

# Hallucinations in Dementia

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Approximately 20% of older people with dementia manifest visual or auditory hallucinations. In order to effectively diagnose and treat these individuals, the etiology of hallucinations must be addressed; however, there has been very limited research in this area. There is an association between vision loss and hallucinations, and analyses of case studies suggest other potential etiologies. Accordingly, hallucinations can occur when the person with dementia either misinterprets reality, experiences sensory deprivation, is exposed to inappropriate sensory stimulation, has delirium/medical problems, or when his/her behaviour is misinterpreted due to cultural differences with caregivers. Understanding the etiology of hallucinations will assist in developing an appropriate nonpharmacological treatment, which may improve quality of life.

**Key words:** hallucinations, dementia, etiology, nonpharmacological, treatment

## Prevalence of Hallucinations

A hallucination (visual, auditory, or other) refers to a sensory experience that occurs in the absence of actual sensory stimulation, such as thinking one sees something that is not there.<sup>1</sup> Studies concerning the prevalence of hallucinations in dementia have yielded a wide range of results: Wragg and Jeste<sup>2</sup> compared six

studies regarding the prevalence of hallucinations among individuals with Alzheimer's disease (AD) or other types of dementia, and reported frequencies to range from 3% to 50%. In their review of four studies of dementia patients of mixed diagnosis, Allen and Burns<sup>3</sup> reported the frequency of hallucinations to range from 18% to 34%. In a review of

55 studies of the prevalence, incidence, and persistence of psychotic symptoms in Alzheimer's disease, Ropacki and Jeste<sup>4</sup> found that the median prevalence of hallucinations was 18%, with visual hallucinations being most prevalent (median prevalence of 18.7% compared to a median prevalence of 9.2% for auditory hallucinations). They also found that 26% of visual hallucinations and 45% of auditory hallucinations tended to be persistent, that is, manifesting the symptoms upon consecutive evaluations. The rate reported could depend on the informant, as in a study of hallucinations in participants of adult day centres, the staff members who reported them for 6.1% of the participants, and the relatives who reported them in 27.3% of the cases.<sup>5</sup>

Research concerning the onset of hallucinations and their prevalence at various stages of dementia has also yielded inconsistent results. Lerner *et al.*,<sup>6</sup> Cooper *et al.*,<sup>7</sup> and Reisberg *et al.*<sup>8</sup> reported more hallucinations among those with more advanced dementia than among those with less severe dementia. Similarly, Becker *et al.*<sup>9</sup> found that hallucinations were associated with decreased cognitive functioning. In contrast, Burns, Jacoby, and Levy<sup>10</sup> found neither visual nor auditory hallucinations were related to severity of dementia, although none of their subjects with mild dementia had auditory hallucinations. In their study of participants of adult day care centres, Cohen-Mansfield *et al.*<sup>5</sup> reported that hallucinations occurred in very late stages of the disease, specifically in stages 6 and 7 of the Brief Cognitive Rating Scale (BCRS).<sup>11</sup>

Persons who have Alzheimer's disease manifest markedly different psychotic-like symptoms than do older patients diagnosed with schizophrenia (Figure 1). First of all, very few people with AD have histories of psychosis. Secondly, the symptoms themselves differ in terms of overall incidence, and incidence of specific subtypes and symptoms. Hallucinations tend to be visual in Alzheimer's disease and auditory in schizophrenia. Jeste and Finkel<sup>12</sup> have proposed criteria for diagnosing psy-

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chosis of Alzheimer's disease as a distinct syndrome. These involve the presence of visual or auditory hallucinations or delusions at least intermittently for a period of one month or longer. It is important, however, that the proposed diagnostic criteria for psychotic symptoms should be differentiated from symptoms that may be caused by medications, or from symptoms that occur exclusively during the course of a delirium.

One of the distinctive features of Lewy body dementia is a relatively high prevalence of hallucinations. Mosimann *et al.*<sup>13</sup> compared hallucinations in patients with Parkinson's disease dementia (PPD) and dementia with Lewy bodies (DLB) and found hallucination characteristics to be similar in both disorders. Most patients experienced hallucinations daily, normally lasting minutes. Hallucinations were mostly visual, in which patients commonly saw people or animals, and the experiences were usually perceived as unpleasant.

