

Audiological-Medical Management of Patients with a Chronic Health Issue: Age Related Hearing Loss



Dan Quall MS, CCCA
Director of Strategic Initiatives

Audacity 2021



Disclosures

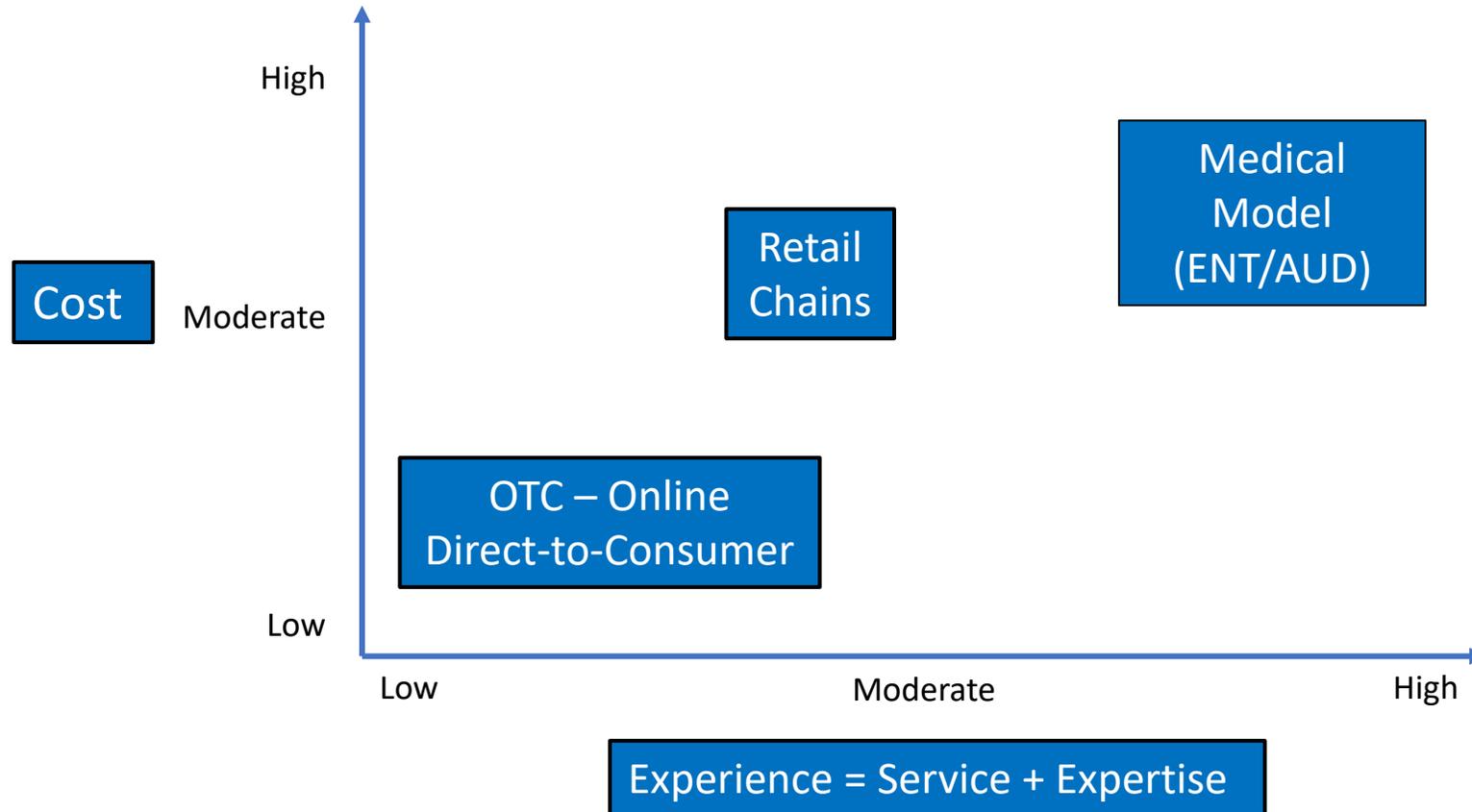
- Employee of Fuel Medical
- Primary Revenue is hearing aid purchases through our group



Today

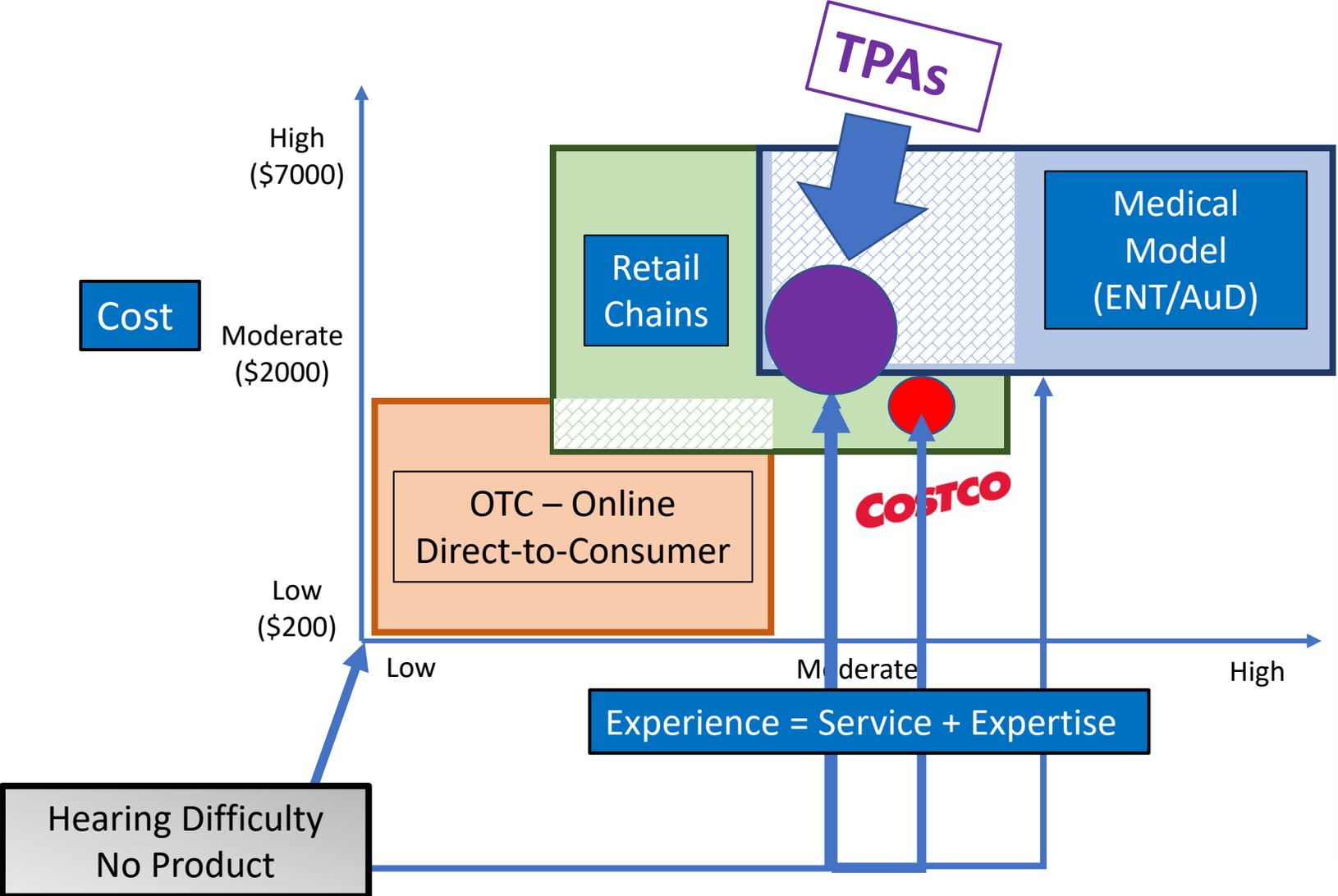
- The Market
- Age Related Hearing Loss and comorbid issues
- Review what medical management of ARHL could look like
- Putting MM of ARHL to Practice
- What's next

