

# Behavioral and psychological disturbances in Alzheimer disease: Assessment and treatment

Determining the origins of behavioral problems can help caregivers deal with some of the distress experienced by patients with dementia.

**ABSTRACT: Behavioral and psychological symptoms of dementia can be the most challenging problems that caregivers face. While the symptoms are common, the literature on prevalence and treatment is riddled with varying definitions and measurements. Treatments include both nonpharmacological and pharmacological approaches. The basis of all successful management is careful definition of the problem and monitoring of interventions for effects and side effects in order to maximize the function of the patient and minimize the stress to the caregiver.**

**A**lzheimer disease (AD) is not a disease of cognition alone. A wide array of behavioral and psychological problems are associated with it. In fact, delusional jealousy, paranoia, auditory hallucinations, screaming, and agitation were all prominent features of the dementia described by Alzheimer in his original report.<sup>1</sup> Behavioral disturbances may be the most challenging problems for caregivers to deal with and often lead to a need for institutional care. The origin of the problems needs to be understood before defining patient-centred management strategies.

## Definitions and origins of behavioral problems

“The term *behavioral disturbance* refers to a behavioral or psychological syndrome or a pattern associated with subjective distress, functional disability, or impaired interactions with others or the environment.”<sup>2</sup>

The classification of such disturbances in dementia patients has typically been phenomenological and has relied on a description of mental state and problematic behaviors,<sup>3</sup> as listed in **Table 1**.

It can be argued that behavior should be recognized as a form of communication rather than as a random, unpredictable, or meaningless event, making it essential for both family and health care team members to carefully assess the nature and timing of the behaviors to understand the communication. Once understood, modification of exacerbating factors may prevent reoccurrence. A simple example is agitation caused by pain. Because of cognitive problems, the patient cannot express discomfort verbally and therefore ends up pacing or screaming in an attempt to communicate. The agitated behavior in this instance could be seen as adaptive or as a call for help instead of being seen as “random” or “difficult.”

Behaviors can also be seen as caused by both environmental provocations and intrinsic neurobiological aspects of the disease.<sup>4</sup>

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**Assessment tools**

In physicians' offices or institutions, the most practical way to measure behavior is to begin by having the caregiver give a detailed description of what has been observed before drawing any conclusions as to the origins of the problem. The caregiver should be asked to paint a picture in words. It can be helpful to have caregivers keep a daily patient behavior diary.<sup>5</sup> This should include duration, frequency, and severity of symptoms, the pattern of the disturbance over time, and which activity is occurring or which caregiver is in attendance when the behavior occurs.

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When possible, the caregiver should complete the diary for a few days before an intervention is planned and continue after the intervention is completed to observe effects. It is best to introduce one intervention at a time in order to assess the degree of success of a particular mode of therapy.

There are many formal behavior assessment tools that can be used if caregivers are trained properly to administer them. These include:

- The Cohen-Mansfield Agitation Inventory (CMAI)<sup>6</sup>
- The Cornell Scale for Depression and Dementia<sup>7</sup>
- The Geriatric Depression Scale (GDS)<sup>8</sup>
- The Neuropsychiatric Inventory (NPI)<sup>9</sup>
- Behavioral Pathology in Alzheimer's Disease (Behave-AD)<sup>10</sup>

**Behavioral problems in AD**

The reported frequency of behavioral problems in Alzheimer disease vary widely.<sup>4,11</sup> This undoubtedly "relates to the fact that there is a lack of consensus regarding the best way to assess noncognitive features of Alzheimer's disease and selection bias in clinical samples which may lead to an overestimation of the true prevalence of disturbed behaviors and an underestimation of 'deficit' symptoms."<sup>4</sup>

In a population-based study of psychiatric phenomena in 178 patients with AD in a defined area of the United Kingdom,<sup>12</sup> the following cumulative prevalences of individual mental and behavioral disturbances were found: delusions—16%, hallucinations—17%, major depression—24%, mania—3.5%, agitation/aggression—20%, wandering—17%, and apathy—41%.

**Psychotic symptoms**

Psychotic symptoms include misidentification of other people or self, delusions, and auditory or visual hallucinations.

