

# Management of Neuropsychiatric Symptoms of Dementia in Clinical Settings: Recommendations from a Multidisciplinary Expert Panel

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Noncognitive neuropsychiatric symptoms (NPS) of dementia (aggression, agitation, depression, anxiety, delusions, hallucinations, apathy, disinhibition) affect individuals with dementia nearly universally across dementia stages and etiologies. NPS are associated with poor outcomes for individuals with dementia and caregivers, including excess morbidity and mortality, greater healthcare use, and earlier nursing home placement, as well as caregiver stress, depression, and difficulty with employment. Although the Food and Drug Administration has not approved pharmacotherapy for NPS, psychotropic medications are frequently used to manage these symptoms, but in the few cases of proven pharmacological efficacy, significant risk of adverse effects may offset benefits. There is evidence of efficacy and limited potential for adverse effects of nonpharmacological treatments, typically considered first line, but their uptake as preferred treatments remains inadequate in real-world clinical settings. Thus, the field currently finds itself in a predicament in terms of management of these difficult symptoms. It was in this context that the University of Michigan Program for Positive Aging, working in collaboration with the Johns Hopkins Alzheimer's Disease Research Center and Center for Innovative Care in Aging sponsored and convened a multidisciplinary expert

panel in Detroit, Michigan, in fall 2011 with three objectives: to define critical elements of care for NPS in dementia; to construct an approach describing the sequential and iterative steps of managing NPS in real-world clinical settings that can be used as a basis for integrating nonpharmacological and pharmacological approaches; and to discuss how the approach generated could be implemented in research and clinical care. *J Am Geriatr Soc* 62:762–769, 2014.

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Although cognitive impairment is the clinical hallmark of dementia, noncognitive neuropsychiatric symptoms (NPS) are exceedingly common and dominate the presentation.<sup>1</sup> NPS occur in all types of dementia in clusters or syndromes identified as depression, psychosis, agitation, aggression, apathy, sleep disturbances, and disinhibition.<sup>2</sup> NPS are universal, affecting 98% of individuals at some point in the disease course.<sup>2</sup> Thirty percent of the cost of caring for community-dwelling individuals with dementia is directly attributable to NPS management.<sup>3</sup> NPS appear to be a consequence of the confluence of multiple, but sometimes modifiable, interacting factors internal and external to persons with dementia; are closely linked to the underlying brain disease causing cognitive symptoms; and result in part from heightened vulnerability to the environment as cognitive ability declines.

Noncognitive neuropsychiatric symptoms, as opposed to core cognitive symptoms, tend to create the most difficulties for individuals with dementia, caregivers, and providers and commonly lead to early nursing home placement,<sup>4,5</sup> excess morbidity, mortality, hospital stays,<sup>6</sup> caregiver stress and depression, and reduced caregiver employment income.<sup>7,8</sup> These symptoms pose threats to caregivers' own health and quality of life.<sup>9</sup> Caregivers of individuals with NPS are more distressed and depressed than those not man-

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aging NPS.<sup>10</sup> Clinically significant NPS, if untreated, are associated with faster disease progression than in the absence of such symptoms.<sup>11</sup> Therefore, effective treatments may have the potential to modify disease course, lower costs, and improve quality of life for individuals with dementia and caregivers.

In real-world settings, few well-proven treatment options are currently available for NPS. Although there are no Food and Drug Administration–approved medications for NPS, it is common clinical practice to use psychotropic medications such as antipsychotics to control symptoms, but antipsychotics show modest efficacy in improving NPS<sup>1</sup> and have significant risks including side effects and mortality.<sup>12</sup>

Nonpharmacological management of NPS is increasingly recognized as a critical part of comprehensive, state-of-the-art dementia care.<sup>13,14</sup> Nonpharmacological approaches tend to conceptualize behaviors as stemming from unmet needs, environmental overload, and interactions of individual, caregiver, and environmental factors. The goals of nonpharmacological treatment are prevention, symptom relief, and reduction of caregiver distress.<sup>15</sup> Multiple medical organizations and expert groups (including the American Geriatrics Society, American Psychiatric Society, and American Association for Geriatric Psychiatry) recommend nonpharmacological strategies as the preferred first-line treatment approach to NPS,<sup>16–19</sup> except in emergency situations when NPS could lead to imminent danger or otherwise compromise safety. In the latter cases, the standard of care supports psychotropic use in the absence of data. Unfortunately, effective nonpharmacological strategies for NPS have not been translated into real-world clinical management and standard care.<sup>20</sup> Despite major concerns about safety and efficacy, psychotropic drugs remain the primary treatment approach, often without systematic assessment of potential underlying causes.<sup>21</sup>

