	2000	US	3
120	Sorensen, L	2004	Australia	4
125	Straka, R	2005	US	1
193	Hermiz, O	2002	Australia	1
209	Segal, L	2004	Australia	1

(b) Between primary health care and hospital, including outreach, emergency department and transitions of care between in and outpatient care

Article ID	1st Author	Year	Country	Health issue
002	Allen, K	2002	US	1
016	Burns, R	2000	US	3
031	Doughty, R	2002	New Zealand	1
045	Harris, M	2002	Australia	4
050	Jolly, K	1998	UK	1
051	Jolly, K	1999	UK	1
052	Joubert, J	2006	Australia	1
073	McInnes, E	1999	Australia	3
081	Naji, S	1999	UK	2
084	Nazareth, I	2001	UK	3
086	Nicholson, C	2001	Australia	1
095	Preen, D	2005	Australia	1
097	Rabow, M	2004	US	3
110	Rutherford, A	2001	Australia	4
115	Sin, D	2004	Canada	1
117	Smith, B	1999	Australia	1
121	Spillane, L	1997	US	4

135	Wade, V	2005	Australia	1
144	Caplan, G	2004	Australia	3
145	Marks, M	1999	Australia	1
146	Brand, C	2004	Australia	1
149	Montgomery, P	2003	Canada	3
152	Smeenk, F	2000	Netherlands	3
156	McInnes, G	1995	UK	1
185	Drummond, N	1994	UK	1
195	Hughes, S	2000	US	3
196	Kasper, E	2002	US	1
205	Naylor, M	1999	US	3

(c) Between primary health care and specialty services

Article ID	1st Author	Year	Country	Health issue
001	Aiken, L	2006	US	1
003	Arean, P	2005	US	2
005	Bartels, S	2004	US	2
010	Borenstein, J	2003	US	1
019	Byng, R	2004	UK	2
029	Dey, P	2002	UK	2
030	Donohoe, M	2000	UK	1
032	Drury, M	2000	UK	4
033	Druss, B	2001	US	3
035	Faber, E	2005	Netherlands	4
037	Finley, P	2003	US	2
040	Gater, R	1997	UK	2
042	Griswold, K	2005	US	2
055	Katon, W	1997	US	2
056	Katon, W	1999	US	2
058	Katon, W	2004	US	2
059	Katzelnick, D	2000	US	2
060	Koopmans, G	1996	Netherlands	4
063	Leggett, P	2004	UK	4
064	Lester, H	2003	UK	2
066	Lin, E	2000	US	2
074	Meeuwesen, L	1996	Netherlands	4
080	Modell, M	1998	UK	4
096	Premaratne, U	1999	UK	1
100	Rea, H	2004	New Zealand	1
102	Reuben, D	1999	US	3
109	Roy-Byrne, P	2001	US	2
111	Samet, J	2003	US	2
114	Simon, G	2001	US	2
131	Unutzer, J	2002	US	2
133	Vierhout, W	1995	Netherlands	4
134	Vlek, J	2003	Netherlands	1
137	Weisner, C	2001	US	2
141	Wood, K	1994	New Zealand	2
170	Rollman, B	2005	US	2

175	Hedrick, S	2003	US	2
198	Leveille, S	1998	US	3
204	Naji, S	1994	UK	1

(d) Between primary health care and residential aged care facilities

Article ID	1st Author	Year	Country	Health issue
027	Crotty, M	2004	Australia	3
069	Llewelyn Jones, R	1999	Australia	2

Appendix 6: Studies by health issue addressed

For further details of any particular study, use the article ID or author and year to locate the study in Appendix 8.

Key for settings:
1 Within primary health care
2 Between primary health care and hospitals/hospital services
3 Between primary health care and specialist services
4 Between primary health care and residential aged care facilities

(a) Chronic conditions

Article ID	1st Author	Year	Country	Setting
001	Aiken, L	2006	US	3
002	Allen, K	2002	US	2
009	Bogden, P	1997	US	1
010	Borenstein, J	2003	US	3
022	Choe, H	2005	US	1
030	Donohoe, M	2000	UK	3
031	Doughty, R	2002	New Zealand	2
050	Jolly, K	1998	UK	2
051	Jolly, K	1999	UK	2
052	Joubert, J	2006	Australia	2
061	Krein, S	2004	US	1
067	Litaker, D	2003	US	1
086	Nicholson, C	2001	Australia	2
095	Preen, D	2005	Australia	2
096	Premaratne, U	1999	UK	3
100	Rea, H	2004	New Zealand	3
108	Rothman, R	2005	US	1
115	Sin, D	2004	Canada	2
117	Smith, B	1999	Australia	2
125	Straka, R	2005	US	1
134	Vlek, J	2003	Netherlands	3
135	Wade, V	2005	Australia	2
145	Marks, M	1999	Australia	2
146	Brand, C	2004	Australia	2
156	McInnes, G	1995	UK	2
185	Drummond, N	1994	UK	2
193	Hermiz, O	2002	Australia	1
196	Kasper, E	2002	US	2
204	Naji, S	1994	UK	3
209	Segal, L	2004	Australia	1

(b) Mental health

Article ID	1st Author	Year	Country	Setting
003	Arean, P	2005	US	3
005	Bartels, S	2004	US	3
019	Byng, R	2004	UK	3
029	Dey, P	2002	UK	3
037	Finley, P	2003	US	3
040	Gater, R	1997	UK	3
042	Griswold, K	2005	US	3
055	Katon, W	1997	US	3
056	Katon, W	1999	US	3
058	Katon, W	2004	US	3
059	Katzelnick, D	2000	US	3
064	Lester, H	2003	UK	3
066	Lin, E	2000	US	3
069	Llewelyn Jones, R	1999	Australia	4
081	Naji, S	1999	UK	2
109	Roy-Byrne, P	2001	US	3
111	Samet, J	2003	US	3
114	Simon, G	2001	US	3
131	Unutzer, J	2002	US	3
137	Weisner, C	2001	US	3
141	Wood, K	1994	New Zealand	3
170	Rollman, B	2005	US	3
175	Hedrick, S	2003	US	3

(c) Aged and palliative care

Article ID	1st Author	Year	Country	Setting
016	Burns, R	2000	US	2
027	Crotty, M	2004	Australia	4
033	Druss, B	2001	US	3
073	McInnes, E	1999	Australia	2
084	Nazareth, I	2001	UK	2
097	Rabow, M	2004	US	2
102	Reuben, D	1999	US	3
113	Sellors, J	2003	Canada	1
119	Sommers, L	2000	US	1
144	Caplan, G	2004	Australia	2
149	Montgomery, P	2003	Canada	2
152	Smeenk, F	2000	Netherlands	2
195	Hughes, S	2000	US	2
198	Leveille, S	1998	US	3
205	Naylor, M	1999	US	2

(d) Other

Article ID	1st Author	Year	Country	Setting
032	Drury, M	2000	UK	3
035	Faber, E	2005	Netherlands	3
045	Harris, M	2002	Australia	2
049	Jameson, J	1995	US	1
060	Koopmans, G	1996	Netherlands	3
063	Leggett, P	2004	UK	3
074	Meeuwesen, L	1996	Netherlands	3
080	Modell, M	1998	UK	3
110	Rutherford, A	2001	Australia	2
120	Sorensen, L	2004	Australia	1
121	Spillane, L	1997	US	2
133	Vierhout, W	1995	Netherlands	3

Appendix 7: Studies by country

For further details of any particular study, use the article ID or author and year to locate the study in Appendix 8.

Key for settings:
1 Within primary health care
2 Between primary health care and hospitals/hospital services
3 Between primary health care and specialist services
4 Between primary health care and residential aged care facilities

Key for health issues:
1 Chronic conditions, including diabetes, heart disease, COPD, asthma, AIDS
2 Mental health, including substance abuse
3 Aged and palliative care
4 Other

(a) United States

Article ID	1st Author	Year	Setting	Health issue
001	Aiken, L	2006	3	1
002	Allen, K	2002	2	1
003	Arean, P	2005	3	2
005	Bartels, S	2004	3	2
009	Bogden, P	1997	1	1
010	Borenstein, J	2003	3	1
016	Burns, R	2000	2	3
022	Choe, H	2005	1	1
033	Druss, B	2001	3	3
037	Finley, P	2003	3	2
042	Griswold, K	2005	3	2
049	Jameson, J	1995	1	4
055	Katon, W	1997	3	2
056	Katon, W	1999	3	2
058	Katon, W	2004	3	2
059	Katzelnick, D	2000	3	2
061	Krein, S	2004	1	1
066	Lin, E	2000	3	2
067	Litaker, D	2003	1	1
097	Rabow, M	2004	2	3
102	Reuben, D	1999	3	3
108	Rothman, R	2005	1	1
109	Roy-Byrne, P	2001	3	2
111	Samet, J	2003	3	2
114	Simon, G	2001	3	2
119	Sommers, L	2000	1	3
121	Spillane, L	1997	2	4
125	Straka, R	2005	1	1
131	Unutzer, J	2002	3	2
137	Weisner, C	2001	3	2

170	Rollman, B	2005	3	2
175	Hedrick, S	2003	3	2
195	Hughes, S	2000	2	3
196	Kasper, E	2002	2	1
198	Leveille, S	1998	3	3
205	Naylor, M	1999	2	3

(b) Australia

Article ID	1st Author	Year	Setting	Health issue
027	Crotty, M	2004	4	3
045	Harris, M	2002	2	4
052	Joubert, J	2006	2	1
069	Llewelyn Jones, R	1999	4	2
073	McInnes, E	1999	2	3
086	Nicholson, C	2001	2	1
095	Preen, D	2005	2	1
110	Rutherford, A	2001	2	4
117	Smith, B	1999	2	1
120	Sorensen, L	2004	1	4
135	Wade, V	2005	2	1
144	Caplan, G	2004	2	3
145	Marks, M	1999	2	1
146	Brand, C	2004	2	1
193	Hermiz, O	2002	1	1
209	Segal, L	2004	1	1

(c) United Kingdom

Article ID	1st Author	Year	Setting	Health issue
019	Byng, R	2004	3	2
029	Dey, P	2002	3	2
030	Donohoe, M	2000	3	1
032	Drury, M	2000	3	4
040	Gater, R	1997	3	2
050	Jolly, K	1998	2	1
051	Jolly, K	1999	2	1
063	Leggett, P	2004	3	4
064	Lester, H	2003	3	2
080	Modell, M	1998	3	4
081	Naji, S	1999	2	2
084	Nazareth, I	2001	2	3
096	Premaratne, U	1999	3	1
156	McInnes, G	1995	2	1
185	Drummond, N	1994	2	1
204	Naji, S	1994	3	1

(d) Netherlands

Article ID	1st Author	Year	Setting	Health issue
035	Faber, E	2005	3	4
060	Koopmans, G	1996	3	4
074	Meeuwesen, L	1996	3	4
133	Vierhout, W	1995	3	4
134	Vlek, J	2003	3	1
152	Smeenk, F	2000	2	3

(e) New Zealand

Article ID	1st Author	Year	Setting	Health issue
031	Doughty, R	2002	2	1
100	Rea, H	2004	3	1
141	Wood, K	1994	3	2

(f) Canada

Article ID	1st Author	Year	Setting	Health issue
113	Sellors, J	2003	1	3
115	Sin, D	2004	2	1
149	Montgomery, P	2003	2	3

Appendix 8: Primary research studies included in the review and associated statistically significant outcomes

Note: to find studies relating to particular strategies, settings, health issues or countries see Appendices 5,6, 7 or 8 respectively.

Article ID	Author / Yr/ Country	Health issue	Strategies implemented	Statistically significant outcome(s) reported
	Bogden, P 1997 US	Chronic conditions	• Co-location of pharmacist in the primary care clinic. • Patients met with the pharmacist 30 minutes before seeing their physician. The pharmacist took a medication history, answered questions, encouraged compliance, determined the least costly medication regimen and made recommendations to the physician. • Recommendations were reviewed with the resident/ intern and primary care physician. • Resident then saw the patient and discussed with the supervising physician	• The success rate for patients in achieving LDL cholesterol levels in the intervention group was double the rate of the control group (43% versus 21%, p<.05) • The intervention had its greatest effects on patients with coronary heart disease (p<.05) • Patients in the intervention arm – the average reduction in total cholesterol concentrations increased significantly as risk profiles became more adverse (p<.01) • Younger patients in the intervention group were able to lower their total cholesterol levels by significantly greater amounts (p<.05)
001	Aiken, L 2006 US	Chronic disease	• RN case managers coordinated care planning with PhoenixCare team members, primary care physicians, health plan case manager (if there were one), patient/family, and community agencies. • Three protocols for care of patients at three different levels of acuity were developed (admission-unstable patient, stable patient and exacerbation-unstable patient) • Structured links with primary care were included in the protocols in the form of medical management, emergency response plans and advance care planning. • Other aspects of case management delivered to patients were patient education (health promotion, self management) and support services (psychological, spiritual and emotional support and counseling, community resource referral).	• Sig. Improvements in domains for self management • Less symptom distress for COPD • More symptom distress for CHF • Improvements in SF 36 general health, physical functioning, vitality
002	Allen, K 2002 US	Chronic condition	• In-home biopsychosocial assessment by an advanced practice nurse at 1 month post discharge (first contact within 7 days of discharge to organise assessment) • A care plan was developed by an interdisciplinary team • Care plan implemented in collaboration with the patient's primary care physician • Patient received a letter from the advanced practice nurse outlining	• The intervention group was superior to usual care (p<.0001) • A significant interaction (p=0.01) between the interventions effectiveness and the level of baseline NIHSS deficits. This implies that the patients with greater baseline deficits obtained the greatest relative benefit from the intervention

