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Evidence Check

Does comprehensive care lead to improved patient outcomes in acute care settings?

An **Evidence Check** rapid review brokered by the Sax Institute for the Australian Commission on Safety and Quality in Health Care. September 2015.

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This report was prepared by:

Karen Grimmer, Kate Kennedy, Ashley Fulton, Michelle Guerin, Jeric Uy, Louise Wiles, Phil Carroll.

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Contents

Glossary of terms

Accessible care	Delivering health care that is timely, geographically reasonable, and provided in a setting where skills and resources are appropriate to medical need.
Acute healthcare facility	A hospital or other healthcare facility providing healthcare services to patients for short periods of acute illness, injury or recovery.
Appropriate care	Care, intervention or action that is considered to be appropriate to the patient's particular needs, requests and prognosis. Appropriate care or treatment should be based on established and accepted standards, such as evidence-based clinical guidelines.
Assessment	A clinician's evaluation of the disease or condition based on the consumer's subjective report of the symptoms and course of the illness or condition, and the clinician's objective findings, including data obtained through laboratory tests, physical examination, medical history, and information reported by family members and other members of the healthcare team.
Care coordination	The coordination of services, provided with the aim of enhancing care delivery and transitions, and including preliminary care plans and identification of the need for more intensive case management.
Care planning	Addressing an individual's full range of needs, taking into account their health, personal, social, economic, educational, mental health, ethnic and cultural background and circumstances. Other issues that can impact on a person's total health and wellbeing in addition to medical needs are recognised in the care planning process.
Clinical risk	The chance of an adverse outcome resulting from clinical investigation, treatment or patient care.
Co-design	Engaging with individuals and/or groups from the beginning to the end of the process.
Collaborative care	Health care professionals assuming complementary roles and cooperatively working together, sharing responsibility for problem-solving and making decisions to formulate and carry out plans for patient care.
Consumer	A person who uses, or may potentially use health services. Depending on the nature of the health service organisation, this person may be referred to as a patient, a client, a consumer, a customer or some other term. Consumers also include families, carers, friends and other support people, as well as representatives of consumer groups.

Consumer-centred care	An approach to the planning, delivery and evaluation of health care that is founded in mutually beneficial partnerships among clinicians and consumers. Related terms include patient-centred care and person-centred care.
Co-production	The contribution of service users to the provision of services.
Cultural inclusion	Promotes laws and policies that ensure cultural participation, access, and the right to express and interpret culture.
Effective care	Delivering health care that is adherent to an evidence base and results in improved health outcomes for individuals and communities, based on need.
Efficient care	Delivering health care in a manner that maximises resource use and avoids waste.
Equitable care	Delivering health care that does not vary in quality because of personal characteristics such as gender, race, ethnicity, geographical location, or socioeconomic status.
Goal	A general or specific objective towards which to strive. An ultimate desired state towards which actions and resources are directed.
Goals of care	Clinical and other goals for a consumer's episode of care that are determined in the context of a shared decision-making process.
Goal-directed care planning	The ongoing process through which staff/clinicians and clients/consumers work together, to collaboratively set goals, establish priorities and develop strategies to achieve positive and meaningful outcomes for clients/consumers.
Guideline	Statements that include recommendations intended to optimise patient care. They are informed by a systematic review of evidence and an assessment of the benefits and harms of alternative care options. Clinical practice guidelines are systematically developed statements to assist practitioner and consumer decisions about appropriate health care for specific circumstances.
Health	A state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity.
Health care	The prevention, treatment and management of illness and injury, and the preservation of mental and physical wellbeing through the services offered by clinicians, including medical, nursing and allied health professionals.
Health goal	An ultimate desired state of health towards which actions and resources are directed.
Health outcome	A change in the health of an individual, or group of people or population, that is attributable to an intervention or series of interventions.

Interdisciplinary team	A team of providers who work together to develop and implement a plan of care. Membership depends on the services required to identify and address the expectations and needs of the patient, carers and family.
Interprofessional collaborative practice	When multiple health workers from different professional backgrounds work together with patients, families, carers [sic], and communities to deliver the highest quality of care.
Multidisciplinary care	Occurs when professionals from a range of disciplines work together to deliver comprehensive care that addresses as many of the patient's health and other needs as possible.
Multidisciplinary team	A team including professionals from a range of disciplines who work together to deliver comprehensive care that addresses as many of the consumer's health and other needs as possible. The professionals in the team may function under one organisational umbrella or may be from a range of organisations brought together as a unique team. As a consumer's condition changes over time, the composition of the team may change to reflect the changing clinical and psychosocial needs of the patient. Multidisciplinary care includes interdisciplinary care. Discipline: a branch of knowledge within the health system.
Partnership	A situation that develops when consumers are treated with dignity and respect, when information is shared with them, and when participation and collaboration in healthcare processes are encouraged and supported to the extent that consumers choose. Partnerships can exist in different ways in a health service organisation, including at the level of individual interactions; at the level of a service, department or program; and at the level of the organisation. Generally, partnerships at all levels are necessary to ensure that the health service organisation is responsive to consumer input and needs, although the nature of the activities for these different types of partnership will depend on the type of health service organisation.
Patient safety	The avoidance or reduction to acceptable limits of actual or potential harm from health care management or the environment in which health care is delivered.
Patient safety incident	Any unintended or unexpected incident, which could have or did lead to harm for one or more patients receiving healthcare. It is a specific type of adverse event.
Person-centred practice	A treatment and care provided by health services [that] places the person at the centre of their own care and considers the needs of the person and/or their carers.
Person-centredness	A philosophy, a way of thinking or mindset which involves viewing, listening to and supporting a person with a disability based on their strengths, abilities, aspirations and preferences to make decisions to maintain a life that is meaningful to them.
Safe care	Delivering health care that minimises risks and harm to service users.

Shared decision making	An approach where clinicians and patients share the best available evidence when faced with the task of making decisions, and where patients are supported to consider options to achieve informed preferences.
Shared services	The coordinated or otherwise explicitly agreed upon, sharing of responsibility for provision of medical or nonmedical services on the part of two or more otherwise independent hospitals or health programs.

1 Executive summary

Background

The International Centre for Allied Health Evidence (iCAHE) was tasked with undertaking a rapid literature review (Sax Institute Evidence Check) regarding the best available research evidence for the effectiveness of comprehensive care in acute settings as defined by the Sax Institute on improving outcomes. The reason for the review is to inform the Australian Commission on Safety and Quality in Health Care initiatives in its current revision of the National Safety and Quality Health Service (NSQHS) Standards, with the intention of releasing version two in 2017/18. A new NSQHS Standard on Comprehensive Care is currently being developed and will be added to the Standards. The new Comprehensive Care Standard will incorporate the following three elements:

1. Systems to support comprehensive care
2. Development of comprehensive care plans
3. Delivery of comprehensive care.

This standard is focused on health services adopting systems to enable clinicians to identify a consumer's healthcare needs, using integrated screening and assessment processes and working with consumers to identify shared goals for an episode of health care. The outcome of this process is the development of a comprehensive care plan which enables members of the healthcare team to work collaboratively to deliver care that is aligned with the consumer's preferences and healthcare needs, considers the impact of their health issues on their life and wellbeing, and is clinically appropriate for their circumstances.

For the purpose of this review, comprehensive care was defined as including at least two of these elements: Screening and assessment for common clinical risks associated with cognitive, behavioural, mental and/or physical conditions; integrated multidisciplinary care planning; the delivery of integrated, multidisciplinary care and/or team work and collaboration across specialties and disciplines. Additionally, the intervention must involve patient-centred care and goal-directed care, where the goals of care have been defined by a shared decision-making process that explicitly includes patient preferences in goal setting and development of a care plan.

Objectives

The objective of this rapid review was to provide a synthesis of best available research evidence on the effect of comprehensive care in acute settings on patient outcomes.

Review questions

There are three review questions, with the second and third questions flowing from the findings of the first question:

1. Does comprehensive care lead to improved patient outcomes in acute care settings?
2. For those comprehensive care interventions that have been evaluated and have some evidence of improving outcomes as defined in Question 1, what are the system-level, organisational-level and unit-level (team, people) factors that have been associated with effective implementation?

3. For those comprehensive care interventions identified in Question 1 that included in the intervention screening and assessment for risks associated with cognitive, behavioural, mental and/or physical conditions:

    a) How has integrated screening for multiple, common clinical risks been conducted (for example, pressure injury, falls, malnutrition and dehydration, frailty, and cognitive impairment in older, frail populations)?

    b) Which screening tools have been used and is there evidence that these are validated tools?

Methods

Specific search criteria for ensuring inclusion of relevant research were identified using an iterative, systematic, step-by-step approach. Searching was conducted via peer-reviewed databases, grey literature sources and pearling of the reference lists of literature reviews relevant to the topic. Literature was included based on the definition of comprehensive care as supplied by the Sax Institute, investigating any health population in any acute care setting. Articles were restricted to those published between 2000 to October 2015 and in English language. Potentially relevant publications were reviewed by iCAHE researchers for relevance. Included articles were critically appraised using the CASP or the McMasters critical appraisal tools, as relevant. Data was extracted into a purpose-built extraction sheet. All method steps were approved by the Sax Institute and the Australian Commission on Safety and Quality in Health Care.

Results

The search identified 1521 publications. Sixty eight duplicates were found and 1181 articles were excluded based on review of title and abstract. Two hundred and seventy-two articles were retrieved for full examination. A further 256 were then excluded, leaving 16 articles included in the review. Reasons for exclusion were: (a) does not fit the comprehensive care definition given by the Commission, (b) not in an acute care setting, (c) no formal evaluation of the comprehensive care intervention, (d) not written in English, (e) conference abstracts, opinion or commentary documents, (f) outside of the date range.

Body of evidence

Of the 16 included studies, 12 (75%) were of moderate to high methodological quality, three (18.75%) were of moderate quality, and one (6.25%) was of low quality. All were relevant for, and generalisable to, the Australian acute care settings and populations. The overall rating of the body of evidence was NHMRC (National Health and Medical Research Council) evidence grade B.

Recommendations

Implementation of comprehensive care in an acute care setting, particularly for older adults, can improve patient satisfaction, length of stay, cost of care, readmissions, and shared decision making and goals of care. Implementation of comprehensive care, at an organisational level, should consider aspects of upskilling staff, embedding comprehensive care into ongoing quality improvement initiatives and changes to hospital policies and procedures. At a unit level the goals of comprehensive care needs to be established and appropriate team structures and mode of delivery of comprehensive care established.

Question 1

The evidence shows that initiating a comprehensive care program has the potential to lead to improved health service, patient and clinical outcomes in acute care settings. All 16 included studies reported on at least one outcome measure relevant to comprehensive care interventions. Patient satisfaction, length of stay, costs of care and acute care readmissions were the most frequently reported outcome measures. Patient satisfaction increased significantly (in 6 of 10 articles), length of stay decreased significantly (in 4 of 5 articles), cost of care decreased significantly (in 5 of 7 articles), readmission rates decreased significantly (in 2 of 4 articles) and frequency of patient involvement in shared decision making and goals of care discussions increased significantly (in all 3 relevant articles). Of the remaining articles for each outcome measure, information on significance was either lacking (not tested or reported), or statistical significance was not reached.

Older patients (55+ years) were the most investigated age group in the literature found (in 12 of the 16 included articles).

Question 2

All 16 included studies reported on aspects of Question 2. All were relevant to Australian acute care settings and populations.

No articles discussed individual factors associated with effective implementation of comprehensive care. Instead, the articles described the intervention and the outcome of the intervention in relation to patient-centred, health care system and clinical outcomes. None of the articles discussed System (health system) level factors.

Organisational- and unit-level factors were discussed. Organisation-level factors focused on upskilling staff, standardisation of hospital practices and policy, and ongoing quality improvement.

Unit-level factors discussed team structures, modes of delivery of the intervention, and the focus of comprehensive care.

Question 3

The evidence body comprised five articles of high methodological quality all of which are relevant to Australian acute care settings and populations.

These five articles included a screening tool as part of the comprehensive care intervention (see Table 3), using a total of six screening tools. Of the six screening tools used, only one was validated. Authors reported screening or assessment for discharge planning, frailty, geriatric needs and palliative care, however specific details of the tool content was rarely reported.