Studies have found that the presence of psychotic features predicts a more rapid cognitive decline. However, psychosis occurs at all stages of AD and does not accelerate mortality.<sup>4</sup>

**Affective symptoms**

Affective symptoms range from apathy to agitation and from dysphoria to a clear syndrome of depression. Reported rates of depression in AD have

**Table 1. Major behavioral and psychological disturbances in dementia.**

|                                    |
|------------------------------------|
| <b>Depression</b>                  |
| <b>Psychosis</b>                   |
| <b>Agitation</b>                   |
| • Nonaggressive                    |
| - physical (wandering)             |
| - verbal (screaming)               |
| • Aggressive                       |
| - physical (hitting)               |
| - verbal (cursing)                 |
| <b>Resistance to care</b>          |
| <b>Hypo/hyperphagia</b>            |
| <b>Disinhibition</b>               |
| <b>Diurnal rhythm disturbances</b> |
| <b>Sleep disorders</b>             |

ranged from 0% to 86%, with major affective disorder in 5% to 15% of patients, minor depression in 25%, and depressive symptoms in 50% at some stage of illness.<sup>11,13</sup> Lower reports of depression as measured by the Neuropsychiatric Inventory have been found in AD (20%) than in vascular dementia (32.3%).<sup>3</sup>

Because depression is highly treatable, it may be prudent to overdiagnose and give trials of antidepressants. The diagnosis of depression is easier to make in early stages of dementia when verbal skills are intact. In severe dementia, however, behaviors such as withdrawal, agitation, or screaming may need to be interpreted as depressive equivalents.

**Agitation/aggression**

Acts of aggression are particularly frightening for both family caregivers and staff in institutions. They also have a wide variety of causes ranging from pain to delirium to poor care approaches. Agitation is harder to define than discrete acts of aggression. Cohen-Mansfield and Deutsch<sup>14</sup> have argued for separating definitions of aggressive and nonaggressive behav-

**Table 2. A tool to assist in the understanding of the origins of behaviors.**

|                       | Biological dimension | Psychological dimension | Social dimension | Environmental dimension |
|-----------------------|----------------------|-------------------------|------------------|-------------------------|
| Predisposing factors  |                      |                         |                  |                         |
| Precipitating factors |                      |                         |                  |                         |
| Perpetuating factors  |                      |                         |                  |                         |

iors. They also suggest subcategorizing verbal and physical symptoms of agitation. Each requires a different approach to care. In one study, motor restlessness and nonverbal expression of agitation were found in up to 66% of patients, verbal outbursts in up to 45%, and physically threatening or violent behaviors in up to 27%.<sup>15</sup>

### Sleep disturbances

Disruption of sleep in patients with dementia has many adverse effects, including increased likelihood of day-night reversal, increased agitation, and increased caregiver stress. The inability to keep patients being cared for at home in bed at night has been found to strongly influence decisions for nursing home placement.<sup>16</sup> In a review of current management of sleep disturbances in dementia, Boeve and colleagues report that there are a few well-designed studies.<sup>17</sup> They describe sleep problems in four categories: insomnia, hypersomnia, excessive nocturnal motor activity, and hallucinations or behavioral problems. Specific therapy depends on a precise understanding of the cause of the problem.

### General approaches to management

There are two overall goals when treating behavioral or psychological problems related to dementia. The first is to remove or significantly reduce the symptom while preserving maximum function. The second is to lighten the burden of the caregiver.

The most important principle when treating patients with dementia is to establish as far as possible an understanding of the origins of behaviors before developing a management strategy. The origins of behaviors should be analyzed according to biological, psychological, social, and environmental dimensions (**Table 2**). Factors should be considered that could *predispose* a patient to a particular behavior, that could *precipitate* a behavior, or that could *perpetuate* a behavior. For example, a patient who has a predisposing biological factor (an enlarged prostate) and who has a precipitating biological factor (an obstruction causing a urinary tract infection) may become confused, agitated, and aggressive. The perpetuating factor here may be a lack of awareness on the patient's part of the need to empty his bladder on a regular basis in an attempt to avoid obstruction. The treatment approach would then be not only to treat the urinary tract infection and to consider surgery, but in the meantime to have a member of the health care team regularly assess the patient's voiding status or bladder size to avoid obstruction and the resulting behavioral problems.

The second most important principle when treating a patient with dementia is to use medications thoughtfully and only when psychosocial/environmental approaches are not adequate on their own. The third most important principle involves continually evaluating and modifying the

approach based on outcomes. It should also be understood that caregivers must be involved in care planning to ensure these strategies are achievable and easily monitored for effectiveness.

The Vancouver Coastal Health Authority's Geriatric Psychiatry Education Program (GPEP) uses a simple but effective approach to assess behavioral problems (**Figure 1**). This approach has been used as an educational tool and a checklist in care facilities to help staff understand and deal with patient problems.

