



Research Report: Summary Hearing Loss & Dementia

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Hearing Loss and Cognitive Decline.

What is the Relationship? And is Dementia Avoidable?

Hearing Loss impacts over 48 Million people in the U.S. and is listed by the Department of Health and Human Services as the 3rd most common chronic disorder affecting today's seniors. Unfortunately, for most of us, age-related hearing loss is inevitable; impacting nearly 50% of seniors between the ages of 60-70, almost 2/3rd of people between the age of 70-80, and nearly 80% of individuals over the age of 80. Age-related hearing loss is characterized by the progressive loss of receptor (hair) cells in the ear, that consequently reduces the quantity, and quality, of neural connections from the ear to the brain. This slow-onset disease can have a significant impact on several key brain areas, including the memory, hearing, speech and language portions of cognition. Several key research studies have pointed to the potential links of hearing loss and Dementia, including the groundbreaking work from Dr. Lin and his colleagues at Johns Hopkins Medical Center that indicate hearing loss can increase the risk of Dementia by 200-500% (see summary data in Figure 1).

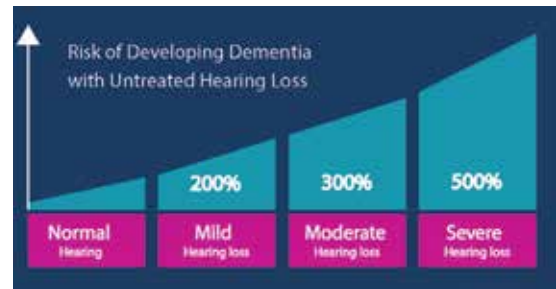


Figure 1: Summary of Data from Lin et al., 2011 Johns Hopkins Medical Center

It (hearing loss) not only increases age-related memory loss, it increases the incidents of Alzheimer's disease so if you can prevent the onset of Alzheimer's disease or delay it with good hearing devices that's a major public health advance



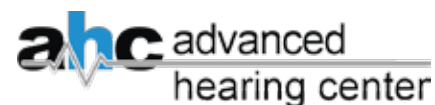
Quote by Erik Kandel, Recipient of the Nobel Prize in Physiology or Medicine

Every 3-4 seconds another patient is diagnosed with Dementia. Rates of Dementia are estimated to triple in the next 30 years. Unlike some other diseases, with Dementia the physical body is estimated to outlive the individual's mental capabilities by 10 or more years. There is no cure for this catastrophic disease, but there are treatments available, including several ways to decrease your risk of developing Dementia.

Dr. Keith Darrow, PhD, CCC-A M.I.T. and Harvard Medical Trained NeuroScientist and Clinical Audiologist



Owner of Hearing and Balance Centers of New England Expert in Speech and Hearing Bioscience and Technology Director of Audiology Research at Intermountain Audiology Professor at Worcester State University Nationally Recognized Speaker, Trainer, and Researcher Research Associate at Massachusetts Eye and Ear Infirmary His publications and research cited over 500 times



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Hearing Loss & Dementia

Recent research has found that hearing loss can increase the risk of developing Dementia by 200-500%. This report, from researchers at Johns Hopkins Medical Center and the National Institute on Aging found that individuals with hearing loss (when compared to participants with normal hearing) are at a significantly higher risk of developing Dementia over time. The more hearing loss they had, the higher their likelihood of developing the memory-robbing disease. "A lot of people ignore hearing loss because it's such a slow and insidious process as we age," Dr. Frank Lin (of Johns Hopkins Medical Center) says. "Even if people feel as if they are not affected, we're showing that it may well be a more serious problem."

Three risk factors associated with hearing loss and Dementia include Social Isolation, Cerebral Atrophy and Cognitive Overload.

1. Social Isolation -The Impact of reduced social and physical activity. Withdrawal from social situations is common in individuals with hearing loss. Many studies cite feelings of embarrassment, fear of making mistakes in conversations, and feeling like you are not part of the conversation as the common rationale for individuals with hearing impairment to separate themselves from family, friends and community. This retreat from social activity has even been found in individuals with a mild degree of hearing loss. In addition, individuals with hearing loss are less likely to engage in physical activity. Both increased social isolation and reduced physical activity are strong risk factors for the development of Dementia



*Blindness Separates You From Things...
Deafness Separates You From People.*



Quote by Helen Keller

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Active Aging: How to Reducing Social Isolation

Active Ageing – the process of optimizing opportunities for better health, continuing development of knowledge, and increased security in order to maximize quality of life as you age. The word ‘active’ is used to describe a person’s involvement with social, physical, economic, spiritual and civic affairs. We all share the same goal to maintain autonomy and independence as we age, and thus we must rely on preserving the tenants of interdependence (socialization and reliance on family and loved ones) and intergenerational solidarity (maintaining companionship with age-matched peers) to insure active aging.

Tips for Active Aging include:

- Share a meal with family and friends 3-5 times per week
- Commit to an aerobics / exercise regiment
- Learn a new hobby each year
- Play an instrument (or learn a new instrument)
- If you love to read.... Keep reading (try to mix up the topics!)
- If you don’t read much – try to read a book every other month
- Participate in classes at your local senior center
- Volunteering at a local hospital, shelter, etc.,
- Go back to school. Many local Universities offer free tuition to people over 65!

Both Social Isolation and Depression are major risk factors for the development of Dementia, and both increase as we age. Being a lifelong learner and staying active is important to maintain a healthy, active brain, and can also reduce your risk of cognitive decline and dementia. Some studies have shown that social activities, larger social networks, and a history of social contact are associated with better cognitive function and reduced risk for cognitive decline.

