



Position Statement 26

Management of Behavioural and Psychological Symptoms of Dementia (BPSD)

Key Points:

The person and their family

- Behavioural and psychological symptoms of dementia (BPSD's) can be associated with rapid decline of cognition and reduced quality of life and can be an expression of unmet need.
- Early diagnosis and management of the person with dementia, together with carer education and support can reduce negative outcomes and prevent premature institutionalisation.
- Management of BPSD should be individualised to meet the needs of the person with expressions of unmet need and should be based on the characteristics and severity of the symptoms.
- Carers should have access to education and training about dementia and BPSD with a focus on patient centered care, stress management and coping skills, including awareness of the available resources and support services.
- Dementia-specific respite centers should be available to offer structured activities for people with dementia and BPSD.

Training and education

- All General Practitioners should receive dementia education and training to facilitate early diagnosis and management of dementia including BPSD.
- All hospital staff involved in the care of older adults should receive training in dementia and BPSD and health managers should ensure that staff has access to regular updates of dementia and BPSD management.
- The aged care work force should receive adequate training in management of dementia and BPSD.

Policy and practice

- Health care professionals trained in management of BPSD should be available to all residential aged care facilities to provide education, training and support to staff and to assist in the assessment and management of BPSD.
- Accreditation standards for residential care facilities (RCF's) should include dementia-friendly design principles and RCF's should be designed to better suit people with dementia.
- All tertiary hospitals should have specialised dementia services to manage patients with severe BPSD.
- "Hospital in the Home" programs should be used effectively to treat medical illnesses of people with dementia to avoid hospitalisation altogether to avoid worsening of BPSD symptoms.
- Access to Geriatric, Old Age Psychiatry and Psychology services should be freely available to manage difficult cases of BPSD and collaboration between specialists, primary care physicians, aged care facilities, community care providers and all health professionals involved in care of older people with dementia is important.
- Non-pharmacological individualised strategies should be the first line of management of BPSD used by the family, relatives and paid carers in the community and in the hospital setting.
- Judicious use of medications by people with expertise in this area may be necessary as an adjuvant therapy or when non-pharmacological management has failed. Careful monitoring for side effects is an essential part of care.

Funding

- Adequate funding of service providers and supporting agencies is essential.
- Policy makers should pay particular attention to allocate resources for dementia training for the aged care work force.
- Research into prevention, management and other interventions in BPSD's should be prioritised by government.

This Position Statement represents the views of the Australian and New Zealand Society for Geriatric Medicine. This Statement was approved by the Federal Council of the ANZSGM on 12 September 2016. Authors: Dr Champa Ranasinghe, Professor Len Gray and Professor Elizabeth Beattie.

Background paper

Behavioural and psychological symptoms of dementia (BPSD) refer to the non-cognitive symptoms of disturbed perception, thought content, mood or behaviour that frequently occur in people living with dementia.¹

BPSD comprise a broad spectrum of symptoms including verbal and physical aggression, agitation and/or restlessness, screaming, pacing and repetitive motor activity, anxiety, depression and apathy, psychosis (delusions and hallucinations), disinhibition, inappropriate sexual behaviour, emotional lability, repetitive vocalisation, cursing and swearing, sleep disturbance, shadowing, sun downing, intrusiveness and wandering.^{2,3}

BPSD could be considered as an expression of unmet need⁴ and could be a manifestation of the person with dementia's reduced capacity to cope with stress and should be explored with a view of finding potential intervention strategies and directing personalised care. Pejorative language such as "wanderers" and "disruptive behaviours" should be avoided.

Epidemiology

Up to 90% of people with dementia have BPSD at some stage of their illness.⁵⁻⁷ A systematic review found that BPSD is more common in the nursing home setting.⁸ However Cheng and colleagues found higher prevalence of BPSD among community dwelling people with dementia.⁹

A longitudinal study on the course of neuropsychiatric symptoms of residents with dementia in long-term residential care found that individual symptoms fluctuate. With increasing severity of dementia, the affective symptoms became less severe while agitation, psychosis and apathy increased in severity.¹⁰ Other researchers also report the fluctuating course of BPSD symptoms with symptoms reaching the peak before end stage dementia.¹¹⁻¹²

The prevalence of BPSD in Australia and New Zealand is largely unknown. But one study conducted in 11 nursing homes in Sydney found that 90% of residents with dementia have BPSD.¹³

Impact of Dementia and BPSD

An estimated 298,000 Australians and 48,182 New Zealanders had dementia in 2011 and this figure is estimated to triple by 2050.^{14,15}

In Australia dementia was the third leading cause of death and disability burden and contributed to 4% of total disease burden in 2010.¹⁴ New Zealand also has similar figures.¹⁵

BPSD are associated with poor quality of life of the person with dementia, carer burden, increased health care cost, prolonged hospitalisation^{16,17} and early institutionalisation.¹⁶⁻¹⁸

In Australia, the total expenditure on people with dementia was estimated to be \$4.9 billion in 2009–10¹⁴ and in New Zealand the total financial cost of dementia in 2011 was estimated as \$954.8 million.¹⁵ Although direct financial cost for management of BPSD is unknown, it could be postulated that a high proportion of expenditure in dementia services could be directly attributed to the cost of BPSD management. With the predicted increase in prevalence of dementia¹⁹ the health care cost related to the management of BPSD is also expected to increase. In recognition of the impact of dementia, in April 2012 all Australian Health Ministers recognised dementia as the ninth National Health Priority Area (NHPA).¹⁹

The Role of General Practitioners

There is a substantial time delay from the onset of symptoms of dementia to seek medical assistance, have a diagnosis confirmed and then link with dementia services.^{19,20} Lack of knowledge, funding and time to assess patients with cognitive and behavioural problems, limited access to specialist services, misconceptions of the value of early diagnosis and difficulties in communicating the diagnosis are important factors contributing to the

delay in diagnosis of dementia by General Practitioners.²¹⁻²³

The Community Affairs References Committee on care and management of younger and older Australians living with dementia and behavioural and psychiatric symptoms of dementia (BPSD)²³ has recommended creation of a new funding mechanism to encourage General Practitioners to spend more time in diagnosis of dementia and linking people with dementia with support services.

In a paper published by Alzheimer's Australia, Philips et al recommend training and education to support GPs in diagnosing and managing dementia and BPSD including the benefits of early diagnosis and effective communication strategies.²² This paper also recommended providing incentives to GPs to spend more time in the assessment process.

