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Evidence Check

Specialist dementia care units

An **Evidence Check** rapid review brokered by the Sax Institute for the Commonwealth Department of Health. September 2017

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This report was prepared by:

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Abbreviations and acronyms

ALOIS	ALzheimer's and cOgnitive Improvement Studies register
ASCU	Alzheimer's Special Care Unit
BASIS	Behaviour Assessment and Intervention Services
BPSD	Behavioural and Psychological Symptoms of Dementia
CADE	Confused and Disturbed Elderly
CAMI	Cohen-Mansfield Agitation Inventory
CINAHL	Cumulative Index to Nursing and Allied Health Literature
DCIG	Dementia and Cognitive Improvement Group (Cochrane Library)
DSCU	Dementia Special Care Unit
DoH	Department of Health
GRIP	Grip on Challenging Behaviour care program
HoNOS	Health of the Nation Outcome Scales
GRIP	Grip on Challenging Behaviour care program
NHMRC	National Health and Medical Research Council
MHACPI	Mental Health Aged Care Partnership Initiative
P.I.E.C.E.S.	Physical, Intellectual, Emotional, Capabilities, Environment, and Social components
T-BASIS	Transitional Behaviour Assessment and Intervention Services
SDCU	Specialist Dementia Care Units

Executive summary

This is the report of an Evidence Check rapid review of the literature to inform the implementation of the decision by the Commonwealth Government to establish Specialist Dementia Care Units (SDCUs) as part of a broader set of initiatives aimed at improving services for people living with dementia. The SDCUs are expected to be established over a four-year period with at least one located in each of the 31 Primary Health Network regions across Australia. SDCUs are defined as specialist units that provide care for people with very severe and extreme behavioural and psychological symptoms of dementia (BPSD).

The purpose of the Evidence Check was to review the international evidence regarding the effective management and care of people with very severe and extreme BPSD and answer three questions:

Question 1:
What specialist dementia care units have been shown to be effective in managing symptoms for people with very severe and extreme behavioural and psychological symptoms of dementia?

Question 2:
What are the common elements of the effective SDCUs?

Question 3:
What critical success factors have been identified in the effective SDCUs?

Searching the literature included searching academic databases such as Medline, CINAHL and PsycINFO and searching the grey literature. Full details of the literature searching are included as an appendix to this report.

Papers included in the Evidence Check were from Australia and countries with comparable health systems to Australia: New Zealand, Scandinavia, Western Europe, the UK, USA and Canada. In deciding which papers to include, the following criteria were used:

- The paper reports on either a geographically defined unit or a model of care
- The unit/model of care is located in a hospital or residential aged care facility
- There is some form of specialist care, involving either specialist staffing and/or a particular model of care
- The focus of the unit/model of care is the management of behaviours rather than the management of acute physical illness
- At least some patients/residents have dementia with behaviours described as 'challenging', 'severe' or 'extreme'
- The paper is reporting either a research or evaluation investigating processes or outcomes OR is a review of the literature.

The Evidence Check identified 25 papers about 17 units, including two literature reviews and three evaluation reports from the grey literature. The papers reported on a range of different units catering to different populations of people with dementia and behavioural symptoms across a variety of settings. There was little consistency in the findings across the studies.

The quality of the evidence was assessed using a framework developed by the National Health and Medical Research Council (NHMRC), which resulted in nine studies being identified as having the greatest potential to inform the development of SDCUs: one study categorised as best practice, two studies categorised as promising practice and six studies assessed as emerging practices.

It was difficult to assess the generalisability of the studies (i.e. the extent to which the studies matched people targeted by SDCUs — people with dementia with extreme or very severe BPSD). All the studies have some degree of applicability to the Australian healthcare context.

Evidence of effectiveness in managing very severe or extreme BPSD was limited: four units demonstrated improvement in behavioural symptoms, but in three of these instances the results were based on a weak study design (Level IV). The evidence for improvement in behavioural symptoms for the fourth unit was based on a good study design (Level II).

Synthesising the results of the Evidence Check resulted in the identification of eight 'common elements' across the included papers:

1. Unit philosophy/approach to care
2. Supportive physical environment
3. Education, skills and training
4. Medical staffing
5. Allied health staffing
6. Therapeutic and meaningful activities
7. Assessment and care planning
8. Multidisciplinary approach.

The 'evidence' to support these common elements is somewhat limited, in part due to the limited scope of the studies/evaluations of most units. More comprehensive evaluations (e.g. of factors influencing implementation) may have resulted in stronger evidence for each of the common elements. Despite this, some confidence in the veracity of these common elements can be found in the broader literature about the optimal management of people with dementia, including those with BPSD, which identifies a similar set of elements.

There was very limited evidence to support the identification of critical success factors, in large part because of the relative lack of process evaluations in the included studies. However, the evidence available is entirely consistent with the evidence from the implementation science literature.

It is important to note this Evidence Check identified no major 'failure' factors. Rather, it was a case of the extent to which the common elements and critical success factors were in place.

1. Introduction

In June 2016, the Commonwealth Government announced it would spend $7.5 million to establish Specialist Dementia Care Units (SDCUs) as part of a broader set of initiatives to improve services for people living with dementia.[1] The SDCUs will be established over a four-year period with at least one located in each of the 31 Primary Health Network regions across Australia.[1] SDCUs are defined as specialist units that provide care for people with very severe and extreme behavioural and psychological symptoms of dementia (BPSD). The SDCU initiative is part of a reform process that builds on several decades of research, policy and program development designed to better support the growing number of Australians with dementia. Importantly, in 2012 dementia was formally recognised as a national health priority.[2]

More recently (2014–2016), the Commonwealth Government commissioned three Ministerial Dementia Forums to identify key priorities for improving services for people with dementia in both residential aged care and community settings. Stakeholders participating in these forums included service providers, clinicians, carers and people with dementia.[3]

Establishment of SDCUs was a recommendation of the first Dementia Forum and was included in a Forum Options Paper released in December 2014. Key recommendations included:

- Establishment of specialised units
- Increasing the role, cohesiveness and coordination of the Dementia Behaviour Management Advisory Service and/or Dementia Training Study Centres
- The use of teams of health professionals to help providers address the needs of people with severe BPSD
- Increasing access to rehabilitation and transitional accommodation for people with dementia.[4]

Since 2014, the Commonwealth has implemented a series of initiatives as part of its policy commitment to improving dementia services.[1] The establishment of SDCUs represents the 'third tier' in programs to assist aged care consumers experiencing BPSD, complementing the existing Dementia Behaviour Management Advisory Service (Tier 1) and the Severe Behaviour Response Teams (Tier 2).[5] This Evidence Check has been completed within the context of this ongoing policy development process.

The purpose of this Evidence Check is to review current international evidence regarding the effective management and care of people with very severe and extreme BPSD to inform the design of Commonwealth-funded SDCUs. The aim of the review is to answer three questions, which have been used to structure the review findings:

- Question 1: What specialist dementia care units have been shown to be effective in managing symptoms for people with very severe and extreme behavioural and psychological symptoms of dementia (Brodaty, Tiers 6 and 7)?[6]
- Question 2: What are the common elements of the effective SDCUs?
- Question 3: What critical success factors have been identified in the effective SDCUs?

2. Background and context

2.1 The care and management of people with dementia in residential settings

Up to 91% of those who develop dementia will live their final years in some type of supported residential accommodation.[7] Within these facilities, between 29% and 90% of residents living with dementia experience BPSD, which is associated with increased mortality and morbidity and decreased quality of life.[6] As such, while perhaps not concerning very severe or extreme BPSD exclusively, much of what we have learnt from these residential environments provides a basis for understanding the factors that are important when considering SDCUs.

Previous research regarding supportive care of people with dementia suggests that philosophy of care, particularly person-centred care,[8] is important to guide effective, humane, individualised and personalised care of people with dementia, including within residential care environments.[9-11] Its application has determined that quality of life for people with dementia is optimised when a care environment is adapted to respond holistically to support the unique needs and abilities of each individual.[12]

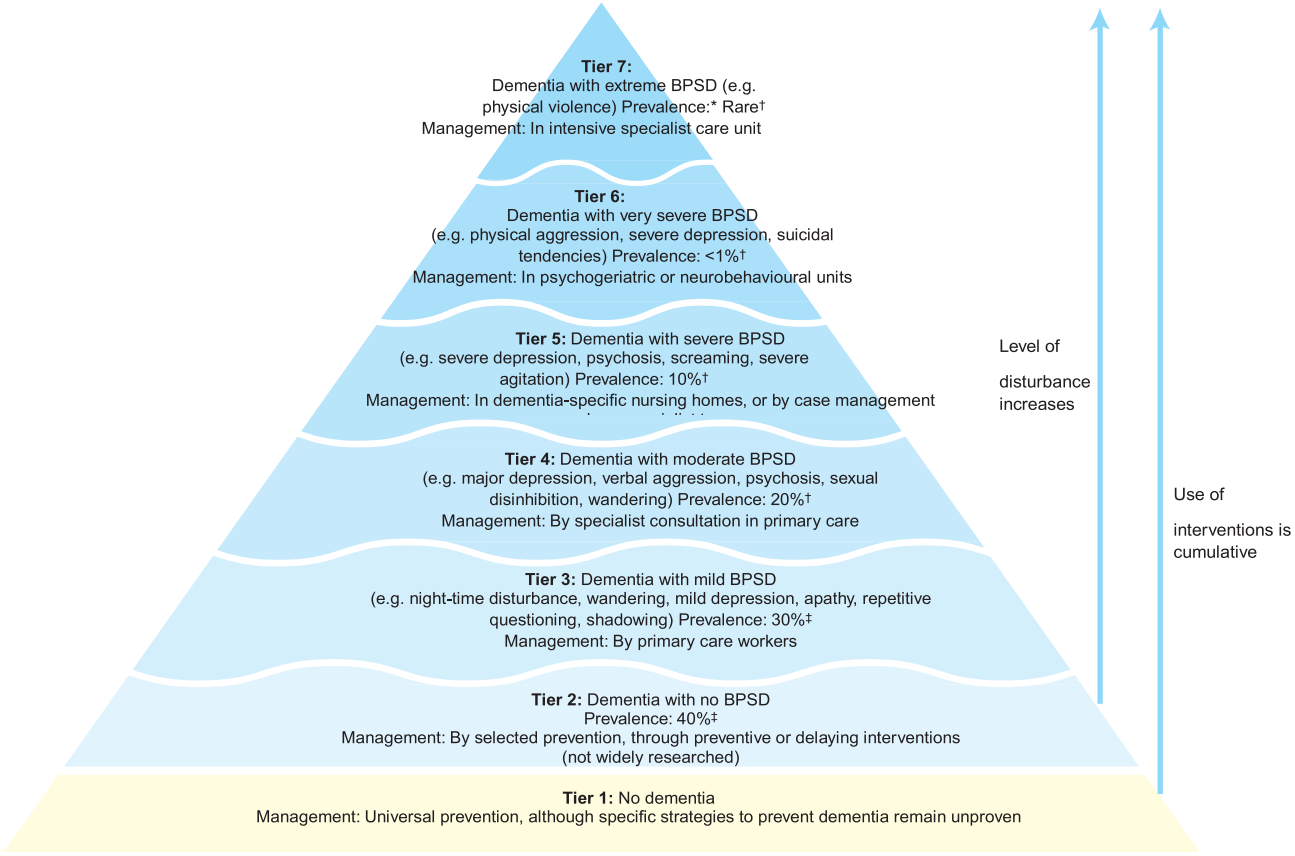
The care environment incorporates the physical environment, the provision of therapeutic and meaningful activities, staff factors and organisational approaches to care.[12] For example, supportive design for residential care environments considers both the reduction of external stressors and the promotion of positive environmental aspects to support person-centred care. Supportive design principles for people with dementia include unobtrusively reducing risks; allowing people to see and be seen; and providing opportunities for people to be alone or with others.[13]

In this light, it is important that this Evidence Check is undertaken in the context of what is known to underpin supportive approaches to the care of people with dementia in other residential environments.

2.2 Understanding the behavioural and psychological symptoms of dementia

The term BPSD has been used to refer to the diversity of psychological responses and behaviours in populations with dementia and can include symptoms such as agitation, depression, anxiety, apathy, delusions, hallucinations and sleep or appetite changes.[14] Predictors of BPSD may include younger age, male gender, greater functional incapacity, diagnosis of depression and/or psychosis, and greater dependency.[15] The prevalence of BPSD in nursing homes may be greater than 90%, with 80% having behavioural disturbances and more than half having depression or psychosis.[15]

A seven-tiered model (Figure 1) for service delivery based on the severity and prevalence of BPSD was proposed by Brodaty, Draper and Low in 2003 and is often used in policy and planning processes.[6] People with dementia can move up or down the tiers depending on causes and interventions. For example, agitation and aggression can occur as a result of a urinary tract infection and then decrease when the infection is treated.[16]



* Prevalence is expressed as estimated percentage of people with dementia who currently fall into this category.

† Estimate based on clinical observations. ‡ Estimate based on Lyketsos et al.[6]

Figure 1: Seven-tiered model of management of behavioural and psychological symptoms of dementia

2.3 Specialist behavioural and mental health support services

People with dementia with persistent and severe BPSD may benefit from access to specialised behavioural and mental health support services.[12] Initiatives such as the Behaviour Assessment and Intervention Services (BASIS) and Transitional BASIS (T-BASIS) units are an example of state-funded responses to provide a specialist behavioural intervention.[16] The Severe Behaviour Response Team initiative is an example of a Commonwealth government program that provides specialist in-reach consultancy services to residential aged care facilities across Australia.

Brodaty and Cumming argue gaps remain in providing BPSD care at the higher tiers of service needed for those unable to be managed in mainstream residential care.[16] They also argue there is a need to improve management of severe behavioural symptoms and that provision of services to rural and remote areas and to specific groups such as Indigenous and culturally diverse communities remains a challenge.[16]

The Alberta Model recognises the benefits of additional specialised support for residential care. These include: a first-tier service that provides a consultative referral resource and for additional 'crisis response' services including in-reach specialist services; and, if persistent, access to a 'behavioural treatment and stabilisation unit'. This highlights the importance of specialised care teams and units being developed as part of the continuum of care, ensuring they have strong working relationships with residential care and specialist mental health and psychogeriatric services to support appropriate admission and discharge processes.[12]

The Alberta Model is considered particularly appropriate in the context of this Evidence Check given its perceived quality and comprehensiveness and its tiered approach, which fits well with the seven-tiered model of management of behavioural and psychological symptoms of dementia outlined in Section 2.2.

3. Methodology

3.1 Search strategy and scope

The search strategy was based in part on a previous literature review conducted by the Centre for Health Service Development for the Severe Behaviour Response Team Evaluation. Initial search terms were identified from relevant publications of that literature review and from the SDCU Evidence Check brief. Additional input for the search strategy was obtained from academic experts in the field of dementia research.

Academic databases covered in the search strategy included: Cochrane Library, Dementia and Cognitive Improvement Group (DCIG) library, ALOIS: DCIG Study Register associated with Cochrane Library, Medline, CINAHL and PsycINFO. Details of the search terms and limiters used are included in Appendix A.

