

Foundations of Hearing Loss and Cognition

Brandy Pouliot, AuD

Moderated by:

Webinar FAQs

- **How to ask a question:**
 - Click Q&A, type your question and Send.
- **Resources Tab:**
 - Download the course handout
 - Link to course information page
 - View presenter information
- **How to view captions:**
 - Click Show Caption CC Button
- **How to earn CEUs:**
 - After the webinar, go to your Pending Courses and pass the multiple-choice exam.
- **For assistance or tech support:**
 - Call 800-866-2160
 - Use the Q&A window

Foundations of Hearing Loss and Cognition●

Brandy Pouliot, Au.D.

Audiology Development Manager

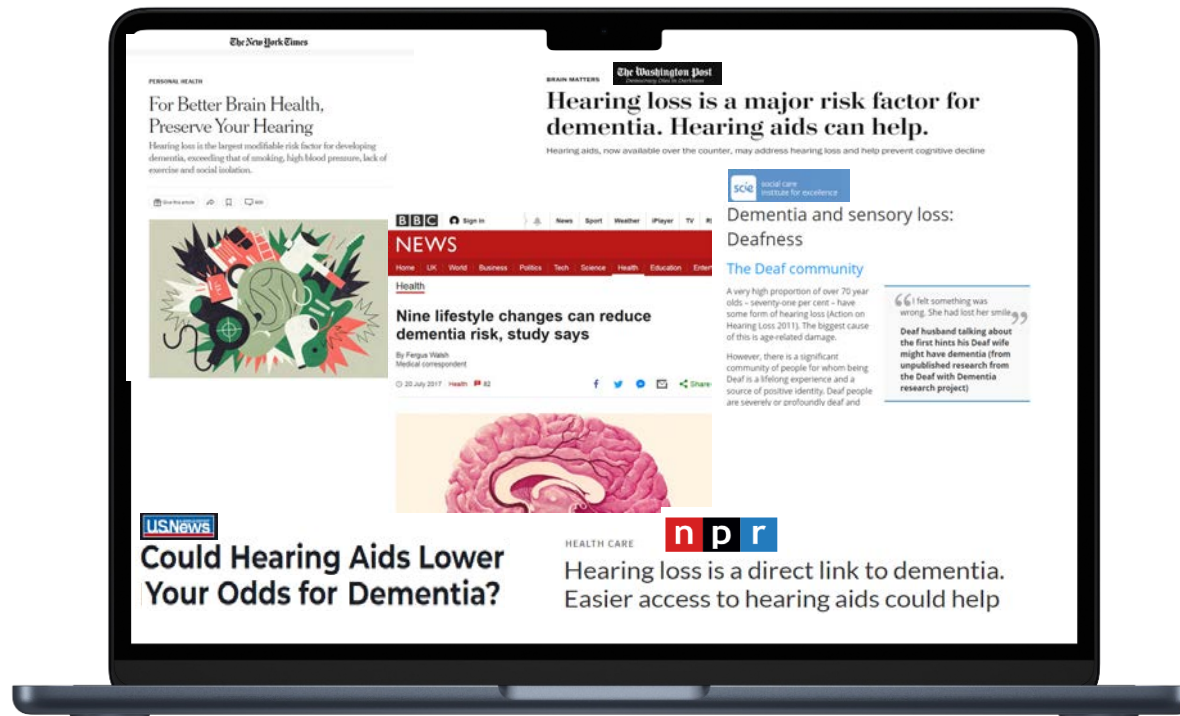
Phonak US



Learning Objectives

- After this course, participants will be able to describe the relationship between hearing loss and cognition.
- After this course, participants will be able to list the evidence supporting hearing and cognition and how it impacts their client's hearing care.
- After this course, participants will be able to identify the appropriate language to use when discussing cognition and hearing loss with clients.

This is a hot topic

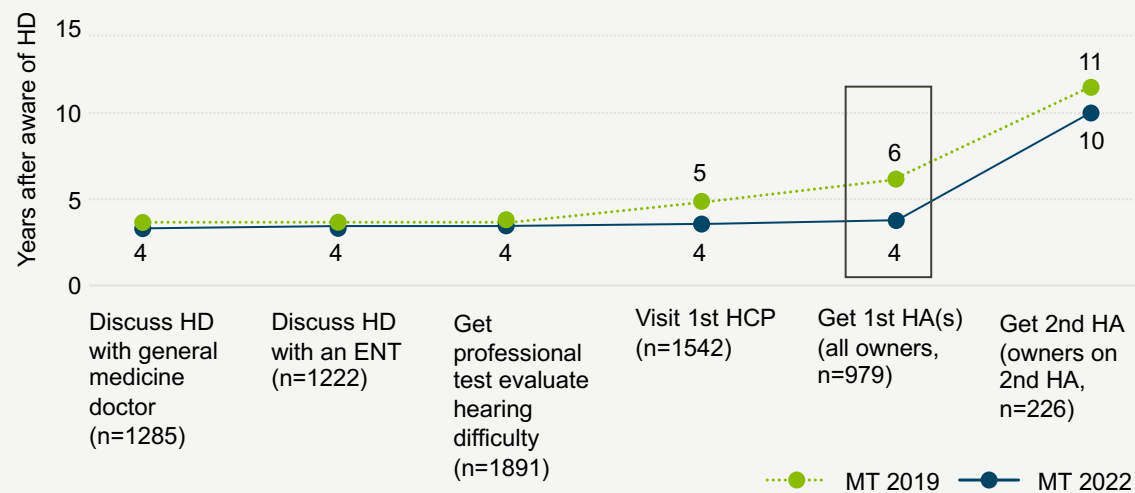


The wait time to get hearing aids dropped to 4 years in 2022

Could be due to:

- Educational efforts and media coverage of the link between untreated hearing loss and comorbidities, including:
 - social isolation and depression
 - cognitive decline and dementia

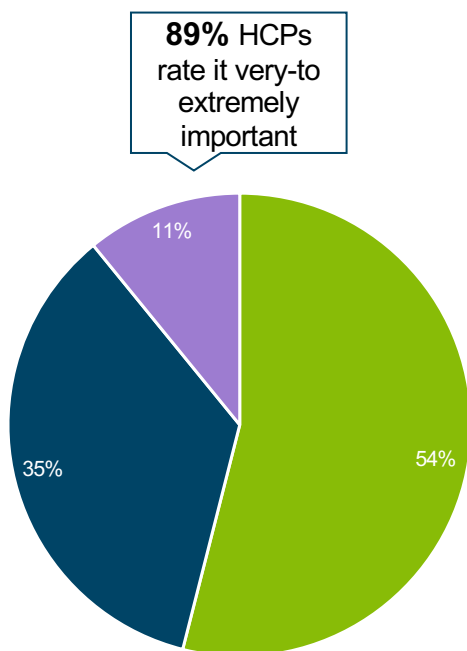
The average of years to take each step after becoming aware of hearing difficulty.