			the team recommendations, interventions completed, reminders of their next office visit and important issues to discuss with their primary care provider	
003	Arean, P 2005 US	Mental Health	• Patients received a 20- minute educational videotape and a booklet about late-life • depression • Patient attended an initial visit with a Depression Clinical Specialist (DCS) at the primary care clinic who conducted a clinical and psychosocial history, discussed education materials and patient preference for treatment. • New cases and cases needing treatment plan adjustments were discussed with a supervising team psychiatrist and liaison primary care physician during a weekly team meeting. The psychiatrist saw complicated or non-responsive patients in the PHC clinic. • DCS worked with patient and their regular primary care provider to establish and deliver a treatment plan according to a recommended treatment algorithm (antidepressant or psychotherapy delivered by DCS in primary care clinic). Scripts written by GP. • • DCSs attempted to follow patients for up to 12 months, monitoring treatment response, and adjusting treatment when necessary in collaboration with the primary care provider. •	The CC group also reported greater satisfaction with mental health services than UC (p<0.0001) Effects of CC are particularly noted in one ethnic group (Latino group) – latinos who received CC were significantly more likely to use antidepressants medication & psychotherapy than Latinos in UC (p=0.015). Older minorities who received CC had significantly better depression outcomes as measured by the HSCL-20 depression severity score, significantly higher rates of treatment response & significantly higher rates of remission than minorities in UC (p<0.0001) Blacks who received CC had substantially better functional outcomes than did blacks in UC (p=0.005) Patients in the intervention group were significantly more likely to use antidepressants or psychotherapy than were patients in the usual care group (82% versus 61% at 12 months p<0.001) Patients in the intervention group showed a significantly greater increase in exercise days at month 12 (mean difference 0.50 day, p=0.01) A significantly higher proportion of IMPACT patients reported taking antidepressants at each follow up (p<0.0001) Depression & other outcomes. At all three follow up times, IMPACT patients fared significantly better than controls on every outcome, except overall functional impairment at 24 months. IMPACT patients reported significantly greater confidence in managing their depression at 24 months (p=0.001). Regardless of the number of chronic diseases, intervention patients had significantly lower depression severity during all follow up assessments (p<.001) as compared with patients in usual care Compared with the non panic group, the panic group were more likely to be taking antidepressants (92% versus 81.4%, Chi Square = 5.62, p=0.02) & to have required at least the 2nd step of the three-step intervention model (47.5% versus 35.8%, Chi Square = 6.24, p=0.01) Patients experiencing significant reduction in depressive symptoms were much more likely to report improvement on the SF-12 physical components and more likely to report no IADL impairments (87.3% vs 75.4%, p<.001) at 12 months.
005	Bartels, S 2004	Mental Health	• Co-location of a mental health/ substance abuse professional in a primary care clinic (assessment, care planning, counseling, case	No statistically significant health, patient satisfaction or economic outcomes

	US		management, psychotherapy, and pharmacological treatment). • Written or verbal communication about the clinical evaluation and treatment plan between the mental health/substance abuse clinician and the primary care provider • Protocol for time to appointment with the mental health provider (2 to 4 weeks following the primary care provider visit). • Patients with at risk drinking were offered a Brief Alcohol Intervention.	reported,.
010	Borenstein, J 2003 US	Chronic Disease	• An evidence based treatment algorithm was developed by a multidisciplinary team of physicians, clinical pharmacists, nurses and participating physicians. • The guideline was used as the basis for group education in subsequent physician meetings and in individual physician education sessions conducted by clinical pharmacists and the principal investigator. • Patients attended a hypertension clinic run by clinical pharmacists where they received assessment and education. • According to protocol pharmacists then called each patient's physician with their findings and made recommendations. Physicians made all final treatment decisions • Follow-up visits were scheduled every 2-4 weeks at the discretion of the pharmacist.	• At 12 months, reductions in systolic BP from baseline for the PPCM and UC groups were 22mmHg (p<0.01) and 11mmHg (p<0.01) respectively • The greater reduction of 10mmHg in systolic BP observed in PPCM versus UC was significant (p<0.01). • Reductions in diastolic BP from baseline for the PPCM and UC groups were 7 mmHG (p<0.01) and 8 mmHG (p<0.01) respectively. • Overall blood pressure goals were achieved in 60% and 43% of PPCM and UC patients (p=0.02) • The average provider visit costs/patient were lower for PPCM than UC patients ($160 vs $195, p=0.04) • A trend toward a greater increase in drug cost from baseline was observed in the PPCM versus the UC group ($11.31 vs $4.25, p=0.12)
016	Burns, R 2000 US	Aged and palliative care	• Initial comprehensive assessment by an interdisciplinary primary care team in the GEM clinic after discharge from hospital. • long-term, interdisciplinary outpatient management. A physician, nurse practitioner, social worker, or clinical psychologist, served as the main liaison between each intervention group participant and the GEM team.	There were significant changes in IADL scores over time (p=.017) and 2 year group-time interaction IADL scores were also significant (p=.006), with the GEM group reporting relatively fewer IADL impairments. Compared with the UC group of participants, the GEM group also reported significantly increased global social activity (GSA) at 2 years (p<.001) Compared with the UC group of participants, the GEM group also reported significant increased global social activity at 2 years (p<.001) Both groups showed improvement in the quality of life scores, but the GEM group showed greater improvement(group time interaction, p=.003) Compared with baseline, general well being was improved in both groups (p<.001) but the increase was greater for the GEM group (group time interaction p=.001) In the Cantril life satisfaction scale, the GEM group demonstrated greater improvement (group-time interaction p<.001) During the 2 year study period, the GEM group demonstrated significantly improved MMSE scores (p=.025) compared with the usual care group.

019	Byng, R 2004 UK	Mental Health	• Joint working groups • Initial assessment of epidemiological needs, patients' views on needs, and sharing visions for change by small joint working groups of professionals and managers drawn from each practice and its associated community mental health team. • Joint working groups worked on developing a shared care agreement - appointing and developing the role of a linked specialist mental health worker, meetings, formal communication guidelines, detailing responsibilities for groups of patients. • Joint working groups worked on planning the chronic disease management systems within the practice -setting up registers, databases, audits, and systems of recall and training needs assessment	Significant differences in relapses. More documented in the control practices compared to intervention (0.28, 95% CI= 0.08 – 0.49, p-0.01) Medication costs were significantly higher in the intervention group at baseline whereas this was reversed at follow-up.
022	Choe, H 2005 US	Chronic conditions	• *During an initial clinic visit the clinical pharmacist case manager provided assessment of medication management, and provided patients with basic education regarding diabetes self-management skills. • All therapeutic recommendations were discussed with the primary care physicians before significant therapy alterations. • The clinical pharmacist followed up on disease management and medication management protocols approved by the primary care physicians and provided feedback on diabetes status using a standardised form. • Patients were followed-up by the pharmacist via regular telephone contact and saw patient's inconjuction with their routine primary care visits.	Low-density lipoprotein measurement (100% versus 85.7%, p=.02), retinal examination within 2 years (97.3% versus 74.3%, p=.004) and documented monofilament examination for neuropathy (92.3% versus 62.9%, p=.002) occurred more frequently among those in the intervention group compared with the control group. The mean difference in HBA1c change scores between the intervention & control groups was 1.2% (p=.03). A strong statistical interaction between the intervention & baseline HBA1c levels (P<.001) suggesting that patients with higher HBA1c levels at enrollment had a greater improvement in glycaemic control than those with more moderate elevations
027	Crotty, M 2004 Australia	Aged and palliative care	• A medication review was conducted prior to each case conference. • Two multidisciplinary case conferences conducted 6-12 weeks apart. The GP (chair), a geriatrician, a pharmacist, residential care staff and a representative of the Alzheimer's Association of South Australia attended. • All facilities received a half day workshop from the Alzheimer's association.	• No statistically significant health, patient satisfaction or economic outcomes reported.
029	Dey, P 2002 UK	Mental Health	• Primary Health Care Liaison Worker • PHCLW conducted practice-based review clinics • PHCLW offered practice-based support and training to primary care physician • Practice-wide shared care agreements • Routine assessment of all existing CDT clients and transfer to	No statistically significant health, patient satisfaction or economic outcomes reported,.

			shared care.	
030	Donohoe, M 2000 UK	Chronic conditions	• Foot care model (flow chart for decision support) including diagnosis, guidelines for referral. • Standardised foot care education leaflets for patients • Separate education program was for chiropodists • Explanatory practice visits including coordinated training of primary care staff (GPs, practice and district nurses, podiatrists) • Ongoing practice visits from member of foot care team to ensure quality of care	Improvement in patient's overall attitude towards their foot care (mean percentage change 3.9, p<0.001) intervention group and 0.7, p<0.001 control group. The mean change in attitude was significantly greater in the intervention group (p=0.01) Attitudes towards patient's personal foot care responsibilities improved in the intervention group by 2.5% (p<0.001) compared with a decrease of 0.2% in the control group with a significant difference in change between the groups (p=0.027) There was a small but significant improvement in the knowledge scores of both groups after the 6 month intervention period (mean percentage change 1.1, p=0.015 and 1.3 p=0.002. A significantly greater proportion of patients in the intervention group had their feet examined (p<0.001), received foot care education (p<0.001) and found the education useful (p<0.03) Knowledge scores only improved in the intervention group, giving a significant difference in the change of score between the two groups (p=0.008)
031	Doughty, R 2002 New Zealand	Chronic conditions	• Outpatient clinical review with the study team within 2 weeks of hospital discharge included review of clinical status, pharmacological treatment, initiation of one-on-one education with the study nurse, and patient diary provided. • A follow-up plan was devised aiming for 6-weekly visits alternating between the GP and heart failure clinic, although the patients were free to see their GPs at any time they wished • A detailed letter, including rationale for any changes in treatment, was faxed to the GP on the same day as the patient visited the heart failure clinic and followed up by a phone call to discuss. • GPs made changes to the patient's management as they saw fit but were encouraged to discuss aspects of the patient's management with the clinic team at any stage. • Group education sessions run by a cardiologist and study nurse were offered, two within 6 weeks of hospital discharge and a further after 6 months.	There was a significant improvement in physical functioning from baseline to 12 months between the intervention & control groups (-11.1 & 15.8, 2p=0.015)
032	Drury, M 2000 UK	Other	• Patient held record. Included communication/diary sheets for use by the patient, their family, health professionals, and carers; pages for appointments, medication, addresses and phone numbers. • The study nurse explained use of the record and encouraged patients and carers to show to anyone concerned with their care and use as a tool for communication	Patients in the intervention group (patient held record) felt significantly less able to face all future aspects of their illness (p=0.05)

033	Druss, B 2001 US	Aged & Palliative Care	• Co-location of primary care clinics within three Veteran's Affairs Mental Health Clinics. • Family practitioner liaison officer maintained links with mental health teams: attended weekly team meetings, notified them of patients' medical status, asked them to provide feedback to clinic and encourage patients to attend primary care clinic • The registered nurse provided patient education, liaison with mental health care providers and case management services.	After 1 year, veterans in the integrated care clinic reported significantly fewer problems in 6 of 8 satisfaction domains: access, attention to patient preferences, courtesy, coordination, continuity & overall care. The largest effect was in continuity of care, where only 1.3% of those in integrated care reported a problem, compared with 22.5% of those in the general medical clinic Primary care costs in the integrated care clinic were estimated at $1582 per patient ($266 per visit) in contrast to $398 per patient ($148 per visit) for the general medicine clinic (t=2.4, p=.02 for group X time interaction in random regression model)
035	Faber, E 2005 Netherlands	Other	• 4 hour joint training course with GPs and OHPs to learn how to work collaboratively • Collaboration protocol - two versions (GP and OHP) - suggest moments and context of collaboration • Two non-compulsory follow-up training sessions - practice using the protocol, discuss difficulties	Patients in the intervention region were significantly more satisfied with their OHP than patients in the control region with a difference of 14.8 points (3months) and 12.0 points (6months) The control group had a significantly quicker return to work than the intervention group. The median duration for sick leave was 45 (17-83 days) in the control group compared to 76 (range 33-164 days) in the intervention region. The hazard ratio (HR) for return to work differed significantly between both groups (HR=0.52) in favour of the control group after adjustment for age, gender, duration of sick leave before inclusion, high demand/low control at work, recurrent LBP, quality of life, duration of LBP before project, functional disability & fear of movement.
037	Finley, P 2003 US	Mental Health	• Case management for depressed patients by clinical pharmacists under the supervision of physician mentors from the departments of psychiatry and internal medicine following a treatment protocol (developed by department and clinic) • Initial patient contact protocol: GP pages pharmacists and pharmacist conducts intake interview with patient (assessment, formulate treatment plan, organise referral and educate patients). • Follow-up contacts protocol: routine telephone contact and clinic visits with pharmacist who provides ongoing medication management, patient education, prescriptions for adverse effects, continual feedback to primary care physician, • A mentor psychiatrist met weekly with clinic personnel and is available by beeper during clinic hours. If extensive counseling or psychotherapy is needed psychologists, social workers and nurse specialists from department of psychiatry may become involved	A much greater degree of treatment satisfaction in the collaborative care model than for the controls. Greater satisfaction with the personal nature of care, availability of providers, ability of providers to listen, explanation as to why antidepressants were prescribed, explanation on how to take the antidepressants & patients overall satisfaction with the HMO ($p<0.05$) Drug adherence rates were higher among the intervention group. 57 patients (76%) in the intervention group were compliant compared to 30 (60%) of control patients (OR 2.11, 95% CI 0.97-4.58, p=0.057)
040	Gater, R	Mental	• A multi-disciplinary community mental health team based in	There were more met needs for intervention group & fewer unmet needs