There are several reasons for the predominant use of medications over nonpharmacological strategies. Most specialties have some training in psychotropic use for NPS, but few receive instruction in nonpharmacological approaches and are aware of their effectiveness.<sup>21</sup> Even when aware of these techniques and their value, most providers lack basic training in assessing NPS and choosing or communicating strategies to individuals with dementia and caregivers. Assessing NPS and using nonpharmacological strategies can be time-prohibitive and not reimbursed. Approaches developed in research trials<sup>22–25</sup> typically circumvent provider time limitations by training nonmedical personnel to deliver interventions, and thus, strategies remain outside standard clinical practices. Enhancing clinician decision-making for NPS is timely and critical in view of a national movement to improve dementia care,<sup>26</sup> new American Medical Association Pay-for-Performance Guidelines<sup>27</sup> that will require physicians to evaluate and treat NPS as part of on-going standard care, as well as Centers for Medicare and Medicaid Services efforts to reduce unnecessary use of antipsychotics in nursing homes.<sup>28</sup>

Critically needed is an evidence-informed standardized approach to managing NPS that integrates pharmacological and nonpharmacological treatments for real-world implementation. To address this, the University of

Michigan Program for Positive Aging, in collaboration with the Johns Hopkins Alzheimer's Disease Research Center and Center for Innovative Care in Aging, sponsored and convened a multidisciplinary expert panel in Detroit, Michigan, in 2011. Panel members had clinical and research expertise in managing NPS in dementia and reducing distress in family caregivers. This article summarizes the approach that the panel developed.

## IMPORTANT CARE ELEMENTS FOR NPS

Treatments for NPS can be categorized as pharmacological, medical, or nonpharmacologic (which the expert panel referred to as “behavioral and environmental interventions”). The nonpharmacological strategies underlying the Describe, Investigate, Create, Evaluate (DICE) approach are those with the strongest evidence base, including thorough assessments for underlying causes and family caregiver interventions.<sup>22–25,29–31</sup> Members of the expert panel discussed different decision-making approaches that had common elements of identifying and treating NPS.<sup>18,32–35</sup> This included the “4 D Approach,”<sup>13</sup> an earlier step-wise algorithm related to dementia behavior management that served as the starting point from which the panel further elaborated and relabeled steps to enhance clarity and ease of use by clinicians and from which the mnemonic “DICE” was developed.

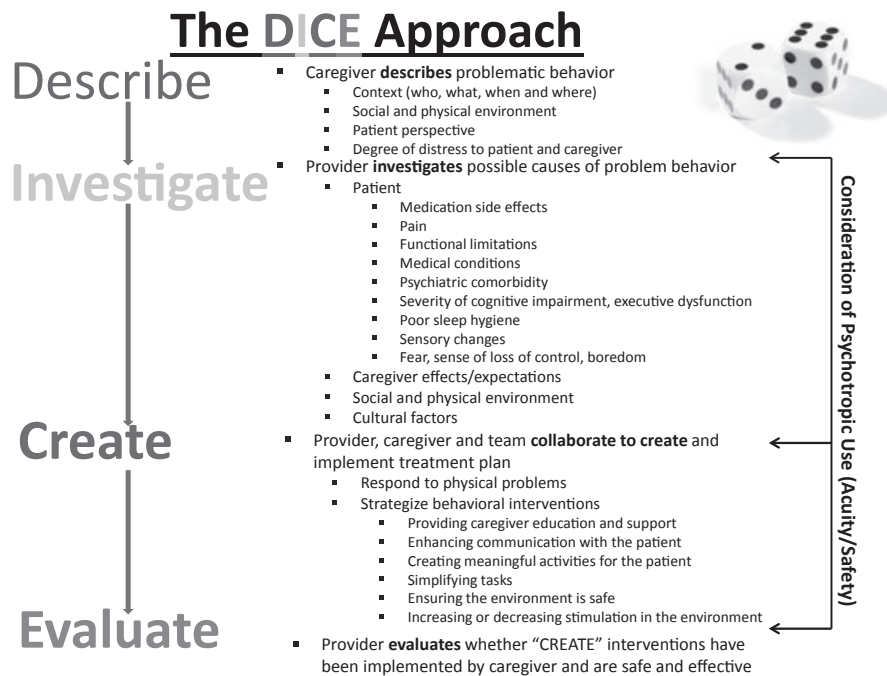
## THE DICE APPROACH

The DICE approach assumes that a problem NPS has been identified and brought to the provider's attention (Figure 1). To expand upon and detail each step of the approach, the panel used a case example of an 80-year-old woman with moderate dementia who strikes out at her daughter during bathing. This case reflects a typical clinical scenario often resulting in prescription of a psychotropic and for which research supports behavioral and environmental interventions.