Adapted from: Powers TA, Carr K. MarkeTrak 2022: Navigating the changing landscape of hearing healthcare. *Hearing Review*. 2022;29(5):12-17.

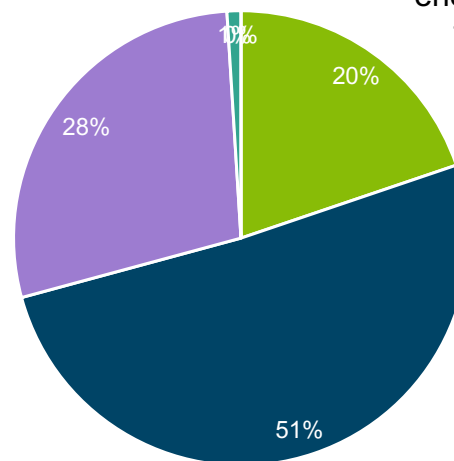
How important is the topic of cognition for an HCP? n=203

How important do you think it is to talk about cognition in the context of hearing care?



71%
encounter it
often/always
as a topic

How often do you encounter "cognition" as a topic of concern in your everyday practice?



HCP N=203 CA, US, NL (39 male, 163 female, 1 did not disclose)



The relationship
between hearing
loss & cognition.

The aging population



8 billion people living
in the world,
10 billion
by 2050

10% of the
population are 65+,
16%
by 2050

Adults
65+
doubles
by 2050

Adults
80+
triples
by 2050



Hearing loss is highly prevalent

Age-related hearing loss is ranked the 5th leading cause of disability across ages¹
WHO (2021) estimates:²

Globally,
1.5 billion
people live with
some degrees of
hearing loss

Projected to
increase to
2.5 billion
by 2050

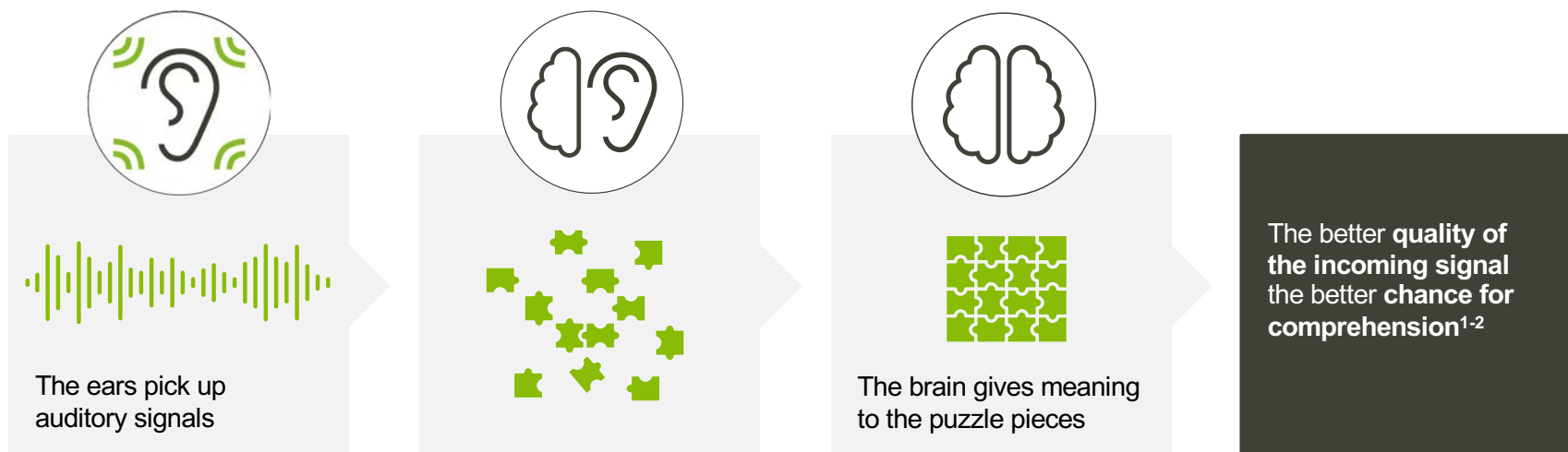
Over
430 million+
people of all ages
worldwide need
rehabilitative services
for hearing loss

Currently,
65%
of adults over age 60
have hearing loss

1. Institute for Health Metrics and Evaluation (IHME). (2018). Findings from the Global Burden of Disease Study 2017. Seattle, WA: IHME.
http://www.healthdata.org/sites/default/files/files/policy_report/2019/GBD_2017_Booklet.pdf

2. World Health Organization. (2021). World report on hearing. Geneva: *World Health Organization*. Retrieved from <https://www.who.int/publications/i/item/world-report-on-hearing>

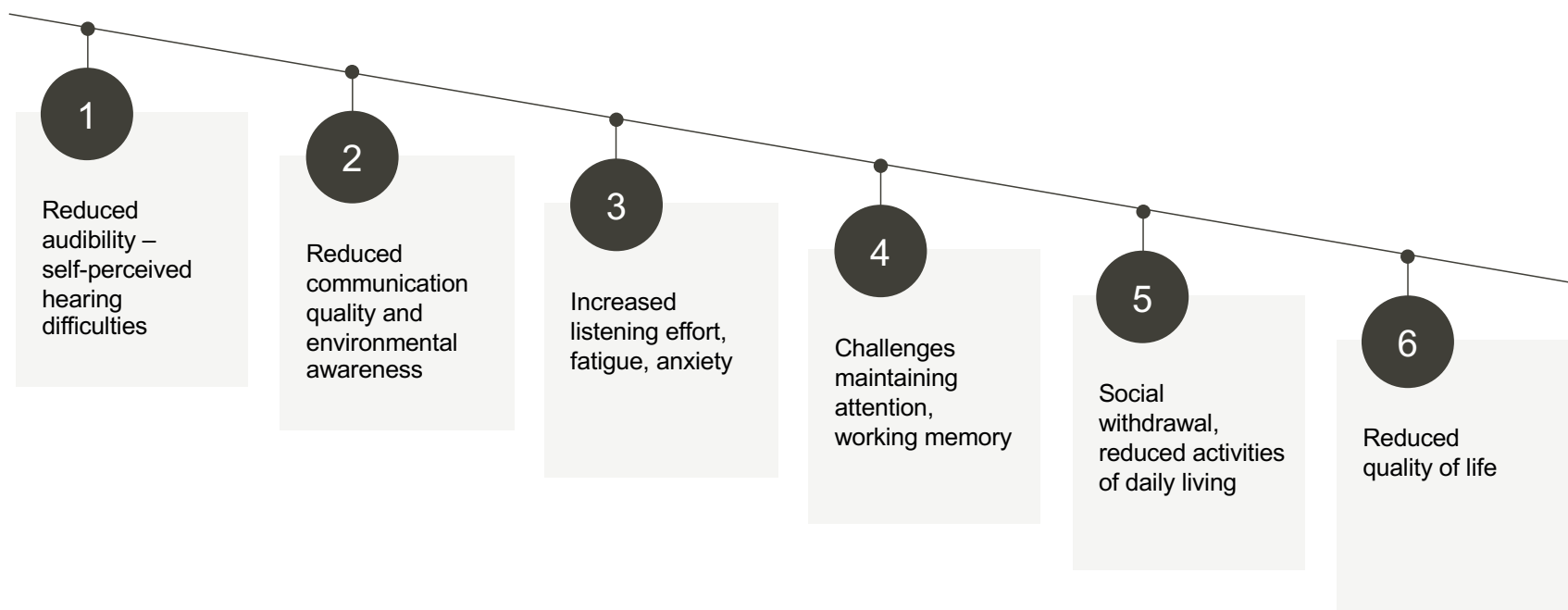
Ears and brain are 'equal partners'