The content of hallucinations and the emotional reaction to them have not been studied in other types of dementia. Sometimes the specific content is unclear, because the report on the delusion is obtained from caregivers who are not experiencing the hallucination but inferring from the patient's behaviour. Clinical reports suggest a variety of contents, where some persons see familiar persons, and, at times, the experience can be soothing, whereas others experience frightening or bothersome hallucinations. Future research should examine those issues.

### The Etiology of Hallucination Symptoms in Dementia

The etiology of hallucinations has received less research attention than that of behaviour problems. The understanding of that etiology is therefore limited. What has been detected in research or clinical experience involves misinterpretation of reality by the person with dementia, vision loss and sensory deprivation, cultural differences, inappropriate sensory stimulation, and delirium/medical causes.

### Misinterpretation of Reality by a Person with Dementia

In-room intercoms may be misinterpreted by a person with dementia who does not understand where the voice comes from or what it says, and may thus be interpreted as hearing voices talking from the walls.<sup>14</sup> Hallucinations were found to be related to insufficient light in the environment,<sup>15</sup> suggesting that some people may have difficulty identifying what they see, leading to an erroneous interpretation, which is perceived as seeing objects that are not present.

### Sensory Deprivation or Vision Loss

Hallucinations have been consistently related to vision loss.<sup>5,15,16</sup> Persons with poor vision may be more likely to misidentify objects.<sup>17,18</sup> Moreover, the perceptual deficits in low vision syndrome may increase confusion, especially if people are in unfamiliar settings such as a long-term care facility, assisted living facility, or adult day care. Another possible explanation is related to the "sensory deprivation" notion<sup>19</sup> in which, in the absence of the stimulation of sensory areas by external objects, people experience hallucinations.<sup>20,21</sup> This latter explanation is supported by reports of persons without dementia experiencing musical hallucinations related to deafness.<sup>22,23</sup>

### Cultural Differences

Under certain circumstances, caregivers may erroneously believe that older persons are hallucinating. In some cultures, "talking" to the dead is a fairly common practice,<sup>24,25</sup> yet persons with dementia who "communicate" with departed loved ones are often said to be hallucinating. Also, someone who is heard speaking aloud in a certain way, or singing, could in fact be praying, invoking a higher power based on religious beliefs or practices, or self-stimulating in an environment that is lacking appropriate stimuli, and hence may not be hallucinating.

### Inappropriate Sensory Stimulation

Various stimuli have been clinically reported to cause delusions or hallucinations. A reflection in a bathroom mirror,

or in a window at night, may lead an older adult with dementia to believe that someone is in the same room, or on the other side of the door. People with middle- to late-stage dementia often cannot recognize their own reflection in a mirror or differentiate between a reflection and a live person.<sup>26</sup>

In a small study of bright light therapy (BLT) and its effects on people with dementia of Alzheimer's type (DAT), one of the patients, after eight days of BLT, complained of blurred vision and her eyes became markedly red. The patient began hallucinating. The hallucinations stopped one day after discontinuing BLT.<sup>27</sup> In this case, the bright light was inappropriate sensory stimulation that aggravated the patient's condition.

### Delirium/Medical Causes

Although Jeste and Finkel<sup>12</sup> specifically excluded medical causes—such as delirium or drug-induced psychotic symptoms—from the definition of such symptoms, many of the rating scales for assessing the symptoms do not assure that medical conditions will be excluded. Further, in clinical practice, the determination of such causes may be complex and not obvious, and therefore people may be diagnosed with psychotic symptoms when, in fact, the symptoms involve treatable medical causes.

### Depression

Cooper *et al.*<sup>7</sup> observed that individuals with Alzheimer's with a history of depression were slightly more likely to experience hallucinations than individuals with Alzheimer's disease and without a history of depression (13% vs. 8%).

### Nonpharmacological Treatment of Hallucinations

In the absence of information about nonpharmacological interventions of psychotic symptoms, general principles of nonpharmacological management are briefly reviewed. The steps to be taken in developing a nonpharmacological intervention are outlined in Table 1. Key elements include detailed assessment and individualized interventions, as well as