Articles excluded during the title and abstract cull included the following:

- Drug trials
- Prevalence studies
- Biological studies
- Community-based studies
- Mild dementia/cognitive impairment studies
- Studies of general nursing home settings/populations
- Incorrect diagnosis such as stroke
- Studies on delirium without a dementia focus
- Family carer studies
- Assessment tool studies
- Mental health studies not related to specialist care units
- Qualitative studies of patient/staff/family experience
- Studies of volunteers.

Additional articles were located through snowball searching techniques (pursuing references of references and tracking citations forward in time) and from the current knowledge of those conducting the review.

We found grey literature by searching the web using terms included in the academic literature search. Search engines used included google.com, google.com.au and bing.com. The first 10 pages of each search were scanned and relevant articles identified by the brief summary. This provided 34 documents to review initially. Through a snowball search starting with these documents we then identified another 45 documents. An expert participant provided six extra items. The Department of Health forwarded an additional 46 grey literature documents to be reviewed for inclusion, of which 21 items were new. In total, 106 documents were identified.

To be included, articles needed to be published between 2007 and 2017, written in English, and from Australia, New Zealand, Scandinavia, Western Europe, the UK, USA or Canada. In deciding which papers to include, the following criteria were used:

- The paper reports on either a geographically defined unit or a model of care
- The unit/model of care is located in a hospital or residential aged care facility
- There is some form of specialist care, involving either specialist staffing and/or a particular model of care

- The focus of the unit/model of care is the management of behaviours rather than the management of acute physical illness
- At least some patients/residents have dementia with behaviours described as 'challenging', 'severe' or 'extreme'
- The paper is reporting either a research or evaluation investigating processes or outcomes OR is a review of the literature.

3.2 Search results

Searching academic databases resulted in a total of 12,779 hits. After limiters were applied 1149 articles were identified for possible inclusion. These were then culled by article title, or abstract if necessary, by two team members (CD, PG). Further culling involved reviewing the full text of articles by three team members (MM, CD, PG) to assess for inclusion in the review.

Grey literature documents were assessed for inclusion by two team members (PS, CD), who identified 74 documents as being potentially relevant to the review. Further assessment identified eight documents for full text assessment. A total of 154 additional documents were identified outside the academic database searches. Of these 16 were selected for full text review and nine were selected for inclusion in the Evidence Check. In total, 17 papers were included in the review. A summary of the literature search results is detailed in Figure 2.

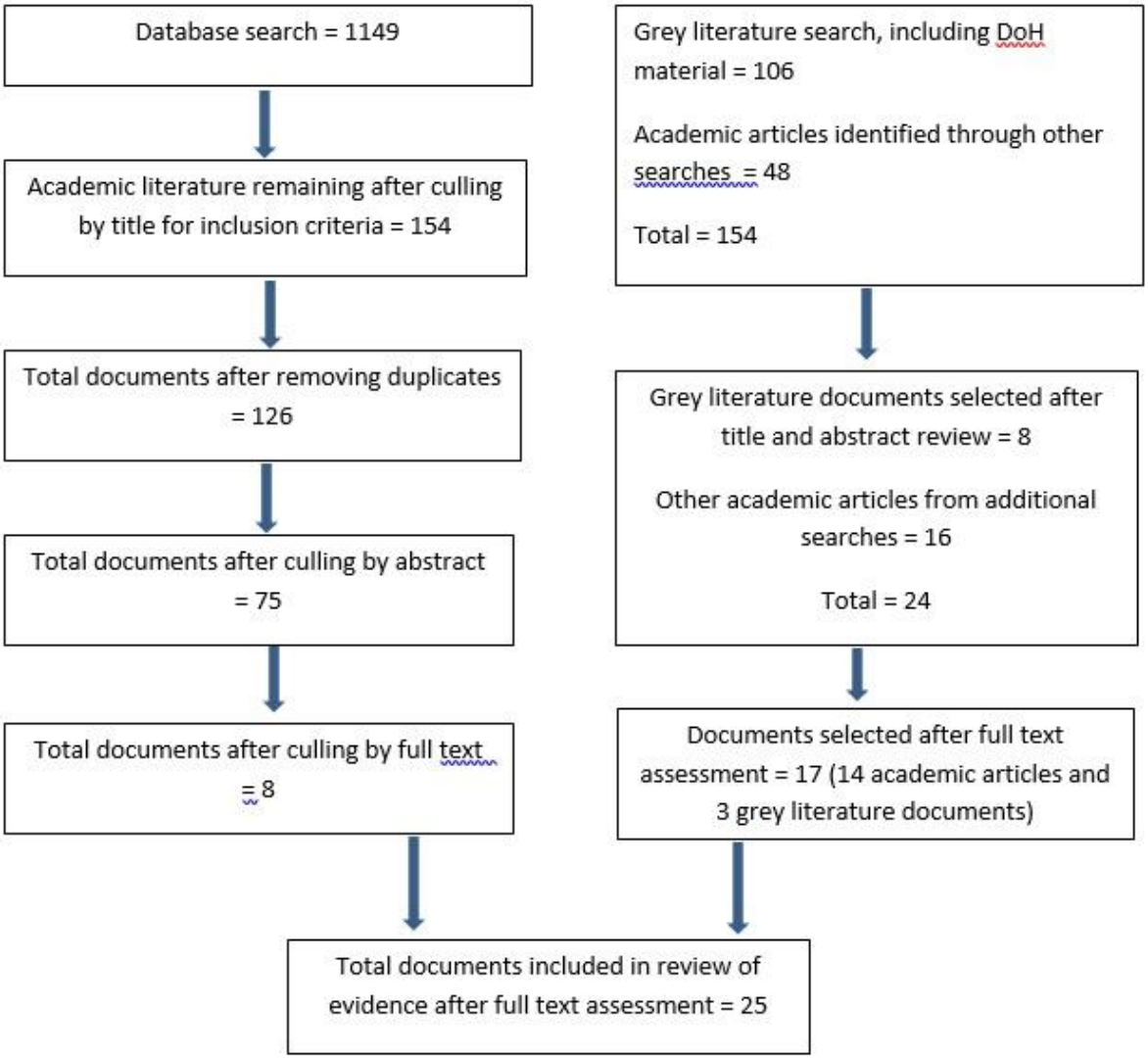


Figure 2: Summary of literature search results

3.3 Synthesis of the literature

Articles selected for review were entered into an Excel spreadsheet for comparison using a template with the following column headings:

- Author/year
- Funding resources
- Staffing
- Physical design features
- Links
- Intervention/activity program
- Discharge
- Post-discharge services
- Informal carer involvement
- Outcomes
- Critical success factors
- Critical failure factors.

One team member (CD) reviewed the articles and entered them into the Excel spreadsheet and this was then reviewed by two other team members (MM, RG).

Three team members (CD, MM, RG) completed the literature synthesis, with additional work done by remaining team members (PG, LP, PS, DF). The PDF files of papers included in the review were imported into NVivo software to facilitate greater understanding of the common elements (Section 4.5) and critical success factors (4.6), developed inductively by coding the content of the papers.

3.4 Assessment of quality of evidence

The National Health and Medical Research Council (NHMRC) has developed a framework for developers of clinical guidelines that provides a structured approach for considering not only the body of evidence that is relevant to a particular clinical question but also the setting in which that evidence is to be applied. The framework has five components:

- The evidence base — the quantity and quality of the studies relevant to the clinical question (the 'included' studies)
- Consistency — the extent to which the findings are consistent across the included studies.
- Clinical impact
- Generalisability
- Applicability.[17]

An assessment of generalisability involves determining how well the evidence answers the question that was asked, particularly (in the case of this Evidence Check) the extent to which the participants and settings of the included studies match the patient population to be targeted by the SDCU (i.e. dementia with extreme or very severe BPSD). Applicability is an assessment of the extent to which the evidence is relevant to the Australian system of health and aged care.[17]

Clinical impact is an assessment of the likely benefit of applying the evidence to the target population and is based on a judgement that is necessarily quite subjective.[17] Given the nature of this Evidence Check, impact is potentially broader than just clinical impact, involving consideration of the impact of a particular unit on the staff who work there and the broader system of care delivery (e.g. a unit may achieve reduced lengths of stay, contributing to greater overall efficiency in the care of the target population).

Using the NHMRC framework as a guide, the issue of 'quality of evidence' for each study included in the Evidence Check involved consideration of study design, the outcomes achieved by that study, the 'fit' between patients participating in the study and the target population for SDCUs, the setting of the unit (hospital or residential aged care) and the location of the unit.

To provide further guidance to policy makers and decision makers, the following were used to identify those studies with the greatest potential to inform the development of SDCUs:

- Best practice — an intervention, method or technique that has consistently been proven effective through the most rigorous scientific research (especially conducted by independent researchers) and which has been replicated across several cases or examples
- Promising practice — an intervention is considered to be a promising practice when there is sufficient evidence to claim the practice has been proven effective at achieving a specific aim or outcome, consistent with the goals and objectives of the activity or program
- Emerging practices — interventions that are new, innovative and which hold promise based on some level of evidence of effectiveness or change that is not research-based and/or sufficient to be deemed a promising or best practice.[18, 19]

4. Findings

4.1 Summary of included studies and evidence base

The Evidence Check identified 25 papers about 17 unique units or models of care, including two literature reviews and three evaluation reports from the grey literature. Details are included in a series of appendices:

- Appendix B: Summary of included papers
- Appendix C: Setting, location and patient population
- Appendix D: Admission criteria, diagnosis and discharge
- Appendix E: Organisational characteristics.

Appendix C provides additional information to facilitate judgements about generalisability and applicability. No papers were excluded based on the quality of what was reported. The review includes studies published between 2005 and 2017. The number of participants in individual studies varied from 16 to 6299. No studies identified a particular special needs group.

4.2 Patient flow — admission criteria, occupancy, lengths of stay and discharge

The units included in the Evidence Check are by definition 'specialist units', with access limited to people who meet the admission criteria. This was generally that the person was older (over 65 years of age) with behavioural problems associated with dementia and/or mental illness. In 15 of the 17 units included in the review, people with a diagnosis of dementia comprised the majority of the patient population (in seven of these units they comprised all patients). Details of dementia diagnoses are included in Appendix C. Two papers specified that the person be 'ambulant'.[20, 21] The ability to ambulate was implied in other papers with an emphasis on the units being secure, with safe areas for people to wander.

Entry to the units was also largely influenced by the setting. This was evident particularly in hospital settings where examples of admission criteria included internal transfer of a patient awaiting nursing home placement from an acute ward,[22] a confused person presenting to the emergency department,[23] and a person with BPSD who cannot be managed on a general medical ward.[24]

In units where collaboration by geriatricians and psychiatrists was a key feature of the model, entry criteria included people with dementia and psychiatric health problems.[25, 26] In one unit, described as a specialist old age psychiatry unit, the admission criteria included that the person's BPSD presented a 'clinical risk'.[27]

Information about length of stay and bed occupancy was mixed, with large variation in reported lengths of stay between units. 10 papers reported on length of stay and varied in how they did this. Six reported average or mean of length of stay ranging from 15 days to 161 days. Five reported median lengths of stay (one paper reported both average and median) from six to 801 days.

Only three papers reported on bed occupancy rates, which ranged from 43% to 96%. The unit with the highest occupancy rate of 96% (Hammond Care unit of the MHACPI project) also had the longest average length of stay (161 days). In this unit (as well as at the other MHACPI project), there was an average of 50 days' delay (approximately one-third of the length of stay) in discharging residents once they were assessed as being ready for discharge due to inability to find suitable residential aged care facilities with vacancies at the required time.[28] This highlights the importance of being able to find suitable accommodation for residents once they are able to leave and live in less supported accommodation.

Many of the included studies did not specify what linkages they had with the broader health and aged care system. However, as most of the units had some admission and discharge process, it is assumed they had

established links with other hospitals, community-based agencies and long-term care facilities. Where linkages were mentioned they included formalised outreach teams;[20] and providing post-discharge support by way of staff from the unit going to the patient's discharge destination to assist with the settling process.[27] Further information about admission and discharge arrangements in each unit can be found in Appendix D.

4.3 Components of the evidence base

Before presenting the findings, the characteristics of the included papers are considered in terms of three components of the NHMRC 'body of evidence' framework — consistency, generalisability and applicability.[17]

4.3.1 Consistency

The papers identified for inclusion in the Evidence Check reported on a range of different units, catering to different populations of people with dementia and behavioural symptoms, across a variety of settings. There was little consistency in the findings across the studies included in the review.

4.3.2 Generalisability

In the context of this Evidence Check, generalisability primarily involves determining how well the participants and settings of the included studies match the patient population to be targeted by the SDCU (i.e. dementia with extreme or very severe BPSD). The rating of generalisability according to the NHMRC body of evidence framework is summarised in Table 1.

Table 1: Assessment of generalisability and applicability

	Excellent	Good	Satisfactory	Poor
Generalisability	Population/s studied in the body of evidence are the same as the target population	Population/s studied in the body of evidence are similar to the target population	Population/s studied in the body of evidence differ from the target population but it is clinically sensible to apply this evidence to the target population	Population/s studied in the body of evidence differ from the target population and it is hard to judge whether it is sensible to generalise to the target population
Applicability	Directly applicable to the Australian healthcare context	Applicable to the Australian healthcare context with few caveats	Probably applicable to the Australian healthcare context with some caveats	Not applicable to the Australian healthcare context

Note: Definitions taken from the paper describing the development of the NHMRC body of evidence framework.[17]

The papers reported on patients/residents with varying degrees of dementia and BPSD, with behaviour described using terms such as 'challenging', 'disruptive' and 'problem'. None of the papers described the patient population as having 'extreme BPSD' or 'severe BPSD', as used in the model of organisation of services for people with BPSD.[16] It is not possible to say with any confidence that any of the papers can be rated as 'excellent' for generalisability. Most appear to fall within the range of good/satisfactory.

4.3.3 Applicability

Applicability is an assessment of the extent to which the evidence is relevant to the Australian system of health and aged care. The Evidence Check included papers from countries considered to have similar health systems to that of Australia: New Zealand, Scandinavia, Western Europe, the UK, USA and Canada. As such, none of the papers can be considered as 'poor' with regards to applicability (Table 1). Some papers report on units located in Australia (i.e. applicability is excellent). The 17 units included in the review are located in

acute hospitals (10 units), residential care (five units), a 'geriatric hospital' (one unit) and a rural health service in Victoria (one unit).

The hospital-based units catered for higher levels of BPSD, which is not surprising given the complexity of BPSD management. The degree of applicability of studies conducted in acute hospitals depends on whether SDCUs are established in acute hospitals or residential aged care.

Two examples from NSW illustrate the trade-off between applicability and other components of an evidence base. Both studies have a 'low level' study design (Appendix B) and limited evidence of effectiveness (Table 3) but excellent applicability to the Australian context.