Carer interventions

Family members and friends as carers play very important roles in the lives of people with dementia by providing supervision, personal care, assistance in day-to-day activities and managing behavioural problems.¹⁹ In 2011 approximately 200,000 Australians were carers for a person with dementia living in the community.¹⁹ Families and informal carers also play a role in both avoiding and delaying entry into residential aged care facilities.²⁴

The management of BPSD can present a significant challenge to carers, resulting in considerable stress causing high carer burden.²⁵ BPSD impose the greatest burden on carers when compared with cognitive impairment and physical dependence alone.²⁶ Carer distress and poor interpersonal relationships between the person living with dementia and the carer can exacerbate BPSD and up-skilling the carer to manage BPSD can delay institutionalisation.²⁷

The carers' diverse social and health characteristics present considerable challenges in evaluating carer interventions.²⁸ REACH studies found that active engagement of carers with multifaceted interventions together with ongoing support reduced carer burden, depressive symptoms in carers and care recipients' problem behaviour²⁹⁻³². Marriott et al³³ found similar results. Furthermore structured carer training programs with follow-up and support services have shown to delay institutionalisation without compromising psychological health of carers.^{34, 35}

A meta-analysis by Brodaty et al³⁶ and a systematic review by Parker et al³⁷ reported

limited duration interventions without ongoing long-term support to be unsuccessful carer interventions. Moreover Selwood et al³⁸ reported that individual interventions targeted at specific needs of carers are more effective than group interventions and this finding is supported by Marziali et al.³⁹ For people of Culturally and Linguistically Diverse (CALD) or indigenous background such interventions are important.⁴⁰

Contrary to expectations, a Cochrane review by Maayan et al⁴¹ did not find respite care beneficial for people with dementia or their carers. An actual lack of benefit needs to be considered as one interpretation and should not be written off. The type of respite offered may not have met the needs of either patient or carers and further trials are needed to examine this aspect of BPSD management. Despite this lack of evidence Community Affairs References Committee on Care and management of younger and older Australians living with dementia and BPSD has recommended the establishment of dementia-specific respite facilities, including in regional and remote areas²³ and NICE guideline on management of BPSD⁴² also recommends carers have access to respite services.

Educating carers about available resources and support services play an important part in management of BPSD. The National Dementia Support Program (NDSP) and the Dementia Behaviour Management Advisory Service (DBMAS) in Australia, Alzheimer's New Zealand and National Dementia Cooperative (NDC) in New Zealand provide education and support to people with dementia, their carers and those working with people with dementia. However these agencies are not adequately resourced⁴³ and authorities should allocate adequate funding for these agencies.

The place of acute hospitals in managing BPSD

People with BPSD can present to hospital to get treatment for acute illnesses or for evaluation and management of BPSD. One in every four people with dementia requires hospital services each year.⁴⁴ Although there are no separate figures for hospitalisation due to BPSD, it is not unreasonable to predict that a significant number of people with dementia present to hospitals with BPSD.

Hospitalisation can cause worsening of BPSD and can be a significant distress to the person with dementia, their caregivers and staff. A behaviourally disturbed patient can cause disruption to the effective functioning of a clinical unit. According to recent research only 14% of

hospitals have secure, safe, dementia-friendly wards.^{44, 45} Establishment of specialised dementia units in secondary and tertiary hospitals may overcome this problem.

A literature review by Dobrohotoff et al concluded that the studies on design principles of Psycho-Geriatric Units are rare, but studies of environmental design in long-term care facilities can be used to inform the optimal design of psycho-geriatric units.⁴⁶ Simple measures, such as colour coding to provide good visual access, orientation guides, appropriate lighting, clear signage, areas of interest or a garden for planned wandering can help to relax and reassure patients.⁴⁴ In these units, close observation of patients with more detailed assessment of BPSD to identify triggers, antecedents or activating events can be done to determine appropriate management strategies.⁴⁷

The Royal College of Psychiatrists, Royal College of Nursing and the Commission on Dignity in Care for Older People in 2011 have brought attention to the importance of dementia friendly environments in hospitals which was also recommended by NICE guideline on management of BPSD.⁴²

“Enhancing the Healing Environment – the Environments of Care for People with Dementia” program - showed that appropriately designed hospital environments can reduce the incidence of BPSD, the need for antipsychotic medications and falls and can promote independence, greater caregiver involvement and staff satisfaction.⁴⁸

A clinical study by Tibaldi et al found that Hospital in the Home programs are associated with a lower incidence of BPSD and reduced caregiver’s distress.⁴⁹ A systematic review by Shepperd et al found people with dementia treated by Hospital in the Home programs received antipsychotic medications less frequently.⁵⁰ Adequately resourced Hospital in the Home programs could be used effectively to treat people with dementia in their own homes without being admitted to hospitals thereby potentially avoiding deterioration of BPSD symptoms.

Dementia training for hospital staff

Many hospitals do not have enough appropriately trained staff to manage people with dementia within the general ward setting.⁵¹ A study by Smyth et al found deficits in dementia knowledge among Australian health care staff.⁵² Dementia education and training programs have been found to improve knowledge and confidence among health care staff in managing patients with dementia and BPSD.⁵²⁻⁵⁴ Dementia education is recommended by many

BPSD management guidelines, however according to the National Audit in Dementia Care conducted in UK, a large proportion of hospitals do not include dementia awareness training in their induction programs.⁵⁵ Time constraints, inflexible work rosters and lack of awareness of the need for dementia training are barriers to effective dementia training.⁵⁴ Support from the executive level, dedicated funding with flexible work-rosters together with tailored high quality dementia programs addressing the real work situation have been identified as key enhancers of successful dementia education.⁵⁴

The Dementia Champions Program implemented in Biggart hospital in Scotland, where use of specialist dementia nurses to provide education and support to other hospital staff was proved to be successful in improving dementia knowledge amongst clinical staff.⁵⁶

Many organisations both locally and internationally have developed BPSD management guides and tools. Well received resources developed within Australia and New Zealand include the Best Care for Older People Everywhere: The Toolkit (2012)⁴⁷, Assessment and Management of People with Behavioural and Psychological Symptoms of Dementia (BPSD) by NSW Health and Royal Australian and New Zealand College of Psychiatrists (RANZCP)⁵⁷ Reducing Behaviours Of Concern (ReBOC) by Alzheimer’s Australia, South Australia⁵⁸, Management Strategies to address Behaviours of Concerns by Bendigo Health⁵⁹ and Walking in Another’s Shoes: Encouraging person-centred care through an experiential education program in New Zealand.⁶⁰

BPSD in Aged Care Homes

About 53% (112,139 residents) of all permanent residents in Australian Government subsidised aged care homes in 2009–10 had a diagnosis of dementia¹⁹ and managing BPSD is a significant aspect of care in these people.

Increased incidence of BPSD in residential homes is associated with lower staff levels and training, management less geared towards using behavioural management strategies, higher numbers of residents per room, fewer activities for residents and higher resident dependency.⁶¹

A systematic review by Spector et al found very few studies examining the effects of staff training interventions in reducing BPSD and numerous methodological problems in the available studies. Despite that, they found that staff training

programs could reduce BPSD in people with dementia living in care homes.⁶²

Many clinical bodies in Australia and New Zealand have expressed concerns regarding the standards of care delivered to residents living with dementia and BPSD by Aged Care Homes and a lack of accreditation standards in this area. A submission by the Royal Australian and New Zealand College of Psychiatrists (RANZCP) to the Community Affairs Reference Committee on care and management of younger and older Australians living with dementia and BPSD has expressed concerns regarding the variability of the standards between RACFs and management of BPSD not being recognised as a priority by many RACFs.⁴³ The RANZCP submission also expressed concern about high staff turnover and limited training available for the care workers and highlighted the importance of reviewing the regulations and guidelines regarding the design of residential aged care homes to better suit people with dementia. This submission also recommended that all residential care homes should have access to a clinician with expertise in BPSD management to provide training in managing BPSD, support the staff and link them with external providers such as DBMAS, geriatric and mental health services.

