Current Psychiatry Reports (2019) 21: 66
https://doi.org/10.1007/s11920-019-1049-5

GERIATRIC DISORDERS (JA CHEONG, SECTION EDITOR)

Management of Behavioral and Psychological Symptoms of Dementia

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Published online: 1 July 2019

Abstract

Purpose of Review We review non-pharmacological and pharmacological approaches to managing behavioral and psychological symptoms of dementia (BPSD). We examine methods for assessment and evidence for interventions, focusing on recent findings and innovations. Finally, we recommend an algorithm for management of BPSD.

Recent Findings Training of formal caregivers is the most effective intervention for BPSD; other non-pharmacological interventions are also beneficial. Antidepressants and antipsychotics remain a mainstay of pharmacological treatment for BPSD. There is limited evidence supporting the use of stimulants, cognitive enhancers, dextromethorphan/quinidine, benzodiazepines, anticonvulsants, and pimavanserin.

Summary The management of BPSD is highly individualized. Following thorough assessment, the initial step is addressing contributing medical problems. Non-pharmacological interventions should be tried prior to pharmacological interventions. Antipsychotics should be prescribed only when behaviors pose a significant safety risk or if the person with dementia is very distressed. New approaches will be needed to address an increasing population of people with dementia.

Keywords Behavioral and psychological symptoms · Neuropsychiatric symptoms · Dementia · Alzheimer's disease · Non-pharmacological interventions · Geriatric psychiatry

Introduction

With the population aging at an alarming rate, the number of people with dementia worldwide is estimated to grow from 44 million in 2013 to 135 million by 2050 [1]. In addition to cognitive impairment, behavioral and psychological symptoms of dementia (BPSD), also known as neuropsychiatric symptoms of dementia, are core features of dementia. Defined by the International Psychogeriatric Association as "symptoms of disturbed perception, thought content, mood, and behavior frequently occurring in patients with dementia," BPSD affect up to 90% of patients diagnosed with dementia during the course of their illness. BPSD include but are not limited to apathy, depression, anxiety, psychosis, agitation, aggression, sleep disturbances, and other problematic behaviors such as wandering, sexually inappropriate behaviors, and care refusal [2–4]. Although most studied in patients with Alzheimer's disease, BPSD can complicate any cause of dementia. These symptoms are among the most distressing to patients with dementia and their caregivers and are associated with a high economic burden [5]. Patients with BPSD experience emotional distress, diminished quality of life, greater functional impairment, more frequent hospitalizations, increased risk of abuse and neglect, and decreased survival [6]. Caregivers experience increased burden of stress, depression, and financial consequences such as decreased income from employment [6, 7].

Managing BPSD first requires detailed assessment of the symptoms and situation to determine a treatment approach that will be most effective for the patient and caregiver, given available resources. After touching on assessment, we will focus on evidence for management of BPSD by category, including addressing medical causes, non-pharmacological treatments, and pharmacological treatments. We will conclude by suggesting an algorithm for response to BPSD. Although most research about managing BPSD involves patients with

This article is part of the Topical Collection on *Geriatric Disorders*

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Alzheimer's disease, we believe that management strategies can be reasonably used in other causes of dementia, aside from a few considerations. Given the likely increase in the number of persons with dementia, the complexity of BPSD, and the high burden of BPSD, new options to manage these symptoms will be essential to ensuring quality dementia care.

Assessing BPSD

The first step when encountering BPSD is a thorough assessment. This process begins with obtaining an accurate medical and psychiatric history including substance use, the underlying cause of dementia, and the patient's cognitive and functional baseline. Next, one should focus on specifying and characterizing the BPSD and the context surrounding the behavior, as well as assessing for other BPSD. Important details include a description of the behavior, timing, onset, severity, precipitants and consequences of the behavior, and history of the behavior. Psychological or environmental factors contributing to the BPSD may also be identified. Medication review (including over-the-counter medications), physical exam, and targeted medical evaluation to assess for delirium or other medical etiologies of the symptoms are also necessary components of a full assessment of BPSD. If delirium is suspected, the confusion assessment method (CAM) may be useful [8].

