

### Effective strategies for the implementation of organisation-wide delirium and/or dementia care

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### Executive Summary

#### Objective

This literature review summarises strategies to implement delirium and/or dementia guidelines, interventions or programs in hospitals and residential dementia care facilities that were reported to be effective in improving clinical (patient) and process (staff/organisation) outcomes. The results include the content of the intervention (i.e. prevention, treatment, screening, or management of delirium/dementia); format of intervention (i.e. mode in which how the content was delivered, whether through education, posters, reminders); as well as its context (i.e. clinical setting). It also provides insight into how the implementation process of guidelines and interventions could be enhanced.

#### Methods

A literature search using Google and Google Scholar was used to identify systematic reviews, meta-analyses, reports in English that were published between 2011 to current.

#### Summary of findings

A total of 186 results were identified, two systematic reviews [1, 2] and two reports [3, 4] were included in this review for which data was extracted. Clinical settings included diverse hospital settings (emergency department, intensive care unit as well as other settings within the hospital) and the content of each intervention varied widely.

The ten most frequently reported strategies used to implement delirium and/or dementia guidelines, interventions or programs are listed below (details of these strategies are found in Table 3, full report):

- |  |                                    |
|--|------------------------------------|
| 1. Educational meetings                  | 6. Audit and feedback              |
| 2. Outreach visits                       | 7. Local opinion leader            |
| 3. Local consensus processes             | 8. Structural interventions        |
| 4. Distribution of educational materials | 9. Provider oriented interventions |
| 5. Patient-mediated intervention         | 10. Reminders                      |

The table below shows the implementation strategies for delirium and/or dementia management interventions most frequently reported in literature.

Setting/Context	List of interventions	Type of implementation strategy
Hospital: Intensive care unit	Integrated pain, agitation/sedation and delirium monitoring and management (PAD); Awakening and breathing coordination, delirium monitoring/management and early exercise/mobilisation (ABCDE bundle); Multifaceted sleep promotion program; Delirium screening; Delirium prevention program.	<ul style="list-style-type: none"> <li>Educational meetings</li> <li>Patient-mediated strategies</li> <li>Distribution of materials</li> </ul>
Hospital: Emergency department	Aged care services in emergency teams (ASETs); Geriatric Rapid Acute Care Evaluation (GRACE) program; Medical Assessment Units (MAUs).	<ul style="list-style-type: none"> <li>Provider-oriented strategies</li> <li>Structural strategies</li> </ul>

Within other hospital settings	Rapid Assessment Interface and Discharge (RAID) psychiatric liaison service; Specialist wards or units; Hospital education programs; Care of the Confused Hospitalised Older Person Study (CHOPS); Fall Rehabilitation Therapy, Acute Geriatric Unit (AGU); End-of-life care.	<ul style="list-style-type: none"> <li>• Educational meetings</li> <li>• Provider-oriented strategies</li> <li>• Structural strategies</li> </ul>
Residential dementia care facility	<p>Staff training in Assisted Living Residence (STAR); Training in dementia care, nutrition nursing care, and formal staff management skills; Training in feeding skills, behaviour skills and communication skills;</p> <p>Education program (dignity and dementia); Restraint minimisation program; Carers program; Nursing assistant communication skills program (NACSP); Staff education and peer support;</p> <p>Resident-oriented care; Integrated care; Emotion-oriented care; Restorative care for the cognitively impaired; Palliative care; Basic care; Individualised music; Foundations of dementia care (FDC); Gentle persuasive approaches curriculum (GPA); Family information, memory and communication skills booklets; Nursing guideline on depression in dementia.</p>	<ul style="list-style-type: none"> <li>• Educational meetings</li> <li>• Outreach visits</li> <li>• Local consensus</li> </ul>

Quantitative results from the two systematic reviews [1,2] were combined to derive the most commonly-reported implementation strategies in the intensive care unit and residential dementia care facilities, and their effect on the outcomes of interest. Although the results were unable to show the effect of a single strategy on a particular outcome in isolation, it reflected the proportion of studies that reported significant improvement in outcomes when a given strategy was used. Results show that:

- Education (holding meetings and/or distribution of educational material) was used in 98.4% of the 62 studies.
- Delivering educational meetings was the most commonly reported implementation strategy in the intensive care unit and residential dementia care facility; significant increases were reported in screening adherence in 87% of the studies having used this strategy for the purpose of screening.
- Local consensus and distribution of educational material were implementation strategies that had significant positive impact on staff knowledge and screening adherence in more than 70% of the studies.
- Patient-mediated strategies had significant impact on both screening adherence as well as incidence of delirium in more than 75% of studies.
- More than 75% of studies that used other implementation strategies such as outreach, audit/feedback, opinion leaders, provider-oriented strategies (which involve skill mixes and revision of professional roles of staff), and/or reminders also reported significant increases in screening adherence.
- Patient-mediated implementation strategies (which involve the collection of new, previously unavailable clinical data collected directly from patient) significantly decreased the incidence of delirium in 75% of studies that used this strategy.

## Implications for changing practice

### *Multifaceted approach, integration of diverse care settings [1,3]*

Multifaceted implementation programs (which include the monitoring and management, screening and prevention of delirium in the intensive care unit) have been shown to effectively change adherence to delirium screening and delirium knowledge. Findings also suggest that a multifaceted as well as integrated approach between hospital, mental health, residential aged care and community services is most likely to ensure that dementia care is delivered in the most appropriate and beneficial setting for the patient.

### *Multiple implementation strategies [1,2]*

The findings from this review suggest that the most frequently reported implementation strategies in literature were educational meetings, outreach, local consensus, distribution, patient-mediated, audit/feedback, opinion leaders, structural, provider-oriented and reminders. The use of multiple implementation strategies is recommended to successfully implement a psychosocial method to dementia care, although based on conducted research no statement can be made on which combination of implementation strategies is most effective. A higher number of implementation strategies (six or more) used concomitantly and delirium management being integrated according to the PAD guidelines or ABCDE bundle, are associated with positive effects or implementation efforts on clinical outcome.

### *Delineate successful intervention (effective practice change) from improvements in clinical outcomes [1]*

It is important that successful implementation (i.e. effective practice change), should be clearly delineated from the effect of such practice changes on clinical outcomes. Robust data on effectiveness of specific implementation strategies with regard to the care of delirious critically ill patients are scarce and there is a lack of data on the association between specific practice changes (for example, delirium screening) and improvements in clinical outcomes. Successful implementation was evident in most studies on delirium screening implementation that showed improved adherence, even without known benefit for clinical outcomes. In other words, implementation was generally successful (i.e. adherence to monitoring screening processes) but linkage of this outcome on clinical outcomes was not proven.

### *Sustainability of an intervention [2]*

Quality improvement initiatives should include caregivers who are intended to apply the intervention, and report on the number of caregivers who actually adopt the intervention, as well as consider the long-term sustainability of the intervention on the organisational level. Considering the constructs of the RE-AIM (Reach, Efficacy, Adoption, Implementation, and Maintenance) framework addresses aspects that promote sustainability. Implementation strategies such as education, local opinion leaders, local consensus, provider-mediated, and structural strategies may enhance the sustainable adoption of an intervention; while the cost and delivery of an intervention, as well as barriers and facilitators are important implementation criteria of an intervention. Running many innovation projects concurrently, family participation, and time required to learn and apply the dementia and/or delirium intervention were described in the evidence as impeding factors of the implementation of psychosocial interventions in dementia care.

### *Organisational support [1,2,4]*

The effectiveness of implementation programs may be enhanced when not only health care professionals are targeted for behavioural change but when organisational changes are employed and are necessary. A project or opinion leader can boost the implementation, and an individual care plan that explains where the intervention fits will stimulate the actual application of the intervention. The Regulation and Quality Improvement Authority report reviewed the implementation of the National Institute for Health and Clinical Excellence (NICE) clinical guideline 42: Dementia to inform the planning and delivery of dementia services in Health and Social Care (HSC) Trusts in Northern Ireland. Feedback from guideline users indicated organisations should consider staff training, awareness, communication, governance, planning, culture and an integration with a dementia strategy to enhance the implementation of a guideline.

## **Limitations**

The results from this review should be interpreted with caution. The systematic reviews included diverse studies with varied data with regards to definitions of outcomes measured, study design, focus of implementation, applied implementation strategies (duration, intensity, and guidance) and models.

This review summarised information presented in the selected publications but did not statistically analyse pooled data of the effectiveness of any given strategy on a specified outcome in isolation. The extent of the information presented should not be construed as indicating the relative importance or effectiveness of individual implementation strategies, but results (from the provider perspective) of any investigations into the strategy's efficacy.

The report also included descriptive/qualitative studies and data which are at high risk of bias.

## **References**

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1. [Zoran Trogrlic, Mathieu van der Jagt, Jan Bakker, Michele C Balas, E Wesley Ely, Peter HJ van der Voort and Erwin Ista \(2015\)](#). A systematic review of implementation strategies for assessment, prevention, and management of ICU delirium and their effect on clinical outcomes. *Critical Care*, 19:157
2. [Petra Boersma, Julia C.M. van Weert, Jeroen Lakerveld and Rose-Marie Dröes \(2015\)](#). The art of successful implementation of psychosocial interventions in residential dementia care: a systematic review of the literature based on the RE-AIM framework. *International Psychogeriatrics*, 27:19-35.
3. [Australian Institute of Health and Welfare \(2013\)](#). Dementia care in hospitals: costs and strategies. Cat. no. AGE 72. Canberra: AIHW.
4. [The Regulation and Quality Improvement Authority Assurance \(2014\)](#). Review of the Implementation of NICE Clinical Guideline 42: Dementia Overview Report

## Background

Monash Health is embarking on an organisation-wide quality improvement initiative in delirium/dementia care with planned implementation of delirium/dementia guidelines and care standards. To inform this initiative the Centre for Clinical Effectiveness (CCE) has conducted a rapid literature review on strategies that effectively implement delirium/dementia care guidelines/and or interventions.

