

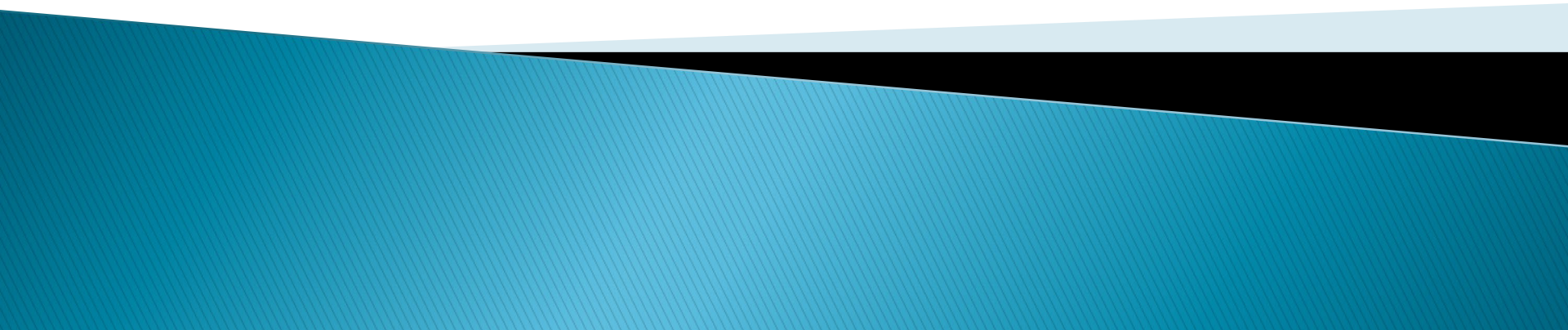
HEARING SOLUTIONS SIG

Sun City Texas Computer Club

February 14, 2019

**“Maintaining Your Best Hearing to
Combat Dementia”**

Dr. Ashley Richburg Au.D., CCC–A Hill Country Audiology

- * Bachelor of Science in Speech–Language and Hearing Sciences.
 - * Doctorate of Audiology all from Texas Tech University.
 - * Obtained Audiological clinical experience in education, Veterans Affairs, industrial, and private practice.
 - * During graduate school, she researched alternative methods in the reduction and treatment of tinnitus, speech recognition scores of bimodal hearing individuals.
 - * She is most passionate about amplification as a means of treatment for her patients.
 - * Dr. Richburg believes that each patient should be treated individually and mindfully with full attentiveness to helping him or her hear the very best that they can.
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Maintaining Your Best Hearing To Combat The Onset of Dementia

By Ashley Richburg Au.D., CCC-A
Hill Country Audiology

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WHAT WIVES SAY...

...go to the store; lay down the mulch; wash and wax the car; get the kids at school; rent some videos, and finish the rest of the dishes.



WHAT HUSBANDS HEAR...

...**GO** to the store; **LAY DOWN** the mulch; wash **AND** wax the car; **GET** the kids at school; rent **SOME** videos, and finish the **REST** of the dishes.