A patient's difficulty with providing clear details of their history complicates the assessment of BPSD. It is particularly important that caregivers, family, close contacts, and primary medical providers be contacted to provide this information. Additionally, if the BPSD involves acute agitation, aggression, or other symptoms where the safety of the patient or others around them is in question, assessment will initially be abbreviated and occur in tandem with management to stabilize the situation. In these cases, a comprehensive assessment should still take place once immediate danger has been mitigated. Using a structured model for assessing and managing BPSD can be useful in challenging situations. Three such models have recently been promulgated:

1. The describe, investigate, create, and evaluate model (DICE) is a patient and caregiver centered evidence-informed approach to BPSD developed by a multidisciplinary expert panel. Steps in addressing BPSD with this approach include Describing the problematic behavior, Investigating possible causes of the behavior, Creating a treatment plan, and Evaluating the outcome of this plan. This approach is advantageous as it is applicable in many treatment settings, and considers medical, non-pharmacological, and pharmacological treatments [6]. The evidence base for DICE is increasing. Since development, the DICE approach has been incorporated into a web-based tool called WeCareAdvisor, designed to be used by family caregivers to assess, manage, and track BPSD. A pilot-randomized control trial assessing this tool vs. waitlist over a 1-month study period, showed significant reduction in caregiver distress [9•]. Additionally, a recent consensus statement listed DICE as one of the two most promising non-pharmacological approaches for BPSD overall and for agitation [10••].
2. The Wisconsin STAR Method considers five domains—medical factors, medication factors, social factors, personal factors, and behavioral factors—which interact and contribute to BPSD. This method maps out clinical data visually, allowing users to consider many variables at the same time, determine the most relevant information, and identify any missing data. This approach has not been formally studied in the management of BPSD [11].
3. The Targeted Interdisciplinary Model for Evaluation and Treatment of Neuropsychiatric Symptoms (TIME) is a three-phase approach used in the treatment of moderate to severe agitation in people with dementia. TIME involves a registration and assessment phase (examining the patient and gathering detailed data regarding BPSD), guided reflection phase (case conferences held to apply a cognitive solving method to each BPSD), and action and evaluation phase [12]. This manualized approach has been studied in a single-blinded, cluster, randomized controlled trial conducted in 33 nursing homes in Norway, which showed significant reduction of agitation at both 8 and 12 weeks in intervention group relative to control group [13•].

Medical Causes

The next step in managing BPSD is addressing any medical problems that may be contributing. It should be noted that a number of medical issues, particularly infections, that would not cause behavioral or psychological symptoms in healthier patients, might manifest as BPSD in patients with dementia. Although not exhaustive, Table 1 includes medical conditions that could trigger BPSD, with suggested evaluation. It should also be noted that it may take days or even weeks for BPSD to improve after beginning treatment of an underlying medical problem.

When investigating medical causes of BPSD, delirium is important to consider particularly in sudden acute onset of new BPSD. The relationship between dementia, delirium, and BPSD is complex and may be overlapping. Dementia is a risk factor for delirium, though most patients with BPSD will not also have delirium. However, most patients with dementia who also have delirium will have behavioral and psychological symptoms [14]. When identified, the emphasis of treatment should be on addressing the underlying cause of delirium.