## Objective(s)

The review aims to inform the management of Monash Health by providing:

1. A summary of implementation strategies of delirium and/or dementia (D&D) guidelines, interventions or programs in hospitals and residential aged-care facilities that were reported to be effective in improving clinical (patient) and process (staff/organisational) outcomes. Wherever possible, the results include the content of the strategies (i.e. prevention, treatment, assessment, diagnosis, or management delirium/dementia); format of interventions (i.e. mode in which the content was delivered, whether through education, posters, reminders); as well as the context (i.e. setting).
2. Insight into how the implementation process of guidelines and interventions could be enhanced.

## Question(s)

1. What implementation strategies are effective for programs, quality improvement projects and guidelines in dementia and/or delirium care in improving clinical and process outcomes in hospitals and aged-care facilities?
2. How can the effectiveness of the implementation process of the guidelines and interventions be enhanced?

## Methods

**Table 1.** Search strategy

Item	Description
Population/Setting	<p>Include: Strategies for implementing guidelines, programs, quality improvement projects in any hospital setting (i.e. intensive care units, general medicine, geriatric wards, emergency departments) and residential aged-care facilities (i.e. nursing homes and dementia care)</p> <p>Exclude: Strategies for general practices and in other settings</p>
Outcomes	<p>Include: Strategies that were evaluated by means of having an effect on:</p> <ol style="list-style-type: none"> <li>1) Patient/clinical outcomes (mortality, length of stay)</li> <li>2) Process outcomes (not limited to staff skills/attitudes, staff knowledge, screening adherence, changes in organisational systems and processes, improvement in practice, incidence of delirium/dementia, hospital admissions, anti-psychotic drug use)</li> </ol> <p>Exclude: Strategies that were not evaluated for its effectiveness in improving outcomes</p>
Publication details	<p>Include: Systematic reviews, meta-analyses, reports</p> <p>Exclude: Primary studies; studies that have not described or evaluated their implementation strategies</p> <p>Limits: English language</p>
Publication date	2011 – current

Databases searched	Google; Google Scholar
Google	Search terms used: "delirium dementia guideline implementation strategy review" Limitations: Numbers ranging from 2011-2016.

## Scope

For the purpose of this review, strategies for implementing D&D guidelines, programs or quality improvement projects are not limited to any hospital setting, and included those implemented in residential aged-care facilities (RAC). The review summarises information already included in selected publications but does not assess or statistically analyse pooled data of effectiveness of a strategy on a specified outcome). It presents an overview of effective implementation strategies by means of the proportion of studies reporting a significant effect on clinical (patient) and process (staff/organisational) outcomes for a given strategy.

## Summary of Results

A literature search in Google and Google Scholar identified a total of 186 results, of which 11 reviews and/or reports were shortlisted. Two were excluded due to setting (i.e. General Practice). Three publications lacked adequate description of the implementation strategies, or did not report their effects on outcomes. Of the six publications that met the inclusion criteria, two literature reviews were further excluded due to relevant data already being included in a more recent systematic review. Finally, two systematic reviews [1, 2] and two reports [3, 4] were included in this review for which data was extracted.

**Table 2.** Description of selected publications included in this review

Reference	Type of publication	Setting	Content of document
Trogrlic [1] 2015	Systematic review (21 publications)	Intensive care unit (ICU)	Efficacy of implementation that was defined by outcomes such as mortality, length of stay (LOS), and/or adherence to delirium screening.
Boersma [2] 2015	Systematic review (54 publications)	Residential dementia care (RDC)	Factors contributing to successful implementation of psychosocial interventions focusing on behaviour changes in caregivers and (organisation-related) facilitating and impeding factors.
Australia Institute of Health and Welfare [3] 2013	Report (based on a literature review)	Hospitals	An outline of innovative strategies and practices that have been implemented in hospitals in Australia and internationally.
Regulation and Quality Improvement Authority [4] 2014	Independent report submitted to the Minister for Health, Social Services and Public Safety	Health and social services (HSC) Trusts	<ol style="list-style-type: none"> <li>1) Assessment of the implementation of the National Institute for Health and Clinical Excellence (NICE) clinical guideline 42: Dementia and how the guidelines were being utilised for the planning and delivery of dementia care services.</li> <li>2) Identify how the effectiveness of implementation process for NICE guidelines could be enhanced.</li> </ol>

# **1. Effectiveness of implementation strategies on improving clinical and process outcomes in hospitals and residential aged-care facilities**

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## **Description of implementation strategies**

Table 3 provides a list and description of implementation strategies according to the Cochrane Effective Practice Organisation of Care Group (EPOC) classification system. [1]

The ten most frequently reported strategies from the selected literature have been highlighted in Table 3 and are listed below:

1. Distribution of educational materials
2. Educational meetings
3. Local consensus processes
4. Outreach visits
5. Local opinion leader
6. Audit and feedback
7. Reminders
8. Patient-mediated intervention
9. Provider oriented interventions
10. Structural interventions

The effect of these strategies on improving clinical and process outcomes of delirium and/or dementia (D&D) management are reported in Tables 4, 5 & 7.

**Table 3.** Implementation strategy taxonomy according to the Cochrane Effective Practice Organisation of Care Group (EPOC) classification system [1]

<i>Professional strategies</i>	<i>Description</i>
1. Distribution of educational materials	Distribution of published or printed recommendations for clinical care, including clinical practice guidelines, audio-visual materials and electronic publications. The materials may have been delivered personally or through mass mailings.
2. Educational meetings	Conferences, lectures, workshops or traineeships
3. Local consensus processes	Inclusion of participating providers in discussion to ensure that they agreed that the chosen clinical problem was important and the approach to managing the problem was appropriate
4. Outreach visits	Use of a trained person who met with providers in their practice settings to give information with the intent of changing the provider's practice. The information given may have included feedback on the performance of the provider(s).
5. Local opinion leader	Use of providers nominated and explicitly identified by their colleagues as educationally influential.
6. Audit and feedback	Any summary of clinical performance of health care over a specified period of time. The summary may also have included recommendations for clinical action. The information may have been obtained from medical records, computerised databases, or observations from patients.
7. Reminders	Patient or encounter-specific information, provided verbally, on paper or on a computer screen, which is designed or intended to prompt a health professional to recall information. This would usually be encountered through their general education; in the medical records or through interactions with peers, and so remind them to perform or avoid some action to aid individual patient care. Computer-aided decision support and drugs dosage are included.
8. Marketing / Tailored interventions	Use of personal interviewing, group discussion (focus groups), or a survey of targeted providers to identify barriers to change and subsequent design of an intervention that addresses identified barriers.
9. Mass media	(1) Varied use of communication that reached great numbers of people including television, radio, newspapers, posters, leaflets, and booklets, alone or in conjunction with other interventions; (2) targeted at the population level.
10. Patient-mediated intervention	New, previously unavailable clinical information collected directly from patients and given to the provider; for example, patient depression scores from a survey instrument.
<i>Organisational strategies</i>	<i>Description</i>
11. Provider oriented interventions	Revision of professional roles, for example, expansion of role to include new tasks; creation of clinical multidisciplinary teams who work together; formal integration of services; skill mix changes (changes in numbers, types or qualifications of staff); arrangements for follow up; satisfaction of providers with the conditions of work and the material and psychic rewards (for example, interventions to boost morale); communication and case discussion between distant health professionals
12. Patient oriented interventions	Mail order pharmacies (for example, compared to traditional pharmacies); presence and functioning of adequate mechanisms for dealing with patients' suggestions and complaints; consumer participation in governance of health care organisation; other categories
13. Structural interventions	Changes to the setting/site of service delivery; changes in physical structure, facilities and equipment; changes in medical records systems (for example, changing from paper to computerised records); changes in scope and nature of benefits and services; presence and organisation of quality monitoring mechanisms; ownership, accreditation, and affiliation status of hospitals and other facilities; staff organisation
<i>Financial strategies</i>	<i>Description</i>
14. Provider or patient interventions	In summary: patient or provider is financially supported to execute specific actions.
<i>Regulatory strategies</i>	<i>Description</i>
15. Changes in medical liability	Any intervention that aims to change health services delivery or costs by regulation or law (these interventions may overlap with organisational and financial interventions).
16. Management of patient complaints	-
17. Peer review or Licensure	-

## Effect of implementation strategies on clinical and process outcomes in the intensive care unit

A summary of 21 high quality publications (Appendix Table A-1) on implementation strategies for the assessment, prevention and management of delirium in the intensive care unit (ICU) and their effect on clinical and process outcomes is presented in Table 4. [1] The table below describes the content of the best practice for D&D management that was delivered (i.e. delirium screening, monitoring, prevention) and the model/framework which guided the implementation/change process. The table also includes the implementation strategies used and their effect on clinical (i.e. ICU, hospital or 30-day mortality; ICU length of stay (LOS)) and process outcomes (i.e screening adherence, delirium knowledge, incidence of delirium, anti-psychotic drug-use) pre- and post-implementation.