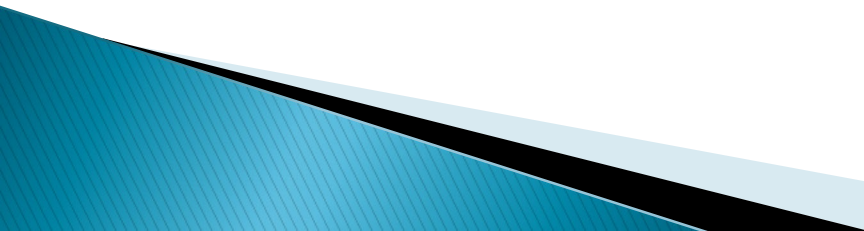


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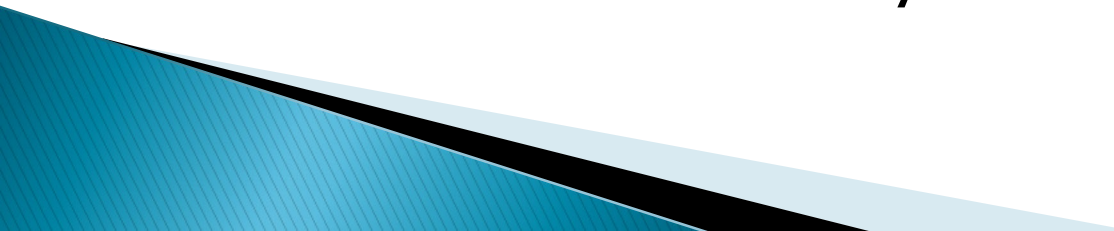
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Reynolds

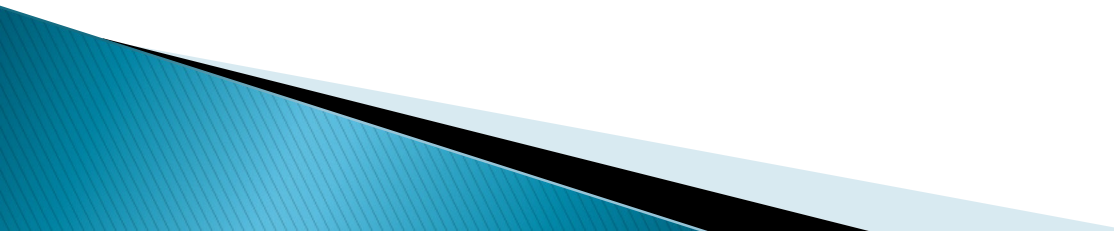
THE RELATIONSHIP BETWEEN OUR EARS AND OUR BRAIN

- ▶ Cognitive impairment and hearing loss are two distinct neurologic conditions that are associated with aging.
 - ▶ We call age related hearing loss Presbycusis. Presbycusis, by definition, occurs gradually and is a natural decline in the peripheral auditory system that typically presents itself through a sloping high frequency (Sensorineural) hearing loss.
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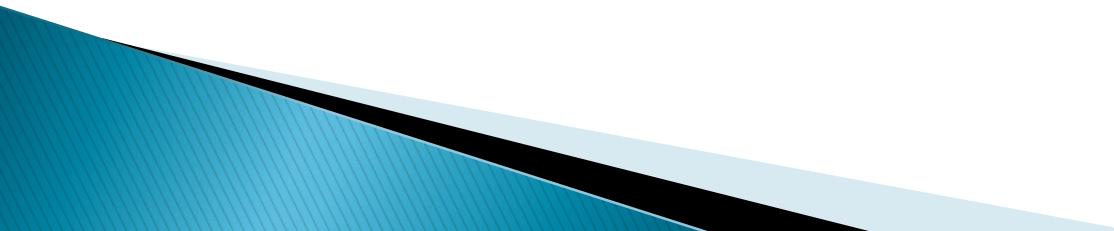
COMMON SYMPTOMS OF PRESBYCUSIS

- ▶ Speech sounding muffled.
 - ▶ Noticing that you can hear men's voices much better than women and children.
 - ▶ Catching part of a word in a conversation but not all of it in its entirety.
 - ▶ Struggling to distinguish speech sounds/conversation amongst the presence of background noise.
 - ▶ Hearing but not being able to “understand what was said clearly”.
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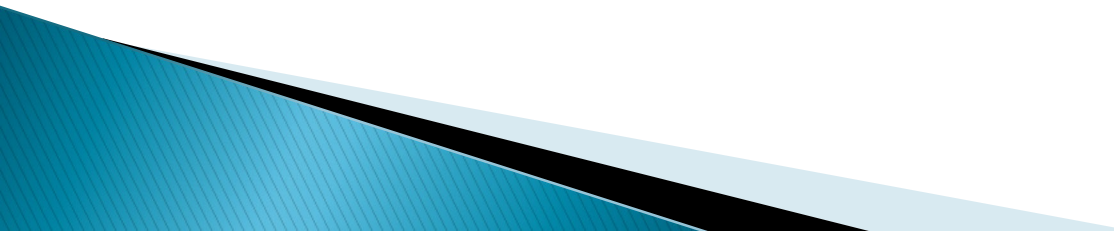
PRESBYCUSIS CONTINUED

- ▶ Signs and symptoms of Presbycusis can begin as early as age 55.
 - ▶ According to the National Institute on Deafness and Other Communication Disorders (NIDCD), approximately one in three people in the United States between the ages of 65 and 74 have hearing loss, and nearly half of those older than 75 have difficulty hearing.
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WHAT IS COGNITIVE IMPAIRMENT?

