

Hearing Loss and its Effect on Healthy Aging

49th Annual Oregon State University Gerontology Conference
April 23, 2026

Laura K. Byerly, MD
Associate Professor of Medicine
Oregon Health & Science University
Oregon Geriatrics Workforce Enhancement Program





Disclosures

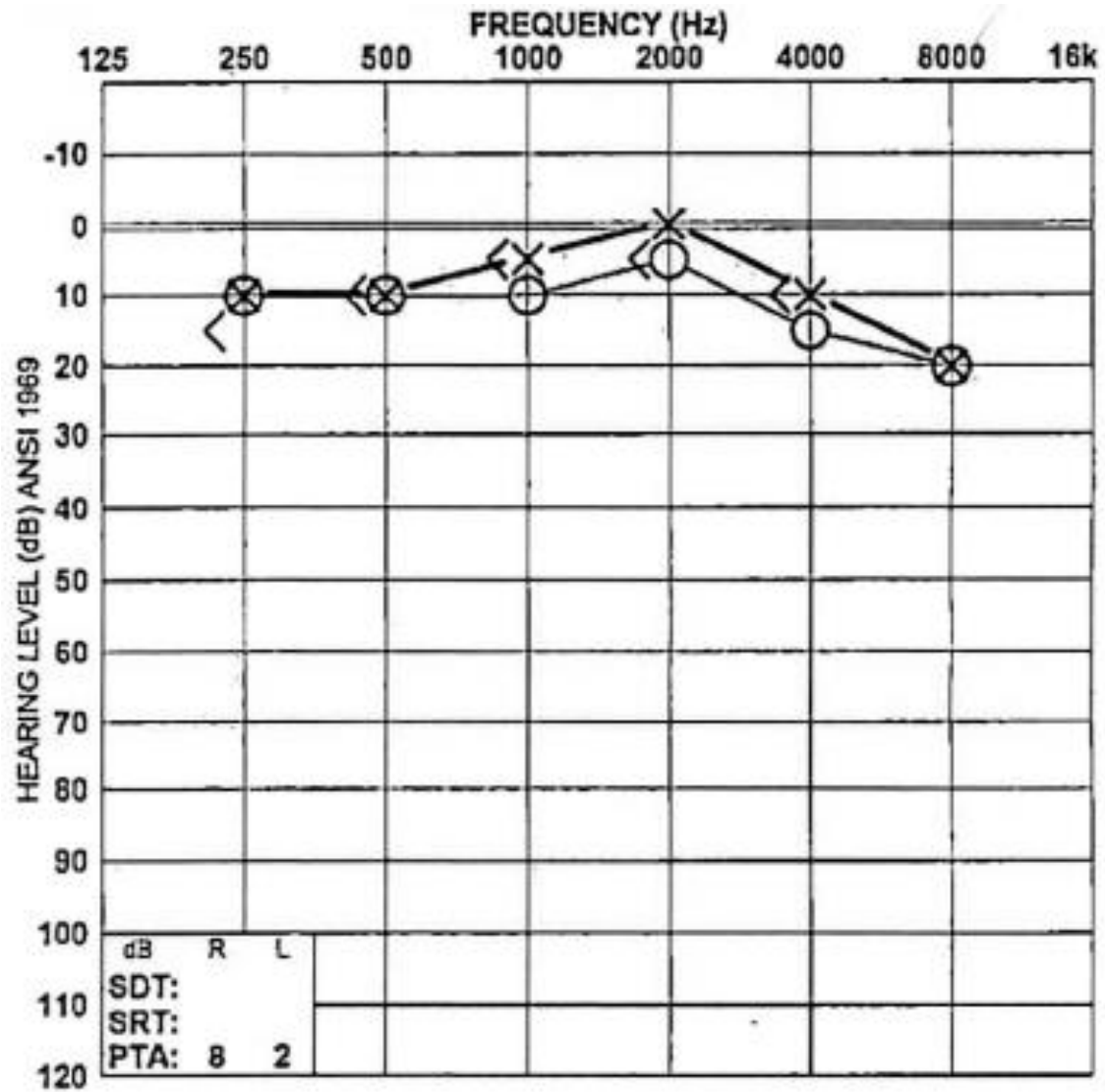
- Dr. Byerly has no financial or commercial disclosures relevant to her presentation
- She is the program director of a HRSA-funded Geriatrics Workforce Enhancement Program Award (U1Q53044)
- The contents are those of the author and do not necessarily represent the official views of, nor an endorsement, by HRSA, HHS or the U.S. Government

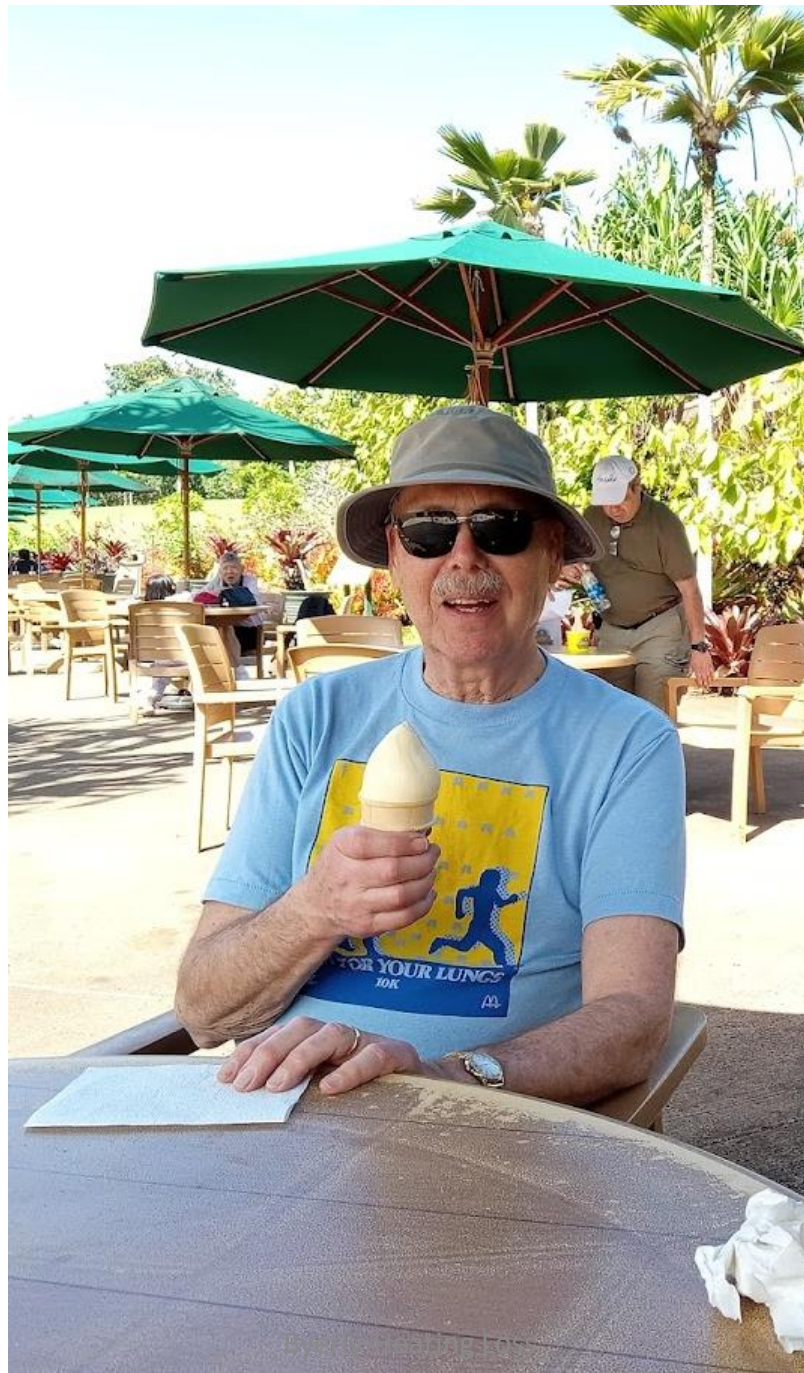
Objectives

Goal	At the end of this session, you will be able to:
Describe	Describe how common hearing loss is within older adults.
Describe	Describe how hearing loss can impact a person's quality of life, mood, and memory .
Describe	Describe the impact of hearing interventions on cognition.
Identify	Identify options that could help your clients'/patients' hearing and communication with others.