**Table 4.** Implementation strategies of D&D management interventions in the ICU and their impact on clinical and process outcomes

<p><b>Content of interventions</b></p> <p>Best practice for D&amp;D management:</p> <ul style="list-style-type: none"> <li>• PAD (integrated pain, agitation/sedation and delirium monitoring and management)</li> <li>• ABCDE (awakening and breathing coordination, delirium monitoring/management and early exercise/mobilisation bundle)</li> <li>• Multifaceted sleep promotion program</li> <li>• Delirium screening</li> <li>• Delirium prevention program</li> <li>• Visual feedback system</li> </ul>
<p><b>Models/frameworks which guided the implementation/change process</b></p> <ul style="list-style-type: none"> <li>• CFIR (consolidated framework for implementation research)</li> <li>• Modified extended training</li> <li>• Structured Quality Improvement (QI) model</li> </ul>
<p><b>Implementation strategies reported</b></p> <ul style="list-style-type: none"> <li>• Education (meaning one or both of the following strategies): distribution of educational material (81%) and/or educational meetings (100%), were implementation strategies used in all studies. (Appendix Table A-8).</li> <li>• Patient-mediated interventions, corresponding with implementation of screening for delirium with a validated tool such as the CAM-ICU, was applied in 86% of the studies, whereas outreach visits, audit and feedback and local consensus processes were applied in 67%, 62% and 57% of the studies respectively (Appendix Table A-8).</li> <li>• Three of the seventeen implementation strategies were not used at all (that is mass media, changes in medical liability and management of patient complaints). The remaining strategies (provider-oriented interventions /financial compensation, licensure, tailored interventions, and patient-oriented interventions) were used in less than 35% of the studies.</li> </ul>
<p><b>Effect on clinical (patient) and process (staff/organisation) outcomes</b></p> <p><i>Mortality:</i></p> <ul style="list-style-type: none"> <li>• Audit and feedback was used in all studies showing significant mortality reduction but in none without significant reduction of mortality (P = 0.012).</li> <li>• Mortality risk reduction was significantly higher (P = 0.0424) in studies that used high number of different implementation strategies (RR = 0.73; 95% CI 0.60, 0.88) compared with studies that used with low number of strategies.</li> <li>• Mortality reduction was higher (P = 0.0478) in the studies that used a higher number of implementation strategies to implement the PAD guideline or ABCDE approach (n = 6).</li> </ul>



### ICU LOS:

- A high ( $\geq 6$ ) number of strategies showed a reduced ICU LOS ( $-1.51$ , 95% CI  $-2.16$ ,  $-0.86$ ) versus no change when using fewer strategies ( $-0.36$ , 95% CI  $-1.61$ ,  $0.89$ ).

### Incidence of Delirium:

- When PAD guideline or ABCDE approach was compared to other best practice management strategies there was no difference in delirium incidence ( $n = 8$ ) before and after the implementation.

### Screening adherence:

- In studies specifically focused on implementation of delirium screening ( $n = 10$ ), improvements in adherence to screening ranged from 14% to 92%, but the clinical outcomes were not typically reported. Significant improvement of screening adherence after the implementation was reported in 82% of the studies that did not report clinical outcomes.

### Delirium knowledge:

- Knowledge improvement was reported in 19% (4/21) of studies. The other studies did not report this outcome.

### Association between clinical and process outcomes:

- No significant associations existed between changes in the process measures (delirium incidence, use of antipsychotic drugs or screening adherence) and mortality before and after the implementation. Likewise, no significant associations were found between the process measures and ICU LOS.

Key: CAM – Confusion Assessment Method

## Effect of implementation strategies on process outcomes in residential dementia care

Of the 54 publications (Appendix Table A-3) included in a systematic review of the successful implementation of psychosocial interventions in residential dementia care (RAC); 41 were quantitatively assessed according the five dimensions of the RE-AIM framework and presented in Table 5. [2] The five dimensions of the RE-AIM framework (Reach, Efficacy, Adoption, Implementation, and Maintenance) are further defined in Appendix Table A-2. The Efficacy (i.e. effectiveness) of the implementation strategies was based on two process outcomes: staff knowledge and skills/attitudes. The other dimensions such as the adoption, implementation and maintenance of the interventions are addressed in Section 2 of this review.

For the purpose of this review, the data presented in the supplementary document was re-categorised according to the implementation strategy taxonomy described earlier in Table 3 and shown below. Individual papers were not screened or analysed and hence the content of interventions (treatment, assessment, management, or diagnosis of D&D) was not described. Patient/clinical outcomes were not reported in the supplementary document and not included in this review.

**Table 5.** Implementation strategies of D&D management interventions in the RAC and their impact on clinical and process outcomes

List of interventions
<ul style="list-style-type: none"><li>• Training interventions such as Staff training in Assisted Living Residence (STAR), training in dementia care, formal staff management skills, feeding skills, nutrition nursing care, behaviour skills, communication training and memory book;</li><li>• Education program (dignity and dementia), restraint minimisation program, Carers program, nursing assistant communication skills program (NACSP), focused program, staff education and peer support;</li><li>• Resident-oriented care, integrated care, emotion-oriented care, restorative care for the cognitively impaired, palliative care, basic care, end-of-life care, individualised music, foundations of dementia care (FDC), validation, gentle persuasive approaches curriculum (GPA), family information booklet, communication skills booklet, nursing guideline on depression in dementia, Acute Geriatric Unit (AGU).</li></ul>
Implementation strategies reported
<ul style="list-style-type: none"><li>• 95% of studies reported educational meetings as a strategy. 51% of studies used outreach visits and 32% of studies reported the use of local consensus.</li><li>• Distribution and audit/feedback were reported in 12% and 10% of studies, respectively.</li><li>• Opinion leaders, provider-oriented and reminders were each reported in 5% or less of the studies.</li></ul>

## Effect on process (staff/organisation) outcomes

### Staff knowledge:

- 60% of studies (n=12) found significant increase in knowledge of dementia care after the implementation of the intervention.
- 60% (n=12) used multiple implementation strategy where in 67% (8/12) of studies led to an increase in knowledge acquisition.

### Staff skills and attitude:

- 50% (n=14) found significant effects on attitudes and skills following the implementation of the intervention. 68% (n=19) used a multiple implementation strategy (i.e. two or more implementation activities were executed) where in 79% (12/19) of the studies had significant or a few positive results on the attitude and/or skills of the caregivers.

### Overall:

- The results demonstrate that it is important to apply a multiple implementation strategy to increase knowledge and skills in caregivers. However based on conducted research no statement can be made on which combination of implementation strategies is most effective. [2]

## Effect of implementation strategies on other clinical or process outcomes in hospitals and residential aged care facilities

The Hospital Dementia Services (HDS) Project, a 3-year project funded by the National Health and Medical Research Council (NHMRC), involved a team of researchers from the Australian Institute of Health and Welfare, University of Canberra and University of New South Wales (NSW). Project partners and collaborators are NSW Health, Alzheimer's Australia, the Aged and Community Services Association of NSW & ACT, the Benevolent Society, the University of Queensland and La Trobe University. [3] Their report described Australian and international strategies grouped according to the settings in which they are delivered. [3] Strategies implemented in residential aged-care facilities (RAC) and within any hospital settings that were described in adequate detail as well as evaluated for outcomes of interest (clinical and process) were included in this review. Some outcomes were reported in literature reviewed, while the HDS team were responsible for evaluating others. Therefore unlike the data from Table 4 and 5, it was unclear if the improvements reported in Table 6 were statistically significant.

**Table 6.** Strategies within Australian and overseas hospitals that aimed to reduce hospital admissions and length of stay (LOS) for people with dementia

Setting / Context	Interventions	Content of intervention	Effect on clinical or process outcomes	Implementation strategies reported
Residential aged care facility (RAC)	Special care units (SCU)	Not described	Reduction in risk of hospitalisation, reduction in use of restraints and anti-psychotic medication	<ul style="list-style-type: none"> <li>• Educational meetings</li> <li>• Structural strategies</li> </ul>
	Aged care nurse practitioners (NPs)	Assessment, management	Reduction in hospitalisation rate/hospital admissions	
Emergency department (ED)	Aged care services in emergency teams (ASETs)	Management	Reduced hospital admission, improvement in attitude	<ul style="list-style-type: none"> <li>• Educational meetings</li> <li>• Outreach visits</li> <li>• Structural</li> <li>• Provider-oriented</li> </ul>
	Geriatric Rapid Acute Care Evaluation (GRACE) program	Assessment	Reduction in bed-days	
	Medical Assessment Units (MAUs)	Assessment, diagnosis, treatment	Reduction in LOS, reduction in time in ED	
Other hospital settings	Rapid Assessment Interface and Discharge (RAID)	Assessment, treatment, referral	Reduction in LOS, reduction in hospital admissions	<ul style="list-style-type: none"> <li>• Educational meetings</li> <li>• Provider-oriented</li> <li>• Structural</li> <li>• Local consensus</li> <li>• Reminders</li> </ul>
	Specialist wards or unit	Management, diagnosis	Reduction in LOS	

Hospital education programs	Identification, management	Improvement in practice, greater staff satisfaction	<ul style="list-style-type: none"> <li>• Outreach visits</li> <li>• Distribution</li> <li>• Audit/feedback</li> </ul>
The Care of the Confused Hospitalised Older Person Study (CHOPS)	Assessment, referral	Improvement in staff knowledge	
Fall Rehabilitation Therapy	Assessment	Reduction in LOS	
Acute Geriatric Unit (AGU)	Assessment, management	Reduction in prevalence of D&D	
End-of-life Care	Treatment	Reduction in LOS	

In general, the above studies were of low-quality and at a high risk of bias, therefore making causal links between implementation strategies and the outcomes reported tenuous. Further details of the interventions and their effect on the outcomes are described in Appendix Tables A4-6; details of outcomes and implementation strategies are displayed in Table A-7.

## **Summary of effective implementation strategies in the intensive care unit and residential dementia care**

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To find out which implementation strategies effected significant improvements in clinical and process outcomes in D&D management and care, quantitative results from the two systematic reviews (62 studies) were combined in a narrative manner. Table 7 shows the most commonly-reported implementation strategies in the intensive care unit and residential dementia care, and the weight of evidence in literature for which significant improvement in outcomes were reported. [1,2]

The table presents the proportion of papers that reported statistically significant effects on outcomes for a specified implementation strategy (i.e. the number of studies that reported a significant improvement in outcome over the total number of studies that had evaluated the outcome when using a given strategy).

It is critical to note that as many studies used a combination of more than one strategy and evaluated different outcomes, hence the number of studies showing a significant effect for a given strategy on each outcome varied from strategy to strategy (Appendix Table A-8). The results therefore are unable to show the effect of a single strategy on a particular outcome in isolation, but rather reflects the proportion of studies that reported significant improvement outcomes when a given strategy was used.

A summary of the most frequently reported implementation strategies and the significant impact on clinical and process outcomes is presented in the table below.