	1997 US	Health	primary care (two community psychiatric nurses, a social worker, an occupational therapist and a psychologist) • The mental health team had regular meetings with the primary care teams • The mental health team conducted weekly psychiatric clinics in the surgeries	(p<0.001).. There were more unmet social needs in the control group (p<0.05) The intervention patients were significantly more satisfied with the service they had received: More likely to receive the service that they wanted Prepared to recommend the service to a friend Return to the service if necessary Intervention patients were also happier with the physical accessibility of the service (p<.01), appointment times (p<.01). They were less likely to report that staff changes had been disruptive for them (p<.01) and more likely to feel that the staff understood their problems (p<.05) There was significantly more unmet needs in the control patients relatives (p<0.05) For intervention patients, the expenditure on health & social service resources was significantly correlated with the number of problems recorded (r=0.57, p=0.006) while in the control group there was no significant association between the number of problems & expenditure (r=0.2; NS)
042	Griswold, K 2005 US	Mental Health	• Care managers facilitated access to primary medical care. • Care managers reinforced patient education that was delivered during primary care visits. • Care managers provided primary care providers with index cards with psychiatric hospital discharge diagnosis, pharmacotherapy, and mental health treatment site referral. • Care managers provided follow-up (home visits, mobile outreach) where appropriate • Care managers provided assistance through peer connections to community mental health sites and social services	No statistically significant health, patient satisfaction or economic outcomes reported,.
045	Harris, M 2002 Australia	Other	• Structured proforma for written communication for referrals from GPs to the emergency department • Structured proforma for written feedback from ED to GPs on the outcomes of the referral	No statistically significant health, patient satisfaction or economic outcomes reported.
049	Jameson, J 1995 US	Other	• *Each patient in the intervention group was given a 45- to 60-minute pharmacotherapy consultation by a clinical pharmacist. • The pharmacist then met with the treating physician to discuss his findings. A new regimen was developed by a collaborative dialogue between the physician and the pharmacist. • *Finally, the pharmacist conducted a brief educational session with the patient to explain any changes in the regimen and to improve the	• There were significant differences between the 2 groups with regard to within-group changes in outcome variables from baseline to 6 months. The number of drugs, number of doses & the 6 month cost all decreased in the intervention group & increased in the control group; the net difference was 1.1 drugs (p=0.04), 2.15 doses (p=.007) and $293 per 6 months (p=.008).

			patient's understanding of their drug therapy. • *One month after the intervention, the pharmacist contacted the patient by telephone (5 to 10 minutes) to reinforce the treatment plan.	
050	Jolly, K 1998 UK	Chronic conditions	• Cardiac liaison nurses (CLN) and practice nurses received a 2 day training course and bimonthly follow-up meetings on the the theory of behaviour change. • CLNs facilitated a patient held record developed to facilitate structured follow-up. Included risk factors and discharge medications, suggested frequency of follow-up visits, and a series of prompts to encourage discussion at follow -up. • Practice nurses completed a checklist at each consultation which were feedback to the CLN. PNs were asked by the CLN to encourage patients to attend cardiac rehabilitation program. • Guidelines for the care of patients with ischemic heart disease were developed by research team and local GPs	No statistically significant health, patient satisfaction or economic outcomes reported.
051	Jolly, K 1999 UK	Chronic conditions	• Cardiac liaison nurses were responsible for coordination of follow up care including the transfer of responsibility between hospital and general practice and support to practice nurses. • Liaison nurse telephoned the practice prior to discharge to discuss care of patient and organise first follow-up visit. • A discharge summary was given to each patient at discharge by the liaison nurse give to the general practitioner. Evidence based guidance on clinical management was attached for use by the GP. • A patient held record was given to each patient at discharge by the liaison nurse to prompt and guide follow-up care at standard intervals. • Liaison nurses provided support to practice staff via telephone and visiting each practice every 3-6 months.	• The mean score for patients with angina in the intervention group, was 1.8 points higher than in control subjects on the anxiety sub-scale (test for interaction p=0.03) and 1.3 points higher on the depression subscale (test for interaction P=0.07)
052	Joubert, J 2006 Australia	Chronic conditions	• A risk factor profile and discharge summary prepared for each patient by coordinator, verified by study neurologist and communicated to GP. • Neurologist conducted patient and carer review shortly after discharge at the stroke clinic, held weekly meetings with the coordinator and was available for ongoing support and advice for GPs. • A shared care package was prepared for the GP- goals and recommendations for risk factor management, recommendations for treatment of depression, a flow chart for the serial recording of vascular risk factors and depression and stroke literature	• The percentage of patients reaching the recommended total cholesterol of 5.18 mmol/L was greater in the intervention group (p=0.02) • Exercise participation increased over the 12 month period in the intervention group compared to the control group (p=0.048) • The intervention program was associated with reduced rates of depression (p=0.06)

			• Pre and post visit telephone assessment was conducted at every three-monthly scheduled GP visit by the coordinator for early detection of depression and details were faxed to the GP. • After each three-monthly GP visit, the flow charts were transmitted by facsimile to the stroke unit scrutinized by the coordinator and entered into the database.	
055	Katon, W 1997 US	Mental Health	• Participants received a 20- minute educational videotape and a booklet about late-life depression. • More frequent and longer visits during the first 8 weeks, alternating between primary care physician and psychiatrist. • Primary care physicians received a half day training sessions on the AHCPR depression guidelines • Psychiatrists provided case-by-case feedback to physicians, communicated recommendations, and agreed upon treatment strategy for each patient. • Patients were monitored from monthly review of medication refill printouts and patients who were not adhering were contacted by the primary care physician or the physician's nurse.	Satisfaction with care of depression was reported by 93% of intervention group patients and 75% of control group patients (p<.03) and satisfaction with antidepressant medication was reported by 85% and 60% respectively (p<.01) A significant greater number of patient sin the intervention group with minor depression reported satisfaction with antidepressant treatment (82% vs 61%, p<.02) In patients with major depression, 75% of patients in the intervention group were receiving an adequate dosage of antidepressant medication at greater than or equal to 90 days, compared with 50% of the control group patients (p<.01), among those with minor depression, the proportions of patients adhering to adequate doses for greater than or equal to 90 days were 80% and 40% respectively (p<.001) Significant improvement in depressive symptoms occurred in 75% of intervention group patients & 44% of control group patients (p<.01) In patients with major depression, the intervention group had greater adherence than the UC control group to adequate dosage of antidepressant medication for 90 days or more (75.5% versus 50%, p<.01). The intervention patients were more likely to rate the quality of care received n for depression as good to excellent (93% versus 75%) & rate antidepressant medication as helping somewhat to a great deal (p<.01)
056	Katon, W 1999 US	Mental Health	• Patient receives educational book and videotape on depression • Visits with liaison psychiatrist in primary care clinic for a maximum of 3 months • Psychiatrist made telephone calls to patient and monthly review of pharmacy data on antidepressant refills to monitor progress. • Psychiatrist assisted patient and primary care physician to alter medications if necessary. • Primary care physicians received immediate verbal consultation about their patient's progress and a typed psychiatric consultation note within one week.	At the 3 & 6 month follow up interviews, significantly more intervention patients rated the quality of care they received for depression as good to excellent compared with usual care patients (3months 94.5% versus 63.9%, Chi Square=23.51, p<.00001; 6 months 79.5% versus 63.5%, Chi Square 4.21, p=.04) Test of treatment effectiveness is whether patients meet a predefined level of clinical recovery at a specified time. At each time, significantly more intervention patients than usual care patients had recovered (3 months 40% versus 23%, Chi Square 6.18, p=.01, 6 months 44% versus 31%, Chi Square=3.90, p=.05).
058	Katon, W 2004	Mental Health	• Training for nurses to implement collaborative care treatment in primary care including diagnosis, collaborative care, stepped-care	The intervention group had significantly higher rates of adequate dosage in the 1st 6 months (57.3% intervention versus 40% in UC) & the 2nd 6 months

	US		principles, pharmacology, and problem-solving treatment. • Nurses delivered a stepped care approach to treatment. Step 1: treatment with antidepressant medications and/or problem solving treatment. Step 2: change in treatment. Step 3: referral to specialty mental health care for longer term follow-up • After decrease in clinical symptoms, continuation phase treatment was delivered by the nurse. Monthly scheduled telephone contacts or monthly continuation group contacts • Twice a month nurse supervision with a team including psychiatrist, psychologist and family physician to review new cases and patient progress. • Regular interaction between nurse and family physician (written or verbal). Psychiatrist supervision involved alternate week telephone contact.	period (53% intervention versus 38.2% UC). At 6 & 12 months, the intervention group reported significantly greater satisfaction than the UC group. Depression scores: at 6 months the intervention group had a significantly lower adjusted mean than the UC group (F=4.11, p=.04) & this difference continued to be significant at 12 month assessment (F=4.96, p=.03)
059	Katzelnick, D 2000 US	Mental Health	• Standardised 2 hour physician training program focused on initial diagnosing of depression and initiation of pharmacotherapy • Patients received a booklet and videotaped educational materials from the treatment coordinator. • Primary care physicians diagnosing patients and recommended antidepressant treatment following a specific pharmacotherapy algorithm and follow-up visits were scheduled. • Treatment coordinators provided ongoing monitoring of patients via telephone contact, monitoring or prescriptions/discontinued treatment and feedback to primary care physicians on patient progress and recommendations. • Study psychiatrists had ongoing contact with primary care physicians via periodic case reviews and as-needed telephone consultation.	• Patients assigned to the intervention group experienced significantly better outcomes at every follow up assessment ▪ HAM-D Scores (p<.001) ▪ 57.6% of 203 DMP patients rated themselves as much or very much improved at 12 months compared with 33.7% of 178 usual care patients (p<.001) • At 12 months DMP patients reported significantly better social functioning, mental health & general health perceptions than UC patients on the SF-20 (p<.05)
060	Koopmans, G 1996 Netherlands	Other	• Integral assessment of the patient by the research assistant. • Telephone communication between neurologist and GP, _focusing on verification of data provided by the patient and reason for the referral • A supervision session was held between psychiatrist, neurologist and research assistant, where findings of the physical by the neurologist, the psychosocial assessment and findings from the GP conservation were reviewed and a treatment plan recommended • A second telephone communication between neurologist and GP to present recommended treatment plan and agree upon an intervention program for the patient • The neurologist discussed the treatment plan with the patient.	In both groups, patients showed a significant improvement on Functional Status Index (intervention group p=0.00) (control group (p=0.04) & a tendential significant improvement on the GHQ-28 (intervention group p=0.07) (control p=0.12) The number of major surgical procedures was higher in both groups than the number of minor surgical procedures.

061	Krein, S 2004 US	Chronic condition	• Nurse case managers received a 2-day training session to familiarise them with use of the collaborative treatment algorithms. • Nurse case managers provided patients with self management, reminders for recommended screenings/tests, appointment scheduling, clinical monitoring and medication review. • Providers were notified by e-mail that a change in medication was recommended and could opt to have the case manager make the adjustment or to address the issue personally. • Primary care providers received a summary of the VA Diabetes Guidelines and an overview of the study, and were invited to a clinical conference conducted by the research team.	Patients in the intervention group were significantly more satisfied with their diabetes care & were also more likely to rate the overall care by their diabetes care providers as better than average(p=0.04)
063	Leggett, P 2004 UK	Other	• A camera was placed in each practice and GPs received 15 minutes training in its use. • For patients requiring referral to a dermatologist the GP took photographs of the skin condition and sent them with a referral letter to the dermatologist • If diagnosis by the dermatologist was not possible, patients were given an appointment. If diagnosis was possible, a letter was sent to the GP with advice on management.	No statistically significant health, patient satisfaction or economic outcomes reported.
064	Lester, H 2003 UK	Mental Health	• Patient held records for patients receiving GP and community mental health shared care.	No statistically significant health, patient satisfaction or economic outcomes reported,.
066	Lin, E 2000 US	Mental Health	• Patient receives educational book and videotape on depression • Visits with liaison psychiatrist in primary care clinic for a maximum of 3 months • Psychiatrist made telephone calls to patient and monthly review of pharmacy data on antidepressant refills to monitor progress. • Psychiatrist assisted patient and primary care physician to alter medications if necessary • Primary care physicians received immediate verbal consultation about their patient's progress and a typed psychiatric consultation note within one week.	Both groups reported decreasing interference associated with depression. Patients receiving intervention in the 1st 6 months reported significantly less interference with activities than patients receiving usual care on the Global SDS (z=2.23, p=.025 for the time x treatment group interaction) Each of the 3 SDS sub scales, work, family & social activities showed similar patterns of significant improvement in the intervention group compared with the usual care group (z=2.23, p=.025)
067	Litaker, D 2003 US	Chronic Disease	• Written treatment algorithms were used to create patient management flowcharts to guide the nurse practitioner (first line contact for care), in treatment decisions and to standardise treatment in team care. • The nurse practitioner discussed management decisions or problems not addressed by the algorithms with the primary care physician and	Change in general satisfaction with care was significantly higher in the intervention group (p=0.01). Communication with provider (p=0.03) and interpersonal care (p=0.02) were higher at the end of 1 year compared with baseline values. HBA1c significant decrease in intervention group (p=0.02) The average personnel costs per patient for 1 years treatment of hypertension &