Table 1 Medical causes of BPSD and delirium

Category	Medical Condition	Suggested evaluation if suspected
Metabolic	Electrolyte abnormalities in sodium, calcium, or magnesium	Check serum electrolytes in all patients with new or altered BPSD.
	Hypo- or hyperglycemia	Check serum glucose or finger-stick glucose in all patients with new or altered BPSD.
	Acute kidney injury	Check BUN and creatinine in all patients with new or altered BPSD. Creatinine may not be accurate in older adults, so GFR should be calculated.
	Hypoxia, hypercarbia	Check pulse oximetry if hypoxia suspected. In rare cases, arterial blood gases may be necessary to rule out hypercarbia.
	Hepatic encephalopathy	Check bilirubin, transaminases and perhaps ammonia if history of hepatic disease.
	Thiamine deficiency (Wernicke's encephalopathy)	Check thiamine level, if suspected.
	Hypo- or hyperthyroidism	If not done in the last year, check TSH in all new or altered BPSD.
Infectious	Urinary tract infection	Check urinalysis with microscopy in all patients with new or altered BPSD; if evidence of infection, check urine culture. Do not treat empirically with antibiotics.
	Meningitis or encephalitis	If suspected, hospitalization and appropriate evaluation are indicated.
	Other infections	Evaluation depends on suspected site of infection (e.g., chest X-ray for suspected pneumonia). Checking a CBC is reasonable, but older adults with infection may not have leukocytosis.
CNS insults	Cerebrovascular accident	Order head CT or brain MRI, if suspected.
	Subdural hematoma	Order head CT, if suspected.
	Epileptic seizure, or post-ictal state	Order Neurological consultation and consider EEG, if suspected.
	Traumatic brain injury	No specific testing indicated—diagnosis will depend on history and caregiver report.
Other	Constipation, urinary retention, dehydration, malnutrition	No specific testing—diagnosis will depend on history and caregiver report.
	Vision loss, hearing loss	Diagnosis will depend on history and caregiver report.
	Pain	Specifically assess for pain; consider use of rating scale.
	Obstructive sleep apnea (OSA) restless legs syndrome (RLS), REM behavior disorder (RBD)	RLS and RBD are clinical diagnoses; order polysomnography to diagnose OSA.

Key: *BUN* blood urea nitrogen, *CNS* central nervous system, *COPD* chronic obstructive pulmonary disease, *CT* computed tomography, *EEG* electroencephalography, *GFR* glomerular filtration rate, *MRI* magnetic resonance imaging, *REM* rapid eye movement, *TSH* thyroid-stimulating hormone

Adapted from Walaszek (2019), Table 4.3 [72]

When treating BPSD due to infection, the site of infection and pathogen should be identified when possible prior to initiating antibiotic treatment. Care must be used when choosing pharmacological treatments so as not to cause unnecessary harm to the patient. Specifically, fluoroquinolones have been associated with disturbances in attention, disorientation, agitation, anxiety, amnesia, and delirium and should be avoided in patients with dementia if possible [15]. Additionally, antibiotic stewardship is particularly a problem in long-term care facilities. More than half of antibiotic courses prescribed in long-term care facilities are unnecessary and, when necessary, are often excessively broad spectrum or administered for longer than needed [16]. Much of this is related to the controversy about whether or not a urinary tract infection (UTI) alone can precipitate delirium or BPSD. Given the benign nature and high rate of asymptomatic bacteriuria especially in long-term care facilities, most guidelines suggest that urinalysis positive for infection should only be considered and treated as a UTI if there are also specific signs and symptoms suggestive of UTI such as recent onset of dysuria, urgency, frequency, or urethral purulence [17, 18•]. In this case, we also recommend getting a urine culture prior to starting antibiotic treatment, and using the results of this to guide treatment instead of empirically prescribing antibiotics.

The prevalence of pain in patients with dementia is high, with one study citing a range from 47 to 68% [19]. Patients with dementia may have difficulty describing or reporting their pain due to cognitive difficulties, and therefore, pain may go unrecognized or untreated. As pain may contribute to BPSD, treating it is important. A recent review by

Huesbo et al. in 2016 suggests that the most consistently studied and effective intervention for pain is acetaminophen up to 3000 mg per day. Another promising approach is a stepwise protocol of treating pain (SPTP) using multiple analgesics. In this review, there were no studies that investigated the effectiveness of pain treatment in this population with NSAID, tramadol, codeine, or buprenorphine monotherapy [20••]. A more recent review highlights the continued dearth of information regarding the effectiveness pain interventions for people with dementia. Interestingly, this review also makes the important observation that community-dwelling people with dementia were more likely to receive strong opioids (e.g., fentanyl) than people without dementia when stronger analgesics were used [21•]. Based on these data, we would recommend prescribing acetaminophen 1000 mg two or three times daily to patients who do not have a history of hepatic impairment and who are not currently drinking alcohol excessively. We would also use extreme caution in prescribing opioid pain medications in this population due to lack of evidence and potential for adverse effects.