Quick check—
**does hearing loss impact your life or
that of a person you care about?**

My audiogram





Hearing Loss Rapid Fire Refresher



Hearing loss: A common problem

65% of adults >70 years old

96% of adults >90 years old

Only about 30% of persons with hearing challenges use hearing aids

But...only 1/3 of older adults even recognize their impaired hearing

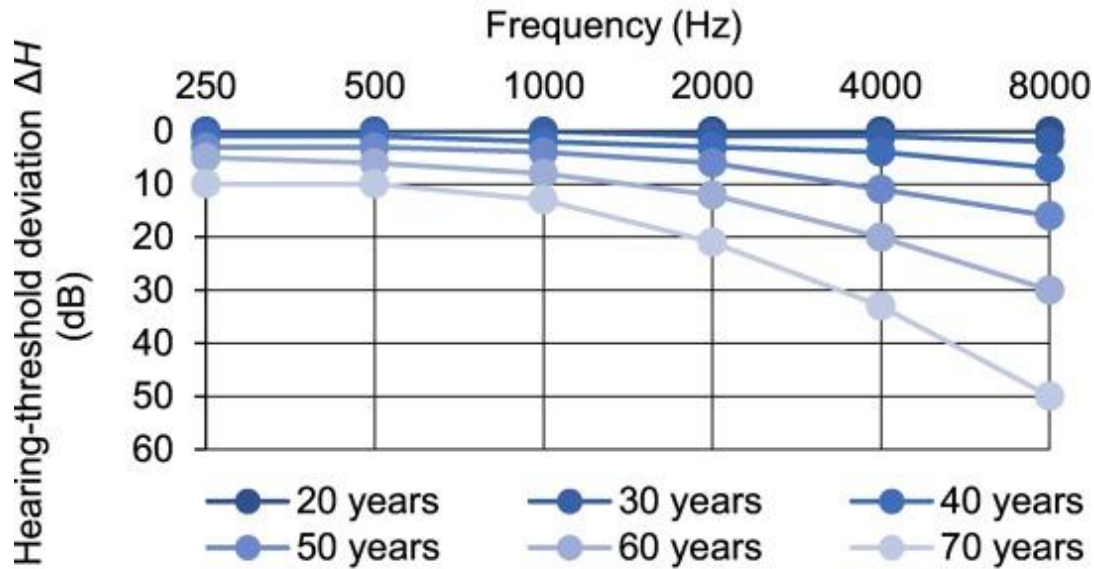
Question time!

Which of the following parts of hearing do older adults most commonly **lose first**?

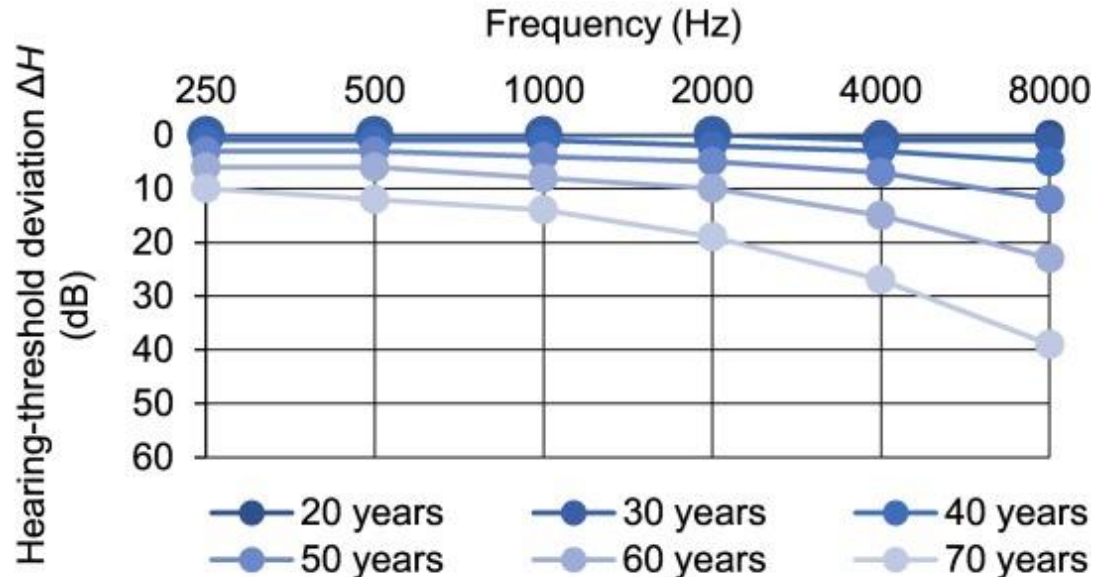
A: High pitched sounds

B: Low pitched sounds

Median hearing threshold deviations for males



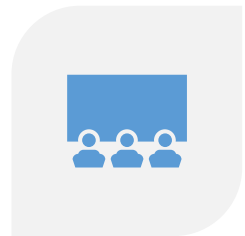
Median hearing threshold deviations for females



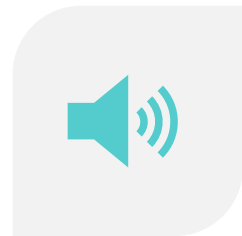
“Age-Related Hearing Loss”
loses **HIGH** pitched sounds
first

Slade et al, The Effects of Age-Related Hearing Loss on the Brain and Cognitive Function, October 2020

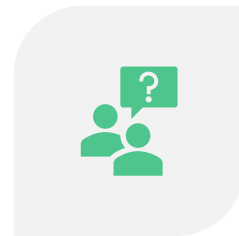
What to look (hear?) for with hearing loss



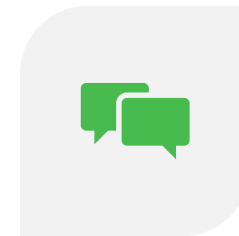
CROWDS/LARGE
GROUP EVENTS



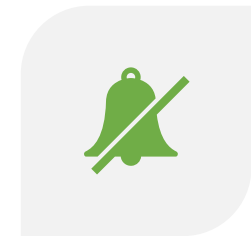
VOLUME
ADJUSTMENTS



REPETITION OF
QUESTIONS



DIFFICULTY TRACKING
CONVERSATIONS



SILENCE...

How does hearing loss present?