2 Background

The International Centre for Allied Health Evidence (iCAHE) was tasked with undertaking a rapid review of the literature regarding the best available research evidence on the effect of comprehensive care in acute settings on improving patient outcomes. For the purpose of this review, comprehensive care was defined by the Australian Commission on Safety and Quality in Health Care (hereafter referred to as the Commission) as having multiple elements:

- Screening and assessment for common clinical risks associated with cognitive, behavioural, mental and/or physical conditions
- Integrated, multidisciplinary care planning
- The delivery of integrated, multidisciplinary care
- Team work and collaboration across specialties and disciplines.

Comprehensive care must include at least two of the elements specified above, and involve interventions that include patient-centred care and goal-directed care, where the goals of care have been defined by a shared decision-making process that explicitly includes patient preferences in goal setting and developing a care plan.

Comprehensive care may be otherwise named in the literature, for example as integrated care, multidisciplinary care, collaborative care or goal-directed care. However, for the purpose of this review must fit the definition above to qualify for inclusion.

3 Methodology

Purpose of this rapid review

This rapid review determines the current best evidence to inform guidance documents that are being developed for the implementation of the new National Safety and Quality Health Service (NSQHS) Comprehensive Care Standard.

Objectives of this review

The objective of this rapid review is to provide a brief synthesis of best available research evidence on the effect of comprehensive care in acute settings on improving patient outcomes.

Methodology

An iterative, systematic, step-by-step approach was utilised for this review.

Review question

There are three review questions, with the second and third questions flowing from the findings of the first question:

1. Does comprehensive care lead to improved patient outcomes in acute care settings?
2. For those comprehensive care interventions that have been evaluated and have some evidence of improving outcomes as defined in Question 1, what are the system-level, organisational-level and unit-level (team, people) factors that have been associated with effective implementation?
3. For those comprehensive care interventions identified in Question 1 that included in the intervention screening and assessment for risks associated with cognitive, behavioural, mental and/or physical conditions:
    a) How has integrated screening for multiple, common clinical risks been conducted (for example, pressure injury, falls, malnutrition and dehydration, frailty, cognitive impairment in older, frail populations)?
    b) Which screening tools have been used and is there evidence that these are validated tools?

Criteria for considering research for this review

In collaboration with the Sax Institute and the Australian Commission on Safety and Quality in Health Care (the Commission), specific criteria for ensuring inclusion of relevant research were considered and agreed upon. Research included in this review relates to evidence underpinning the effectiveness of comprehensive care in acute settings that focused on specific outcomes (see below).

Types of studies

Any primary intervention study or review of the literature that evaluates the intervention of comprehensive care, as defined by the Commission.

Types of participants

Any patient or health provider group in any acute care setting, which are involved in a comprehensive care treatment program that meets the definition supplied by the Commission.

Types of interventions

Any intervention that encompasses the comprehensive care definition supplied by the Commission:

> *"Comprehensive care has multiple elements:*
>
> - *Screening and assessment for common clinical risks associated with cognitive, behavioural, mental and/or physical conditions*
> - *Integrated, multidisciplinary care planning*
> - *The delivery of integrated, multidisciplinary care*
> - *Team work and collaboration across specialties and disciplines.*
>
> *Comprehensive care must include more than one of the elements specified above, and involve interventions that include patient-centred care and goal-directed care, where the goals of care have been defined by a shared decision-making process that explicitly includes patient preferences in a goal setting and developing a care plan.*
>
> *Comprehensive care may be otherwise named in the literature, for example as integrated care, multidisciplinary care, collaborative care or goal-directed care. However, for the purpose of this review must fit the definition above to qualify for inclusion."*

Types of outcomes

Outcomes include clinical outcomes and patient-centred outcomes, but are not limited to specific conditions or patient populations.

Search strategy for identification of articles

Publications available in each of the listed databases were searched to evaluate the volume of research undertaken in this area, and to highlight trends and changes in direction, over time. The literature review was restricted to include publications reported in English language, between 1 January 2000 and 28 October 2015.

Peer-reviewed databases

Medline, EMBASE, CINAHL, Health Source (nursing/academic and consumer), OVID Nursing, Scopus, Web of Science, Cochrane Library, SAGE, NHS Economic Evaluation Database (NHS-EED).

Truncation symbols and Boolean operators

Appropriate truncation symbols, wild cards and Boolean operators were used for each database.

Pearling

Reference lists of retrieved articles were searched to maximise the retrieval of relevant publications.

Grey literature

The following grey literature resources were also searched using the same key words: Agency for Healthcare Research and Quality (AHRQ), Alberta Health and Wellness decision provincial reviews, Australian Government Department of Health and Ageing, Canadian Agency for Drugs and Technologies in Health (CADTH), Google Scholar, Healthcare Improvement Scotland, Health Quality Council of Alberta, Health Quality Ontario, Institute of Health Economics, Manitoba Centre for Health Policy, McGill University Health Centre, National Institute for Health and Care Excellence (NICE), The National Health Service UK, NLCAHR: Newfoundland and Labrador Centre for Applied Health Research (contextualised Health Research Synthesis program), Ottawa Hospital Research Institute, Pan-Canadian HTA collaborative, WorldCat.org, and the World Health Organisation (Health Evidence Network).

Keywords

A combination of search terms were used to identify potentially relevant peer-reviewed publications (see Appendix 1 for table of search terms and Medline example). Synonymous terms and related MeSH headings were used to expand the search as appropriate. These key words and search strategies have been derived from text mining software, existing systematic reviews and other literature on this topic. These keywords were confirmed with the Commission prior to searching commencing.

Database searching steps

These search terms form the basis of an initial search of the databases. This formative phase of the search strategy is an integral part of the three-step search process. The second phase of the search process involves the analysis of text words contained in the title and abstract of retrieved citations and of the index terms used to describe identified publications. The third step involves an integrated validation search using all identified key words and index terms, through the same electronic databases.

Literature selection

The title, abstract and descriptors of the identified articles were assessed for relevance to the review. Disagreements in selection were mediated by an independent team member.

Critical appraisal

Once relevant publications were identified, reviewers evaluated methodological quality using the appropriate critical appraisal tool for the study design. Depending on the design of the articles, the CASP and the McMasters critical appraisal tools have been selected. These tools give a complete and compatible system to assess the quality of all the study designs likely to be found in this area.

Data extraction

Data were extracted from included publications using a specifically developed template. The data extraction template was developed in collaboration with stakeholders to ensure all relevant information that can inform the overall project is captured.

Data synthesis

Findings and methodological quality of included articles were synthesised into a narrative summary. The strength of the body of evidence addressing each research question has been determined based on the NHMRC Evidence Grading Matrix, which is included in Appendix 2.

4 Results

Search results

The search identified 1521 publications, which were then reviewed by iCAHE researchers for relevance. After removal of duplicates (68), review of titles and abstracts resulted in the exclusion of 1181 articles. Two hundred and seventy-two articles were subsequently retrieved for full examination. After scrutiny, a further 256 were excluded, leaving 16 articles for inclusion in the review. Reasons for exclusion were: (a) does not fit the comprehensive care definition given by the Commission, (b) not in an acute care setting, (c) no formal evaluation of the comprehensive care intervention, (d) not written in English, (e) conference abstracts, opinion or commentary documents, (f) outside of the date range.

Figure 1 shows the process of article selection.

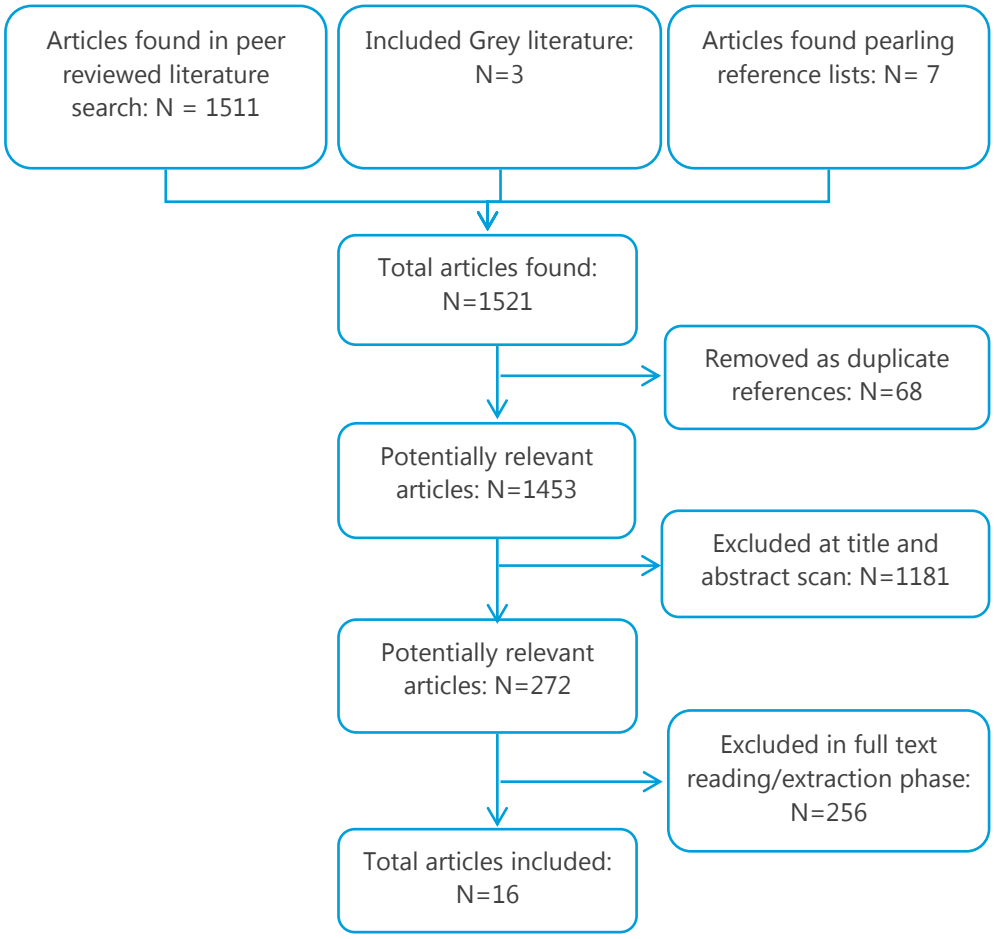


Figure 1. Flowchart of the article selection process

We assessed 728 of the 839 records that were ultimately excluded for failing to meet the Commission's definition of comprehensive care. These were characterised by either their lack of multidisciplinary involvement (n=4, 0.5% of excluded articles for this reason), patient-centred care (n=26, 3.5%), or shared decision-making (n=698, 95.8%). It is important to note that while many of these articles sought feedback or perspectives from patients, this often came after the administration of a pre-determined intervention.

In the included articles, comprehensive care was provided with the following purposes: care planning (discharge, palliative or community), clinical pathways (spinal cord injuries and hip fractures), self-management (discharge, nutrition or daily activities scheduling) or clinical management (disease specific or trauma).

Characteristics of included articles

The 16 included articles comprised five randomised controlled trials (Ekelund 2015, Gade 2008, Preen 2005, Slingerland 2013, Zatzick 2001)[1-5], eight comparative cohort articles (Arbaje 2010, Bull 2000, Chi 2004, Lamba 2012, McLlvoy 2000, Penticuff 2005, Stone 2008, Weiland 2003)[6-13], and three pre-post intervention articles (Menefee 2014, Olsson 2009, Scott-Smith 2007).[14-16] Details of the individual articles are provided in Appendix 3.

Methodological quality of included

The 16 included articles were scored with either the CASP randomised controlled trial critical appraisal tool (scored out of 11), or the McMaster quantitative critical appraisal tool (scored out of 10). The critical appraisal score tables can be found in Appendix 4. Only one article scored poorly at 40% (Scott-Smith 2007)[16], three were moderate, between 50–69% (Penticuff 2005, Preen 2005, Weiland 2003)[3, 11, 13] and 12 were found to be of high quality between 70–90% (Arbaje 2010, Bull 2000, Chi 2004, Ekelund 2015, Gade 2008, Lamba 2012, McLlvoy 2000, Menefee 2014, Olsson 2009, Slingerland 2013, Stone 2008, Zatzick 2001).[1, 2, 4-10, 12, 14, 15]

Evidence mapping

Table 1 shows the evidence base mapped against the review questions.