In addition to treating underlying issues, medications or other substances that could cause or contribute to the BPSD observed should be discontinued or reduced. Special attention should be given to medications with anticholinergic properties, sedative-hypnotic drugs, opioids, and alcohol. One recent study showed that reducing anticholinergic burden by at least 20% significantly reduced the severity and frequency of BPSD and decreased caregiver burden [22•]. The updated Beers Criteria may also be a helpful resource in identifying potential medication contributors to BPSD [23••]. Clinicians must also consider drug-drug interactions when reviewing or making changes to medications.

Non-pharmacological Interventions

Non-pharmacological interventions for BPSD should always be tried before pharmacological interventions, as patients with dementia often already have significant polypharmacy, which may contribute to BPSD [24]. There are several shortcomings when considering the research and implementation of non-pharmacological interventions. These include insufficient evidence of efficacy, difficulty in implementing strategies, and limited applicability to patients with dementia living on their own (most studies were conducted in long-term care). In spite of these shortcomings, because of their lack of adverse effects, we still recommend non-pharmacological approaches to BPSD first in situations that are not imminently dangerous. Targets of these interventions include formal caregivers, informal caregivers (such as family members), or the patients themselves.

Interventions for Caregivers

Interventions to support and educate family members and other caregivers are effective and have few adverse effects. Caregiver interventions with the greatest efficacy involve training paid caregivers in person-centered care or communication skills with or without behavioral management training and dementia care mapping (DCM) [25]. In long-term care facilities that have adopted a person-centered approach, a recent review shows that DCM has had efficacy in reducing BPSD among residents and burnout among staff. In this technique, a trained "mapper" investigates care processes at the facility and provides feedback for improvement at both a patient-specific and institutional level [10•].

Psychoeducational interventions are the most commonly studied interventions for informal caregivers; 86% of studies have shown benefit. In this category, multicomponent interventions had the most positive impact on caregivers, including benefits in caregiver confidence in caregiving and caregiver distress, though less effect on patient outcomes including the reduction of BPSD [26••, 27••]. Additionally, interventions that supported caregiver coping strategies involving problem focus, acceptance, and social-emotional support showed benefits in terms of mental health and depression for the caregivers. Support groups and joint engagements by both caregivers and people with dementia were also beneficial [28]. New and promising approaches are continuing to emerge to reduce caregiver distress and improve well-being. These include use of telehealth technology to link caregivers with dementia care experts for in home support, and the use of web-based caregiver interventions such as WeCareAdvisor [9, 29].

Studies examining Tailored Activity Programs (TAP) as a method for reducing BPSD and caregiver burden have yielded promising results in multiple settings. One intervention, TAP-H, involved staff on an inpatient psychiatric unit identifying the interests and capabilities of each patient with dementia, and developing a plan to tailor activities and train families to do the same after discharge. This intervention improved affect and reduced negative behaviors in the patients [30]. Another intervention, TAP-VA, involving a home-based activity program, also reduced behavioral symptoms, slowed functional dependence, and alleviated caregiver distress [31].

Interventions for Persons with Dementia

Persons with dementia and their family members report lack of meaningful activities as a critical unmet need for this population [32]. Thus, one set of non-pharmacological strategies mentioned above includes introducing a range of structured meaningful activities for patients with dementia, often based on patient preferences and functional abilities; reviews have differed on whether customizing activities for an individual with dementia adds benefit [33••]. Exercise has shown

varying results with one review suggesting no clear evidence of benefit from exercise on neuropsychiatric symptoms or depression [34•] and another showing that exercise reduces depression levels in persons with dementia [35]. We also recommend that persons with dementia maintain a daily routine, which can be stabilizing and comforting.