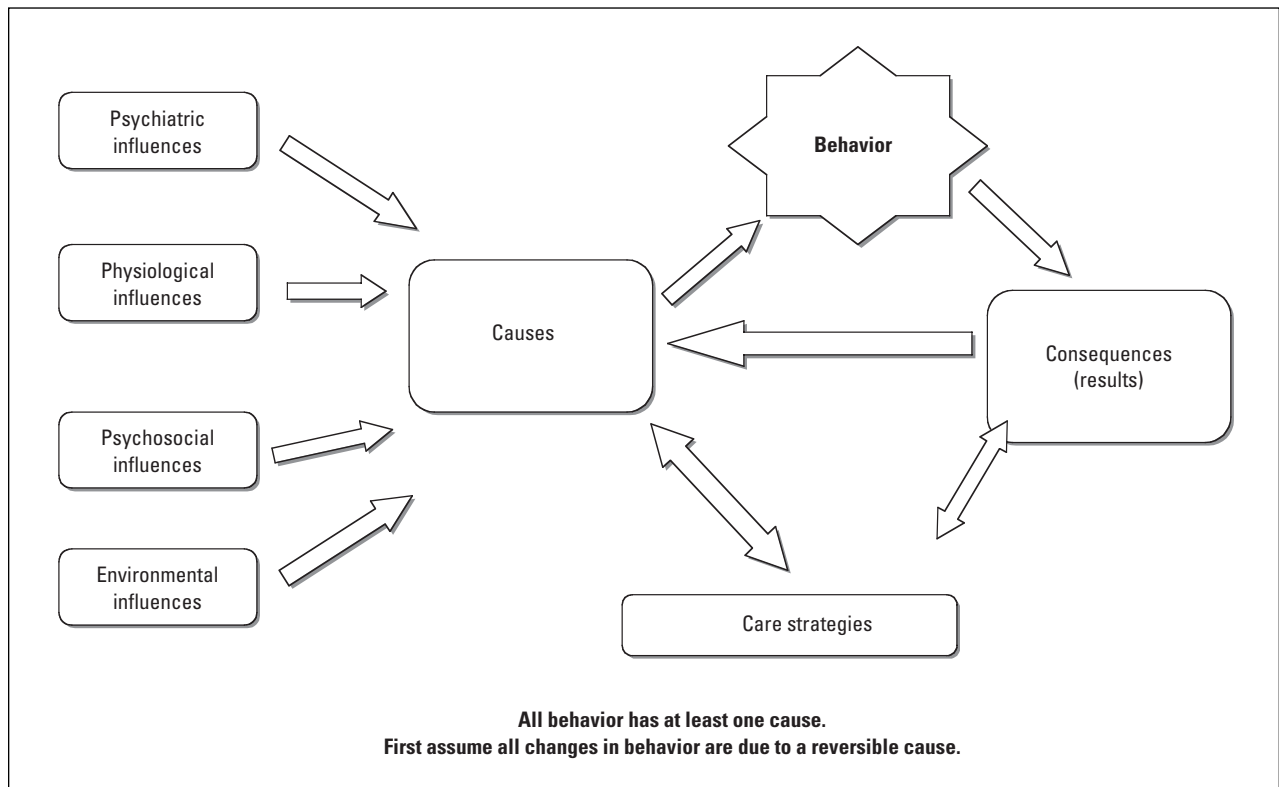
Tariot<sup>18</sup> describes an 11-point approach to behavioral disturbances:

1. Define target symptoms.
2. Establish or revisit medical diagnoses.
3. Establish or revisit neuropsychiatric diagnoses.
4. Assess and reverse aggravating factors (sensory, environmental).
5. Adapt to specific cognitive deficits (e.g., cues, memory books).
6. Identify relevant psychosocial factors.
7. Educate caregivers.
8. Employ behavioral management principles when appropriate.
9. Use psychotropic agents for specific syndromes.
10. Use psychotropic agents for specific symptoms.
11. Continually evaluate effectiveness and reassess as required.

### Nonpharmacological management

Cohen-Mansfield<sup>19</sup> offers three theoretical models that support certain types of nonpharmacological approaches:

**The unmet needs model.** The patient's behavior relates to sensory deprivation, boredom, and loneliness. Sensory stimulation, activities, and social contact may be appropriate therapeutic approaches.