A report by Alzheimer's Australia about the quality of residential aged care also highlighted the inadequacy of RACF staff training in management of BPSD and those not utilising support services such as DBMAS.⁶³ This report also raises the issue of low staffing level and inappropriate skills mix leading to low quality care.

The Community Affairs Reference Committee on care and management of younger and older Australians living with dementia and BPSD recommended the roll out of a phased program of accredited training in dementia and management of BPSD to all employees of Aged Care Homes.²³

The NICE guideline on BPSD management recommends dementia friendly environmental design principles in residential aged care and to pay careful consideration to the size of units, the mix of residents, and the skill mix of staff to ensure that the environment is supportive and therapeutic.⁴²

Gaps in the evidence and guidelines

Prevalence, course, biological and psychosocial associations, management and outcome of BPSD are active areas of research. However, good quality randomised control trials examining specific aspects of BPSD are rare⁶⁴. Furthermore, as

diverse symptoms of BPSD are often used as a single primary outcome measure, the efficacy of therapies for specific symptoms can be difficult to determine.

Systematic appraisal of dementia guidelines for the management of BPSD found that all guidelines recommended non-pharmacological interventions as first line treatment.⁶⁵ However no agreement was found among dementia guidelines for the majority of specific practice recommendations with regard to non-pharmacological interventions. Pharmacological management was proposed as second-line treatment, with agreement for the use of a selection of antipsychotics based on supporting evidence⁶⁵ together with guidance for timely discontinuation by some of the guidelines.^{66, 67}

BPSD rating scales

BPSD severity can range from mild BPSD to extreme BPSD, which can be very difficult to manage, and could be potentially harmful to the person with dementia and/or others. Brodaty and colleagues proposed a seven-tier model⁶⁸ for describing BPSD severity providing the basis for comprehensive planning of service delivery.

Various scales are used to assess the severity of BPSD and the International PsychoGeriatric Association mentions²⁷ Neuropsychiatric Inventory⁶⁹ (NPI), Behavior Rating Scale for Dementia of the Consortium to Establish a Registry for Alzheimer's Disease⁷⁰ (CERAD-BRSD) and Behavioral Pathology in Alzheimer's disease⁷¹ (BEHAVE-AD) as validated and commonly used tools. While the Cornell Scale⁷² is used to diagnose depression in patients with dementia, the Cohen-Mansfield Agitation Inventory⁷³ (CMAI) and Pittsburgh Agitation Scale⁷⁴ (PAS) are used to assess agitation. The Neuropsychiatric Inventory-Distress subscale⁷⁵ (NPI-D) measures caregiver distress.

Van der Linde and colleagues found 83 instruments measuring various aspects of BPSD⁷⁶. While most of the tools had good reliability and validity, very few were validated by independent studies and in primary care settings. They recommended more studies investigating these instruments in a variety of settings and the need for clearer definitions of BPSD symptoms to improve measurements.

Assessment of BPSD and models of care

As effective communication is crucial in assessment and management of BPSD, clinicians should involve trained interpreters whenever

possible to overcome the language and cultural barriers when assessing persons with dementia from Indigenous or Culturally and Linguistically Diverse (CALD) backgrounds in order to provide culturally appropriate services.⁶¹

All three commonly used behavioural assessment models try to understand the reasons behind the concerned behaviour. While the needs driven behavior model⁴ proposes that BPSD is an indication of unmet need and the person's attempt to respond to their current situation and communicate their needs the A, B, C model utilises behavioural observation and analysis to develop management strategies to treat BPSD.^{61, 77} The A, B, C model proposes identifying the problematic behaviour and its probable causes, manipulating the triggers and altering the perpetuating responses to treat behavioural disturbances.

The person-centered approach to dementia care^{78, 79} developed by Kitwood and colleagues provides a holistic framework for understanding the person with dementia by thorough and detailed assessment of the behaviour in combination with the interpersonal and physical environment to generate potential intervention strategies.^{61, 80}

An assessment of BPSD should include a baseline measurement of frequency and severity of behaviour, management plan with proposed treatment, changes to daily routine and environment together with a scheme for monitoring the behaviour and a plan for a review.⁷⁷

Compounders in diagnosis

Delirium can compound and exacerbate BPSD and should always be considered in a patient with BPSD. Hodgson et al found that 36% of community dwelling people with BPSD had undiagnosed acute illness with bacteraemia (15%), hyperglycaemia (6%) and anaemia (5%) being the most prevalent.⁸¹

Voyer et al found the use of physical restraint and consumption of high-risk drugs, such as narcotics, benzodiazepines, antipsychotics and antidepressants are associated with increased incidence of delirium.⁸² As both these practices are increasingly used for patient with BPSD it can be postulated that the presence of BPSD is associated with higher risk of delirium.

Holttä et al reported overlap between delirium and neuropsychiatric symptoms in people with dementia.⁸³ They found that 85% of patients with delirium superimposed on dementia suffer from multiple neuropsychiatric symptoms, and nearly

one in three patients with neuropsychiatric symptoms fulfilled criteria for delirium.

Landreville and colleagues found delirium is associated with higher level of BPSD.⁸⁴ They also found that delirium is associated with certain subtypes of BPSD (wandering/trying to leave, sleep disturbances and irrational behaviour) which is consistent with disorganised thinking, perceptual disturbances, psychomotor agitation and altered sleep-wake cycle associated with delirium.

Management of BPSD

The classification of BPSD as emergent and non-emergent is useful. People with emergent BPSD are in severe distress, pose an imminent danger to themselves or caregivers and/or have severely disruptive behaviours. People with non-emergent BPSD do not have symptoms to this level of severity but their symptoms may be inconvenient, disruptive to daily routine and impact on quality of life.⁸⁰ Emergent BPSD warrants immediate action including both pharmacological and non-pharmacological measures whereas in non-emergent BPSD non-pharmacological measures can be instituted first while ongoing evaluations are being conducted.