Sensory interventions such as therapeutic touch, massage, and multisensory stimulation have had mixed results. Some of the benefit is likely derived from the interaction between patient and therapist [33••]. Music therapy was listed in a recent consensus statement as one of the most promising non-pharmacological approaches for BPSD [36••]. Music therapy should be led by a trained therapist and has been shown to evoke pleasant memories in persons with Alzheimer's disease, which may reduce stress [33••]. Therapeutic touch may involve massage with a variety of approaches including different locations and methods of stimulation. Reviews of the efficacy of therapeutic touch have differed: one review suggested it is not effective [25], another suggested it is effective [37], and another argued that efficacy depends on patient preference [33••]. Aromatherapy also has mixed reviews with respect to reducing BPSD with most reviews [25, 26••, 33••] suggesting that this is ineffective, and one review [37] suggesting it is effective. Light therapy has not been shown to reduce agitation or depression in recent reviews [25, 33••, 34•, 37]. An example of multisensory stimulation is Snoezelen, which involves multiple objects pertaining to the five senses including music, aroma, and images [33••].

Some psychotherapeutic modalities are also helpful for BPSD in patients with milder forms of cognitive impairment [38•]. Problem solving therapy, which focuses on trying to find the best possible solution to current problems and on teaching patients problem solving skills, may be effective in treating in depression and anxiety [39]. Reminiscence therapy, which aims to use remote memory to increase wellbeing and pleasure, has been shown to be helpful for depression [33••]. There is insufficient evidence for the use of validation therapy or simulated presence therapy in persons with dementia [25, 40].

Pharmacological Interventions

If non-pharmacological measures have failed and if a patient's behavior poses a threat to themselves or others or if the patient experiences significant distress, pharmacological intervention may be reasonable. The physician must consider the risks associated with the use of medications for BPSD (including the risks of polypharmacy). Clinical trials have generally shown only modest effectiveness of medications for BPSD; no medications have been approved in USA for BPSD, and only risperidone is approved for BPSD in Canada and parts of Europe [41•, 42, 43]. In fact, almost every psychotropic medication is on the Beers list, which indicates caution should be used when prescribing in older adults or that these medications should not be used at all in older adults [23••]. Physicians should start each medication at a low dose, should titrate slowly, and should consider eventually discontinuing the medication. Here, we will review the most recent research on several medication classes for treatment of BPSD.

Antidepressants

Antidepressants are commonly used in the treatment of BPSD due to their low side effect burden compared to other pharmacological interventions and the high comorbidity of depression with dementia. However, the evidence for efficacy of antidepressants in BPSD is mixed and limited showing that antidepressants are most helpful for treating agitation and less for depression, apathy, anxiety, or psychosis in dementia [44•].

Citalopram still has the strongest evidence for efficacy in agitation with the CitAD trial showing that 30 mg of citalopram daily had a positive effect on agitation in dementia [45••, 46]. Unfortunately, this study also confirmed the risk of QT prolongation [44•]. Although there is less evidence, escitalopram may also be effective without QT prolongation and is often a good starting point for antidepressant use in BPSD [47]. The evidence for efficacy of sertraline is mixed, though its cardiac safety is a strong point [44•]. Paroxetine and tricyclic antidepressants should generally be avoided due to anticholinergic properties [44•]. In a recent Cochrane review, trazodone 50 mg at bedtime was well tolerated and improved sleep in patients with dementia and sleep disturbance [48]. Additionally, trazodone 150–300 mg per day was found effective in reducing BPSD in frontotemporal dementia [49]. Although mirtazapine plays an important role in treatment of older adults with depression, a recent pilot study showed no significant therapeutic effect of 15 mg mirtazapine on Alzheimer's patients with sleep disorders and in fact found worsening of daytime sleep patterns [50]. Bupropion has not been studied in controlled trials in dementia.

Although there are many side effects of antidepressant medications, almost all antidepressants can cause hyponatremia in older adults with the exception of bupropion [51, 52]. We therefore recommend checking a baseline plasma sodium level and checking every 2–3 weeks after starting or increasing the dose of a medication, modifying treatment as necessary.

Antipsychotics

Although controversial due to their side effect profile and FDA black box warning advising against the use of atypical antipsychotics in older adults with dementia due to association with increased mortality, antipsychotic medications have the largest number of studies of any intervention for BPSD.