**Figure 1.** Model used by the Geriatric Psychiatry Education Program (GPEP) of the Vancouver Coastal Health Authority.

**The behavioral learning model.**

The patient is caught up in a relationship between antecedents of behaviors, behaviors, and the consequences. The consequences may be reinforcing. A behavior-modification approach may be called for.

**The environmental vulnerability/reduced stress threshold model.** The patient has lost coping skills as a consequence of developing dementia. There is a greater vulnerability to the environment and a lower threshold at which stimuli have effects on behavior. An environment with reduced stimulation, relaxation therapy, or massage may be considered.

Cohen-Mansfield describes seven categories of nonpharmacological approaches (Table 3) and concludes that the literature on efficacy of non-pharmacological behaviors is prob-

lematic.<sup>19</sup> Most studies occur in institutions and look at inappropriate behaviors as a whole, not at specific behaviors. Assessment measures and duration of treatment vary. Very few control groups are used. Nonetheless, there is evidence that many nonpharmacological therapies improve quality of life beyond just reducing inappropriate behaviors.

Drance<sup>20</sup> writes about the importance of modifying not only the physical environment but the interpersonal environment. This may involve making sure caregivers have the knowledge to give best-practice care, have good communication skills, and follow a care approach in which patient abilities are supported. In an institution, all of this requires strong support from an administration that recognizes how providing a culture of caring is

just as important as providing physical care.

**Caregiver support**

The degree of behavioral problems in patients with dementia correlates to caregiver burden.<sup>21</sup> When patients with dementia experience depression, their caregivers report higher levels of burden.<sup>22</sup> Studies suggest that caregivers who are firm and directive in managing behavioral problems tend to have less depression.<sup>23</sup> Brodaty conducted a meta-analysis of psychosocial interventions for caregivers and found that structured programs, such as those teaching the patient *and* the caregiver problem-solving skills were more effective in reducing caregiver stress.<sup>24</sup> The flexible provision of a consistent professional to give long-term support to caregivers was important. Less

**Table 3. Categories of nonpharmacological therapy.**

|  |
|--|
| <p><b>Sensory intervention</b></p> <ul style="list-style-type: none"> <li>• Music</li> <li>• Massage/touch</li> <li>• White noise</li> </ul> <p><b>Social contact</b></p> <ul style="list-style-type: none"> <li>• One-to-one</li> <li>• Pet visits</li> <li>• Simulated presence therapy or videos</li> </ul> <p><b>Behavioral therapies</b></p> <ul style="list-style-type: none"> <li>• Cognitive</li> <li>• Stimulus control</li> </ul> <p><b>Activities</b></p> <ul style="list-style-type: none"> <li>• Structured activities</li> <li>• Organized outdoor walks</li> <li>• Physical activities</li> </ul> <p><b>Environmental interventions</b></p> <ul style="list-style-type: none"> <li>• Wandering corridors</li> <li>• Natural or enhanced environments</li> <li>• Reduced stimulation environments</li> </ul> <p><b>Medical/nursing care interventions</b></p> <ul style="list-style-type: none"> <li>• Pain management</li> <li>• Hearing aids</li> <li>• Removal of restraints</li> </ul> <p><b>Combination therapies</b></p> |
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**Table 4. Atypical neuroleptic therapy.**

| Drug        | Starting dose           | Total daily dose |
|-------------|-------------------------|------------------|
| Risperidone | 0.25 mg o.d. or b.i.d.  | Up to 2 mg       |
| Olanzapine  | 2.5 mg q.h.s. or b.i.d. | Up to 10 mg      |
| Quetiapine  | 25 mg q.h.s. or b.i.d.  | Up to 200 mg     |

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successful programs were short, involved support groups alone, or were educational courses with no long-term follow-up.

It is clear that caregivers need ongoing long-term support when dealing with loved ones with dementia and behavioral problems. They also need to be involved as partners with the health care team to learn to problem-solve and evaluate the effectiveness of individual interventions. Family caregivers are often the patients' most important assets and must be cared for just as carefully as the patients themselves.

**Pharmacological management**

The first and perhaps the most important step in pharmacological management should be to rationalize the use of all medications in this population

and to simplify the drug regimen wherever possible.

Psychotropic agents can be used to treat specific syndromes such as major affective disorders or symptoms such as apathy, irritability, agitation, or psychosis. Careful attention must be paid to potential side effects or drug interactions to prevent substituting one problem for another.

