Revealed: Hearing Loss

The #1 Modifiable Risk Factor of **Dementia**

VIRSONO
Hearing Center

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Hearing Loss & Dementia

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 Center for Decease Control and Prevention as the 3rd most common chronic disorder affecting today's seniors[1]. Unfortunately, for most of us, age-related hearing loss is inevitable; impacting nearly 50% of seniors between the ages of 60-70, almost 2/3 of people between the age of 70-80 and nearly 80% of individuals over the age of 80[2]. 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 that indicate hearing loss can increase the risk of Dementia by 200-500%, including the groundbreaking work from Dr. Frank Lin and his colleagues at Johns Hopkins Medical Center (see summary data in Figure 1)[3].

Every 3 seconds another patient is diagnosed with Dementia[4]. Rates of Dementia are estimated to triple in the next 30 years[5]. 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.

Hearing loss and incident dementia study, 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[3].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.

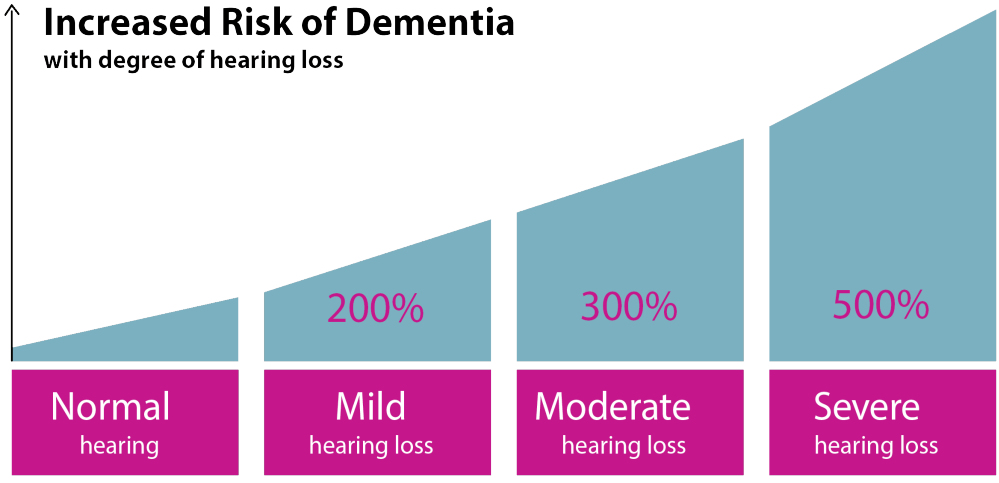

Figure 1: Summary of Data from Hearing loss and incident dementia,

Sources:
1. Centers for Disease Control and Prevention. (2018, December 11). Public Health and Scientific Information. Centers for Disease Control and Prevention. https://www.cdc.gov/nceh/hearing_loss/public_health_scientific_info.html
2. Lin FR, Niparko JK, Ferrucci L. Hearing loss prevalence in the United States. Arch Intern Med. 2011 Nov 14;171(20):1851-2. doi: 10.1001/archinternmed.2011.506. PMID: 22083573; PMCID: PMC3564588.
3. Lin FR, Metter EJ, O'Brien RJ, Resnick SM, Zonderman AB, Ferrucci L. Hearing loss and incident dementia. Arch Neurol. 2011 Feb;68(2):214-20. doi: 10.1001/archneurol.2010.362. PMID: 21320988; PMCID: PMC3277836.
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1. Social Isolation

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 rational 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[1]. In addition, individuals with hearing loss are less likely to engage in physical activity[1]. Both increased social isolation and reduced physical activity are strong risk factors for the development of Dementia[1].

Active Aging: How to Reduce Social Isolation

Active Aging – 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 ensure active aging.

Both Social Isolation and Depression are major risk factors for the development of Dementia, and both increase as we age[2]. 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[3,4].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.

> "From the first moment I got them, I was hooked on Earlens. There was no way I was going to go try something else. This is the way to go. They're worth every penny."
>
> – Dante

> "After getting my brand new Earlens, I immediately turned the radio on to my favorite music and I just sat there, and tears, I mean literally, tears just came down."
>
> – Genie

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

Quote by Helen Keller

Sources:

1. Rutherford BR, Brewster K, Golub JS, Kim AH, Roose SP. Sensation and Psychiatry: Linking Age-Related Hearing Loss to Late-Life Depression and Cognitive Decline. Am J Psychiatry. 2018 Mar 1;175(3):215-224. doi: 10.1176/appi.ajp.2017.17040423. Epub 2017 Dec 5. PMID: 29202654; PMCID: PMC5849471.

3. Vemuri P, Lesnick TG, Przybelski SA, Machulda M, Knopman DS, Mielke MM, Roberts RO, Geda YE, Rocca WA, Petersen RC, Jack CR Jr. Association of lifetime intellectual enrichment with cognitive decline in the older population. JAMA Neurol. 2014 Aug;71(8):1017-24. doi: 10.1001/jamaneurol.2014.963. PMID: 25054282; PMCID: PMC4266551.