**Table 7.** Summary of the most frequently reported implementation strategies and the significant impact on clinical and process outcomes

Decreasing frequency of reported use of strategy ↓	Implementation Strategies	Outcomes						
		↓ Mortality	↓ LOS	↓ Incidence of D&D	↓ Drug use	↑ Screening adherence	↑ Staff knowledge	↑ Staff skills & attitude
	Educational Meetings	✓	✓	✓	✓	✓	✓	✓
	Outreach	✓	✓	!	!	✓	✓	✓
	Local Consensus	✓	✓	✓	✓	✓	✓	✓
	Distribution	✓	✓	✓	✓	✓	✓	!
	Patient-mediated	✓	✓	✓	✓	✓	!	-
	Audit/feedback	!	✓	!	✓	✓	!	!
	Opinion Leaders	✓	✓	✓	!	✓	!	!
	Structural	!	!	✓	!	✓	!	-
	Provider-oriented	!	!	!	!	✓	!	!
	Reminders	!	!	✓	!	✓	!	!

	≥ 75% of studies reported a significant outcome	Mortality	Hospital/intensive care unit (ICU)/ 30-day mortality
	< 75% of studies reported a significant outcome	LOS	Length of stay in ICU
	< 25% of studies reported a significant outcome	D&D	Delirium and/or Dementia
✓	Reported in ≥ 5 studies	Drug-use	Anti-psychotic drug use
!	Reported in < 5 studies	Screening adherence	Delirium screening adherence
	Outcome not reported		

Holding educational meetings was the most commonly reported implementation strategy in the intensive care unit and residential dementia care facility; significant increases were reported in screening adherence and staff knowledge in 87% (13/15) and 67% (16/24) of the studies having used this strategy, respectively. A significant decrease in the incidence of delirium/dementia (D&D) was also reported in 67% (6/9) of the studies using this strategy.

More than 75% of studies that used strategies such as outreach, local consensus, distribution, patient mediated, audit/feedback and/or opinion leaders reported a significant increase in screening adherence.

In the studies which used local consensus as a strategy, significant increases in screening adherence and staff knowledge were reported in 78% and 71% of studies, respectively. Significant increases were reported in screening adherence and staff knowledge in 86% and 75% of studies which used distribution as a strategy, respectively. A significant decrease in the incidence of D&D and a significant increase in screening adherence was reported in 75% and 85% studies where patient-mediated strategies were used, respectively.

Of the studies that used strategies such as audit/feedback, opinion leaders, structural, provider-oriented, or reminders, 67% – 88% reported significant increases in screening adherence. All the studies that evaluated the effect of patient-mediated, audit/feedback, opinion leaders, structural, provider-oriented, and reminders on staff knowledge reported a significant increase. However there were less than five studies reporting the outcomes for each strategy.

## 2. Enhancing the effectiveness of the implementation process of guidelines and interventions

### Enhancing the effectiveness of the implementation process of a clinical guideline

The Regulation and Quality Improvement Authority (RQIA) report reviewed the implementation of the National Institute for Health and Clinical Excellence (NICE) clinical guideline 42: Dementia to inform the planning and delivery of dementia services in Health and Social Care (HSC) Trusts in Northern Ireland. [4] Its report identified how the effectiveness of the implementation process for NICE guidelines could be enhanced. The review reflected views of staff, people living with dementia, and carers by means of focus groups, questionnaires and interviews. It contained information on the dissemination and communication of the documents; the assessment, implementation and evaluation of the clinical guideline; and its recommendations.

The review identified barriers to the implementation process, consolidated suggestions for enhancements, and made recommendations for the implementation of NICE clinical guideline 42. This information is found below.

**Table 8.** Barriers identified in the implementation of the NICE Clinical Guideline 42: Dementia

Components	Description of barriers
Implementation tools	<ul style="list-style-type: none"> <li>• General lack of knowledge of NICE implementation tools</li> <li>• NICE website was difficult to navigate</li> <li>• Implementation tools were not easily accessible</li> <li>• Staff were either not aware or not familiar of the tools available.</li> <li>• Staff lacked the time to use the tools</li> <li>• Staff had developed their own tools to aid implementation</li> </ul>
Introduction of the guideline	<ul style="list-style-type: none"> <li>• The release of the circular associated with clinical guideline 42 did not fall within the scope of the new process for implementation of NICE guidance, hence no requirement was made for trusts to formally implement the guidelines.</li> <li>• Circular for the implementation of the clinical guideline was vague and did not direct specific actions that needed to be taken.</li> </ul>
Workload	<ul style="list-style-type: none"> <li>• Increasing overall volume of work and lack of work capacity for front line staff.</li> <li>• Large case-loads and other work pressures lead to insufficient time for staff to allocate to the implementation of clinical guidelines.</li> </ul>
Support	<ul style="list-style-type: none"> <li>• Lack of support from within the organisation to properly implement the guideline.</li> <li>• No additional funding or resources being made available to implement the recommendations within the guideline.</li> <li>• This was closely linked to staffing levels and availability.</li> </ul>

**Table 9.** Views and suggestions that may enhance the implementation of the Clinical Guideline 42: Dementia

Component	Description of suggestions (feedback from participants)
Training	<ul style="list-style-type: none"> <li>• Training courses on dementia for staff in the acute setting, primary and community care, older people's mental health and domiciliary care.</li> <li>• Training in challenging behaviour, to ward and community based staff, as well as some staff in residential and nursing homes.</li> <li>• Training to skill up dementia champions, who will provide training and advice to other members of staff in the area of dementia care.</li> <li>• Incorporating dementia training throughout working projects.</li> </ul>
Awareness	<ul style="list-style-type: none"> <li>• Awareness raising sessions to inform staff about the availability of NICE clinical guidelines.</li> </ul>

	<ul style="list-style-type: none"> <li>• Raising awareness through staff induction and training.</li> <li>• Participants proposed: <ul style="list-style-type: none"> <li>➤ The need for a supporting document that translates how specific guidelines relate to different people at different levels within their organisation.</li> <li>➤ Holding awareness sessions for staff throughout the trusts, to look at the NICE website and clinical guideline 42.</li> <li>➤ Information regarding clinical guideline 42 to be disseminated to different professional groups, such as social workers and nurses.</li> <li>➤ Widening the awareness and knowledge of the guideline among other relevant agencies that interact with the dementia care services.</li> <li>➤ Discussing clinical guideline 42 in team meetings.</li> <li>➤ Incorporating aspects of clinical guideline 42 into personal development plans.</li> <li>➤ Identifying aspects of clinical guideline 42 that could be counted towards continuing professional development.</li> </ul> </li> </ul>
Communication	<ul style="list-style-type: none"> <li>• More effective structures and processes to be in place for the communication and dissemination of NICE clinical guidelines by:</li> <li>• Dedicated sections on HSC trusts' intranets for communicating NICE information.</li> <li>• Simplified links to support access to the information.</li> <li>• A specific section on the NICE website (for the user i.e. Northern Ireland)</li> </ul>
Governance	<ul style="list-style-type: none"> <li>• Corporate ownership</li> <li>• Each trust should assign a senior executive as the governance lead for NICE guidelines, with responsibility for updating progress, as a standing agenda item at executive team meetings.</li> <li>• Measurements or indicators relating to implementation should be integrated into governance structures and reported on regularly.</li> <li>• Participants felt that implementation groups should be established, with members being assigned specific responsibilities during the implementation of guidelines.</li> </ul>
Planning	<ul style="list-style-type: none"> <li>• The need for a planning mechanism.</li> <li>• Identify other initiatives in the same area that are ongoing or planned at the same time.</li> <li>• Through that mechanism, identify ways to work collaboratively to achieve implementation by considering other related guidance or strategies.</li> </ul>
Culture	<ul style="list-style-type: none"> <li>• A change in culture associated with NICE guidelines is required, if full implementation of guidelines is to be achieved.</li> <li>• NICE guidelines were still perceived only as "guidance", even though formally endorsed as something which was to be implemented and complied with.</li> <li>• NICE champions should be identified to promote the respective guidelines.</li> <li>• NICE training should become mandatory for staff.</li> </ul>
Integration with Dementia Strategy	<ul style="list-style-type: none"> <li>• Both clinical guideline 42 and the dementia strategy should dovetail for the improvement of dementia care services.</li> <li>• Trusts should discuss the links between clinical guideline 42 and the dementia strategy at team meetings.</li> <li>• Clinical guideline 42 should be used as guidance and a reference for service improvements.</li> </ul>

- Clinical guideline 42 should be used as the evidence base for the work streams of the dementia strategy.

## Enhancing the implementation process of an intervention

It was shown that little consideration was given to the adoption of an intervention by caregivers and to the long-term sustainability (maintenance) of an intervention. [2] The systematic review of the successful implementation of psychosocial interventions for elderly people with dementia that reported outcomes: Adoption, Implementation and Maintenance, included the extent of which interventions were adopted, implemented, and maintained. Tables 10 and 11 summarise its findings and report on implementation barriers and facilitators.

*Adoption* was defined as the proportion of caregivers that actually adopt the intervention. [2] Strategies have been grouped according to the categories listed in Table 3.

**Table 10.** Components and details of implementation strategies for adoption

Strategy	Details and components
Education	<ul style="list-style-type: none"> <li>• Offering training at different times or over several days</li> <li>• Offering staff that missed one or more sessions additional individual teaching</li> <li>• Training offered over the internet after the first implementation</li> <li>• Training alone was not strong enough</li> <li>• Follow up for training is desirable for successful implementation</li> <li>• Training on the job</li> <li>• Role play and video as a pedagogic tool</li> <li>• Integration of learning into practice and on the job reinforcement of learning</li> <li>• Supervision and self-monitoring</li> <li>• Internet based training had many benefits however it is useful to include a group component in the training and to deliver training programs in modules</li> </ul>
Local opinion leader	<ul style="list-style-type: none"> <li>• Project leader appointed who was responsible for implementation</li> </ul>
Local consensus and provider-mediated	<ul style="list-style-type: none"> <li>• Mono-disciplinary, interdisciplinary conferences, follow up meetings organised to support implementation.</li> </ul>
Structural	<ul style="list-style-type: none"> <li>• Individual care plans used during implementation</li> </ul>

*Implementation* was defined as the extent to which the intervention in the study is implemented as intended in the real world, including implementation barriers and facilitators. [2]

It is important to consider the following implementation criteria:

1. The percentage or number of perfect delivery of intervention – clearly indicated how often the intervention was performed (mentioned in only 31% of the included publications).
2. A rough indication of the costs that the intervention entailed either time or money (mentioned in only 13% of the included publications).
3. The extent of consistency of implementation across staff/time/settings/subgroups (only 30% and 37% of included publications reported facilitating and impeding factors, respectively).