T-BASIS model of care

NSW Health commenced implementation of the T-BASIS model of care in 2006 as a service redesign process for five existing long-stay hospital-based units that had been established over a 16-year period as specialist dementia units for Confused and Disturbed Elderly (CADE). A two-year (2009–2010) evaluation of the remaining five T-BASIS units in NSW found inconsistency in the effectiveness of the units.[20, 29]

One unit in rural NSW was identified as the 'model unit'. It had effectively transitioned in 2004 from the CADE long-stay model into a short-to-medium stay assessment and treatment model. The specially designed unit was staffed by a multidisciplinary team who implemented psychosocial interventions to address the triggers for BPSD, reducing the use of psychotropic medication and enabling patients to be discharged to an appropriate long-term care option. The transition process was funded by the Commonwealth Aged Care Innovative Pool Program, a unique feature of this formerly solely state-funded unit. The Commonwealth funding provided for two innovative changes: (1) an increase in the care level to enable the unit to provide services for patients with a higher level of BPSD and (2) a small outreach team, operating from the unit with the purpose of building capacity in residential aged care facilities and community-based services to cater for people with BPSD in their usual place of residence. Where this was not possible, the outreach team was able to facilitate admissions to and consequent discharges from the T-BASIS unit. The reach of the unit expanded from a local to a much larger catchment, with the primary source of referral being residential care. The T-BASIS model of care was cost-effective compared with the cost of care in an acute psychiatric unit.[20]

Mental Health Aged Care Partnership Initiative

The Mental Health Aged Care Partnership Initiative (MHACPI) was a pilot of two purpose-designed special care units within residential aged care facilities. These units are operated by not-for-profit organisations (Catholic Health Care and Hammond Care) and are aimed at people living with severe dementia. The MHACPI units are staffed by a multidisciplinary team, who are skilled and experienced in behavioural interventions for BPSD. One of the pilot units has a complementary unit to facilitate discharge of the clients into other permanent aged care places while the other has staff dedicated to a discharge program.[28]

4.4 Effectiveness of units in managing very severe and extreme BPSD

For the Evidence Check, effectiveness was framed in terms of managing very severe or extreme BPSD for people transferred to a SDCU, including a reduction of symptoms that may allow someone to return to a less specialised setting (e.g. mainstream residential care). This perspective has underpinned the analysis that resulted in the identification of the units with the best evidence (Table 2). However, given the very interconnected nature of service provision, the information included in this section on outcomes is broader than just symptom management, including other dimensions of patient outcomes (e.g. patient experience); outcomes for families and carers (e.g. satisfaction with care provision); outcomes for individual providers (e.g. staff satisfaction with a new model of care); and unit-level outcomes (e.g. length of stay).

The evidence for seven of the 17 units included in the review constituted the lowest level of evidence according to the NHMRC hierarchy (Level IV) and either had no evidence of improved outcomes or very little evidence of improved outcomes. The one systematic review identified from searching the literature (of special care units) included Level III studies but concluded that there was no strong evidence of benefit from the units included in the review.[30]

Table 2 summarises the evidence for the remaining nine units with the best evidence of effectiveness, categorised as either 'emerging', 'promising' or 'best' practice. Only the Grip on Challenging Behavior care program can be considered as 'best practice', based on good study design and evidence of effectiveness.

Table 2: Units with the best evidence of effectiveness

Lead author (year), references **Name of unit**	**Country**	**Level of evidence (study type)**
Zwijsen (2014)[31] Grip on Challenging Behavior care program	The Netherlands	Level II (cluster randomised controlled trial with stepped-wedge design) **Best practice**
Goldberg (2013)[23] Medical and Mental Health Unit	England	Level II (randomised controlled trial) **Promising practice**
Nobili (2008)[32] Alzheimer Special Care Units	Italy	Level III-2 (cohort study) **Promising practice**
George (2011)[25] Joint geriatric and psychiatric wards	UK, Australia, USA, the Netherlands, Germany	Literature review, which primarily includes Level IV studies **Emerging practice**
Gonski (2012)[24] Secure Unit	Australia	Level IV (case series) **Emerging practice**
Jayalath (2013)[33] Continuing Care Dementia Unit	England	Level IV (case series) **Emerging practice**
Roberts (2015)[34] Memory Support Unit	Australia	Level IV (case series) **Emerging practice**
Saidlitz (2017)[21] Cognitive and Behavioural Unit	France	Level IV (case series) **Emerging practice**
Zieschang (2010)[35] Special Care Unit	Germany	Level IV (case series) **Emerging practice**

The included studies used a range of outcome and process measures, including behaviour, use of chemical restraint, use of physical restraint, falls, length of stay, quality of life, carer satisfaction and staff satisfaction. Increased function was also considered to be a good outcome measure; however, this needs to be evaluated in light of the falls rate, as some studies reported a significant rate of falls (20% or more) due to a decrease in restraint and an increase in function. The outcomes measured for each unit and the results achieved are detailed in Table 3.

Table 3: Outcomes achieved by units

Lead author (year) Name of unit	Outcomes measured	Outcomes achieved
Anderson (2016)[20] **T-BASIS units**	Challenging behaviours	Behaviours did not improve as a result of staying in the units
	Length of stay	Reduction in median length of stay (compared with previous model)
Astell (2008)[22] **Geriatric Medicine/Old Age Psychiatry Unit**	Outcomes not measured	Not applicable
Chiu (2009)[36] **Psychogeriatric and Geriatric Unit**	Psychosocial performance (using the Health of the Nation Outcome Scales (HoNOS))	Change in total HoNOS score between admission and discharge was significantly better than the NSW state average ($p<0.001$). This was not demonstrated for the main behavioural item of the HoNOS
	Length of stay	Significantly shorter mean length of stay compared with the NSW state average ($p<0.001$)
George (2011)[25] **Joint geriatric and psychiatric wards**	Literature review	The review found the wards may reduce length of stay and be cost-effective (with different comparators used in each study included in the literature review)
Goldberg (2013)[23] **Medical and Mental Health Unit**	Time spent at home in the 90 days after randomisation to the unit	No significant difference in days spent at home between the unit and standard care
	Health outcome measures	No significant differences in health outcomes between the unit and standard care
	Patient experience	Patients' experiences on the unit better than usual care
	Carer satisfaction	Family carers more satisfied with care on the specialist unit; some expressed the need for more staff engagement
Gonski (2012)[24] **Secure Unit**	Length of stay	No reduction in length of stay compared with care in general aged care wards
	Falls	Low incidence of falls compared with general wards or results reported in the literature
	Use of psychotropic medications	Inconclusive results (comparing use of medications on admission and discharge)
	Use of 'specials'*	Low use of 'specials' compared with general wards or results reported in the literature
	Carer satisfaction	Carers expressed satisfaction with the care provided
	Staff satisfaction	Staff said they were sufficiently trained and a majority were able to confidently manage behavioural problems.
Jayalath (2013)[33]	Neuropsychiatric symptoms	No evidence of improvement in neuropsychiatric symptoms

Continuing Care Dementia Unit	Severity of dementia	Reduction in the number of patients prescribed psychotropic medications (comparing initial assessment with 2-year follow-up of the same patients)
Koskas (2011)[37] **Cognitive and Behavioural Unit**	Severity of BPSD	No significant differences in change in severity of BPSD between admission and discharge compared with a co-located Acute Psychogeriatric Unit
	Discharge rates	No significant differences in discharge rates between the unit and a co-located Acute Psychogeriatric Unit
	Use of psychotropic medications	No change in use of psychotropic medications between admission and discharge
Lai (2009)[30] **Special Care Units**	Systematic review of special care units	The authors concluded there is "*no strong evidence of benefit from the available non-RCTs. It is probably more important to implement best practice than to provide a specialised care environment*"[30, p 2]
NSW Health (2011)[28] **Mental Health Aged Care Partnership Initiative**	Independence with activities of daily living	Due to small numbers of admitted residents assessed at discharge (24 of 77 admissions) it was "*difficult to draw any conclusions about clinical outcomes*".[28, p 15] Clinical outcomes on discharge were not reported. No reasons for the low number of assessments on discharge were reported
	Level of agitation	
	Mental health outcomes	
	Depression	
	Family/carer satisfaction	Families/carers expressed satisfaction with the service provided
	Staff skills, knowledge, attitudes and satisfaction	Staff agreed that their skills and knowledge in working with the target group had improved
Nobili (2008)[32] **Alzheimer Special Care Units (ASCU)**	Cognitive performance	No significant difference in the rate of cognitive decline between patients in the ASCUs and nursing homes
	Functional status	No significant differences in the rate of functional decline between patients in the ASCUs and nursing homes
	Rate of hospitalisation	ASCU patients had a lower level of 6-month hospitalisation (9.5%) compared with the nursing home group (16.9%)
	Use of antipsychotic medication	Some improvement in the use of antipsychotic medication
	Use of physical restraint	Significant reduction in the use of restraints for patients in ASCUs compared with those in nursing homes ($p<0.01$)
	Falls	No difference in the risk of falls in ASCUs compared with nursing homes
Roberts (2015)[34] **Memory Support Unit**	Behavioural and psychological symptoms of dementia	Reduced frequency of BPSD between baseline and follow-up

	Medication use	Reduced use of antipsychotic and sedative medication between baseline and follow-up
	Quality of life (using dementia care mapping)	Residents were engaged in meaningful activities that they seemed to enjoy
	Quality of care (using dementia care mapping)	The majority of staff demonstrated person-centred dementia care practices
Saidlitz (2017)[21] **Cognitive and Behavioural Unit**	Behavioural symptoms	Significant improvement in behaviour symptoms between admission to the unit and discharge ($p<0.001$)
	Activities of daily living	No change in activities of daily living between admission and discharge
	Medication use	Significant reduction in mean number of psychotropic medications between admission and discharge ($p<0.05$)
Soto (2012)[26] **Alzheimer Special Acute Care Inpatient Unit**	Descriptive study of admissions to the unit, measuring cognition, activities of daily living, nutritional status and BPSD	The results describe the characteristics of admissions to the unit. No evidence of improved outcomes (which was not the aim of the study)
Stevenson (2007)[27] **Psychiatric Intensive Care Unit for elders**	Routinely collected data	The results describe the characteristics of admissions to the unit. No evidence of improved outcomes
Zieschang (2010)[35] **Special Care Unit**	Length of stay	Mean length of stay comparable to other patients elsewhere in the hospital
	Activities of daily living (ADL)	Median scores for ADL improved significantly between admission and discharge ($p<0.001$)
	Mobility	Mobility improved significantly between admission and discharge ($p<0.001$)
	Behaviour	The number of patients with challenging behaviour reduced significantly between admission and discharge ($p<0.001$)
Zwijsen (2014)[31] **Grip on Challenging Behavior care program**	Challenging behaviour symptoms — assessed using the Cohen-Mansfield Agitation Inventory (CMAI)	Significant decrease in challenging behaviour (based on total CMAI score) in the intervention group compared with the control group (although the decrease was smaller than expected)
	Use of psychoactive drugs	Reduced likelihood of being prescribed certain medications
	Use of physical restraints	No impact on the use of restraints
	Job satisfaction	The program had 'positive effects' on job satisfaction
	Staff burnout	The program had no impact on staff burnout

* Note: use of 'specials' refers to the practice of allocating a member of staff to closely monitor a person exhibiting challenging or difficult behaviour.

4.5 Common elements

Review of the included studies identified eight common elements across all the studies (Table 4). Some occurred more frequently than others and it is important that each common element is not considered in isolation. Each common element influences the other. For example, the staffing profile will influence the unit philosophy (or the philosophy may influence the way the unit is staffed); the approach to assessment and care planning will be influenced by the staffing profile and the knowledge and skills of the staff; the type of therapeutic activities that can be provided will be influenced by the staffing profile (particularly allied health staffing) and the knowledge and skills of staff.

Table 4: Common elements of special dementia care units

	Common element	No. of units (out of a total of 17)
1	Unit philosophy/approach to care	14 units[20, 21, 23-28, 30-32, 34, 35, 37]
2	Supportive physical environment	13 units [21-25, 27, 28, 32-37]
3	Education, skills and training	12 units [23-28, 30-32, 34, 35, 37, 38]
4	Medical staffing	11 units [20, 22, 23, 25-28, 32, 33, 36, 37]
5	Allied health staffing	9 units [21-23, 26-28, 32, 33, 36]
6	Therapeutic and meaningful activities	9 units [21, 23, 27, 30, 32-35, 37]
7	Assessment and care planning	7 units [20, 23, 26, 28, 31, 32, 36]
8	Multidisciplinary approach	6 units [20, 24, 25, 28, 31, 36]

Table 5 demonstrates the association between the number of common elements and the units with the best evidence of effectiveness. The unit rated as 'best practice' involved the implementation of a new program (the Grip on Challenging Behavior care program) in dementia special care units. The focus in the three studies reporting the results was on the program rather than the units where the program was being implemented. This may explain the absence of information about some of the common elements (e.g. medical staffing, allied health staffing) in the program.

Table 5: Common elements and levels of evidence

	Lead author (year), name of unit	No. of common elements
Best practice	Zwijsen (2014) Grip on Challenging Behavior care program[31]	**4/8**
Promising practice	Goldberg (2013) Medical and Mental Health Unit[23]	**7/8**
Promising practice	Nobili (2008) Alzheimer Special Care Units[32]	**7/8**
Emerging practice	George (2011) Joint geriatric and psychiatric wards[25]	**4/8**
Emerging practice	Gonski (2012) Secure Unit[24]	**4/8**
Emerging practice	Jayalath (2013) Continuing Care Dementia Unit[33]	**4/8**
Emerging practice	Roberts (2015) Memory Support Unit[34]	**4/8**
Emerging practice	Saidlitz (2017) Cognitive and Behavioural Unit[21]	**4/8**
Emerging practice	Zieschang (2010) Special Care Unit[35]	**4/8**
Average across the eight other units		**4.5/8**

The two units identified as promising practices both exhibited a good 'fit' with the common elements. The six emerging practices only featured four of the common elements and the remaining units (with low levels of evidence) averaged four–five common elements.

4.5.1 Unit philosophy or approach to care

Fourteen of the 17 units included in the Evidence Check were described as having some form of overarching philosophy or approach to care provision. The predominant philosophy/approach was an individualised or 'case specific' cognitive and behavioural rehabilitation approach.[20, 21, 24, 27, 31, 32, 35, 37]

Sometimes this was expressed in terms of person-centred care or individualised care:

- Person-centred care and involvement of family and carers in care planning[25]
- The underlying philosophy was that of person-centred care[39]
- Individualised behavioural programs[27]
- An individualised approach to care.[32]

In other instances, a person-centred approach was implied rather than explicitly stated:

- The units predominantly rely on psychosocial means to resolve incidents.[20]

Proactive engagement with family carers was highlighted in four of the included studies as a key feature of person-centred and individualised care. Strategies included flexible visiting times enabling family carers to participate in activities with their relative;[34, 35] assisting with settling a distressed person by sitting with them;[23] and a carer education program and provision of individualised support to carers.[26]

Person-centred care is conceptually related to cognitive and behavioural approaches, but generally less 'medically based'. Both these approaches aim to reduce the rate of physical and pharmacological restraint. This is achieved by incorporating individually tailored therapy, treatment and activity programs into medical and nursing care plans.