Stratification of Hearing Market



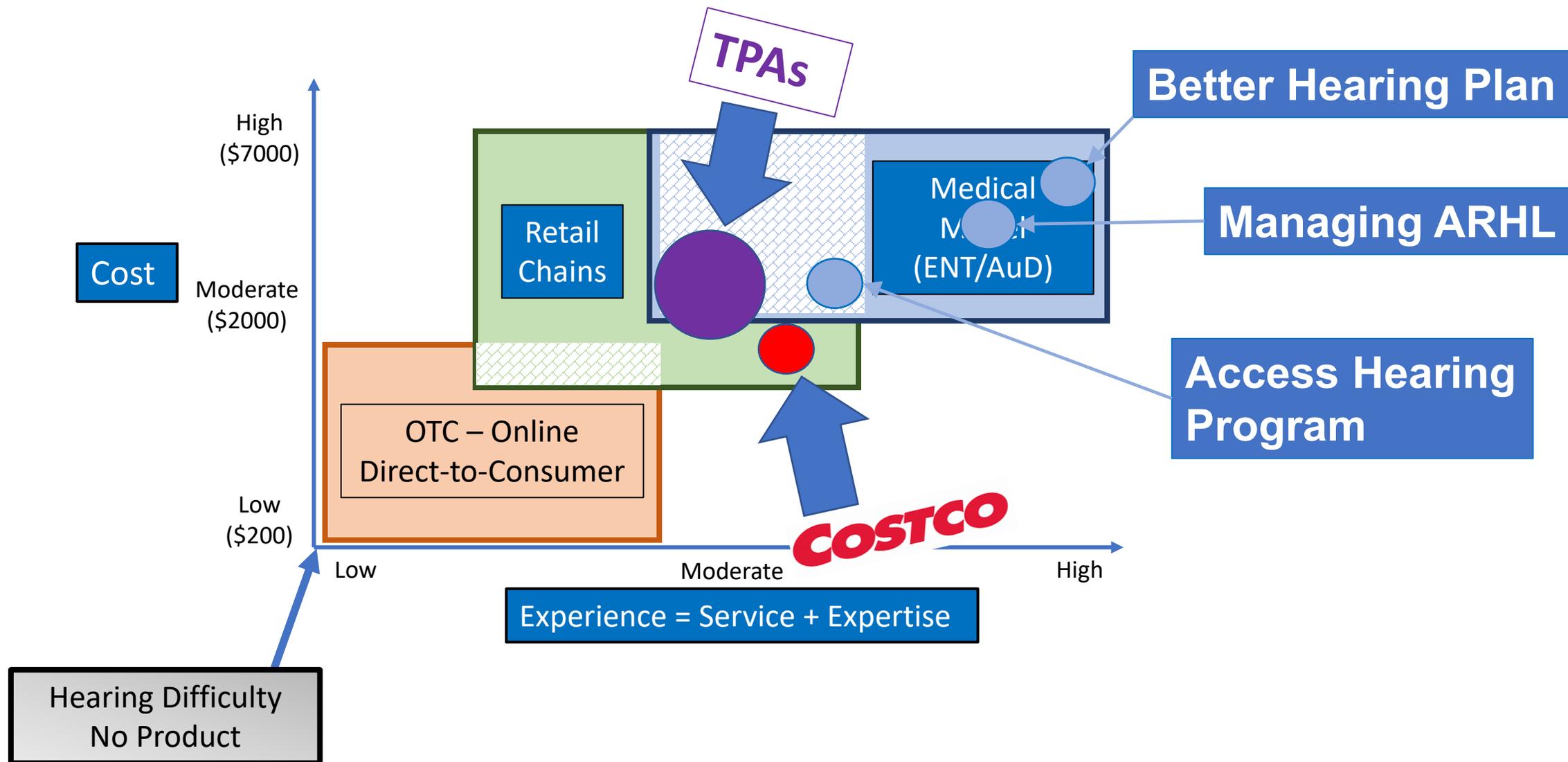
Source: Dr. Jed Grisel, MD

Market Challenges and Challengers

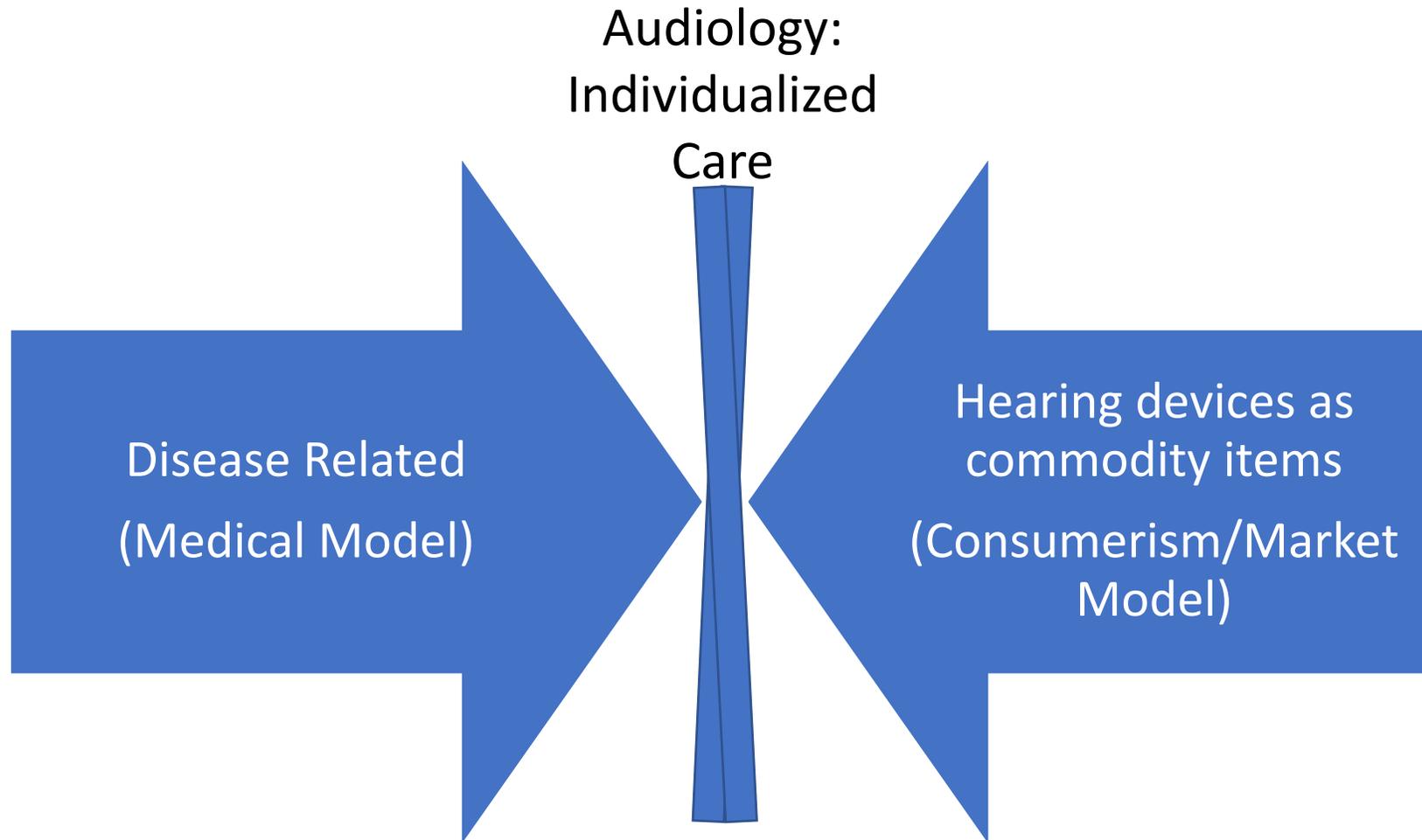


- Total Ear Expertise
 - ✓ ENT
 - ✓ AuD
- Changes with Inner-Ear and Central Processing
 - ✓ Tinnitus
 - ✓ Cochlear Function
 - ✓ Vestibular Function
 - ✓ Central Processing
- Comorbid Monitoring
 - ✓ Cognitive Issues
 - ✓ Depression Issues
 - ✓ Fall Prevention
 - ✓ Health Costs
- Total Care Packages
 - ✓ Products
 - ✓ Services

Market Challenges and Challengers



Note Pressures on Hearing Healthcare Definition



The False Narrative

Big Box, TPAs and Retailers have turned the acquisition of hearing services for Age Related Hearing Loss to:

Hearing Test + Hearing Aid + Fitting = Management of ARHL