			they developed a treatment plan. • The nurse practitioner carried out telephone contact and office visits with the patient to incorporate patient preferences in the treatment plans, assess adherence, and patient education.	diabetes mellitus were significantly higher and amounted to $134.68 for team treated patients and $93.70 for those treated by their PCP alone (md=$40.38, p<0.001).
069	Llewelyn Jones, R 1999 Australia	Mental Health	• GP, resident, staff, local psycho geriatric services, and project team reps met regularly to ensure project feasibility and acceptability. • Monthly liaison committee meetings between GPs and residential care staff. • Depression related health education and activity programmes for residents • Training of general practitioners and carers in detection and management of depression • Depression education and support for residential care staff from a specialist psychogeriatric nurse.	• Significantly more movement to less depressed geriatric depression scale levels in the intervention group (chi square=6.37, df 1, p=0.012)
073	McInnes, E 1999 Australia	Aged and palliative care	• GPs made a pre-discharge visit to patients approximately 1-5 days after being invited by a geriatrician. GPs were able to talk to allied and medical staff as required had access to patient medical notes and were able to see the patient. • A consultation sheet was issued requesting written information from the GP specific to the individual patient e.g. recommendations for post-discharge community service provision	• At 6-week follow up, significantly more of the test group reported that their return home was well prepared (93% versus 82%, OR=2.72, 95% CI=1.09-6.82, p=0.03)
074	Meeuwesen, L 1996 Netherlands	Other	• Two structured phone conversations between neurologist and GP • Agreed care plan • Referral to GP for follow up care OR shared care (or ongoing care from neurologist or referral to psychiatric service) • Weekly case conferences amongst multidisciplinary specialist team (excluding GP)	No significant statistical health, patient satisfaction, economic outcomes reported.
080	Modell, M 1998 UK	Other	• A nurse facilitator provided each practice with information materials on hemoglobin disorders and carrier testing such as posters, leaflets and a reference manual. • A nurse facilitator trained practice staff on haemoglobinopathy screening and counseling services through 3 formal sessions. • The nurse reviewed communication between the laboratory and practices by using computerised lab records.	No statistically significant health, patient satisfaction or economic outcomes reported.
081	Naji, S 1999 UK	Mental Health	• Phone call from hospital to GP before discharge, discussing patient's condition • Appointment arranged with GP on behalf of patient within one week of discharge • Copy of discharge summary given to patient and posted to GP	Patients in the novel discharge group had a significantly larger median number of GP consultations related to mental health than was the case for those in the conventional discharge group (3.0 95% CI 1-5 versus 2.0, 95% CI 0-4 and Mann-Whitney p=0.016).

084	Nazareth, I 2001 UK	Aged and palliative care	• Hospital pharmacist assessed medication use, ability to manage medications, liaised with carers and community professionals where appropriate and developed discharge plan • A copy of the discharge plan was given to the patient, the patient's community pharmacist and general practitioner and any other professionals or carers involved. • Between 7 and 14 days post discharge domiciliary assessment by a community pharmacist, with report back to hospital pharmacist. • Care plan revised if patient re-admitted within six months • Hospital and community pharmacists were trained on all aspects of the care plan and given a detailed manual to guide through the various staged of the care plan.	No statistically significant health, patient satisfaction or economic outcomes reported.
086	Nicholson, C 2001 Australia	Chronic conditions	• Hospital specialist retains responsibility for patient care in hospital in the home (agreed roles) • Care provided by nurses, GPs, hospital staff and other providers • Daily phone contact between GP, nurse and respiratory team, organised by hospital • Hospital provided 24 hour telephone support and rapid re-admission if needed	No statistically significant health, patient satisfaction or economic outcomes reported.
095	Preen, D 2005 Australia	Chronic conditions	• EPC discharge plan developed by nurse 24-48 hours before discharge • Plan faxed to GP and other identified service providers and given to patient • GP sees patient within 7 days of discharge	Satisfaction with input into discharge care planning was significantly greater (36.5%, p=0.02) for those receiving the care plan compared with the control group A significant difference (p=0.004) was also observed for the item evaluating how the current discharge process compared with previous hospital separations for similar diagnosis. Patients in the intervention group rated the achievability of post discharge care arrangements significantly higher (10.1%, p=0.038) than those in the control group Mental quality of life was significantly improved (p=0.003) from pre-discharge to 7 days post-discharge within the intervention group (13.4%) with no statistical difference observed for control subjects
096	Premaratne, U 1999 UK	Chronic Disease	• Practice nurses trained in asthma care by specialist asthma nurses • Nurse specialists visited practices, helping practice nurses to organise their clinics, assisted in improving patient management and gradually devolved responsibility for clinics to them	We found no clear evidence that the intervention altered the delivery of asthma care
097	Rabow, M 2004	Aged and palliative	• Multi-disciplinary intervention by team including chaplain, nurse, doctor, social worker, pharmacist, psychologist, volunteer	• Advanced care planning in the CCT group produced significant results:

	US	care	coordinator, art therapist • Assessments by social worker, presented to team and including recommendations for physicians • Social worker provides case management and support by phone and in person • Nurse provided education for families and care givers • Pharmacist conducted medication reviews • Chaplain offered spiritual support • Monthly support groups and art activities for patients and families • Medical and pharmacy students provided volunteer support, and reported back to team • •	▪ Completed funeral arrangements (p=.03) • The odds of a patient reporting any dyspnea at time 3 were significantly less for the intervention group (OR = 6.07, 95% CI 1.04-35.56) • Intervention patients reported significantly less dyspnea interfering with daily activities (F=7.06, p=.01) • There was a significant group X time interaction with decreased limitation of activity due o dyspnea for the intervention patients but increased limitation over time for control patients (F=6.83, P=.01) • There was a statistically significant improvement in sleep quality in the intervention group (F=4.05, p=.05) • There was no significant group difference in mean anxiety • Intervention group patients reported higher overall spiritual well-being than controls (F=8.21, p=0.007)
100	Rea, H 2004 New Zealand	Chronic Disease	• Guideline developed and circulated to all GPs (whether in the trial or not) • Patients assessed (input from specialist nurse and doctor) and care plan developed by GP, including an action plan for the patient • Patients received education on smoking, medication and use of inhalers from practice nurse and respiratory nurse • Regular check ups with practice nurse and GP. At least one home visit by respiratory nurse • Respiratory nurse provides professional back up to practice nurse and links to specialist and secondary care services. Locator alert system identified patients if hospitalised, and admission notification sent to GP who took part in discharge planning	After 12 months the FEV1 (QOL outcomes) for the intervention group improved, whereas it deteriorated for the control group, resulting in a significant difference between the patient groups (p<0.001)
102	Reuben, D 1999 US	Aged & Palliative Care	• Subjects received an outpatient comprehensive geriatric assessment from a social worker, a gerontologic nurse practitioner/geriatrician team, and a physical therapist at a community-based clinic. • A short interdisciplinary case conference followed the evaluations. 6 different geriatricians served on the team on a rotating basis; the same nurse practitioner, social worker and physical therapist participated in the team throughout the study. • The geriatrician called the physician to convey CGA recommendations and allow physicians to comment. This was followed by a letter with recommendations, a copy of the dictated consultation, and copies of literature relevant to the patient's condition.	At 15 months physical functioning status scores in the control group had dropped significantly, whereas the treatment group had maintained its functional status (p=0.021)

			• Patient received written recommendations, dictated copy of consultation, and a booklet on how to talk to your doctor. Followed by telephone call from health educator to review recommendations and prepare for discussion with their physician.	
108	Rothman, R 2005 US	Chronic condition	• For intervention group, intensive disease management care, including education sessions, counseling and medication management provided by pharmacist (via telephone or in person) • Treatment recommendations discussed with the patient's primary care provider • Pharmacists saw patients directly or in consultation with physician using dedicated clinic slots. • Use of algorithm to manage CVD risk factors by the pharmacist developed with input from the practice physicians. Register to track patient progress and outcomes. • Diabetes care coordinator supports behavior change and identifies need for further interventions via regular phone contact with patients, consulting with and trained by pharmacists.	• Both systolic & diastolic blood pressure improved more among intervention than control patients. Systolic: intervention patients had a 7-mm Hg decrease a difference of 9 mm Hg (95% CI 3-16mmHg, p=0.008). Diastolic: control patients had an increase of 1 mmHg while intervention patients had a decrease of 4 mmHg (difference 5mmHg, 95% CI 1 to 9 mmHg, p=0.02) • At 12 month follow up the use of aspirin for cardiovascular risk prevention was higher for intervention patients than control patients. Among control patients aspirin was used in 58% of eligible patients, compared to 91% among intervention patients (p<0.0001).
109	Roy-Byrne, P 2001 US	Mental Health	• Patients were mailed an educational videotape and pamphlet on panic disorder and its treatment. • Patient provided with an initial psychiatric visit in the primary care clinic where patients were prescribed antidepressant medication and educational materials discussed. • Two follow-up phone calls and a second visit were conducted by the psychiatrist with patients following a schedule of extended care. • The primary care physician received a typed consultation note after each psychiatric visit. • 1 hour training session for participating doctors.	At the 6 & 12 month follow up interviews, more CC than UC patients were satisfied or very satisfied with the quality of care they received for emotional problems (6 months 82% versus 43% Chi Square 13.71, p<.001; 12 months 76% versus 52%, Chi Square 4.28, p=.039) CC patients improved significantly more over time than usual care patients on anxiety, depression, and disability measures, with the greatest effects at 3 and 6 months.
110	Rutherford, A 2001 Australia	Other	• GPs were phoned during admission and invited to provide input into discharge planning, by phone or in person and reminded that they could claim for an EPC payment • Special discharge summaries with educational material and input from allied health staff given to patient or sent to GPs within 1-2 days of discharge	No statistically significant health, patient satisfaction or economic outcomes reported.
111	Samet, J 2003 US	Mental Health	• Multi-disciplinary assessment and initial care at primary care clinic operated two times a week by a nurse, social worker and physician located in a residential detoxification unit within detoxification unit • Selection of appropriate primary care physician for patient and referral to that physician • Discharge/referral summary sent to primary care physician	No statistically significant health, patient satisfaction or economic outcomes reported,.

113	Sellors, J 2003 Canada	Aged and palliative care	• Pharmacists conducted face-to-face medication reviews with the patients in the physicians office • The pharmacists gave written recommendations to the physician which summarised the patient's medications, identified drug related problems and recommended actions to resolve any such problems. • The pharmacist and physician met to discuss the recommendations and the physician subsequently recorded the recommendations they intended to implement and when. • 1 and 3 months after meeting the pharmacist reviewed medications with the patient via telephone and at 3 and 5 months after the meeting the pharmacist and physician met again to discuss progress.	No statistically significant health, patient satisfaction or economic results reported.
114	Simon, G 2001 US	Mental Health	• Patient receives educational book and videotape on depression • 2-4 visits with liaison psychiatrist in primary care clinic. Then alternating visits to primary care physician and psychiatrist • As-needed referral to psycho-social treatment or community resources • Algorithm based adjustment of pharmacotherapy • Care transferred to primary care physician after 3-4 months. Ongoing monitoring of adherence to medication regime by liaison psychiatrist	After adjustment for patient age, sex, baseline SCL-90 depression score & chronic disease score, the incremental number of depression free days attributable to collaborative care intervention was significantly greater than zero (t=2.28, df=166, p=0.02)
115	Sin, D 2004 Canada	Chronic conditions	• All patients asked to make follow up appointment with their primary care physician • For patients in intervention group, a coordinator offered to make the follow up appointment • (Control group) Patients in control group phoned to remind to go for follow up appointment with primary care physician	No statistically significant health, patient satisfaction or economic outcomes reported.
117	Smith, B 1999 Australia	Chronic conditions	• Visit by respiratory nurse in hospital • Case conference in hospital if needed with hospital doctor, GP, respiratory nurse • Respiratory nurse conducts review in patient's home within 7 days of discharge • Results of review discussed with GP. Involvement of community care and support services arranged by nurse • Education material provided by respiratory nurse in liaison with GP for smokers	In intervention group (HBNI) there was a significant deterioration in lung function at 12 months the mean FEV1 from 35 HBNI subjects fell to 0.74 L from 0.82 L at baseline (p=0.04). Total COOP scores significantly decreased from 33.2 (SE=1.1) at baseline to 30.2 (SE=1.2) at 12 months in the HBNI group indicating an improvement in total HRQL at 12 months (p=0.013) Three COOP scores were significantly lower: emotional condition, difficulty doing daily tasks & general HRQL (p=0.01, p=0.03, p=0.03). Significantly more patients requiring home oxygen died than those who did not (p<0.001)
119	Sommers, L 2000 US	Aged and palliative care	• Nurse and social worker co-located with primary care physicians in their practices	A higher mean number of social activities for intervention patients (8.6 to 8.8) compared with controls (8.9 to 8.6, p=.04; 95% CI 0.02-0.10)

			• *Home health assessment by nurse or social worker • Treatment plan drafted by physician, nurse and social worker • *Follow up contact with patient at least every 6 weeks by nurse and social worker by phone, home visit, small group session, hospital visit or office visit. • Multi-disciplinary case reviews at least once a month (nurse, social worker, physician)	
120	Sorensen, L 2004 Australia	Other	• 2 education sessions. The first was a multi-site satellite transmitted education session and workshop for GPs and pharmacists conducted by a multidisciplinary team. The second education was a video conference for GPs only. • Home visit by a pharmacist initiated by a structured, written GP referral. To record medication related risk factors and data for the medication review. • The pharmacist prepared a medication review report using the GP information and home-visit findings following specific guidelines for medication reviews and forwarded to the GP within 2 weeks. • Recommendations were discussed at a multidisciplinary conference between the GP, pharmacist and other professional members of the patient's health care team. • GP developed an action plan and implemented the actions in consultation with the patient at a subsequent visit to the surgery.	No statistically significant health, patient satisfaction or economic results reported.
121	Spillane, L 1997 US	Other	• Care plans based on medical records were developed for frequent ED users and held at the ED. • On first visit to the ED during the study period a psychiatric or social worker assessment was done and a primary care provider was appointed to the patient. • Multidisciplinary case conferences were organised soon after initial visit to ED with inclusion of the primary care provider. Focus on coordination of care in ED, outpatient and community settings and encourage primary care in the outpatient clinic.	No statistically significant health, patient satisfaction or economic outcomes reported.
125	Straka, R 2005 US	Chronic conditions	• Clinical pharmacist met with PHC provider to develop a patient specific care plan and approved by PHC provider for implementation by the pharmacist. All recommendations made with knowledge of the patient's complete drug regimen and history. • *Plan implemented by pharmacist which included treatment, patient education, referral to risk management programs (e.g. smoking cessation) and communication of all new and modified prescriptions to the patient's pharmacy by the clinical pharmacist.	• At 6,5 months LDL level in the intervention group was reduced an average of 35.6 +- 26 mg/dl from baseline, compared with 6.7 +- 24 mg/dl in the control group ($p<0.001$) • A statistically significant reduction in HDL & total cholesterol levels was also noted. • Of the patients in the intervention group, 72% achieved the LDL goals of