**Table 11.** Facilitating and impeding factors of the implementation of psychosocial interventions in dementia care

Influencing factor/theme of the implementation	Facilitating	Impeding
1. Opinion leader or management support	✓✓✓ ✓✓✓ ✓✓	✓✓✓ ✓✓✓ ✓✓✓
2. Enthusiastic and or experienced team	✓✓✓ ✓✓✓	✓✓✓ ✓
3. Influence on quality of care	✓✓✓ ✓✓✓ ✓✓	✓✓✓ ✓✓✓
4. Material and/or immaterial conditions	✓✓✓ ✓	✓✓✓ ✓✓✓
5. Time required to learn and apply the intervention	✓	✓✓✓ ✓✓✓ ✓✓✓ ✓✓✓ ✓✓✓ ✓✓✓ ✓✓
6. Learning culture in the organisation	✓✓	
7. Multiple innovations/projects running simultaneously		✓✓✓ ✓✓✓
8. Willingness of residents and/or family to participate in the intervention		✓✓✓ ✓

✓ – represents one publication reporting the theme as either a facilitating or impeding factor.

*Maintenance* was defined as the extent to which the intervention is sustained over time. [2]

Only 20% of included studies described primary outcomes at six or more month follow up after implementation of the intervention. Outcomes of knowledge and/or attitude maintained at minimal six month follow up but the outcomes at six or more month follow up were not (or hardly maintained). [2]

Other issues concerning the construct of maintenance is whether there are measures, discussions, or alignments to the organisation mission or whether another form of sustainability is realised in the organisation. Other concerns include if and how an intervention program was adapted for long-term implementation, or which elements were retained after the implementation was completed. [2]



## Conclusion

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### Implications for changing practice

#### *Multifaceted approach, integration of diverse care settings [1,3]*

Multifaceted implementation programs (which include the monitoring and management, screening and prevention of delirium in the intensive care unit) have been shown to effectively change adherence to delirium screening and delirium knowledge. [1] Findings also suggest that a multifaceted as well as integrated approach between hospital, mental health, residential aged care and community services is most likely to ensure that dementia care is delivered in the most appropriate and beneficial setting for the patient. [3]

#### *Multiple implementation strategies [1,2]*

The findings from this review suggest that the most frequently reported implementation strategies in literature were educational meetings, outreach, local consensus, distribution, patient-mediated, audit/feedback, opinion leaders, structural, provider-oriented and reminders. The use of multiple implementation strategies is recommended to successfully implement a psychosocial method to dementia care, although based on conducted research no statement can be made on which combination of implementation strategies is most effective. [2] A higher number of implementation strategies (six or more) used concomitantly and delirium management being integrated according to the PAD guidelines or ABCDE bundle, are associated with positive effects or implementation efforts on clinical outcome. [1]

#### *Delineate successful intervention (effective practice change) from improvements in clinical outcomes [1]*

It is important that successful implementation (i.e. effective practice change), should be clearly delineated from the effect of such practice changes on clinical outcomes. Robust data on effectiveness of specific implementation strategies with regard to the care of delirious critically ill patients are scarce and there is a lack of data on the association between specific practice changes (for example, delirium screening) and improvements in clinical outcomes. [1] Successful implementation was evident in most studies on delirium screening implementation that showed improved adherence, even without known benefit for clinical outcomes. In other words, implementation was generally successful (i.e. adherence to monitoring screening processes) but linkage of this outcome to clinical outcomes was not proven. [1]

#### *Sustainability of an intervention [2]*

Quality improvement initiatives should include caregivers who are intended to apply the intervention, and report on the number of caregivers who actually adopt the intervention, as well as consider the long-term sustainability of the intervention on the organisational level. Considering the constructs of the RE-AIM (Reach, Efficacy, Adoption, Implementation, and Maintenance) framework addresses aspects that promote sustainability. [2] Implementation strategies such as education, local opinion leaders, local consensus, provider-mediated, and structural strategies may enhance the sustainable adoption of an intervention; while the cost and delivery of an intervention, as well as barriers and facilitators are important implementation criteria of an intervention. [2] Running many innovation projects concurrently, family participation, and time required to learn and apply the dementia and/or delirium intervention were described in the evidence as impeding factors of the implementation of psychosocial interventions in dementia care. [2]

#### *Organisational support [1,2]*

The effectiveness of implementation programs may be enhanced when not only health care professionals are targeted for behavioural change but when organisational changes are employed and are necessary. [1] A project or opinion leader can boost the implementation, and an individual care plan that explains where the intervention fits will stimulate the actual application of the intervention. [2] The Regulation and Quality Improvement Authority report reviewed the implementation of the National Institute for Health and Clinical Excellence (NICE) clinical guideline 42: Dementia to inform the planning and delivery of dementia services in Health and Social Care (HSC) Trusts in Northern Ireland. Feedback from guideline users indicated organisations should consider staff training, awareness, communication, governance, planning, culture and an integration with a dementia strategy to enhance the implementation of a guideline. [4]

## Limitations

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The results from this review should be interpreted with caution.

The systematic reviews included diverse studies with varied data with regards to definitions of outcomes, methodological design, focus of implementation, applied implementation strategies (duration, intensity, and guidance) and models. [1, 2]

This review summarised information presented in the selected publications but did not assess or statistically analyse pooled data of the effectiveness of any given strategy on a specified outcome in isolation.

The extent of the information presented should not be construed as indicating the relative importance or effectiveness of individual implementation strategies; but the results (from the provider perspective) of any investigations into the strategy's efficacy. [3] The report included descriptive/qualitative studies and data which are at high risk of bias, making causal links between implementation strategies and any outcomes reported tenuous. [3, 4]

Results on ICU LOS should be considered cautiously because concurrent changes in mortality may affect ICU LOS, instead of the implementation intervention itself being responsible for lower ICU LOS, as censoring by death may bias and (theoretically) even reverse the associations found. [1]

The outcomes reported by Regulation and Quality Improvement Authority reflected staff and carers' views for enhancement of the implementation of the Clinical Guideline 42: Dementia. They were not quantifiable and recommendations were written for its applicability to Northern Ireland. [4]

## References

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1. Zoran Trogrlic, Mathieu van der Jagt, Jan Bakker, Michele C Balas, E Wesley Ely, Peter HJ van der Voort and Erwin Ista (2015). A systematic review of implementation strategies for assessment, prevention, and management of ICU delirium and their effect on clinical outcomes. *Critical Care*, 19:157
2. Petra Boersma, Julia C.M. van Weert, Jeroen Lakerveld and Rose-Marie Dröes (2015). The art of successful implementation of psychosocial interventions in residential dementia care: a systematic review of the literature based on the RE-AIM framework. *International Psychogeriatrics*, 27:19-35.
3. Australian Institute of Health and Welfare (2013). Dementia care in hospitals: costs and strategies. Cat. no. AGE 72. Canberra: AIHW.
4. The Regulation and Quality Improvement Authority Assurance (2014). Review of the Implementation of NICE Clinical Guideline 42: Dementia Overview Report

## Appendix

Table A-1. Summary of implementation strategies in the ICU and their effect on clinical and process outcomes listed according to publications [1]

Implementation strategy			Studies reporting both clinical outcomes and process outcomes before versus after implementation								
	Author		Mansouri <sup>a</sup>	Skrobik <sup>a</sup>	Balas <sup>b,i</sup>	Radtke <sup>a,ii</sup>	Robinson <sup>a</sup>	Kamdar <sup>c,iii</sup>	Reade <sup>d</sup>	Dale <sup>a</sup>	Bryckz. <sup>e</sup>
PO	1	Distribution**	1	1	1	1	1	1	0	1	0
	2	Educational Meetings	1	1	1	1	1	1	1	1	1
	3	Local consensus	1	1	1	0	1	1	0	1	1
	4	Outreach	0	0	1	1	0	0	1	1	0
	5	Opinion leaders	0	1	1	1	1	0	1	0	0
	6	Patient-mediated	1	1	1	1	1	1	1	1	0
	7	Audit/feedback	1	1	1	0	0	0	0	0	0
	8	Reminders	0	0	1	1	0	1	0	0	0
	9	Tailoring (barriers)	0	1	1	0	0	0	0	0	0
	10	Mass media	0	0	0	0	0	0	0	0	0
O	11	Provider-oriented	1	0	1	0	0	1	0	0	0
	12	Patient-oriented	0	1	0	0	0	0	0	0	1
	13	Structural	0	1	1	1	0	0	0	0	0
F	14	Provider	1	0	0	0	0	0	0	0	0
R	15	Medical liability	0	0	0	0	0	0	0	0	0
	16	Patient complaints	0	0	0	0	0	0	0	0	0
	17	peer review/licensure	0	0	1	0	0	0	0	0	0
<b>Total number IS used</b>			<b>7</b>	<b>9</b>	<b>12</b>	<b>7</b>	<b>5</b>	<b>6</b>	<b>4</b>	<b>5</b>	<b>3</b>
<b>Post-implementation***</b>											
<b>Mortality</b>			<b>↓</b>	<b>↓</b>	<b>↓</b>	<b>↓</b>	<b>↓</b>	<b>↓</b>	<b>↑</b>	<b>=</b>	<b>↓</b>
<b>ICU length of stay</b>			<b>↓</b>	<b>↓</b>	<b>↓</b>	<b>↓</b>	<b>↓</b>	<b>↓</b>	<b>=</b>	<b>↓</b>	<b>↓</b>
<b>Screening adherence</b>			<b>↑</b>	<b>↑</b>	<b>↑</b>	<b>↑</b>	-	-	-	<b>↑</b>	-
<b>Incidence</b>			-	<b>↓</b>	<b>↓</b>	-	-	<b>↓</b>	<b>↓</b>	<b>↓</b>	<b>↑</b>
<b>Antipsychotic drug use</b>			<b>↓</b>	<b>↑</b>	<b>↑</b>	-	<b>↑</b>	-	-	<b>↓</b>	<b>↓</b>
<b>Delirium knowledge</b>			-	-	-	-	-	-	-	-	-

*Implemented care component:* a – PAD (integrated pain, agitation/sedation and delirium monitoring and management); b – ABCDE (awakening and breathing coordination, delirium monitoring/management and early exercise/mobilisation bundle); c – Multifaceted sleep promotion program; d – Delirium screening; e – Delirium prevention program. *Model of implementation, if applicable:* i – CFIR (consolidated framework for implementation research); ii – Modified extended training; iii – structured Quality Improvement (QI) model.