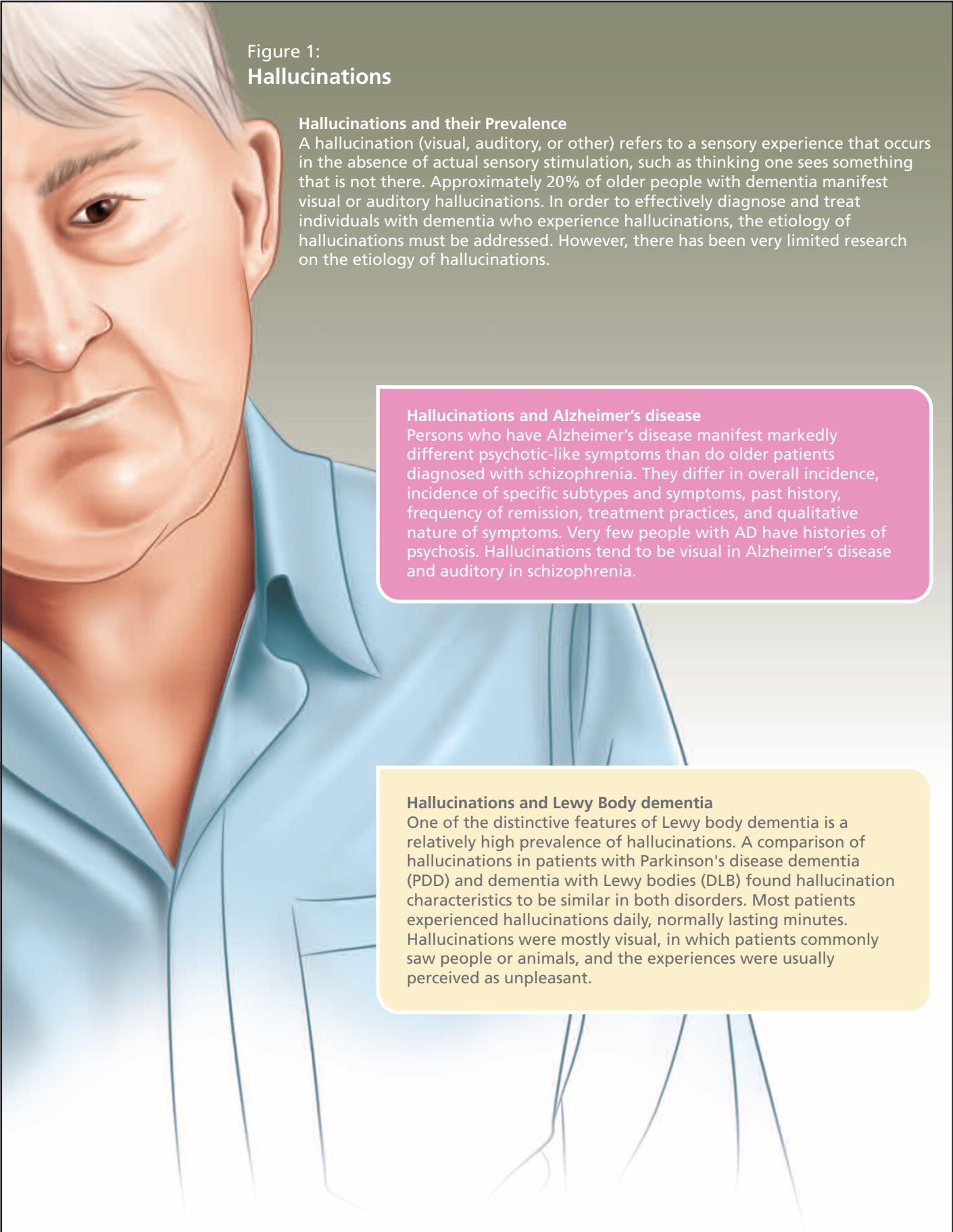


Figure 1:  
**Hallucinations**

#### **Hallucinations and their Prevalence**

A hallucination (visual, auditory, or other) refers to a sensory experience that occurs in the absence of actual sensory stimulation, such as thinking one sees something that is not there. Approximately 20% of older people with dementia manifest visual or auditory hallucinations. In order to effectively diagnose and treat individuals with dementia who experience hallucinations, the etiology of hallucinations must be addressed. However, there has been very limited research on the etiology of hallucinations.

#### **Hallucinations and Alzheimer's disease**

Persons who have Alzheimer's disease manifest markedly different psychotic-like symptoms than do older patients diagnosed with schizophrenia. They differ in overall incidence, incidence of specific subtypes and symptoms, past history, frequency of remission, treatment practices, and qualitative nature of symptoms. Very few people with AD have histories of psychosis. Hallucinations tend to be visual in Alzheimer's disease and auditory in schizophrenia.

