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# ELDER CARE

## A Resource for Interprofessional Providers

### Hearing Loss and Cognitive Assessment

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#### Effects of Hearing Loss on Cognitive Assessment

Research has demonstrated an association between hearing loss and low scores on both verbal and non-verbal cognitive tests in older adults. Hearing loss affects 2/3 of adults over 70. Most standardized cognitive assessment tests used by clinicians include items that rely on hearing for successful completion of the assessment. For example, the most commonly used tests require the repetition or recall of spoken words, letters, numbers, or sentences. And, even for assessments that do not require verbal responses, the instructions are provided verbally so hearing impairment can influence performance.

An example is the widely used Montreal Cognitive Assessment (MoCA), in which 3 of 8 components require the ability to hear. The MoCA requires the tester to read a list of letters, during which the subject must tap the tester's hand at each letter A. Additionally, this test includes a list of numbers to be read aloud and repeated in order, and a shorter list to be read and repeated in reverse order.

Table 1 shows seven commonly used screening tools and the role of hearing in each. The AD8 and IQCODE are the only two in which hearing alone would not influence the results, but both require the patient to read. Therefore, a patient with hearing loss and low vision might struggle to perform these tests. Both, however, ask for information that can be provided by a caregiver of the patient.

This combination of hearing impairment and low vision (dual-sensory impairment) is common in older adults. About 11% of American adults aged 80 and over have dual sensory impairment, and only 19% of people in this age group have no sensory impairment at all.

#### Hearing Loss Can Increase Dementia Risk

Studies have shown that hearing loss increases a person's risk of developing dementia. Even mild hearing loss (~25dBHL across frequencies) is associated with cognitive decline at a rate equivalent to 7 years of aging. The association between hearing impairment and dementia could be due to a decrease in nerve cell connectivity, social isolation, or overloading cognitive resources in an effort to process auditory stimuli.

Environmental sounds and speech recognition can be difficult to comprehend in the presence of decreased central auditory processing ability. Such a deficit could be related to dementia or indicate impaired temporal lobe function in an aging central auditory system.

Whatever the cause, the risk of dementia increases with the severity of hearing impairment. Individuals with mild hearing loss have twice the risk of dementia compared to individuals without hearing impairment. Those with severe hearing loss have 5-times the risk.

**TABLE 1. HEARING PLAYS A ROLE IN MANY COGNITIVE ASSESSMENT TESTS**

Test	Role of Hearing in Test Administration
AD8 Dementia Screening Interview (AD8)	None, unless test is read aloud due to visual impairment
General Practitioner Assessment of Cognition (GPCOG)	Recall of a name and address, immediate and delayed
Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE)	None, unless test is read aloud due to visual impairment
Memory Impairment Screen (MIS)	Minimal, unless visual impairment prevents patient from reading word cues
Mini-Cog Screening for Cognitive Impairment	3-word recall, immediate and delayed
Mini-Mental State Exam (MMSE)	3-word recall, immediate and delayed; repeat a spoken phrase
Montreal Cognitive Assessment (MoCA)	5-word recall, immediate and delayed; letter and number attention; repeat a spoken phrase

#### TIPS

- Take hearing loss into consideration, and document hearing concerns in the medical record.
- Perform cognitive assessments in a quiet, well-lit environment free from background noise.
- Recommend hearing tests in conjunction with cognitive assessment, and refer to audiology if test results show hearing impairment.

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## Clinical Presentation of Hearing Loss and Dementia

Some common symptoms of hearing loss are similar to the communication deficiencies experienced by individuals with dementia, sometimes making it difficult to differentiate hearing loss from dementia. Table 2 gives a brief explanation of how and why similar symptoms can occur in both conditions.

Patients with hearing loss may be using more of their cognitive resources to understand spoken language, thus increasing their “cognitive load.” As a result, they may perform poorly on tests of both memory and executive function. It is common for those with age-related hearing loss to say that they can “hear but not understand.”

Patients with dementia, on the other hand, may be able to hear spoken language without difficulty, but struggle to understand meaning in the words.

In-office cognitive screening tools are designed for easy use and require minimal training. They generally take only 3-10 minutes to conduct. Because of these characteristics, they are widely used in clinical practice for assessing cognitive ability and often essential for early detection of dementia. It is important to consider hearing impairment when using these assessment tools, as hearing impairment can influence results and lead to an incorrect diagnosis of cognitive impairment or dementia.

## Assessing Cognitive Function with Hearing Impairment

When hearing loss is present or suspected, several steps should be taken to increase the likelihood of an accurate assessment. The best approach is to correct for the hearing deficit, if possible. Encourage patients to wear their hearing aids during cognitive assessments, and, if they don't have one, consider using an amplification device. Conduct the assessment in a quiet room using an assessment that minimizes auditory requirements, and sit so the patient can see your mouth and lips when you speak (Table 3.)

## References and Resources

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**Table 2. Symptoms That May Overlap Between Hearing Loss and Dementia**

Symptom	Why it Occurs in Hearing Loss	Why it Occurs in Dementia
Hyperacusis (sound aversion, sounds sensitivity)	Abnormal processing of received auditory stimuli	Reduction in central auditory processing
Difficulty comprehending speech in settings with background noise	Decreased processing range of decibels	Decreased attention or executive function
Trouble discriminating location of sounds	Loss of peripheral hearing sensitivity	Inability to cognitively determine location of sounds

**Table 3. What To Do When Hearing Loss is Present or Suspected During Cognitive Assessment**

- Use one of the assessment instruments (AD8 or IQCODE) that does not require auditory tasks (see Table 1).
- Only 20% of older Americans with hearing loss wear hearing aids. If the patient has one, assure that it is used during the assessment.
- If the patient does not have a hearing aid, try using a hearing amplification device.
- Perform the test in a quiet, well-lit environment, facing the patient with your mouth and lips clearly visible to the patient when you speak.
- Acknowledge that hearing loss may influence results of cognitive assessment; a below-normal score may not always indicate cognitive impairment.
- If hearing impairment is suspected to have influenced the results of the assessment, recommend a hearing assessment before drawing conclusions about the patient's cognitive status.
- If hearing impairment is confirmed, retest with use of well-fitted, appropriate hearing aids.

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