\*\*\*Statistically significant changes are in bold text. PO – professional-oriented; O – organisational; F – financial; R – regulatory; IS – implementation strategies.

1 – strategy used; 0 – strategy not used

Continuation of table A-1.

Implementation strategy			Studies reporting process outcomes, without clinical outcomes, before versus after implementation*											Percent using strategy	
			Eastwood <sup>d</sup>	Devlin <sup>d,iv</sup>	Scott <sup>d</sup>	Gesin <sup>d</sup>	Riekerk <sup>d,v</sup>	Kastrup <sup>f</sup>	Boogaard <sup>d,vi</sup>	Pun <sup>a</sup>	Hager <sup>a,vii</sup>	Soja <sup>d</sup>	Page <sup>d</sup>		Bowen <sup>d,viii</sup>
PO	1	Distribution**	0	0	1	1	1	1	1	1	1	1	1	1	81
	2	Educational Meetings	1	1	1	1	1	1	1	1	1	1	1	1	100
	3	Local consensus	0	0	0	1	1	1	1	0	1	0	0	1	62
	4	Outreach	1	1	1	1	1	0	1	1	0	1	1	1	67
	5	Opinion leaders	0	1	0	0	1	0	1	0	1	1	0	1	52
	6	Patient-mediated	1	1	1	1	1	1	1	0	1	1	1	0	86
	7	Audit/feedback	1	1	0	1	1	1	1	1	1	1	0	1	62
	8	Reminders	0	0	0	0	0	1	1	0	1	1	0	1	38
	9	Tailoring (barriers)	0	0	0	0	1	0	1	0	1	1	0	1	33
	10	Mass media	0	0	0	0	0	0	0	0	0	0	0	0	0
O	11	Provider-oriented	0	1	0	0	1	0	1	1	1	0	0	0	43
	12	Patient-oriented	0	0	0	0	0	0	0	0	0	0	0	0	10
	13	Structural	0	0	0	1	1	1	1	1	1	0	0	0	48
F	14	Provider	0	0	0	0	0	0	1	0	0	0	0	0	10
R	15	Medical liability	0	0	0	0	0	0	0	0	0	0	0	0	0
	16	Patient complaints	0	0	0	0	0	0	0	0	0	0	0	0	0
	17	peer review/licensure	0	0	0	0	0	0	0	0	0	0	0	0	5
<b>Total number IS used</b>			<b>4</b>	<b>6</b>	<b>4</b>	<b>7</b>	<b>10</b>	<b>7</b>	<b>12</b>	<b>6</b>	<b>10</b>	<b>10</b>	<b>4</b>	<b>8</b>	
<b>Post-implementation***</b>															
<b>Mortality</b>			↑	-	-	-	-	-	-	-	-	-	-	-	-
<b>ICU length of stay</b>			=	-	-	-	-	-	↓	-	-	-	-	-	
<b>Screening adherence</b>			-	↑	↑	-	↑	↑	↑	↑	=	↑	↑	↑	
<b>Incidence</b>			-	-	-	-	-	↑	↑	-	↑	-	-	-	
<b>Antipsychotic drug use</b>			↓	-	-	-	-	-	↓	-	-	-	-	-	
<b>Delirium knowledge</b>			-	-	↑	↑	↑	-	↑	-	-	-	-	-	

Implemented care component: a – PAD (integrated pain, agitation/sedation and delirium monitoring and management); b – ABCDE (awakening and breathing coordination, delirium monitoring/management and early exercise/mobilisation bundle); d – Delirium screening; e – Delirium prevention program; F – visual feedback system. *Model of implementation if applicable*: iv – SCT (script concordance theory); v – Structural implementation pathway; vi – Model of Grol and Wensing; vii – 4E's framework (engage, educate, execute and evaluate); viii – Diffusion of innovations theory. \*\*See table 3 for a full description of strategies \*\*\*Statistically significant changes are in bold text. PO – professional-oriented; O – organisational; F – financial; R – regulatory; IS – implementation strategies.

Table A-2. The five dimensions of the RE-AIM framework defined in the review [2]

RE-AIM EVALUATION DIMENSIONS		
DIMENSION (LEVEL)	ORIGINAL DEFINITION BY GLASGOW <i>et al. (1999)</i>	DEFINITION IN THIS STUDY
Reach (individual)	Proportion of the target <i>population</i> that participated in the intervention.	Proportion of <i>caregivers</i> in care settings that participated in the intervention during the study.
Efficacy (individual)	Success rate if implemented as in guidelines; defined as <i>positive outcomes minus negative outcomes</i> .	Outcomes (positive and negative) regarding <i>knowledge, skills, and/or attitudes</i> of the professionals in the study.
Adoption (organization)	Proportion of <i>settings, practices, and implementation plans</i> that will adopt this intervention.	Proportion of <i>caregivers that actually adopt</i> the intervention in the study.
Implementation (organization)	Extent to which the intervention is implemented as intended in the real world.	Extent to which the intervention in the study is implemented as intended in the real world, <i>including implementation barriers and facilitators</i> .
Maintenance (individual and organization)	Extent to which a <i>program</i> is sustained over time.	Extent to which the <i>intervention</i> is sustained over time.

Table A-3. Summary of implementation strategies in RAC and their effect on improving staff knowledge and skills/attitudes from quantitative studies [2]

Implementation strategy	Study numbers as they appear in the supplementary document of the Systematic Review [2]																						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Educational Meetings	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Patient-mediated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Distribution	-	-	-	-	-	-	-	✓	-	✓	-	-	-	-	-	✓	-	-	-	-	-	-	-
Outreach	✓	✓	✓	✓	✓	-	✓	✓	-	-	-	✓	✓	✓	-	✓	-	-	-	✓	-	✓	✓
Local Consensus	-	✓	✓	✓	✓	-	-	-	-	-	-	-	-	-	✓	-	-	-	-	✓	-	✓	-
Audit/Feedback	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Opinion Leader	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	✓	-
Structural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Provider-oriented	-	✓	✓	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Reminders	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<i>Number of Strategies reported</i>	2	4	4	3	3	2	2	3	1	2	1	2	2	2	2	3	1	1	1	3	1	4	2
<i>Improvement in Knowledge</i>	-	-	-	-	-	-	✓	✓	-	x	-	-	-	✓	✓	-	-	x	✓	x	x	-	x
<i>Improvement in Skills/Attitudes</i>	-	-	✓	✓	+	+	+	✓	x	x	✓	✓	-	-	-	✓	x	-	-	x	✓	+	-

Continuation of Table A-3

Implementation strategy	Study numbers as they appear in the supplementary document of the Systematic Review [2]																		Percent using the strategy
	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
Educational Meetings	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓	✓	✓	✓	95
Patient-mediated	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Distribution	-	-	-	-	-	✓	-	-	-	-	-	✓	-	-	-	-	-	-	12
Outreach	✓	-	-	-	✓	-	-	✓	-	-	✓	-	✓	✓	✓	-	-	-	51
Local Consensus	-	-	-	✓	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	-	32
Audit/Feedback	-	-	-	-	-	-	-	✓	✓	-	-	-	-	-	-	-	-	✓	10
Opinion Leader	-	-	-	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-	5
Structural	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0
Provider-oriented	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5
Reminders	-	-	-	-	-	-	-	-	✓	-	-	-	-	-	-	-	-	-	2
<i>Number of Strategies reported</i>	2	1	1	1	2	2	1	3	4	1	2	1	3	3	3	2	2	2	
<i>Improvement in Knowledge</i>	x	✓	✓	-	✓	✓	x	-	✓	x	✓	-	-	-	-	-	✓	-	
<i>Improvement in Skills/Attitudes</i>	x	✓	✓	-	-	✓	x	x	-	✓	x	-	✓	✓	✓	-	+	+	

✓ significant improvement reported; + few significant results reported; x no significant change was reported. '-' not reported.