Pitch



Clarity



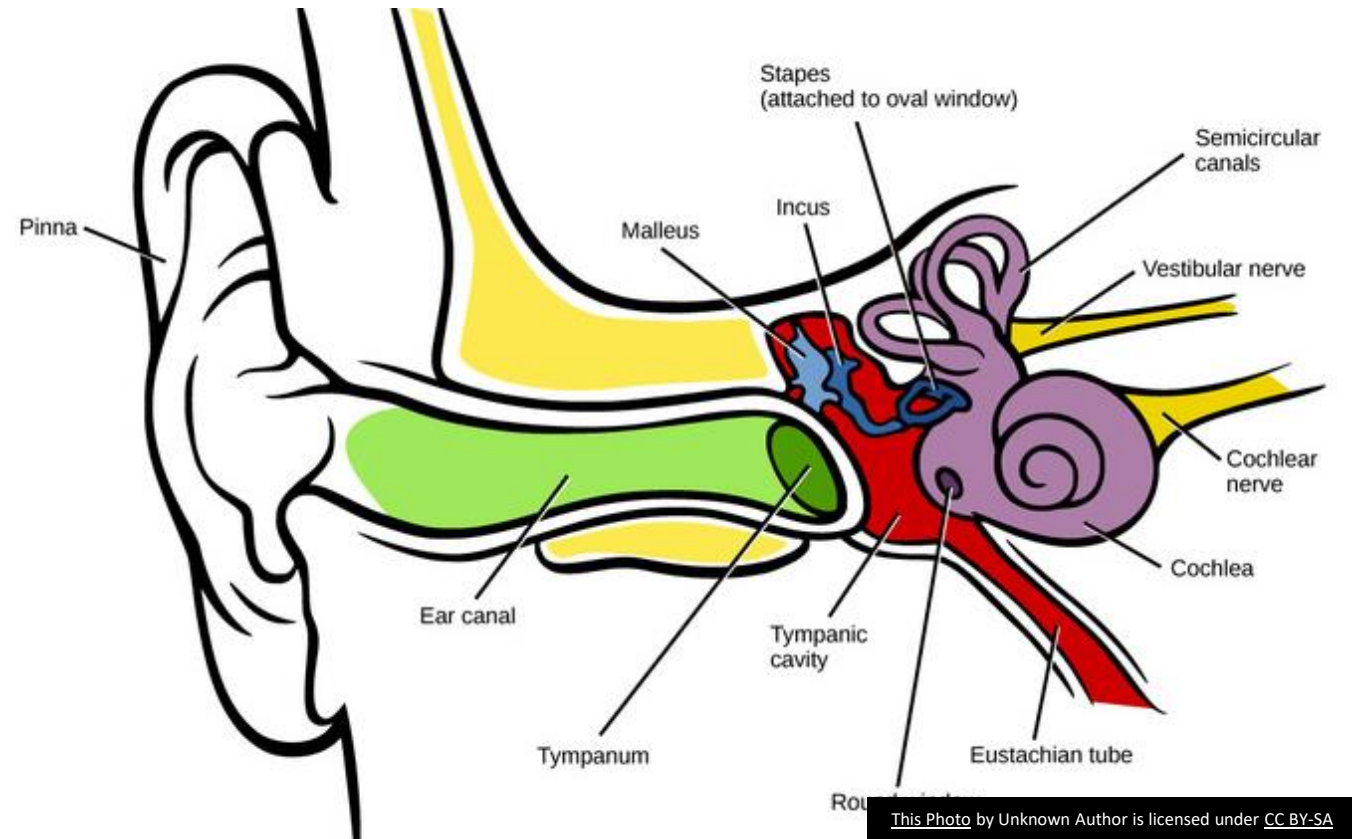
“Cocktail party” challenges



Volume

Normal hearing changes

- High-pitched frequency loss
- Some consonants are challenging
 - **S, Z, T, F, G** are rough
 - **Vowels** are easier
- **External ear problems:** Blockage!
- **Internal ear problems:** Cochlea or nerve damage



Risk factors for hearing loss



Noise



Music



Machinery



Military
service

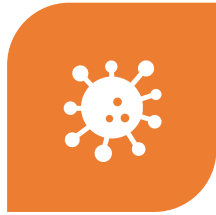


Trauma

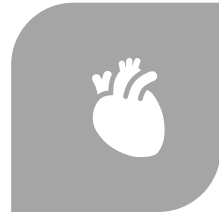


Medications

Medical Conditions and Hearing Loss



INFECTION



VASCULAR (BLOOD
VESSEL) DISEASE



DIABETES



HIV



BONE DISORDERS



RADIATION
EXPOSURE



MENIERE'S DISEASE



BRAIN TUMORS

Hearing Loss Impacts on Life



Question time!

Hearing loss in older adults can increase the risk of which of the following conditions?

A: Dementia

B: Depression

C: Falls

D: Parkinson's disease

E: All of the above

Hearing loss affects LIFE

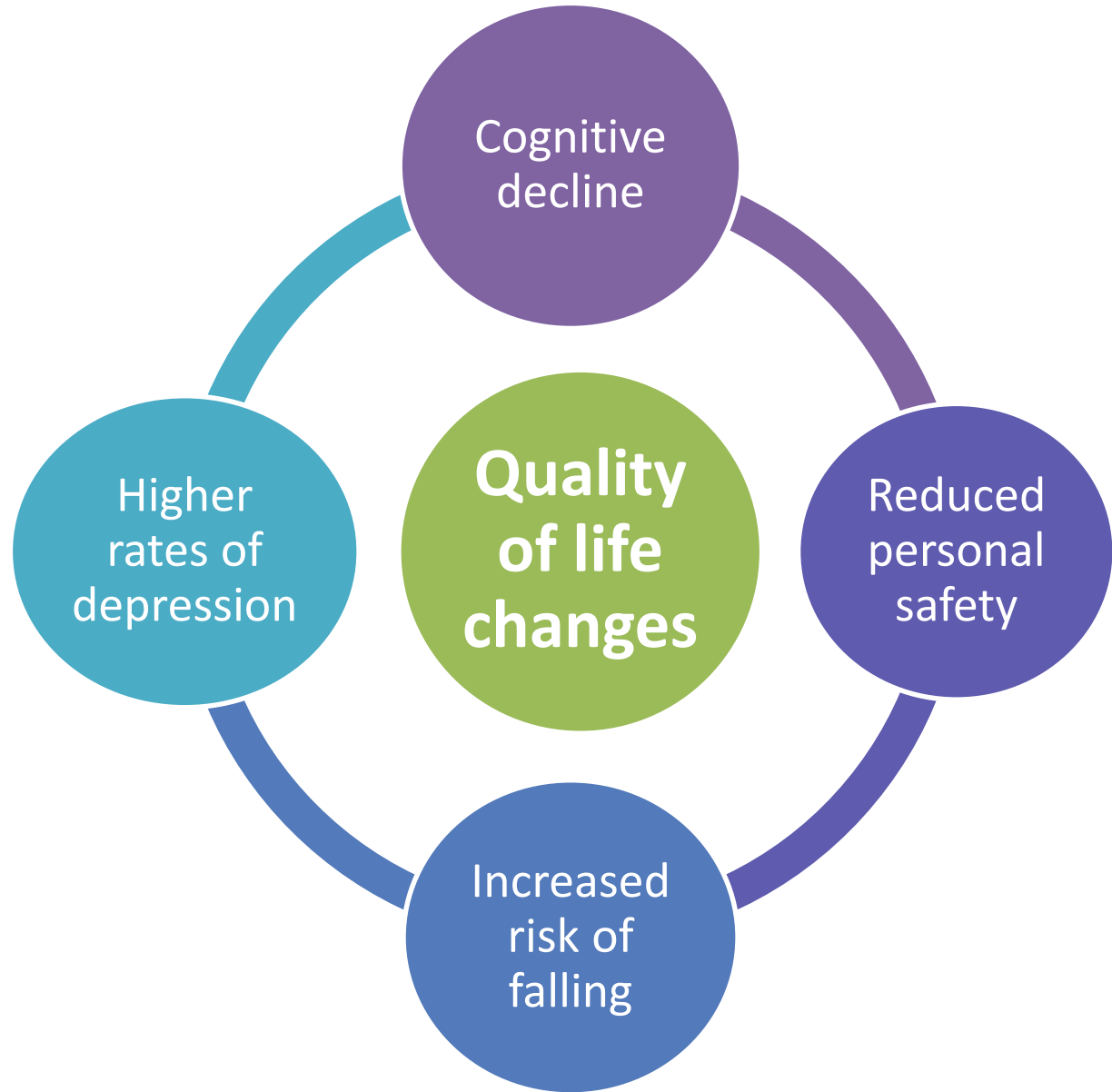
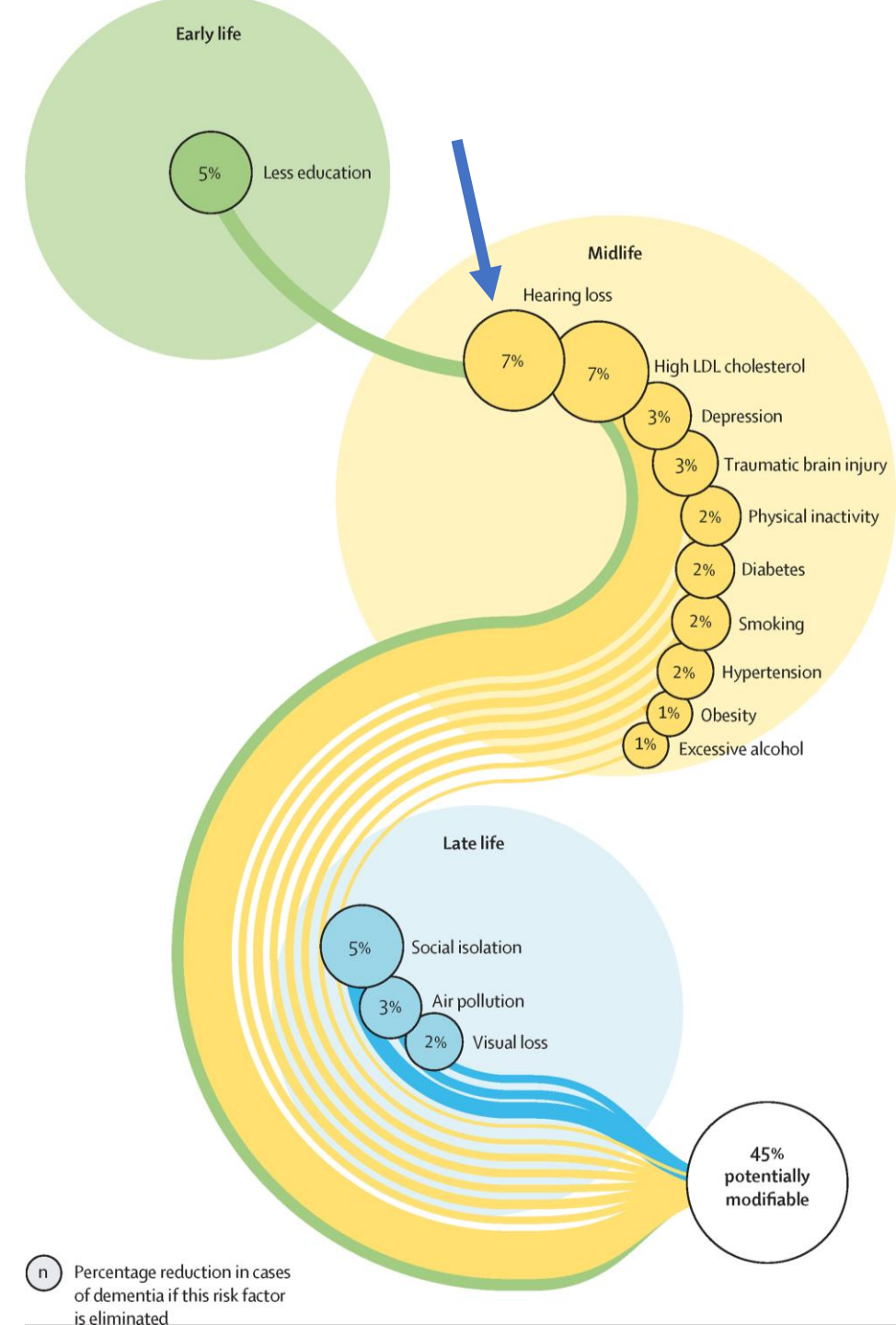