### Step 1. Describe

The first step (Table 1) is to describe the presenting behavior to derive an accurate characterization of the NPS and the context in which it occurs through discussion with caregiver and individual with dementia (if possible).

Strategies for eliciting details include asking caregivers to play back the NPS “as if in a movie.” A basic problem-solving approach identifies antecedents, describes the specifics of the NPS, and then details consequences to uncover the context in which NPS occur and potential underlying modifiable patterns or contributory factors. Caregivers can be encouraged to record NPS and the related patient, caregiver, and environmental considerations (Table 1) in diaries or logs at home if possible. Except in severe dementia, when communication may be problematic, the perspective of the individual with dementia should be elicited, and clinicians should probe to determine what he or she can describe about the NPS. It is important to understand what aspect of the symptom is most distressing or problematic for the individuals and caregiver and the treatment goal. Eliciting this information



**Figure 1.** The DICE Approach.

helps to evaluate the caregiver’s knowledge of dementia and NPS and leads to specific treatment strategies.

*In the case example, the caregiver uses the term “agitation,” yet this could encompass a range of symptoms (anxiety, repetitive questions, aggression, wandering), each of which might have a different underlying cause and corresponding management strategy. The Describe step reveals that “agitation” refers to the individual becoming physically and verbally aggressive with the caregiver at bath time. The individual expresses that bathing “hurts.” (She experiences pain when the caregiver puts her in the bath.) The caregiver indicates that, although she is not afraid for her own safety, she believes the individual with dementia is “doing this on purpose.” The caregiver’s goal is to have the individual bathe daily. There are no symptoms to suggest psychosis, and the individual with dementia does not have depressive symptoms.*

### Step 2. Investigate

Once the NPS is well characterized, the next step is for the provider to examine, exclude, and identify possible underlying and modifiable causes (Table 1). Similar to the examination of delirium, the key to managing NPS is thorough assessment of underlying causes. Undiagnosed medical conditions are important contributors. Individuals with dementia may have pain and undiagnosed illnesses (e.g., urinary tract infection, anemia) disproportionately more than those without.<sup>29,36</sup>

#### Individual Considerations

This includes evaluating the current medication profile and presence of undetected medical conditions or pain. Compiling a list of medications, optimally by having the caregiver bring in bottles, including prescription and over-

the-counter drugs and supplements, is an important first measure. Providers should assess the contributions of medication side effects, particularly those with anticholinergic properties, as well as considering possible drug interactions. Investigating medical conditions such as urinary tract and other infections, constipation, dehydration, and pain is critical. Obtaining blood work such as chemistry (e.g., blood glucose and electrolytes), complete blood count with differential, and a urinalysis may be helpful. Providers should also consider the effect of underlying prior psychiatric comorbidity (e.g., lifelong major depressive or anxiety disorder). Other important considerations include limitations in functional abilities, severity of cognitive impairment, poor sleep hygiene, sensory changes, and boredom. Psychological factors including feelings of inadequacy and helplessness and fear of “being a burden” to the family may play a role in the development and exacerbation of NPS.

#### Caregiver Considerations

These include understanding the historical and current quality of the relationship between the individual and the caregiver. Caregivers may lack an understanding of the link between dementia and NPS and believe the individual is “doing this to them on purpose.” Caregiver communication styles, expectations, over- and underestimation of the individual’s abilities, and their own stress and depression may inadvertently exacerbate behaviors. Finally, understanding the family cultural context is important. Beliefs will affect the behaviors of the caregiver and the individual with dementia differently. In some families, nursing home placement may not be acceptable, and tremendous strain may be created in attempting to keep a person with severe limitations at home. In other families, discussing NPS may be difficult and viewed as “airing dirty laundry” to “outsiders.”