The Medical Community knows the acquisition of hearing services for Age Related Hearing Loss should include:

Hearing Test + Hearing Aid + Fitting + Ongoing HA Service + Aural Rehab + Auditory Training + Tinnitus Management + changes in Hearing over time + changes in Cognitive Function + changes in Depression + changes in Fall Incidence + other ear diseases + Cochlear Implant referral.... =
Management of ARHL

Consequently, there is an overwhelming impression among health care professionals and also the public that a hearing aid is all that is needed to “treat” hearing loss. In reality, ARHL is like any other physical impairment and requires concerted counseling, rehabilitative training, environmental accommodations, and patience.

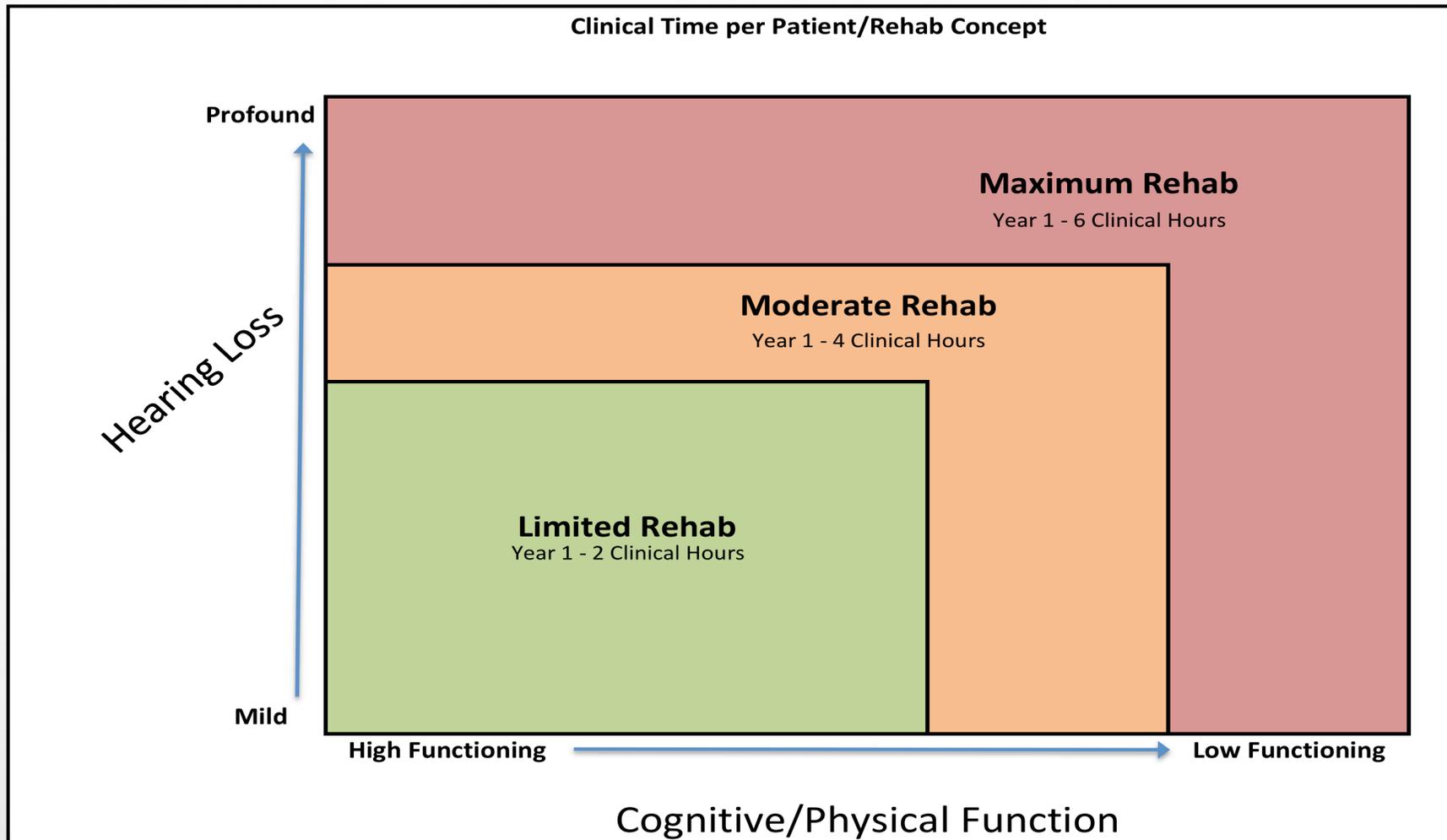
Hearing Loss in Older Adults

Who’s Listening?