Figure courtesy of Michelle Hungerford, AuD

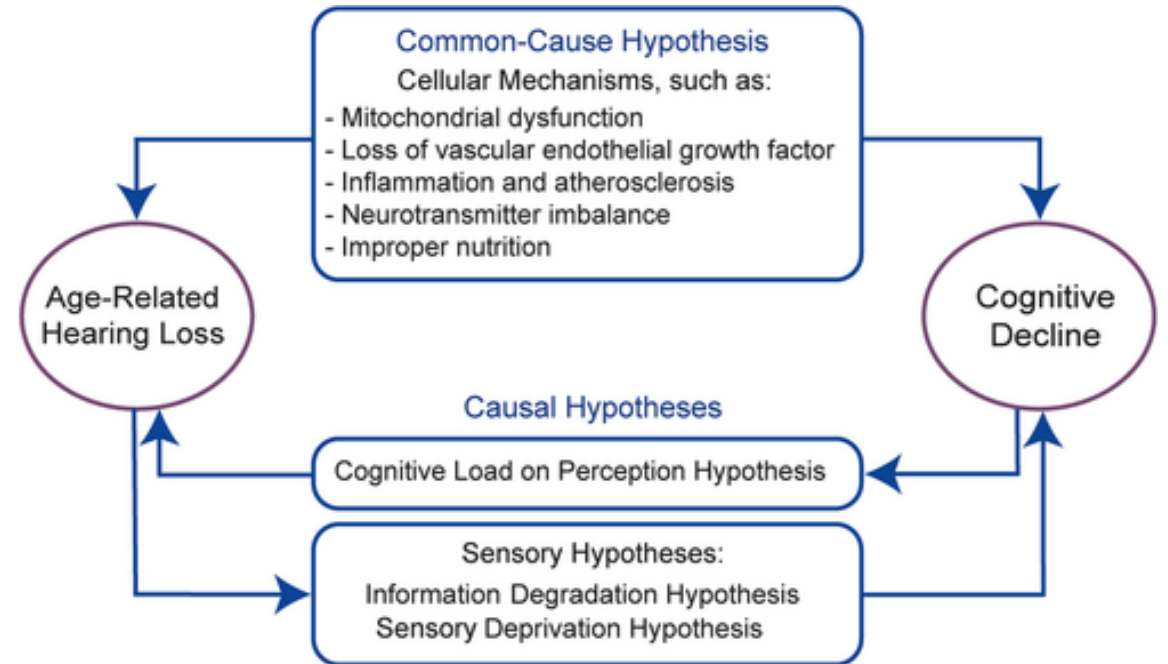
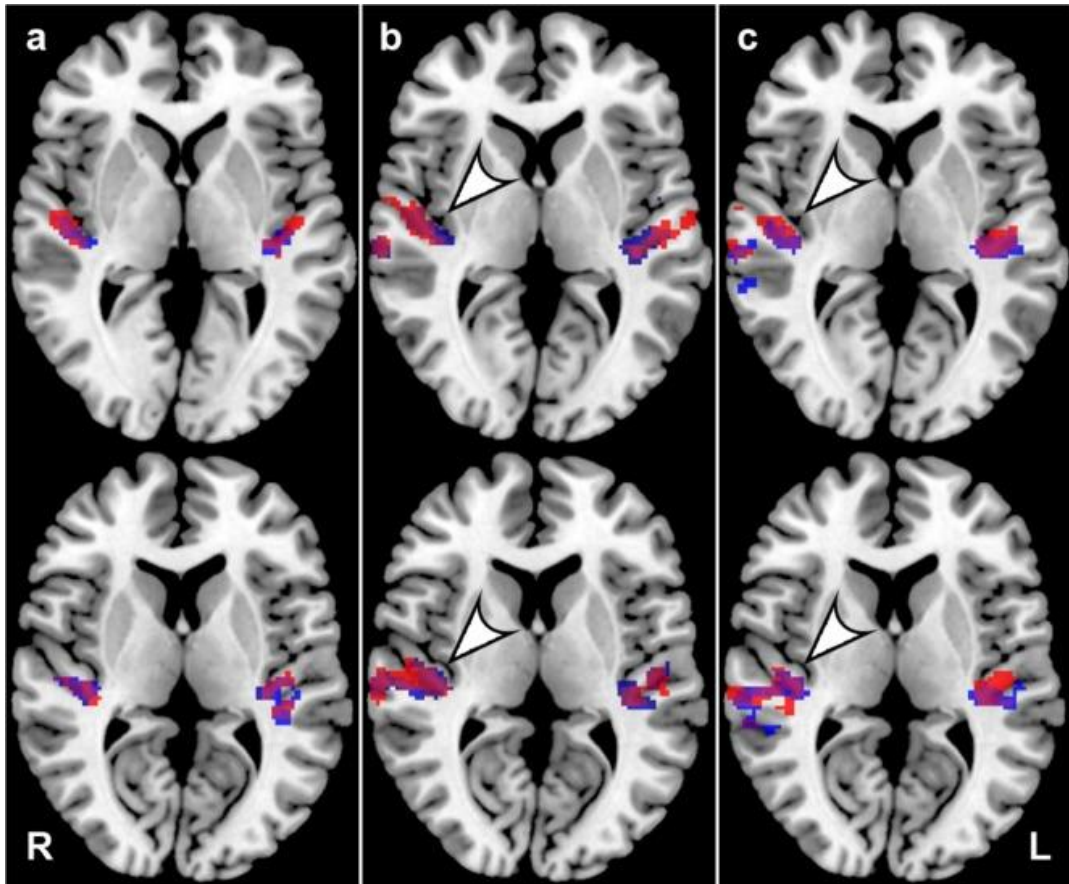
Risk along the lifespan matters

- Updated risk factor meta-analysis in 2024
- 12 original risk factors + 2 new ones
- Vision and High Cholesterol

Livingston et al, Dementia prevention, intervention, and care: 2024 report of the Lancet standing Commission; The Lancet Commissions; 2024



What does hearing loss do to the brain?



Hearing risk and memory

Association with mild cognitive impairment and dementia

More severe hearing loss = higher risk of dementia

Hearing loss taxes the brain

Lots of risk factors for dementia—
but this one is changeable!