**Table 1. Linkage of DICE Steps with Patient/Caregiver/Environmental Considerations**

DICE STEP	Patient Considerations	Caregiver Considerations	Environmental Considerations
Describe	<ul style="list-style-type: none"> <li>• What behavior did the patient exhibit?</li> <li>• How did the patient perceive what occurred?</li> <li>• How did the patient feel about it?</li> <li>• Is the patient’s safety at risk?</li> </ul>	<ul style="list-style-type: none"> <li>• How much distress did the behavior generate for the caregiver?</li> <li>• Does the caregiver feel their safety is threatened by the behavior?</li> <li>• What about the behavior is distressing to the caregiver?</li> <li>• What did the caregiver do during and after the behavior occurred?</li> </ul>	<ul style="list-style-type: none"> <li>• Who was there when behavior occurred (e.g. family members, unfamiliar people)?</li> <li>• When did the behavior occur (time of day) and what relationship did this have to other events (e.g. occurring while bathing or at dinner)?</li> <li>• Where did the behavior occur (e.g. home, daycare, restaurant)?</li> <li>• What happened before and after the behavior occurred in the environment?</li> </ul>
Investigate Could the behavior be caused by/ contributed to by:	<ul style="list-style-type: none"> <li>• Recent changes in medications?</li> <li>• Untreated or undertreated pain?</li> <li>• Limitations in functional abilities?</li> <li>• Medical conditions (e.g. urinary tract infection)?</li> <li>• Underlying psychiatric comorbidity?</li> <li>• Severity of cognitive impairment, executive dysfunction?</li> <li>• Poor sleep hygiene?</li> <li>• Sensory changes (vision, hearing)?</li> <li>• Fear, sense of loss of control, boredom?</li> </ul>	<ul style="list-style-type: none"> <li>• Caregiver’s lack of understanding of dementia (e.g. patient is “doing this to” them “on purpose”)?</li> <li>• Caregiver’s negative communication style (e.g. overly critical or harsh, use of complex questions, offering too many choices)?</li> <li>• Caregiver’s expectations not aligned with dementia stage (under or over estimation of capability)?</li> <li>• Caregiver’s own stress/ depression?</li> <li>• Family/Cultural context (e.g. not wanting to involve “outsiders” or “air dirty laundry”, promise to keep patient at home)?</li> </ul>	<ul style="list-style-type: none"> <li>• Over- (e.g. clutter, noise, people) or under- (e.g. lack of visual cues, poor lighting) stimulating environment?</li> <li>• Difficulty navigating or finding way in environment?</li> <li>• Lack of predictable daily routines that are comforting to patient?</li> <li>• Lack of pleasurable activities tapping into preserved capabilities and previous interests?</li> </ul>
Create	<p>Respond to physical problems:</p> <ul style="list-style-type: none"> <li>• Discontinue medications causing behavioral side effects if possible</li> <li>• Manage pain</li> <li>• Treat infections, dehydration, constipation</li> <li>• Optimize regimen for underlying psychiatric conditions</li> <li>• Sleep hygiene measures</li> <li>• Deal with sensory impairments</li> </ul>	<p>Work collaboratively with caregiver/ other team members to institute nonpharmacologic interventions including (see Table 2 for detail):</p> <ul style="list-style-type: none"> <li>• Providing caregiver education and support</li> <li>• Enhancing communication with patient</li> <li>• Creating meaningful activities for patient</li> <li>• Simplifying tasks</li> </ul>	<p>Work collaboratively with caregiver/other team members to institute nonpharmacologic interventions including (see Table 2 for detail):</p> <ul style="list-style-type: none"> <li>• Ensuring the environment is safe</li> <li>• Simplifying/enhancing the environment</li> </ul>
Evaluate	<ul style="list-style-type: none"> <li>• Has the intervention(s) been effective for the problem behavior?</li> <li>• Have there been any unintended consequences or “side effects” from the intervention(s)?</li> </ul>	<ul style="list-style-type: none"> <li>• Which interventions did the caregiver implement?</li> <li>• If the caregiver did not implement the interventions, why?</li> </ul>	<ul style="list-style-type: none"> <li>• What changes in the environment have been made?</li> </ul>

**Environmental Considerations**

An environment that is over- or understimulating or presents way-finding challenges and lack of predictable routines and pleasurable activities can also affect NPS. Home safety is important; whether the individual can easily leave home, has access to dangerous objects (knives, guns), and can navigate safely from one room to the next and whether there are grab bars and other

equipment and adaptations (e.g., labels, adequate task lighting) that compensate for functional difficulties should be considered.