Non-Pharmacological Management

All BPSD guidelines recommend individualised non-pharmacological management as the preferred option for management of BPSD.⁶⁵ A systematic review on non-pharmacological management of agitation by Livingston et al found only limited number of high quality randomised control studies.⁸⁵

Supervised person-centred care, dementia care mapping, behavioural management and communication skills through paid caregivers were efficacious at reducing clinically significant agitation in care home residents, both immediately and up to 6 months following the intervention.⁸⁵ Sensory therapy activities and structured music therapies were also found to reduce agitation.⁸⁵ This systematic review did not find bright light therapy, aromatherapy or home-like environment to be effective therapies for BPSD. They found insufficient evidence to comment on family caregiver training in cognitive behaviour therapy and behavioural management, pet therapy or unsupervised paid caregiver activities.⁸⁵ However, lack of strong evidence for these interventions should not prevent clinicians considering these interventions on a case-by-case basis as many were small studies underpowered to detect efficacy.

A Cochrane review by Cook et al found potential beneficial effects of multi-component interventions utilising functional analysis where exploration of purpose of an individual's behaviour is used to resolve distress and associated behavioural manifestations.⁸⁶ They found reduced frequency of challenging behaviours and positive effect on caregiver reaction using this method. However the incidence and severity of challenging behaviour or the degree of caregiver burden was not reduced by these interventions. More studies examining the effect of functional analysis in larger samples are needed to better evaluate this area.

A systematic review and meta analysis of effects of music therapy on BPSD by Ueda and group found that music therapy had moderate effect on anxiety and small effect on behavioural symptoms.⁸⁷ Combination of singing, listening, rhythmic exercise and improvisation were used in the 20 studies reviewed in this meta analysis and most of the studies used the music preferred by the participants.

A review by Thune'-Boyle et al found that exercise appeared to be beneficial in reducing some aspects of BPSD such as depressed mood and agitation.⁸⁸ They also found while evidence for efficacy of exercise on anxiety, apathy and repetitive behaviours is currently weak or lacking, that exercise might improve sleep and reduce "wandering". They found many methodological flaws in previous studies examining this area and recommended future longitudinal studies with trials of well-defined exercise interventions suitable for people with dementia.

In a Cochrane review examining data from 11 clinical studies, Forbes et al found no effect of light therapy on cognitive function, sleep, challenging behaviours like agitation or neuropsychiatric symptoms associated with dementia.⁸⁹

While a systematic review examining 11 clinical studies by Fung et al found aromatherapy is beneficial in reducing BPSD⁹⁰, a Cochrane review of seven randomised controlled studies by Forrester et al found equivocal evidence for the benefits of aromatherapy.⁹¹ Both groups recommended better designed trials examining the effect of aromatherapy on BPSD symptoms.

Pharmacological Management

Expert consensus guidelines on BPSD management ^{27, 42, 66, 67} recommend pharmacotherapy as second line treatment for more severe and persistent BPSD not responding to non-pharmacological measures alone with close monitoring for side effects and regular review for

ongoing need for continuation therapy in particularly for anti psychotic treatment. These guidelines also recommend obtaining consent for anti psychotic treatment either from the patient or their substitute decision maker explaining the modest benefit and potential adverse effects.

Multiple systematic reviews on typical and atypical antipsychotic medications found only modest benefit for treatment of aggression and psychosis with associated increased risk of cerebrovascular events and extra pyramidal side effects. These reviews recommend antipsychotic medications to be used in only in severe BPSD causing severe distress or risk of physical harm. ^{92, 93} Ballard and colleagues found that both risperidone and olanzapine reduce aggression while risperidone was also efficacious in treating psychosis. Both agents were associated with increased incidence of cerebrovascular events and extra pyramidal side effects.⁹² However in a systematic review by Carson et al⁹⁴ found that risperidone and olanzapine were more efficacious for treating BPSD with comparable side effects to placebo.

In a systematic review, Glind et al⁹³ found that trazadone and haloperidol is not effective for agitation but caused more side effects. In a meta-analysis by Cheung et al⁹⁵ found that quetiapine causes minor improvement of BPSD compared to placebo which may not be clinically significant.

A systematic review on the effect of discontinuation of antipsychotics by Pan et al ⁹⁶ found that antipsychotic drug discontinuation had no statistically significant difference in BPSD severity compared to the continuation of therapy. A Cochrane review by Declercq et al⁹⁷ found antipsychotic medications can be stopped in many people with BPSD without detrimental effects on their behaviour. In this review some studies reported an increased risk of relapse after discontinuation of antipsychotic medications and they recommend continuation of antipsychotics in people with more severe BPSD at baseline.

Very few studies have evaluated other pharmacological agents in treating BPSD. Cholinesterase inhibitors, selective serotonin reuptake inhibitors and melatonin have shown some benefit while mood stabilisers have failed to show clinically significant benefit. The better side effect profile makes these medications an attractive alternative to antipsychotics; however further studies are needed to evaluate their efficacy better.

A systematic review by Rodda et al⁹⁸ found only limited benefit of cholinesterase inhibitor therapy for management of BPSD. In this review they

analysed 14 clinical trials examining the efficacy of donepezil, rivastigmine and galantamine for management of BPSD. In this review only three studies showed statistically significant and clinically modest benefit. They supported cholinesterase inhibitor therapy for management of BPSD in the absence of effective and safe alternative therapy.

A systematic review by Henry and colleagues⁹⁹ and a Cochrane review by Seitz et al¹⁰⁰ found selective serotonin reuptake inhibitors (SSRI) and trazadone were effective for management of BPSD and well tolerated by the patients. They recommended well-designed randomised controlled trials examining the efficacy of antidepressants in management of BPSD and concluded antidepressants are an effective alternative for treatment of BPSD.

A systematic review by Yeh et al¹⁰¹ looking at the efficacy of mood stabilisers in managing BPSD did not find enough evidence to support the efficacy of mood stabilisers. They evaluated clinical studies trialing carbamazepine, valproate, gabapentin, topiramate, lamotrigine, oxcarbazepine and lithium; only carbamazepine showed some beneficial effect and they also recommended further studies in this area.

In a meta-analysis of melatonin for the treatment of dementia, Jansen et al¹⁰² found that melatonin may be effective in treating BPSD. However no recent clinical studies have examined this therapy.

Pharmacotherapy in management of BPSD is understudied area and well-designed clinical trials are needed to evaluate these potential therapies.

An integrated service delivered by primary and specialised health care professionals, aged care assessors, service providers, educational and training facilities and support services only can provide much needed comprehensive service for the people living with dementia and their caregivers.

Conclusion

Management of BPSD remains a challenge to all health professionals and caregivers alike. Educating and supporting caregivers can prevent many negative outcomes. All health professionals involved in the care of the older adults should have adequate training in dementia and management of BPSD. Governments should provide more resources to manage BPSD and better quality clinical research is needed to improve the knowledge of BPSD and its management.

Person centered dementia care is the cornerstone of management of BPSD and caregivers should be involved in management plan. Non-pharmacological strategies should be used initially and carefully selected pharmacological agents with close monitoring for potential side effects may play a role in management of BPSD.