Hearing loss and Parkinson's Disease



Association of severe hearing loss and Parkinson's disease



Cell damage to brain affects hearing and movement



“Worse hearing confers more risk”



Hearing aids associated with reduced risk of Parkinson's disease

Hearing loss and **falls**

Hearing loss associated with a **17% higher risk of falling**

Sensory impairment **changes how we walk/move**

Potential common pathway with **inner ear** (hearing loss and balance loss)

Hearing loss increases cognitive load and **“distracts”** from balance and stability

Hearing loss and mood

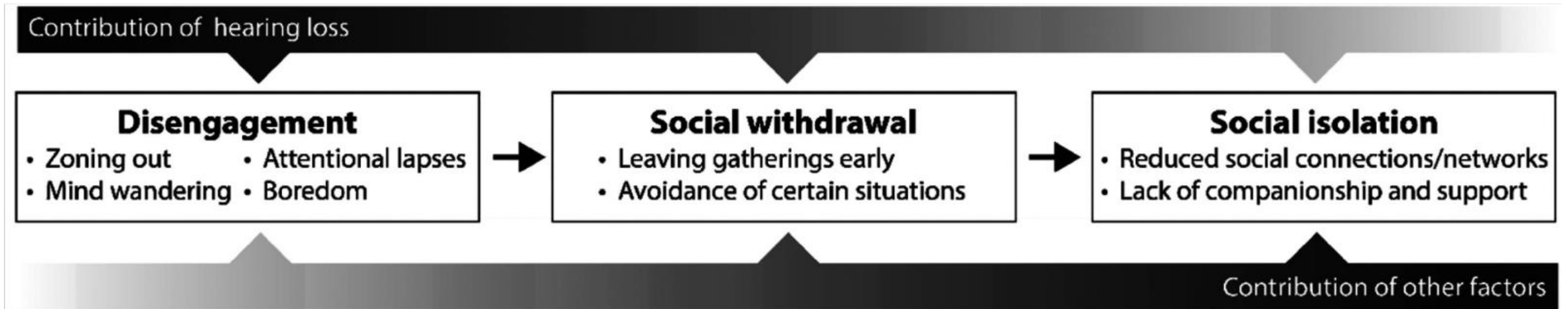
Higher risk of depression and anxiety

Contributions from social isolation/withdrawing from activities

Sudden hearing loss = highest risk

Deep dive into hearing loss and isolation

- Longer term and worsening hearing loss **increases the risk of social isolation**
- Social isolation is its own risk factor for dementia!



Motala, Johnsrude, Herrmann; A longitudinal framework to describe the relation between age-related hearing loss and social isolation; Trends Hear, 2024

But is there any data for hearing aids and brain health?



Promising data of hearing aid use

- Retrospective study of people >66 years old with hearing loss
- Association of hearing aids with **delayed diagnoses** of:
 - Dementia
 - Depression
 - Falls

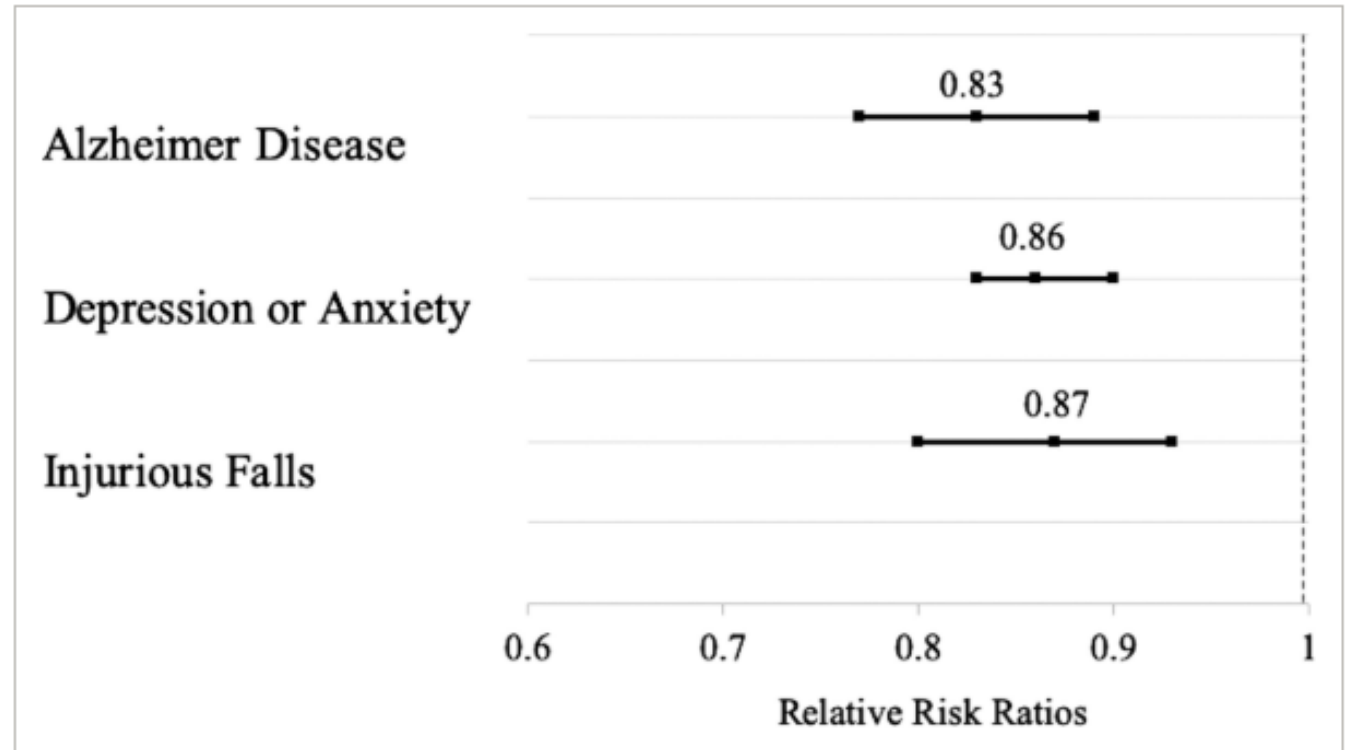


Figure 2

[Open in figure viewer](#) | [Download PowerPoint](#)

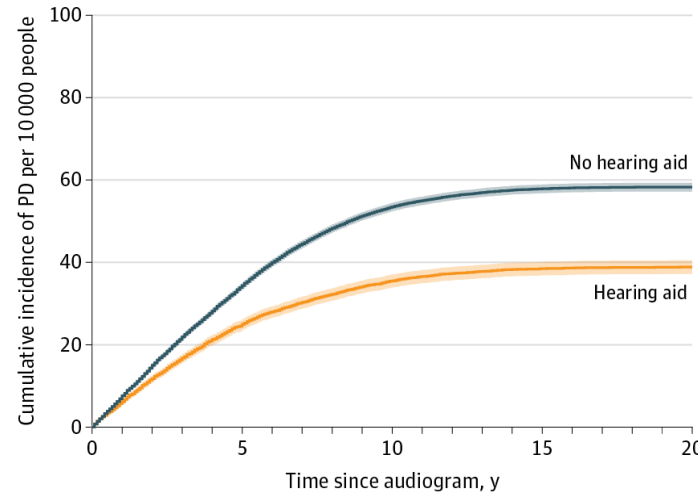
Unadjusted hazard ratios for developing age-related conditions among adults with hearing loss who used hearing aids compared with those who did not. Unadjusted hazard ratios and 95% confidence intervals were determined using Cox proportional hazards regression models with hearing aid use as the covariate.