For a cognitive and behavioural unit in France, "*nonpharmacological measures are favoured and may include physical activities, cognitive stimulation, relaxation, reorientation, and sensory stimulation*".[21, p 81] The Grip on Challenging Behavior care program implemented in the Netherlands is a structured approach "*using the current guidelines and models on challenging behavior in dementia.*"

> *"It structures the process of detection, analysis, treatment, and evaluation of the treatment of challenging behavior and pre-arranges multidisciplinary consultation. The care program provides tools for multidisciplinary care teams that help them in taking the right steps and asking the right questions to identify and, if possible, treat the underlying problem of the challenging behavior."* [31, p 531]

It is important to note that information about unit philosophy or approach to care is largely based on the stated philosophy or approach in the relevant papers, rather than what is actually happening in practice, which may differ. This is illustrated by the study of the medical and mental health unit implemented in the UK, where "*much of the person-centred care activity in the Unit was observed in the activities room being carried out by the activities coordinators*".[40, p 1338] A person-centred approach did not manifest itself in other parts of the unit at other times:

> "*Staffing levels were such that meeting basic physical needs of patients (washing, toileting, assisting with eating, giving medication, undertaking routine observations) took up most staff time. Care was generally delivered in a routine and task-orientated fashion. Communication was usually brief or absent when meeting physical needs. Staff often gave no introduction of who they were and could at times appear discourteous. Patients were often ignored whilst routine care was delivered; putting down or removing trays of food in front of patients, looking at charts by the patient's bed, cleaning around them or preparing medicines all without acknowledging the patient for example, by a simple*

greeting, smile or making eye contact. Patients requesting attention were often deflected by promise of later attention." [40, p 1336]

In summary, what appears to be important is having some form of common understanding of how care should be delivered. As indicated in Section 2.1, this should ideally be based on the principles of person-centred care.

4.5.2 Supportive physical environment

Some descriptions of the environment were quite vague or simply stated something about the structure of the unit in a way that does not align with any of the 10 principles for improving the environment for people with dementia recently published by the NSW Agency for Clinical Innovation.[41] For example:

- Structural improvement to the unit [33]
- Ward physically co-located within a larger geriatric ward.[36]

Table 6 details how changes to the environment described in the included studies align with the 10 principles. The principles to 'optimise helpful stimulation' and 'support movement and engagement' were the most frequently mentioned. The reports of 13 of the 17 units included in the review described environmental modifications in line with at least one of the 10 principles, but none described an environment that met all 10 principles. This may be due, at least in part, to the word limits imposed by journals, which make detailed description difficult to achieve. However, it seems reasonable to conclude that although a supportive environment for people with dementia is one of the 'common elements', there is considerable room for improvement in the way these units are designed.

The following provides an explanation of what is meant by the term 'human scale' in Table 6:

> "*The scale of a building will have an effect on the behaviour and feelings of a person with dementia. The scale should help the person feel in control rather than feeling lost or uneasy. The experience of scale is determined by three factors; the number of people that the person encounters, the overall size of the building and the size of the individual components, such as doors, rooms and corridors. A person should not be intimidated by the scale of the surroundings*." [41, p 9]

Table 6: Improving the environment for people with dementia

	Principle	Evidence
1	Unobtrusively reduce risks	▪ Additional security with alarmed exits and pinpoint entry system[22] ▪ Secure environment[25] ▪ Specific architectural plan to enable risk-free wandering[37] ▪ Access to areas to safely wander[27]
2	Provide a human scale	▪ Homely environment[25] ▪ Provision of a home-like environment[28] ▪ Colourful, home-like space[34] ▪ Environmental features that create a home-like atmosphere[35]
3	Allow people to see and be seen	▪ Environmental design to facilitate close supervision of patients[36]
4	Reduce unhelpful stimulation	▪ Separate accommodation for male and female patients allowing the ward to accommodate patients with sexually inappropriate behaviour or aggression[22] ▪ Minimisation of excessive noise[24] ▪ Separate areas for the minimisation of noxious stimuli[37]

		▪ Minimisation of noxious stimuli[32]
5	Optimise helpful stimulation	▪ Calm environment[22] ▪ Photographs, light boxes of flowers and landscapes on the wall[40] ▪ Strong colours to identify individual bays[40] ▪ Use of conducive colours and lighting[24] ▪ More natural lighting[33] ▪ Room doors and hand-rails of bright colours to facilitate identification[32] ▪ Wayfinding cues to help residents identify different areas and routes[32]
6	Support movement and engagement	▪ Spacious environment[22] ▪ An area to mobilise, outside area, dining room and lounge[24] ▪ More space[33] ▪ Creation of wandering areas[32] ▪ Space for walking, including access to an outdoor garden[21] ▪ Access to a private enclosed patio/garden area[27] ▪ Environmental features that allow for safe and unrestricted ambulation within the unit[35]
7	Create a familiar space	▪ Environment modifications to facilitate identification of different areas and routes[32]
8	Provide a variety of spaces to be alone or with others	▪ Separate areas for structured activities[32] ▪ Specific areas within the unit were dedicated to music, hobbies, quiet reflection and reading, physical activity, games, story-telling, quiet social interaction, and domestic activities[34] ▪ Option to leave the patient alone until he or she is willing to communicate[38]
9	Provide links to the community	None identified
10	Support the values and goals of care	None identified

4.5.3 Education, skills and training

The issue of staff training was emphasised as an important element in 12 of the units. The subject matter of the training programs included the following:

- Knowledge and skills in behavioural management[28]
- Management of behavioural problems without recourse to physical or pharmacological restraint[25]
- Recognition of delirium and dementia[23]
- Montessori activity training[34]
- De-escalating aggressive incidents.[27]

Some papers mentioned who did the training (e.g. dementia consultant)[34] or who attended the training. Details of the training programs tended to be relatively limited. Only one study evaluated the impact of the training, with staff agreeing that their skills and knowledge in working with the target group had improved.[28]

Other papers emphasised the importance of having staff with the necessary skills and expertise to work in the specialised unit:

- Staff with adequate education and experience in the care of patients with behavioural dysfunction[24]

- Staff specifically trained in assessing behavioural problems.[32]

One unit noted that the purpose of the education was "*not only to pass on information and knowledge but also to provide a platform for reflection of the daily work processes and for sharing experiences on the unit, thus ensuring an adequate knowledge concerning dementia but also facilitating the transfer from theory to practice*".[38, p 455]

The Grip on Challenging Behavior care program (GRIP) fosters a multidisciplinary approach guiding care workers through the detection, analysis, treatment and evaluation of challenging behaviour.[42] It was implemented in 17 SDCUs in the Netherlands. Questionnaires completed by 380 care workers prior to and after the implementation of GRIP showed that it had a positive effect on perceived levels of job satisfaction while not impacting on job demands. No effect was found on staff burnout, with the level of staff burnout being relatively low prior to implementation of the program.[42] In interpreting their results, the authors noted the following:

> "*The results on burnout and job satisfaction are not conclusive. This could be explained by the fact that job satisfaction and burnout depend upon many factors other than challenging behaviour. The effects could, however, also be muted by the implementation rate of GRIP, which was suboptimal.*" [42, p 72]

4.5.4 Medical staffing

Medical staffing was typically described in terms of type of specialist medical input. This included:

- Geriatricians (seven units)[20, 22, 25, 26, 28, 36, 37]
- Psychogeriatricians (four units)[20, 28, 33, 36]
- Psychiatrists (seven units)[22, 23, 25-28, 37]
- Neurologists (two units)[26, 37]
- Physicians (one unit)[32]
- General practitioners (two units).[22, 33]

It is interesting to note that three of the four units staffed with psychogeriatricians were in NSW.

4.5.5 Allied health staffing

Nine of the units included in the review were reported to have particular features of allied health staffing or increased allied health staffing to meet the needs of a new unit or model of care (Table 7). Given that the combinations of allied health staff in a particular unit is illustrative of the type of care in that unit, the following information is provided about each unit.

Table 7: Allied health staffing

Name of lead author, year, name of unit	Allied health staffing
Astell (2008) Geriatric Medicine/Old Age Psychiatry Unit	Clinical psychology; occupational therapy and therapies coordinator[22]
Chiu (2009) Psychogeriatric and Geriatric Unit	Physiotherapists, occupational therapists and social workers[36]
Goldberg (2013) Medical and Mental Health Unit	Staffing enhanced with activities coordinators[40] Additional physiotherapy, speech and language therapy[23]
Jayalath (2013) Continuing Care Dementia Unit	Two activity workers appointed to support the occupational therapist[33] Improved access to occupational therapy[33]
NSW Health (2011) Mental Health Aged Care Partnership Initiative	Psychology, diversional therapy and podiatry[28]
Nobili (2008) Alzheimer Special Care Units	Psychologists and occupational therapists[32]
Saidlitz (2017) Cognitive and Behavioural Unit	Psychologists, occupational therapists, gerontological assistants and physiotherapists[21]
Soto (2012) Alzheimer Special Acute Care Inpatient Unit	Physiotherapists, dietitians, social workers and psychologists[26]
Stevenson (2007) Psychiatric Intensive Care Unit for elders	Psychology, occupational therapy, speech therapy, pharmacist[27]

Occupational therapists, activity coordinators or diversional therapists feature in almost all the descriptions of allied health staffing. In one unit "*the most visible impact on care was the work of the activities coordinators*".[40, p 1337] There is little emphasis on speech pathologists (two units), social workers (two units), podiatrists (one unit) and pharmacists (one unit).

4.5.6 Therapeutic and meaningful activities

The descriptions of more than half the units emphasised the importance of therapeutic and meaningful activities in three ways:

- Stating that there was a program of such activities[30, 32]
- Describing the nature of the activities (e.g. music therapy, social outings)[27, 34, 37]
- Commenting that the emphasis on such activities had increased because of increased staffing (typically an occupational therapist or someone with specific responsibilities for 'activities').[33, 35]

The therapeutic and meaningful activities did not cover the full range detailed in Section 5.4.3. For example, there was no mention of domestic activities (e.g. folding linen) or pet therapy.

4.5.7 Assessment and care planning

Seven units identified the importance of assessment and care planning, with some emphasising the need for individualised assessment and care planning and others emphasising the importance of a multidisciplinary or comprehensive approach (Table 8).

Table 8: Assessment and care planning

Name of lead author, year, name of unit	Assessment and care planning
Anderson (2016) T-BASIS units	The use of multidisciplinary assessments and individualised bio-psychosocial management plans The development of detailed management plans for patients returning to their residential aged-care facility after their stay in the unit[20]
Chiu (2009) Psychogeriatric and Geriatric Unit	Rapid assessment of patients with acute medical deterioration Joint care allows for effective communication and integration of medical and psychiatric care plans[36]
Goldberg (2013) Medical and Mental Health Unit	More comprehensive patient assessment[23]
NSW Health (2011) Mental Health Aged Care Partnership Initiative	Nursing assessment within first two days of admission. Full assessment and referral to allied health within first week Development of care plan, review of management plan, and initiation of discharge planning within the first week[28]
Nobili (2008) Alzheimer Special Care Units	Individual care plans and a problem-oriented approach[32]
Soto (2012) Alzheimer Special Acute Care Inpatient Unit	Comprehensive psychogeriatric assessment on admission, with all patients undergoing a social evaluation[26]
Zwijsen (2014) Grip on Challenging Behavior care program	Assessment tools to help staff take the right steps and ask the right questions to identify and, if possible, treat the underlying problem of the challenging behaviour[31]

Unfortunately, none of the included studies undertook an evaluation of how well the process of assessment and care planning was being done.

4.5.8 Multidisciplinary approach

The range and scope of disciplines included in the units varied according to setting, with hospital-based units having a more comprehensive range of disciplines. The core disciplines of the multidisciplinary teams were geriatricians, psychiatrists and general medical staff; nursing staff with a mix of medical and mental health skills; and regular access to a range of allied health staff.

The literature review on joint geriatric and psychiatric wards emphasised the importance of having a 'dedicated multidisciplinary team' and identified that one of the key characteristics of such units is "*joint working between geriatricians and psychiatrists to avoid unnecessary transfers and avoid missing important medical and psychiatric diagnoses*".[25, p 546]

The whole foundation of the Grip on Challenging Behavior care program is a multidisciplinary approach that emphasises the importance of an initial assessment and analysis of challenging behaviour, planning appropriate treatment and evaluating outcomes.[31, 43] The program demonstrates the important link between a multidisciplinary approach and the previous common element — assessment and care planning.

4.6 Critical success factors

For the purpose of this Evidence Check, 'critical success factors' are defined as the key factors identified by the studies' authors as essential to the effectiveness of a unit. This could potentially include any of the common elements identified in Section 4.5. For example, the literature review of joint psychiatric/geriatric

wards for older people identified what were described as 'key characteristics' of such wards, which have many similarities to the 'common elements':

- Joint working between geriatricians and psychiatrists to avoid unnecessary transfers and avoid missing important medical and psychiatric diagnoses
- Homely secure environment to facilitate rehabilitation and maintain independence
- Person-centred care and involvement of family and carers in care planning
- Access to acute investigations and treatments of an acute hospital
- Training of medical and nursing staff to manage behavioural problems without recourse to physical or pharmacological restraint (antipsychotics)
- Dedicated multidisciplinary team and continuity of care
- Good community links with psychiatric and medical staff to facilitate safe discharge.[25, p 546]

The studies included in this Evidence Check focused on measuring outcomes for patients/residents (e.g. incidence of particular behaviours, patient experience, levels of function), which is to be expected given that the aim was to find evidence for the optimal management of people with very severe or extreme BPSD. There was much less emphasis on measuring the impact of units/models of care on the staff or the system of care delivery. An exception was the Grip on Challenging Behavior care program, which sought to evaluate the impact of the program on job satisfaction and staff burnout.[42]

Only one study (about the Grip on Challenging Behavior care program) addressed the issue of implementation fidelity by seeking to identify the extent to which the new program had been implemented.[43] This was only done rather crudely, with implementation assessed as being either 'poor', 'moderate' or 'good'. However, what it did do was focus the attention of the researchers on the issue of implementation. Without such a focus, questions such as 'why did implementation proceed poorly' or 'why did implementation not proceed as anticipated' simply don't get asked, as was the case with most of the studies included in this Evidence Check.

Only three studies involved some form of process evaluation.[28, 34, 43] Process evaluations "*can provide valuable insight into why an intervention fails or has unexpected consequences, or why a successful intervention works and how it can be optimised*".[44, p 3] In the absence of process evaluations, it is much less likely that factors considered 'critical' or 'key' to success will be identified.

Taken together (focus on patient outcomes, lack of attention to implementation, limited number of process evaluations), this means that there is only limited data to support the identification of critical success factors.

The summary report of the evaluation of the Mental Health Aged Care Partnership Initiative identified what were described as six 'critical success factors' that contributed to the successful operation of the model:

- A committed service provider with an effective and committed board of management
- A well-designed facility/unit, including a relaxing (homely) environment to increase comfort, maximise abilities and reduce agitation in residents
- An effective clinical advisory committee
- Passionate and skilled staff
- The ability to access on-call staff support when required
- Psychiatric services complemented by the services of an interested general practitioner.[28]

The report also refers to the importance of 'effective leadership'. It is unclear how much data was collected to support these findings.

The study of the Memory Support Unit implemented in rural Victoria concluded that:

"*Strong, supportive leadership from the Board and Chief Executive Officer to managers and team leaders was crucial for the process of change. Organisational cultural change was facilitated by education and ongoing support and training for staff*".[34, p 107]

The process evaluation of the Grip on Challenging Behavior care program identified various 'barriers and facilitators' to implementation, summarised in Table 9.