Frank R. Lin, MD, PhD

JAMA, March 21, 2012—Vol 307, No. 11 1147

The Current Audiology Conundrum

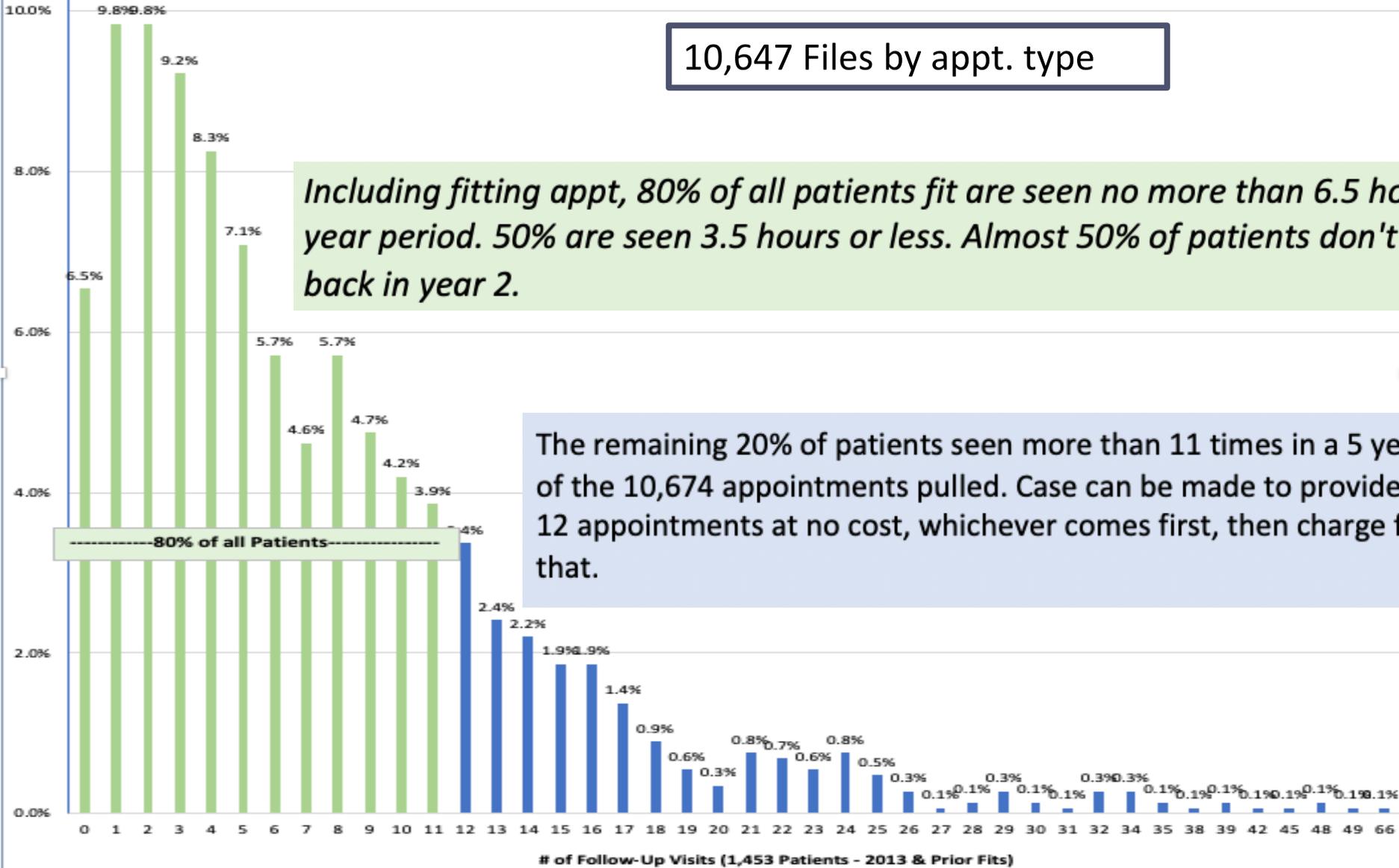


Total Follow-Up Visits per patient within 5 Years of Hearing Aid Fitting (80% seen 2x per Year or Less)

10,647 Files by appt. type

Including fitting appt, 80% of all patients fit are seen no more than 6.5 hours over a 5 year period. 50% are seen 3.5 hours or less. Almost 50% of patients don't even come back in year 2.

The remaining 20% of patients seen more than 11 times in a 5 year span represent 50% of the 10,674 appointments pulled. Case can be made to provide all patients 3 years or 12 appointments at no cost, whichever comes first, then charge for office visits after that.



Management of a Chronic Health Issue

Age Related Hearing Loss

Degree HL

None (Normal)

Mild

Moderate

Severe/Profound

Products

PSAPs, OTC, Apps

Hearing Aids and Accessories

Cochlear Implants

Treatment and Management Activities (Tele-Med)

