

WHAT YOU AND YOUR PATIENTS NEED TO KNOW ABOUT DEMENTIA

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If you ask your older adult patients what their greatest healthcare concern is, the response will most likely not be hearing loss. In all likelihood, the response will be dementia or Alzheimer's disease.

Given the tremendous increase in longevity, it is obvious that audiologists will need to prepare for service delivery to healthy older adults, as well as those with dementia disorders. According to the U.S. Census Bureau (2011a), the number of people 65 and older in the United States on July 1, 2009, was 39.6 million, with the nation's elderly population projected to double to 88.5 million by 2050. In 2003, it was noted by the U.S. Department of Health and Human Services that the fastest-growing age group in the United States was individuals 85 years and older (U.S. Department of Health and Human Services, 2003). However, more recent data indicate that the 90-years-and-older group is growing more rapidly than the 85–89 age population (U.S. Census Bureau, 2011b). The life expectancy gains of older adults, many of whom will have significant hearing impairments, will have a major impact on the profession of audiology and its service delivery models. In the 2010 census, there were 53,364 centenarians (people 100 and older), an increase of 5.8 percent since 2000 (U.S. Census Bureau, 2010).

For a number of years, there has been considerable research and interest regarding Alzheimer's disease and other forms of dementia. The Alzheimer's Disease International organization has predicted that there will be a doubling of people with dementia every 20 years, with a forecast that 66

million individuals worldwide will have Alzheimer's by 2030 and 115 million by 2050 (Alzheimer's Disease International, 2009). Currently, there are approximately 5.4 million Americans with Alzheimer's — the most common cause of older adult dementia (Alzheimer's Association, 2012; National Institute on Aging, 2011).

With age, there are cognitive changes experienced by older adults. Normal age-related changes in cognitive abilities include working memory, which unlike rote memory involves manipulation of information, such as planning ahead, problem solving, organizing and managing the information heard, etc.; attentional skill; and speed of processing. Unlike dementia, which typically does not appear until later in life, these normal age-related changes in cognition occur relatively early, around 20 years of age, with a steady decline thereafter (Baltes & Lindenberger, 1997).



Abnormal changes in cognition, however, differ significantly from normal age-related changes. While normal age-related changes typically may involve occasional word-finding difficulties, temporary loss of acquaintances' names, slower processing of information, and forgetfulness, abnormal changes in cognition due to dementia often involve notable changes in memory regarding recent events and communication, lack of awareness of memory problems, problem-solving difficulties, confusion regarding familiar territory and acquaintances, and changes in moods and personality. There are a number of types of dementia; the most common of which is Alzheimer's disease (AD), which will be the primary focus of this article.

AD Risks

The cause of AD is not yet known. Genetic mutation is one precursor that has been identified, and researchers are exploring a number of potential causes of AD. One of the primary risks for AD, not surprisingly, is age. Additional risks being identified include family history, cardiovascular disease, social engagement, diet, head trauma and traumatic brain injury.

As audiologists, one of our concerns should be the risk many of our older adult patients take when they do not seek help with their hearing losses. The studies discussed here suggest that both depression and loneliness have a strong

relationship with dementia. As we are aware, many older adults with hearing loss reject the use of hearing aids, thus often becoming depressed, withdrawing from previously enjoyed activities and becoming lonely.