1.Kiessling, J., Pichora-Fuller, M. K., Gatehouse, S., Stephens, D., Arlinger, S., Chisolm, T., . . . von Wedel, H. (2003). Candidature for and delivery of audiological services: special needs of older people. *International Journal of Audiology*, 42 Suppl 2, 2S92-101.

2.Pichora-Fuller, M. K. (2008). Audition and cognition: Where lab meets clinic. *The ASHA Leader*, 13(10), 14-17.

Hearing loss impacts well-being

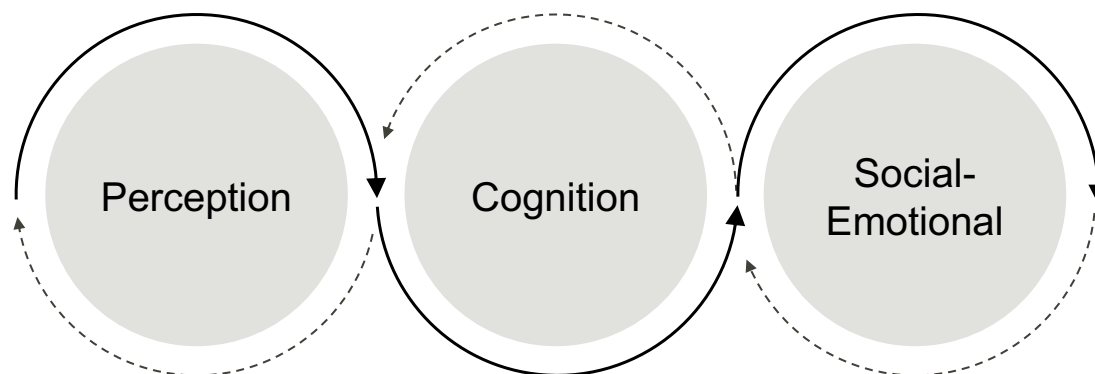


Vercammen, C., Ferguson, M., Kramer, S.E., Meis, M., Singh, G., Timmer, B., Gagné, J-P., Goy, H., Hickson, L., Holube, I., Launer, S., Lemke, U., Naylor, G., Picou, E., Scherpiet, S., Weinstein, B., & Pelosi, A. (2020). Well-Hearing is Well-Being: A Phonak Position Statement. *Hearing Review*, 27(3):18-22.

World Health Organization (2021). World Report on Hearing. 2021. Geneva, Switzerland.

‘Hearing’ provides foundation for communication and social functioning¹⁻²

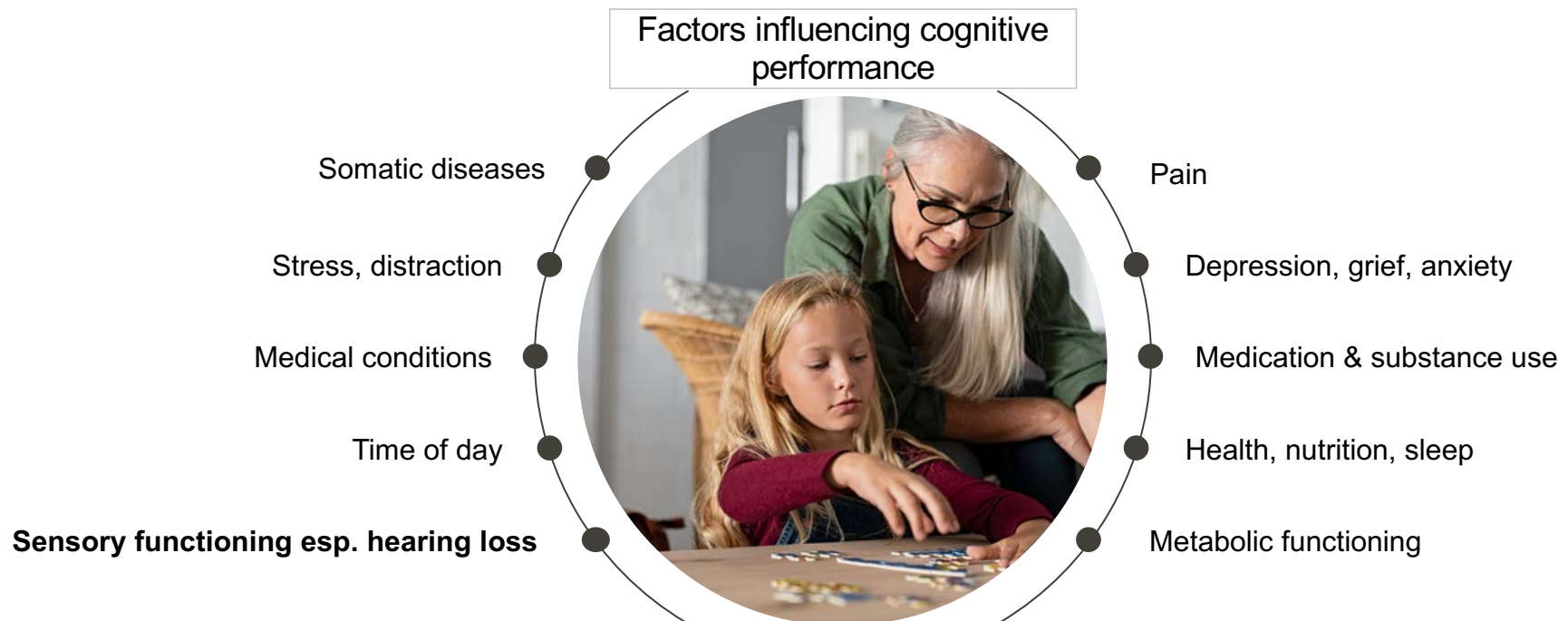
Hearing ○ — • Listening ○ — • Comprehending ○ — • Communicating



1. Kiessling, J., Pichora-Fuller, M. K., Gatehouse, S., Stephens, D., Arlinger, S., Chisolm, T., . . . von Wedel, H. (2003). Candidature for and delivery of audiological services: special needs of older people. *International Journal of Audiology*, 42 Suppl 2, 2S92-101.