Table 9: Barriers and facilitators – Grip on Challenging Behavior care program

Theme	Barrier / facilitator	Evidence from the study
Organisational aspects	Staff turnover	"*… staff turnover rates could influence the implementation process. Staff turnover sometimes resulted in situations in which only a part of the team was truly well informed about the care program*." [43, p 7]
	High workload	"*High workload and time being scarce were often mentioned as one of the barriers to implementing the care program*." [43, p 7]
	Multidisciplinary meetings	"*For the care program to work properly there has to be a structure in which physician, psychologist and care staff meet each other regularly*."[43, p 8]
Culture of the organisation/unit	Support of key persons	"*… it was important that key persons such as physicians, psychologists and DSCU leaders functioned as 'team champions' in supporting the use of the care program*".[43, p 8]
	Attitude towards change	"*… some respondents stated that their team was very open to a new method in managing behavioral problems. These teams often seemed to be motivated to start working with the Grip on Challenging Behavior care program. In other DSCUs, respondents observed there was more reluctance in changing current routines and procedures*." [43, p 8]
Aspects of the care program	The care program was not digitally available	There were difficulties integrating the paper forms for the new program with the electronic health records being implemented in the nursing homes.
	Many forms	Staff complained initially that the forms needed to implement the new program were 'overwhelming', which hindered implementation.

5. Discussion

The aim of the Evidence Check is to answer three questions:

- Question 1: What specialist dementia care units have been shown to be effective in managing symptoms for people with very severe and extreme behavioural and psychological symptoms of dementia (Brodaty, Tiers 6 and 7)?[6]
- Question 2: What are the common elements of the effective SDCUs?
- Question 3: What critical success factors have been identified in the effective SDCUs?

5.1 Effectiveness

The Evidence Check identified 25 papers about 17 units, reporting on a range of different units catering to different populations of people with dementia and behavioural symptoms across a variety of settings. It was difficult to decide which papers to include in the review, resulting in the development of quite detailed inclusion criteria. For example, it was not always clear whether the particular unit being studied was targeting 'severe' or 'extreme' BPSD. There was little consistency in the findings across the studies. All the studies have some degree of applicability to the Australian healthcare context.

The review assessed the quality of the evidence using a framework developed by the NHMRC and identified nine studies as having the greatest potential to inform the development of SDCUs: one study categorised as best practice, two studies categorised as promising practice and six studies assessed as emerging practices.

We framed effectiveness in terms of managing very severe or extreme BPSD, for which the evidence was limited: four units demonstrated improvement in behavioural symptoms, but in three of these instances the results were based on a weak study design (Level IV).[21, 34, 35] The evidence for improvement in behavioural symptoms for the fourth unit was based on a good study design (Level II).[31] The Evidence Check did not identify a consistent pattern of improvement for other outcome measures (e.g. use of physical restraints or length of stay).

Several of the included papers focused on new units or models of care, with three described as 'pilots'.[28, 34, 37] In studying these units, we found an absence of references to the wider literature from fields such as organisational change, implementation science, diffusion of innovations and knowledge translation to either inform the research methods or assist with interpreting the findings. Only one study (about the Grip on Challenging Behavior care program) addressed the issue of implementation fidelity by seeking to identify the extent to which the new program had been implemented.[43] This is an important issue when judging effectiveness, particularly when the results of a study are mixed or inconclusive, as is often the case. In those situations, unless there is some data about implementation fidelity, it is difficult to distinguish between an effective intervention that has been poorly implemented and an ineffective intervention.

Taking a broader approach to evaluating SDCUs, including investigation of the factors influencing implementation, has the potential to inform the implementation of the SDCUs and the results achieved.

5.2 Common elements

The Evidence Check identified eight 'common elements' across the included papers:

1. Unit philosophy/approach to care
2. Supportive physical environment
3. Education, skills and training

4. Medical staffing
5. Allied health staffing
6. Therapeutic and meaningful activities
7. Assessment and care planning
8. Multidisciplinary approach.

In the context of this review, the only measure of whether any of these common elements are more important than others is the frequency with which each occurs, i.e. 'unit philosophy/approach to care' is the most frequently occurring; 'multidisciplinary approach' is the least frequently occurring. However, this is an unreliable measure. For example, the frequency of occurrence is partly dependent on how well each unit is described in the included papers. Also, simply describing that one of the common elements is in place for a particular unit provides no insight into how, and to what extent, that element contributes to the success or otherwise of the unit.

These common elements should not be considered in isolation, but rather as a series of elements that need to work together, not unlike the ingredients in a recipe. For example, the way a unit is staffed (both in terms of the quantity and quality of staff) will influence how the unit operates, which may be in accord with a stated philosophy such as person-centred care, or it may operate quite differently, as illustrated in Section 4.5.1 with an example of how person-centred care was not being adhered to uniformly.

5.3 Critical success factors

There was very limited evidence to support the identification of critical success factors, in large part because of the relative lack of process evaluations in the included studies. However, the evidence available is entirely consistent with the evidence from the implementation science literature. For example, there is a considerable literature referring to the need to examine change at different levels, including the individual, the team, the organisation and the broader context.[45, 46] This is best expressed by Ferlie and Shortell based on their work in hospitals:

> *"The multilevel approach to change does not mean that every change effort must be directed to all four levels simultaneously. Rather, it means that a change aimed primarily at one level would be considered within the context of the other three levels."* [45, p 289]

Implementation is influenced by the setting within which implementation takes place, the individuals involved and the process by which implementation is accomplished.[47]

This multilevel, multidimensional perspective is reflected in the section on critical success factors. For example, the influence of individuals (attitude towards change, skilled staff, supportive leaders and 'champions') and the influence of organisations (high workload and lack of time, difficulties integrating different systems).

It is important to note the Evidence Check identified no major 'failure' factors. Rather, it is a case of the extent to which the common elements and critical success factors are in place.

5.4 How the findings 'fit' within the broader evidence base

The 'evidence' to support the common elements within the papers included in this Evidence Check is somewhat limited, in part due to the limited scope of the studies/evaluations of most units. More comprehensive evaluations (e.g. of factors influencing implementation) may have resulted in stronger evidence for each of the common elements. Despite this, some confidence in the veracity of these common elements can be found in the broader literature about the optimal management of people with dementia, including those with BPSD, which identifies a similar set of elements.

For example, NSW Health commissioned a report from the Faculty of Psychiatry of Old Age of the Royal Australian and NZ College of Psychiatrists, NSW, published in 2004, to develop recommendations to improve the management and care of older people who manifest severe and persistent challenging behaviour. The recommendations were based on a review of the international literature, site visits to relevant Australian services, consultation with experts in the field and focus group discussions.[48] The report outlined a potential model of care based on the seven-tiered hierarchical model of management of BPSD,[6] identifying a number of factors that enhance the capacity to care for this group of people:

- A commitment at board of management and senior executive levels to high-quality care
- Targeted staff education
- The employment (or access to) multidisciplinary and specialist advice
- Specific dementia-friendly building and refurbishment projects
- Employment strategies designed to attract and retain care staff with the 'right attitude'
- Philosophies of care that stress client-centred, individualised care planning
- Employment of experienced psychiatric nurses or staff that have sufficient knowledge of psychiatric conditions to refer to specialist expertise when indicated
- Timely and effective consulting arrangements with a psychogeriatrician, psychiatrist or geriatrician, as well as access to other multidisciplinary specialist help and complementary medicine practitioners
- Highly individualised care planning centred on the resident
- Activities directed at proactive intervention to prevent behavioural disturbance, rather than just for diversion
- Dementia-friendly design
- A culture of tolerance for bizarre or strange behaviour that is not threatening, risky or aggressive.[48]

All the elements of this model of care can be found in the sections on common elements and critical success factors. Further evidence about some of these elements is briefly summarised in the following sections.

5.4.1 Supportive physical environment

Best practice design for residential care environments considers not only the reduction of external stressors or 'unhelpful stimuli' but also the promotion of positive environmental aspects to support person-centred care. Pioneering work in the field of design for dementia care environments provides 10 principles that are critical to reducing unmet need and supporting person-centred care of people with dementia, including those with BPSD.[13, 49, 50] Each principle is supported by evidence and information about how to apply the principle in practice.[41]

The Alberta Health Services has provided a model for the care of people with dementia, with person-centred care being a core concept. This model recommends that the living environment should be 'home-like' and contain a sense of familiarity, include appropriate sensory stimulation (not over or under-stimulating) such as proper lighting and visual stimulation, and allow for privacy when desired.[12]

A review of psychogeriatric units and unit design found these units should be free of disinhibited, noisy or aggressive patients and suggested a segregated special care unit as an approach. They found evidence for the inclusion of more space, gardens, quiet areas, a seclusion suite, and activity and games rooms. They also noted some evidence for an environment in specialist units for people with dementia and behavioural issues that may include adequate personal space within a safe, secure and low-stimulus setting.[51] The authors also point out that improvements in outcomes from better unit design also depend on the implementation of a patient-centred approach to care. The ultimate goal of any dementia care environment is to support people to lead a life that has 'meaning and value to them'.[13, 50]

5.4.2 Education, skills and training

There has been much research into staff training and education to assist in the management of BPSD in residential aged care. Two recent systematic reviews have focused on reducing the incidence of BPSD[52] and staff outcomes.[53]

The first review described staff training as a 'potentially valuable' method; however, the available evidence to support this was described as 'poor quality'. Sixteen of the 20 studies included in the review had follow-up measures highlighting that any positive effects of the training intervention were maintained at follow-up. There did not appear to be a link between the intensity of the training programs and the effectiveness of reducing BPSD. Programs including individual supervision to help staff incorporate strategies into everyday practice tended to be more successful. Supervision models that also included observations, feedback and incentives for staff were more effective in maintaining skills over time when compared with conventional supervision models.[52]

The second review highlighted that training was most effective at improving staff knowledge, although this was not maintained over time. Training that focused on the management of challenging behaviours had the greatest impact on staff. Understanding resident behaviour and having the skills to manage it led staff to develop a sense of self-efficacy and competence. Training programs focusing on person-centred approaches were also found to be effective whereas studies focusing on improving resident outcomes appeared to have had the least impact on staff outcomes. Again, there was no clear link between training intensity and outcome.[53]

Phillipson and colleagues carried out a narrative review of the literature to help understand what works in the design and content of education programs to promote best practice in dementia care. Based on the outcomes of the review, the authors highlighted six recommendations for integrating knowledge translation principles into education interventions that target the dementia workforce. The six recommendations are: (1) the education strategy must be tailored to the workers' needs and work context, (2) it must be multimodal, (3) it must include mentoring to sustain practice into the future, (4) the education messages must be clear and jargon-free, (5) the organisation must provide incentives for staff to participate, and (6) the education must include a focus on workplace change to modify the previous practice of an organisation.[54]

5.4.3 Therapeutic and meaningful activities

Table 10 outlines the many and varied types of therapeutic and meaningful activities that can be used in the care of people with BPSD.

Table 10: Categories for specific non-pharmacologic interventions for BPSD

Sensory Enhancement/ Relaxation	Social Contact: Real or Simulated	Behaviour Therapy
▪ Massage and touch ▪ Individualised music and music therapy ▪ White noise ▪ Controlled multisensory stimulation (Snoezelen) ▪ Art therapy ▪ Aromatherapy ▪ Gardening ▪ Cooking	▪ Individualised social contact ▪ Pet therapy ▪ 1:1 social interaction ▪ Simulated interactions/family ▪ Videos/reminiscing	▪ Differential reinforcement ▪ Stimulus control
Structured Activities	**Environmental Modifications**	**Training and Development**
▪ Recreational activities ▪ Outdoor walks ▪ Physical activities ▪ Exercise class ▪ Meaningful activities (e.g. folding laundry, delivering newspapers)	▪ Wandering areas natural/enhanced ▪ Environments ▪ Reduced stimulation ▪ Light therapy	▪ Staff education (e.g. CARE Program, P.I.E.C.E.S., proper communication) ▪ Staff support ▪ Training programs for family caregivers

Note: the table is taken from McGonigal-Kenney and Schutte [55] and the Canadian Ministry of Health.[56]

Each of these strategies has a large number of journal articles, case studies, randomised control trials and systematic reviews associated with them. For example, music therapy for people with dementia alone has an associated 17 systematic reviews, 101,000,000 Google search results and 2083 results in Scopus.[57] Each music therapy article has varying results, different responses for different symptoms and unique methodologies.[57]

The conduct of therapeutic and meaningful activities is very important in the management of severe and extreme BPSD. It is beyond the scope of this Evidence Check to evaluate the evidence associated with individual non-pharmacological interventions.

5.4.4 Multidisciplinary approach

Multidisciplinary teams are critical to the creation of a person-centred care environment. According to a review of the literature, collaborative and empowered staff who are trained in person-centred care and are provided with support and resources will contribute most to improved quality of life for residents with dementia in residential environments.[12] Also important is consistent staffing and monitoring of quality and structures for supporting staff in specialist roles.[12]

References

1. The Liberal Party. Government response to the Dementia Forum Report https://www.liberal.org.au/latest-news/2016/06/16/coalition-targets-better-dementia-care-across-australia 2016. [Access Date: 8 July 2017].
2. Australian Institute of Health and Welfare. Dementia, the ninth National Health Priority. http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=10737423074 2012. [Access Date: 10 July 2017].
3. KPMG. Ministerial Dementia Forum, Dementia Care – Core Business', Final report. 2015
4. KPMG. Ministerial Dementia Forum, Options Paper, Final. 2014
5. Sax Institute, Commonwealth Department of Health. Specialist Dementia Care Units. Final proposal for circulation. 2017
6. Brodaty H, Draper BM, Low LF. Behavioural and psychological symptoms of dementia: a seven-tiered model of service delivery. Medical Journal of Australia. 2003;178(5):231-34.
7. Volicer L. End-of-life care for people with dementia in residential care settings. Available: https://www.alz.org/national/documents/endoflifelitreview.pdf2005
8. Kitwood T. Dementia reconsidered: the person comes first. Buckingham: Open University Press; 1997
9. Alzheimer Society of Canada. Guidelines for care: Person-centred care of people with dementia living in care homes. Toronto: Alzheimer Society of Canada; 2011.
10. Alzheimer's Australia. Quality dementia care: practice in residential care settings for all staff. Sydney, Australia: Alzheimer's Australia; 2007.
11. World Health Organisation. Dementia: a public health priority. Geneva: World Health Organisation; 2012
12. Alberta Health Services. Meeting the needs of people living with dementia in Alberta's residential living options. Ensuring person centred care. Available at http://www.albertahealthservices.ca: 2014.
13. Fleming R, Purandare N. Long-term care for people with dementia: environmental design guidelines. International Psychogeriatrics. 2010;22(7):1084-96.
14. Finkel SI. Behavioral and psychological symptoms of dementia (BPSD): a clinical and research update. IPA Bulletin. 1999;16:2.
15. Brodaty H, Draper B, Saab D, Low LF, Richards V, et al. Psychosis, depression and behavioural disturbances in Sydney nursing home residents: prevalence and predictors. International Journal of Geriatric Psychiatry. 2001;16(5):504-12.
16. Brodaty H, Cumming A. Dementia services in Australia. International Journal of Geriatric Psychiatry. 2010;25(9):887-995.
17. Hillier S, Grimmer-Somers K, Merlin T, Middleton P, Salisbury J, et al. FORM: an Australian method for formulating and grading recommendations in evidence-based clinical guidelines. BMC Medical Research Methodology. 2011;11(23)
18. Canadian Homelessness Research Network. What works and for whom? A hierarchy of evidence for promising practices research. Toronto: Canadian Homelessness Research Network Press; 2013a.
19. Canadian Homelessness Research Network. What works and for whom? A framework for designing and implementing promising practices research. Toronto: Canadian Homelessness Research Network Press; 2013b.
20. Anderson K, Bird M, Blair A, MacPherson S. Development and effectiveness of an integrated inpatient and community service for challenging behaviour in late life: from Confused and Disturbed Elderly to Transitional Behavioural Assessment and Intervention Service. Dementia. 2016;15(6):1340-57.
21. Saidlitz P, Sourdet S, Voisin T, Vellas B. Management of behavioural symptoms of dementia in a specialized unit care. Psychogeriatrics. 2017;17(2):81-88.
22. Astell AJ, Clark SA, Hartley NT. Predictors of discharge destination for 234 patients admitted to a combined geriatric medicine/old age psychiatry unit. International Journal of Geriatric Psychiatry. 2008;23(9):903-08.
23. Goldberg SE, Bradshaw LE, Kearney FC, Russell C, Whittamore KH, et al. Care in specialist medical and mental health unit compared with standard care for older people with cognitive impairment admitted to general hospital: randomised controlled trial (NIHR TEAM trial). British Medical Journal. 2013;347:f4132.
24. Gonski PN, Moon I. Outcomes of a behavioral unit in an acute aged care service. Archives of Gerontology and Geriatrics. 2012;55(1):60-65.
25. George J, Adamson J, Woodford H. Joint geriatric and psychiatric wards: a review of the literature. Age and Ageing. 2011;40(5):543-48.