- ▶ Cognitive impairment refers to a spectrum of conditions ranging from mild cognitive impairments to dementia.
 - ▶ It was estimated that in 2010, there were 4.7 million individuals ages 65 years or older with Alzheimer's or dementia.
 - ▶ Using 2010 United States census data, it is projected that this number will increase to 13.8 million by the year 2050.
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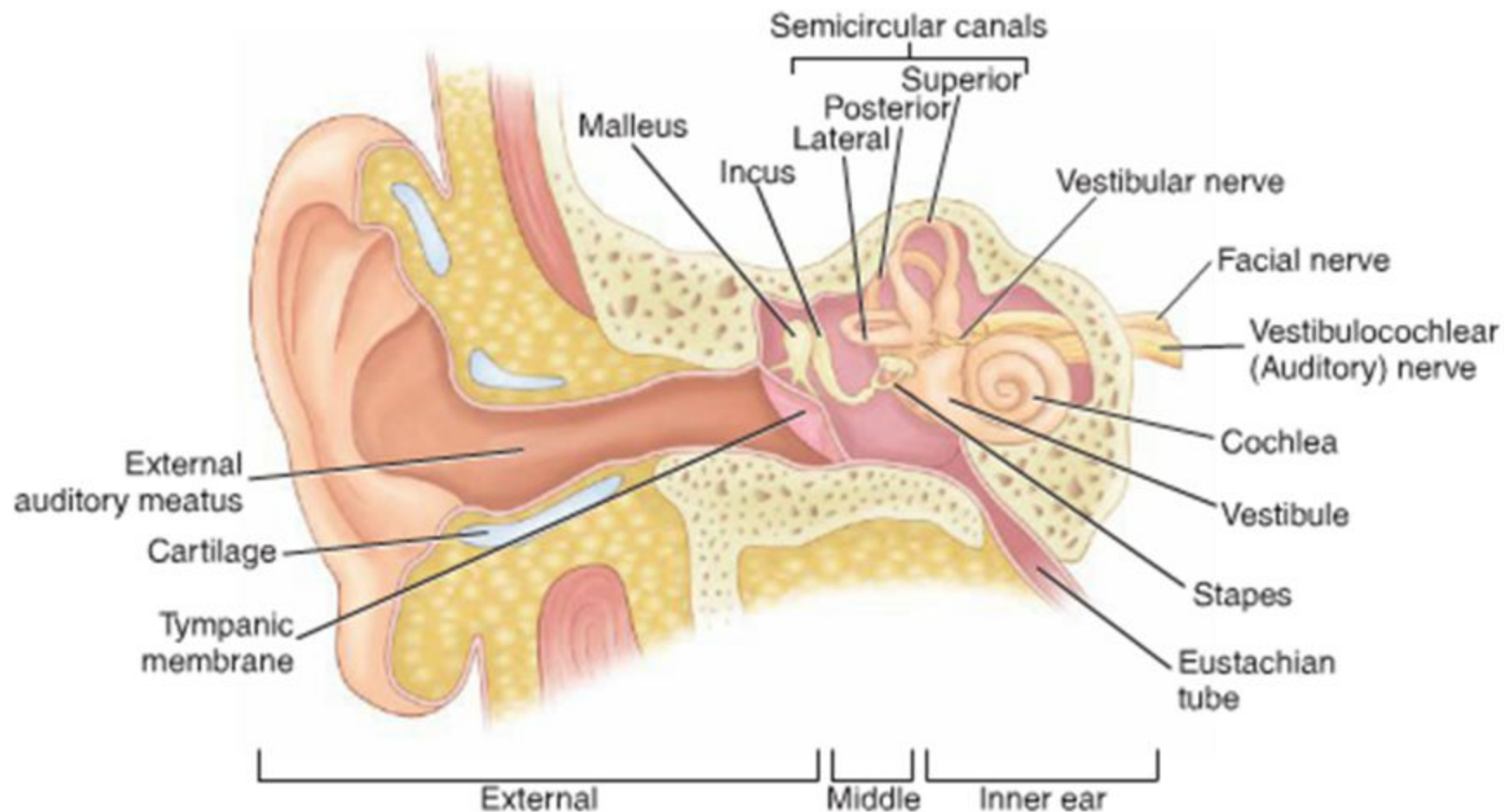
COGNITION AND THE AUDITORY SYSTEM