2. World Health Organization. (2021). World Report on Hearing. Geneva: *World Health Organization*. Retrieved from <https://www.who.int/publications/item/world-report-on-hearing>.

Hearing loss influences cognitive performance*



*Starting point based on talents, education, training

Smith, J., & Baltes, P. B. (1996). Altern aus psychologischer Perspektive: Trends und Profile im hohen Alter [A psychological perspective on aging: Trends and profiles in very old age] *Die Berliner Altersstudie* (pp. 221-250): Akademie-Verlag.

Normal aging in the older adult

- As we age, the brain **naturally changes**
- Cognitive change is a **normal process** of aging
- Individuals **vary greatly** in age-related cognitive changes experienced
- To age well, **individuals must** compensate for changes that may impact speech understanding



Typical cognitive changes associated with normal aging

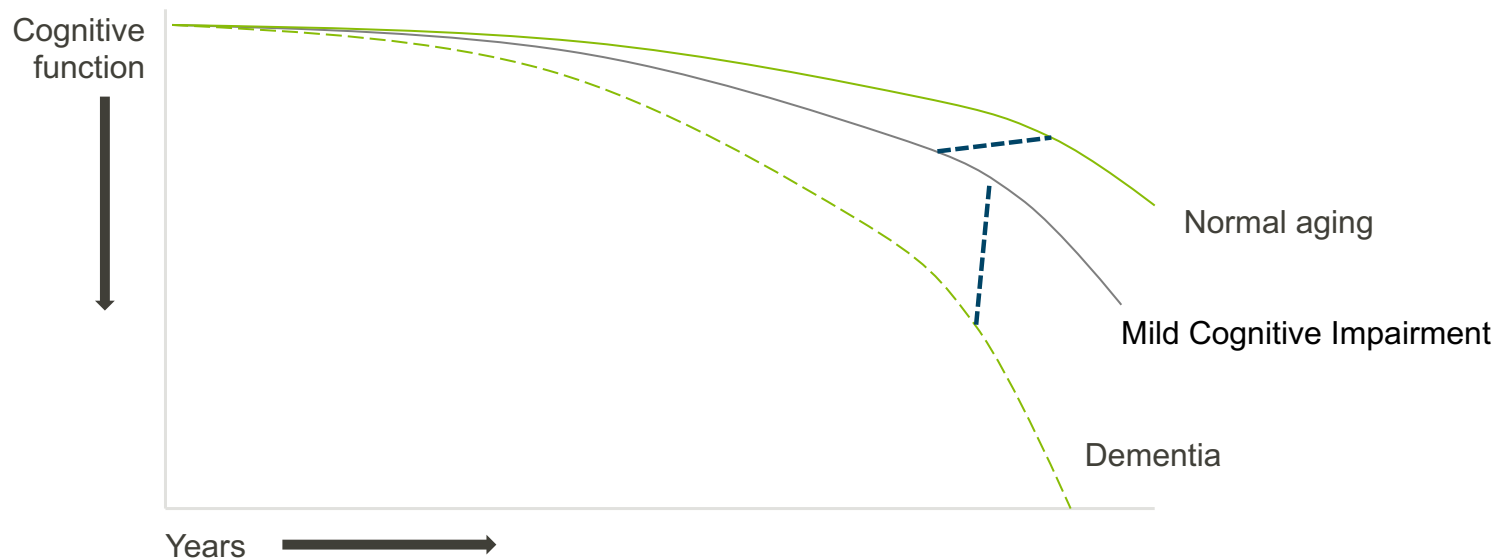
- Reduced speed of information processing
- Reduced capacity of working memory
- Greater effort required for learning new information
- Difficulties dividing or switching attention



These changes are **part of normal aging** and do not interfere with independence in daily activities.



Normal versus “pathological” aging in cognition



Dementia develops **over time** and is preceded by **cognitive impairment** and **normal aging**

Figure adapted from Sperling, R. A., Aisen, P. S., Beckett, L. A., Bennett, D. A., Craft, S., Fagan, A. M., . . . Montine, T. J. (2011). Toward defining the preclinical stages of Alzheimer's disease: Recommendations from the National Institute on Aging-Alzheimer's Association workgroups on diagnostic guidelines for Alzheimer's disease. *Alzheimer's & Dementia*, 7(3), 280-292.



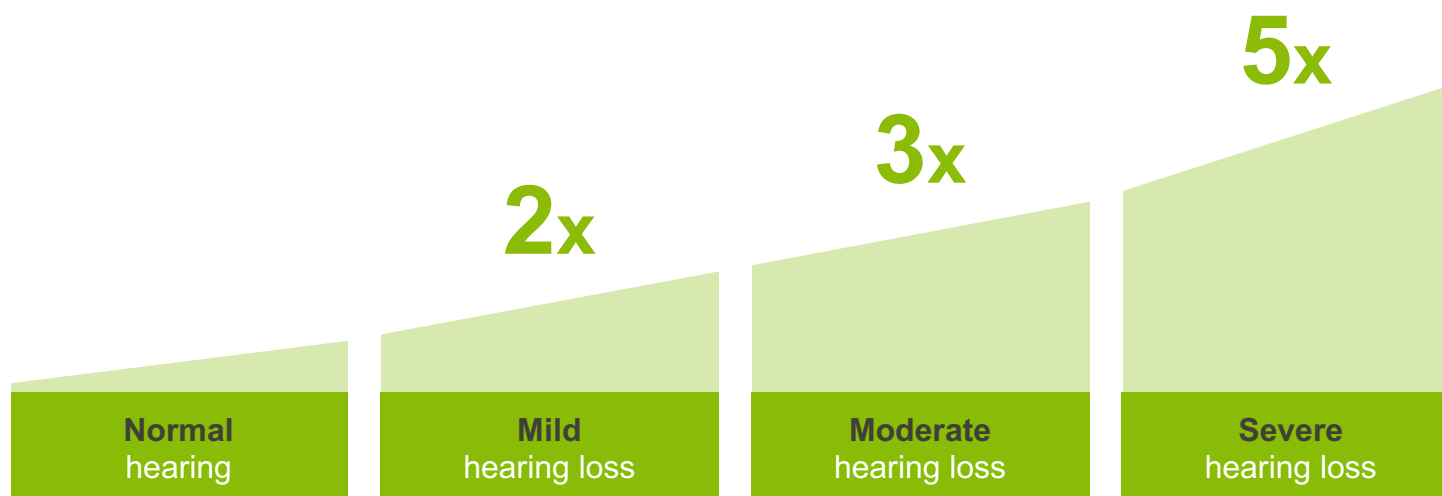
Research findings
on the relationship
between hearing
loss & cognition.