References

1. Finkel S, Costae Silva J, Cohen G, Miller S, Sartorous N. Behavioural and psychological symptoms of dementia: a consensus statement on current knowledge and implications for research and treatment. *Int Psychogeriatr* 1996;8 :497-500
2. Petrovic M, Hurt C, Collins D, Burns A, Camus V, Liperoti R, et al. Clustering of behavioural and psychological symptoms in dementia (BPSD): a European Alzheimer's dementia consortium (EADC) study. *Acta Clin. Belg.* 2007; 62(6): 426– 432.
3. Best Practice Guideline for Accommodating and Managing Behavioural and Psychological Symptoms of Dementia in Residential Care, A Person-Centered Interdisciplinary Approach. British Columbia 2012(Cited on 25/06/2014). Available from <http://www.health.gov.bc.ca/library/publications/year/2012/bpsd-guideline.pdf>
4. Algase D, Beck C, Whall A, Berent S, Richards K, Beattie E. Need-driven dementia-compromised behavior: An alternative view of disruptive behavior *American Journal of Alzheimer's Disease.* 1996; 11(2): 10-19.
5. Lyketsos CG, Steinberg M, Tschanz JT, Norton MC, Steffens DC, Breitner JC. Mental and behavioural disturbances in dementia: Findings from the Cache County Study on Memory in Aging. *Am J Psychiatry.*2000; 157 (5): 708-714. (Cited on 24/07/2014). Available from <http://ajp.psychiatryonline.org/article.aspx?articleid=174106>
6. Lyketsos CG, Lopez O, Jones B, Fitzpatrick AL, Breitner J, DeKosky S. Prevalence of neuropsychiatric symptoms in dementia and mild cognitive impairment: results from the Cardiovascular Health Study. *JAMA.* 2002; 288 (12): 1475-1483.

7. Savva G M, Zaccai J, Matthews F E, Davidson J E, McKeith I, Brayne C. Prevalence, correlates and course of behavioural and psychological symptoms of dementia in the population. *The British Journal of Psychiatry* 2009; 194: 212–219.
8. Seitz D, Purandare N, Conn D. Prevalence of psychiatric disorders among older adults in long-term care homes: a systematic review. *International Psychogeriatrics* 2010; 22 (7), 1025-1039.
9. Cheng T, Chen T, Yip P, Hua M, Yang C, Chiu M. Comparison of behavioral and psychological symptoms of Alzheimer's disease among institution residents and memory clinic outpatients. *International Psychogeriatrics* 2009; 21 (06): 1134-1141.
10. Selbaek G, Engedal K, Benth J.S, Bergh S. The course of neuropsychiatric symptoms in nursing-home patients with dementia over a 53-month follow-up period. *International Psychogeriatrics* 2014; 26 (1): 81-91.
11. Tariot PN, Blazina L. The psychopathology of dementia. In: *Handbook of dementing illnesses*. Morris JC (ed). New York: Marcel Dekker Inc., 1994.
12. Lovheim H, Sandman PO, Karlsson S, Gustafson Y. Behavioral and psychological symptoms of dementia in relation to level of cognitive impairment. *International Psychogeriatrics* 2008; 20 (4): 777–789.
13. Brodaty H, Draper B, Saab D, Low LF, Richards V, Paton H, Lie D. Psychosis, depression and behavioural disturbances in Sydney nursing home residents: prevalence and predictors. *Int J Geriatr Psychiatry* 2001; 16(5): 504-512.
14. Australian Bureau of Statistics 2010. *Disability, Ageing and Carers, Australia: Summary of Findings*, cat. no. 4430.0:ABS. (Accessed on 24/07/2014). Available from: <http://www.abs.gov.au/ausstats/abs@.nsf/mf/4430.0>
15. Updated dementia economic report 2011, New Zealand, Alzheimer's New Zealand January 2012. (Accessed on 06/01/2015). Available from http://www.alzheimers.org.nz/files/reports/Updated_Dementia_Economic_Impact_Report_2012_New_Zealand.pdf
16. Finkel SI, Costa SJ, Cohen G, Miller S, Sartorius N. Behavioural and psychological signs and symptoms of dementia: a consensus statement on current knowledge and implications for research and treatment. *Int Psychogeriatr* 1996; 8 (Suppl 3): 497–500.
17. Finkel SI. Behavioral and psychological symptoms of dementia: a current focus for clinicians, researchers, and caregivers. *J Clin Psychiatry* 2001; 62 Suppl 21:3-6.
18. Ding-Cheng C, Kasper J, Black BS, Robins PV. Presence of behavioural and psychological symptoms predicts nursing home placement in community-dwelling elders with cognitive impairment. *J Gerontol A Biol Sci Med Sci* 2003; 58(6): 548-554.
19. Australian Institute of Health and Welfare 2012. *Dementia in Australia*. Cat. no. AGE 70. Canberra: AIHW. (Accessed on 22/05/2014). Available from: <http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=10737422943>
20. Speechly CM, Bridges-Webb C, Passmore E. The pathway to dementia diagnosis. *Medical Journal of Australia* 2008; 189(9): 487–489.
21. Bradford A, Kunik ME, Schulz P, Williams SP, Singh H. Missed and delayed diagnosis of dementia in primary care: prevalence and contributing factors. *Alzheimer Disease & Associated Disorders* 2009; 23(4): 306–314.
22. Phillips J, Pond D, Goode SM. Timely diagnosis of dementia: can we do better? *Alzheimer's Australia Paper 24*, September 2011. (Accessed on 12/05/2014). Available from: http://www.fightdementia.org.au/common/files/NAT/Timely_Diagnosis_Can_we_do_better.pdf
23. The Senate. *Community Affairs References Committee on care and management of younger and older Australians living with dementia and behavioural and psychiatric symptoms of dementia (BPSD)*, Common wealth Australia, March 2014. (Accessed on 12/06//2014). Available from: http://www.aph.gov.au/~media/Committees/Senate/committee/clac_ctte/dementia/report/report.pdf
24. Dramé M, Lang P, Jolly D, Narbey D et al. Nursing home admission in elderly subjects with dementia: predictive factors and future