Hearing Screening Apps

Cognitive Screening

Depression Scaling

Med Ototoxicity Monitoring

Biometric Data

Cerumen management

Hearing Eval

Auditory Training

Balance Assessment

Hearing Situation Scaling

Aural Rehab

Reprogramming

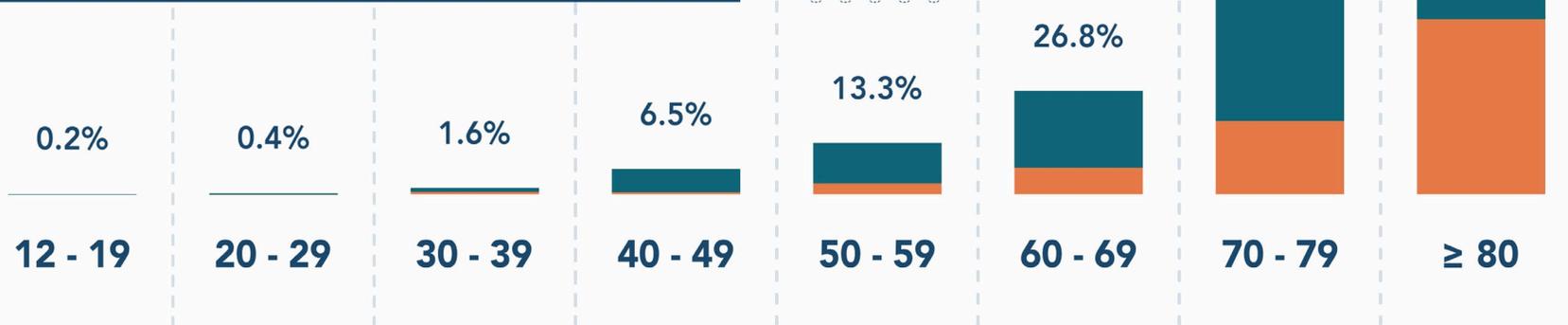
HA Data Logging

Remote care

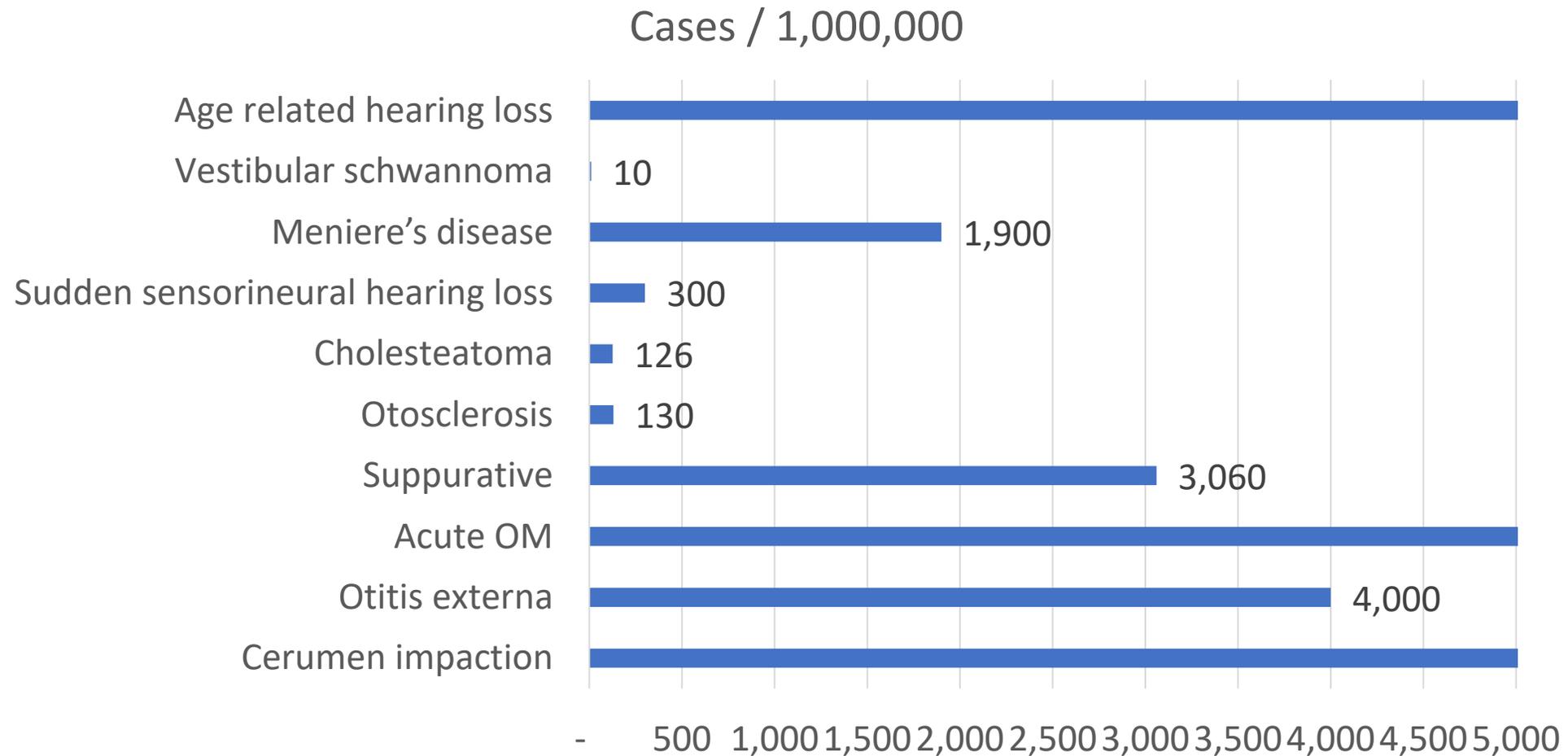
Percentage of Individuals with Hearing Loss by Age & Severity

MILD **MODERATE+**

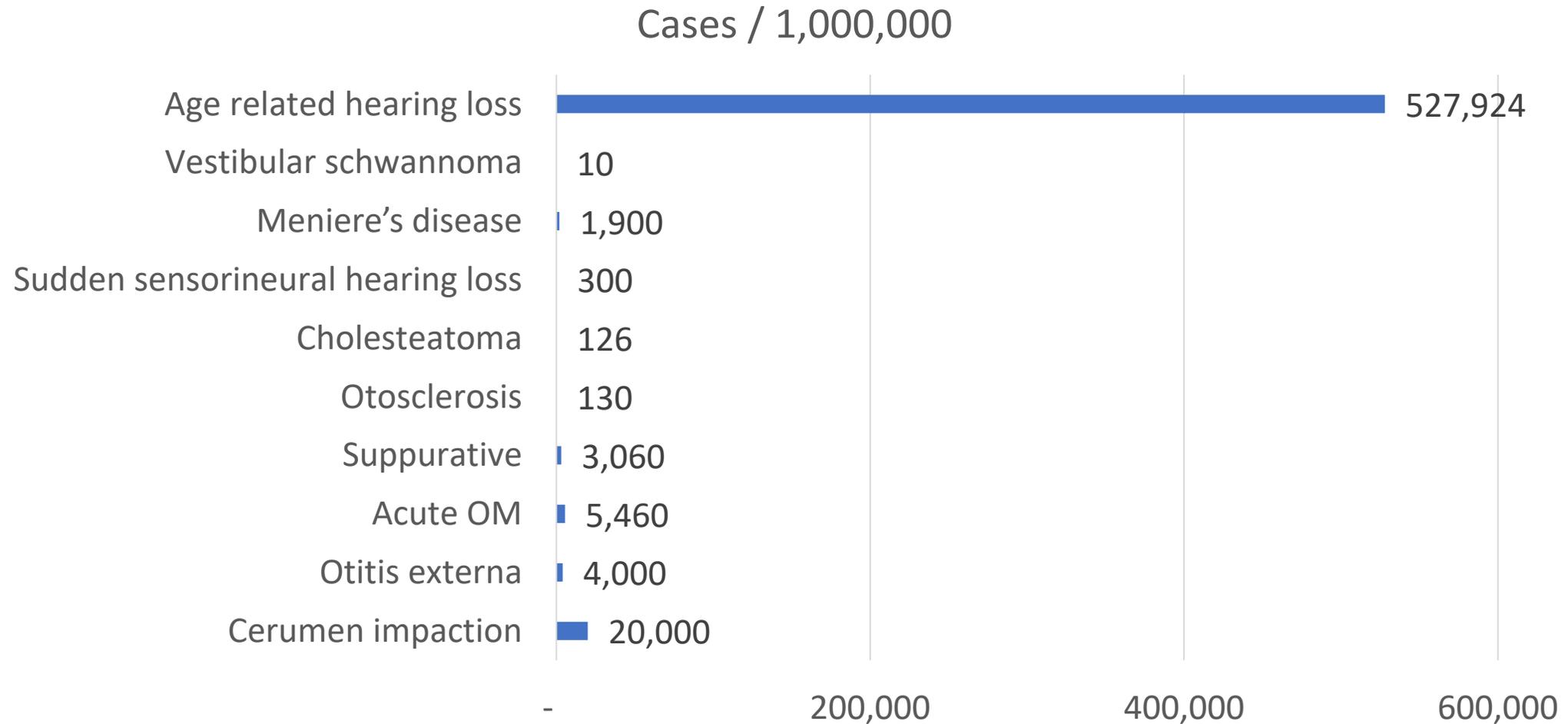
38.2 Million (14.3%) Americans aged 12 years or older have hearing loss