...current science is unsettled as to the nature of the hearing loss-dementia link. Yet, the lay public is prone to receive the message as a warning that hearing loss is an **indicator** of dementia. It is time to reconsider our message...

Hearing loss and cognitive well-being

Risk of dementia with untreated hearing loss¹



1. Lin, F. R., Metter, E. 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.



Understanding the evidence

Risk

Increases chance or probability of something happening

Untreated hearing loss

Chances of developing dementia increase

Association: statistical relationship

A relationship between two variables (e.g., exposure and disease)

Untreated hearing loss

Dementia

Causation

A prediction of a probable outcome based on evidence from previous experience

Too much exposure to loud noise

Hearing loss

National Institutes of Health (Nov, 2016). Understanding health risks: Improving your chances of good health. Retrieved from <https://newsinhealth.nih.gov/2016/10/understanding-health-risks>

The Britannica Dictionary Online. Retrieved from <https://www.britannica.com/dictionary/riskprobability> and causation.

Hearing health and cognitive health



Epidemiological evidence suggests an **association between hearing loss and cognition** and that hearing aids have a positive effect for healthy aging.¹



According to Lancet Commission reports on dementia, hearing loss was identified as the largest **potentially modifiable risk factor** for dementia.²

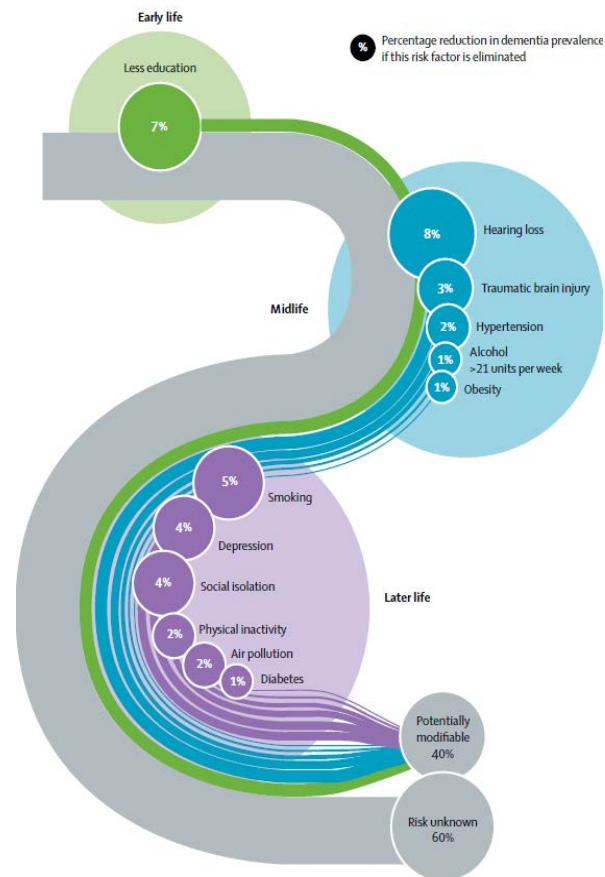


1. Taljaard, D. S., Olaithe, M., Brennan-Jones, C. G., Eikelboom, R. H., & Bucks, R. S. (2016). The relationship between hearing impairment and cognitive function: a meta-analysis in adults. *Clinical Otolaryngology*, 41(6), 718-729.
2. Livingston, G., et al.. (2020). Dementia prevention, intervention, and care: 2020 report of the Lancet Commission. *The Lancet*, 396(10248), 413-446.

Hearing loss – A modifiable risk factor

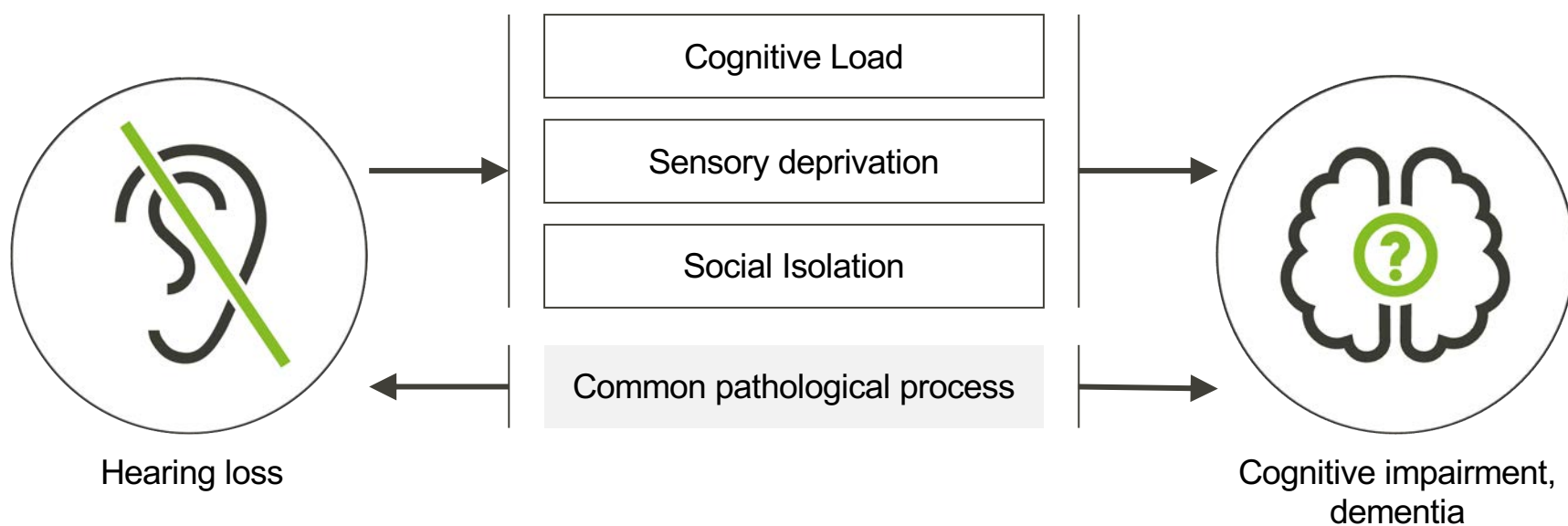
Top 5 modifiable risk factors:¹

Hearing loss	8%
Less education	7%
Smoking	5%
Depression	4%
Social isolation	4%



1. Livingston, G., Huntley, J., Sommerlad, A., Ames, D., Ballard, C., Banerjee, S., . . . Mukadam, N. (2020). Dementia prevention, intervention, and care: 2020 report of the Lancet Commission. *The Lancet*, 396(10248), 413-446.