Mahmoudi E et al. Can Hearing Aids Delay Time to Diagnosis of Dementia, Depression, or Falls in Older Adults? J Am Geriatr Soc. 2019

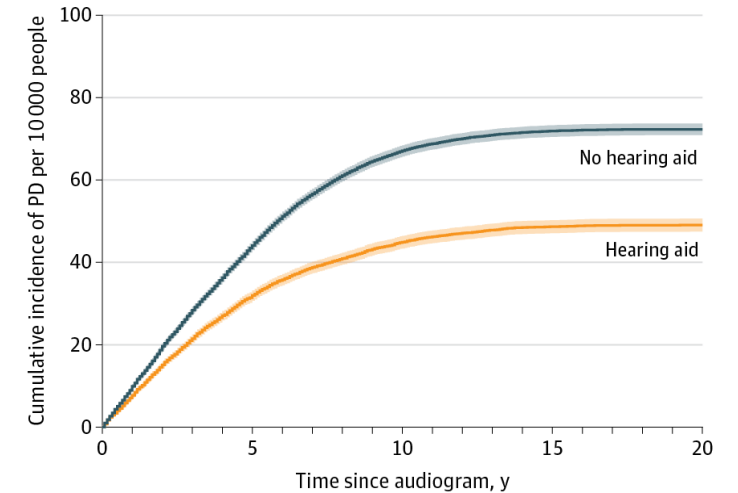
Hearing aids and Parkinson's disease

- Large group of Veterans over 10-year course
- **Receiving a hearing aid within 2 years of impaired hearing diagnosis reduced the risk of Parkinson's disease**

A All participants



B Hearing loss only



Change in cases of PD per 10 000 person-years, No. (95% CI)

	0-2 y	2-5 y	5-10 y	10-15 y	15-20 y
Hearing aid vs no hearing aid	-1.6 (-2.4 to 0.9)	-9.2 (-10.7 to -7.7)	-17.4 (-19.3 to -15.6)	-18.3 (-20.3 to -16.4)	-18.3 (-20.3 to -16.3)
Hearing loss only	-2.1 (-2.9 to -1.3)	-11.7 (-13.4 to -10)	-21.6 (-23.6 to -19.5)	-22.6 (-24.7 to -20.5)	-22.6 (-24.7 to -20.5)

Neilson et al, Hearing Loss, Incident Parkinson Disease, and Treatment With Hearing Aids, JAMA Neurology, 2024

Hearing aid adherence matters

Naylor et al, Dementia and hearing-aid use: a two-way street, Age Ageing, 2022

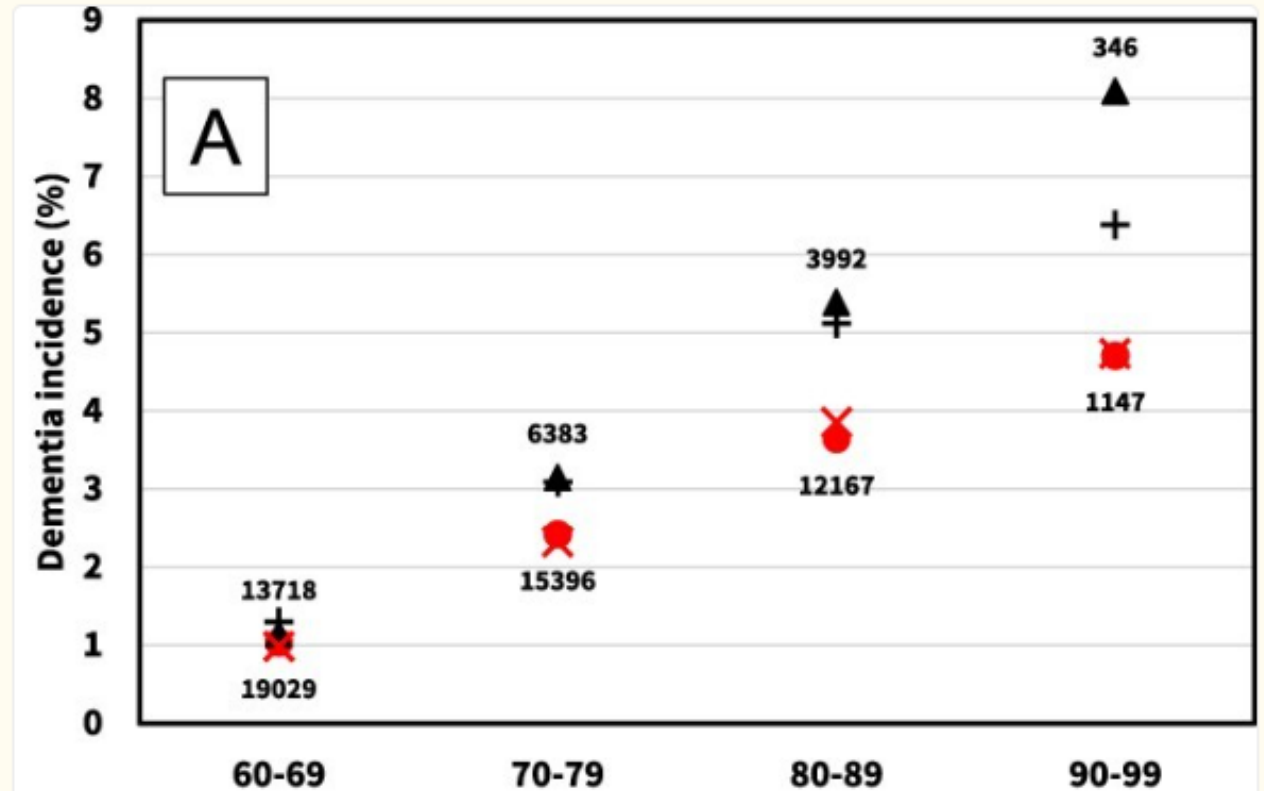
● and ✕

Persistent users of HAs

▲ and +

Non-persistent users of HAs

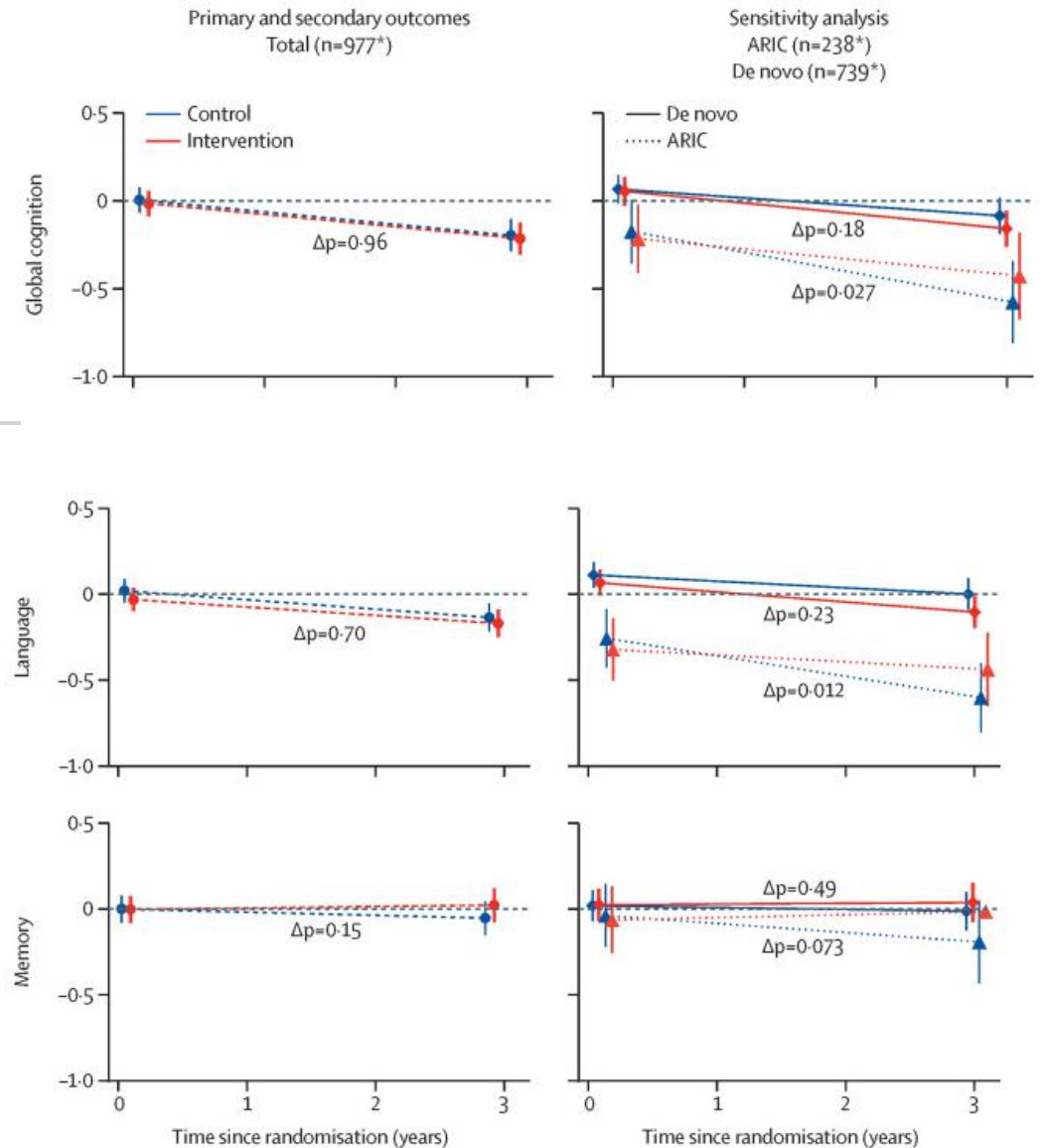
Figure 2.