Table 1. Evidence mapped to review questions

Reference	Q1. Improved patient outcomes	Q2. Factors associated with effective implementation	Q3. Integrated screening with evidence of validation
Arbaje 2010[6]	✓	✓	✓
Bull 2000[7]	✓	✓	✓
Chi 2004[8]	✓	✓	✓
Ekelund 2015[1]	✓	✓	✓
Gade 2008[2]	✓	✓	✓
Lamba 2012[9]	✓	✓	
McLlvoy 2000[10]	✓	✓	
Menefee 2014[14]	✓	✓	
Olsson 2009[15]	✓	✓	
Penticuff 2005[11]	✓	✓	
Preen 2005[3]	✓	✓	
Scott-Smith 2007[16]	✓	✓	
Slingerland 2013[4]	✓	✓	
Stone 2008[12]	✓	✓	
Weiland 2003[13]	✓	✓	
Zatzick 2001[5]	✓	✓	

5 Question 1

Does comprehensive care lead to improved patient outcomes in acute care settings?

Question 1: Key points and summary

Patient satisfaction, length of stay, costs of care and acute care readmissions were the most frequently measured outcomes in relation to comprehensive care interventions.

Older patients were the most investigated age group in the literature found (12 of the 16 included studies focused on older populations).

Length of stay decreased significantly in 80% of studies measuring this, cost of care decreased significantly in 85.7% of studies, readmission rates decreased significantly in 50% of studies, patient satisfaction increased significantly in 60% of studies, and shared decision making and goals of care increased significantly in 100% of studies investigating these outcomes.

The literature shows that initiating a comprehensive care program can lead to improved health service, patient and clinical outcomes in acute care settings. The evidence is of moderate to high methodological quality (12 high quality (75%), three moderate quality (19%), and one low quality (6%)) and is relevant to the Australian acute care settings and population.

Thirty nine outcomes were reported in the 16 included articles, with the most common being patient satisfaction (10), length of stay (5), costs of care (7) and acute care readmissions (4). Outcomes in relation to comprehensive care were mixed. Refer to Table 2 for an overview of outcomes reported.

Comprehensive care was provided with the following purposes: care planning (discharge, palliative or community), clinical pathways (spinal cord injuries and hip fractures), self-management (discharge, nutrition or daily activities scheduling) or clinical management (disease specific or trauma).

Interventions included 'floating' specialist teams that co-managed patients and liaised into the community; ward-specific teams that utilised care planning, community transfers, assisted in patient self-management, and initiated care pathways; and hospital policy and procedure changes. For details of interventions as supplied by the articles, refer to Appendix 3.

Table 2. Change in outcomes measured by included articles

Table key:

*	A significant change has been reported	
↑	An increase in the outcome has been reported	i.e.: ↑* = a significant increase in patient satisfaction
↓	A decrease in the outcome has been reported	i.e.: ↓* = a significant decrease in cost of care
→	No change has been reported	i.e.: → = no change in length of stay was found
CT	We are unable to tell if there has been a change based on the reporting	

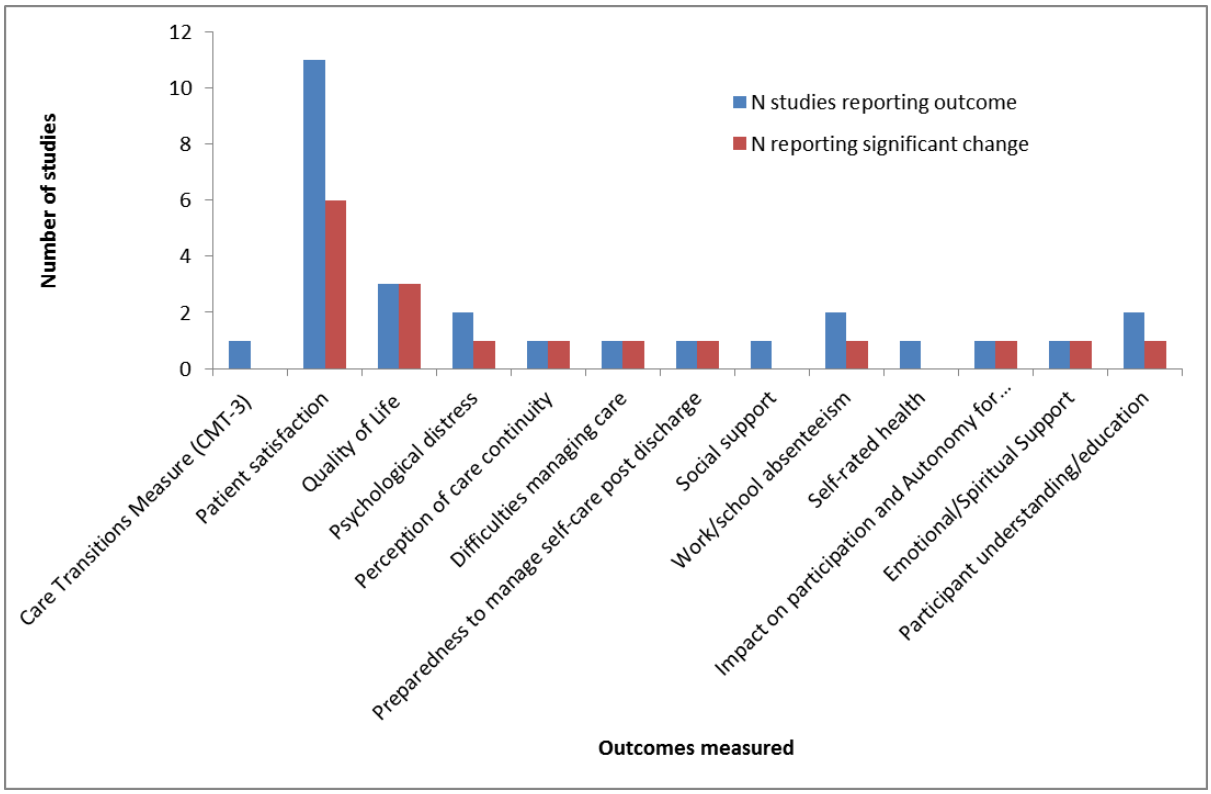
	Arbaje 2010[6]	Bull 2000[7]	Chi 2004[8]	Ekelund 2015[1]	Gade 2008	Lamba 2012[9]	McLlvoy 2000[10]	Menefee 2014[14]	Olsson 2009[15]	Penticuff 2005[11]	Preen 2005[3]	Scott-Smith 2007[16]	Slingerland 2013[4]	Stone 2008[12]	Weiland 2003[13]	Zatzick 2001[5]
Care transitions measure (CMT-3)	↑															
Patient satisfaction	↑	↑*	↑*		↑*			↑		↑*	↑*	↑		↑*	↑	
Length of stay		↓*				↓*	↓*				→			↓*		
Quality of life		↑*									↑*					
Psychological distress		↓*														→
Perception of care continuity		↑*														
Difficulties managing care		↓*														
Preparedness to manage self-care post discharge		↑*														

	Arbaje 2010[6]	Bull 2000[7]	Chi 2004[8]	Ekelund 2015[1]	Gade 2008	Lamba 2012[9]	McLlvoy 2000[10]	Menefee 2014[14]	Olsson 2009[15]	Penticuff 2005[11]	Preen 2005[3]	Scott-Smith 2007[16]	Slingerland 2013[4]	Stone 2008[12]	Weiland 2003[13]	Zatzick 2001[5]
Substance use																→
Social support																→
Functional status																→
Readmissions		→			↓*			↓						↓*		
Cost of care			↓*		↓*			↓	↓*			↓	↓*	↓*		
Targeted treatment of diabetic patients with baseline HbA1c .8.5%													↑*			
Work/school absenteeism															→	
Self-rated health			↑													
Impact on participation and autonomy for older persons (IPA-O)				↑*												
Interdisciplinary collaboration												↑				
Emotional/spiritual support					↑*											
Symptom control					→		↑*									
Survival					→											

	Arbaje 2010[6]	Bull 2000[7]	Chi 2004[8]	Ekelund 2015[1]	Gade 2008	Lamba 2012[9]	McLlvoy 2000[10]	Menefee 2014[14]	Olsson 2009[15]	Penticuff 2005[11]	Preen 2005[3]	Scott-Smith 2007[16]	Slingerland 2013[4]	Stone 2008[12]	Weiland 2003[13]	Zatzick 2001[5]
Advanced care directives completed					↑*											
Hospice enrolment					↓*											
Participant understanding/education										↑*		↑				
Decision conflicts										↓*						
Goals of care discussions/shared decision making						↑*				↑*	↑*					
Adverse health events							↓*					↓				
Patient compliance												↑			→	
Self-directed palliation						↑*										

Outcomes reported across the included articles focused on patient-centred outcomes, health service outcomes and service outcomes.

Patient-centred outcomes



Graph 1. Patient-centred outcome measures

Patient-centred outcomes reported in the included articles were: patient satisfaction (10 articles), goals of care (3 articles), quality of life (2 articles), psychological distress (2 articles), patient understanding (2 articles), preparedness to self-manage (1 article), self-rated health (1 article), autonomy (1 article), emotional and spiritual support (1 article), and decision conflicts (1 article). Patient satisfaction was the most frequently measured outcome across all articles (10 out of the 16). Of the 10 articles that assessed patient satisfaction, six articles (60% of articles) showed significant improvement in satisfaction (Bull 2000, Chi 2004, Gade 2008, Penticuff 2005, Preen 2005, Stone 2008)[2, 3, 7, 8, 11, 12] and four (40% of articles) showed non-significant improvement in patient satisfaction following the delivery of a comprehensive care intervention (Arbaje 2010 measured two variations of patient satisfaction) (Arbaje 2010, Menefee 2014, Scott-Smith 2007, Weiland 2003).[6, 13, 14, 16]

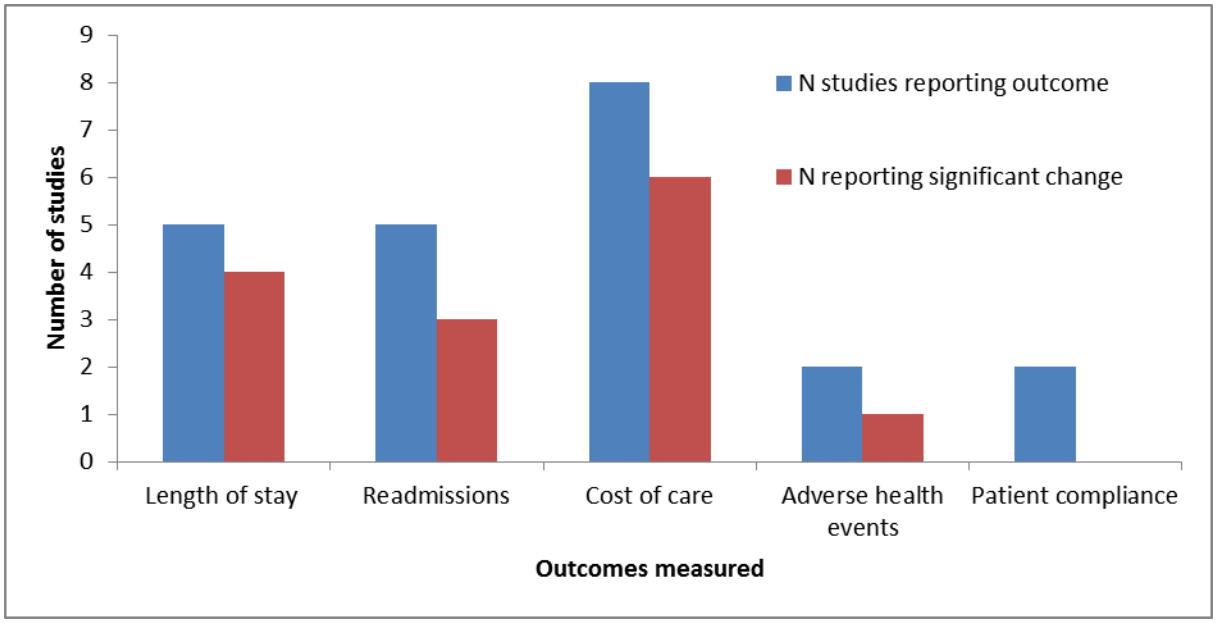
Significant increases in the frequency of patient involvement in goals of care discussions and/or shared decision making was found with the application of a comprehensive care intervention by three of the included articles (Lamba 2012, Penticuff 2005, Preen 2005).[3, 9, 11] Gade[2] found significant increases in communication with health professionals after the intervention.