Potential pathways of hearing loss and dementia

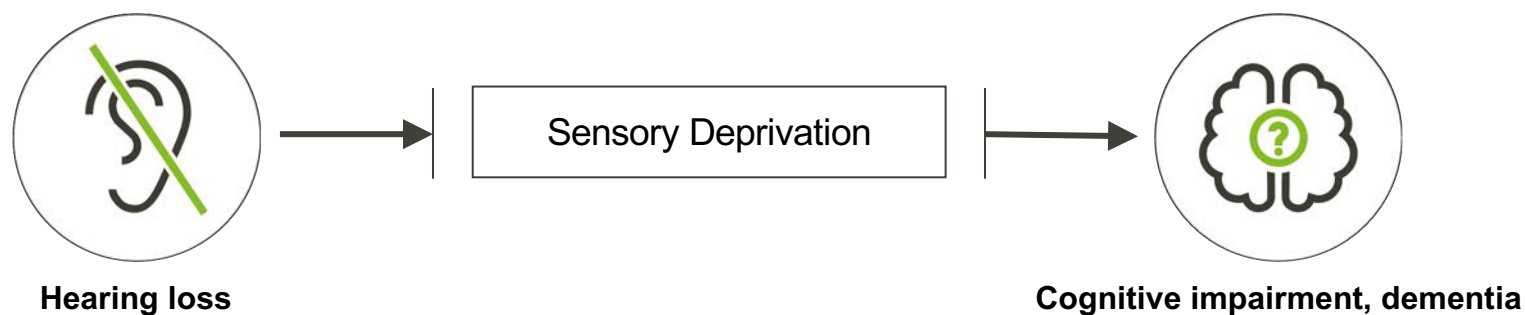


Potential pathway #1: Cognitive load



“It sounds like you’re mumbling, can you please speak up, I can’t understand what you’re saying”

Potential pathway #2: Brain structure/function



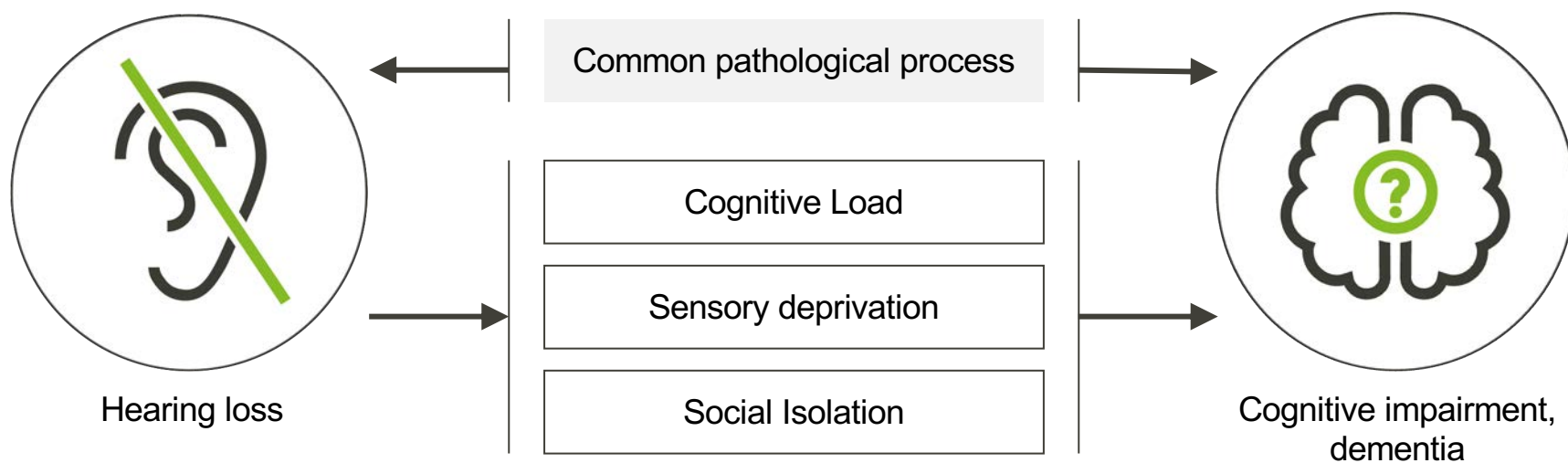
Direct effects on the brain

- Lower grey matter volume in the auditory cortex
- Faster rates of brain atrophy and changes to brain structure and function
- Smaller pool of resources available for other cognitive tasks

Potential pathway #3: Social Isolation

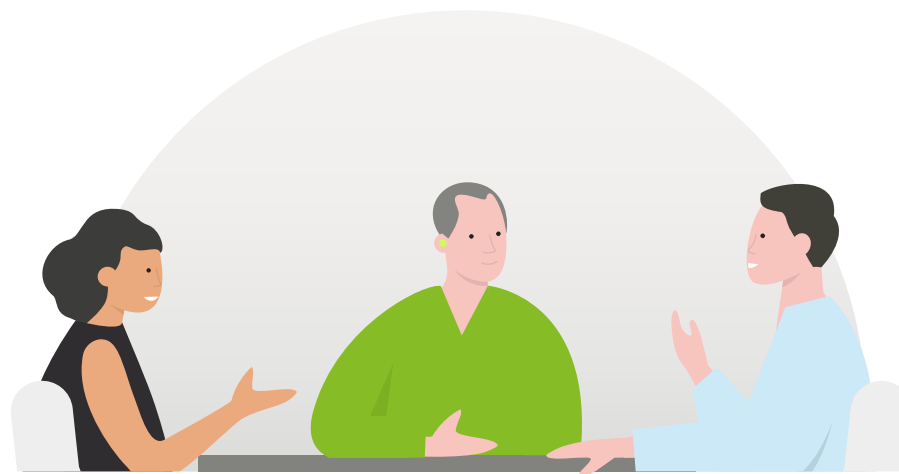


Potential pathway #4: Common pathological process



The effects of hearing interventions on cognitive outcomes

- **More access** to sound provides clarity and supports auditory processing¹
- Hearing aids **improve listening abilities and communication**²
- Hearing aids can have short term **beneficial effects on cognition**³⁻⁵
- Hearing aid use could mitigate the risk of cognitive decline⁶



1. Picou, E. M., Ricketts, T. A., & Hornsby, B. W. (2013). How hearing aids, background noise, and visual cues influence objective listening effort. *Ear and Hearing*, 34(5), e52–e64.
2. Ferguson, M. A., Kitterick, P. T., Chong, L. Y., Edmondson-Jones, M., Barker, F., & Hoare, D. J. (2017). Hearing aids for mild to moderate hearing loss in adults. *The Cochrane Database of Systematic Reviews*, 9(9), CD012023.
3. Maharani, A., et al. (2018). Longitudinal Relationship Between Hearing Aid Use and Cognitive Function in Older Americans. *Journal of the American Geriatrics Society*, 66(6), 1130–1136.
4. Sarant, J., et al. (2020). The effect of hearing aid use on cognition in older adults: Can we delay decline or even improve cognitive function?. *Journal of Clinical Medicine*, 9(1), 254.
5. Sanders, M. E., Kant, E., Smit, A. L., & Stegeman, I. (2021). The effect of hearing aids on cognitive function: A systematic review. *PLoS One*, 16(12), e0261207.
6. Mahmoudi, E., et al. (2019). Can hearing aids delay time to diagnosis of dementia, depression, or falls in older adults? *Journal of the American Geriatrics Society*, 67(11), 2362-2369.