Once psychotropic medications are ordered, a plan for monitoring their effects and ongoing need must be implemented.

**Cholinesterase inhibitors (ChEIs).**

Anecdotal reports suggest that these drugs may be helpful with a number of behavioral disturbances, including apathy, agitation, and psychosis. Few trials have reported the effects of ChEIs on behavior and some have contradict-

ed others.<sup>25</sup> Cummings reports reductions in apathy and also suggests that the cholinesterase inhibitors may have positive emotional effects in those who do not respond cognitively.<sup>26</sup> He also concludes that they may reduce neuropsychiatric symptoms in late stages of the disease.

**Antipsychotics.**

Placebo-controlled trials examining the role of antipsychotics in managing Alzheimer disease psychosis and disruptive behaviors have demonstrated the effectiveness of haloperidol, risperidone, and olanzapine.<sup>5</sup> Katz and colleagues have demonstrated the effectiveness of risperidone in managing aggression and psychosis.<sup>27</sup> Tariot concludes that quetiapine can be helpful with psychosis in dementia and that its side effect profile may be

**Table 5. Sertraline or citalopram therapy**

| Drug       | Starting dose | Maintenance Dose |
|------------|---------------|------------------|
| Sertraline | 25–50 mg o.d. | 100–200 mg o.d.  |
| Citalopram | 10 mg o.d.    | 20–40 mg o.d.    |

particularly advantageous with respect to tolerability.<sup>28</sup> In June 2005 Health Canada advised physicians (Health Canada Advisory 2005-63) that recent studies showed that elderly demented patients prescribed atypical neuroleptics had a 1.6 greater death rate than those taking placebos. They also reminded physicians that quetiapine and olanzapine are not approved for treating behavioral disorders in elderly patients with dementia. Risperidone is approved for the short-term treatment

The use of neuroleptics should be reviewed on a regular basis every 1 or 2 months with the aim of reducing them to the minimum effective dose or stopping them altogether if the behavior is felt to be controllable without them.

**Antidepressants.** While tricyclics should be avoided because of potential anticholinergic side effects, other antidepressant medications can be used by patients with AD. The serotonin modulator trazodone (25 to 50 mg h.s.) can

### **The SSRIs should be used as first-line therapy for depression. Sertraline and citalopram have the best side effect profiles.**

of aggression and psychosis in patients with severe dementia. Given the difficulties with extrapyramidal side effects, the old neuroleptics are best avoided, except for loxapine when used judiciously. The atypical neuroleptics risperidone, olanzapine, and quetiapine are best given regularly, either once a day or twice a day rather than as needed (**Table 4**). Additional doses may be given as needed, but should be used judiciously to avoid oversedation.

be used as a sedative hypnotic<sup>5</sup> and can also be used in small doses (12.5 to 25 mg) during the day to decrease agitation. The SSRIs should be used as first-line therapy for depression. Sertraline and citalopram have the best side effect profiles. Start the sertraline or citalopram at a low dose and slowly increase over 1 month or 6 weeks to a maintenance dose (**Table 5**). Side effects may include an increase in INR values or hyponatremia. If patients taking

SSRIs become more listless or confused, check sodium levels to see if they have become hyponatremic.

**Benzodiazepines.** In general, benzodiazepines should be avoided by patients with AD because of side effects. However, a sublingual dose of lorazepam (0.5 mg) might be helpful as an anxiolytic before medical tests or difficult care procedures such as wound dressings to calm the patient and prevent agitation or struggling. A small dose of zopiclone (5 mg) can be recommended as a hypnotic when needed for short transitional periods, such as during a major move or when the patient is recovering from a medical illness, but should not be used long term.

**Anticonvulsants.** Carbamazepine has been reported to decrease agitation in patients with Alzheimer disease, but its side effects are significant (ataxia, drowsiness, disorientation, rash).<sup>29</sup> It is not appropriate as first-line therapy. Anecdotaly, gabapentine has been found helpful for agitation, but controlled studies have not been conducted.

### **Conclusions**

In order to understand behavioral problems in patients with dementia, health care professionals must be biopsychosocial/environmental detectives. Treatment should be individualized to the patient-caregiver dyad. Using evidence or best practices would be ideal. Unfortunately, much more research is needed regarding both pharmacological and nonpharmacological modes of therapy as well as a combination of approaches. In the meantime, carefully observing patients, listening to caregivers, acting to eliminate disturbance-precipitating factors, and performing trials of therapies is our best approach.

**Competing interests**

None declared.

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