26. Soto ME, Andrieu S, Villars H, Secher M, Gardette V, et al. Improving care of older adults with dementia: description of 6299 hospitalizations over 11 years in a special acute care unit. Journal of the American Medical Directors Association. 2012;13(5):486.e1-6.
27. Stevenson GS, Menon A, Gallacher N. A psychiatric intensive care unit for older adults. Journal of Psychiatric Intensive Care. 2007;2(2):103-10.
28. NSW Health. Mental Health Aged Care Partnership Initiative Evaluation Summary Report. Sydney, NSW: NSW Health; 2011
29. Bird M, Anderson K, Blair A, MacPherson S. Evaluation of the Transitional Behavioural Assessment and Intervention Service (T-BASIS) Unit Initiative and Model of Care — Executive Summary. Aged Care Evaluation Unit, NSW Greater Southern Area Health Service; 2011.
30. Lai CKY, Yeung JHM, Mok V, Chi I. Special care units for dementia individuals with behavioural problems. Cochrane Database of Systematic Reviews. 2009(Issue 4)
31. Zwijsen SA, Smalbrugge M, Eefsting JA, Twisk JWR, Gerritsen DL, et al. Coming to grips with challenging behavior: a cluster randomized controlled trial on the effects of a multidisciplinary care program for challenging behavior in dementia. Journal of the American Medical Directors Association. 2014a;15(7):531.e1-31.e10.
32. Nobili A, Piana I, Balossi L, Pasina L, Matucci M, et al. Alzheimer special care units compared with traditional nursing home for dementia care: are there differences at admission and in clinical outcomes? Alzheimer Disease and Associated Disorders. 2008;22(4):352-61.
33. Jayalath D, Shankar K, Ashaye K. Two-year follow-up study of patients with dementia in an NHS continuing care unit. The Psychiatrist. 2013;37(1):11-14.
34. Roberts G, Morley C, Walters W, Malta S, Doyle C. Caring for people with dementia in residential aged care: successes with a composite person-centered care model featuring Montessori-based activities. Geriatric Nursing. 2015;36(2):106-10.
35. Zieschang T, Dutzi I, Müller E, Hestermann U, Grünendahl K, et al. Improving care for patients with dementia hospitalized for acute somatic illness in a specialized care unit: a feasibility study. International Psychogeriatrics. 2010;22(1):139-46.
36. Chiu A, Nguyen HV, Reutens S, Grace D, Schmidtman R, et al. Clinical outcomes and length of stay of a co-located psychogeriatric and geriatric unit. Archives of Gerontology and Geriatrics. 2009;49(2):233-36.
37. Koskas P, Feugeas MCH, Saad S, Belqadi S, Daraux J, et al. Management of behavioral and psychological symptoms of dementia in a dedicated psychogeriatric unit: a pilot experience. Alzheimer Disease and Associated Disorders. 2011;25(2):184-86.
38. Zieschang T, Dutzi I, Müller E, Hestermann U, Specht-Leible N, et al. A special care unit for acutely ill patients with dementia and challenging behaviour as a model of geriatric care. Zeitschrift für Gerontologie und Geriatrie. 2008;41(6):453-59.
39. Spencer K, Foster P, Whittamore KH, Goldberg SE, Harwood RH. Delivering dementia care differently—evaluating the differences and similarities between a specialist medical and mental health unit and standard acute care wards: a qualitative study of family carers' perceptions of quality of care. BMJ Open. 2013;3(12)
40. Goldberg SE, Whittamore KH, Pollock K, Harwood RH, Gladman JRF. Caring for cognitively impaired older patients in the general hospital: A qualitative analysis of similarities and differences between a specialist Medical and Mental Health Unit and standard care wards. International Journal of Nursing Studies. 2014;51(10):1332-43.
41. Agency for Clinical Innovation. Key principles for improving healthcare environments for people with dementia. Chatswood, NSW: Agency for Clinical Innovation; 2014.
42. Zwijsen SA, Gerritsen DL, Eefsting JA, Smalbrugge M, Hertogh CMPM, et al. Coming to grips with challenging behaviour: A cluster randomised controlled trial on the effects of a new care programme for challenging behaviour on burnout, job satisfaction and job demands of care staff on dementia special care units. International Journal of Nursing Studies. 2015;52(1):68-74.
43. Zwijsen SA, Smalbrugge M, Eefsting JA, Gerritsen DL, Hertogh CM, et al. Grip on challenging behavior: process evaluation of the implementation of a care program. Trials. 2014b;15(1):302.
44. Craig P, Dieppe P, Macintyre S, Michie S, Nazareth I, et al. Developing and evaluating complex interventions: the new Medical Research Council guidance. British Medical Journal. 2008;337(a1655):979-83.
45. Ferlie EB, Shortell SM. Improving the quality of health care in the United Kingdom and the United States: a framework for change. Milbank Quarterly. 2001;79(2):281-315.
46. Grol R, Wensing M. What drives change? Barriers to and incentives for achieving evidence-based practice. Medical Journal of Australia. 2004;180(6 Suppl):S57-S60.
47. Damschroder L, Aron D, Keith R, Kirsh S, Alexander J, et al. Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. Implementation Science. 2009;4(1)

48. Faculty of Psychiatry of Old Age. The management and accommodation of older people with severe and persistent challenging behaviours in residential care. Sydney, NSW: The Royal Australian and New Zealand College of Psychiatrists, New South Wales; 2004.
49. Fleming R, Bowles J. Units for the confused and disturbed elderly: development, design, programming and evaluation. Australasian Journal on Ageing. 1987;6(4):25-28.
50. Fleming R, Forbes I, Bennett K. Adapting the ward for people with dementia. Sydney: NSW Department of Health; 2003
51. Dobrohotoff JT, Llewellyn-Jones RH. Psychogeriatric inpatient unit design: a literature review. International Psychogeriatrics. 2011;23(2):174-89.
52. Spector A, Orrell M, Goyder J. A systematic review of staff training interventions to reduce the behavioural and psychological symptoms of dementia. Ageing Research Review. 2013;12(1):354-64.
53. Spector A, Revolta C, Orrell M. The impact of staff training on staff outcomes in dementia care: a systematic review. International Journal of Geriatric Psychiatry. 2016;31(11):1172-87.
54. Phillipson L, Goodenough B, Reis S, Fleming R. Applying knowledge translation concepts and strategies in dementia care education for health professionals: recommendations from a narrative literature review. Journal of Continuing Education in the Health Professions. 2016;36(1):74-81.
55. McGonigal-Kenney M, Schutte D. Evidenced-based practice guideline for non-pharmacologic management of agitated behaviors in persons with Alzheimer Disease and other chronic dementing conditions. Iowa: Gerontological Nursing Interventions Research Center; 2004
56. Canadian Ministry of Health. Best practice guideline for accommodating and managing behavioural and psychological symptoms of dementia in residential care: a person-centered interdisciplinary approach. Available: http://www.health.gov.bc.ca/library/publications/year/2012/bpsd-guideline.pdf Accessed July 2017: 2012.
57. Kubel C. Knowledge translation as a predictor of usability and effectiveness in decision-support tools for the behavioural and psychological symptoms of dementia. PhD proposal. Faculty of Science, Medicine & Health, University of Wollongong; 2014
58. Spencer K, Foster P, Whittamore KH, Goldberg SE, Harwood RH. MCOP discussion paper: Staff confidence in managing patients with delirium and dementia. Nottingham, United Kingdom: University of Nottingham; 2015.
59. Stevenson GS, Shankar P, Malkison F. Utility of a Scottish regional intensive psychiatric care unit for demented elders. International Journal of Geriatric Psychiatry. 2005;20(4):389-90.

Appendices

Appendix A: Search strategies and results

Date	Database	Search Strategy	Results	Limits applied	Results	Downloaded to Endnote
14/6/2017	Cochrane Library	"dementia care unit"	7	None		2
14/6/2017	Dementia and Cognitive Improvement Group (DCIG)	Hand searched	191	None		1
14/6/2017	ALOIS: DCIG Study Register associated with Cochrane Library	("special care" OR "specialist dementia care" OR neurobehavioral OR psychogeriatric) AND (unit OR service OR inpatient)	125	Date: 2007–2017 Intervention Type: Non-pharmacological Health Status Diagnosis: dementia elderly "cognitive impairment"	63	1
14/6/2017	ALOIS: DCIG Study Register associated with Cochrane Library	Advanced search of 5508 records using limiters	5508	Date: 2007–2017 Intervention Type: Non-pharmacological Health Status Diagnosis (any word): dementia elderly "cognitive impairment" Intervention (any word): unit service inpatient	8	6

Date	Database	Search Strategy	Results	Limits applied	Results	Downloaded to Endnote
14/6/2017	Medline	(dementia OR alzheimer's OR cognitive impairment OR memory loss) AND (specialist care OR aged-care OR neurobehavioural OR neurobehavioral OR confused and disturbed elderly OR transitional behavioural assessment and intervention OR inpatient OR psychogeriatric OR extended care OR intensive specialist care) AND (BPSD OR "behavioural and psychological symptoms of dementia" OR neuropsychiatric symptoms OR physical violence OR physical aggression OR severe depression OR suicidal tendencies)	329	Date of publication: 2007–2017 Language: English	171	22
15/6/2017	CINAHL	(dementia OR alzheimer's OR cognitive impairment OR memory loss OR cognitive decline OR cognitive impairment) AND (specialist care OR aged-care OR neurobehavioural OR neurobehavioral OR confused and disturbed elderly OR transitional behavioural assessment and intervention OR inpatient OR psychogeriatric OR extended care OR intensive specialist care) AND (BPSD OR "behavioural and psychological symptoms of dementia" OR neuropsychiatric symptoms OR physical violence OR physical aggression OR severe depression OR suicidal tendencies)	381	Date: 2007–2017 Language: English Age: All adult Geographic location: Australia & New Zealand, Continental Europe, UK and Ireland, Europe, USA, Canada	165	31
15/6/2017	PsycINFO	(dementia OR alzheimer's OR cognitive impairment OR memory loss OR cognitive decline OR cognitive impairment) AND (specialist care OR aged-care OR neurobehavioural OR neurobehavioral OR confused and disturbed elderly OR transitional behavioural assessment and intervention OR inpatient OR psychogeriatric OR extended care OR intensive specialist care) AND (BPSD OR "behavioural and psychological symptoms of dementia" OR neuropsychiatric symptoms OR physical	587	Date: 2007–2017 Language: English Age: Adulthood (18+ years); 30–39 years; 40–64years; 65+ years; 85+ years Subject: Geropsychology, elder care, psychosocial factors, intervention, distress, cognitive ability, agitation, aggressive behaviour, long term care,	93	16

Date	Database	Search Strategy	Results	Limits applied	Results	Downloaded to Endnote
		violence OR physical aggression OR severe depression OR suicidal tendencies)		geriatric patients, clinical trials, patients, geriatrics, dementia, behaviour, alzheimer's disease, cognitive impairment, neuropsychiatry, major depression, aging, psychiatric symptoms		
16/6/2017	Medline	(unit OR service OR inpatient OR specialist OR residential OR extended OR acute) AND (behavi#r OR psycholog* OR BPSD OR geriatric* OR psychogeriatric* OR neuropsychiatric OR violence OR aggression OR depression OR suicide* OR delirium OR dementia OR alzheimers OR (cognitive AND impairment) AND (evaluation OR program OR pilot OR review)	Over 48,000	This search was restructured		
16/6/2017	Medline	(AB (dementia OR alzheimer's OR (cognitive AND impairment))) AND (AB (unit OR service OR inpatient OR specialist OR residential OR extended OR acute)) AND (AB (behavi#r OR psycholog* OR BPSD OR geriatric* OR psychogeriatric* OR neuropsychiatric OR violence OR aggression OR depression OR suicide* OR delirium)) AND (AB (evaluation OR program OR pilot OR review))	2238	Date: 2007–2017 Language: English Age: 45–64 years, 65+ years, 80+ years Geographic location: Australia & New Zealand, Europe, UK and Ireland, Continental Europe, USA, Canada	75	9
16/6/2017	CINAHL	(AB (dementia OR alzheimer's OR (cognitive AND impairment))) AND (AB (unit OR service OR inpatient OR specialist OR residential OR extended OR acute)) AND (AB (behavi#r OR psycholog* OR BPSD OR geriatric* OR psychogeriatric* OR neuropsychiatric OR violence OR aggression OR depression OR suicide* OR delirium)) AND (AB (evaluation OR program OR pilot OR review))	2119	Date: 2007–2017 Language: English Age: 45–64 years, 65+ years, 80+ years	245	27

Date	Database	Search Strategy	Results	Limits applied	Results	Downloaded to Endnote
				Geographic location: Australia & New Zealand, Europe, UK and Ireland, Continental Europe, USA, Canada		
19/6/2017	PsycINFO	(AB (dementia OR alzheimers OR (cognitive AND impairment)) AND (AB (unit OR service OR inpatient OR specialist OR residential OR extended OR acute) AND AB (behavi#r OR psycholog* OR BPSD OR geriatric* OR psychogeriatric* OR neuropsychiatric OR violence OR aggression OR depression OR suicide* OR delirium) AND (AB (evaluation OR program OR pilot OR review)	1294	Date: 2007–2017 Language: English Age: 45–64 years, 65+ years, 85+ years Population: Human	329	39
Totals			**12,779**		**1149**	**154**