What about CAUSATION? Meet ACHIEVE!

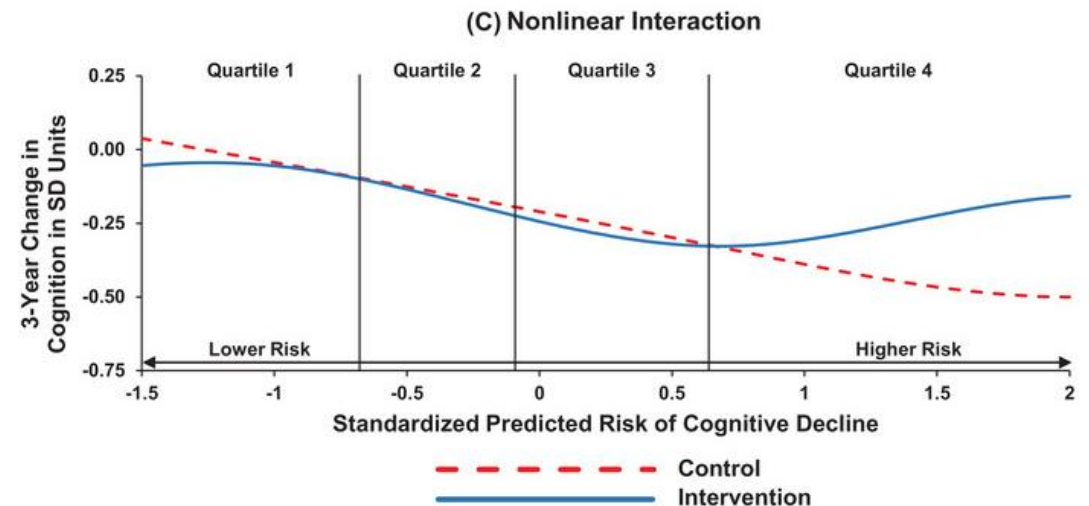
- First RCT of hearing aid effect on cognition
- Randomized to hearing aid or healthy aging education
- Followed for 3 years
- **Key point:** People with higher vascular risks for cognitive decline had more improvement with Has (48% improvement)

Lin et al, ACHIEVE Trial, The Lancet, 2023



Digging into the ACHIEVE secondary outcomes

- Sub-analysis of high-risk patients (ARIC cohort)
- “Hypothetical” predictive model
 - Used ARIC Cohort data not included in ACHIEVE
- Model “overshot” predicting cognitive decline EXCEPT in highest risk group
- Hearing intervention slowed cognitive decline by 62% in highest risk patients
- **Key point:** Predicts even more benefit for highest risk patients



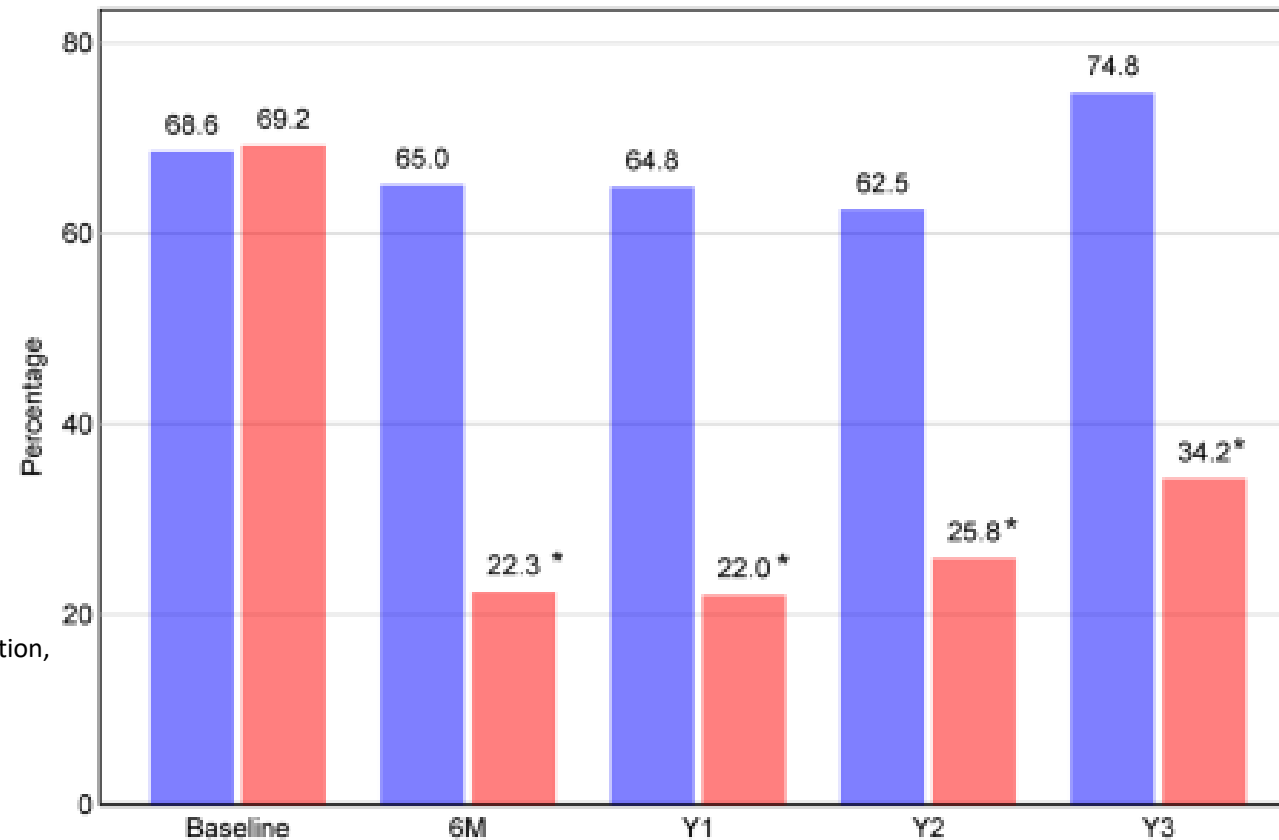
Pike et al, Cognitive benefits of hearing intervention vary by risk of cognitive decline, *Alzheimer's & Dementia*, 2025.

A look at communication and Hearing Aids

Adverse impact of hearing on **Quality of Life** at Year 3

- Hearing intervention + support = 34% w/ impaired QOL
- Education control = 75% w/ impaired QOL
- **NNT with hearing aids = 2.4 people!**
- **Key point:** Hearing interventions can significantly improve QOL

FIGURE 3 Proportion of participants with clinically significant Hearing Handicap Inventory for the Elderly— Screening version (HHIE-S) scores (greater than mild handicap, score ≥ 10) by intervention assignment. Blue represents the control intervention while red represents the hearing intervention group. * $p < 0.001$.