*In the case example, the provider learns that the individual with dementia has a diagnosis of arthritis but is not taking pain medication. When the caregiver moves the individual’s limbs quickly, it causes pain, which may contribute to her aggression to stop it. The caregiver’s*

**Table 2. Behavioral and Environmental Modification Strategies for Managing Noncognitive neuropsychiatric symptoms**

Domain	Generalized Strategy (non-behavior specific)
Activity	<ul style="list-style-type: none"> <li>• Tap into preserved capabilities and previous interests</li> <li>• Encourage activities involving repetitive motion (folding towels, sorting buttons)</li> <li>• Set up activity and help patient initiate participation</li> </ul>
Caregiver education and support	<ul style="list-style-type: none"> <li>• Convey that behaviors are not intentional</li> <li>• Relax the rules (e.g. baths do not have to occur every day)</li> <li>• Provide knowledge that with disease progression, patient will have difficulty with executive function and completing tasks without guidance and cueing</li> <li>• Avoid confrontation or trying to reason and convince</li> <li>• Self-care; finding and taking opportunities for respite</li> <li>• Identify and utilize a support network</li> </ul>
Communication	<ul style="list-style-type: none"> <li>• Allow patient sufficient time to respond to questions</li> <li>• Provide 1- to 2-step simple verbal commands</li> <li>• Use a calm, reassuring voice</li> <li>• Offer simple choices (no more than 2 at a time)</li> <li>• Avoid harsh tone and negative words</li> <li>• Lightly touch to reassure, calm, direct or redirect</li> <li>• Identify self/other for patients who are unable to remember names</li> <li>• Help patient find words for self-expression</li> </ul>
Environment	<ul style="list-style-type: none"> <li>• Remove clutter</li> <li>• Use labeling and visual cues (e.g. arrows pointing to bathroom)</li> <li>• Eliminate noise and distractions whenever possible</li> <li>• Enhance environment if it is bland and lacking interest</li> </ul>
Simplifying tasks	<ul style="list-style-type: none"> <li>• Break tasks into simple steps</li> <li>• Use verbal or tactile prompts at each step</li> <li>• Create/provide structured daily routines that are predictable for patient</li> </ul>
Examples of Specific Behavioral Targets	Possible Targeted Strategies
Hearing voices	<ul style="list-style-type: none"> <li>• Evaluate hearing or adjust amplification of hearing aids</li> <li>• Assess quality and severity of symptoms</li> <li>• Determine whether they present an actual threat to safety or function</li> </ul>
Wandering/Elopement	<ul style="list-style-type: none"> <li>• Identify triggers for elopement and modify them</li> <li>• Notify neighbors and police of patient's condition and potential for elopement</li> <li>• Outfit with ID (e.g. Alzheimer's Association Safe Return program)</li> </ul>
Nighttime wakefulness	<ul style="list-style-type: none"> <li>• Evaluate sleep routines and sleep hygiene</li> <li>• Assess environment for possible contributions (e.g. temperature, noise, light, shadows)</li> <li>• Eliminate caffeine</li> <li>• Create a structure that includes daily activity and exercise and a quiet routine for bedtime (e.g. calming activity or music)</li> <li>• Limit daytime napping</li> <li>• Use a nightlight</li> <li>• Nighttime respite for caregiver</li> </ul>
Repetitive questioning	<ul style="list-style-type: none"> <li>• Respond with a calm reassuring voice</li> <li>• Use of calm touch for reassurance</li> <li>• Inform patient of events only as they occur</li> <li>• Structure with daily routines</li> <li>• Use of distraction and meaningful activities</li> </ul>
Aggression	<ul style="list-style-type: none"> <li>• Determine and modify underlying cause of aggression (e.g. psychosis, pain, particular caregiver interaction), evaluate triggers and patterns</li> <li>• Warn caregiver not to confront or return physicality</li> <li>• Discuss other self-protection strategies with caregiver (e.g. distract, backing away from patient, leaving patient alone if they are safe, and seeking help)</li> <li>• Limit access to or remove dangerous items</li> <li>• Create a calmer, more soothing environment</li> </ul>



communication is also overly complex for the individual's dementia stage. The caregiver appears to lack an understanding of the link between dementia and behaviors ("she is doing this on purpose"). The caregiver's tone with the individual when frustrated is harsh and confrontational ("I can't have you acting like this. I have to give you a bath now!"). The caregiver's goal to bathe the individual daily reflects the caregiver's own values and preferences and intent to keep daily life as it was before dementia onset. The bathtub does not have a grab bar or bath mat, which may be contributing to the fear of getting into and out of the tub.