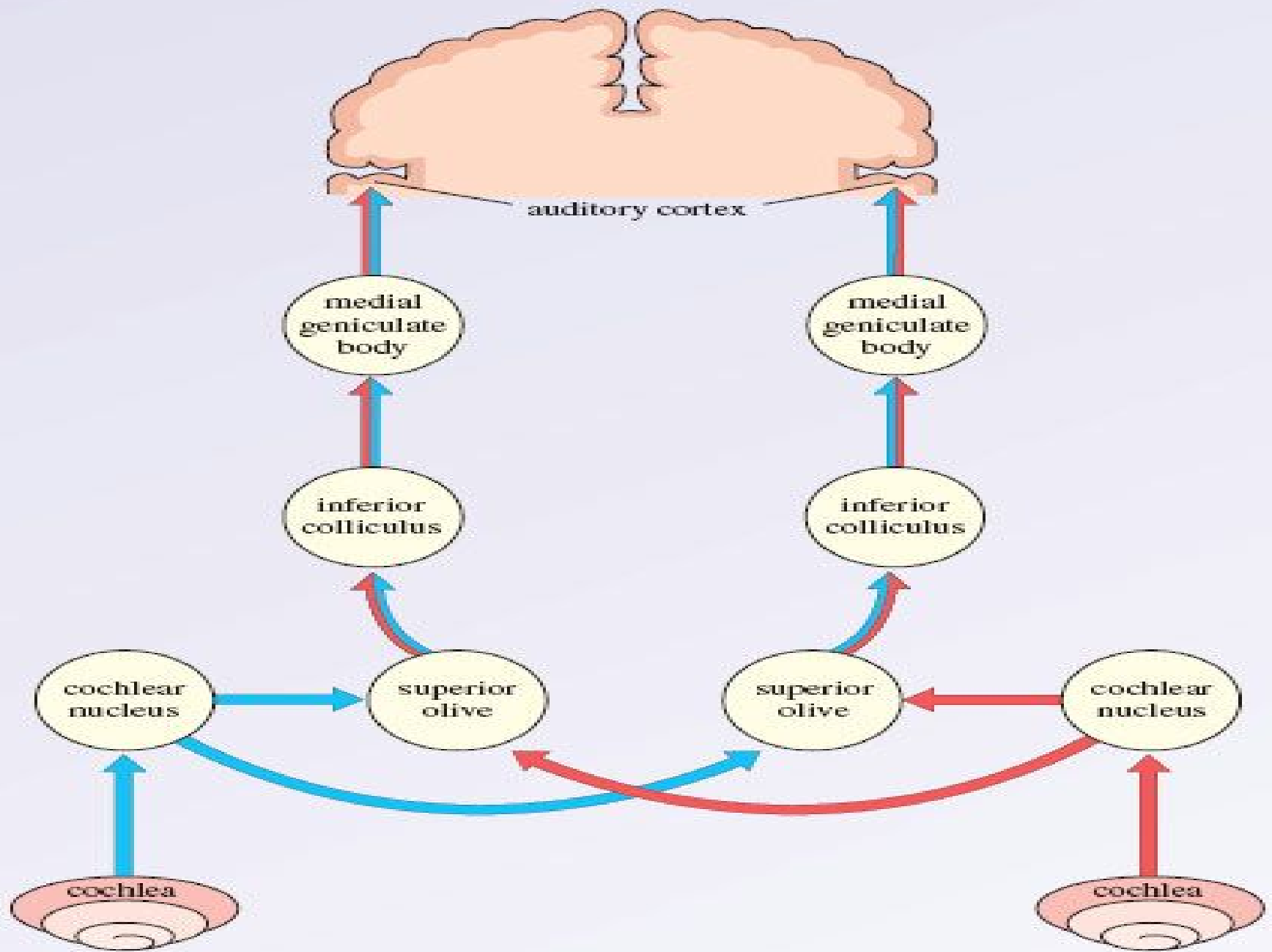
- ▶ According to the National Health and Nutritional Examination Survey (NHANES), more than 80% of individuals older than 85 years old have Presbycusis.
 - ▶ In addition to the loss of peripheral hearing function with age, there is also a decrease of central auditory function.
 - ▶ This can be described as the way the brain processes auditory information.
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COGNITION AND THE AUDITORY SYSTEM