Table A-4. The table presents strategies within Australian and overseas hospitals that aimed to reduce hospital admissions and LOS for people with dementia. [3]

Strategies within the hospital		
Description of strategy	Outcomes	Content and related tools
<p><b>1. Rapid Assessment Interface and Discharge (RAID) psychiatric liaison service:</b></p> <ul style="list-style-type: none"> <li>Launched in the UK in 2009.</li> <li>Multidisciplinary team offered a comprehensive range of mental health specialities so that all patients could be assessed, treated, signposted or referred appropriately</li> <li>Emphasised on the importance of a rapid response with target time for patient assessment—a target of 1 hour for patients admitted to the ED and a target of 24 hours for patients admitted to the wards</li> <li>All adult hospital patients with mental health needs were eligible for the service, including older people with dementia and other cognitive impairments</li> <li>Formal training for acute staff in the hospital</li> <li>Emphasised on diverting and discharging patients from the ED and facilitating early but effective discharge from the wards. Follow-up clinics were provided for discharged patients, including a general old age psychiatry clinic and an adjoined memory clinic.</li> </ul>	<ul style="list-style-type: none"> <li>The average LOS for the RAID subgroup was 0.9 days shorter than for the controls, while for the RAID-influence subgroup the difference was 3.2 days.</li> <li>Extrapolating these figures over the full (unmatched) sample, it was estimated that a total of 9,290 bed-days were saved over the 8-month study period, equating to 13,935 bed-days per year. It was also found that RAID assessments in the short-stay unit led to a reduction of 160 hospital admissions per year.</li> <li>The likelihood of re-admission was 70% lower in the RAID subgroup; although no effect was found for the RAID-influence subgroup. The lower rate in the RAID subgroup equated to approximately 1,800 prevented re-admissions per year, or 8,100 bed-days based on an average LOS of 4.5 days.</li> </ul>	-
<p><b>2. Specialist wards or units:</b></p> <ul style="list-style-type: none"> <li>Allowed the collaboration of specialist care providers to work together, supported by nurses specially trained to provide medical and psychiatric care.</li> <li>Joint working between psychiatrists and geriatricians ensured that an accurate diagnosis was made and unnecessary ward transfers were avoided.</li> <li>A multidisciplinary clinical care team had specialist training in dementia and the management of behavioural problems without recourse to physical or chemical restraints.</li> <li>A homely, secure rehabilitation environment catered for the specific needs of people with dementia and provided better observation of patients</li> <li>Person-centred care with greater involvement of families and carers in the planning process.</li> </ul>	<ul style="list-style-type: none"> <li>Two of the evaluative studies reported longer LOS for patients in these joint wards (both in the UK), but the remaining studies (based in Germany, USA and Australia) all reported reduced LOS.</li> <li>In Germany, <b>Centre for the Elderly</b> (a combined medical and psychiatric inpatient unit) reduced LOS significantly from 16 to 14 days in the geriatric department and from 34 to 26 days in the psychogeriatric department.</li> <li>Structured interviews with staff revealed that older patients with comorbidity, in particular dementia and depression, benefited from the interdisciplinary treatment model.</li> </ul>	



<p><b>Behavioural units and Transitional Behavioural Assessment</b></p> <ul style="list-style-type: none"> <li>• Focused on behavioural and environmental approaches to care and the use of nonpharmacological therapies (i.e. music therapy and dog therapy).</li> <li>• Avoided the use of restraints, wherever possible.</li> <li>• A secure ward environment supported safe mobilisation, including an outdoor area with garden features.</li> <li>• Minimised excessive noise and stimuli, including the use of conducive colours and lighting.</li> <li>• Areas for dining and relaxing with activities such as card games.</li> <li>• Sufficient well-trained staff.</li> <li>• Development of good relationships between staff and patients. Staff learnt the personal history of patients and became familiar caregivers which helped reduce agitated and aggressive behaviour.</li> </ul>	<ul style="list-style-type: none"> <li>• Compared with care in general aged care wards, there was no reduction in LOS, possibly due to delayed placement in appropriate long-term care.</li> <li>• Marked reduction in fall incidence</li> <li>• Less use of 'specials' (one-on-one nursing for a given patient) to constantly monitor patients whose behaviour placed them at higher risk of injury to themselves or/as well as to others in the unit.</li> </ul>	<p>-</p>
<p><b>3. Hospital education programs:</b></p> <ul style="list-style-type: none"> <li>• Aimed to inform clinicians and hospital staff about dementia to assist improving identification and equip staff with appropriate skills to manage people with dementia.</li> <li>• Implemented across Australia including the Dementia Online Program.</li> <li>• Implemented a bed-based cognitive impairment identifier (CII) graphic to alert staff of the patient's cognitive impairment</li> <li>• Implemented a hospital-wide education program based on themes identified through a series of focus groups. Sessions were 30-40 minutes in length and were administered by the Clinical Director Sub-acute Medicine and a Clinical Nurse consultant (CNC).</li> </ul>	<ul style="list-style-type: none"> <li>• 80% of staff reported that it had improved their practice and 40% reported that it had improved response to carers.</li> <li>• Greater satisfaction with care their family member received.</li> <li>• The education program and graphic helped to improve hospital processes that support people with dementia.</li> <li>• Clinical leaders including geriatricians, psychogeriatricians, ASETs, Dementia CNCs and Nurse practitioners (NPs) in Dementia, Aged Care or Psychogeriatrics were often an important source of information, education and training for hospital staff.</li> </ul>	<p>Dementia toolkit offered to all hospitals through the Victorian Government's Long Stay Older Persons Program</p> <ul style="list-style-type: none"> <li>• <b>Confusion Assessment Method (CAM)</b> important means of embedding D&amp;D knowledge and understanding in care practices.</li> <li>• <b>Cognitive Impairment Pathway</b> is a comprehensive tool which includes CAM, the <b>Mini-Mental Status Examination</b> and the <b>'Clockface Test'</b>.</li> <li>• <b>Behaviour monitoring chart</b> designed to show the patient's behaviour as a graph throughout the day using colour coding to indicate when there have been aggressive incidents, the times that they may have occurred, as well as the severity of the incident.</li> </ul>

<p><b>4. The Care of the Confused Hospitalised Older Person Study (CHOPS):</b></p> <ul style="list-style-type: none"> <li>• An initiative of the NSW Agency for Clinical Innovation in collaboration with the Clinical Excellence Commission and GP NSW, piloted across five hospitals.</li> <li>• Developed delirium policies (although knowledge of these was variable)</li> <li>• Used tools such as delirium risk screens on patient admission forms prompting referrals for assessment using the Confusion Assessment Method</li> <li>• Placed delirium alerts on the patient's bedside chart and documenting intervention strategies on the patient care plan</li> <li>• Produced delirium resource folders available at nurses' stations, including evidence-based literature, a flowchart of the process, all necessary tools and supporting documents.</li> <li>• Provided brochures about delirium for patients and their family/carers.</li> </ul>	<ul style="list-style-type: none"> <li>• Nearly all site hospitals indicated that there have been significant improvements in staff understanding and awareness of delirium, although all acknowledged there was room for improvement.</li> <li>• Noted improvements in relation to delirium identification and treatment were usually as a result of the efforts of key staff members, including Dementia CNCs, Delirium CNCs, and NP in psychogeriatrics.</li> </ul>	<p><b>Delirium Superimposed on Dementia Algorithm</b> (DSDA) recommended a process for assessing delirium in patients with pre-existing dementia. This tool recognises that the patient's baseline mental status is a key parameter for assessing and treating delirium.</p>
<p><b>5. Acute Geriatric Unit (AGU)</b></p> <ul style="list-style-type: none"> <li>• Patients with delirium were transferred to an AGU.</li> <li>• Protocols were implemented in the Acute geriatric unit (AGU) to improve the assessment and pharmacological management of delirium and cognitive impairment.</li> <li>• Clear guidelines developed for staff in the ED and AGU based on published literature, data collected during the baseline period and clinical experience.</li> <li>• Guidelines were developed to standardise the assessment of behavioural disturbances, increase nonpharmacological management of behavioural disturbances and reduce the inappropriate use of antipsychotic medications.</li> <li>• Education programs were conducted for staff in the ED and AGU. In the ED, triage and charting procedures were changed to remind physicians to evaluate adults aged 75 and older for cognitive impairment and delirium. In the AGU, staff were trained to conduct mental status assessments and introduced to the guidelines described above.</li> <li>• An audit and feedback program was implemented to assess nurses' performance of mental status assessment and the prescribing patterns for cognitively impaired patients.</li> </ul>	<ul style="list-style-type: none"> <li>• The prevalence of delirium decreased from 40.9% among enrolled patients to 22.7% at 4 months, and 19.1% at 9 months.</li> </ul>	<p>-</p>
<p><b>6. Fall rehabilitation therapy</b></p> <p>initial assessment by a geriatric team to evaluate the patient's condition</p> <ul style="list-style-type: none"> <li>• physiotherapy sessions twice a week and daily physical activities with nurses</li> <li>• evaluation of the patient's need for daily living aids by an occupational therapist</li> <li>• patient and family counselling by physiotherapists and nurses</li> </ul>	<p>Mild-moderate dementia: the median LOS was 47 days in the intervention group compared with 147 days in the control group; while for mild dementia, the median LOS was 29 days in the intervention group compared with 46.5 days in the control group.</p> <p>Three months after the operation, patients in the intervention group with mild dementia were equally successful in returning to their independent living arrangements as people without dementia (study 1)</p>	

<ul style="list-style-type: none"> <li>• home visits by a physiotherapist before the patient was discharged to assess their home environment, and 10 follow-up visits from the physiotherapist following discharge.</li> <li>• a staff education program</li> <li>• an individualised care plan for each patient</li> <li>• a tailored rehabilitation program</li> <li>• early detection of post-operative complications.</li> </ul>	<p>significant difference in hospital LOS between the two groups. The length of post-operative stay, including rehabilitation, was 20.0 days (+/- 12.0 days) in the intervention group, compared with 32.1 days (+/- 35.3 days) in the control group. In the 12 months after the fracture, the average LOS for all hospitalisations was 23.8 days (+/- 16 days) in the intervention group, compared with 41.3 days (+/- 57.3 days) in the control group.(study 2)</p>	
<p><b>7. End of life care</b></p> <ul style="list-style-type: none"> <li>• news about the patient's terminal diagnosis was communicated to family and carers</li> <li>• assistance was provided to locate the patient's advance care directive and identify their preferences for end-of-life care</li> <li>• treatment options were discussed with the patient's guardians</li> <li>• palliative care strategies were adopted when the treatment goals became 'comfort measures only'</li> <li>• education was provided to staff on palliative care strategies.</li> </ul>	<p>The hospital LOS decreased from 12.1 days in a historical control group to 7.4 days in the intervention group, while intensive care unit LOS decreased from 6.8 days to 3.5 days.</p>	

Table A-5. The table describes strategies within emergency departments (ED) of hospitals that aim to improve identification, assessment and treatment of dementia as well as appropriate referral and admission practices. [3]