Appendix B: Summary of included papers

Lead author (year), references, name of unit	Study description	Level of evidence (study type)
Anderson (2016)[20, 29] **Transitional Behavioural Assessment and Intervention Service (T-BASIS) units** **Australia**	Mixed methods evaluation of five T-BASIS units involving site visits, interviews, administration of clinical assessment tools (e.g. to assess behaviour), use of administrative data (e.g. length of stay) and medical record audits	Level IV (case series)
Astell (2008)[22] **Geriatric Medicine/Old Age Psychiatry Unit** **Scotland**	Evaluation of all 234 patients admitted to the unit over a 4-year period. Data collected at time of separation from the unit	Level IV (case series)
Chiu (2009)[36] **Psychogeriatric and Geriatric Unit** **Australia**	Retrospective audit comparing characteristics of patients admitted to the unit with the average for NSW	Level IV (case series)
George (2011)[25] **Joint geriatric and psychiatric wards** **UK, Australia, USA, the Netherlands and Germany**	Review of the literature, which identified 13 papers on joint geriatric/psychiatric wards published between 1980 and 2010. No randomised controlled trials included	Literature review which primarily includes Level IV studies **Emerging practice**
Goldberg (2013)[23, 39, 40, 58] **Medical and Mental Health Unit** **England**	Patients were randomised to receive either care in the unit or usual care (in an acute geriatric medical ward or general medical ward). Data collection included a range of health outcome measures, time spent at home in the 90 days after randomisation, carer satisfaction and direct observation	Level II (randomised controlled trial) **Promising practice** (would have been rated as 'best practice' if there had been evidence of improved outcomes)
Gonski (2012)[24] **Secure Unit** **Australia**	Retrospective audit of 45 consecutive admissions to the unit over a 4-month period. Data collection included diagnosis, falls, medications, use of 'specials', length of stay and behaviour	Level IV (case series) **Emerging practice**

Lead author (year), references, name of unit	Study description	Level of evidence (study type)
Jayalath (2013)[33] **Continuing Care Dementia Unit** **England**	Prospective, observational study of patients admitted to the unit. Patients assessed for the presence of neuropsychiatric symptoms and severity of dementia, compared with assessments of the same patients two years previously	Level IV (case series) **Emerging practice**
Koskas (2011)[37] **Cognitive and Behavioural Unit (CBU)** **France**	Comparison of clinical assessment data between patients admitted to the CBU and patients admitted during an earlier time period to a co-located Acute Psychogeriatric Unit	Level IV (case series)
Lai (2009)[30] **Special Care Units** **The USA, Canada, Italy and Germany**	Systematic review of special care units, which included 8 non-RCTs published between 1995 and 2006 (no randomised controlled trials were identified)	Systematic review including Level III studies. Selection bias identified as a 'major problem'
NSW Health (2011)[28] **Mental Health Aged Care Partnership Initiative** **Australia**	Mixed-methods evaluation from 2006 to 2008 with data collection including resident activity and demographic data, clinical profile data, focus groups, interviews and surveys to collect data from families, carers and service providers	Level IV (case series)
Nobili (2008)[32] **Alzheimer Special Care Units (ASCU)** **Italy**	Representative sample of 35 ASCUs and 9 nursing homes randomly selected. 10 consecutive admissions to each unit enrolled on admission. Clinical outcomes measured at 6, 12 and 18 months	Level III-2 (cohort study) **Promising practice**
Roberts (2015)[34] **Memory Support Unit** **Australia**	Described as a 'small pilot study'. Data collection included retrospective audit of medication use, assessment of BPSD at baseline and follow-up, dementia care mapping, interviews with families/carers and a staff survey	Level IV (case series) **Emerging practice**
Saidlitz (2017)[21] **Cognitive and Behavioural Unit (CBU)** **France**	Prospective study of patients admitted to the CBU in 2011 and 2012. Data collection included length of stay, medication used, activities of daily living and behavioural symptoms at admission and discharge	Level IV (case series) **Emerging practice**

Lead author (year), references, name of unit	Study description	Level of evidence (study type)
Soto (2012)[26] **Alzheimer Special Acute Care Inpatient Unit (SACU)** **France**	Study of admissions to the SACU from 1996 to 2006. Data collection included clinical assessment data	Level IV (case series)
Stevenson (2007)[27, 59] **Psychiatric Intensive Care Unit for elders (PICUe)** **Scotland**	Quantitative descriptive Small prospective study of activity in the PICUe using routinely collected data Two studies were published (in 2005 and 2007) using the same methodology to report data for different time periods	Level IV (case series)
Zieschang (2010)[35, 38] **Special Care Unit (SCU)** **Germany**	Prospective data collection on mortality, length of stay, main diagnosis, activities of daily living, mobility and behaviour	Level IV (case series) **Emerging practice**
Zwijsen (2014)[31, 42, 43] **Grip on Challenging Behavior care program** **The Netherlands**	Participating dementia special care units were randomly assigned to 1 of 5 groups with progressive start times for implementation of the care program. Data collected on behaviour symptoms, use of psychoactive drugs and use of restraints	Level II (cluster randomised controlled trial with stepped-wedge design) **Best practice**

Appendix C: Included papers — setting, location and patient population

Lead author (year), name of unit	Setting	Location	Patient population
Anderson (2016) **Transitional Behavioural Assessment and Intervention Service (T-BASIS) units**	Hospital	NSW	Ambulant people with dementia, largely with moderate or severe dementia. People with significant challenging behaviours
Astell (2008) **Geriatric Medicine/Old Age Psychiatry Unit**	Hospital	Scotland	77% of patients moderately or severely affected by dementia. High level of behavioural problems (81%)
Chiu (2009) **Psychogeriatric and Geriatric Unit**	Large teaching hospital	Sydney	Some patients (number not stated) in AN-SNAP class 301 (which is not limited to patients with dementia)
George (2011) **Joint geriatric and psychiatric wards**	Hospital	UK (5 studies), Australia (4), USA (2), the Netherlands (1) and Germany (1)	The major patient group was patients with delirium and dementia, particularly with behavioural problems and coexistent medical illnesses
Goldberg (2013) **Medical and Mental Health Unit**	Large general hospital	England	Patients aged over 65 admitted to hospital with acute physical illness or injury, identified as 'confused' on admission. Two-thirds had previously diagnosed dementia. Behavioural and psychological symptoms described as 'common'
Gonski (2012) **Secure Unit**	Large teaching hospital	Sydney	Acutely ill elderly patients. 89% had dementia, of which 47% had superimposed delirium. 89% exhibited at least one type of challenging behaviour
Jayalath (2013) **Continuing Care Dementia Unit**	Residential aged care	England	The unit is described as being for patients with 'severe behavioural and psychiatric symptoms in dementia'
Koskas (2011) **Cognitive and Behavioural Unit**	Geriatric hospital	France	Elderly patients showing the most advanced dementia and disruptive BPSD
Lai (2009) **Special Care units**	Residential care	The USA (3 studies), Canada (2), Italy (2) and Germany (1)	The special care units included in the review targeted people with dementia. Some references in the included studies to 'problem behaviours' and 'disruptive behaviours' but no references to 'extreme' or 'severe' BPSD

Lead author (year), name of unit	Setting	Location	Patient population
NSW Health (2011) **Mental Health Aged Care Partnership Initiative**	Residential aged care facilities	NSW	One unit targeted older people with complex, severe behavioural and psychiatric symptoms associated with mental illness and/or dementia. The other unit targeted older people with dementia or other age-related organic impairment, and/or pre-existing psychiatric illness. The report contains no data on severity of BPSD
Nobili (2008) **Alzheimer Special Care Units**	Residential aged care	Italy	Diagnosis of moderate to severe dementia and severe behavioural disturbances (total score of 24 or more on the Neuropsychiatric Inventory (NPI) scale, or a score of 12 in one of the NPI subscales)
Roberts (2015) **Memory Support Unit**	Rural health service	Victoria	All participating residents on the unit had a diagnosis of moderate to severe dementia. No references to severe, extreme or challenging behaviours
Saidlitz (2017) **Cognitive and Behavioural Unit**	Hospital	France	85% of patients had a diagnosis of dementia. The purpose of the unit is described as the 'care of disruptive psycho-behavioural symptoms'
Soto (2012) **Alzheimer Special Acute Care Inpatient Unit**	Hospital	France	83% of admissions had a diagnosis of dementia. Presence of BPSD identified as a frequent reason for admission but the severity of the BPSD is not addressed in the paper
Stevenson (2007) **Psychiatric Intensive Care Unit for elders**	Hospital	Scotland	The majority of patients (86%) had a diagnosis of dementia and presented with behavioural problems resulting in a risk to themselves, other patients or staff
Zieschang (2010) **Special Care Unit (SCU)**	Hospital	Germany	Acutely ill older patients with challenging behaviour due to dementia and/or delirium. Eighty six per cent had a diagnosis of dementia
Zwijsen (2014) **Grip on Challenging Behavior care program**	Nursing homes	The Netherlands	All residents included in the study had a diagnosis of dementia. Behaviours described as 'challenging' rather than 'extreme' or 'severe'

Appendix D: Included papers — admission criteria, diagnosis and discharge

Lead author (year), name of unit, country	Admission criteria	Dementia diagnosis on admissions	Mental health diagnosis	Discharge
Anderson (2016) **Transitional Behavioural Assessment and Intervention Service (T-BASIS) units** **Australia**	Need for medium-stay assessment / treatment to manage BPSD. Primary target group is ambulant people with dementia and physical health co-morbidities. Some with primary diagnosis of mental health or mental health co-morbidities	Alzheimer's, vascular, alcohol-related, all accepted	Psychosis, usually a co-morbidity with dementia	Not clear if the RACF for discharge was the RACF pre-arrival
Astell (2008) **Geriatric Medicine/Old Age Psychiatry Unit** **Scotland**	Deemed in the acute setting to require ongoing assessment and management while awaiting placement in nursing home. Patients have a combination of physical and psychiatric problems, with 80% BPSD	Dementia type not specified — severe (38%), moderate (42%) and mild (20%)	Depression	Death (23%), return home (9%) and RACF placement (58%) but not specified if it was returning or a new admission to RACF
Chiu (2009) **Psychogeriatric and Geriatric Unit** **Australia**	Psychogeriatric patients over 50 years, average age of 80 years. Older psychiatric patients with acute medical illness	Not specified	Not specified	Not specified, but low rate of re-admission noted
George (2011) **Joint geriatric and psychiatric wards** **UK, Australia, USA, the Netherlands and Germany**	Over 65 with either dementia, delirium and depression and/or mental health problems and BPSD	Various, not specified	Not specified	To other facility not specified
Goldberg (2013) **Medical and Mental Health Unit** **England**	Patients presenting to emergency department were confused and over 65 years. Excluded: if under Mental Health Act, drug and alcohol problem, other clinical problems requiring admission to medical, surgical or other high-dependency ward	Dementia type not specified	Not specified	Death

Lead author (year), name of unit, country	Admission criteria	Dementia diagnosis on admissions	Mental health diagnosis	Discharge
Gonski (2012) **Secure Unit** **Australia**	BPSD, unable to be managed on general medical wards	Alzheimer's, vascular, dementia mixed type, half with superimposed delirium	Not specified	To other RACF, half of new admissions went to a higher level of care, some returned home, or were transferred to a general medical ward
Jayalath (2013) **Continuing Care Dementia Unit** **England**	Dementia-related BPSD	Alzheimer's, frontotemporal, vascular, Lewy body	Not specified	To other RACF, death, remain in unit
Koskas (2011) **Cognitive and Behavioural Unit** **France**	Patients with dementia and BPSD who require inpatient long-term hospitalisation, but with goal of returning home.	Alzheimer's	Not specified	Aim is for patients to return home
Lai (2009) **Special Care Units.** **The USA, Canada, Italy and Germany**	Dementia	Alzheimer's, dementia type not specified in all studies	Depression, various specified in each study	Death
NSW Health (2011) **Mental Health Aged Care Partnership Initiative** **Australia**	People aged 65 years or older, with dementia or other age-related organic impairment, and/or pre-existing psychiatric illness	Alzheimer's, frontotemporal, vascular, alcohol-related	Not specified	To other RACF, to other facility, psychiatric hospital, non-psychiatric hospital, home
Nobili (2008) **Alzheimer Special Care Units** **Italy**	Patients with moderate to severe dementia with BPSD. Noted to be younger, more mobile and less clinically compromised than nursing home patients	Alzheimer's	Not specified	Death, another unit in the same centre

Lead author (year), name of unit, country	Admission criteria	Dementia diagnosis on admissions	Mental health diagnosis	Discharge
Roberts (2015) **Memory Support Unit** **Australia**	Dementia	Not specified	Not specified	Death, remain in unit
Saidlitz (2017) **Cognitive and Behavioural Unit** **France**	Ambulant patients with dementia and BPSD who require inpatient long-term hospitalisation, but with goal of returning home.	Alzheimer's, dementia type other than Alzheimer's not specified	Not specified	Return to original RACF, death, return home, other hospital unit, psychiatry unit
Soto (2012) **Alzheimer Special Acute Care Inpatient Unit** **France**	Older patients with neurodegenerative disease and BPSD requiring specialist diagnosis, assessment and management of dementia and related medical complications	Alzheimer's, atypical cases of neurodegenerative disease	Not specified	Return to original RACF, other discharge destinations, e.g. return home assumed as median duration of hospitalisation was 8 days and rate of death was not specified
Stevenson (2007) **Psychiatric Intensive Care Unit for elders** **Scotland**	Males, over 65, primary diagnosis of organic brain disease (mainly dementia) with BPSD. 'Clinical risk' — actual or threatened harm that exceeds the capacity of the psychogeriatric inpatient ward to manage the situation safely	Alzheimer's, frontotemporal, vascular, alcohol-related, Huntington's	Schizophrenia, psychosis: 29% had been previously detained under the Mental Health Act	To other facility, return to psychogeriatric unit, 50% still under Mental Health Act. 42% remained under Adults with Incapacity Act
Zieschang (2010) **Special Care Unit (SCU)** **Germany**	Dementia or delirium and need for specialised management of BPSD	Dementia type not specified, but 43% of patients had a superimposed delirium	Anxiety, depression	Return to original RACF, to other facility, new admission to RACF, return home, transfer to another hospital
Zwijsen (2014) **Grip on Challenging Behavior care program** **The Netherlands**	Dementia and BPSD. This study of a 4-step care program took place within dementia special care units in nursing homes with existing residents	Alzheimer's frontotemporal, vascular, Parkinson's, Lewy body mixed Alzheimer's / vascular	Anxiety, depression, not specified	Remained in unit in nursing home

Appendix E: Included papers — organisational characteristics

Lead author (year), name of unit	Ethos / philosophy of care/ approach	Organisational structure / governance / leadership	Funding / resources	Staffing	Staffing comments	Physical design features	Intervention / activity program
Anderson (2016) **Transitional Behavioural Assessment and Intervention Service (T-BASIS) units** **Australia**	Multidisciplinary team of health professionals working in a specifically designed 16-bed unit to develop medical bio-psychosocial management plans for patients with BPSD using a 'case specific care' approach	NSW state health run hospital units, managed by the Director of Mental Health in collaboration with the Director of Aged Care. Medical Director, either geriatrician or psychogeriatrician, with medical, nursing and allied health staff. Key aspect of the structure is an outreach team	NSW Health funded except for one unit (Yathong Lodge), which is joint Commonwealth / State funded	Registered nurse, enrolled nurse, Clinical Nurse Consultant, diversional therapist, social worker, geriatrician, psychogeriatrician, general practitioner/VMO, security staff, dedicated ward clerk and access to a range of allied health professionals, e.g. physiotherapists and speech therapists	In rural areas where geriatrician / psychogeriatrician not able to be appointed, medical director could be GP or psychiatrist under clinical supervision by a geriatrician or psychogeriatrician	Units were purpose built for management of people with BPSD	Primarily a personalised approach to psychosocial therapies / interventions. Use of medication to manage BPSD reduced to minimum
Astell (2008) **Geriatric Medicine/Old Age Psychiatry Unit**	Not specified	Non-acute, 26 bed geriatric medicine / old age psychiatry secure unit run as part of the hospital	Health funds not specified	Psychologist, occupational therapist, diversional therapist,	Multidisciplinary team, mix of general and mental health trained nurses, and	26 bed unit, separate accommodation for male and female patients. Secure unit with alarmed exits	Focus on treating medical / mental health issues and increasing ADL function to facilitate