#### **Hallucinations and Lewy Body dementia**

One of the distinctive features of Lewy body dementia is a relatively high prevalence of hallucinations. A comparison of hallucinations in patients with Parkinson's disease dementia (PDD) and dementia with Lewy bodies (DLB) found hallucination characteristics to be similar in both disorders. Most patients experienced hallucinations daily, normally lasting minutes. Hallucinations were mostly visual, in which patients commonly saw people or animals, and the experiences were usually perceived as unpleasant.

**Table 1:** Developing a Nonpharmacological Intervention for Hallucinations in Older Adults with Dementia

**Assess:**

- Identify the problem through assessments of the symptom
- Assess interaction of symptom with the environment (antecedents, consequences).
- Systematic observation is very useful for this assessment
- Clarify who is negatively affected by the symptom

**Ascertain causes for the symptom, such as:**

- Person is suffering from sensory deprivation
- Person misinterprets the stimulation around him/her, or stimulation is inappropriate
- Person has vision loss
- Person has delirium or depression
- Person's behaviour is appropriate to his/her culture

**Intervention is individualized to:**

- Match the cause of the symptom
- Match to the consequence of the symptom, e.g., does it not harm anyone and should it be accommodated?
- The person's prior habits and preferences
- His/her current abilities

**The intervention may be addressed to the:**

- Person with dementia
- Environment
- Staff member
- System of care
- No intervention may be necessary
- Assess and re-evaluate whether symptoms and quality of life have improved after administration of the intervention

timely re-evaluation of symptoms.

While research on the nonpharmacological management of hallucinations is lagging behind that of other nonpharmacological care, knowledge gleaned from clinical experience and research results in a number of promising approaches.

First, the classification of the hallucination needs to be verified. Medical causes need to be excluded, along with minor misinterpretations and confabulations. Second, the impact of the hallucination needs to be ascertained. Some hallucinations provide comfort to the person and do not need to be addressed. For example, some find talking to deceased loved ones a pleasant and comforting experi-

ence.<sup>28</sup> Hallucinations that do not have a negative impact usually do not warrant treatment.<sup>29</sup> If caregivers, formal or informal, are disturbed by behaviour that is detached from reality, the intervention needs to target the caregivers and clarify what are appropriate and inappropriate goals for intervention. Comfort and positive life experience for the person with dementia are important goals, whereas experiencing reality in a way that matches that of caregivers is less relevant. Third, possible causes of the hallucinations enumerated above (i.e., misunderstanding or misdiagnosis of the person with dementia, sensory deprivation/inappropriate sensory stim-

ulation, medical causes) should be investigated. Possible psychosocial and environmental causes for the hallucinations also need to be examined. Certain objects, such as a mirror or a window, can easily be misperceived. When such causes and antecedents are identified, changing the sequence of events that leads to misinterpretation can alleviate the hallucination. Specifically, the causes outlined above raise direct implications for treatment.

**Sensory Deprivation/Vision Loss**

Visual aids including eyeglasses, enhanced contrast, larger type/object, or improved lighting may help. In their study, Pankow *et al.*<sup>30</sup> reported the experience in which optical aids were effective in reducing frequency of visual hallucinations in three older patients with dementia and visual deficits. Additionally, persons with dementia who may experience sensory deprivation may benefit from sensory stimulation through auditory or touch channels.

**Inappropriate Sensory Stimulation and Misinterpretation of Reality**

An analysis of the stimulation that is producing the psychotic symptom will dictate the needed change. Removing a mirror, placing a curtain over a window, shutting off an intercom system, removing bright light, etc., may be all that is needed to alleviate the psychotic-like symptom. Providing better lighting that may help the person identify the objects in his/her environment may also reduce hallucinations.

**Delirium/Medical Causes**

Appropriate medical treatment, such as change in medications or antibiotic treatment, may resolve psychotic symptoms that are physiologically based.

**Other Treatment Routes**

Several other treatment routes must also be considered. A systematic analysis of antecedents and consequences of psychotic symptoms can be critical. Altering or eliminating specific antecedents may successfully alter or even eliminate the psychotic-like manifestations. It is equally

important to assess the mood of the older person.