			• Any changes in care communicated to primary care physician by email, phone or face to face meetings. • *Patients contacted by telephone to ensure timely follow-up for fasting lipid panels and liver function tests, advise on medication changes and conduct further patient education.	less than 100mg/dl versus 18% in the control group (p<0.001). • The control group made greater progress toward the target LDL level with 111+- 33 mg/dl (p<0.001 versus the intervention group)
131	Unutzer, J 2002 US	Mental Health	• DCSs attempted to follow patients for up to 12 months, monitoring treatment response, and adjusting treatment when necessary in collaboration with the primary care provider.	Intervention patients also reported less health related functional impairment (p<0.001 at 3 & 12 months, p=.02 at 6 months) & greater overall quality of life in the past month (p<.001) at all follow ups).
133	Vierhout, W 1995 Netherlands	Other	• Joint consultation sessions with 1 orthopedic surgeon, 3 GPs and patients present at each session.	More patients in the intervention group were symptom-free at 1 year (35% vs 24%, p<0.05).
134	Vlek, J 2003 Netherlands	Chronic Disease	• Joint consultation between GPs, cardiologist and patient • Follow up consultation with cardiologist after 12 months	• No statistically significant health, patient satisfaction or economic outcomes reported.
135	Wade, V 2005 Australia		• All intervention GPs received patient depression scores (from hospital) and an education pack • Patients reviewed in hospital by cardiab rehab nurse and psychiatric liaison registrar • GPs were offered psychiatric advice through either: an EPC multi-disciplinary case conference; a phone call from the psychiatrist • GPs had access to fast track referral of patients to psychiatrist; and referral for 6 sessions of CBT	• At 12 months, when the 3 forms of intervention were compared with the control group, only the psychiatrist telephone call led to a significant reduction in the proportion of patients with moderate to severe depression (CES-D >/ 27), 19% versus 35% (RR:0.55, 0.34-0.86), NNT (4-24)
137	Weisner, C 2001 US	Mental Health	• 3 physicians with specialty training in substance abuse, 1 medical assistant and 2 nurses provided primary care within the substance abuse clinic rather than the primary care clinic.	Significantly more integrated services patients were newly diagnosed during treatment as having 4 kinds of conditions: arthritis, headache, injuries, poisonings/overdoses & anxiety disorders. Independent services patients had only higher rates of acid-peptic disorders as a new condition. Subjects in both groups showed significant improvement at 6 month follow up on alcohol & other drug severity scores. Although there was a trend for higher abstinence, no significant differences were found between integrated services & independent services in total. SAMC subgroup. Integrated care patients had significantly higher total (69% versus 55%, p=.006) and alcohol (80% versus 65%, p=.oo2) abstinence rates than independent care patients Average medical costs decreased from $313.50 to $200.08 (p=.04) among the full integrated services sample, whereas there was no significant reduction in the independent services sample. Among SAMC patients, medical costs for integrated services decreased from $470.39 to $226.86 (p=.006) and for independent services from $356.96 to

				$301.51 (p=.04)
141	Wood, K 1994 New Zealand	Mental Health	• Small multidisciplinary case management teams (psychiatrist, social worker and domiciliary nurse) provided care using an assertive community treatment approach for patients in each general practice • Every patient was assigned to a key worker for regular follow-up, but crisis care was provided by any of the team members • Case management teams held weekly meetings to establish and review management goals for the patients under their care • Informal contact between GPs, other practice staff, and the case management team was encouraged.	No statistically significant health, patient satisfaction or economic outcomes reported.
144	Caplan, G 2004 Australia	Aged and palliative care	• Comprehensive geriatric assessment conducted after discharge from ED in the patient's home by a member of the team followed by discussion with the patient's GP, formulation of a care plan and initiate any urgent interventions or referrals. • Weekly interdisciplinary team meetings (geriatrician or geriatric registrar, nurses, physiotherapists, occupational therapists) where patient's history was presented and further referrals or interventions could be ordered. • Home follow-up for up to 28 days by the team and referral to GP, specialist physicians or nurses, community health nurses, or other community services during the 4 weeks or for longer term follow-up after the 4 weeks.	At 6 months intervention patients Barthel score had declined 0.25 points but the control group experienced a decline of 0.75 points (p<.001). By 18 months there was no difference between the 2 groups
145	Marks, M 1999 Australia	Chronic conditions	• In addition to standard discharge procedures GPs were telephoned by one of the investigators at or before discharge with details of patient's admission and planned follow-up and made an appointment for patients within 2 weeks of discharge. • Before discharge patients were given treatment orders for next 2 weeks, asthma action plans for future episodes, asthma education booklets, and an appointment to see GP within 2 weeks.	No statistically significant health, patient satisfaction or economic results reported.
146	Brand, C 2004 Australia	Chronic conditions	• A chronic disease nurse consultant (CDNC) saw patients within 24 hours before discharge from hospital to assess patient and develop a discharge treatment plan. • A copy of the discharge summary was faxed to the patient's GP • The patient was seen again by the nurse in the chronic disease clinic (CDC) for further patient assessment, review of action plan. • The CDNC faxed a summary report to the GP after clinic visit, coordinated case conferencing and liaison between consultant and GP. • The CDNC coordinated clinic bookings by letter and phone with	No statistically significant outcomes reported for health, patient satisfaction or economic outcomes.

			patient and was available to GP and patient by phone between visits. Patients were sent a reminder letter for appointments and transport arranged if necessary.	
149	Montgomery, P 2003 Canada	Aged and palliative care	• Comprehensive assessment was undertaken by a coordinator trained by the investigators and day-hospital staff. • A care plan was developed by the coordinator and reviewed with the geriatrician and the day-hospital team • Options for intervention included home assessment, referral, or hospitalisation. If acute care hospitalisation was required the client was referred back to the family physician; geriatric admissions were referred to a geriatric care facility. • A copy of the team assessment and plan were made available to the referrer within one week. • Patients were followed for 3 months to ensure provision of resources and resolution of problems, together with preventive measures.	Intervention family members reported significantly higher mean satisfaction scores with the "promptness" of service than control family members (4.21 versus 3.63, t=2.11, p=0.02)
152	Smeenk, F 2000 Netherlands	Aged and palliative care	• A specialist nurse coordinator coordinated discharge and organised care in the home. • A 24 hr telephone consultation services was installed on the hospital's multidisciplinary oncology ward for use by the primary care team including GP. • If necessary hospital staff were available for consultation with patient in the home • A patient held home-care dossier was used to collaborate actions by the primary and hospital care teams. • Care protocols were developed by a multidisciplinary team for intravenous therapy, epidural-spinal pain relief, and the pharmaceutical trajectory	The intervention programme contributed significantly (p=0.048) towards a better physical functioning Total costs per patient for drugs was significantly lower in the intervention group compared to the control group (579 versus 957 Dutch guilders).
156	McInnes, G 1995 UK	Chronic conditions	• A computerised shared care record for patients with hypertension at the blood pressure clinic and a Personal Health Booklet for the patient. Computerised record is used to update the GP's patient record and the patients record book • Every year the patient is prompted to arrange an appointment with the GP. • At the appointment the GP conducts a standard set of test and records findings in a two page medical record and returns the record and Person Health Booklet to the shared care registry. • The medical record is reviewed according to a protocol and then scrutinised by a specialist and sent back to GP with recommendations	No statistically significant health, patient satisfaction or economic outcomes reported.

170	Rollman, B 2005 US	Mental Health	• 2 nonbehavioral health specialist care managers telephoned patients to conduct a mental health assessment, provide basic psycho education, and assess the patient's treatment preferences for his/her anxiety disorder. • Weekly case review sessions were held between the research team and care managers to review patient progress and make suggestions for treatment or referral. • Following case review sessions, the care manager forwarded patient-specific guideline-based treatment recommendations to the patient's PCP via EMR for their consideration. • The care manager subsequently telephoned the patient at regular intervals to promote adherence with treatment recommendations and assess clinical response. Use of register to follow up patients • The care manager also informed the physician of his/her patient's progress, recommended modifications in the treatment regimen, and offered other assistance as indicated.	• Although intervention patients self-reported a higher rate of pharmacotherapy usage for a mental health problem at 2 month follow up than usual care patients (65% versus 41%, p=0.006) it did not differ at other follow up assessment points. • Compared with usual care patients, intervention patients reported a greater reduction in anxiety symptoms (p=.03) and increased mental health related quality of life (p=.03) • Intervention patients were more likely to experience a 40% or greater decline in depressive symptoms from baseline (p<0.001) • Intervention patients reported an absolute improvement of 5.7 more hours worked per week (p=0.05) and 2.6 fewer work days absent in the past month (p=0.03) from baseline than those randomised to usual care. • Intervention patients were more likely than usual care patients to remain working (94% versus 79%, p=.04), work more hours per week (40.5 versus 31.7, p=.03) and report fewer work days absent in the past month (1.1 versus 2.7, p=.05) at 12 month follow up
175	Hedrick, S 2003 US	Mental Health	• Collaborative care team (psychologists, psychiatrist, social workers) met weekly to develop treatment plans and 6 and 12 week progress evaluation for each patient. • The team communicated with GPs using electronic progress notes, which had an alert and co-signature function and allowed the team to track receipt and acknowledgement of notes and follow-up. • If the GP questioned the recommendations the team psychiatrist contacted them by telephone to achieve consensus on a treatment plan. • The team tracked pharmacy records and if agreed upon prescriptions were not written in a timely fashion the team contacted the GP to discuss the recommendation • Stepped treatment provided to patients by the team included patient education, antidepressant treatment, CBT and telephone patient support and progress evaluation	Patients in the collaborative care group experienced a significantly larger decrease in depressive symptomatology during acute-phase treatment than did patients in the CL group(p<.025). However the differences were not significant at 9 months A total of 80% of collaborative care patients received prescriptions for anti-depressants during the 9 month treatment trial, compared to 62% for Cl care (p<.0001). We observed declines in the PCS score in both the collaborative & CL groups, with a statistically significant decrease in collaborative care PCS from baseline to 9 months
185	Drummond, N 1994 UK	Chronic conditions	• Using the computer based patient record system, 16 chest physicians review patients in this scheme annually. • Interim reviews take place in general practice, typically every three months; however, the interval between reviews can be shortened if the patient's condition merits this. • Patients are sent computer generated questionnaires at the	No statistically significant health, patient satisfaction or economic outcomes reported.

			appropriate time about symptoms and aspects of their condition and inviting them to make an appointment with their GP. Asked to give completed questionnaire to GP at consultation • Simultaneously, the patient's GP is sent a separate computer generated questionnaire about the patient condition and use of services and mentioning that the patient is due to attend shortly for an asthma review • The information from both questionnaires is then added to the patient's computerised record. Copies of the updated record are sent to the GP, along with any suggestions from the consultant for changes in the management plan.	
193	Hermiz, O 2002 Australia	Chronic conditions	• Home visits by a community nurse at one and four weeks after discharge • After the visit a care plan documenting problem areas, education provided, and referral to other services was posted to each patient's general practitioner, and, if appropriate, the general practitioner was contacted by telephone. • At the second visit patients were encouraged to continue to refer to the education booklet for guidance and to keep in contact with their general practitioner.	The GPs of the intervention practices were significantly more likely to have been contacted by the nurses (8/67 versus 1/80, p=0.008) & report receiving the care plan, & most of them who had received the care plan rated them as useful
195	Hughes, S 2000 US	Aged and palliative care	• Participating sites provided continuous post discharge patient care management from a multidisciplinary team • Components were: target care to high risk patients, designated primary care manager, 24 hr contact for patients, prior approval of hospital readmissions, transfer stable readmitted patients to step down beds, involving team in discharge planning	At 6 months, VA hospital re-admission costs for the TM/HBPC group were lower, but home based care & nursing home care costs were significantly higher than the control group costs. Despite significantly lower private sector costs, total TM/HBPC costs were 6.8% higher than the total control group costs. At 12 months the HBPC (p<.001) and nursing home (p=.02) costs were significantly higher for the TM/HBPC group than the control group, and only out-patient costs were significantly lower in the TM/HBPC group compared to the control (p=.02)
196	Kasper, E 2002 US	Chronic conditions	• Four team members, a cardiologist, a CHF nurse, a telephone nurse coordinator and the patient's primary physician, provided post discharge team care. • The CHF cardiologists designed and documented a treatment plan for all study patients before randomisation and saw the patients at baseline and six months • Patients had at least monthly follow up with the CHF nurses at the CHF clinics or patients home. They adjusted medications under the directions of the CHF cardiologists, following a pre-specified algorithm	After six months, patients with systolic dysfunction in the Dietary compliance was more likely to be described as "good" or 'average" in patients in the intervention group versus the non intervention group, based on a review of dietary history (65 of 94 patients versus 38 of 85 patients, p=0.002) The intervention patients were also more likely to be at their goal weight, as compared with the non intervention patients (47 of 94 patients versus 17 of 85 patients, p=0.001). At the final visit, patients in the intervention group were less symptomatic, according to NYHA functional class. Patients in the intervention group were more likely to report stable or improved symptoms as compared with those in