The latest evidence from the ACHIEVE study (2023)



THE LANCET

Hearing intervention
versus health education
control to **reduce
cognitive decline** in
older adults with hearing
loss in the USA
(ACHIEVE):

**A multicenter,
randomized controlled
trial**

Lin, F.R., Pike, J.R., Albert, M.S., et al. (2023). Hearing intervention versus health education control to reduce cognitive decline in older adults with hearing loss in the USA (ACHIEVE): a multicentre, randomised controlled trial. *Lancet (London, England)*, S0140-6736(23)01406-X.

Participants:

987

Set up:

Multicenter, randomized
controlled trial of adults
aged 70–84 years with
untreated hearing loss &
without substantial
cognitive impairment

Investigated:

Whether comprehensive
hearing care, including
hearing aid fitting, helps
to mitigate cognitive
decline in an elderly
population

PHONAK
life is on

The latest evidence from the ACHIEVE study (2023)

- In older adults at increased risk for cognitive decline, hearing intervention **slowed down loss of thinking and memory abilities by 48% over 3 years**
- Participants who received the hearing intervention, on average, **had no declines in memory over the 3-year period compared to a decrease in memory** seen in participants who received the control intervention
- **Treating hearing loss** in older adults at increased risk for cognitive decline **slows down loss of thinking and memory**



Lin, F.R., Pike, J.R., Albert, M.S., et al. (2023). Hearing intervention versus health education control to reduce cognitive decline in older adults with hearing loss in the USA (ACHIEVE): a multicentre, randomised controlled trial. *Lancet* (London, England), S0140-6736(23)01406-X.

The latest evidence from the ENHANCE study (2023)



The ENHANCE Study:
Evaluation of hearing
aids & cognitive effects.

Prospective Cohort Study

Prof. Julia Sarant et. al 2023

Participants:

160

Set up:

Participants received
hearing intervention,
including hearing aid
fitting & were followed
up for 3 years

Investigated:

Whether remediation of
hearing loss in older
adults with hearing aids
will delay or prevent
cognitive decline.

PHONAK
life is on

The latest evidence from the ENHANCE study (2023)*

- Comparatively, cognition at the 3-year follow-up was stable overall for hearing aid users but **declined for the non-hearing aid user** group
- Treatment of hearing loss with hearing **aids may delay cognitive decline**
- Referral to hearing screening and rehabilitation **may assist with delaying/minimizing cognitive decline** in older adults



Sarant, J., et al. (2023, July 16-20). Cognitive Function in Older Adults with Hearing Loss: Outcomes for treated vs untreated groups at 3-year follow-up [Conference presentation]. AAIC 2023 Conference, Amsterdam, Netherlands.

What does this research mean?

Evidence is increasing and promising

Hearing aid use supports cognitive health

We can still not talk about causality



More than hearing aids



Hearing
assistive
technologies



Person-
centered
goal-setting



Hearing-related
psychosocial
adjustment
counseling



Self-
management
training



Hearing aid
orientation

Key takeaways

“Risk” in different contexts can mean different things

1

Hearing loss is a potentially modifiable risk factor for dementia

2

Pathways that explain the interplay between hearing loss & cognition are still unclear

3

We cannot say hearing loss causes dementia or hearing aid use prevents dementia

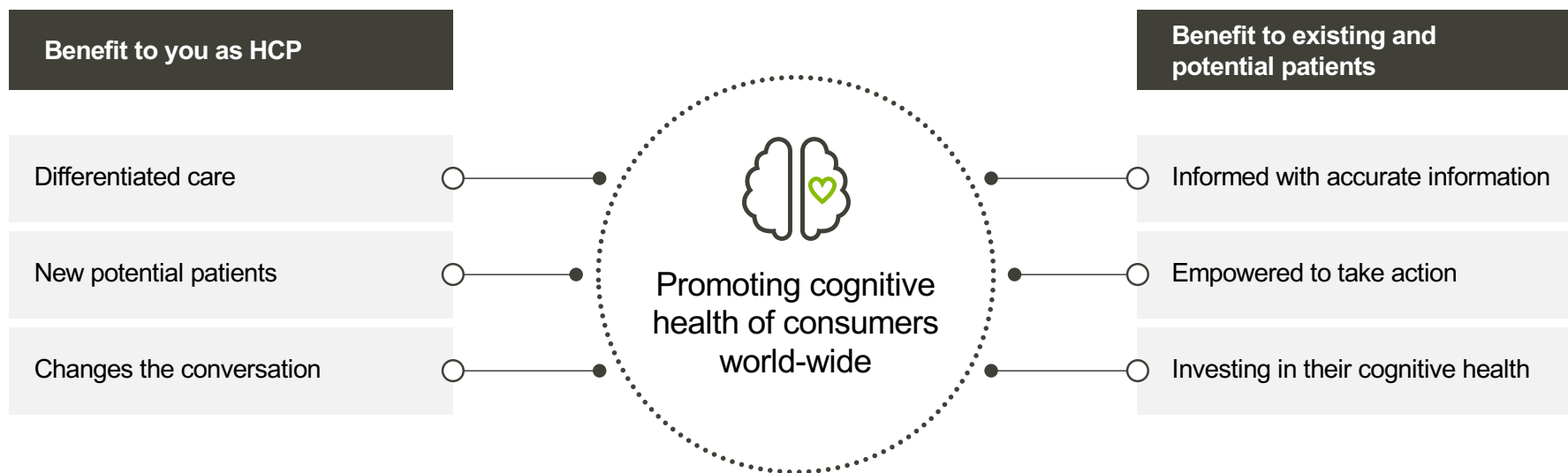
4

Hearing aid interventions can have protective effects for the brain



The role of cognition
in audiological care
& counseling.