Results of a study by Wilson and others (2007) indicated a strong relationship between loneliness and dementia. The authors recruited 823 older adults without dementia and evaluated their loneliness and cognitive function over a period of six years. The final data analysis indicated a strong correlation between loneliness and dementia, with the risk of AD more than doubling for people who reported loneliness. Similarly, Saczynski and her colleagues (2010) found that older adults with depression might have twice the risk of ultimately developing dementia or AD. As with many potential AD causes being studied by researchers, it is not clear whether depression is a potential risk factor leading to dementia, or whether depression is an early sign of dementia. Given the depression and loneliness often experienced by individuals with hearing loss, particularly those with untreated hearing loss, the findings of Wilson et al. and Saczynski et al. generate food for thought about the importance of older adults seeking hearing help when needed. Wilson (2011) suggests that as we anxiously wait for future advances in basic and translational research regarding cognition interventions for older adults, we should take advantage of current research that suggests that mental stimulation and growth-oriented lifestyles are two of the keys to maintaining cognitive health during our "golden years." One other surprising but very interesting finding was that of Lupton and her coauthors (2010). The authors determined that while their study revealed that education and employment variables showed no effect on the onset of AD, retirement age had a significant effect with people who retired later more likely to avoid AD longer than early retirees.

The Link Between Hearing Loss and AD

One of the early findings of the relationship between hearing impairment and dementia was a study conducted by Uhlmann and his colleagues



(1989). These researchers compared 100 cases with AD to a non-demented control group with similar age, gender and education to evaluate the potential connection between AD and hearing loss. Their findings were that individuals with AD were significantly more likely to have hearing loss of 30dB or more than the control group and that cognitive dysfunction as measured by the Mini-Mental State Examination was correlated with hearing loss in both non-demented and demented patients.

Since Uhlmann and others' research, there has been considerable interest and investigation regarding the link between hearing loss and dementia. For a number of years, George Gates has conducted research to determine the potential connection between hearing loss and abnormal declines in cognition. Several of his research studies have shown that central auditory processing (CAP) disorders in older adults may be precursors of cognitive impairment, including Alzheimer's disease. Gates and his coauthors found that very poor performance on the Synthetic Sentence Identification with Ipsilateral Competing Message (SSI-ICM) test preceded the diagnosis of AD by several years and thus potentially could serve as an early screening test for cognitive disorders in older adults (Gates, Feeney & Mills, 2008). The authors speculated that the importance of early identification of dementia via CAP tests such as the SSI-ICM might become even more relevant as new therapies for AD are found.

Gates and his research cohorts conducted further research to confirm that CAP may be a precursor to the onset of Alzheimer's disease and found that CAP functioning was significantly poorer even with mild impairment, particularly for the Dichotic Sentence Identification test (free report mode) (Gates et al., 2011). The authors indicated that it is important to establish a routine of conducting CAP testing with older adults, not only to determine auditory rehabilitation needs but also for early identification of possible cognitive loss.

Research conducted by Frank Lin and his cohorts at Johns Hopkins School of Medicine has provided substantial evidence of the link between hearing loss and dementia. In a large-scale study, Lin and his coauthors found a strong connection between

hearing loss and dementia (2011). Recent research by Kiely and others (2012) revealed that individuals with cognitive impairment experience faster declines in peripheral hearing. Thus, the authors recommend that researchers and clinicians be aware of impaired cognition when evaluating the hearing abilities of individuals, but in turn, be aware of impaired hearing when evaluating individuals with cognitive impairments, including dementia. Although the link between hearing loss and cognition has been identified by a number of researchers, there is little data at this time to determine if the use of hearing aids and other types of aural rehabilitation could delay dementia.

Although there is growing evidence that cognitive intervention may be effective in reducing the consequences of AD and Mild Cognitive Impairment (MCI), there has been less success with interventions to prevent AD and MCI, such as commercial brain training software games and products (Sitzer, Twamley & Jeste, 2006; Papp, Walsh & Snyder, 2009; Owen et al., 2010).

Hearing Management for Individuals with Dementia

Although there are a number of challenges and barriers when providing hearing technology for people with dementia, a number of researchers have provided evidence of the benefits of hearing loss technology for this population (Weinstein & Amsel, 1986; Palmer et al., 1998; Palmer et al., 1999; Allen et al., 2003; Burkhalter et al., 2009). Many of the patients with AD or other forms of dementia will benefit significantly from hearing assistive technology, but it is unlikely that you can successfully conduct the standard evaluation and rehabilitation protocols you typically use with your adult patients. Some tips for interacting and working with patients who have dementia include the following:

- Include family members, caregivers and/or assistive living or nursing practitioners in the evaluation and treatment process. They may help calm the patient, and you will be able to share information with and receive patient information from the caregiver.