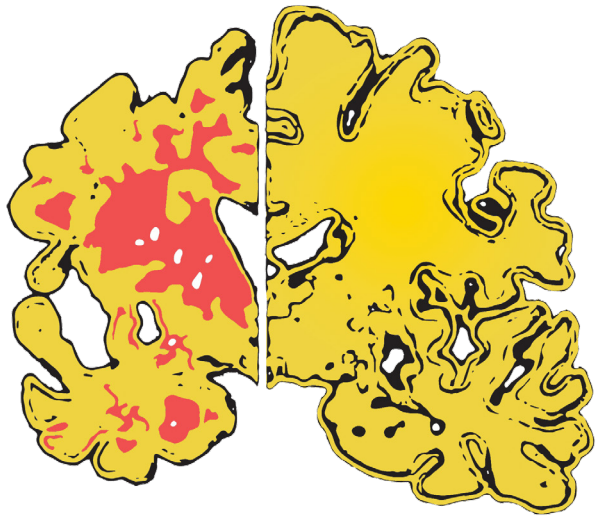
4. Centers for Disease Control and Prevention. (2018, December 11). Public Health and Scientific Information. Centers for Disease Control and Prevention. https://www.cdc.gov/nceh/hearing_loss/public_health_scientific_info.html

2. 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 of cerebral atrophy[1]. 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[2].

Individuals with Hearing Loss can experience significant cerebral atrophy[2]. The most significant reduction in cerebral volume occurs in areas involved in:

- Memory
- Hearing
- Speech
- Language



Brain With Hearing Loss **Brain With Normal Hearing**

"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

TIPS!

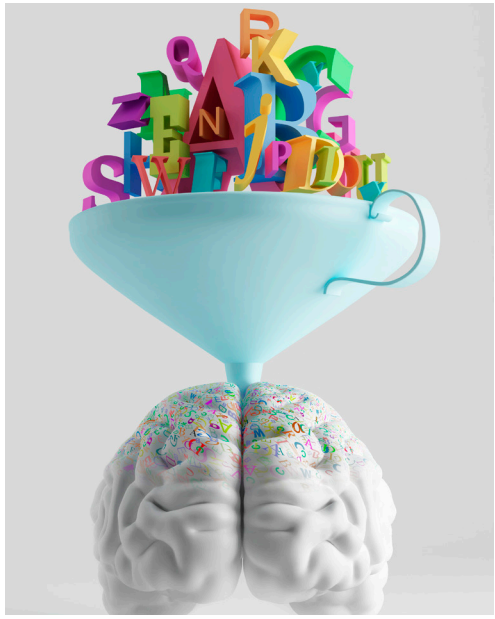
Tips for Active Aging include:

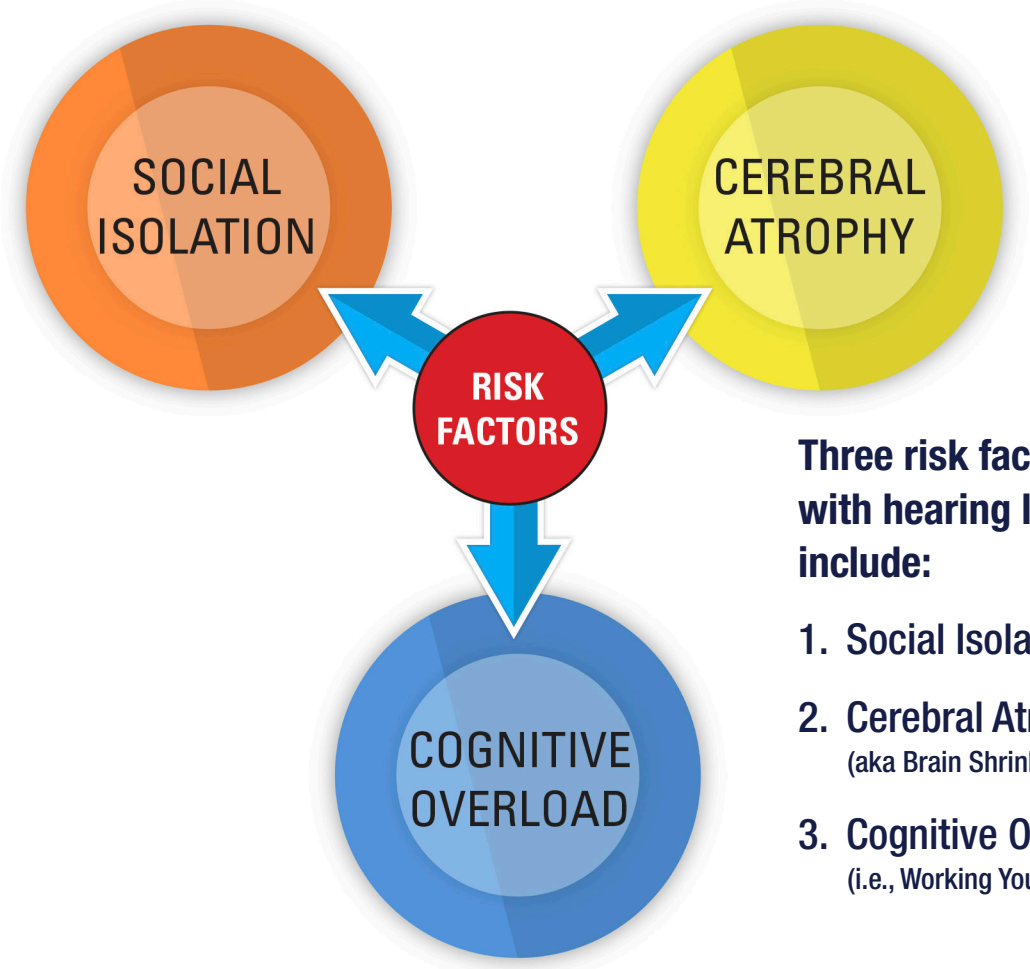
- Share a meal with family and friends 3-5 times per week
- Commit to an aerobics / exercise regimen
- Learn a new hobby each year
- Play an instrument (or learn a new instrument)
- If you love to read…. Keep reading (try to mix up the topics!)
- If you don't read much – try to read a book every other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