Randomized controlled trials and systematic reviews show that antipsychotics only have modest efficacy in treating psychosis, agitation, and aggression in BPSD and increase the risk of adverse effects—yet in clinical practice, they appear to be effective and are commonly used [53].

Compared to typical antipsychotics which show no clear efficacy in BPSD (with the exception of haloperidol), atypical antipsychotics do have evidence of efficacy for BPSD in dementia [4]. An AHRQ Comparative Effectiveness Review found the most effective antipsychotics include risperidone (psychosis, agitation, overall BPSD), olanzapine (agitation), and aripiprazole (overall BPSD) [54•]. Though commonly used, quetiapine has failed to show effectiveness for BPSD, except at higher doses (100–200 mg/day) that may not be well tolerated [55••]. The CATIE-AD study comparing risperidone, olanzapine, and quetiapine to placebo in persons with BPSD demonstrated efficacy but also showed a large percentage of participants discontinuing medication due to adverse effects [56•].

Given the widespread use of antipsychotics, in 2016, the American Psychiatric Association published practice guidelines on the use of antipsychotics to treat agitation or psychosis in patients with dementia, focusing on symptoms in a non-urgent setting. The guidelines emphasized judicious use and suggested reserving antipsychotics for when symptoms are severe and dangerous, and when non-pharmacological approaches have been tried [55••]. The guidelines also recommend tapering off medications after 4 weeks of an adequate trial in patients with no clinically significant response and tapering off medication after 4 months in patients who show an apparent response to medications [55••]. A recent Cochrane review had results consistent with these recommendations, showing that discontinuing antipsychotic medication after 3 months of treatment is not associated with worsening BPSD except in patients with more severe baseline BPSD [57].

Benzodiazepines

Although widely used, evidence for efficacy of benzodiazepine use in BPSD is limited and fraught with severe adverse effects [58]. A recent treatment algorithm for BPSD recommended slow tapering off benzodiazepines and "z-drugs" (zolpidem, zaleplon, eszopiclone), barring extenuating circumstances [43]. This study also suggested that occasional use of lorazepam as needed is acceptable in cases of extreme agitation or aggression not amenable to other interventions, or when a brief stressful circumstance may induce these behaviors [43]. There is evidence supporting the use of clonazepam for REM behavior disorder [59]. Other than these exceptions, we generally recommend avoiding benzodiazepines in the management of BPSD.

Fig. 1 Management algorithm for BPSD. Key: BPSD = behavioral and psychological symptoms of dementia; EMS = emergency medical services; SSRI = selective serotonin reuptake inhibitor. Adapted from Walaszek (2019), Figure 5.1 [70]

Treatment in Lewy Body Disease

Lewy body disease (LBD), which encompasses Parkinson disease dementia (PDD) and dementia with Lewy bodies (DLB), merits special consideration. As patients with these forms of dementia commonly experience psychotic symptoms and also are especially prone to side effects from antipsychotics, other pharmacological treatment classes are recommended to treat BPSD.