- ▶ Research tells us that a decline in one of these domains (i.e., the brain or the auditory system) could potentially influence the others.
- ▶ Let's take a deeper look into these systems before we go any further.

Peripheral





The Auditory pathways

1. Tiny middle ear bones amplify sound
2. Cochlear sorts sounds by frequency
3. Nerve passes signal from cochlear to brain stem
4. Signal travels through brain getting decoded along the way
5. Auditory cortex processes sound

- Medial geniculate
- Inferior colliculus
- Superior olive
- Cochlear nucleus

Cerebral cortex

Auditory receiving centers

Temporal lobe

Medial geniculate body

Inferior quadrigeminal body

Lateral lemniscus

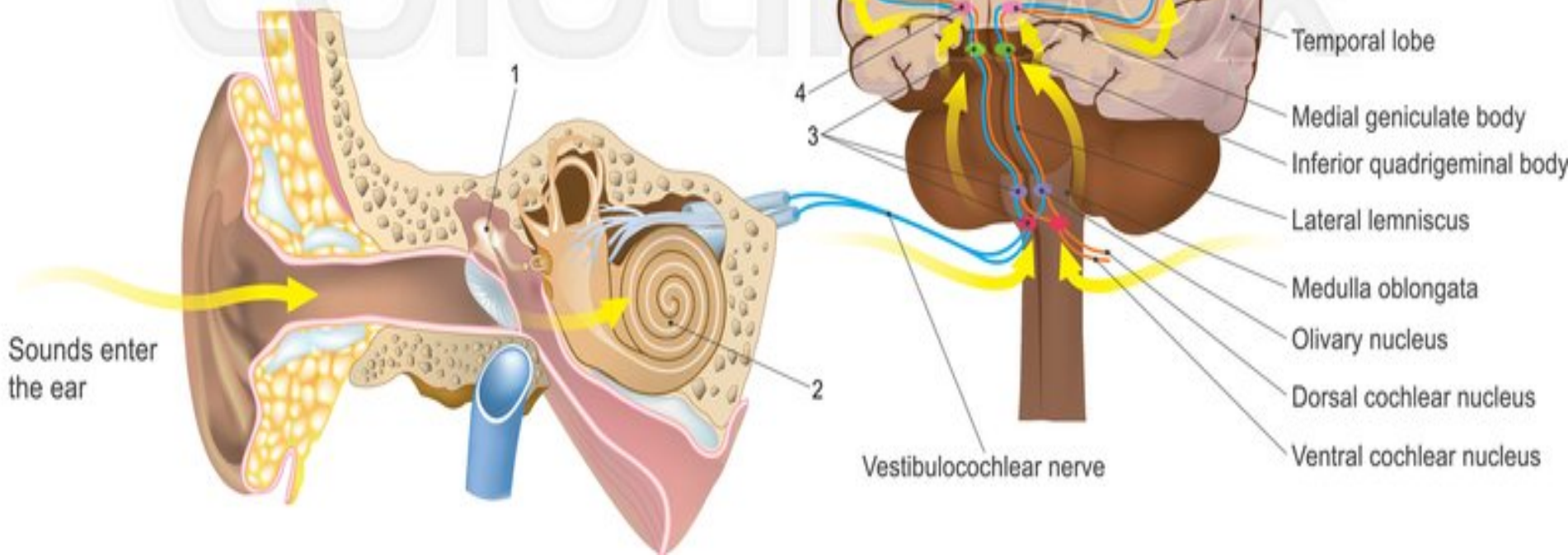
Medulla oblongata

Olivary nucleus

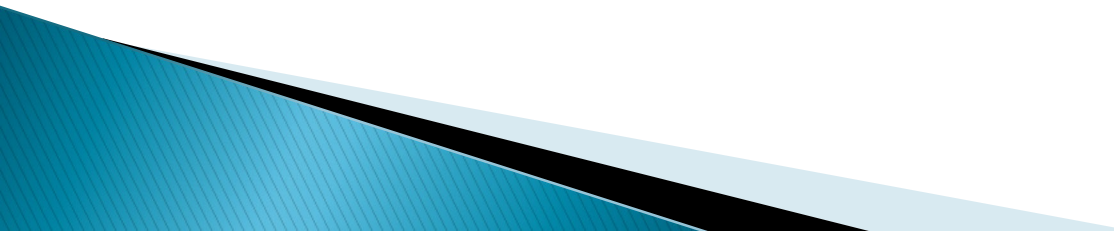
Dorsal cochlear nucleus

Ventral cochlear nucleus

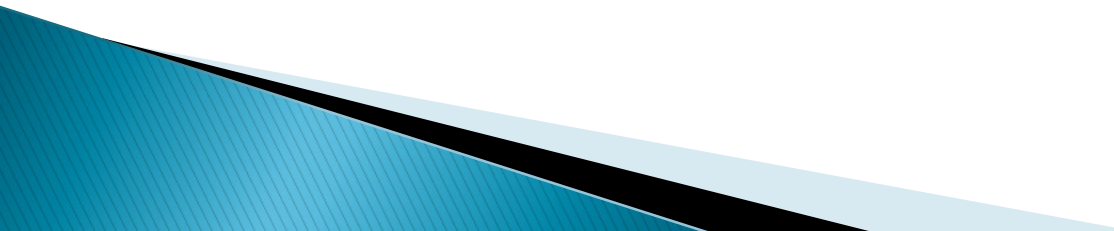
Vestibulocochlear nerve



COGNITION AND THE AUDITORY SYSTEM

- ▶ Did you have any idea that your brain and ears were so intricately woven?
 - ▶ This is why it is so important to effectively and properly stimulate our ears in a healthy way so that we are also stimulating our brain.
 - ▶ We will touch more on this at the very end of the presentation.
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WHAT THE RESEARCH TELLS US

- ▶ In one study, patients with hearing loss were 24% more likely to have Alzheimer's or Dementia.
 - ▶ In another study they found that the more significant the hearing loss was, the more likely a patient was to develop Dementia.
 - ▶ These studies do not suggest that hearing loss itself causes dementia but it does show that there is a significant link between the two.
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WHAT THE RESEARCH TELLS US

- ▶ Researchers have provided a few theories as to why we have a correlation between cognition and hearing:
- ▶ 1.) A change in brain functionality
 - The portion of our brain in charge of hearing and processing auditory information starts to work differently when we have a hearing loss vs. when we have normal hearing. This causes a change in how our brain is structured and could be related to the effects of Dementia or Alzheimer's.