- challenges. *Journal of American Medical Directors Association* 2012; 13(1): 83.
25. Youngmee K, Richard S. Family caregivers' strains: comparative analysis of cancer caregiving with dementia, diabetes, and frail elderly caregiving. *Journal of Aging and Health* 2008; 20(5): 483– 503.
 26. Machnicki G, Allegri RF, Dillon C, Serrano CM, Taragano FE. Cognitive, functional and behavioral factors associated with the burden of caring for geriatric patients with cognitive impairment or depression: evidence from a South American sample. *International Journal of Geriatric Psychiatry* 2009; 24(4): 382–389.
 27. The IPA Complete Guides to Behavioural and Psychological Symptoms of Dementia BPSD – Specialists Guide. International Psycho geriatric Association 2012. (Accessed on 14/07/2014). Available from: http://www.bsa.ualberta.ca/sites/default/files/____IPA_BPSD_Specialists_Guide_Online.pdf
 28. Poulos C, Beattie E, Gresham M, Harkin D. Beyond Respite: designing effective wellness programs for carers, June 2014. (Accessed on 12/05/2014) Available from: http://www.dementiaresearch.org.au/index.php?option=com_drcrc&view=drcrc&layout=project&Itemid=101&pid=156
 29. Schulz R, Belle SH, Czaja S J, Gitlin LN, Wisniewski SR, Ory MG. Introduction to the special section on Resources for Enhancing Alzheimer's Caregiver Health (REACH). *Psychol Aging* 2003; 18: 357–360.
 30. Eisdorfer C, Czaja SJ, Loewenstein DA, Rubert MP, Arguelles S, Mitrani VB, Szapocznik J. The effect of a family therapy and technology- based intervention on caregiver depression. *The Gerontologist* 2003; 43: 521–531.
 31. Belle SH, Burgio L, Burns R, Coon D, Czaja J, Gallagher-Thompson D et al. Enhancing the quality of life of dementia caregivers from different ethnic or racial groups. *Annals of Internal Medicine* 2006; 145(10): 727–738.
 32. Lykens K, Moayad N, Biswas S, Reyes-Ortiz C, Singh KP. Impact of a Community Based Implementation of REACH II Program for Caregivers of Alzheimer's Patients. *PLoS ONE* 2014; 9(2): e89290. doi: 10.1371/journal.pone.0089290. Accessed on 02/08/2014. Available from: <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0089290>
 33. Marriott A, Donaldson C, Tarrier, Burns A. Effectiveness of cognitive-behavioural family intervention in reducing the burden of care in carers of patients with Alzheimer's disease. *Br J Psychiatry* 2000; 176: 557–562.
 34. Brodaty H, Gresham M, Luscombe G. The Prince Henry Hospital dementia caregivers' training programme. *International Journal of Geriatric Psychiatry* 1997; 12(2): 183–192.
 35. Mittelman M S, Haley WE, Clay OJ, Roth DL. Improving caregiver well-being delays nursing home placement of patients with Alzheimer disease. *Neurology* 2006; 67(9): 1592–1599.
 36. Brodaty H, Green A, Koschera A. 'Meta-analysis of psychosocial interventions for caregivers of people with dementia'. *Journal of the American Geriatrics Society* 2003; 51(5): 657 - 664.
 37. Parker D, Mills S, Abbey JA. 'Effectiveness of interventions that assist caregivers to support people with dementia living in the community: A systematic review'. *International Journal of Evidence-Based Healthcare* 2008; 6(2): 137-172.
 38. Selwood A, Johnston K, Katona C, Lyketsos C, Livingston G. 'Systematic review of the effect of psychological interventions on family caregivers of people with dementia', *Journal of Affective Disorders* 2007; 101(1): 75-89.
 39. Marziali E, McCleary L, Streiner DL. 'Evaluation of an assessment battery for estimating dementia caregiver needs for health and social care services', *American Journal of Alzheimer's Disease and Other Dementias* 2010; 25(5): 446-454.
 40. Xiao L D et al. The effects of a personalized dementia care intervention for caregivers from Australian minority groups. *American Journal of Alzheimer's Disease & Other Dementias* 2016, Vol. 31(1) 57-67.
 41. Maayan N, Soares-Weiser K, Lee H. Respite care for people with dementia and their carers (Review). *The Cochrane Collaboration* 2014, Issue 1. (Published Online: 16 January 2014, accessed on 13/06/2014). Available from: <http://summaries.cochrane.org/CD004396/D>

- EMENTIA_respite-care-for-people-with-dementia-and-their-carers.
42. Dementia: Supporting people with dementia and their carers in health and social care. NICE guidelines [CG42]. Review October 2012. (Accessed on 07/07/2014). Available from: <http://www.nice.org.uk/Guidance/CG42>
 43. RANZCP Submission. Inquiry into care and management of young and older Australians living with dementia and behavioural and psychiatric symptoms of dementia (BPSD), May 2013. Accessed on 12/05/2014, Available from: <https://www.ranzcp.org/Files/Publications/Submission-BPSD-and-Dementia-7-May-2013.aspx>
 44. Dementia Care in the acute hospital setting: issues and strategies. A report for Alzheimer's Australia paper 40, June 2014. (Accessed on 05/08/2014) Available from: https://fightdementia.org.au/sites/default/files/Alzheimers_Australia_Numbered_Publication_40.PDF
 45. Draper B, Karmel R, Gibson D, Peut A, Anderson P. The Hospital Dementia Services Project: age differences in hospital stays for older people with and without dementia. *Int Psychogeriatr* 2011; 23(10): 1649-1658.
 46. Dobrohotoff JT, Llewellyn-Jones RH. Psychogeriatric inpatient unit design: a literature review. *Int Psychogeriatr* 2011; 23(2): 174-189.
 47. Dementia: Best care for older people everywhere-The toolkit-Victorian Government Health Information, Australia. (Accessed on 04/08/2014). Available from: [http://docs.health.vic.gov.au/docs/doc/32A6DBBBE7D5512BCA257A9300019EAE/\\$FILE/1208011_BCOPE%20The%20Toolkit_WEB-3rdOct-v02.pdf](http://docs.health.vic.gov.au/docs/doc/32A6DBBBE7D5512BCA257A9300019EAE/$FILE/1208011_BCOPE%20The%20Toolkit_WEB-3rdOct-v02.pdf)
 48. The King's Fund. Developing Supportive Design for People with Dementia, 2013. (Accessed on 14/07/2014). Available from: <http://www.kingsfund.org.uk/publications/developing-supportive-design-people-dementia/>
 49. Tibaldi V, Aimonino N, Ponzetto M, Stasi MF, Amati D, Raspo S, et al. A randomized controlled trial of a home hospital intervention for frail elderly demented patients: behavioral disturbances and caregiver's stress. *Arch Gerontol Geriatr Suppl* 2004; 9: 431-436.
 50. Shepperd S, Doll H, Angus RM, Clarke MJ, Iliffe S, Kalra L et al. Avoiding hospital admission through provision of hospital care at home: a systematic review and meta data analysis of individual patient data. *Canadian Medical Association Journal* 2009; 180:175–182.
 51. Australian Institute of Health and Welfare. Dementia care in hospitals: costs and strategies 2013. Cat. No. AGE 72. Canberra: AIHW. (Accessed on 23/06/2014). Available from: <http://www.aihw.gov.au/WorkArea/DownloadAsset.aspx?id=60129543386>
 52. Smyth W, Fielding E, Beattie E, Gardner A, Moyle W, Franklin S et al. A survey-based study of knowledge of Alzheimer's disease among health care staff. *BMC Geriatrics* 2013; 13:2. (Accessed on 07/08/2014). Available from: <http://www.biomedcentral.com/content/pdf/1471-2318-13-2.pdf>.
 53. Galvin, J. E., Kuntemeier, B., Al-Hammadi, N., Germino, J., Murphy-White, M., & McGillick, J. (2012). "Dementia-friendly Hospitals: Care not Crisis": An Educational Program Designed to Improve the Care of the Hospitalized Patient With Dementia. *Alzheimer Dis Assoc Disord* 2012; 24(4), 372-379. (Accessed on 23/06/2014). Available from: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2955811/>.
 54. Foreman P, Gardner I. Evaluation of Education and Training of Staff in Dementia Care and Management in Acute setting. Melbourne. Aged Care Branch, Victorian Government Department of Human Services, 2005. (Accessed on 22/07/2014). Available from: http://www.health.vic.gov.au/agedcare/downloads/dementia_eval_rpt.pdf.
 55. National Audit of Dementia Care in General Hospitals 2012-13. Second round audit and update. Royal College of Psychiatrists, 2013. (Accessed on 07/08/2014). Available from: www.hqip.org.uk/.../NAD-NATIONAL-REPORT-12-June-2013.pdf.
 56. Biggart Dementia Project 2009-2010. Alzheimer's Scotland 2010. (Accessed on 05/06/2014). Available from: http://www.qihub.scot.nhs.uk/media/162497/nhsaa_biggart_dementia_report_july_2010.Pdf