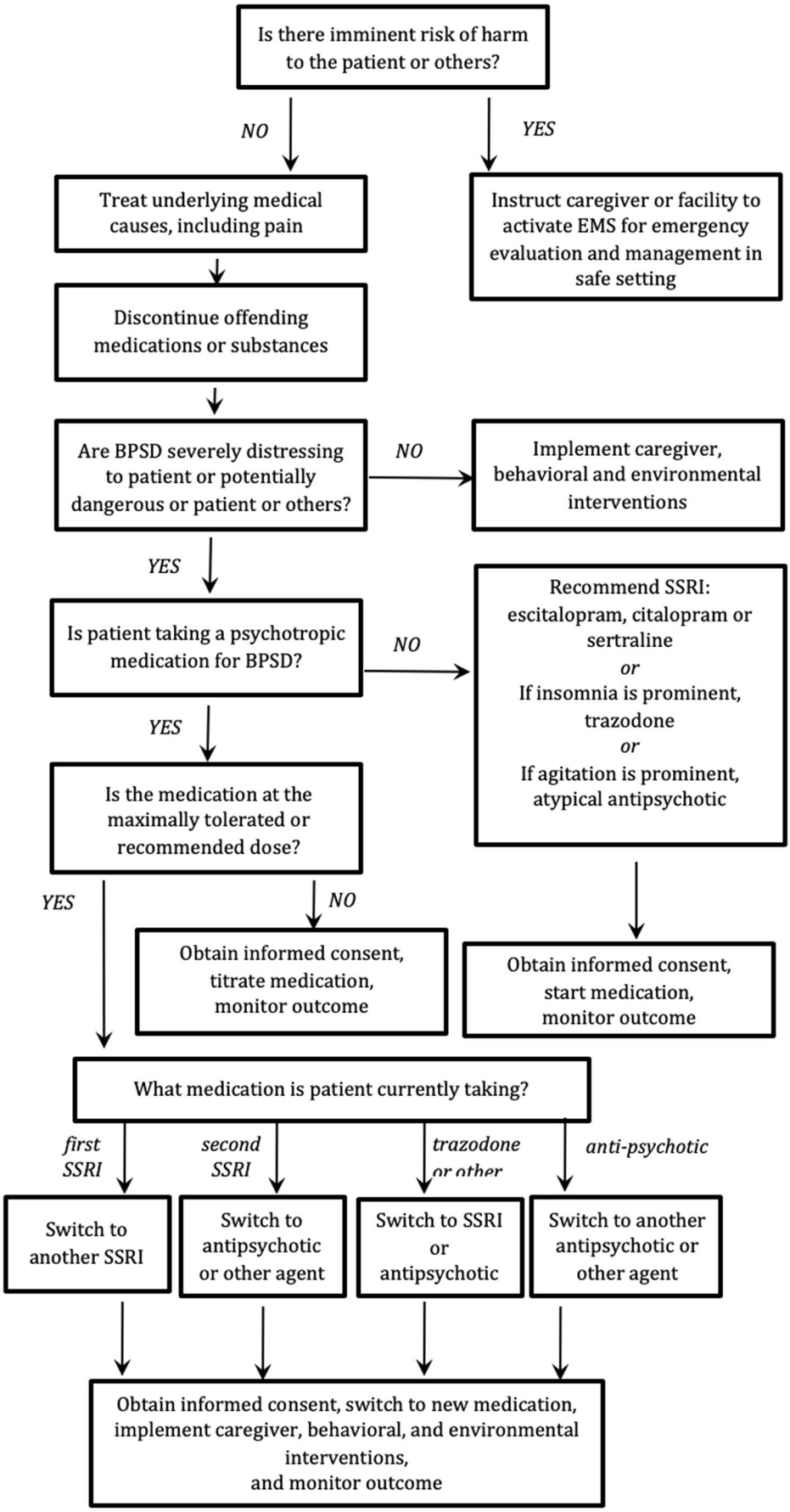
Cholinesterase inhibitors such as donepezil or rivastigmine have been shown to improve BPSD in subjects with PDD but not DLB [60•]. This study also showed that donepezil was tolerated better than rivastigmine [60•] (note that cholinesterase inhibitors have little if any benefit for BPSD in Alzheimer's disease, and side effects may even contribute to BPSD in these populations [41]). Additionally, memantine is ineffective for BPSD in PDD, DLB, or other forms of dementia [41, 60•, 61]. Overall, for patients with LBD, we recommend trying a cognitive enhancer (donepezil) and avoiding antipsychotic medications (for patients with Alzheimer's disease, memantine may delay cognitive decline but is unlikely to have a positive effect on BPSD.)

Pimavanserin has received a lot of attention with recent approval in the USA for treatment of Parkinson disease psychosis. Evidence for the efficacy of pimavanserin in Parkinson disease psychosis is modest, with concern for QT prolongation, drug-drug interactions, and FDA concern about increased mortality risk [62]. The use of this medication in dementia is still unclear. A trial of pimavanserin for psychosis associated with Alzheimer's disease found benefit after 6 weeks, but not after 12 weeks [63]. Other limiting factors for this medication include high cost and need for a specialty pharmacy.