- Be prepared. A patient with AD may or may not be cooperative with the traditional hearing test, in which case you may try strategies to understand the degree of the patient's hearing abilities.
- Plan to make several visits in order to succeed in helping the patient if you are working with patients in a facility or home.
- Speak slowly, clearly, calmly and gently with simple words and sentences; then give the patient time to respond. Use simple gestures when the person seems confused.
- Understand that the patient may be anxious or irritable and may repeatedly ask the same questions over and over. Be patient and smile.
- Reduce background noise as much as possible.
- Let the patient know your name and who you are, even if you have seen them many times before.
- Explain to the caregiver, as clearly and succinctly as possible, how to help the patient use the assistive hearing device you have recommended and/or provided, and follow up with the caregiver to determine the patient's success with the device.

In conclusion, regarding the title of this article (What you and your patients need to know about dementia), what the practitioner needs to know is that there is increasing evidence of a link between hearing loss and dementia and that individuals with dementia and hearing difficulties can benefit from hearing assistive devices. Beyond the audiologist's training and experience, two of the most important needs are having patience and indomitable spirit when helping patients who are challenged by their cognitive problems. Keep in mind that even a simple hearing device can improve the quality of life for many people with AD, as well as that of the patients' caregivers and loved ones.

Regarding our adult patients, it is important for them to know that there is a link between hearing loss and dementia and that effects of hearing loss

often include depression and loneliness, both highly linked to dementia. Although more research is needed to unwind the connections between hearing loss and dementia, it may be important for consumers to understand that hearing loss may ultimately be identified as a risk factor for dementia.

References

Alzheimer's Association. (2012). 2012 Alzheimer's Disease Facts and Figures. Retrieved July 19, 2012, from http://www.alz.org/downloads/facts_figures_2012.pdf

Alzheimer's Disease International. (2009). 2009 World Alzheimer Report. Retrieved July 19, 2012, from <http://www.alz.co.uk/research/files/WorldAlzheimerReport.pdf>

Allen, N.H., Burns, A., Newton, V., Hickson, F., Ramsden, R., Rogers, J., Butler, S., Thistlewaite, G., & Morris, J. (2003). The effects of improving hearing in dementia. *Age and Ageing*, 32(2), 189–193.

Baltes, P.B., & Lindenberger, U. (1997). Emergence of a powerful connection between sensory and cognitive functions across the adult life span: A new window to the study of cognitive aging? *Psychology and Aging*, 12(1), 12–21.

Burkhalter, C.L., Allen, R.S., Skaar, D.C., Crittenden, J., & Burgio, L.D. (2009). Examining the effectiveness of traditional Audiological Assessments for nursing home residents with dementia-related measures. *Journal of the American Academy of Audiology*, 20(9), 529–538.

Gates, G.A., Feeney, P.M., & Mills, D. (2008). Cross-sectional age-changes of hearing in the elderly. *Ear and Hearing*, 29(6), 865–874.

Gates, G.A., Anderson, M.L., McCurry, S.M., Feeney, M.P., & Larson, E.B. (2011). Central auditory dysfunction as a harbinger of Alzheimer Dementia. *Archives of Otolaryngology-Head & Neck Surgery*, 137(4), 390–395.

Kiely, K.M., Gopinath, B., Mitchell, P., Luszcz, M., & Anstey, K.J. (2012). Cognitive, health, and sociodemographic predictors of longitudinal decline in hearing acuity among older adults. *Journal of Gerontology: Medical Sciences*.