57. NSW Ministry of Health & RANZCP. Assessment and Management of People with Behavioural and Psychological Symptoms of Dementia (BPSD); A Handbook for Clinicians. Sydney: NSW Ministry of Health & RANZCP 2013. (Accessed on 12/05/2014) Available from: https://www.ranzcp.org/Files/Publications/A-Handbook-for-NSW-Health-Clinicians-BPSD_June13_W.aspx.
58. Alzheimer's Australia (South Australia) & Alzheimer's Australia SA & National Dementia Behaviour Advisory Service (Australia) 2012, ReBOC: reducing behaviours of concern: a hands on guide: a resource to assist those caring for people living with dementia, Alzheimer's Australia SA Inc, Glenside, S. Aust. (Accessed on 12/06/2014). Available from http://dbmas.org.au/uploads/resources/SA_DBMAS_REBOC_Guide_2012.pdf
59. The Loddon Mallee Regional Dementia Management Strategy. Bendigo Health-NSW Health. (Accessed on 12/08/2014). Available from: <http://www.dementiamanagementstrategy.com/>.
60. Walking in Another's Shoes: Encouraging person-centred care through an experiential education programme. AKOAOTEAROA, National Centre for Tertiary Teaching Excellence. (Accessed on 06/01/2015). Available from: <https://akoaootearoa.ac.nz/download/ng/file/group-3300/walking-in-anothers-shoes-encouraging-person-centred-care-through-an-experiential-education-programme.pdf>
61. Burns K, Jayasinha R, Tsang R, Brodaty H. Behaviour Management - A Guide to Good Practice; Managing Behavioural and Psychological Symptoms of Dementia (BPSD). Dementia Collaborative Research Centre – Assessment and Better Care (DCRC-ABC), University of New South Wales 2012. (Accessed on 12/05/2014). Available from: http://dbmas.org.au/uploads/resources/DBMAS_Guide_21_05_12.for_USB.pdf
62. Spector A, Orrell M, Goyder J. A systematic review of staff training interventions to reduce the behavioural and psychological symptoms of dementia. Ageing Research Reviews 2013; 12(1): 354-364.
63. Quality of Residential aged Care: the Consumer perspective. A report for Alzheimer's Australia, paper 37 November 2013. (Accessed on 12/06/2014). Available from: http://fightdementia.org.au/sites/default/files/20131112_Paper_37_Quality_of_Residential_Aged_Care.pdf.
64. Van der Linde RM, Stephan BC, Savva GM, Dening T, Brayne C. Systematic reviews on behavioural and psychological symptoms in the older or demented population. Alzheimers Res Ther. 2012; 4(4): 28.
65. Azermai M, Petrovic M, Elseviers MM, Bourgeois J, Van Bortel LM, Vander Stichele RH. Systematic appraisal of dementia guidelines for the management of behavioural and psychological symptoms. Ageing Res Rev. 2012; 11 (1): 78-86.
66. Third Canadian Consensus Conference on Diagnosis and Treatment of Dementia, July 2007. (Accessed on 12/06/2014). Available from: http://www.cccdt.ca/pdfs/Final_Recommendations_CCCDTD_2007.pdf.
67. The Royal Australian and New Zealand College of Psychiatrists. Antipsychotic medications as a treatment of behavioural and psychological symptoms in dementia. Practice guidelines 10. The Royal Australian and New Zealand College of Psychiatrists, June 2009. (Accessed on 12/06/2014). Available from: https://www.ranzcp.org/Files/Resources/Collge_Statements/Practice_Guidelines/pg10-pdf.aspx
68. Brodaty H, Draper B M, Low L. Behavioural and psychological symptoms of dementia: a seven-tiered model of service delivery. Med J Aust 2003; 178 (5): 231-234.
69. Cummings JL, Mega M, Gray K, Rosenberg-Thompson S, Carusi DA, Gornbein J. The Neuropsychiatric Inventory: Comprehensive assessment of psychopathology in dementia. Neurology 1994; 44: 2308–2314. Accessed on 16/06/2014). Available from <http://www.ncbi.nlm.nih.gov/pubmed/7991117>
70. Tariot PN, Mack JL, Patterson MB. The behavior rating scale for dementia of the consortium to establish a registry for Alzheimer's disease. The behavioral pathology committee of the consortium to