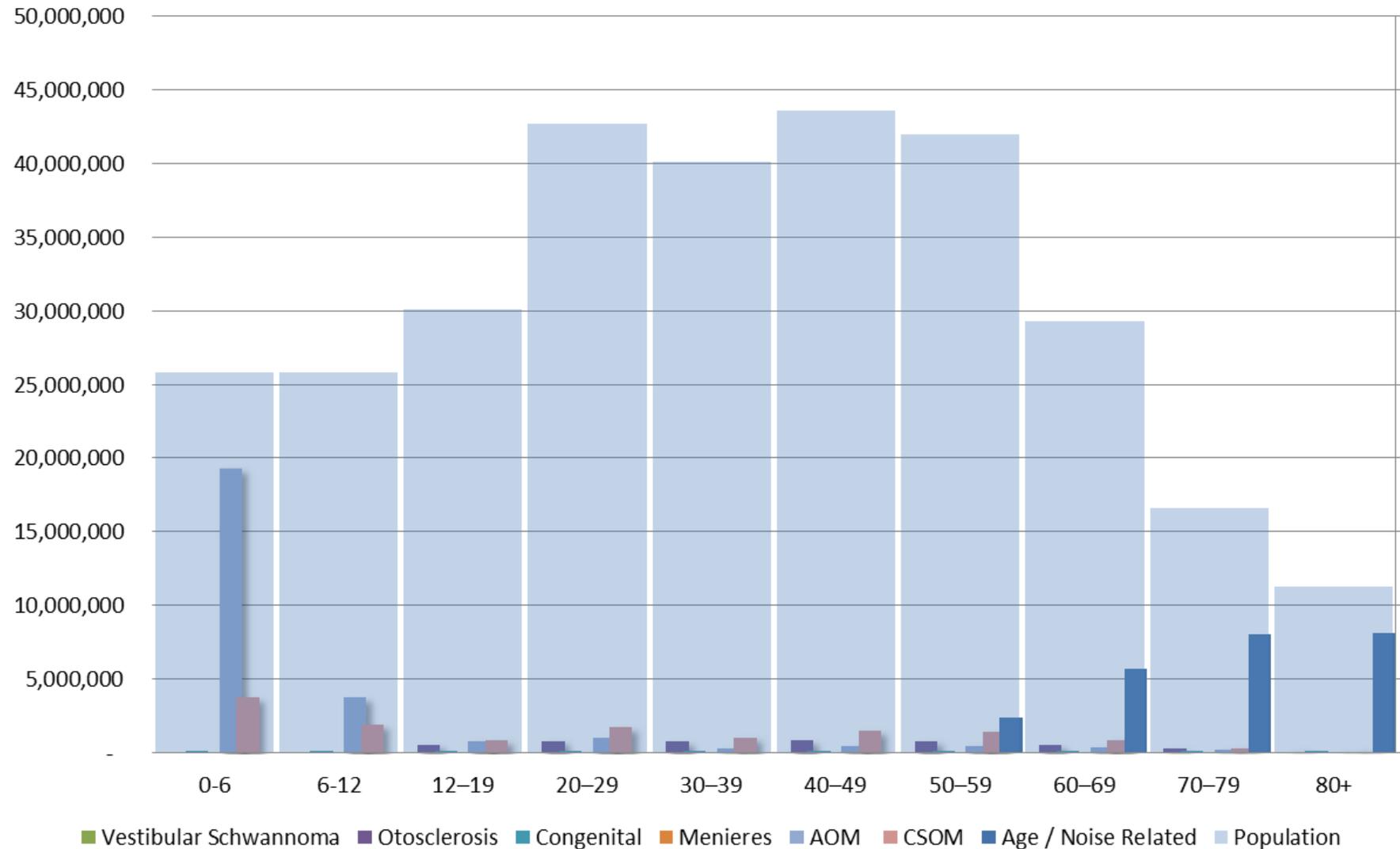
Ear Disease Prevalence (age \geq 50 yrs)



Diseases (age \geq 50 yrs)



Individuals in Population with Hearing Loss / Ear Disease



Co-morbidities

Individuals with moderate hearing loss



Backing up other studies with similar findings, the report noted that over a decade of data on this very large group of older people shows that untreated hearing loss was associated with **46% higher total healthcare costs.**

Co-Morbidities

Physical

- Falling
- Cardiovascular disease/Hypertension
- Diabetes
- Thyroid disease
- Dementia / Cognitive decline

Mental

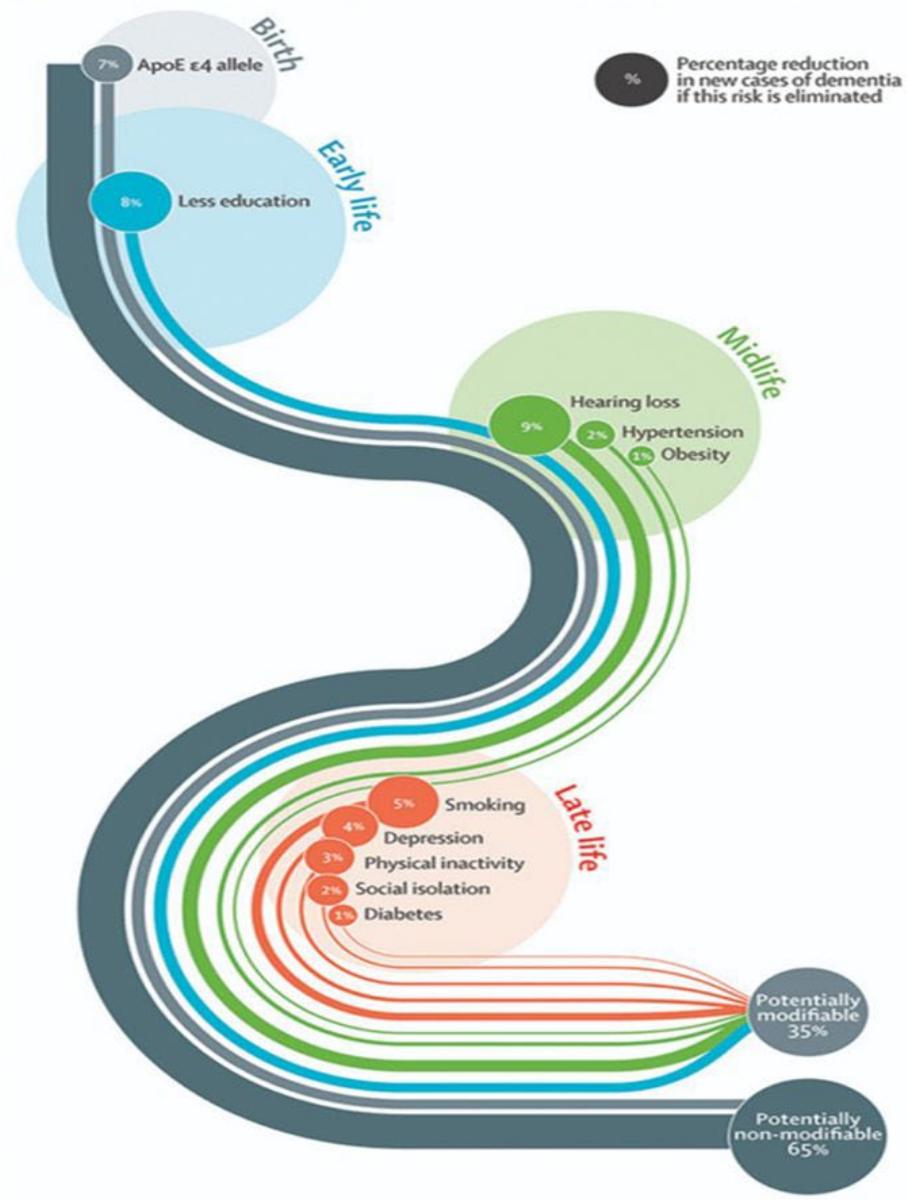
- Depression
- Anxiety
- Social Isolation / Loneliness
- Q of L