Bull[7] and Preen[3] measured quality of life and both articles reported significant increases after the comprehensive care interventions. Social support and functional status did not change after the intervention[5], self-rated health showed non-significant increases.[8]

There were conflicting results reported for effects on physiological distress, Bull[7] found a significant decrease associated with comprehensive care, while Zatzick[5] found no significant change.

Patient understanding was reported in two of the included articles (Penticuff 2005, Scott-Smith 2007), with both identifying an increase in those who received comprehensive care.[11, 16]

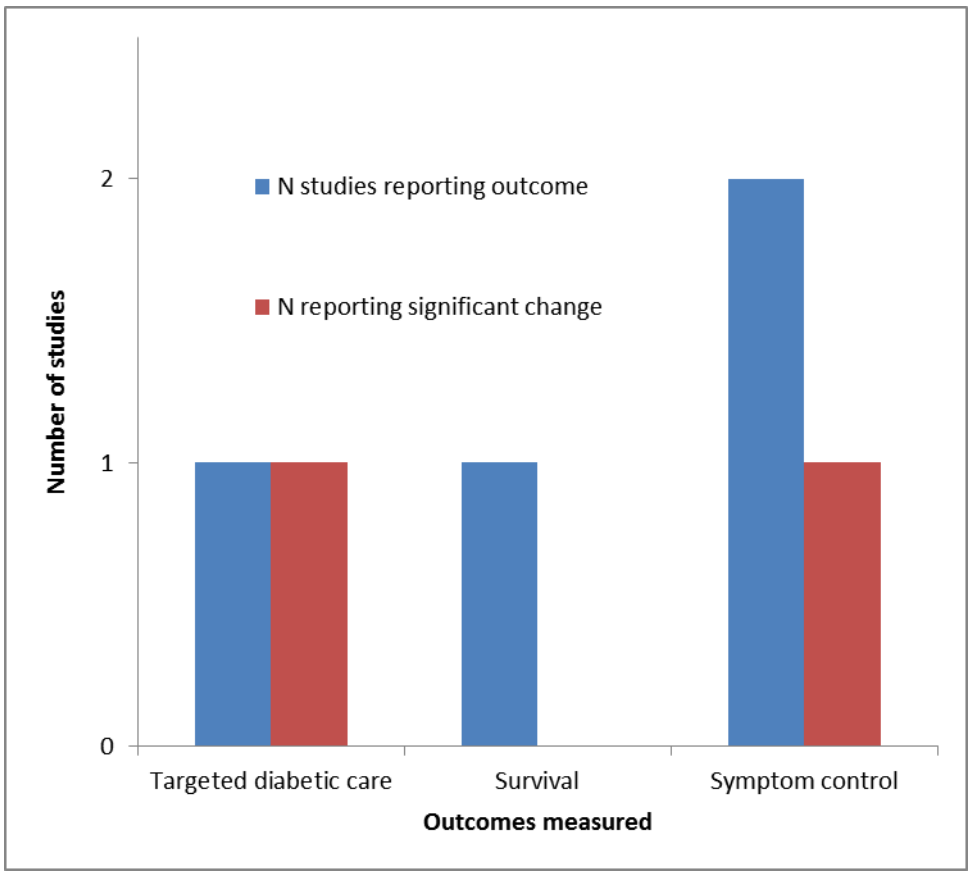
Health service outcomes



Graph 2. Health service outcomes

Health service outcomes reported were: length of stay, readmissions, cost of health care, adverse health events, patient compliance, interdisciplinary collaboration and medical resource usage. Of the articles investigating these outcomes, the majority found a significant change. Bull[7], Lamba[9], McLlvoy[10], and Stone[12] found significant decreases in length of stay with a comprehensive care approach, while Preen[3] found no change between intervention and control groups. Scott-Smith[16] found a non-significant increase in patient compliance after the intervention, while Weiland[13] found no change. Of the articles investigating cost of care, all found decreases with the intervention. Chi[8], Gade[2], Olsson[15], Slingerland[4], and Stone[12] found significant decreases (71.4% of articles), while Menefee[14] and Scott-Smith[16] reported decreases. Scott-Smith[16] reported an increase in interdisciplinary collaboration after the intervention was applied.

Clinical outcomes



Graph 3. Clinical outcomes

Clinical outcomes reported on the included articles were: targeted diabetic care, symptom control, functional status, and survival rate. Slingerland[4] found a significant improvement in health outcomes with a comprehensive diabetic care initiative that was targeted at a specific subpopulation within the diabetic group (patients with baseline HbA1c 8.5%). Gade[2] found no difference in symptom control or survival between the control and intervention groups, however, McLlvoy[10] found a significant improvement in symptom control. This difference is most likely due to the difference in populations investigated in these two papers; McLlvoy[10] intervened on an acute spinal cord injury surgical population while the Gade[2] intervention was on a palliative care/ life limiting illness population.

In considering outcomes related to age, 12 of the 16 articles determined the impact of comprehensive care on older adults (55+ years). The remaining four articles considered the impact of comprehensive care on those younger than 18 years of age and adults (35 years).

Age group variations

Older adults

Twelve of the 16 articles focussed on older participants (Arbaje 2010, Bull 2000, Chi 2004, Ekelund 2015, Gade 2008, Lamba 2012, Menefee 2014, Olsson 2009, Preen 2005, Slingerland 2013, Stone 2008, Zatzick 2001).[1-9, 12, 14, 15] All articles in this grouping scored moderate to high on the critical appraisal tools used (see Appendix 3), and all showed significant changes in of the majority of the reported outcomes following the comprehensive care intervention. Six assessed the cost of care (83% of articles showed significant

decreases), seven assessed patient satisfaction (71.4% of articles showed significant increases), four measured length of stay (75% showed significant decreases), and four measured readmissions (50% showed significant decreases, 25% non-significant decreases and 25% no change). In this age group, the cost of care and medical resource usage significantly decreased across all articles that reported this as an outcome, and the readmission rate either stayed the same[7] or significantly decreased.[2, 12] Menefee[14] showed a decrease in readmission rates, however, they did not report if this was statistically significant or not.

Under 18s

Two of the 16 articles investigated younger age groups. Penticuff[11] investigated the effect of a comprehensive care intervention on mothers' decision making for the care of very low-birth-weight infants, and Weiland[13] investigated the effects of a comprehensive care intervention on satisfaction and clinical outcomes in 15–19 year olds with cystic fibrosis.

Other age groups

McLlvoy[10] investigated the development of a comprehensive clinical care pathway for spinal cord injury patients with a mean age of 34.1 years, and Scott-Smith[16] assessed all general surgical patients across the intervention hospital.

6 Question 2

For those comprehensive care interventions that have been evaluated and have some evidence of improving outcomes as defined in Question 1, what are the system-level, organisational-level and unit-level (team, people) factors that have been associated with effective implementation?

Question 2: Key points and summary

None of the included articles discussed system-level factors.

Organisational-level factors discussed focussed on upskilling staff, standardisation of hospital practices and policy, and ongoing quality improvement.

Unit-level factors discussed in the included studies related to team structure, mode of delivery, and focus of care.

None of the included studies discussed individual factors that were associated with effective implementation of comprehensive care. Rather, the studies described their overall intervention and the outcome of this intervention in relation to patient-centred, health care system and clinical outcomes.

The evidence is of moderate to high methodological quality (eight high quality (80%), one moderate quality (10%), and one low quality (10%)) and is relevant to the Australian acute care settings and population.

All of the 16 articles included in this review addressed aspects of Question 2. None of the included articles discussed individual factors that were associated with effective implementation of comprehensive care. Rather, the articles described their overall intervention and the outcome of this intervention in relation to patient-centred, health care system and clinical outcomes.

System-level factors

For the purpose of this review 'systems level' was defined as: the regulatory, financial and payment arrangements that directly influence organisations' structure and performance (at the organisational level) and, through them, the unit level of the healthcare system.[17]

None of the included articles reported on system-level factors that were associated with effectiveness in association with comprehensive care.

Organisational-level factors

For the purpose of this review 'organisational level' was defined as: the infrastructure and resources to support work and development at the unit level. The organisational level incorporates the decision-making systems, information systems, operating systems and processes (e.g. administrative, human resources) to coordinate and support activities at the unit level.[17]

Ten of the included articles discussed organisational-level factors associated with improved outcomes (Bull 2000, Chi 2004, Gade 2008, Menefee 2014, Olsson 2009, Penticuff 2005, Scott-Smith 2007, Slingerland 2013, Stone 2008, Zatzick 2001).[2, 4, 5, 7, 8, 11, 12, 14-16] Across the articles that reported on successful elements at an

organisational level, upskilling of staff, standardisation of hospital policy and practice and ongoing quality improvement were reported.

Upskilling of acute care staff in the implementation of comprehensive care practices (e.g. inductions, and education/training) occurred at a hospital-wide level. The training comprised of one-off orientations with implementation assistance (Bull 2000, Menefee 2014, Olsson 2009, Penticuff 2005, Zatzick 2001)[5, 7, 11, 14, 15], one month of lectures, discussions and internship courses (Chi 2004)[8]; and in the case of the Planetree model of care, ongoing patient-centred retreats prior to the implementation of the program (Stone 2008).[12]

Standardisation of hospital practices and policy involved changes in hospital practices and policy to support comprehensive care such as implementation of psychotherapy treatment modules[5], changes to hospital policy regarding patient meal options[16], and initial auditing and standardisation of new practices in relation to the implementation of the comprehensive care model.[2]

Ongoing quality improvement involved the establishment of working groups and champions to maintain momentum[12, 14], scheduled staff meetings with the purpose of discussing comprehensive care and improving relationships between organisations, health care providers and patients[2, 12, 15] and education in new initiatives.[12, 14]

For more details on the organisational level factors reported in the included articles see Appendix 5.

Unit-level factors

For the purpose of this review 'unit level' was defined as: the level where the clinical care is provided. It comprises the care team (individual and healthcare team), their local information systems, the support staff, equipment and facilities. It is at the unit level where the work happens and where the individual experiences its quality.[17]

All of the included articles discussed unit-level factors that may have been associated with improved outcomes. Key health professionals involved in delivering comprehensive care were nurses (93.7% of included articles), allied health professionals (50% of included articles) and medical specialists (37.5% of included articles). In relation to the structure of the healthcare teams, three types of models were detailed in the included articles: 1) 'floating' specialised teams, 2) ward-specific teams, and 3) whole-of-hospital approach.

The 'floating' specialised teams comprised solely of specialist nursing teams[2, 6, 8] or interdisciplinary teams (nurses, medical specialists and allied health professionals).[2, 6] The 'floating' specialised team within each hospital was not associated with a particular ward or department, rather they were able to operate across the entire hospital extending elements of specialised care to different hospital units[2, 6, 8], and in some cases even into the community.[8] They engaged a diverse range of healthcare professionals around patient-specific needs and built a common purpose for the provision of care. In some instances these teams delivered aspects of care[6], while in others they instigated and coordinated the care plans, but were not involved in care delivery.[2, 8]

The ward-specific teams comprised of nurse only or interdisciplinary teams (nurses, medical specialists and allied health professionals) that focused their time and care on a specific acute care ward. For example, McLlvoy[10] investigated an interdisciplinary team of nurses, allied health professionals and medical specialists who used a four-phase clinical care pathway for spinal cord injuries in a critical care unit. These teams delivered aspects of care, or coordinated the care planning for patients in their ward either at the hospital or transitioning into the community.

Existing key health professionals comprising of nursing teams[13], dietitian teams[16], or interdisciplinary teams (nurses, medical specialists and allied health professionals)[5, 14] were utilised to support a hospital-wide comprehensive care initiative. These teams delivered aspects of care throughout all wards within the hospital, or coordinated the care planning for patients either at the hospital or transitioning into the community. For example, Scott-Smith[16] aimed to improve nutritional status and satisfaction among inpatients by changing the restrictive prescribed hospital diet to a patient-controlled liberalised diet program. By observing what patients select and reviewing the special dietary orders the physicians have prescribed, dietitians were able to begin nutritional education at a realistic point in the person's care.