WHAT THE RESEARCH TELLS US

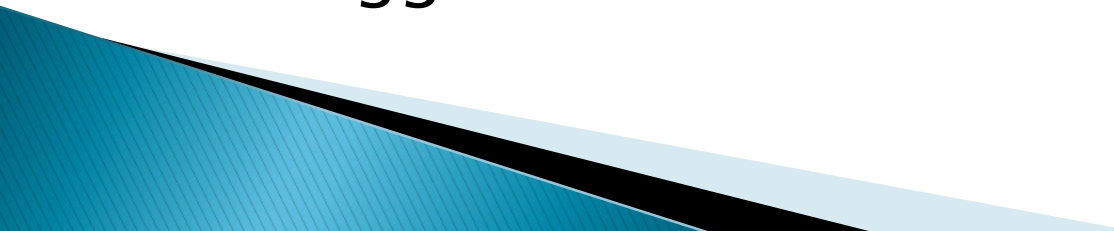
- ▶ 2.) Increases in cognitive load bearing
 - When we have a hearing loss we work a lot harder to understand what those around us are saying.
 - Audiologists call this “listening effort”.
 - Without amplification every conversation we participate in requires much more mental energy and effort.
 - If we are putting great amounts of energy into our “listening effort” then that lessens what is left to put towards our memory and other cognitive functions.

WHAT THE RESEARCH TELLS US

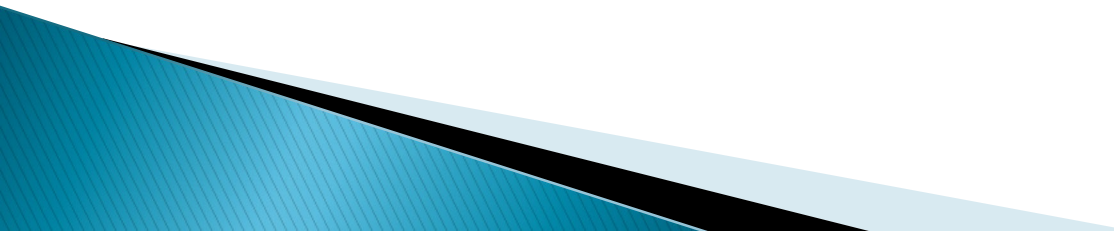
▶ 3.) Social Isolation:

- Audiologists know that many patients come to us because they have felt a lack of engagement amongst their spouses, family, and friends because they feel as if they cannot contribute to conversations like they once could.
 - Researchers and audiologists know that social isolation can have serious consequences on physical and mental health.
 - When we cannot hear the conversation, or we only understand part of it, we tend to alienate ourselves which can lead to extensive issues.
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WHAT CAN WE DO ABOUT THIS?

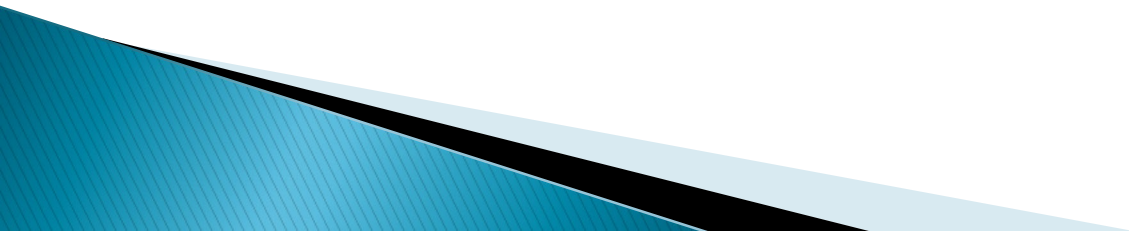
- ▶ It is vital to remember that having hearing loss does not mean that you will have Dementia or Alzheimer's.
 - ▶ However; if we can treat hearing loss effectively and properly, we reduce the likelihood of Dementia or Alzheimer's.
 - ▶ In the next slide we will discuss a study that is suggestive of the above statements.
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WHAT CAN WE DO ABOUT THIS?