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 - ✓ Cochlear Function
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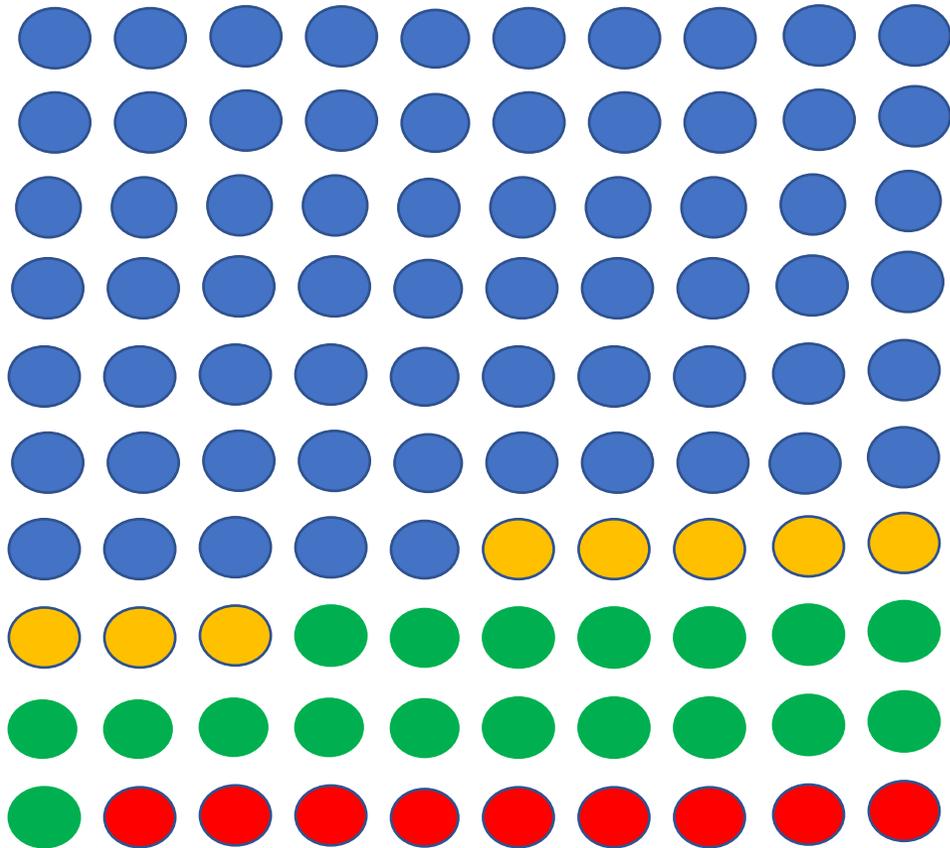
A quick discussion about Epidemiology / Public Health

Risk factors for dementia

The Lancet Commission presents a new life-course model showing potentially modifiable, and non-modifiable, risk factors for dementia.



Dementia Patients



Lancet

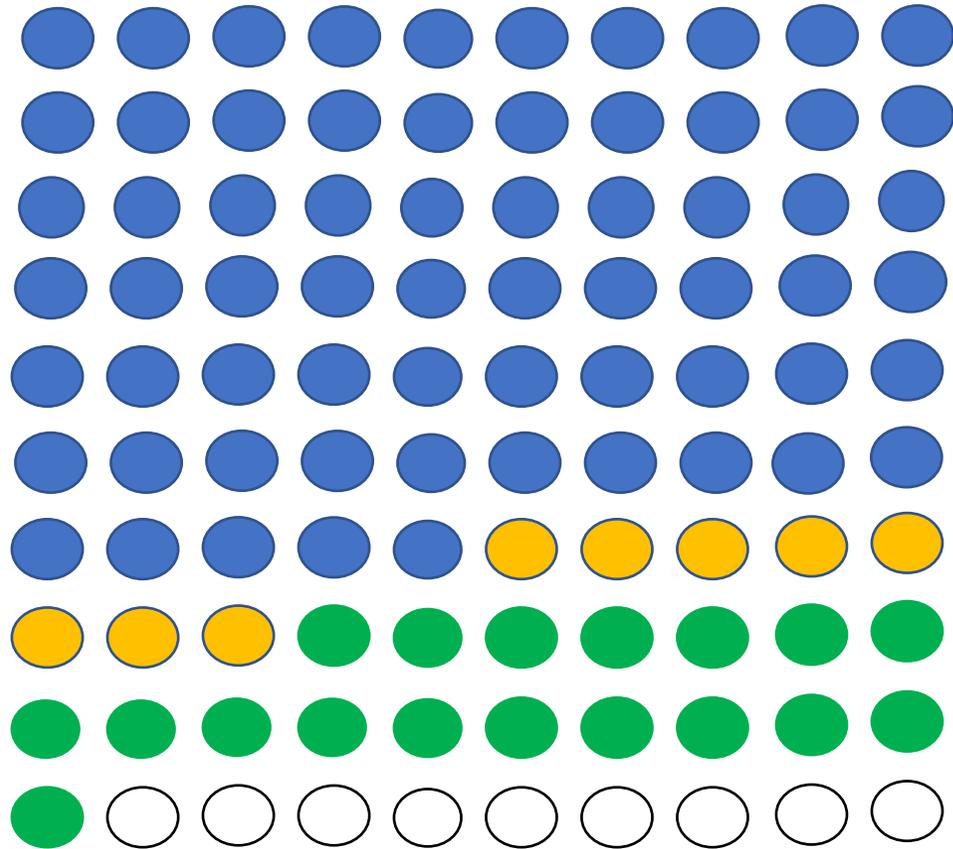
65% non-modifiable

8% Early life

27% Modifiable (mid-life +)

- 1% Diabetes
- 2% Social Isolation
- 3% Physical Activity
- 4% Depression
- 5% Smoking
- 1% Obesity
- 2% Hypertension
- 9% Hearing