Comprehensive care was delivered to patients by these teams using one of two approaches. In the majority of the articles included in this report (Arbaje 2010, Chi 2004, Gade 2008, Ekelund 2015, Lamba 2012, McLlvoy 2000, Olsson 2009, Preen 2005, Menefee 2014, Zatzick 2001)[1-3, 5, 6, 8-10, 14, 15] a team member(s) would meet with the patient (often at the bedside), to discuss the patient's situation, goals, and to then develop a care plan and assist in instigating that plan. However, in four of the included articles (Bull 2000, Penticuff 2005, Scott-Smith 2007, Slingerland 2013, Weiland 2003)[4, 7, 11, 13, 16] an educational self-management approach was used. Patients were provided with information and education enabling them to make informed decisions, ask questions and drive their care.

For more details on the unit-level factors reported in the included articles, see Appendix 6.

7 Question 3

For those comprehensive care interventions identified in Question 1 that included in the intervention screening and assessment for risks associated with cognitive, behavioural, mental and/or physical conditions:

Question 3: Key points and summary

Only five studies included a screening tool as part of the comprehensive care intervention (see Table 3), using a total of six screening tools. Of the six screening tools used, only one was validated. Authors reported screening or assessment for discharge planning, frailty, geriatric needs and palliative care however specific details of the tool content were rarely reported.

The evidence is of high methodological quality and is relevant to the Australian acute care settings and population.

1. How has integrated screening for multiple, common clinical risks been conducted (for example, pressure injury, falls, malnutrition and dehydration, frailty, and cognitive impairment in older, frail populations)?

The five articles included screening or assessment tools for discharge planning (2), frailty (1), geriatric needs (1), palliative care (1) and general screening (1). Most screening occurred at admission (2), during the hospital visit (2) or at discharge (2). Although it should be noted that authors rarely reported the content of the screening tools, therefore it is difficult to determine exactly what was assessed.

2. Which screening tools have been used, and is there evidence that these are validated tools?

Overall, 39 different screening, assessment and outcome tools were used in the included articles (see Appendix 7), however of these only five articles (Arbaje 2010, Bull 2000, Chi 2004, Ekelund 2015, Gade 2008) (total of six screening tools) included the tool as part of the comprehensive care intervention (see Table 3).[1, 2, 6-8] The remaining 34 tools were used solely to determine the impact of the intervention (outcome measure).

Table 1. Tools used as part of the comprehensive care intervention

Tool used	Validated?
Frailty screening questionnaire	Can't tell
Self-administered Discharge Planning Questionnaire (DPQ)	No
Care Transitions Measure (CTM-3)	Yes
Standardised screening questionnaire (details not reported)	Can't tell
Geriatric needs assessment	Can't tell
Palliative care assessment (adapted from Weisman 1997)	No

Gaps in the evidence

There is no standardised comprehensive care definition or terminology used throughout the literature; many articles were excluded from this report as they did not meet the definition supplied by the Commission. For the most part the literature did not include patient-centred care and goal-directed care, where the goals of care have been defined by a shared decision-making process that explicitly includes patient preferences in goal setting and developing a care plan.

There were few detailed descriptions of the intervention applied, making it difficult to recommend a specific comprehensive care program.

Assessment and screening were not embedded into the majority of comprehensive care interventions. Of the five articles that incorporated screening/assessment as part of the comprehensive care intervention, only one used a validated tool.

Recommendations

Implementation of comprehensive care in an acute care setting, particularly for older adults, can improve patient satisfaction, length of stay, cost of care, readmissions, and shared decision making and goals of care. Implementation of comprehensive care, at an organisational level, should consider aspects of upskilling staff, embedding comprehensive care into ongoing quality improvement initiatives and changes to hospital policies and procedures. At a unit level the goal of comprehensive care needs to be established and appropriate team structures and mode of delivery of comprehensive care established.

NHMRC grade of recommendation is level B overall

Evidence base	**B**
Consistency	**B**
Clinical impact	**B**
Able to generalise	**B**
Applicability	**A**

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9 Appendices

Appendix 1. Concepts and key words used in the rapid review search and example search

Concept	Keyword	MeSH
Patient centred care	patient-centered patient-centred person-centred person-centered patient-oriented person-oriented patient-focused person-focused client-focused client-oriented client-centred client-centered consumer-centred consumer-centered consumer-oriented consumer-focused	exp Patient-Centered Care/ exp Professional-Patient Relations/ Professional-Family Relations/ Patient Participation/ Patient Care Planning/ exp Consumer Participation/
Comprehensive care	comprehensive care or integrated care or Interdisciplinary or Multidisciplinary or collaborative health care	Comprehensive Health Care/ or Patient-Centered Care/ or "Delivery of Health Care, Integrated"/ or *Patient Care Team/
Acute care settings	acute care or hospital care or emergency care	*Hospitals/

Medline search

# ▲	Searches	Results
1	(acute care or hospital care or emergency care).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	28,300
2	*Hospitals/	34,685
3	1 or 2	61,928
4	(comprehensive care or integrated care or Interdisciplinary or Multidisciplinary or collaborative health care).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	89,331
5	Comprehensive Health Care/ or *Patient Care Teams/ or Patient-Centered Care/ or "Delivery of Health Care, Integrated"/	49,066
6	4 or 5	129,537
7	exp Patient-Centered Care/	12,793
8	patient-centered.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	17,919
9	patient-centred.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	3046
10	person-centred.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	945
11	person-centered.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	1023
12	patient-oriented.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	1970
13	person-oriented.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	186
14	patient-focused.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	1093
15	person-focused.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	68
16	client-focused.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	84

17	client-oriented.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	114
18	client-centred.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	432
19	client-centered.mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	655
20	exp Professional-Patient Relations/	125,488
21	Professional-Family Relations/	12,670
22	Patient Participation/	19,550
23	Patient Care Planning/	34,439
24	7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23	200,922
25	exp Consumer Participation/	34,118
26	consumer-centered.mp.	70
27	consumer-centred.mp.	14
28	consumer-oriented.mp.	259
29	consumer-focused.mp.	72
30	24 or 25 or 26 or 27 or 28 or 29	215,088
31	3 and 6 and 30	427
32	((acute care or hospital care or emergency care or Hospitals) and (comprehensive care or integrated care or Interdisciplinary or Multidisciplinary or collaborative health care or (Comprehensive Health Care or Patient Care Teams or Patient-Centered Care or "Delivery of Health Care, Integrated")) and (Patient-Centered Care or patient-centered or patient-centred or person-centred or person-centered or patient-oriented or person-oriented or patient-focused or person-focused or client-focused or client-oriented or client-centred or client-centered or Professional-Patient Relations or Professional-Family Relations or Patient Participation or Patient Care Planning or Consumer Participation or consumer-centered or consumer-centred or consumer-oriented or consumer-focused)).ab,ti.	238
33	**limit 32 to (english language and yr="2000 -Current")**	**172**
	AFTER DUPLICATES REMOVED	**167**

Appendix 2. NHMRC Evidence grading matrix

	A	B	C	D
Component	**Excellent**	**Good**	**Satisfactory**	**Poor**
Volume of evidence	Several level I or II studies with low risk of bias	One or two level II studies with low risk of bias or a SR/multiple level III studies with low risk of bias	Level III studies with low risk of bias, or level I or II studies with moderate risk of bias	Level IV studies, or level I to III studies with high risk of bias
Consistency	All studies consistent	Most studies consistent and inconsistency may be explained	Some inconsistency reflecting genuine uncertainty around clinical question	Evidence is inconsistent
Clinical impact	Very large	Substantial	Moderate	Slight or restricted
Able to generalise	Population/s studied in body of evidence are the same as the target population for the guideline	Population/s studied in the body of evidence are similar to the target population for the guideline	Population/s studied in body of evidence different to target population for guideline but it is clinically sensible to apply this evidence to target population	Population/s studied in body of evidence different to target population and hard to judge whether it is sensible to generalise to target population
Applicability	Directly applicable to Australian healthcare context	Applicable to Australian healthcare context with few caveats	Probably applicable to Australian healthcare context with some caveats	Not applicable to Australian healthcare context

Appendix 3. Included papers

Reference, study design, level of evidence	Sample size, patient condition and age range	Author conclusion	Acute setting	Intervention applied	Components of comprehensive care covered
Arbaje 2010[6] Cohort study, 2 groups intervention and usual care III-2	460 consented, 269 completed General geriatrics >65 years	The results indicate that Geri-FITT is associated with slightly higher, though not statistically significantly so, quality care transitions and greater patient satisfaction with inpatient care. Geri-FITT may be a feasible approach to enhancing inpatient management and transitional care for older adults. Further study of its effect on these and other outcomes in other healthcare settings seems warranted.	General Medicine teaching services at an academic medical centre	Patients' goals of care elicited and their cognitive function, risk of falling, functional status, mood, medications, and relevant geriatric syndromes (e.g. sleep disturbance, delirium, constipation, incontinence and falls) assessed by Geri-FITT team. Written management recommendations provided to inpatient medical–nursing team and meetings nearly every day to co-manage geriatric syndromes. Throughout the Geri-FITT patients' hospital care, the geriatric nurse practitioner (GNP) monitored their progress; discussed their care with inpatient physicians, nurses, social workers and rehabilitation therapists; provided patient and caregiver education about medications and self-management skills; and prepared patients and caregivers for expectations at the next site of care. The GNP also provided ongoing nursing staff education focused on identification and management of geriatric syndromes. Within 48 hours of each patient's discharge, the GNP, in	• Screening and assessment for common clinical risks associated with cognitive, behavioural, mental and/or physical conditions • Team work and collaboration across specialties and disciplines • The delivery of integrated, multidisciplinary care • Patient-centred care and goal-directed care, where the goals of care have been defined by a shared decision-making process that explicitly includes patient preferences in goal setting and developing a care plan

				consultation with the inpatient team, prepared a letter to be faxed to the primary care provider, providing a brief description of the hospitalisation, medication changes, and geriatric-specific recommendations. Within 2 days of discharge, the GNP also telephoned the patient or caregiver to review symptoms, medication use, self-management skills, and follow-up instructions.	
Bull 2000[7] Before-and-after non-equivalent control group design III-2	180 elder/caregiver dyads Heart failure ≥55 years	The findings indicated that elders in the intervention cohort felt more prepared to manage care, reported more continuity of information about care management and services, felt they were in better health, and when readmitted spent fewer days in the hospital than the control cohort. Caregivers in the intervention cohort also reported receiving more information about care management and having a more positive reaction to caregiving 2 weeks post	Cardiac units from 2 large community hospitals	The intervention had the following components: 1. An educational program for nurses and social workers included information on discharge-planning assessment, patient and caregiver participation, and use of the patient and caregiver self-administered Discharge Planning Questionnaire (DPQ) to identify needs for follow-up care 2. Elders and caregivers were asked to complete the DPQ approximately 1 to 2 days after the elder was admitted to the participating medical unit 3. Elders and caregivers viewed a videotape on preparing to leave the hospital and were given structured questions related to managing post	• Screening and assessment for common clinical risks associated with cognitive, behavioural, mental and/or physical conditions • Team work and collaboration across specialties and disciplines • Patient-centred care and goal-directed care, where the goals of care have been defined by a shared decision-making process that explicitly includes patient preferences in goal setting and developing a care plan

		discharge than the control cohort.		hospital care to discuss with their doctor, nurse or social worker 4. Elders were given a form to list medication information and a brochure on how to access community services.	
Chi 2004[8] Longitudinal quasi-experimental research design III-3	331 disabled elderly people Disability Mostly ≥65 years (only 6.6% <65)	The findings show that hospital-based care management is a viable option and has the potential to become an important segment in the delivery of long-term care services. More effort should be expended in its development and in the evaluation of its effectiveness.	Hospital	**Consultation:** Care managers provided telephone and in-person consultations to disabled persons or their caregivers regarding health, long-term care needs, and social welfare benefits. **Screening:** Eligibility and urgency of needs were screened by care managers with a standardised screening questionnaire. Care managers would immediately arrange for a home visit for those in urgent need. **Comprehensive assessment:** Care managers would conduct in-home visits to perform a comprehensive assessment for those who were disabled. **Implementation of care plan:** Once agreement was reached, care managers would contact appropriate service providers. Information on the client's health status and needs would also be passed to providers.	• Screening and assessment for common clinical risks associated with cognitive, behavioural, mental and/or physical conditions • Integrated multidisciplinary care planning • Team work and collaboration across specialties and disciplines • Patient-centred care and goal-directed care, where the goals of care have been defined by a shared decision-making process that explicitly includes patient preferences in goal setting and developing a care plan