			• The telephone nurse coordinator followed up patients using a set script and pursued problems as clinically indicated, but did not adjust medications over the telephone. • All members of the team, except for the patients' primary physicians, participated in weekly patient care meetings. Primary physicians approved all care provided by the team and managed all problems not related to CHF and received regular feedback.	the non intervention group (81 of 94 patients versus 55 of 85 patients, p=0.003) and were less likely to have ankle edema (18 of 89 patients versus 35 of 85 patients, p=0.003).
198	Leveille, S 1998 US	Aged and palliative care	• Geriatric nurse practitioner (GNP) contacted the primary care physician to obtain the patient's current health information and the primary care providers goals for the patient. • Initial meeting at the senior center between the GNP and patient to develop a targeted health management plan addressing risk factors for disability and self management of chronic illness. • Follow - up visits and phone contacts by the GNP to monitor progress and provide ongoing treatment and patient education. • Reports on their patient's participation were sent to all referring primary care physicians, but seldom telephone contact. • Volunteer mentors, who were senior center participants trained in a 12 hour session health promotion course, provided peer support to participants.	The intervention group improved in their attitudes & behaviours with respect to physical activity, measured by the PACE score compared to controls. The overall level of physical activity was significantly higher in the intervention group compared with controls at follow up (p=.031) Greater reductions in psychoactive medication use were seen in the intervention group compared with controls (36% versus 20% reduction in mean number of psychoactive drugs, p=.039).
204	Naji, S 1994 UK	Chronic conditions	• Integrated care patients seen in general practice every three or four months and in the hospital diabetic clinic annually. • General practitioners were given written guidelines for integrated care, including measurements and examinations to be undertaken, and on the current diabetes management policy. • Coordination of appointments and recall of patients in both arms of the trial were facilitated by the computer based patient record system,12 which was run from the hospital clinic • GPs received a computer generated reminder that the patient was due for consultation together with the most recent clinical details • After the appointment the practice added new information to the record and returned it to the clinic to be added to the computerised record. Updated records were returned to the practice to ensure consistency and completeness.	No statistically significant health, patient satisfaction or economic outcomes reported.
205	Naylor, M 1999 US	Aged and palliative care	• Initial Advanced practice nurses (APN) with patient within 48 hrs of hospital admission and at least every 48 hrs during the entire period of hospitalisation. • APN developed a standardised comprehensive discharge planning and home follow up protocol while the patient was in hospital, which guided patient assessment and specified a minimum set of	At 24 weeks, total and per-patient imputed reimbursements for post index acute health services in the control group were approximately twice as much as that of the intervention group ($1238928 versus $642595 p<.001) ($6661 versus $3630, p<.001) Intervention group cost savings were driven by the control groups substantially

			APN visits. • APN conducted at least 2 home visits, initiated telephone contact at least weekly and were available to patients 7 days a week. • At completion of the intervention, APNs sent written summaries to patients, caregivers, physicians, and other providers to whom APNs had referred patients, detailing the plans, goal progression, and ongoing concerns.	greater total DRG reimbursement for all hospital readmissions at 24 weeks after discharge ($1024218 versus $427217, p<.001).
209	Segal, L 2004 Australia	Chronic conditions	• A written care plan was developed by the client's care coordinator who, in the SCHN CCT, was the client's general practitioner (GP). • Care plans were reviewed at a frequency determined by an assessment of likely risk of hospital admission. • A local health and community services directory was compiled as a resource for care co-coordinators and others in seeking services for their clients. • The SHCN was the principal auspicing agency for the trial in partnership with the Dandenong Division. Included planning, start up, recruitment, development of the CC model, on-going management of the funds pool and mounting of special initiatives.	Within the CC Group, clients in higher risk categories were more likely to report a positive rating concerning the impact of the trial on their perceived quality of life. At the highest risk level, 67% indicated some improvement in their quality of life due to the trial, compared to 42% in the medium risk level and 15% in the lowest (Chi Square = 145.4, df=4, p=0.000).

Appendix 9: Primary Studies Quality Assessment Tool

QUALITY ASSESSMENT TOOL FOR QUANTITATIVE STUDIES COMPONENT

RATINGS A) SELECTION BIAS

Ref ID: _____
Author: _____
Year: _____
Reviewer: _____

(Q1) **Are the individuals selected to participate in the study likely to be representative of the target population?**

Very Likely Somewhat Likely Not Likely

(Q2) **What percentage of selected individuals agreed to participate?**

80 - 100% 60 – 79% Less than 60% Not Reported Not Applicable Agreement Agreement Agreement

Rate this section (see dictionary)	Strong	Moderate	Weak

B) ALLOCATION BIAS

Indicate the study design

RCT Quasi-Experimental Case-control, Before/After study, (go to i) (go to C) No control group, or Other: _____ (go to C)

(i) Is the method of random allocation stated? Yes No
(ii) If the method of random allocation is stated is it appropriate? Yes No

(iii) Was the method of random allocation reported as concealed? Yes No

Rate this section (see dictionary)	Strong	Moderate	Weak

C) CONFOUNDERS

(Q1) **Prior to the intervention were there between group differences for important confounders reported in the paper?**

Yes No Can't Tell Please refer to your Review Group list of confounders. See the dictionary for some examples. Relevant Confounders reported in the study:

(Q2) **If there were differences between groups for important confounders, were they adequately managed in the analysis?**

Yes No Not Applicable

(Q3) **Were there important confounders not reported in the paper?**

Yes No

Relevant Confounders NOT reported in the study:

Rate this section (see dictionary)	Strong	Moderate	Weak

D) BLINDING

(Q1) Was (were) the outcome assessor(s) blinded to the intervention or exposure status of participants?

Yes No Not Reported Not Applicable

Rate this section (see dictionary)	Strong	Weak	Not Applicable

E) DATA COLLECTION METHODS (Q1) Were data collection tools shown or are they known to be valid? Yes No

(Q2) Were data collection tools shown or are they known to be reliable?

Yes No

Rate this section (see dictionary)	Strong	Moderate	Weak

F) WITHDRAWALS AND DROP-OUTS

(Q1) Indicate the percentage of participants completing the study. (If the percentage differs by groups, record the lowest).

80 -100% 60 - 79% Less than Not Reported Not Applicable 60%

Rate this section (see dictionary)	Strong	Moderate	Weak	Not Applicable

G) ANALYSIS (Q1) Is there a sample size calculation or power calculation?

Yes Partially No

(Q2) Is there a statistically significant difference between groups?

Yes No Not Reported

(Q3) Are the statistical methods appropriate?

Yes No Not Reported

(Q4a) Indicate the unit of allocation (circle one)

Community Organization/ Group Provider Client Institution

(Q4b) Indicate the unit of analysis (circle one)

Community Organization/ Group Provider Client Institution

(Q4c) If 4a and 4b are different, was the cluster analysis done?

Yes No Not Applicable

(Q5) Is the analysis performed by intervention allocation status (i.e. intention to treat) rather than the actual intervention received?

Yes No Can't Tell

H) INTERVENTION INTEGRITY

(Q1) What percentage of participants received the allocated intervention or exposure of interest?

80 -100% 60 - 79% Less than 60% Not Reported Not Applicable

(Q2) Was the consistency of the intervention measured?

Yes No Not reported Not Applicable

SUMMARY OF COMPONENT RATINGS

Please transcribe the information from the gray boxes on pages 1-3 onto this page.

A SELECTION BIAS

Rate this section (see dictionary)	Strong	Moderate	Weak

B STUDY DESIGN

Rate this section (see dictionary)	Strong	Moderate	Weak

CONFOUNDERS

Rate this section (see dictionary)	Strong	Moderate	Weak

D BLINDING

Rate this section (see dictionary)	Strong	Weak	Not Applicable

E DATA COLLECTION METHODS

Rate this section (see dictionary)	Strong	Moderate	Weak

F WITHDRAWALS AND DROPOUTS

Rate this section (see dictionary)	Strong	Moderate	Weak	Not Applicable

G ANALYSIS Comments

H INTERVENTION INTEGRITY Comments

WITH BOTH REVIEWERS DISCUSSING THE RATINGS:

Is there a discrepancy between the two reviewers with respect to the component ratings?

No Yes

If yes, indicate the reason for the discrepancy

1Oversight 2Differences in Interpretation of Criteria 3Differences in Interpretation of Study

Dictionary for the Effective Public Health Practice Project Quality Assessment Tool for Quantitative Studies

INTRODUCTION

The purpose of this tool is to assess the methodological quality of relevant studies since lesser quality studies may be biased and could over-estimate or under-estimate the effect of an intervention. Each of two raters will independently assess the quality of each study and complete this form. When each rater is finished, the individual ratings will be compared. A consensus must be reached on each item. In cases of disagreement even after discussion, a third person will be asked to assess the study. *When appraising a study, it is helpful to first look at the design then assess other study methods.* It is important to read the methods section since the abstract (if present) may not be accurate. Descriptions of items and the scoring process are located in the dictionary that accompanies this tool.

The scoring process for each component is located on the last page of the dictionary.

INSTRUCTIONS FOR COMPLETION

Circle the appropriate response in each component section (A-H). Component sections (A-F) are each rated using the roadmap on the last page of the dictionary. After each individual rater has completed the form, both reviewers must compare their ratings and arrive at a consensus.

The dictionary is intended to be a guide and includes explanations of terms.

The purpose of this dictionary is to describe items in the tool thereby assisting raters to score study quality. Due to under-reporting or lack of clarity in the primary study, raters will need to make judgements about the extent that bias may be present. When making judgements about each component, raters should form their opinion based upon information contained in the study rather than making inferences about what the authors intended.

A) SELECTION BIAS

Selection bias occurs when the study sample does not represent the target population for whom the intervention is intended. Two important types of biases related to sample selection are referral filter bias and volunteer bias. For example, the results of a study of participants suffering from asthma from a teaching hospital are not likely to be generalisable to participants suffering from asthma from a general practice. In volunteer bias, people who volunteer to be participants may have outcomes that are different from those of non-volunteers. Volunteers are usually healthier than non-volunteers.

Q1 Are the individuals selected to participate in the study likely to be representative of
the target population?

The authors have done everything reasonably possible to ensure that the target population is represented (e.g.	Very Likely
Participants may not be representative if they are referred from a source within a target population even if it is in a systematic manner (e.g. patients from a teaching hospital for adults with asthma, only inner-city schools for adolescent risk.	Somewhat Likely
Participants are probably not representative if they are self-referred or are volunteers (e.g. volunteer patients from a teaching hospital for adults with asthma, inner-city school children with parental consent for adolescent risk) or if you can not tell.	Not Likely

Q2 What percentage of selected individuals agreed to participate?

The % of subjects in the control and intervention groups that agreed to participate in the study before they were assigned to intervention or control groups.	%
There is no mention of how many individuals were approached to participate.	Not Reported
The study was directed at a group of people in a specific geographical area, city, province, broadcast audience, where the denominator is not known, e.g. mass media intervention.	Not Applicable

B) ALLOCATION BIAS

In this section, raters assess the likelihood of bias due to the allocation process in an experimental study. For observational studies, raters assess the extent that assessments of exposure and outcome are likely to be independent. Generally, the type of design is a good indicator of the extent of bias. In stronger designs, an equivalent control group is present and the allocation process is such that the investigators are unable to predict the sequence.

Q1: Indicate the study design.

Investigators randomly allocate eligible people to an intervention or control group.	RCT
Cohort (two group pre and post) Groups are assembled according to whether or not exposure to the intervention has occurred. Exposure to the intervention may or may not be under the control of the investigators. Study groups may not be equivalent or comparable on some feature that affects the outcome.	Two-group Quasi-Experimental
Before/After Study (one group pre + post) The same group is pretested, given an intervention, and tested immediately after the intervention. The intervention group, by means of the pretest, act as their own control group. *Case control study* A retrospective study design where the investigators gather 'cases' of people who already have the outcome of interest and 'controls' that do not. Both groups are then questioned or their records examined about whether they received the intervention exposure of interest. *No Control Group*	Case-control, Before/After Study or No Control Group

Note: The following questions are not for rating but for additional statistics that can be incorporated in the writing of the review.

(i) If the study was reported as an RCT was the method of random allocation stated?

The method of allocation was stated.	YES
The method of allocation was not stated.	NO

(ii) Is the method of random allocation appropriate?

The method of random allocation is appropriate if the randomization sequence allows each study participant to have the same chance of receiving each intervention and the investigators could not predict which intervention was next. e.g. an open list of random numbers of assignments or coin toss	YES
The method of random allocation is not entirely transparent, e.g. the method of randomization is described as alternation, case record numbers, dates of birth, day of the week.	NO

(iii) Was the method of random allocation concealed?

The randomization allocation was concealed so that each study participant had the same chance of receiving each intervention and the investigators could not predict which group assignment was next. Examples of appropriate approaches include assignment of subjects by a central office unaware of subject characteristics, or sequentially numbered, and sealed in opaque envelopes.	YES
The method of random allocation was not concealed or not reported as concealed.	NO

C) CONFOUNDERS

A counfounder is a characteristic of study subjects that:
- is a risk factor (determinant) for the outcome to the putative cause, or
- is associated (in a statistical sense) with exposure to the putative cause

Note: Potential confounders should be discussed within the Review Group and decided a priori.