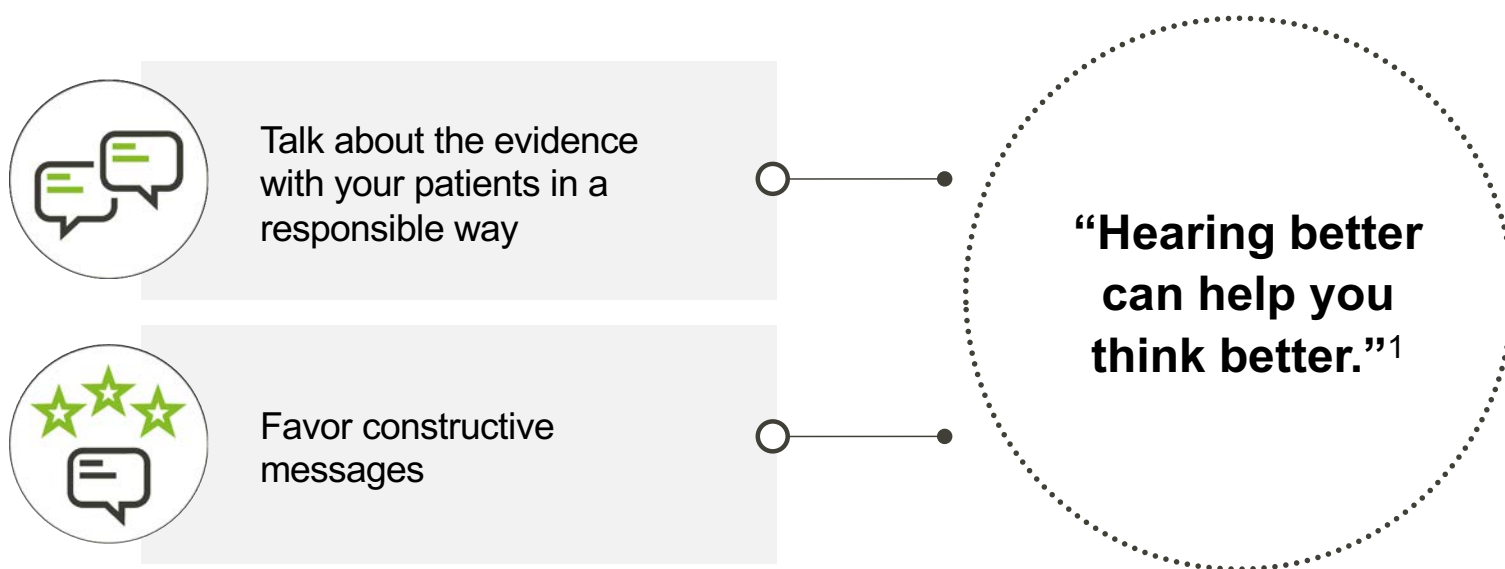
Why addressing Cognition benefits everyone...





... we favor constructive messages that minimize harm while motivating people to act. One such message might be: “**Hearing better can help you think better.**” We would omit mention of dementia when addressing the hearing challenges faced by millions ...

Integrating cognition in audiological care



1. Blustein, J., Weinstein, B. E., & Chodosh, J. (2023). It is time to change our message about hearing loss and dementia. *Journal of the American Geriatrics Society*, 10.1111/jgs.18323. Advance online publication.

Expert guidance now available

Recommendations support you in addressing hearing loss and cognition to:

- Maintain your clients' functional ability
- Support them in living an active and socially engaged life
- Improve their quality of life and communicative behavior



What you can do tomorrow

Listen and observe



Modify clinical practice



Include family in client care



Offer a holistic solution



Provide person-centered care



Sarant, J., Lemke, U., Giroud, N., Scherpiet, S., & Barbara Weinstein, B. (In press). Promoting hearing and cognitive health (well-being) in audiologic rehabilitation for older adults. *International Journal of Audiology*.

5 ways to address cognitive health in hearing healthcare



Listen and respond

- Actively listen and observe
- Combine observations with note taking
- Ask about and follow up on reported concerns
- Use the patient's own words to avoid misinterpretation
- Ask for specific examples or situations



Modify clinical practice

- Maintain eye contact
- Use short simple sentences
- Be positive, flexible and encouraging
- Abbreviate or slow down testing
- Ask one question at a time
- Be flexible in your testing approach



Involve family in patient care

- Involve them in patient care activities
- Ask for their impression and feedback
- Provide instruction and support
- Be empathetic
- Validate their problems and concerns
- Develop and use a referral network



Offer a holistic solution

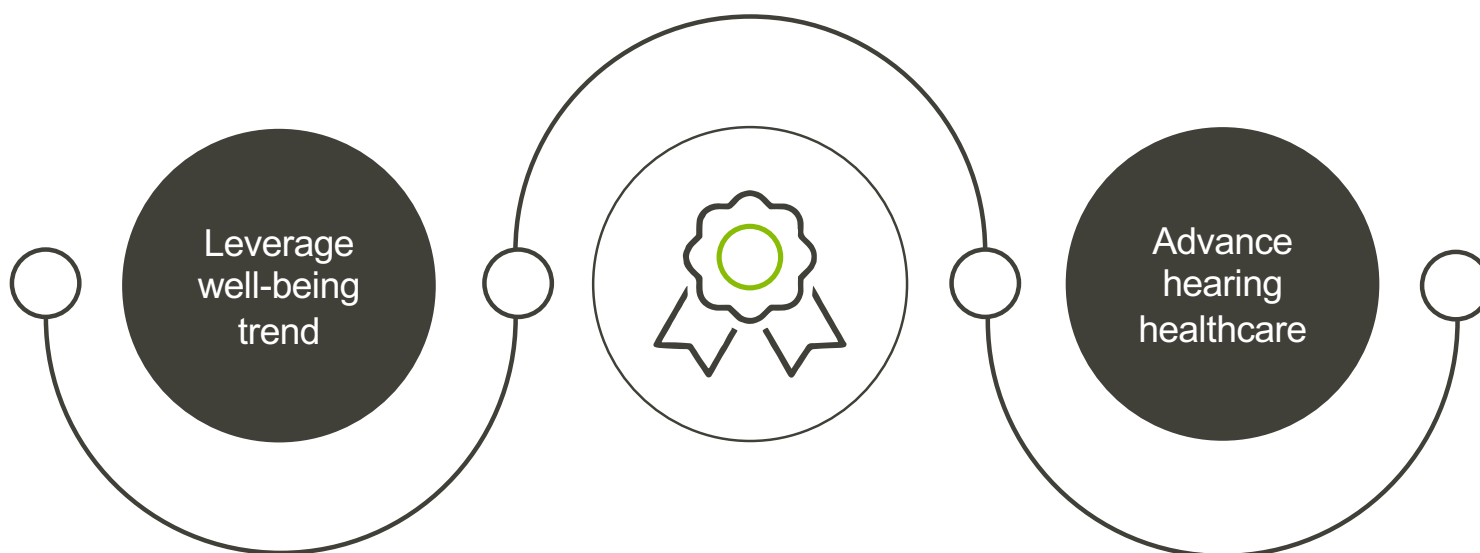
- Hearing technologies based on needs assessments
- Social prescribing
- Alternative technologies or non-technology solutions
- Referrals to other professionals



Provide person-centered care

- Regularly monitor hearing status and re-visit goals
- Set realistic goals and expectations
- Focus on patient's strengths, needs, and lifestyle
- Promote effective and empathetic communication

 Together we can





Together,
we change lives.