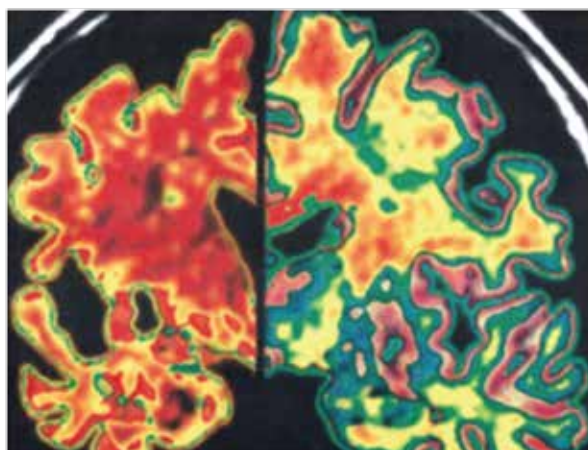


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Cerebral Atrophy (aka Brain Shrinkage)

The association of a shrinking brain, resulting from the loss of neurons, with Dementia has been long documented. Even people with MCI (Mild Cognitive Impairment) show signs up cerebral atrophy. In recent years, scientific studies using advanced brain imaging techniques (including fMRI - Functional Magnetic Resonance Imaging) have demonstrated that hearing impairment is associated with accelerated brain atrophy in both the overall brain, as well as even more advanced reductions in volume associated with the memory, hearing, speech and language portions of the brain.



Brain with Hearing Loss

Brain with Normal Hearing

Individuals with Hearing Loss can experience significant cerebral atrophy. The most significant reduction in cerebral volume occurs in areas involved in:

- Memory
- Hearing
- Speech
- Language

Cognitive Overload (i.e. Working Your Brain Too Hard To Hear)

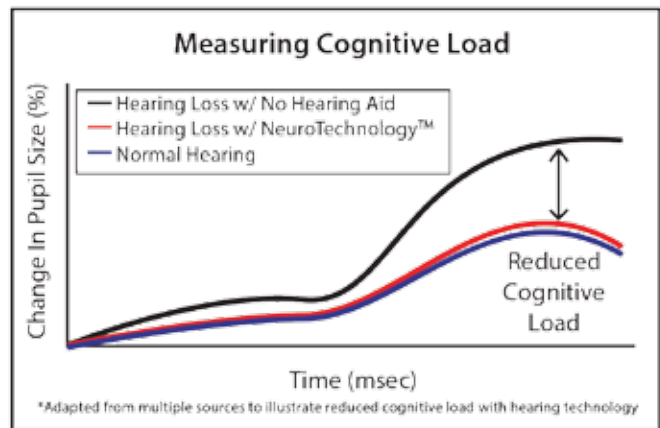
Hearing loss is not normal, and neither is the excess strain that is puts on your brain. While hearing loss may be more common as we age, it is critical that hearing loss be treated. With hearing loss, the brain is constantly on 'overload' trying to fill in the missing pieces, and follow the conversation. Increased cognitive load is considered a risk factor for developing Dementia. Cognitive load, as measured by pupillometry, is a measurement of how hard your brain is working to follow a conversation. Recent research has found that individuals who treat their hearing loss do not work as hard to listen (i.e. have a reduced cognitive load) and have as much as a 20% increase in memory recall when following a conversation.

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NeuroTechnology™: **Reduce Your Risk of Developing Dementia**

Improvements in Cognitive Function: In a recent study, Dr. Jamie Desjardins, PhD, (University of Texas at El Paso), demonstrated that today's current hearing loss treatment options can improve brain function in people with hearing loss. It is known that hearing loss, if left untreated, can lead to emotional and social consequences, reduced job performance, and diminished quality of life. Recently, research has shown that untreated hearing loss also can interfere with cognitive abilities because so much mental effort is diverted toward understanding speech.

The research was aimed at measuring core cognitive functions in 50-60 year olds that beginning hearing loss treatment with NeuroTechnology™. After only two weeks of hearing loss treatment, cognitive testing revealed a significant increase in percent scores for recalling words in working memory and selective attention tests, and the processing speed at which participants selected the correct response was faster. By the end of the study, participants had exhibited significant improvement in their cognitive function.



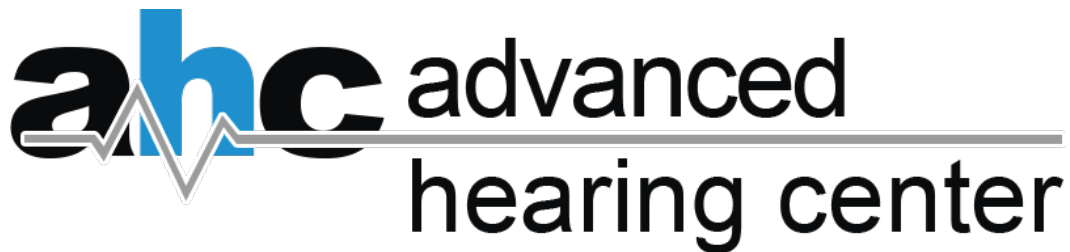
Since 2011, multiple long-term studies have provided strong evidence that treating hearing loss may eliminate the risk of developing Dementia. Dr. Lalwani at Columbia University noted that treating hearing loss "may offer a simple, yet important, way to prevent or slow the development of dementia by keeping adults with hearing loss engaged in conversation and communication."

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