Q1 Prior to the intervention were there differences for important confounders reported in
the paper?

The authors reported that the groups were balanced at baseline with respect to confounders (either in the text or a table)	NO
The authors reported that the groups were not balanced at baseline with respect to confounders.	YES

Q2 Were the confounders adequately managed in the analysis?

Differences between groups for important confounders were controlled in the design (by stratification or matching) or in the analysis.	YES
No attempt was made to control for confounders.	NO

Q3 Were there important confounders not reported?

describe	YES
All confounders discussed within the Review Group were reported.	NO

D) BLINDING

The purpose of blinding the outcome assessors (who might also be the care providers) is to protect against detection bias.

Q1 Was (were) the outcome assessor(s) blinded to the intervention or exposure status of participants?

Assessors were described as blinded to which participants were in the control and intervention groups.	YES
Assessors were able to determine what group the participants were in.	NO
The data was self-reported and was collected by way of a survey, questionnaire or interview.	Not Applicable
It is not possible to determine if the assessors were blinded or not.	Not Reported

E) DATA COLLECTION METHODS

Some sources from which data may be collected are: Self reported data includes data that is collected from participants in the study (e.g. completing a questionnaire, survey, answering questions during an interview, etc.).
Assessment/Screening includes objective data that is retrieved by the researchers. (e.g. observations by investigators).
Medical Records / Vital Statistics refers to the types of formal records used for the extraction of the data.
Reliability and validity can be reported in the study or in a separate study. For example, some standard assessment tools have known reliability and validity.

Q1 Were data collection tools shown or known to be valid for the outcome of interest?

The tools are known or were shown to measure what they were intended to measure.	YES
There was no attempt to show that the tools measured what they were intended to measure.	NO

Q2 Were data collection tools shown or known to be reliable for the outcome of interest?

The tools are known or were shown to be consistent and accurate in measuring the outcome of interest (e.g., test-retest, Cronback's alpha, interrater reliability).	YES
There was no attempt to show that the tools were consistent and accurate in measuring the outcome of interest.	NO

F) WITHDRAWALS AND DROP-OUTS

Q1 Indicate the percentage of participants completing the study.

The percentage of participants that completed the study.	%
The study was directed at a group of people in a specific geographical area, city, province, broadcast audience, where the percentage of participants completing, withdrawing or dropping-out of the study is not known, e.g. mass media intervention.	Not Applicable
The authors did not report on how many participants completed, withdrew or dropped-out of the study.	Not Reported

G) ANALYSIS If you have questions about analysis, contact your review group leader.

Q1. The components of a recognised formula are present. There's a citation for the formula used.

Q2. The appropriate statistically significant difference between groups needs to be determined by the review group before the review begins.

Q3. The review group leader needs to think about how much the study has violated the underlying assumptions of parametric analysis?

Q5. Whether intention to treat or reasonably high response rate (may need to clarify within the review group).

H) INTERVENTION INTEGRITY

Q1 What percentage of participants received the allocated intervention or exposure of interest?

The number of participants receiving the intended intervention is noted. For example, the authors may have reported that at least 80 percent of the participants received the complete intervention.	%
describe	Not Reported
describe	Not Applicable

describe	Yes
describe	No
describe	Not Reported

Q2 Was the consistency of the intervention measured?

The authors should describe a method of measuring if the intervention was provided to all participants the same way.

Q3 Is it likely that subjects received an unintended intervention (contamination or cointervention) that may influence the results?

The authors should indicate if subjects received an unintended intervention that may have influenced the outcomes. For example, co-intervention occurs when the study group receives an additional intervention (other than that intended). In this case, it is possible that the effect of the intervention may be over-estimated. Contamination refers to situations where the control group accidentally receives the study intervention. This could result in an under-estimation of the impact of the intervention.

describe	Yes
describe	No
describe	Can't Tell

Component Ratings for Study

A) SELECTION BIAS
Strong
Q1 = Very Likely AND Q2 = 80-100% Agreement
OR
Q1 = Very Likely AND Q2 = Not Applicable

Moderate Q1 = Very Likely AND Q2 = 60 - 79% Agreement OR Q1 = Very Likely AND Q2 = Not Reported OR Q1 = Somewhat Likely AND Q2 = 80-100% OR Q1 = Somewhat Likely AND Q2 = 60 - 79% Agreement OR Q1 = Somewhat Likely AND Q2 = Not Applicable

Weak
Q1 = Not Likely
OR
Q2 = Less than 60% agreement
OR
Q1 = Somewhat Likely AND Q2 = Not Reported

B) ALLOCATION BIAS
Strong
Study Design = RCT

Moderate
Study Design = Two-Group Quasi-Experimental

Weak Study Design = Case Control, Before/After Study, No Control Group

C) CONFOUNDERS
Strong

Q1 = No	AND Q2 = N/A	AND Q3 = No
Q1 = Yes	AND Q2 = Yes	AND Q3 = No

Moderate

Q1 = Yes	AND Q2 = Yes	AND Q3 = Yes

Weak

Q1 = Can't Tell		
Q1 = Yes	AND Q2 = No	AND Q3 = Yes
Q1 = Yes	AND Q2 = No	AND Q3 = No
Q1 = No	AND Q2 = N/A	AND Q3 = Yes

D) BLINDING
Strong
7
Q1 = Yes
Weak Q1 = No Q1 = Not Reported
Not Applicable

E) DATA COLLECTION METHODS
Strong Q1 = Yes AND Q2 = Yes
Moderate Q1 = Yes AND Q2 = No
Weak
Q1 = No AND Q2 = Yes

OR
Q1 = No AND Q2 = No

F) WITHDRAWALS AND DROP-OUTS
Strong Q1 = 80-100%
Moderate Q1 = 60-79%
Weak Q1 = Less than 60%
OR
Q1 = Not Reported

Appendix 10: Primary Studies Data Extraction Template

Appendix 4: Data extraction template for primary studies

Article ID	
Reviewer	
1st Author	
Scope of Review	
Year	
Title	
Aims/Objectives	
Country	
Aust State	
Stategy Implemented	
Study type	
Study type code	
Apparent Integration Problem	
Direct Quote?	
Clinical issue	
Setting	
Other Setting	
Desc context of study	
Strategy 1	
Strategy 2	
Strategy 3	
Strategy 4	

Strategy 5	
Macro	
Meso	
Micro	
Integ Primary Focus?	
Service outcomes reported	
Health outcomes reported	
Economic outcomes reported	
Integration outcomes reported	
Pt satisfaction reported	
Provider satisfaction reported	
Research tool measures Int	
Measures/indicators outline	
Conceptual Framework?	
Review by Team	
General comments	
Professional boundaries crossed?	
Organisation boundaries crossed?	
Funding system crossed?	
Renumeration type?	
Level (sector)	

Appendix 11: List of Included Published Systematic Reviews

List of included published systematic reviews

1. Bower, P. and B. Sibbald (2005). On-site mental health workers in primary care: effects on professional practice. *Cochrane*.
2. Druss, B. G. and S. A. Von Esenwein (2006). Improving general medical care for persons with mental and addictive disorders: Systematic review. *General Hospital Psychiatry* 28(2): 145-153.
3. Duffy, J. R., L. M. Hoskins, et al. (2004). Nonpharmacological strategies for improving heart failure outcomes in the community: a systematic review. *Journal of Nursing Care Quality* 19(4): 349-60.
4. Faulkner (2003). A systematic review of the effect of primary care-based servic innovations on quality and patterns of referral to specialist secondary care. *British Journal of General Practice* 878-884.
5. Gilbody, S., P. Whitty, et al. (2003). Educational and Organizational Interventions to Improve the Management of Depression in Primary Care: A Systematic Review. *Journal of the American Medical Association* 289(23): 3145-3151.
6. Gosden, T., F. Forland, et al. (2001). Impact of payment method on behaviour of primary care physicians: a systematic review. *Journal of Health Services Research Policy* 6(1): 44-55.
7. Grimshaw, J. M., R. A. G. Winkens, et al. (2005). Interventions to improve outpatient referrals from primary care to secondary care. *The Cochrane Library*.
8. Gruen, R. L., T. S. Weeramanthri, et al. (2005). Specialist outreach clinics in primary care and rural hospital settings. *The Cochrane Library*.
9. Johri, M., F. Beland, et al. (2003). International experiments in integrated care for the elderly: A synthesis of the evidence. *International Journal of Geriatric Psychiatry* 18(3): 222-235.
10. Marshall, M., A. Gray, et al. (2000). Case management for people with severe mental disorders. *Cochrane Database of Systematic Reviews* (2):CD000050.
11. Marshall, M. and A. Lockwood (2005). Assertive community treatment for people with severe mental disorders. *The Cochrane Library* 4.
12. McAlister, F. A., F. M. E. Lawson, et al. (2001). A systematic review of randomized trials of disease management programs in heart failure. *American Journal of Medicine* 110(5): 378-384.
13. Mitchell, G., C. Del Mar, et al. (2002). Does primary medical practitioner involvement with a specialist team improve patient outcomes? A systematic review. *British Journal of General Practice* 52(484): 934-939.
14. Neumeyer-Gromen, A., T. Lampert, et al. (2004). Disease management programs for depression: a systematic review and meta-analysis of randomized controlled trials. *Medical Care* 42(12): 1211-21.
15. Phillips, C. O. W., Scott M.; Kern, David E. (2004). Comprehensive Discharge Planning With Postdischarge Support for Older Patients With Congestive Heart Failure: A Meta-analysis. *Journal of the American Medical Association* 291(11):1358-67.
16. Renders, C. M., G. D. Valk, et al. (2005). Interventions to improve the management of diabetes mellitus in primary care, outpatient and community settings. *The Cochrane Library* 4.
17. Singh, D. (2005). Transforming chronic care: A systematic review of the evidence. *Evidence Based Cardiovascular Medicine* 9(2): 91-94.

18. Turner-Stokes, L., P. B. Disler, et al. (2005). Multi-disciplinary rehabilitation for acquired brain injury in adults of working age. *Cochrane Database of Systematic Reviews* (3):CD004170.
19. Vergouwen, A. C., A. Bakker, et al. (2003). Improving adherence to antidepressants: a systematic review of interventions. *Journal of Clinical Psychiatry* 64(12): 1415-20.
20. Wadhwa, S. and R. Lavizzo-Mourey (1999). Tools, methods, and strategies. Do innovative models of health care delivery improve quality of care for selected vulnerable populations? A systematic review. *Joint Commission Journal on Quality Improvement* 25(8): 408-33.
21. Wasan, A. (2004). What is the evidence for the effectiveness of managing the hospital / community interface for older people? *NZ Health technology Assessment Report*.

Appendix 12: List of Excluded Published Systematic Reviews

List of excluded published systematic reviews

1. Lynch, M., C.L. Estes, and M. Hernandez, *Chronic care initiatives for the elderly: can they bridge the gerontology-medicine gap?* Journal of Applied Gerontology, 2005. **24**(2): p. 108-24.
2. Richards, S. and J. Coast, *Interventions to improve access to health and social care after discharge from hospital: A systematic review.* Journal of Health Services & Research Policy, 2003. **8**(3): p. 171-179.
3. Walker, Z., M. McKinnon, and J. Townsend, *Shared care for high-dependency patients: Mental illness, neurological disorders and terminal care - A review.* Health Services Management Research, 1999. **12**(4): p. 205-211.
4. Wensing, *Organizational interventions to implement improvements in patient care: a structured review of reviews.* Implementation Science, 2006. **1**(2): p. 1-9.
5. Parker, S., *A systematic Review of discharge arrangements for older people.* Health technology Assessment, 2002. **6**(4): p. 1-181.
6. Drake, *Review of Integrated Mental Health and Substance Abust Treatment for Patients with dual disorders.* Schizophrenia Bulletin, 1998. **24**(4): p. 589-608.
7. Wright, C., et al., *A systematic review of home treatment services--classification and sustainability.* Soc Psychiatry Psychiatr Epidemiol, 2004. **39**((10)): p. 789-96, 2004 Oct.
8. Druss, B.G. and S.A. Von Esenwein, *Improving general medical care for persons with mental and addictive disorders: Systematic review.* General Hospital Psychiatry, 2006. **28**(2): p. 145-153.
9. Duffy, J.R., L.M. Hoskins, and M.C. Chen, *Nonpharmacological strategies for improving heart failure outcomes in the community: a systematic review.* J Nurs Care Qual, 2004. **19**((4)): p. 349-60, 2004 Oct-Dec.
10. Gosden, T., et al., *Impact of payment method on behaviour of primary care physicians: a systematic review.* J Health Serv Res Policy, 2001. **6**((1)): p. 44-55, 2001 Jan.
11. Marshall, M., et al., *Case management for people with severe mental disorders.* Cochrane Database Syst Rev (2):CD000050, 2000: p. CD000050, 2000.
12. Turner-Stokes, L., et al., *Multi-disciplinary rehabilitation for acquired brain injury in adults of working age.* Cochrane Database Syst Rev (3):CD004170, 2005: p. CD004170, 2005.
13. Phillips, C.O.W., Scott M.; Kern, David E. *Comprehensive Discharge Planning With Postdischarge Support for Older Patients With Congestive Heart Failure: A Meta-analysis*. in *JAMA v. 291 no. 11 (March 17 2004) p. 1358-67*. 2004.
14. Holland, R., et al., *Systematic review of multidisciplinary interventions in heart failure.[see comment].* Heart, 2005. **91**((7)): p. 899-906, 2005 Jul.
15. Roberts, E. and N. Mays, *Can primary care and community-based models of emergency care substitute for the hospital accident and emergency (A & E) department?* Health Policy, 1998. **44**(3): p. 191-214.
16. Micevski, V., *Review: multidisciplinary disease management programmes do not reduce death or recurrent myocardial infarction but reduce admission to hospital.* Evidence Based Nursing, 2002. **5**(2).
17. Ahmed, A. *Quality and Outcomes of Heart Failure Care in Older Adults: Role of Multidisciplinary Disease-Management Programs*. in *Journal of the American Geriatrics Society v. 50 no. 9 (September 2002) p. 1590-3*. 2002.
18. Bower, P. and B. Sibbald, *On-site mental health workers in primary care: effects on professional practice.* Cochrane, 2005.