Lin, F.R., Metter, J., O'Brien, R.J., Resnick, S.M., Zonderman, A.B., & Ferrucci, L. (2011). Hearing loss and incident dementia. *Archives of Neurology*, 68(2), 214–220.

- Lupton, M.K., Stahl, D., Archer, N., Foy, C., Poppe, M., Hollingworth, P., et al. (2010). Education, occupation and retirement age effects on the onset of Alzheimer's disease. *International Journal of Geriatric Psychiatry*, 25(1), 30–36.
- National Institute on Aging. (2011). Alzheimer's Disease Fact Sheet. Retrieved July 19, 2012, from http://www.nia.nih.gov/sites/default/files/alzheimers_disease_fact_sheet.pdf
- Owen, A.M., Hampshire, A., Grahn, J.A., Stenton, R., Dajani, S., Burns, A.S., Howard, R. J., & Ballard, C.G. (2010). Putting brain training to the test. *Nature*, 465, 775–778.
- Palmer, C.V., Adams, S.W., Durrant, J.D., Bourgeois, M., & Rossi, M. (1998). Managing hearing loss in a patient with Alzheimer disease. *Journal of the American Academy of Audiology*, 9(4), 275–284.
- Palmer, C.V., Adams, S.W., Bourgeois, M., Durrant, J., & Rossi, M. (1999). Reduction in caregiver-identified problem behaviors in patients with Alzheimer Disease post-hearing-aid fitting. *Journal of Speech Language Hearing Research*, 42(2), 312–328.
- Papp, K.V., Walsh, S.J., & Snyder, P.J. (2009). Immediate and delayed effects of cognitive interventions in healthy elderly: A review of current literature and future directions. *Alzheimers & Dementia*, 5(1), 50–60.
- Saczynski, J.S., Beiser, A., Seshadri, S., Auerbach, S., Wold, P.A., & Au, R. (2010). Depressive symptoms and risk of dementia: the Framingham Heart Study. *Neurology*, 75(1), 35–41.
- Sitzer, D.I., Twamley, E.W., & Jeste, D.V. (2006). Cognitive training in Alzheimer's disease: a meta-analysis of the literature. *Acta Psychiatrica Scandinavica*, 114(2), 75-90.
- Uhlmann, R.F., Larson, E.B., Rees, T.S., Koepsell, T.D., & Duckert, L.G. (1989). Relationship of hearing impairment to dementia and cognitive dysfunction in older adults. *Journal of the American Medical Association*, 261(13), 1916–1919.
- U.S. Census Bureau (2010). 2010 Census Shows 65 and Older Population Growing Faster Than Total U.S. Population. Retrieved July 19, 2012, from http://www.census.gov/newsroom/releases/archives/2010_census/cb11-cn192.html
- U.S. Census Bureau. (2011a). Facts for Features: Older Americans Month: May 2011. Retrieved July 12, 2012, from http://www.census.gov/newsroom/releases/archives/facts_for_features_special_editions/cb11-ff08.html
- U.S. Census Bureau (2011b). 90+ in the United States: 2006–2008. American Community Survey Reports, ACS-17. U.S. Government Printing Office, Washington, DC.
- U.S. Department of Health and Human Services. (2003). A profile of older Americans: 2003. Retrieved July 7, 2005, from <http://www.aoa.gov/prof/Statistics/profile/2003/4.asp>
- Weinstein, B. & Amsel, L. (1986). Hearing loss and dementia in the institutionalized elderly. *Clinical Gerontologist*, 4, 3–15.
- Wilson, R.S., Krueger, K.R., Arnold, S.E., Schneider, J.A., Kelly, J.F., Barnes, L.L., Tang, Y., & Bennett, D.A. (2007). Loneliness and risk of Alzheimer Disease. *Archives of General Psychiatry*, 64(2), 234–240.
- Wilson, R.S. (2011). Mental stimulation and brain health: Complex, challenging activities can support cognitive health in older adults. *Generations*, 35(2), 58–62.



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