- establish a registry for Alzheimer's disease. *Am J Psychiatry* 1995; 152(9): 1349–1357. (Accessed on 16/06/2014). Available from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2808763/>
71. Reisberg B, Borenstein J, Salob SP, Ferris SH. Behavioral symptoms in Alzheimer's disease: Phenomenology and treatment. *J Clin Psychiatry* 1987; 48 (Suppl): 9–15. (Accessed on 16/06/2014) Available from <http://www.ncbi.nlm.nih.gov/pubmed/3553166>
 72. Alexopoulos GS, Abrams RC, Young RC, Shamoian CS. Cornell Scale for Depression in Dementia. *Biol Psychiatry* 1988; 23: 271–284. (Accessed on 16/06/2014). Available from <http://www.ncbi.nlm.nih.gov/pubmed/3337862>
 73. Cohen-Mansfield J, Marx MS, Rosenthal AS. A description of agitation in a nursing home. *J Gerontol* 1989; 44: M77–M84. <http://www.ncbi.nlm.nih.gov/pubmed/2715584>
 74. Rosen J, Burgio L, Killar M, Cain M, Allison M, Fogleman M. The Pittsburgh Agitation Scale: a user-friendly instrument for rating agitation in dementia patients. *Am J Geriatr Psychiatry* 1994; 2: 52–59.
 75. Cummings JL. The Neuropsychiatric Inventory: assessing psychopathology in dementia patients. *Neurology* 1997; 48 (Suppl 6): S10–16. http://www.neurology.org/content/48/5_Suppl_6/10S.full.pdf+html
 76. Van Derlinde RM, Stephan BCM, Dening T, Brayne C. Instruments to measure behavioural and psychological symptoms of dementia. *Int. J. Methods Psychiatr. Res* 2014. 23(1): 69–98.
 77. Osser D, Fischer M. Management of the behavioral and psychological symptoms of dementia. Review of current data and best practices for health care providers. National Resource Centre for Academic Detailing, 28 December 2013. (Accessed on 12/06/2014). Available from: <http://www.narcad.org/wp-content/uploads/2014/01/Dementia-Management-of-BPSD-Evidence-Document-Final.pdf>
 78. Kitwood T. "Towards a Theory of Dementia Care: Personhood and Well-being." *Ageing and Society* 1992; 12(3): 269–87.
 79. Kitwood T. *Dementia Reconsidered: The Person Comes First*. Berkshire, UK: Open University Press 1997.
 80. Brooker D. What is person-centred care in dementia? *Reviews in Clinical Gerontology* 2004 13: 215–222.
 81. Hodgson NA, Gitlin LN, Winter L, Czekanski K. Undiagnosed illness and neuropsychiatric behaviors in community residing older adults with dementia. *Alzheimer Dis Assoc Disord* 2011 ; 25 : 109
 82. Voyer P, Richard S, Doucet L, Cyr N, Carmichael PH. Precipitating factors associated with delirium among long-term care residents with dementia. *Applied Nursing Research* 2011; 24: 171-178.
 83. Holta E, Laakkonen ML, Laurila JV, Strandberg TE, Tilvis R, Kautiainen H et al. The overlap of delirium with neuropsychiatric symptoms among patients with dementia. *American Journal of Geriatric Psychiatry* 2011; 19:1034-1041.
 84. Landreville P, Voyer P, Carmichael P. Relationship between delirium and behavioral symptoms of dementia. *International Psychogeriatrics* 2013; 25 (4): 635-643.
 85. Livingston G, Kelly L, Lewis-Holmes E, Baio G, Morris S, Patel N et al. A systematic review of the clinical effectiveness and cost-effectiveness of sensory, psychological and behavioural interventions for managing agitation in older adults with dementia. *Health Technol Assess* 2014; 18 (39): 1-226.
 86. Cook E, Swift K, James I, Malouf R, De Vugt M, Verhey F. Functional analysis-based interventions for challenging behaviour in dementia (Review). *The Cochrane Library* 2012, Issue 2. (Accessed on 12/06/2014). Available from <http://www.thecochranelibrary.com>
 87. Ueda T, Suzukamo Y, Sato M, Izumi S. Effects of music therapy on behavioral and psychological symptoms of dementia: A systematic review and meta-analysis. *Ageing Research Reviews* 2013; 12: 628–641.
 88. Thune-Boyle C, Iliffe S, Cerga-Pashoja A, Lowery D, Warner J. The effect of exercise on behavioral and psychological symptoms

- of dementia: towards a research agenda. *International Psychogeriatrics* 2012; 24 (7): 1046–1057.
89. Forbes D, Blake C M, Thiessen E J, Peacock S, Hawranik P. Light therapy for improving cognition, activities of daily living, sleep, challenging behaviour, and psychiatric disturbances in dementia (Review). *Cochrane Database Syst Rev.* 2014 Feb 26; 2:CD003946. doi: 10.1002/14651858.CD003946.pub4.
 90. Fung J, Tsang H, Chung R. A systematic review of the use of aromatherapy in treatment of behavioral problems in dementia. *Geriatr Gerontol Int* 2012; 12: 372–382.
 91. Forrester LT, Maayan N, Orrell M, Spector AE, Buchan LD, Soares-Weiser K. Aromatherapy for dementia (Review). *Cochrane Database Syst Rev.* 2014 Feb 25; 2:CD003150. doi: 10.1002/14651858.CD003150.pub2.
 92. Ballard CG, Waite J, Birks J. Atypical antipsychotics for aggression and psychosis in Alzheimer's disease (Review). *The Cochrane Library* 2012, Issue 5. (Accessed on 12/07/2014). Available from: www.bibliotecacochrane.com/pdf/CD003476.pdf
 93. Glind E, Enst W, Munster B, Marcel G.M. et al. Pharmacological Treatment of Dementia: A Scoping Review of Systematic Reviews. *Dement Geriatr Cogn Disord* 2013; 36:211–228.
 94. Carson S, McDonagh M, Peterson K. A Systematic Review of the Efficacy and Safety of Atypical Antipsychotics in Patients with Psychological and Behavioral Symptoms of Dementia. *Journal of American Geriatric Society* 2006; 54:354–361.
 95. Cheung G, Janli Stapelberg J. Quetiapine for the treatment of behavioural and psychological symptoms of dementia (BPSD): a meta-analysis of randomised placebo-controlled trials. *New Zealand medical journal* 2011; 124:39-50.
 96. Pan Y, Wu C, Gau S, Chan H, Banerjee S. Antipsychotic Discontinuation in Patients with Dementia: A Systematic Review and Meta-Analysis of Published Randomized Controlled Studies. *Dement Geriatr Cogn Disord* 2014; 37:125–140.
 97. Declercq T, Petrovic M, Azermai M, Vander Stichele R, De Sutter AIM, van Driel ML, Christiaens T. Withdrawal versus continuation of chronic antipsychotic drugs for behavioural and psychological symptoms in older people with dementia (Review). *The Cochrane Library* 2013, Issue 3. *Cochrane Database Syst Rev.* 2013 Mar 28;3:CD007726. doi: 10.1002/14651858.CD007726.pub2.
 98. Rodda J, Morgan S, Walker Z. Are cholinesterase inhibitors effective in the management of the behavioral and psychological symptoms of dementia in Alzheimer's disease? A systematic review of randomized, placebo-controlled trials of donepezil, rivastigmine and galantamine. *International Psychogeriatrics* 2009; 21 (5):813–824.
 99. Henry G, Williamson D, Rajesh R, Tampi M. Efficacy and Tolerability of Antidepressants in the Treatment of Behavioral and Psychological Symptoms of Dementia, A Literature Review of Evidence. *American Journal of Alzheimer's Disease & Other Dementias* 2014; 26(3): 169-183.
 100. Seitz D P, Adunuri N, Gill S S, Gruneir A, Herrmann N, Rochon P. Antidepressants for agitation and psychosis in dementia (Review). *Cochrane Database Syst Rev.* 2011 Feb 16 ;(2): CD008191. doi: 10.1002/14651858.CD008191.pub2.
 101. Yeh YC, Ouyang WC. Mood stabilizers for the treatment of behavioral and psychological symptoms of dementia: An update review. *Kaohsiung J Med Sci.* 2012 Apr; 28(4): 185-193.
 102. Jansen SL, Forbes D, Duncan V, Morgan DG, Malouf R. Melatonin for the treatment of dementia. *Cochrane Database of Systematic Reviews* 2006, Issue 1. Art. No.: CD003802. DOI: 10.1002/14651858.CD003802.pub3.