19. Briggs, *Strategies for integrating primary health services in middle and low income countries: effects on performance, costs and patient outcomes (Review).* Cochrane, 2005.
20. McAlister, F.A., et al., *A systematic review of randomized trials of disease management programs in heart failure.* American Journal of Medicine, 2001. **110**(5): p. 378-384.
21. Renders, C.M., et al., *Interventions to improve the management of diabetes mellitus in primary care, outpatient and community settings.* The Cochrane Library, 2005. **4**.
22. Gilbody, S., et al., *Educational and Organizational Interventions to Improve the Management of Depression in Primary Care: A Systematic Review.* Journal of the American Medical Association, 2003. **289**(23): p. 3145-3151.
23. Gruen, R.L., et al., *Specialist outreach clinics in primary care and rural hospital settings.* The Cochrane Library., 2005.
24. Mitchell, G., C. Del Mar, and D. Francis, *Does primary medical practitioner involvement with a specialist team improve patient outcomes? A systematic review.* British Journal of General Practice, 2002. **52**(484): p. 934-939.
25. Neumeyer-Gromen, A., et al., *Disease management programs for depression: a systematic review and meta-analysis of randomized controlled trials.* Medical Care, 2004. **42**(12): p. 1211-21.
26. Faulkner, *A systematic review of the effect of primary care-based servic innovations on quality and patterns of referral to specialist secondary care.* British Journal of General Practice, 2003. **Review Article**: p. 878-884.
27. Grimshaw, J.M., et al., *Interventions to improve outpatient referrals from primary care to secondary care.* The Cochrane Library, 2005.
28. Harvey, E.L., et al., *An updated systematic review of interventions to improve health professionals' management of obesity.* Obesity Reviews, 2002. **3**(1): p. 45-55.
29. Johri, M., F. Beland, and H. Bergman, *International experiments in integrated care for the elderly: A synthesis of the evidence.* International Journal of Geriatric Psychiatry, 2003. **18**(3): p. 222-235.
30. Khan-Neelofur, D., M. Gulmezoglu, and J. Villar, *Who should provide routine antenatal care for low-risk women, and how often? A systematic review of randomised controlled trials.* Paediatric and Perinatal Epidemiology, 1998. **12**(SUPPL. 2): p. 7-26.
31. Marshall, M. and A. Lockwood, *Assertive community treatment for people with severe mental disorders.* The Cochrane Library, 2005. **4**.
32. Vergouwen, A.C., et al., *Improving adherence to antidepressants: a systematic review of interventions.* J Clin Psychiatry, 2003. **64**((12)): p. 1415-20, 2003 Dec.
33. Wadhwa, S. and R. Lavizzo-Mourey, *Tools, methods, and strategies. Do innovative models of health care delivery improve quality of care for selected vulnerable populations? A systematic review.* Jt Comm J Qual Improv, 1999. **25**((8)): p. 408-33, 1999 Aug.
34. Wasan, A., *What is the evidence for the effectiveness of managing the hospital / community interface for older people?* NZ Health technology Assessment Report, 2004.
35. Singh, D., *Transforming chronic care: A systematic review of the evidence.* Evidence Based Cardiovascular Medicine, 2005. **9**(2): p. 91-94.
36. Richards, D., *Review: comprehensive organisational and educational interventions appear to be effective for managing depression in primary care.* Evidence Based Nursing, 2004. **7**(1).

37. Harkness, K., *Review: specialised multidisciplinary follow up reduces hospital admissions but not mortality in patients with heart failure.* Evidence Based Nursing, 2002. **5**(1).
38. Rideout, E., *Review: comprehensive discharge planning plus post-discharge support reduced total readmissions in older patients with congestive heart failure.* Evidence Based Nursing, 2004. **7**(4).
39. O'Connell, B., L. Kristjanson, and A. Orb, *Models of integrated cancer care: a critique of the literature.* Australian Health Review, 2000. **23**(1): p. 163-178.

Appendix 13: Typology of Integration Strategies compared to Kodner and Freeman

Comparison of items in framework with Kodner and Freeman

Kodner	Framework from this review
Funding	
Pooling of funds	Joint funding
Prepaid capitation	Organisation of the health care system
Administrative	
Consolidation/decentralisation of responsibilities/functions	Not covered
Intersectoral planning	Joint planning
Needs assessment/allocation chain	Joint planning
Joint purchasing or commissioning	Joint funding
Organisational	
Co-location of services	Co-location
Discharged and transfer arrangements	Coordinating clinical activities
Inter-agency planning or budgeting	Joint funding
Service affiliation or contracting	Agreements between organisations
Jointly managed programs or services	Joint management
Strategic alliances or care networks	Organisational agreements
Consolidation, common ownership or merger	Not covered
Service delivery	
Joint training	Support for clinicians
Centralised information, referral or intake	Not covered
Case/care management	Case management
Multi-disciplinary teamwork	Multi-disciplinary teamwork
Around the clock coverage	Not covered
Integrated information systems	Information or communication systems
Standard diagnostic criteria	Shared decision support
Uniform comprehensive assessment procedures	Shared assessment
Joint care planning	Shared care plan
Continuous patient monitoring	Not covered
Common decision support tools	Shared decision support
Regular patient/family contact and ongoing support	Not covered

Based on Kodner (2002)

Freeman	Framework from this review
Experienced continuity	Not directly covered
Continuity of information	Systems for supporting coordination
Cross boundary and team continuity	Relationship between service providers Coordinative provision of care
Flexible continuity	Not directly addressed
Longitudinal continuity	Relationship between service providers
Relational continuity	Relationship between service providers

Based on Freeman (2003)

Appendix 14: Differential effect of different strategy types

The following table was developed by comparing groups of studies that differed only by including or excluding a specific strategy type. This created sets of studies that were matched for all strategy types other than the strategy type of interest. These sets of studies were grouped for each strategy type to provide an analysis of the differential effect of adding that strategy type . These results are very similar to those reported in the text that were derived by a simpler methodolgy

In each pair of rows, the first represents outcomes in studies not using that strategy, the second outcomes in studies that did.

	Outcomes					
	Health		**Patient satisfaction**		**Economic**	
Strategy type	N	%	N	%	N	%
						%
✕Systems for supporting coordination (N=21)	8 (18)	44.4	6 (9)	66.7	2- (11)	18.1
✓ Systems for supporting coordination (N=20)	13 (17)	76.5	3 (8)	37.5	0 (6)	0
✕Support for clinicans (N=24)	10(17)	58.8	5 (10)	50.0	1- (6)	16.7
✓ Support for clinicans (N=18)	11 (17)	64.7	5 (10)	50.0	0 (6)	0
✕Relationships between service providers (N=22)	9 (16)	56.2	2 (9)	22.2	1 (8)	12.5
✓ Relationships between service providers (N=19)	11 (16)	68.7	6 (8)	75.0	1 (8)	12.5
✕Communication between service providers (N=14)	7 (10)	70.0	2 (5)	40.0	2 (5)	40.0
✓ Communication between service providers (N=26)	11 (22)	50.0	4 (8)	50.0	1 (10)	10.0
✕Support for patients (N=25)	11 (19)	57.9	5 (12)	41.7	1 (9)	11.1
✓ Support for patients (N=15)	4 (13)	30.8	3 (6)	50.0	1 (5)	20.0

✕Coordinating clinical activities (N=25)	13 (21)	61.9	8 (13)	61.5	2 (9)	22.2
✓ Coordinating clinical activities (N=20)	10 (15)	66.7	1 (6)	16.7	1 (7)	14.3

Appendix 15: Cost data reported in the studies

Table 1: Description of the primary research studies included in the review and types of economic costings/findings.

Article ID	1st Author	Year	Clinical issue	Economic analysis	Costs	Timespan	Findings
002	Allen, K	2002	Chronic condition	Cost description	Provider time	3/12	APN spent 4h per patient, team members spent 30 m per patient
009	Bogden, P	1997	Chronic condition	Cost Effectiveness	Medications	6/12	Med costs reduced in int group $11.40, increased in control $3.82 Int clinic visits increased
010	Borenstein, J	2003	Chronic condition	Cost Effectiveness	Patient visits Medications	12/12	Int fewer visits to GP, more visits to GP + pharmacist
019	Byng, R	2004	Mental health	Cost Effectiveness	Service development costs IP, Community, medication	3/12 12/12	Service development costs $63 pounds higher per patient in intervention group
027	Crotty, M	2004	Aged & Palliative care	Cost Effectiveness	Medications	3/12	No significant difference intervention and control
030	Donohoe, M	2000	Chronic conditions	Cost description	Intervention cost	6/12	Total cost of intervention 4216 pounds
033	Druss, B	2001	Aged & Palliative care	Cost Effectiveness	IP, clinic and intervention costs	6/12 12/12	Small sample but intervention and usual care similar costs.
037	Finley, P	2003	Mental health	Cost Effectiveness	PHC visits, ED visits, psych consultations medications	6/12	No significant difference intervention and control
040	Gater, R	1997	Mental health	Cost effectiveness	Hospital Comm Health GP Soc Services	24/12 48/12	Very high variation between individual patients and services would require very large study to demonstrate significant differences
049	Jameson, J	1995	Other	Cost effectiveness	Medications	6/12	Six month drug costs net reduction of $293

Article ID	1st Author	Year	Clinical issue	Economic analysis	Costs	Timespan	Findings
							over 6 months – intervention vs usual care
055	Katon, W	1997	Mental health	Cost effectiveness	All costs paid by health plan	28/12	No difference in ambulatory, depression treatment or non depression treatments costs Tracking system would cost $67 per patient enrolled
060	Koopmans, G	1996	Other	Cost effectiveness	Diagnostic, consultations medications, Surgery, IP days	18/12	No significant difference intervention and control
061	Krein, S	2004	Chronic condition	Cost effectiveness	Provider costs	19/12	No difference case management and control. No benefit case management, set up costs not clear
067	Litaker, D	2003	Chronic condition	Cost effectiveness	Provider/staffcosts.	12/12	Costs of care 50% higher for intervention group with increased clinical effectiveness and patients satisfaction
081	Naji, S	1999	Mental health	Cost estimation	Staff, telephone, postage	6/12	For every 10 intervention patients (cost 11.4 pounds) 3 OP appointments might be averted
086	Nicholson, C	2001	Chronic condition	Cost minimisation	Hospital, OP, ED Acute, GP, ED, Clinic, Patient, Carer	1 separation	Home care 29% cost of hospital care. Funding needed to set up system. Need significant scale to realise hospital savings
097	Rabow, M	2004	Aged & Palliative care	Cost Effectiveness	GP, Urgent care visits, ED visits, specialist visits, hospitalisations	12/12	No difference in costs or effectiveness
113	Sellors, J	2003	Aged & Palliative care	Cost Effectiveness	Provider, patient, GP fees	5/12	No difference in costs or effectiveness
114	Simon, G	2001	Mental health	Cost Effectiveness	Health Plan claims OP,IP,Medications	6/12	Incremental cost effectiveness was $21.44 per depression free day
120	Sorensen, L	2004	Other	Cost Effectiveness	Medication and service costs minus intervention costs	18/12	Cost savings of $Aus 67 per patient approximate to intervention costs
137	Weisner, C	2001	Mental	Cost Effectiveness	Service costs (direct	12/12	Average medical costs for integrated group

Article ID	1st Author	Year	Clinical issue	Economic analysis	Costs	Timespan	Findings
			health		+overheads)		fell $313.50-$200.08 SAMC integration medical costs fell $356.96 to $301.51 SAMC had higher overall costs than non SAMC patients (ICER) 1581
156	McInnes, G	1995	Chronic condition	Cost Effectiveness	Cost to NHS per adequate review Cost to patient	24/12	Shared care more cost effective (28.96 pounds) than usual (50.55) and Nurse practitioner clinic (30.95)
185	Drummond, N	1994	Chronic condition	Cost Effectiveness		12/12	No difference in effectiveness – lower GP, Hospital, Patient costs
195	Hughes, S	2000	Aged & Palliative care	Cost Effectiveness	VA and non VA service costs	12/12	Cost of team care 6.8% higher in TM/HBPC at 6 months and 12.1% higher at 12 months Difference = cost of intervention
196	Kasper, E	2002	Chronic condition	Cost Effectiveness	Cost per patient (direct and indirect), own and other hospitals	6/12	No difference in resource use intervention or control. Sample too small.
198	Leveille, S	1998	Aged & Palliative care	Cost Effectiveness	Intervention salaries, hospitaisation costs, no rehab or associated costs	12/12	Intervention cost $300 per participant per year associated with reduced hospitalisation saving 1200 per participant per year
204	Naji, S	1994	Chronic condition	Cost Effectiveness	Provider costs	12/12	Integration and usual care consultation costs similar
205	Naylor, M	1999	Aged & palliative care	Cost Effectiveness	Service costs hospital and home	24/52	Acute services costs for control group twice that of costs for intervention group at 24 weeks
209	Segal, L	2004	Chronic condition	Cost Effectiveness	Community perspective – service, coordination, patient	24/12	Similar hospital costs for intervention and control and higher intervention outpatient service costs. Intervention costs 12% of usual costs. Total resource usage 23% higher in intervention group.