Other Treatments

Recent studies have shown methylphenidate to be helpful for patients with apathy due to Alzheimer's disease though it is associated with hypertension [64•, 65•]. Studies also suggest that methylphenidate and dextroamphetamine may help address disinhibition and apathy in frontotemporal dementia [49]. For patients with apathy, we would recommend starting methylphenidate 5 mg morning and noon and titrating after 2 weeks to 10 mg twice daily. Higher doses of methylphenidate (up to 40 mg per day) may be needed in frontotemporal dementia.

Dextromethorphan with quinidine has been found effective in decreasing agitation, irritability, lability, depression, and


Is there imminent risk of harm to the patient or others?
NO
YES
Treat underlying medical causes, including pain
Instruct caregiver or facility to activate EMS for emergency evaluation and management in safe setting
Discontinue offending medications or substances
Are BPSD severely distressing to patient or potentially dangerous or patient or others?
NO
Implement caregiver, behavioral and environmental interventions
YES
Is patient taking a psychotropic medication for BPSD?
NO
Recommend SSRI: escitalopram, citalopram or sertraline
or
If insomnia is prominent, trazodone
or
If agitation is prominent, atypical antipsychotic
YES
Is the medication at the maximally tolerated or recommended dose?
YES
NO
Obtain informed consent, titrate medication, monitor outcome
Obtain informed consent, start medication, monitor outcome
What medication is patient currently taking?
first SSRI
second SSRI
trazodone or other
anti-psychotic
Switch to another SSRI
Switch to antipsychotic or other agent
Switch to SSRI or antipsychotic
Switch to another antipsychotic or other agent
Obtain informed consent, switch to new medication, implement caregiver, behavioral, and environmental interventions, and monitor outcome

overall BPSD in patients with Alzheimer's disease [66]. This may be reasonable for patients who have not responded or tolerated other pharmacological interventions, though should still be used as a second line agent.

Prazosin up to 6 mg/day was found to be helpful in one small study [67]; we are awaiting the results of a follow-up study.

A recent treatment algorithm for BPSD included carbamazepine, but problems with tolerability and drug-drug interactions limit its use [43].

Electroconvulsive therapy (ECT) does appear to be effective for depression in dementia but may be associated with delirium [68]. ECT has also been effective for agitation and aggression in dementia [69]. Overall, we would not recommend this as a common intervention given difficulty with obtaining consent, and limited evidence; further studies are underway.

Conclusions

Developing a management plan for patients with BPSD is based on characteristics of the patient, cause of dementia, the resources and caregivers available, and the context in which BPSD are occurring. In Fig. 1, we present a basic treatment algorithm for BPSD, incorporating information reviewed in this article. Although individualized, most plans will include addressing underlying medical issues, eliminating medications and substances contributing to BPSD, supporting the patient and caregiver through education and non-pharmacological interventions first, and then careful and judicious consideration of pharmacological interventions when other interventions are not effective.

Although there have been advances in assessment and management of BPSD, we still have a long way to go. Much of the existing evidence is based on small sample sizes and the heterogeneity of study design. The waxing and waning nature of BPSD, improvement of symptoms with time, and high placebo response rates limit our ability to determine which interventions are effective. Given the imminent increase in our older adult population and lack of preventative treatments for dementia, more studies of interventions for BPSD and updated practice guidelines for treating BPSD will be needed. Additionally, new innovations, which may utilize upcoming technologies and other advances to address BPSD, will likely provide options to improve treatment for our patients and reduce caregiver burden.

Compliance with Ethical Standards

Conflict of Interest Laurel J. Bessey declares no potential conflicts of interest.

Art Walaszek reports speakers fees from Advocate Lutheran General Hospital, United Way (Madison, WI), University of Wisconsin-Parkside, Medical College of Wisconsin, and Wisconsin Association of Medical Directors. Dr. Walaszek reports an advance on royalties from American Psychiatric Association Publishing, is a core co-leader for National Institute of Ageing, and acted as PI and Co-PI on two grants for US Administration for Community Living.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by any of the authors.

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