### Step 3. Create

In this step, the provider, caregiver, person with dementia (if possible), and team collaborate to create and implement a treatment plan (Table 1). The provider initially needs to respond to physical problems detected in the investigate step (prescribing antibiotics for a urinary tract infection, giving fluids to a dehydrated individual, managing constipation). This may also include discontinuing medications that have the potential to cause behavioral side effects if possible and evaluating whether other medication side effects may be contributing to NPS. Effective pain management also has an important role and can lead to reducing unnecessary psychotropic prescriptions.<sup>37</sup>

For individuals with an underlying psychiatric condition predating the dementia (such as schizophrenia or bipolar disorder), the psychotropic regimen for the disorder should be optimized with close monitoring and discontinuation of medications that are ineffective or not tolerated. Good sleep hygiene measures should be instituted. Sensory impairments (hearing, vision) should be addressed.

This step requires creativity, with providers brainstorming approaches with the caregiver, individual with dementia (when possible), and other team members (visiting nurse, social worker, occupational therapist). Brainstorming with the caregiver is important to address an active problem, to model problem-solving, and to obtain buy-in for recommendations. Behavioral and environmental strategies deployed at this stage can be categorized as generalized or targeted (Table 2). Generalized strategies are not behavior specific and involve enriching the environment and improving caregiver skills and well-being. Targeted strategies are directed at eliminating a specific NPS (e.g., aggression at bath time).<sup>15</sup> Although there are multiple potentially effective strategies depending upon behavioral, individual, caregiver, and environmental considerations, four domains of generalized strategies may be most easily achievable and least labor intensive: providing caregiver education, enhancing effective communication between caregiver and individual with dementia, assisting the caregiver in creating meaningful activities for the individual with dementia, and helping the caregiver to simplify tasks and establish structured routines. Additional problem-solving should occur concerning ensuring safety and simplifying and enhancing the environment. Also, caregivers provide important information regarding what has worked and what has not, interests of the person with dementia, and a glimpse into lifelong personality and care styles.

*In the case example, the provider starts pain medication, makes a referral for physical therapy, and educates the caregiver about dementia and that behaviors are not intentional. The provider also suggests ways to improve communication (calmer tones, simpler single-step commands, light touch to reassure) and avoid negative interactions (harsh tone, complex multistep commands, open-ended questioning, screaming). Helping the caregiver establish a "new normal" routine that promotes safety and well-being, such as using sponge baths or bathing less frequently and, when taking a bath, using a tub bench and grab bar for safety is promoted.*

### Step 4. Evaluate

The final step is for the provider to assess whether recommended strategies were attempted and effective. If the caregiver did not implement an intervention, it is important to understand why and brainstorm solutions. If an intervention was attempted, it is important to evaluate whether it was implemented effectively, whether the NPS improved, and whether the caregiver's distress was reduced. The reaction of the individual with dementia to the intervention(s) is important to assess, as are any unintended side effects or consequences; a behavioral intervention may make a behavior worse or have unintended consequences. If so, the provider must understand whether the negative outcome is a consequence of the intervention or whether the intervention was not implemented as intended. If psychotropic medications were judged to be needed, it is important to consider a trial of dose reduction or discontinuation to ensure that the medication continues to be necessary. Because NPS change and fluctuate over the course of dementia, ongoing monitoring of behaviors is essential, and removal of interventions, especially medications, should be considered from time to time.

*In the case example, several interventions addressing pain (medication, physical therapy), caregiver education, communication, personal preferences and values, and the environment (bath safety measures) are suggested. The provider follows up with the caregiver regarding which were deployed. If she chose not to deploy some, why? Of those she did use, which were effective and judged helpful?*

### Psychotropic Medication Use

Given a mixed evidence-base for efficacy of most psychotropics used for NPS,<sup>1,38</sup> several in the expert panel group were hesitant to recommend first-line treatment with medications under any circumstances. Others noted that lack of homogeneity of NPS phenotype (e.g., trials of antipsychotics for "agitation") have plagued past trials and that medications might have greater efficacy with better attention to such, but the current research is limited. Given the limitations in the evidence-base, the panel consensus was that psychotropic drugs should be used only after significant efforts have been made to mitigate NPS using behavioral and environmental modifications and medical interventions if needed, with three exceptions. In each of these cases, use would follow a concern regarding significant and imminent risk: major depression with or without suicidal

ideation, psychosis causing harm or with great potential of harm, and aggression causing risk to self or others. The panel also reinforced the need for close follow-up to monitor for adverse effects potentially caused by psychotropic medications and that use should be time-limited, because behaviors and symptoms may resolve over time with or without drug treatment. If providers elect to use psychotropics, it is important to remember that there is no Food and Drug Administration approval for their use in the treatment of NPS and that the risk:benefit ratio of medication use must be carefully evaluated.