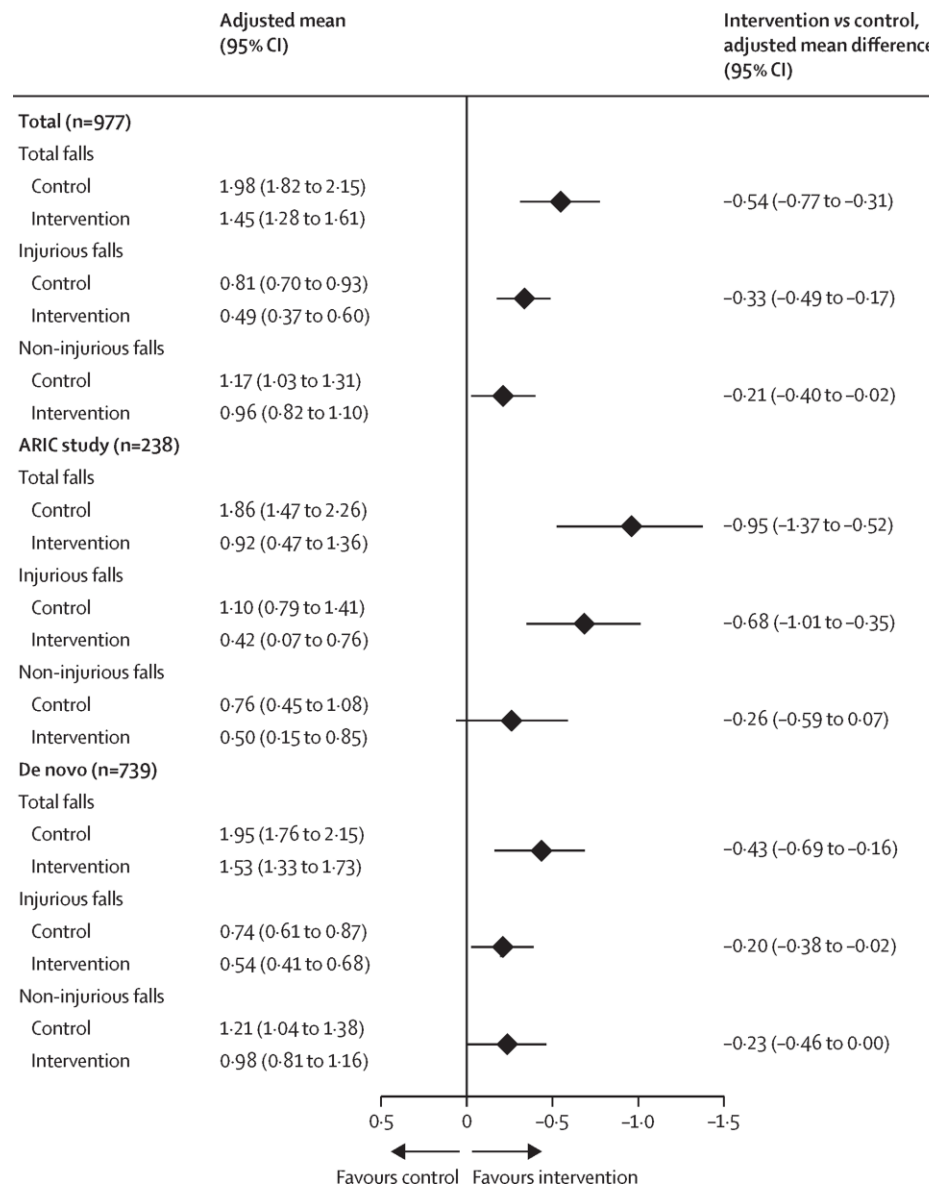


Hearing intervention impact on falls

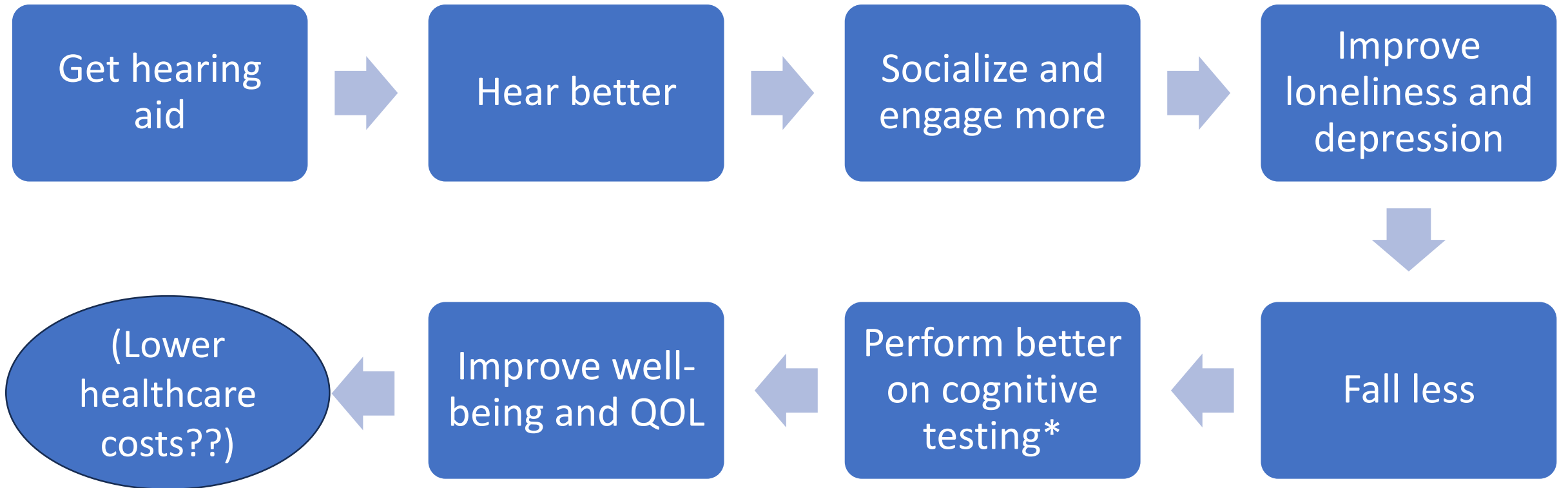
- Same ACHIEVE study data (3-year period)
- Self-reported falls (frequency, injury, and recurrence)
- Mean number of falls: 1.45 (intervention) vs 1.98 (control)
 - **27% reduction in falls**

Key point: Hearing interventions could reduce falls and their associated injury and sequelae

Goman et al, Effects of hearing intervention on falls in older adults; findings from a secondary analysis of the ACHIEVE randomized controlled trial, Lancet Public Health, 2025.



Simplified improvement mechanism



*Note: improved cognitive testing scores does not mean you won't develop dementia in the future



Helping hearing loss



Prescription hearing aids

Benefits

- Programmable and customizable
- Can be used for all hearing loss types
- Support and help through manufacturer and Audiology
- Cool new tech to make life easier

Limitations

- Expensive (\$3000 *per* hearing aid)
- Maintenance can be frustrating
- Need hearing test



© MAYO FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH. ALL RIGHTS RESERVED.

Over the counter hearing aids

Benefits

- More affordable (\$100-\$3000)
- No hearing exam needed
- Good for mild hearing loss

Limitations

- Less custom options
- Not available for all hearing loss
- No real customer support or programming help



Important hearing aid pearls

Costs:

- Not covered by Medicare Part A or B
- Medicaid covers 75% of retail price
- VA often covers through “sliding scale”

Expectations:

- Amplifies volume and specific sounds → not “perfect”
- Crowds still hard
- Can’t improve “processing” speed



Assistive Listening Devices



Healthy Hearing Pearls!



HEALTHY DIET



EXERCISE



TOBACCO USE



SLEEP

How can you tell if someone can't hear you well?



They speak loudly



Turning their head towards sound



Have blank look when asked a question



Eyes are focused on lips



Ask for repetition



Answers/responses are not appropriate

Communication tips when someone has hearing loss

- Position yourself in front of the person and keep your mouth visible if possible
- Use adequate lighting that shines on your face
- Ensure the person is paying attention before you ask a questions
- Speak at a normal volume—don't shout!
- Lower the pitch of your voice if possible
- Rephrase instead of repeating your question or statement. Sometimes you need to use different words that are easier to understand.
- Write down important information
- Remind the to wear their hearing aid!

Communication tips if you have hearing loss

- Advocate for yourself! Let people know you have hearing loss!
- Ask people to face you when they're speaking
- Remind them lower pitches are often easier to hear; consider a phrase such as, "Could you actually say that a little slower and lower?"
- It's okay to tell someone they don't need to shout! Louder isn't always helpful
- Turn off TVs or radios and move away from other noises
- Let the speaker know if you have a "better ear" they could speak towards
- Ask for important points to be put in writing
- Wear your hearing aid!

Final take-aways

- Hearing loss is common, yet so important for memory, mood, falls, and quality of life
- The science is showing the multifactorial benefits of hearing aids
- We all can do something to help people with hearing challenges
- Try a hearing amplifier—it might change your life
- Advocate for hearing equity

“Failure to fund hearing solutions for US seniors is an outrage that should no longer be tolerated”

*- Dr. Ken Covinsky, MD, MPH
UCSF Division of Geriatrics*

Thank you so much for
letting me join you today!

Laura K. Byerly, MD

gwep@ohsu.edu