An important component of treatment is that of educating caregivers, formal or informal, about hallucinations, and about potential environmental triggers to the hallucination. Similarly, caregivers should be encouraged to use sensory aids as much as possible, and to maximize sensory stimulation as part of routine preventive work. The environment would be designed to accommodate sensory deficits (such as increasing size and contrast in all written and other visual materials exhibited), and to provide sufficient stimulation. Stimulation needs to be easily comprehensible, such as a person providing information rather than the intercom providing it.

### Barriers to Nonpharmacological Treatments

The most obvious barrier to implementation of the nonpharmacological approach described above is that the current structure of care does not promote such nonpharmacological assessment and intervention. The current medical model promotes pharmacological solutions to symptoms and does not provide a system for systematic observation, assessment, and analysis of psychotic symptoms in order to determine the likely etiology and the impact on the person's life. This gap in the system is reflected by, and explained by, a lack of reimbursement for such nonpharmacologic care.

Lack of knowledge about environmental etiologies and nonpharmacological treatments is a major barrier. Although some of the relationships between etiologies and psychotic symptoms are well established (e.g., the relationship between vision loss and hallucinations), most examinations of etiologies have not been conducted. Furthermore, our knowledge of the actual benefit of nonpharmacological interventions is based on clinical experience and is not informed by systematic research. This is largely due to the unbalanced financial support for pharmacological approaches versus nonpharmacological

### Key Points

In order to effectively diagnose and treat persons with dementia who experience hallucinations, the etiology of hallucinations needs to be addressed.

The most common etiologies of hallucinations include: vision loss; sensory deprivation; misinterpretation of older person's behaviour due to cultural differences; inappropriate sensory stimulation; and delirium/medical causes.

The steps to be taken in developing a nonpharmacological intervention are: assessing the problem; ascertaining the causes for the symptom; individualizing the intervention; addressing the intervention either to the older person, environment, staff member or system of care; and finally, assessing and re-evaluating whether symptoms and quality of life have improved after administration of the intervention.

Nonpharmacological interventions based on appropriate analysis of etiology should be tried and evaluated. Refinement and trial of alternative interventions may be needed through trial and error.

Future research needs to clarify what proportion of symptoms currently identified as hallucinations fit any of the above etiologies and, therefore, are candidates for nonpharmacological interventions; examine the efficacy of nonpharmacological interventions; and investigate system structures that could provide good nonpharmacological treatments.

approaches, which have fewer and smaller funding opportunities. Another barrier is the complexity of the research, where the treatment is not uniform for all persons with a hallucination, but rather involves a decision tree, in which alternative explanations need to be explored, and the intervention addresses the specific etiology uncovered. At times, a few steps of trial and error are needed to address the etiology. However, systematic trials of treatment algorithms are possible.<sup>31</sup>

Finally, there are several prerequisites to good nonpharmacological care for people with dementia. In order to provide nonpharmacological interventions, the system of care needs to promote an atmosphere and practice of caring that goes beyond what is current-

ly available in most care settings. Attentive listening and observation are needed to differentiate between true hallucinations, misinterpretation, and other phenomena. Even if the person seems not to understand, it is important to communicate with him or her. This involves talking, asking questions, and informing of care activities. Equally important is listening to verbal communication from the person with dementia, even if the output seems garbled or incomprehensible. The message sometimes lies hidden in the words used. Other times it can be found in the intonation. Nonverbal communication can be an important tool in understanding the person with dementia, and touch can at times be an additional form of communication. Furthermore, compassion and empathy by caregivers allow

### Clinical Pearls

Sensory deprivation is implicated in a significant proportion of hallucinations in dementia; therefore, it is often appropriate to increase the level of sensory stimulation that fits the sensory abilities of the person and to utilize visual and auditory aids.

The decision of whether to treat the hallucination should be based on its effects on the patient. If the hallucination has no negative impact, it may not require an intervention.

them to better understand the needs of the person with dementia, and to clarify appropriate avenues for interventions. In order to allow alternative interventions, the system of care needs to promote autonomy and respect for the person with dementia, and to maximize flexibility in all procedures.

**Conclusion**

Future research needs to clarify what proportion of symptoms currently identified as hallucinations fit any of the above criteria for related phenomena and therefore are candidates for nonpharmacological interventions. Subsequently, research studies need to examine the efficacy of nonpharmacological interventions for such hallucinations. Research also needs to investigate system structures that could provide good nonpharmacological treatments, and the financial contingencies and configurations that promote such care.



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