Ekelund 2015[1] Non-blinded randomised controlled trial II	161 Frailty (at least one chronic condition and at least one self-assessed loss in ADL) ≥65 years	Self-determination seems to deteriorate over time in both groups, and the intervention "continuum of care for frail elderly people" seemed to slow the rate of decline in two dimensions; activities in and around the house at 3 month follow-up and at 3 and 6 months concerning social relationship. The intervention has the means to support them in exercising self-determination and aging in place, a valuable benefit both for the individual and for society.	Hospital ED (emergency department)	The intervention involved collaboration between a nurse with geriatric competence at the ED, the hospital ward and a multi-professional team for care and rehabilitation of older people in the municipality, with a case manager (CM) at the hub. The multi-professional team included professionals in nursing, occupational therapy, physiotherapy and social work. Frailty screening was carried out at the ED; if it indicated frailty the nurse completed a brief basic geriatric needs assessment, and need of rehabilitation. If admitted to a ward, screening information was immediately transferred to the ward and to the CM. The CM was responsible for contacting the ward and the patient in order to prepare for discharge. If the patient went directly home from ED, the screening information was transferred to the CM and care planning was offered within a couple of days. Care planning took place at the person's home, and the multi-professional team in collaboration with the CM was responsible. The aim was that the older person was in charge of the meeting.	• Screening and assessment for common clinical risks associated with cognitive, behavioural, mental and/or physical conditions • Integrated multidisciplinary care planning • The delivery of integrated, multidisciplinary care • Team work and collaboration across specialties and disciplines, include patient-centred care and goal-directed care, where the goals of care have been defined by a shared decision-making process that explicitly includes patient preferences in goal setting and developing a care plan

Gade 2008[2] Multicentre randomised controlled trial II	517 Life-limiting illness 18+ years (M=73.6, SD=12.6)	Interdisciplinary palliative care service. Patients reported greater satisfaction with their care experience and providers' communication, had fewer ICU admissions on readmission, and lower total health care costs following hospital discharge. There were no differences in survival or symptom control.	Palliative care departments of 3 hospitals (Denver, Portland and San Francisco)	The teams assessed patients' needs for symptom management, psychosocial and spiritual support, end-of-life planning, and post-hospital care. All of the team's efforts were based on the patient's individual goals of care.	• Screening and assessment for common clinical risks associated with cognitive, behavioural, mental and/or physical conditions • Integrated multidisciplinary care planning • The delivery of integrated, multidisciplinary care • Team work and collaboration across specialties and disciplines • Patient-centred care and goal-directed care, where the goals of care have been defined by a shared decision-making process that explicitly includes patient preferences in goal setting and developing a care plan

Lamba 2012[9] Prospective observational study III-2	235 End-stage liver disease Age range not specified	Interdisciplinary communication interventions with physicians and families resulted in earlier consensus around goals of care for dying liver transplant (LT) patients. Early integration of palliative care alongside disease-directed curative care can be accomplished without change in mortality and has the ability to improve end-of-life care practice in LT patients.	The surgical intensive care unit of an academic, tertiary care, urban, public hospital-based liver transplant centre	A two-part communication intervention: **Part I:** each patient had a palliative care assessment done by a physician and nurse within 24 hours of their admission and the patient's family received psychosocial and/or bereavement support. The Part I assessment consisted of delineating prognosis, advance directives, family support, surrogate decision maker, and pain, as well as other symptoms. **Part II:** an interdisciplinary family meeting was held within 72 hours, regardless of patient prognosis. During this meeting, likely patient outcomes, treatment options, and goals of care were addressed. 18 palliative care team members assessed these family meetings (subjectively) for content on goals-of-care discussion, family understanding of information provided and issues of conflict. A comprehensive interdisciplinary care plan was placed in the medical record.	• Screening and assessment for common clinical risks associated with cognitive, behavioural, mental and/or physical conditions • Integrated multidisciplinary care planning • Team work and collaboration across specialties and disciplines • Patient-centred care and goal-directed care, where the goals of care have been defined by a shared decision-making process that explicitly includes patient preferences in goal setting and developing a care plan

McLlvoy 2000[10] Cross-sectional (no pathway compared to pathway) III-3	55 Spinal cord injury Age range not specified	Phased outcome clinical pathways can be useful in the management of neurotrauma patients in the acute care setting. By developing multidisciplinary plans of care that focus on patient and family outcomes and not arbitrary points in time, hospitals can provide quality care to trauma patients that is both appropriate and cost effective. This plan can be expanded on across the health care continuum from pre-hospital to community reintegration. Providing collaborative quality care will result in improved outcomes for both patients and health care institutions.	Hospital	Three-phase spinal cord clinical pathway including multi-disciplinary interventions, medications and IV's, nutrition, activity and positioning. Lab tests, diagnostic procedures, consults and discharge planning and education.	• Integrated multidisciplinary care planning • The delivery of integrated, multidisciplinary care • Team work and collaboration across specialties and disciplines • Patient-centred care and goal-directed care, where the goals of care have been defined by a shared decision-making process that explicitly includes patient preferences in goal setting and developing a care plan

Menefee 2014[14] Quality improvement III-3	Number of participants not reported Chronic conditions Age range not specified	Reductions in readmission rates, increases in patient satisfaction and review of the plan of care have been realised. Feedback from the interdisciplinary teams continues to be positive, and time in rounds is viewed as value added. The potential financial impact from the use of this model can result in either a cost savings by avoiding readmission penalties and/or a savings in direct and indirect costs of care. The project outcomes and associated positive findings have significant financial and customer implications for healthcare organisations, which will intensify into the future as the components of the Affordable Care Act continue to be implemented in the United States.	Hospital	The Menefee Model (MM) is based on the belief that evidence-based plans of care, without interdisciplinary team collaboration and patient engagement, are ineffective tools for patient care. The MM relies on the presence of plans of care that are consistently used to coordinate interventions based on the goals and needs of the patient. Rather than the typical nursing plan of care, this interdisciplinary plan of care (IPOC), which is developed and used by all team members, serves as the coordination tool during daily IPOC rounds. The care coordination role of the nurse lends itself to the facilitation of rounds and leadership of the interdisciplinary team. The nurse is responsible for the daily dialogue with the patient to assess the patient's goal for the day. This goal is documented in the patient's own words and shared without clinical translation during interdisciplinary rounds. The patient's goal then becomes very powerful *"in their words"* and is the central focus of the interdisciplinary team efforts.	• Integrated multidisciplinary care planning • The delivery of integrated, multidisciplinary care • Team work and collaboration across specialties and disciplines • Patient-centred care and goal-directed care, where the goals of care have been defined by a shared decision-making process that explicitly includes patient preferences in goal setting and developing a care plan

Olsson 2009[15] Economic evaluation within the framework of an Intervention study (a prospective before and after design) III-3	112 Independently living patients Hip fracture ≥65 years	The recovery trajectory for hip fracture surgery may be shortened if nurses pay more attention to the individual patient's resources and motivation for rehabilitation. The application of an integrated care pathway with individualised care appears to enhance both rehabilitation outcomes and cost-effectiveness.	Hospital	The intervention was specifically designed to focus on each patient's motivation and their prerequisites for rehabilitation, and to guide the transition process. A thorough interview was performed during the patient's admission to the ward to create an individual rehabilitation prognosis. As part of the intervention, patients in the intervention group were not transferred to other departments for other than medical reasons, and remained on the orthopaedic ward until they had attained activities of daily living level or equivalent to their prefracture level or until they did progress further in their rehabilitation.	• Integrated multidisciplinary care planning • The delivery of integrated, multidisciplinary care • Team work and collaboration across specialties and disciplines • Patient-centred care and goal-directed care, where the goals of care have been defined by a shared decision-making process that explicitly includes patient preferences in goal setting and developing a care plan
Penticuff 2005[11] Quasi-experimental repeated measures design III-2	231 mothers of very low birth weight infants Very low birth weight Neonatal infants and their parents	There were no statistically significant differences between the groups in satisfaction with infants' care, satisfaction with relationships with physicians and nurses, and satisfaction with the decisions made for their infants' treatment. Infant birth weight and gestational age and maternal demographic characteristics were found	Hospital (neonatal intensive care)	To increase parents understanding of information necessary for informed participation in infant treatment decisions using an infant progress chart and Care Planning Meetings (CMP). The CPM format was intended to facilitate development of parent-professional relationships characterised by open communication, shared decision authority, and trust; thereby enhancing collaborative treatment decision making. In cases in which infants did not incur serious complications, the Care Planning Meetings aimed to promote collaborative	• Screening and assessment for common clinical risks associated with cognitive, behavioural, mental and/or physical conditions • Integrated multidisciplinary care planning • The delivery of integrated, multidisciplinary care • Patient-centred care and goal-directed care, where the goals of care have been defined by a shared decision-making

		to influence collaboration results. The intervention was especially effective in improving understanding and collaboration in low-income, young, minority mothers.		relationships, to support parent-professional discussion, and to facilitate parents' recognition of infant progress. In cases with poor prognoses, the CPMs aimed to promote collaborative relationships that would enhance the development of trust and mutual discussion of the values that underlay treatment goal setting, and would support parents' participation to their desired level in treatment decision making.	process that explicitly includes patient preferences in goal setting and developing a care plan
Preen 2005[3] Randomised controlled trial. II	189 Chronic cardiorespiratory diagnoses >65 years	Our results indicate that a multidisciplinary discharge care plan, initiated before separation, improves quality of life, involvement, and satisfaction with discharge care, and hospital–general practitioner integration. As such, it possesses benefits over current Western Australian hospital discharge procedures for the care of chronically ill populations.	Two Western Australia tertiary hospitals	A research nurse individually tailored a discharge care plan, in accordance with that set down by the Australian Enhanced Primary Care Initiative, which included: 1. Problems identified from hospital notes and patient/care-giver consultation 2. Goals developed and agreed upon with the patient/care-giver based on personal circumstances 3. Identified interventions and community service providers who met patient needs and who were accessible and agreeable to the patient.	• Screening and assessment for common clinical risks associated with cognitive, behavioural, mental and/or physical conditions • Integrated multidisciplinary care planning • The delivery of integrated, multidisciplinary care • Team work and collaboration across specialties and disciplines • Patient-centred care and goal-directed care, where the goals of care have been defined by a shared decision-making process that explicitly includes

					patient preferences in goal setting and developing a care plan
Scott-Smith 2007[16] Pre-post intervention study III-3	Number of participants not reported General surgical patients Age range not specified	The Patient Controlled Liberalized Diet program shows promise in improving dietetic practice and creating a patient-centred approach to nutritional care of hospitalised inpatients. A unique interdisciplinary program with positive patient and staff outcomes did not come about as a methodology for fine-tuning a traditional model of care to create incremental improvements. Rather, it began with the concept of a patient care delivery problem and, by rejecting non-evidence based decision-making traditions, created a new model resulting in improvements in quality of care. The interdisciplinary nature of the program and the focus on patient-	Hospital	Patient-Controlled Liberalized Diet Program (rather than restrictive/prescribed diet) in hospital settings. By observing what patients select, and reviewing the special dietary orders the physicians have prescribed, dietitians are able to begin the nutritional education process at a realistic point. If a patient selects food that is counter to physician orders, the clinical staff will conduct a focused educational visit and continue to monitor the patient's food selections. After three additional choices that are counter to recommendations, a dietitian will visit again. These occurrences are seen as positive in terms of providing additional educational opportunities. If patients make less than optimal dietary choices while in the hospital, under the educational and supervisory watch of their caretakers, it is reasonable to assume they might make the same (or worse) choices, outside of the hospital. The opportunity to help modify what might happen in terms of food choices, post-hospitalisation, is an important one.	• Screening and assessment for common clinical risks associated with cognitive, behavioural, mental and/or physical conditions • Integrated multidisciplinary care planning • Team work and collaboration across specialties and disciplines • Patient-centred care and goal-directed care, where the goals of care have been defined by a shared decision-making process that explicitly includes patient preferences in goal setting and developing a care plan

		centred care are keys to its success and replicability.			
Slingerland 2013[4] Prospective cluster-randomised controlled trial II	506 Type 2 diabetes Mean age 65 years ± 11	Patient-centred care is more valuable when targeted to patients with HbA1c 8.5% (69 mmol/mol), confirming clinical intuition. The findings support treatment in those with baseline HbA1c 7–8.5% (53–69 mmol/mol) and demonstrate little to no benefit among those with HbA1c, 7% (53 mmol/mol). Further studies should assess different HbA1c strata and additional risk profiles to account for heterogeneity among patients.	13 hospitals in the Netherlands	In the patient-centred care cluster, patients were not only seen by their internal medicine doctors and diabetes team as in usual care but additionally received detailed diabetes passports based on national guidelines that aim to educate and record results of medical examinations in order to promote shared disease management. Educational meetings for patients were organised in all of the hospitals where the diabetes passports were introduced. Physicians, diabetes specialist nurses, and dietitians attended these meetings with an opinion leader and received personal feedback with benchmarks on baseline data, adherence to key guidelines, and the use of the diabetes passports.	• The delivery of integrated, multidisciplinary care • Team work and collaboration across specialties and disciplines • Patient-centred care and goal-directed care, where the goals of care have been defined by a shared decision-making process that explicitly includes patient preferences in goal setting and developing a care plan