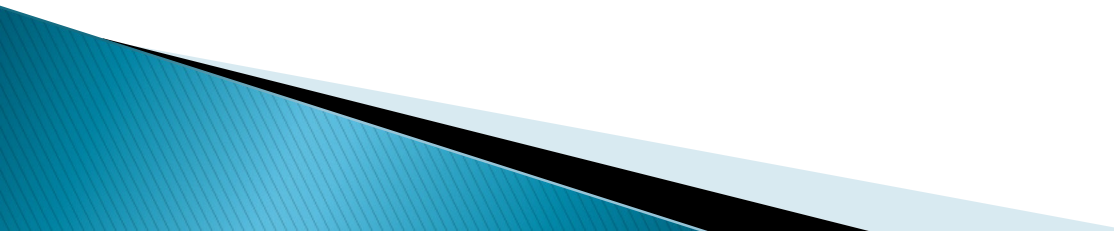
- ▶ Researchers in France provided a number of patients with single sided deafness with amplification (CROS or Cochlear Implant).
 - ▶ They tracked their cognitive performance before and after prescriptively fit amplification and auditory rehabilitation.
 - ▶ 80% of those patients showed cognitive improvement within the first year.
 - ▶ These results nearly double any FDA approved medication for treating Dementia or Alzheimer's.
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CONCLUDING THOUGHTS

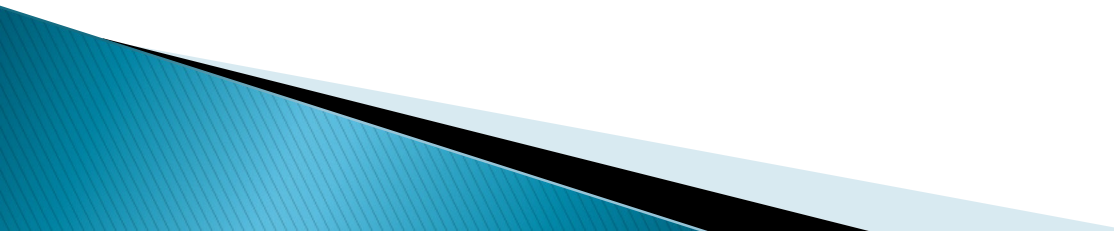
- ▶ Hearing your very best serves in maintaining healthy brain and cognitive function.
- ▶ You can ensure you are hearing your very best by a few practical tips in the next slides.



CONCLUDING THOUGHTS

- ▶ If you do not wear amplification:
 - If you think you may have a hearing loss, schedule an audiological evaluation with an audiologist.
 - Even if you do not have a concern of hearing loss, if you are over the age of 55, it is recommended to be evaluated for a baseline examination.
 - It is imperative to see a hearing care professional who not only understands the amplification that may be on your ears, but the entirety of the auditory system and it's effect on cognition.
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CONCLUDING THOUGHTS

- ▶ If you do wear amplification:
 - If you have a diagnosed hearing loss and wear amplification you should be making regular appointments with your audiologist (at least twice annually) to ensure that your devices remain in good working order.
 - Receiving annual audiological evaluations to allow your audiologist to monitor your thresholds to ensure you have an appropriate prescription in your hearing aids.
 - Ensure accurate targets in your hearing aid are being met through verification or validation measures.
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REFERENCES

- ▶ <https://www.aplaceformom.com/blog/10-17-14-facts-about-senior-isolation/>
- ▶ <https://www.alzheimers.net/the-connection-between-alzheimers-and-hearing-loss/>
- ▶ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4024067/pdf/nihms558229.pdf>
- ▶ <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1447-0594.2011.00789.x>
- ▶ https://www.google.com/search?q=peripheral+auditory+system&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjS25OKmq_gAhUCTawKHW_cCuoQ_AUIDigB&biw=1600&bih=775#imgsrc=oeFd9D-6zH4O0M:
- ▶ <https://jamanetwork.com/journals/jamaneurology/fullarticle/802291?version=meter%20at%20null&module=meter-Links&pgtype=Blogs&contentId=&mediaId=%%ADID%%&referrer=&priority=true&action=click&contentCollection=meter-links-click>
- ▶ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4024067/>
- ▶ https://www.researchgate.net/profile/Stig_Arlinger/publication/10612964_Negative_consequences_of_uncorrected_hearing_loss_-_A_review/links/0912f502caf00a31ce000000/Negative-consequences-of-uncorrected-hearing-loss-A-review.pdf

NEXT MEETING

March 14, 2019

10:00 a.m.

Activity Center Atrium