Psychotropic medications are not likely to affect unfriendliness, poor self-care, memory problems, not paying attention or caring about what is going on, repetitive verbalizations or questioning, rejection or refusal of care, shadowing, and wandering.

Readers are referred to several articles for additional information on the evidence base for and appropriate use of psychotropic medications in dementia<sup>1,39,40</sup> and for additional information on the evidence base for nonpharmacological interventions.<sup>15,31,41</sup>

## RESEARCH AND CLINICAL CONSIDERATIONS

The Centers for Medicare and Medicaid Services has reviewed the DICE approach since its development, and it will be included in their toolkit to promote nonpharmacological approaches in dementia. Although the DICE approach is evidence informed, it requires further research testing in clinical settings. Content for each step may need additional and better specification for use in specific settings or by particular providers. The approach also has utility in clinical trials of treatments for NPS, particularly in testing new pharmacological agents. It can be used to better subtype NPS or focus on particular NPS at randomization coupled with a systematic treatment approach (e.g., behavioral or environmental intervention using the DICE method first, followed by psychotropic testing). The new Medicare Pay-for-Performance guidelines<sup>27</sup> might compensate providers for time spent in DICE or similar approaches. Because use of DICE may result in fewer hospitalizations or readmissions, it may be of interest to accountable care organizations. Application of this approach in social service agencies involved with individuals with dementia deserves special attention. Ultimately, developing technology applications of DICE may simplify its use, save time, standardize its application, and facilitate evaluation of its effectiveness.

## CONCLUSIONS

Noncognitive neuropsychiatric symptoms are among the most significant challenges in dementia care, yet they remain under- or mistreated. Psychotropic medications are currently the most commonly deployed management strategies in real-world settings, but they often have suboptimal risk:benefit profiles and may not affect some of the most frequently occurring symptoms that are most distressing to families and may trigger hospitalizations or nursing home placement. Nonpharmacological techniques have a substantial evidence-base but are currently underused in standard care. Innovative approaches that include training and support of providers are needed to be able to serve

the burgeoning older population with neuropsychiatric symptoms.<sup>42</sup>

The DICE approach offers clinicians an evidence-informed structured approach that can be integrated into diverse practice settings. The approach is inherently individual- and caregiver-centered because concerns of individuals with dementia and their caregivers are integral to each step of the process. DICE enables clinicians to consider conjointly the role of nonpharmacological, medical, and pharmacological treatment; it offers a clinical reasoning approach through which clinicians can more efficiently and effectively choose optimal treatment plans. The DICE approach, endorsed by the Detroit Expert Panel, can enhance clinical practice and outcomes and advance research.

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## APPENDIX 1: DETROIT EXPERT PANEL ON THE ASSESSMENT AND MANAGEMENT OF THE NEUROPSYCHIATRIC SYMPTOMS OF DEMENTIA

Panel Members: Mary Guerriero Austrom, PhD, Indiana University; Frederic C. Blow, PhD, VA Ann Arbor Healthcare System/University of Michigan; Kathleen C. Buckwalter, PhD, University of Iowa; Christopher M. Callahan, MD, Indiana University; Ryan M. Carnahan, PharmD, MS, BCPP, University of Iowa; Laura N. Gitlin, PhD, Johns Hopkins University; Helen C. Kales, MD, VA Ann Arbor Healthcare System/University of Michigan; Dimitris N. Kiosses, PhD, Weill Cornell Medical College; Mark E. Kunik, MD, VA Houston/Baylor College of Medicine; Constantine G. Lyketsos, MD, Johns Hopkins University; Linda O. Nichols, PhD, VA Memphis/University of Tennessee; Daniel Weintraub, MD, VA Philadelphia/University of Pennsylvania; ^Unable to be present on day of panel, post-hoc participation.