Stone 2008[12] Quasi-experimental retrospective evaluation III-2	869 Primary elective surgical knee or primary hip total joint replacement 40–88 years	The findings indicate the Planetree patient-centered model of care positively impacted patient satisfaction, length of stay and cost per case. Nursing and hospital administrators seeking to improve the inpatient hospital experience should consider implementation of the Planetree patient-centered model of care.	Inpatient hospital unit in a 30 bed medical surgical telemetry unit	The Planetree patient-centered model of care promotes patient education, and patient and family involvement within the walls of a nurturing and homelike hospital where the mind, body and spirit are fostered. The Planetree patient centered model of care defines structures and protocols consistent with 10 core components (human interaction, architectural and interior design, food and nutrition, patient and family education, family involvement, spirituality, human touch, healing arts, complementary/alternative therapy and healthy communities) for managing the care of patients and their families.	• Integrated multidisciplinary care planning • Team work and collaboration across specialties and disciplines • Patient-centred care and goal-directed care, where the goals of care have been defined by a shared decision-making process that explicitly includes patient preferences in goal setting and developing a care plan
Weiland 2003[13] Cross-sectional III-3	22 Cystic fibrosis 15–19 years	Engaging hospitalised adolescents with cystic fibrosis in the design of their individualised daily schedule is a win-win proposition, resulting in improved satisfaction while maintaining clinical outcomes.	Cincinnati Children's Hospital Medical Center	Individualised daily schedule was developed to incorporate appropriate treatments and medical care with the patient's individual needs and preferences. The schedule allowed detailed planning of the patient's day, with scheduling to the half hour. This included scheduling of routine activities such as wake up, medications, airway clearance, physical therapy, school, meals and physician rounds. Activities that occurred less often, such as laboratory tests, dressing changes, pulmonary function tests, and even a pass away from	• Integrated multidisciplinary care planning • Team work and collaboration across specialties and disciplines • Patient-centred care and goal-directed care, where the goals of care have been defined by a shared decision-making process that explicitly includes patient preferences in goal setting and developing a care plan

				the hospital for social events, also were scheduled.	
Zatzick 2001[5] Pilot randomised effectiveness trial II	34 Trauma-hospitalised motor vehicle crash or assault survivors 14–65 years	In summary, no organised service delivery system exists for physically injured trauma survivors suffering from post-traumatic behavioral and emotional disturbances. The results of this investigation suggest that collaborative interventions may hold promise for reducing post-traumatic symptomatic distress. Future investigations should develop and test high-quality, cost-effective, stepped collaborative care interventions that target symptomatic and functional impairments among injured trauma survivors.	A Level 1 trauma centre in Northern California	On the surgical ward each patient was assigned to a trauma support specialist who met each intervention patient at the bedside. The trauma support specialists were instructed to develop a therapeutic relationship and follow patients for 4 months through primary care outpatient appointments and community rehabilitation. 3 clinicians with advanced degrees and extensive experience with the surgical inpatient treatment milieu volunteered their time as the trauma support specialists for the pilot study. To establish a basis for collaborative problem definition and shared patient-provider treatment planning, the trauma support specialists were instructed to elicit and track patients' post-traumatic concerns.	• Screening and assessment for common clinical risks associated with cognitive, behavioural, mental and/or physical conditions • Integrated multidisciplinary care planning • Team work and collaboration across specialties and disciplines • Patient-centred care and goal-directed care, where the goals of care have been defined by a shared decision-making process that explicitly includes patient preferences in goal setting and developing a care plan

Appendix 4. Critical appraisal score tables

CASP randomised controlled trial critical appraisal score

No	Reference	CASP RCT critical appraisal scoring items											
		1	2	3	4	5	6	7	8	9	10	11	Score
1	Ekelund 2015[1]	Y	N	N	Y	Y	Y	Y	Y	Y	N	Y	8/11
2	Gade 2008[2]	Y	Y	CT	Y	Y	Y	CT	CT	Y	Y	Y	8/11
3	Penticuff 2005[11]	Y	N	N	Y	Y	Y	CT	CT	Y	Y	Y	7/11
4	Preen 2005[3]	Y	Y	CT	Y	Y	N	CT	CT	Y	N	Y	6/11
5	Slingerland 2013[4]	Y	Y	N	Y	Y	Y	N	Y	Y	Y	Y	9/11
6	Zatzick 2001[5]	Y	Y	N	Y	Y	Y	CT	Y	Y	Y	Y	9/11

Y = Yes, N = No, Can't Tell = CT

Item 1: Did the trial address a clearly focused issue?

Item 2: Was the assignment of patients to treatments randomised?

Item 3: Were patients, health workers and study personnel blinded?

Item 4: Were the groups similar at the start of the trial?

Item 5: Aside from the experimental intervention, were the groups treated equally?

Item 6: Were all of the patients who entered the trial properly accounted for at its conclusion?

Item 7: How large was the treatment effect?

Item 8: How precise was the estimate?

Item 9: Can the results be applied in your context?

Item 10: Were all clinically important outcomes considered?

Item 11: Are the benefits worth the harms and costs?

McMaster quantitative critical appraisal score

No	Reference	McMaster quantitative critical appraisal scoring items										
		1	2	3	4	5	6	7	8	9	10	Score
7	Arbaje 2010[6]	Y	Y	Cohort	Y	Y	Y	Y	Y	CT	Y	8/10
8	Bull 2000[7]	Y	Y	Before-and-after non-equivalent control group design	Y	Y	Y	Y	Y	Y	Y	9/10
9	Chi 2004[8]	Y	Y	Longitudinal quasi-experimental research design	Y	Y	N	Y	Y	Y	Y	8/10
10	Lamba 2012[9]	Y	Y	Prospective observational study	Y	N	Y	Y	Y	Y	Y	8/10
11	McIlvoy 2000[10]	Y	Y	Cross-sectional	N	Y	Y	Y	Y	Y	Y	8/10
12	Menefee 2014[14]	Y	Y	Quality improvement	Y	N	Y	Y	N	Y	Y	7/10
13	Olsson 2009[15]	Y	Y	Economic evaluation	Y	Y	Y	Y	Y	Y	Y	9/10
14	Scott-Smith 2007[16]	Y	Y	Pre/post intervention	Y	CT	N	Y	CT	CT	CT	4/10
15	Stone 2008[12]	Y	Y	Retrospective quasi experimental study	Y	Y	CT	N	Y	Y	Y	7/10
16	Weiland 2003[13]	Y	Y	Not reported, looks like cross-sectional	Y	N	CT	Y	N	Y	Y	6/10

Y = Yes, N = No, Can't Tell = CT

Item 1: Was the purpose stated clearly?

Item 2: Was the relevant background literature reviewed?

Item 3: Describe the study design.

Item 4: Was the design appropriate for the study question?

Item 5: Was the sample described in detail? Was informed consent obtained?

Item 6: Were outcome measures reliable and valid?

Item 7: Was the intervention described in detail?

Item 8: Were results reported in terms of statistical significance? Were anlaysis methods appropriate?

Item 9: Did any participants drop out from the study? Were all participants accounted for?

Item 10: Were study conclusions appropriate given the study methods and results?

Appendix 5. Organisational level factors – the hospital

Themes/Grouping	Reference	Mode/methods	Detail/interventions
Upskilling staff	Bull 2000[7]	Induction/orientation of staff involved in the implementation of the comprehensive care model	*"Nurses and social workers at the hospital implementing the intervention received an orientation to the partnership model and assistance with its implementation."*
	Menefee 2014[14]	Education – computer-based learning, classroom education and on-unit rounding	*"Educational plan of interdisciplinary team in the use of evidenced-based plan of care system. Education on electronic care plans."*
	Chi 2004[8]	Education	*"Two nurses were recruited into the care management program, and were given training, consisting of lectures, discussion and internship for the course for one month during, prior to becoming care managers."*
	Olsson 2009[15]	Education	*"Once-off training session to the orthopaedic team prior to commencement of the trial."*
	Penticuff 2005[11]	Education	*"NICU nurses were instructed in how to help parents use the Infant progress chart, and neonatologists and neonatal nurse practitioners were familiarized with the Care Planning Meeting agenda."*
	Stone 2008[12]	Education	*"Employees attended a mandatory patient-centred care retreat where they learnt about the Planetree patient-centred model of care. Ongoing staff retreats to focus on Planetree philosophy prior to implementation."*
	Zatzrick 2001[5]	Education	*"A psychotherapy module specifically targeting post-traumatic distress and substance use was also developed as part of the multifaceted collaborative intervention. The trauma support specialists received a 4-hour training in brief, psychoeducational interventions targeting PTSD symptoms and motivational enhancement techniques targeting alcohol and drug use."*

Themes/Grouping	Reference	Mode/methods	Detail/interventions
Standardisation of hospital practices and policy	Scott-Smith 2007[16]	Changes in hospital practices and policy to support comprehensive care	*"Shadyside medical staff provides that patients can select anything from the menu and will receive what they ordered. At the same time, a new menu was created with more popular items and educational symbols so that dietary orders can be understood and pursued at the patient's discretion. The food preparation specifications and recipes were revised with an emphasis on flavourful foods and moderate portion sizes."*
	Gade 2008[2]	Initial auditing and standardisation of new practices in relation to the implementation of the comprehensive care model	*"Site visited early in the study to assess protocol adherence, and intervention patients' medical records were reviewed to ensure that all treatment components were addressed."*
	Slingerland 2013[4]	Changes in hospital practices and policy to support comprehensive care	*"In the patient-centred care clusters, patients were not only seen by their internal medicine doctors and diabetes team as in usual care but additionally received detailed diabetes passports based on national guidelines that aim to educate and record results of medical examinations in order to promote shared disease management. Educational meetings for patients were organised in all of the hospitals where the diabetes passports were introduced. Leaflets and waiting room posters were also distributed."*