Lead author (year), name of unit	Ethos / philosophy of care/ approach	Organisational structure / governance / leadership	Funding / resources	Staffing	Staffing comments	Physical design features	Intervention / activity program
Scotland				geriatrician, general practitioner/VMO, psychiatrist, and nursing staff level not specified	geriatrician, psychiatrist and GP input	and pinpoint entry system. Described as 'calm and spacious compared with an acute medical ward'.	discharge to optimum discharge destination
Chiu (2009) Psychogeriatric and Geriatric Unit Australia	Co-location of geriatric and psychogeriatric services to facilitate multidisciplinary co-management of patients	Unit was part of Bankstown-Lidcombe hospital	Bankstown-Lidcombe hospital funded unit	Registered nurse, enrolled nurse, occupational therapist, social worker, geriatrician, psychogeriatrician and physiotherapist	Serviced by 1.2 FTE psychogeriatricians, a psychiatric registrar and CMO all working closely with geriatricians. 0.25 FTE nurse per patient (daytime) 0.2 FTE physiotherapist, 0.5 FTE occupational therapist and full-time social worker	Separate 12-bed inpatient unit but physically co-located within a greater geriatric ward. Close supervision of patients possible from staff desk with 270-degree glass panelling. Close monitoring of aggressive and wandering patients minimised the need for chemical and physical restraint	Physiotherapist, occupational therapist and social worker provide intervention but therapy / activity program not specified
George (2011) Joint geriatric and psychiatric wards UK, Australia, USA, the	Person-centred care	Separate wards within the context of acute hospitals	Health funding	Registered nurse, geriatrician, psychiatrist, and rehabilitation staff / multidisciplinary team	Generally, units had medical and psychiatric specialists, nursing and a mix of allied health / therapy staff	Homely secure environment	Joint medical and psychiatric management, rehab focus, palliative care mentioned, active discharge planning, better management

Lead author (year), name of unit	Ethos / philosophy of care/ approach	Organisational structure / governance / leadership	Funding / resources	Staffing	Staffing comments	Physical design features	Intervention / activity program
Netherlands and Germany							of patient safety concerns
Goldberg (2013) **Medical and Mental Health Unit** **England**	Person-centred dementia care. Multidisciplinary approach to comprehensive geriatric assessment and treatment	Development of the Medical and Mental Health Unit project led by clinical academic investigators from University of Nottingham, and supported by senior management of local health trust	Hospital funding and grant funding to implement the changes	Registered nurse, enrolled nurse, personal care worker (or similar), social worker, speech therapist, dietitian, geriatrician, psychogeriatrician, other medical staff, rehabilitation support worker, physiotherapist, discharge planner and receptionist	Ideal staffing compliment on MMHU ward includes: mental health trained nurses, healthcare assistants, mental health specialist occupational therapist	Ward relocated to a more spacious area. Secure unit with enclosed day and dining area, separate interview / relatives room, more office space. Orientation prompts included: clear signage, secure bedside lockers to reduce loss of personal possessions, small memory boxes near beds for photos and other mementos. Single isolation rooms available for infection control and end-of-life care	Person-centred approach to care plan development for increasing independence with personal care where possible. Care tasks seen as a process and activity. Therapeutic and diversional activity including games, quizzes, craft, music, reminiscence, cooking
Gonski (2012) **Secure unit** **Australia**	Behavioural and environmental approach with controlled use of	Secure unit within an acute hospital	Health funded	Registered nurse, enrolled nurse, geriatrician, and	At least two nursing staff present 24 hours per day	Secure 10-bed unit, with area to mobilise, outside area, dining room and lounge, minimisation of noise	Behavioural interventions not specified

Lead author (year), name of unit	Ethos / philosophy of care/ approach	Organisational structure / governance / leadership	Funding / resources	Staffing	Staffing comments	Physical design features	Intervention / activity program
	pharmacological interventions			allied health — not specified		and calming use of colour and light. Staff able to supervise patients more closely due to design features	
Jayalath (2013) Continuing Care Dementia Unit England	Emphasis on non-pharmacological approach to BPSD management	Not specified	NHS funded continuing care (long-stay inpatient) unit plus specific grant to improve design of the unit	Registered nurse, enrolled nurse, occupational therapist, diversional therapist, pharmacist, general practitioner/VMO and psychiatrist	Hours of occupational therapy were increased during the two-year study period	Two purpose-built bungalows, renovations to increased natural light, and a multisensory (Snoezelen) room was included.	Regular pharmacy reviews of medication in consultation with psychiatrist, a range of diversional activities and behavioural treatments run by occupational therapist, but activity type not specified
Koskas (2011) Cognitive and Behavioral Unit France	Collaborative management by medical and psychiatric specialists and a focus on non-pharmacological interventions. Cognitive and Behavioural Unit's aim is to stabilise behavioural problems	Part of an acute geriatric hospital. Unit within the Department of Psychogeriatrics	Hospital (health insurance) funded	Registered nurse, enrolled nurse, psychologist, occupational therapist, geriatrician, psychiatrist, psychomotor therapist and	Higher number of staff than general ward. Mix of therapy staff to undertake ergotherapy, sociotherapy and psychomotricity	The Cognitive and Behavioural Unit is a seven-bed unit within a hospital setting, co-located with a 15-bed Acute Psychogeriatric Unit. Specific design to enable 'risk-free wandering' and separate areas for the	Psychiatry and medical management with a range of therapies such as ergotherapy, sociotherapy and psychomotricity

Lead author (year), name of unit	Ethos / philosophy of care/ approach	Organisational structure / governance / leadership	Funding / resources	Staffing	Staffing comments	Physical design features	Intervention / activity program
	using individual cognitive and behavioural rehabilitation programs			gerontological assistant		minimisation of 'noxious stimuli'	
Lai (2009) **Special Care Units** **The USA, Canada, Italy and Germany**	Not specified in all studies	Not specified, other than the units were in intermediate or long-term care facilities / nursing homes	Not specified	Not specified	Not specified in the summary of included studies	Secure units, homelike, one semi-attached bungalows each with its own small garden (described as being an 'award-winning facility')	Special activities, individual assessment or care planning, integrated day program replaced episodic therapist interventions
NSW Health (2011) **Mental Health Aged Care Partnership Initiative** **Australia**	An increased level of staffing; a multidisciplinary approach (including nursing, medical and allied health input); enhanced staff psychiatric knowledge and skills in behavioural management; access to specialist psychogeriatric and geriatric medical support and advice; clear clinical	CHC — Memorandum of understanding between Local Health District, Commonwealth Government, NSW Health and CHC. HC — Partnership Service Deed between NSW Health and Hammond Care	CHC — Funded by Australian Government Aged Care Innovative Pool Funding, Local Health District and CHC. Specialist clinical support and in-kind support was provided by the Local Health District	Registered nurse, personal care worker (or similar), psychologist, diversional therapist, podiatrist, geriatrician, psychogeriatrician, general practitioner/VMO, and psychiatrist	Transition co-ordinator, physiotherapist, general allied health professionals as needed	The units provided a home-like environment with a relaxed atmosphere and support was provided by the staff and families	Not specified

Lead author (year), name of unit	Ethos / philosophy of care/ approach	Organisational structure / governance / leadership	Funding / resources	Staffing	Staffing comments	Physical design features	Intervention / activity program
	governance arrangements regarding personal, medical and specialist care needs of clients; and suitable architectural and interior design. Staff demonstrated a preparedness to explore new approaches to caring for residents when more traditional approaches were not working		HC — Funding from NSW Health, Commonwealth Government standard residential funding and HC provided capital funding. Specialist clinical support was provided by Local Health District				
Nobili (2008) **Alzheimer Special Care Units** **Italy**	Individualised care and focus on minimising the use of physical and pharmacological restraint. Each unit was required to improve the suitability of the environment, e.g. by creation of wandering areas; and test new caring programs, e.g. a problem-oriented approach	Alzheimer Special Care Units were established within nursing homes that were already equipped for the care of people with BPSD	Funded by the government of the Lombardy Region	Registered nurse, enrolled nurse, psychologist, occupational therapist, psychiatrist, other medical staff, and rehabilitation therapists	Each patient received on average 1220 minutes per week of staff care compared with 900 minutes per week in nursing homes	20-bed secure ward with a program of design renewal to support, encourage and stimulate people with dementia, and limit negative consequences of BPSD on other residents and staff. This included: creation of wandering areas, separate	Behavioural therapies not specified

Lead author (year), name of unit	Ethos / philosophy of care/ approach	Organisational structure / governance / leadership	Funding / resources	Staffing	Staffing comments	Physical design features	Intervention / activity program
						activity areas, use of colour to maximise orientation and way-finding. and reduction of noxious stimuli	
Roberts (2015) **Memory Support Unit** **Australia**	Person-centred care incorporating Montessori principles, capacity focused. ABLE model — focus on capabilities and Abilities, understand the social context and Background of the resident, Leadership at senior executive level to promote culture change, Environment and design to maximise resident orientation and memory	Organisational leadership by board and CEO through to team leaders and staff	Staffing resources from health service staff in addition to Commonwealth funded staff	Registered nurse, enrolled nurse, Clinical Nurse Consultant, personal care worker (or similar), speech therapist, dietitian, geriatrician, general practitioner/VMO, physiotherapist, cognitive rehabilitation therapist and environmental services staff	Agency and casual staff were not recruited for the ABLE project	15-bed memory support unit with homelike environment, signage to provide memory prompts, staff with large-print name badges, use of colour and tactile 'interactive' wall space. Activity areas included a small shop, relaxation room and other designated activity areas. Outdoor activity areas included a garden, chicken coop, shaded areas, an old car, a barbecue area	Pro-active engagement with GPs re reduction in prescription of antipsychotic and sedative drugs. Dementia care mapping, a range of activities such as music, hobbies, reading, physical activity, social interaction, games and domestic activities such as ironing, gardening, caring for chickens. Note: large TV was removed from the common area

Lead author (year), name of unit	Ethos / philosophy of care/ approach	Organisational structure / governance / leadership	Funding / resources	Staffing	Staffing comments	Physical design features	Intervention / activity program
Saidlitz (2017) **Cognitive and Behavioural Unit** **France**	Cognitive and Behavioral Unit aims to stabilise BPSD through individualised cognitive and behavioural rehabilitation program	Part of Toulouse hospital	Health (insurance) funding	Registered nurse, psychologist, occupational therapist, psychomotor therapist and gerontological assistant		Purpose-designed dementia care secure 10-bed unit with areas for wandering, activities and outdoor garden	A range of cognitive and behavioural interventions, e.g. physical activities, cognitive stimulation, relaxation, reorientation and sensory stimulation. Psychological support also provided to carers
Soto (2012) **Alzheimer Special Acute Care Inpatient Unit** **France**	Person-centred care. Multidisciplinary bio-psychosocial approach using a range of therapies. Focus on non-pharmacological interventions and reduction in use of antipsychotic medications	Part of hospital	Hospital funded	Registered nurse, enrolled nurse, psychologist, social worker, dietitian, geriatrician, psychogeriatrician, psychiatrist, other medical staff, physiotherapist and neurologist	This unit has a full complement of specialist medical, nursing and allied health staff	Secure unit with two separate sections so 'calmer' patients with mild dementia are separate from those with moderate and severe dementia and BPSD. Need for expansion in capacity to cater for patients with the most severe, impulsive and dangerous behaviour in crisis situations led to changing the design to incorporate	A range of allied health staff provided therapies for patients. Details not specified, but improvements were noted in function

Lead author (year), name of unit	Ethos / philosophy of care/ approach	Organisational structure / governance / leadership	Funding / resources	Staffing	Staffing comments	Physical design features	Intervention / activity program
						a separate one-bed secure unit	
Stevenson (2007) **Psychiatric Intensive Care Unit for elders** **Scotland**	Aim to provide a specific intensive psychiatric care unit for older people with an individualised behavioural management approach. Where possible reduce psychotropic medication use	Unit established on site of an existing male psychogeriatric ward in a psychiatric hospital (asylum) under the leadership of a psychiatrist	Hospital funded.	Registered nurse, enrolled nurse, psychologist, occupational therapist, speech therapist, pharmacist, psychiatrist and other medical staff	Physiotherapy, aromatherapy. One session per week from both consultant psychiatrist and trainee psychiatrist. Nursing and allied health staffing levels for 12 beds = 10 trained and 11 untrained staff. 2 staff on at night	Locked ward that was previously a psychogeriatric unit in a Victorian-era asylum. Single open ward design was converted into 20 single-cubicle sleeping areas, no single bedrooms and no ensuite facilities. Access to a private, enclosed patio / garden area and areas to safely wander	Behavioural-based individual and group interventions including diversional activities, music and art therapy, recreational and reminiscence therapies, aromatherapy, hand massage, Snoezelen therapy and social outings. Staff were proactive at de-escalating aggressive incidents
Zieschang (2010) **Special Care Unit (SCU)** **Germany**	Multidisciplinary team. Focus on individualised behavioural interventions in secure unit to reduce use of antipsychotics or 'pharmacological restraints'. Non-confrontational	Unit is part of an acute hospital	Hospital funded	Registered nurse, enrolled nurse, psychologist, occupational therapist, social worker, speech therapist, psychiatrist, physiotherapist,	Additional allied health and therapy staff on the unit provided the nursing staff with additional support in providing the patients with meaningful daytime	6-bed secure unit created in the acute hospital by dividing off the end section of the ward with a code-locked door to provide a safe area for safe ambulation of patients and	A diverse range of therapies and day activities to suit patient needs include shared meals with two therapists eating breakfast with patients. Group

Lead author (year), name of unit	Ethos / philosophy of care/ approach	Organisational structure / governance / leadership	Funding / resources	Staffing	Staffing comments	Physical design features	Intervention / activity program
	approach to patient care, relaxed atmosphere in the unit			behavioural therapist and trained 'lay helpers'	and afternoon activities, which was found to reduce 'sundowning' and prevent boredom and daytime sleep	ensure there was no distracting 'through traffic' from the ward. One room of the unit was designed as a living / activities room and shared dining area	therapies run by the psychologist, music therapy and individual therapy interventions e.g. physiotherapy, speech therapy and behavioural therapy
Zwijsen (2014) **Grip on Challenging Behavior care program** **The Netherlands**	Multidisciplinary approach, individual behaviour-based care planning and psychosocial interventions. Minimise use of psychotropic drugs	Nursing homes	Not specified	Registered nurse, enrolled nurse, personal care worker (or similar), psychologist and other medical staff		Study in 17 separate dementia special care units	Grip on Challenging Behavior is a 4-step structured care program that supports a multidisciplinary approach to BPSD. The four steps are: detection, analysis, treatment and evaluation. Staff were trained in the program and the study evaluated the impact of the program on staff and patients