Sources:
1. Tabatabaei-Jafari H, Shaw ME, Cherbuin N. Cerebral atrophy in mild cognitive impairment: A systematic review with meta-analysis. Alzheimers Dement (Amst). 2015 Dec 11;1(4):487-504. doi: 10.1016/j.dadm.2015.11.002. PMID: 27239527; PMCID: PMC4879488.
2. Lin FR, Ferrucci L, An Y, Goh JO, Doshi J, Metter EJ, Davatzikos C, Kraut MA, Resnick SM. Association of hearing impairment with brain volume changes in older adults. Neuroimage. 2014 Apr 15;90:84-92. doi: 10.1016/j.neuroimage.2013.12.059. Epub 2014 Jan 9. PMID: 24412398; PMCID: PMC3951583.

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

Hearing loss is not normal and neither is the excess strain that it 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.

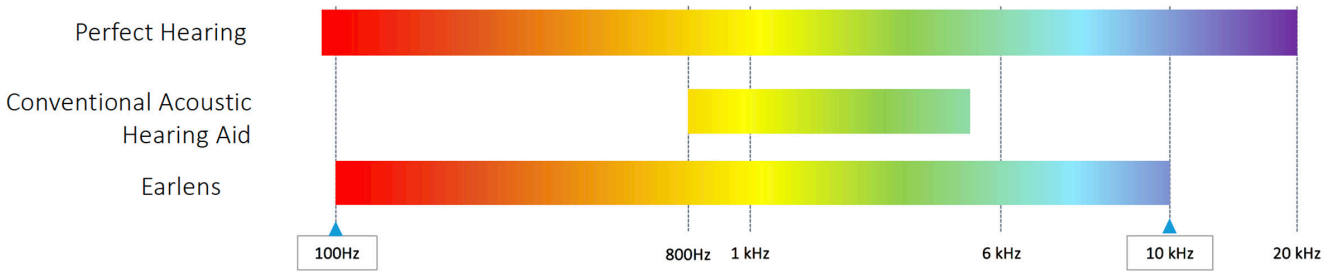




Three risk factors associated with hearing loss and Dementia include:

1. Social Isolation
2. Cerebral Atrophy
   (aka Brain Shrinkage)
3. Cognitive Overload
   (i.e., Working Your Brain Too Hard To Hear)

Restore Access to True Broadband Audibility with **Earlens**



The Earlens Difference

- **Earlens** provides 2.5x the audible bandwidth of conventional hearing aids.
- **Earlens** delivers a more natural listening experience[1].
- **Earlens** improves the ability to understand speech in noisy environments by up to 58%[2].

1. Folkeard P, et al. Detection, Speech Recognition, Loudness, and Preference Outcomes With a Direct Drive Hearing Aid: Effects of Bandwidth. Trends Hear. 2021 Jan-Dec;25:2331216521999139. doi: 10.1177/2331216521999139. PMID: 33874803; PMCID: PMC8060758.
2. Levy SC et al. Extended High-Frequency Bandwidth Improves Speech Reception in the Presence of Spatially Separated Masking Speech. Ear Hear. 2015 Sep-Oct;36(5):e214-24

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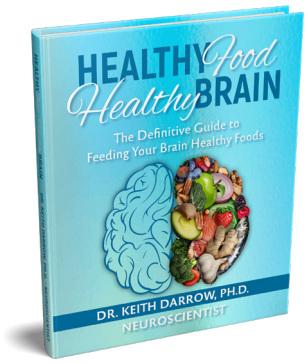
Start Your **Hearing Journey** Today!



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