Themes/Grouping	Reference	Mode/methods	Detail/interventions
Ongoing quality improvement	Menefee 2014[14]	Establishment of a working group (WG) to guide/champion project	*"An interdisciplinary health system WG was composed of 30 direct care team members from nursing, physician and ancillary staff with support team members from the steering council in areas such as information technology and process improvement."*
	Gade 2008[2]	Regular staff meetings with the purpose of discussing comprehensive care and improving relationships between organisations, health care providers and patients	*"To ensure treatment consistency there were biweekly telephone conferences among the three sites to review cases and promote protocol adherence"*
	Olsson 2009[15]	Regular weekly meeting to discuss project and continue to improve comprehensive care	*"Weekly meeting with Integrated Care Pathway team"*
	Stone 2008[12]	Establishment of advisory committee and action team	*"An advisory committee was formed to oversee the implementation. This committee membership included representatives from the board of directors, medical staff, management, staff and past patients. A smaller group of eight management and staff joined an action team with the goal of implementing programs and protocols consistent with the ten core components of the Planetree patient-centred model of care (human interaction, architectural and interior design, food and nutrition, patient and family education, family involvement, spirituality, human touch, healing arts, complementary/alternative therapy and healthy communities)."*
	Slingerland 2013[4]	Regular staff meetings with the purpose of discussing comprehensive care	*"Physicians, diabetes specialist nurses, and dietitians attended these meetings with an opinion leader and received personal feedback with benchmarks on baseline data, adherence to key guidelines, and the use of the diabetes passports. Barriers and facilitators were discussed. Internists received personal feedback on clinical performance after 6 months as well as on the use of the diabetes passports."*

Appendix 6. Unit level factors – the ward and local team

Structure of the health care teams	Reference	Mode of delivery	Details of the intervention	Health professionals involved	Area of care focus
'Floating' specialised teams	Arbaje 2010[6]	In person	**'Floating' specialised geriatric evaluation and co-management service** Geriatric nurse practitioner–geriatrician team to augment providers' limited inpatient geriatrics expertise by combining evaluation and co-management with transitional care service. By 'floating' to where patients were admitted for medical and nursing care, the team was able to extend elements of a specialised geriatric medical service to several medical units, engage diverse healthcare professionals around patient-specific needs, and build a common purpose for providing optimal geriatric and transitional care. This was accomplished by providing care consistent with patient-identified goals, coordinating care across sites, and engaging important providers in the care transition process: inpatient and primary care physicians, nurses, discharge planners, patients, and caregivers.	Nurse and geriatrician	Inpatient and discharge *care planning*
	Chi 2004[8]	In person	**'Floating' specialised nurses in hospital that outreached into the community** Care managers would conduct in-home visits to perform a comprehensive assessment for those who were disabled. Information of functional status, diseases, medication, cognitive function, depression, current use of formal services, availability of family caregivers and social support situations would be gathered. Results of the assessment would serve as the basis for developing a care plan for the clients. Each assessment visit lasted about one hour, and frequently required more than one visit. Care managers would devise a draft care plan after comprehensive assessment. The care plan, in general, would take account of the client's needs, availability of informal care resources, ability to pay and preferences. The care managers would later visit the client again to discuss the appropriateness of services with him or her and his or her family. Discussions would continue until a consensus was reached.	Nurses	Long term *care planning*

Structure of the health care teams	Reference	Mode of delivery	Details of the intervention	Health professionals involved	Area of care focus
	Gade 2008[2]	In person	**'Floating' interdisciplinary inpatient palliative care consultative service** The team met prior to each consultation to share what was known about the patient from the medical record, baseline questionnaire and hospital providers. The entire team then met with the patient/family to address symptoms, diagnosis, prognosis and goals of care. Psychosocial and spiritual concerns were identified and advance directive forms were discussed. After the patient/family meeting, the team convened briefly to synthesise a palliative care plan and organise follow-up by team members.	Palliative care physician, nurse, hospital social worker and chaplain	Long term palliative *care planning*
Ward specific	Ekelund 2015[1]	In person	**ED nurse screening patients -liaising with ward staff in patient admitted or directly with community teams if DC from hospital** Hospital notified the multi-discipline team when an older person admitted to ED/hospital would soon be discharged and require their assistance. The multi-discipline team undertook care planning in the community in the person's home. The older person was 'in charge' of the meeting.	Nurse and multi-discipline community team	Discharge *care planning*
	Lamba 2012[9]	In person	**Structured palliative care program on a surgical intensive care unit (SICU)** Part I assessment consisted of delineating prognosis, advance directives, family support, surrogate decision maker, and pain, as well as other symptoms. To assess prognosis, we used a modified Glasgow Outcome Scale where physicians and nurses were asked the most likely patient outcome using a score of 1–5, with 1 = death and 5 = independent functional recovery. The purpose of prognostication was to engage the SICU team and prompt them to consider goals of care in patients with low predicted functional outcomes. No long-term outcomes were collected on these patients. In Part II, an interdisciplinary family meeting was held within 72 hours, regardless of patient prognosis. During this meeting, likely patient outcomes, treatment options and goals of care were addressed. Palliative care team members assessed these family	Physician, nurses, family, counsellors, interfaith pastor	Palliative *care planning*

Structure of the health care teams	Reference	Mode of delivery	Details of the intervention	Health professionals involved	Area of care focus
			meetings (subjectively) for content on goals-of-care discussion, family understanding of information provided, and issues of conflict. A comprehensive interdisciplinary care plan was placed in the medical record.		
	McIlvoy 2000[10]	In person	**Clinical care pathways for Spinal Cord Injuries** 4-phase process. Phase 1 is the first 24 hours of the admission. During this time all patient enter the clinical care pathway. Phase 2 is the acute critical care phase, which is around 72 hours. Phase 3 is when mobility and weaning occur, around day 14, and phase 4 is pre-rehabilitation.	Trauma surgeon, neurosurgeon, emergency medicine, physical med and rehab physician, nurses, allied health staff	Spinal cord clinical *care pathways*
	Olsson 2009[15]	In person	**Establishment of integrated care pathway for fractured hips in orthopaedic ward** The intervention was specifically designed to focus on each patient's motivation and their prerequisites for rehabiliation, and to guide the transition process. A thorough interview was performed during the patient's admission to the ward to create an individual rehabilitation prognosis. As part of the intervention, patients in the intervention group were not transferred to other departments for other than medical reasons, and remained on the orthopaedic ward until they had attained activities of daily living level equivalent to their pre-fracture level or until they did progress further in their rehabilitation.	Nurses, nursing assistants, physios, OTs, orthopaedic surgeon and hospital welfare officer	Hip fracture *care pathways*

Structure of the health care teams	Reference	Mode of delivery	Details of the intervention	Health professionals involved	Area of care focus
	Preen 2005[3]	In person	Discharge care plan, in accordance with that set down by the Australian Enhanced Primary Care Initiative, which included: (i) problems identified from hospital notes and patient/care-giver consultation, (ii) goals developed and agreed upon with the patient/care-giver based on personal circumstances, and (iii) identified interventions and community service providers who met patient needs and who were accessible and agreeable to the patient. The computer generated care plan was completed on a two-page template approximately 24–48 hours before anticipated discharge and sent (by fax) to the patient's general practitioner, who reviewed the document, making alterations regarding treatment and service provision based on their understanding of the patient's health history. General practitioners also scheduled a consultation (within 7 days post-discharge) for patient review and then return-faxed the document to the hospital.	Nurse	Discharge *care planning*
	Bull 2000[7]	Patient education/ empowerment – brochures/ video	**Nurses and social workers provided information and video to eligible patient on cardiac ward** • Elders and caregivers were asked to complete the Discharge Planning Questionnaire approximately 1 to 2 days after the elder was admitted to the participating medical unit • Elders and caregivers viewed a videotape on preparing to leave the hospital and were given structured questions related to managing post-hospital care to discuss with their doctor, nurse, or social worker • Elders were given a form to list medication information and a brochure on how to access community services.	Nurses and social workers	Discharge *self-management*

Structure of the health care teams	Reference	Mode of delivery	Details of the intervention	Health professionals involved	Area of care focus
	Penticuff 2005[11]	Patient education/empowerment person – infant progress chart (IPC) and in person	Parents received an IPC orientation and used the IPC when visiting their infants in the NICU. Within 72 hours of an infant's NICU admission, parents were given an orientation by a master's-prepared research nurse in how to use the IPC. The orientation session took place in the NICU at the infant's bedside and lasted approximately 45 minutes. They also participated in 3 Care Planning Meetings. Three parent-professional Care Planning Meetings (CPMs) were held at 0–3, 9–12, and 25–28 days of each study infant's NICU stay	Nurse	*Care planning*
Hospital wide	Menefee 2014[14]	In person	The Menefee models develop a plan of interdisciplinary care based on the patient's goals. All aspects of care, such as plan of care, team members, rounds and transitions were driven by the patient's goals.	Nurses. Care managers, social workers, nutritionists, physicians, pharmacists, patient care assistants, rehabilitation therapists	Interdisciplinary *care planning*

Structure of the health care teams	Reference	Mode of delivery	Details of the intervention	Health professionals involved	Area of care focus
	Scott-Smith 2007[16]	Patient education and in person	Patient received counselling from dietitian about appropriate meal choices while in hospital.	Dietitians	Nutrition *self-management*
	Slingerland 2013[4]	In person and education	Educational meetings for patients were organised in all of the hospitals where the diabetes passports were introduced in addition to the normal diabetes care regimen.	Physicians, diabetes specialist nurses and dietitians	Disease specific *clinical management*
	Weiland 2003[13]	Patient empowerment – daily diaries	Daily diaries were developed for all patients with CF who wanted them.	Nurses	Scheduling daily plan *self-management*
	Zatzick 2001[5]	In person	Collaborative interventions characteristically combine continuous medical support services with active sustained follow-up and shared patient-provider treatment planning. On the surgical ward each patient was assigned to a trauma support specialist who met each intervention patient at the bedside. The trauma support specialists were instructed to develop a therapeutic relationship and follow patients for 4 months through primary care outpatient appointments and community rehabilitation.	Trauma support specialists, psychiatrist and trauma nurse	*Clinical management*

Appendix 7. Table of all outcomes measured in included articles

Domain assessed	Tool used	Validated?
Cognition	Mini Mental	Yes
	Confusion assessment method (CAM)	Yes
Mental	Short-form-36	Yes
	Modified City of Hope Patient Questionnaires (MCOHPQ).	
	Emergency Department Depression Screening Instrument (ED-DSI)	Yes
	SF-12	Yes
	Center for Epidemiological Studies Depression Scale (CES-D)	Yes
	Peritraumatic Dissociative Experiences Questionnaire (PDEQ).	Yes
	A modified version of the traumatic event inventory that accompanies the Composite International Diagnostic Interview (CIDI)	No
	PTSD module as developed for the National Comorbidity Survey (NCS)	Yes
	8 items from the Medical Outcomes Study (MOS) Social Support Survey	Yes
Physical	Short-form-36	Yes
	Frailty screening questionnaire	Can't tell
	Risk of falling	Can't tell
	Functional status (Index of ADL)	Yes
	Relevant geriatric syndromes	Can't tell
	Eastern Cooperative Oncology Group performance scale (ECOG)	Yes
	Modified City of Hope Patient Questionnaires (MCOHPQ).	Yes

Domain assessed	Tool used	Validated?
	A modified Glasgow Outcome Scale	Yes
	SF-12	Yes
	Physical Components Summary (PCS) of the Medical Outcomes Study 12-Item Short-Form Health Survey.	Yes
	Injury severity was abstracted from surgical records using a conversion software program that transforms recognised International Classification of Disease Ninth Version Clinical Modification (ICD-9CM) codes into Abbreviated Injury Scale (AIS) and subsequently injury severity scores (ISS)	Yes
	Difficulties Managing Care	Yes
	Symptom questionnaire	Yes
Behavioural	Health Locus of Control	Yes
	Impact on Participation and Autonomy for Older Persons (IPA-O)	Yes
	Civilian version of the Post-Traumatic Stress Disorder Checklist (PCL-C).	Yes
Other	Caregiver response	Yes
	Self-administered Discharge Planning Questionnaire (DPQ)	Yes
	Care continuity	
	The Quality of Dying and Death (QODD).	Yes
	Collaboration and Satisfaction About Care Decisions (CSACD)	Yes
	Decision Conflict Scale (DCS)	Yes
	Parents' Understanding of Infant Care and Outcomes Questionnaire	Yes

Domain assessed	Tool used	Validated?
	Relationships with Professional and Decision Input Questionnaire	No
	Eight items from the Medical Outcomes Study (MOS) Social Support Survey	Yes
	Care Transitions Measure (CTM-3)	Yes
	Client Satisfaction Questionnaire	Yes
	Care continuity	Yes
	Preparedness	No
	Standardised screening questionnaire (details not reported)	Can't tell
	Geriatric needs assessment	Can't tell
	Palliative care assessment (adapted from Weisman 1997)	No