Strategies within the ED of hospitals		
Description of strategy	Outcomes	Content and related tools:
<p><b>1. Aged care services in emergency teams (ASETs):</b></p> <ul style="list-style-type: none"> <li>• Improved the care and management of older people presenting to the ED by providing appropriate access to services within the hospital and in the community.</li> <li>• Role not exclusively in relation to dementia.</li> <li>• Larger multidisciplinary teams consisting of RNs, allied health professionals such as occupational therapists, physiotherapists and dieticians as well as clinical care specialists</li> <li>• Coverage varied from as little as 10 hours per week in small rural hospitals to over 90 hours per week over 7 days in larger hospitals.</li> <li>• Used strategies such as after-hours referral books where potential patients were listed for their attention.</li> <li>• Required skill credibility of people occupying the role, sufficient coverage of hours to allow for follow-up of patients, good relationships within hospital and between acute and non-acute sectors.</li> </ul>	<ul style="list-style-type: none"> <li>• Hospital sites commented that ASETs had resulted in reduced admissions, including among those who presented after a fall or who were not coping at home.</li> <li>• ASET advice to ED medical staff about the safety of discharge to home for patients because of social or functional care needs was mostly also respected.</li> <li>• AETS improved relationships between the hospital and local residential aged care (RAC) facilities.</li> <li>• Fewer unnecessary presentations to ED as mentioned by staff.</li> <li>• Numerous informants at the site also commented there had been an improvement in the attitudes of ED staff towards older patients, including those from RAC facilities.</li> </ul>	<p>-</p>

<p><b>2. Geriatric Rapid Acute Care Evaluation (GRACE) program:</b></p> <ul style="list-style-type: none"> <li>• GRACE CNC was the focal point for communication between nursing homes, GPs and the ED for five days a week.</li> <li>• Phone triage system with RAC facilities ensured that the GRACE CNC was aware of when a patient was being sent and had all the information required for quick assessment.</li> <li>• Information from the Nursing Home Hostel Emergency Decision Index was used by the GRACE CNC to assess if patient required admission to hospital.</li> <li>• Dedicated beds for the GRACE program in the emergency medical unit.</li> <li>• Tests or imaging booked so that these could be done as soon as the patient arrives at the hospital.</li> <li>• Working closely with a senior medical officer from an early stage when RAC patients are brought to the ED.</li> <li>• Ensured that the timing of patient presentation minimised the amount of time they spent in hospital for procedures such as blood transfusion</li> <li>• Education and capacity building in RAC facilities. The GRACE CNC provides training for nurses/staff at RAC facilities to provide simple clinical care for residents, including the administration of intravenous antibiotics, Percutaneous endoscopic gastrostomy (PEG) feeding tubes and male catheterisation.</li> </ul>	<p>Verbal reports indicated that the introduction of this program at a metropolitan hospital had resulted in a reduction in bed-days used by high-care RAC patients from 537 per month to 33 per month over a 5-year period.</p>	<p><b>Nursing Home Hostel Emergency Decision Index</b> is an education tool for use by RAC facilities to guide them about what to look for and do for residents before contacting the hospital, ambulance or doctor, including undertaking some initial checks such as blood pressure and pulse.</p>
<p><b>3. Medical Assessment Units (MAUs)</b></p> <ul style="list-style-type: none"> <li>• Were operational in six of the HDS site hospitals in NSW.</li> <li>• Involved continuing care planning</li> <li>• Involved senior clinicians, including specialist medical staff.</li> <li>• Daily multidisciplinary case conferences.</li> <li>• The presence of an acute aged care ward—facilitated discharge from the rapid assessment units within the time frames specified for the model.</li> </ul>	<ul style="list-style-type: none"> <li>• 40–50% of MAU admissions were transferred to the aged care ward after 48 hours.</li> <li>• Hospital informants estimated that this system reduced LOS in the acute aged care ward by ‘a day or two’</li> <li>• Length of time in the ED had been reduced.</li> <li>• The model also had benefits for managing access block issues for EDs and ED informants were enthusiastic about the service model.</li> </ul>	

Table A-6. The table presents strategies implemented in residential aged care facilities to avoid hospital admissions and prevent dementia. [3]

Strategies in residential aged-care facilities		
Description of strategy	Outcomes	Content and related tools
<p><b>Special care units (SCU)</b></p> <ul style="list-style-type: none"> <li>• Specially trained nursing staff, including nurse practitioners</li> <li>• An environment that is secure and minimises visual and auditory stimuli</li> <li>• Special programs/activities that cater for people with cognitive impairment.</li> </ul>	<ul style="list-style-type: none"> <li>• The presence of an SCU reduced the risk of hospitalisation for 39 among cognitively impaired residents of an aged care facility with dementia by 10%.</li> <li>• Alzheimer patients who were cared for in the SCU were 30% less likely to be hospitalised than those who were cared for in a traditional residential aged care facility</li> <li>• Significant reduction in the use of physical restraints and antipsychotic medications.</li> </ul>	-
<p><b>Aged care nurse practitioners (NPs)</b></p> <ul style="list-style-type: none"> <li>• Managed complex medical needs of people with dementia.</li> <li>• Highly trained registered nurses who functioned collaboratively with physicians and nurses in a clinical setting.</li> <li>• Were responsible for assessing and managing patients.</li> <li>• Provided referrals, prescribe medicines and order diagnostic procedures.</li> </ul>	<ul style="list-style-type: none"> <li>• The likelihood of a person with Alzheimer's disease (or related dementia) experiencing an acute care-sensitive hospitalisation was reduced by 62% in care facilities with an on-site NP. This was mainly due to a sharp fall in the hospitalisation rate for infectious acute care-sensitive conditions, which fell by 71% among residents with Alzheimer disease.</li> <li>• Aged care facilities which were staffed with a full-time NP had between 19 and 23 fewer discretionary hospitalisations per year for every 100 residents.</li> </ul>	

Table A-7. Delirium/Dementia interventions in hospitals and aged-care facilities, their implementation strategies and reported effect on outcomes. [3]

Intervention	Implementation Strategies											Outcomes					
	ED	OR	LC	DI	PM	AF	OL	ST	PO	RE	OS	↓ Hospital Admissions	↓ LOS	↑ Staff skills/attitude or knowledge	↑ Practice improvement	↓ Incidence of D&D	↓ Bed days
Rapid Assessment Interface and Discharge (RAID) psychiatric liaison service <sup>1</sup>	✓							✓	✓			✓	✓				
Specialist wards or units <sup>1</sup>	✓		✓					✓	✓				✓				
Hospital education programs <sup>1</sup>	✓	✓	✓								✓			✓			
The Care of the Confused Hospitalised Older Person Study (CHOPS) <sup>1</sup>				✓						✓	✓			✓			
Fall Rehabilitation Therapy <sup>1</sup>	✓								✓				✓				
Acute Geriatric Unit (AGU) <sup>1</sup>	✓					✓		✓	✓	✓						✓	
End-of-life Care <sup>1</sup>	✓										✓		✓				
Aged care services in emergency teams (ASET)s <sup>2</sup>									✓		✓	✓		✓			
Geriatric Rapid Acute Care Evaluation (GRACE) program <sup>2</sup>	✓	✓						✓	✓								✓
Medical Assessment Units (MAUs) <sup>2</sup>								✓	✓				✓				

Special care units (SCU) <sup>3</sup>	✓							✓				✓*					
Aged care nurse practitioners (NPs) <sup>3</sup>	✓											✓^					

Table A-8. Breakdown of the number of studies for each implementation strategy and their reported effect on clinical and process outcomes. [1, 2] Numbers in the table reflect percentages (%) of studies that reported statistically significant effects on the outcome for the specified implementation strategy (i.e. the number of studies that reported a significant improvement in outcome over the total number of studies that had evaluated the outcome for that given strategy). It is critical to note that as many studies used a combination of more than one strategy and evaluated different outcomes, hence the number of studies showing significant effect for a given strategy on each outcome varied from strategy to strategy. The total number of studies that reported the outcome for a given strategy is reflected in brackets (n).

The results are unable to show the effect of a single strategy on a particular outcome in isolation, but rather reflects the proportion of studies that have reported significant improvement outcomes when a given strategy is used.

Decreasing frequency of reported use of strategy	Implementation Strategies	↓ Mortality (%)	↓ LOS (%)	↓ Incidence of D&D (%)	↓ Drug use (%)	↑ Screening adherence (%)	* ↑ Staff knowledge (%)	* ↑ Staff skills/attitude (%)
	Educational Meetings	30 (n=10)	45 (n=11)	67 (n=9)	38 (n=8)	87 (n=15)	67 (n=24)	50 (n=28)
	Outreach	20 (n=5)	33 (n=6)	75 (n=4)	75 (n=4)	100 (n=11)	75 (n=12)	53 (n=15)
	Local Consensus	43 (n=7)	38 (n=8)	38 (n=8)	29 (n=7)	78 (n=9)	71 (n=7)	20 (n=9)
	Distribution	43 (n=7)	50 (n=8)	43 (n=7)	33 (n=6)	86 (n=14)	75 (n=8)	75 (n=4)
	Patient-mediated	33 (n=9)	50 (n=10)	75 (n=8)	43 (n=7)	85 (n=13)	100 (n=4)	-
	Audit/feedback	75 (n=4)	40 (n=5)	25 (n=4)	40 (n=5)	82 (n=11)	100 (n=4)	33 (n=3)
	Opinion Leaders	40 (n=5)	33 (n=6)	40 (n=5)	25 (n=4)	78 (n=9)	100 (n=3)	0 (n=1)
	Structural	67 (n=3)	50 (n=4)	20 (n=5)	33 (n=3)	67 (n=9)	100 (n=3)	-
	Provider-oriented	67 (n=3)	25 (n=4)	50 (n=4)	33 (n=3)	88 (n=8)	100 (n=2)	100 (n=1)
	Reminders	33 (n=3)	25 (n=4)	40 (n=5)	50 (n=2)	86 (n=7)	100 (n=1)	0 (n=1)

- ≥75% of studies reported significant outcome
- ≥25% of studies reported significant outcome
- <25 % of studies reported significant outcome
- ✓ Reported in ≥ 5 studies
- Outcome not reported

Mortality – hospital or ICU or 30-day mortality  
 LOS – Length of stay in ICU  
 Screening adherence – Delirium screening adherence  
 D&D – Delirium and/or Dementia  
 Drug-use – Anti-psychotic drug use