Eradicate/Eliminate Hearing Loss



Reduce Dementia by 9%

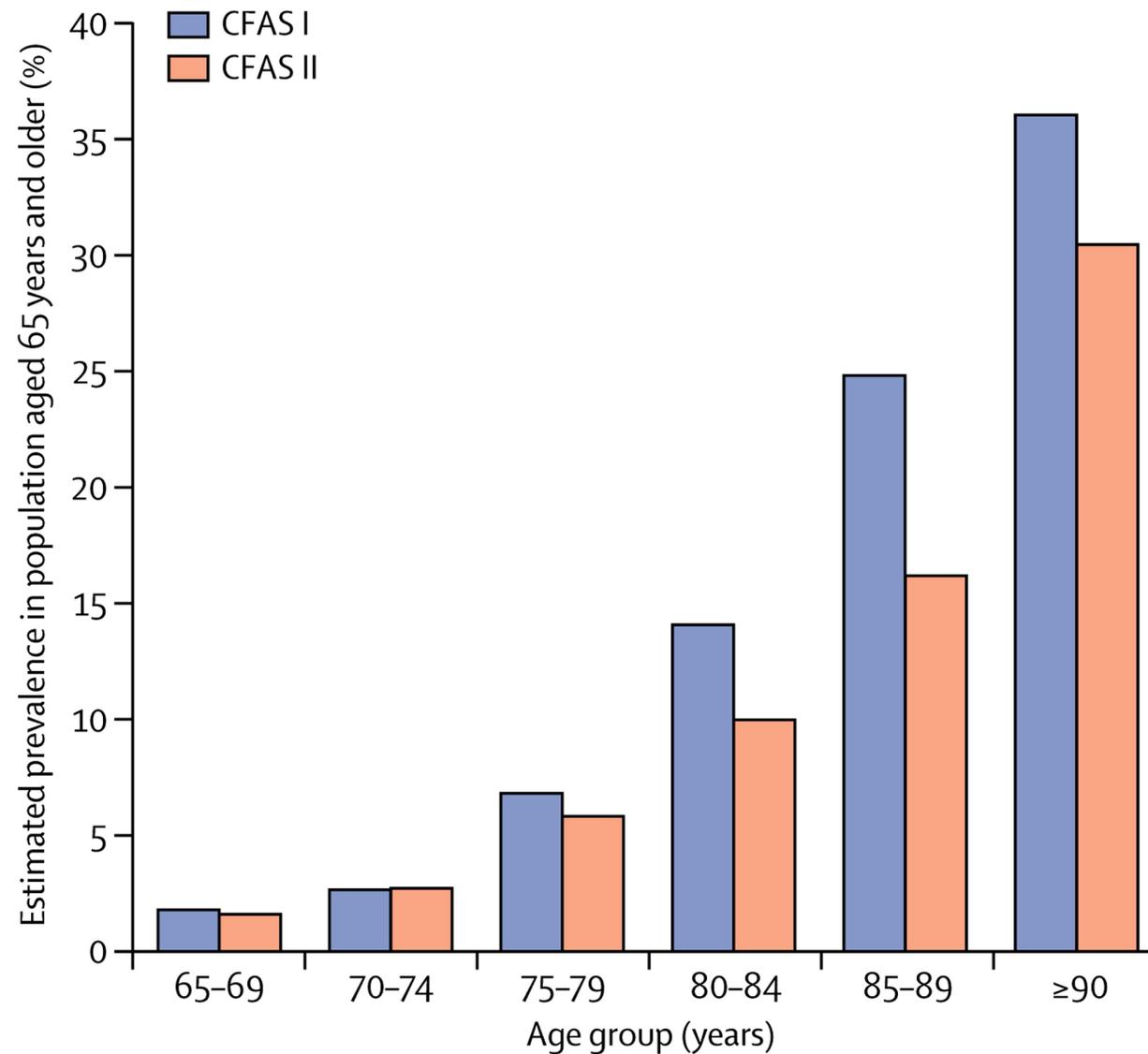
Lancet

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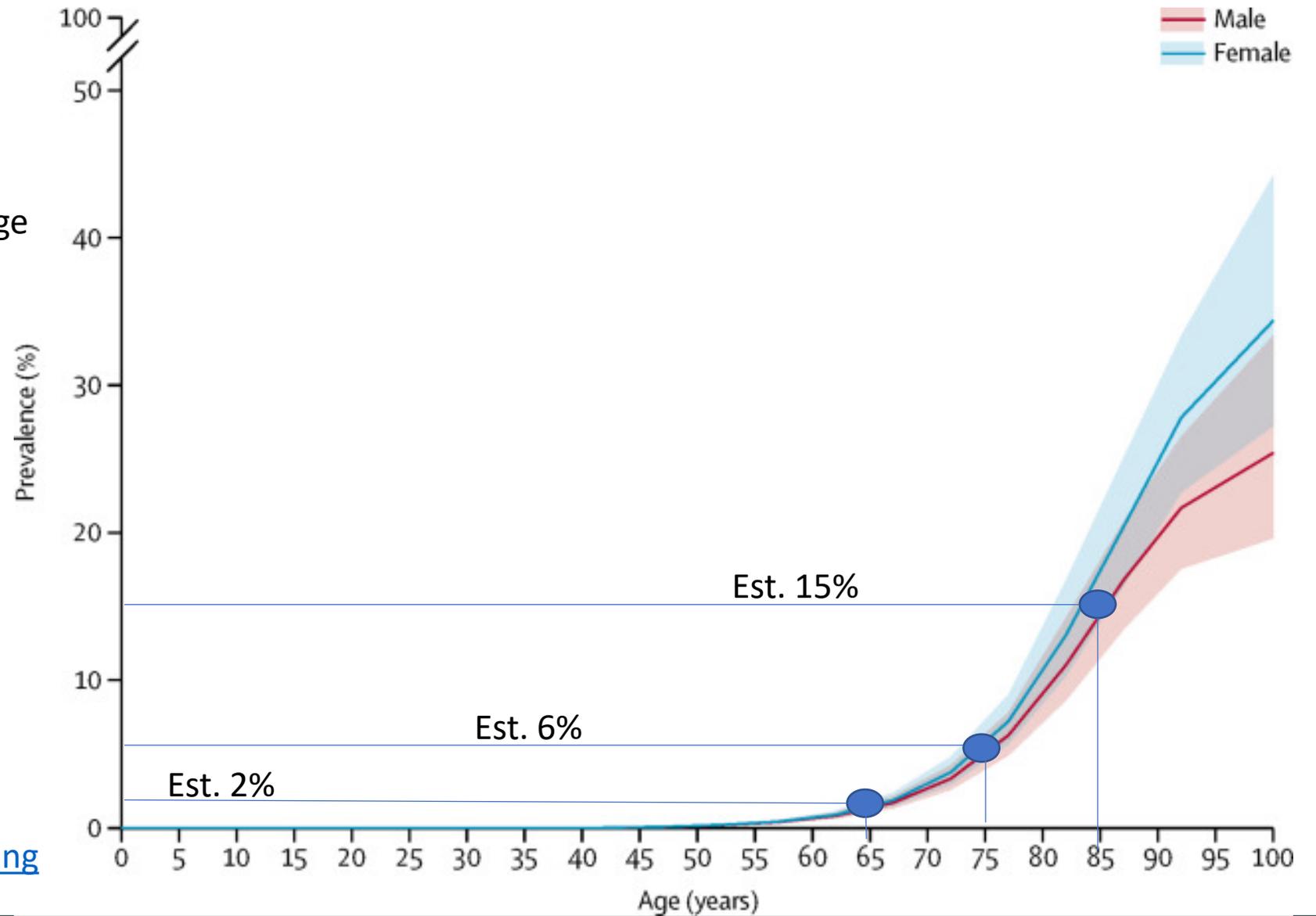
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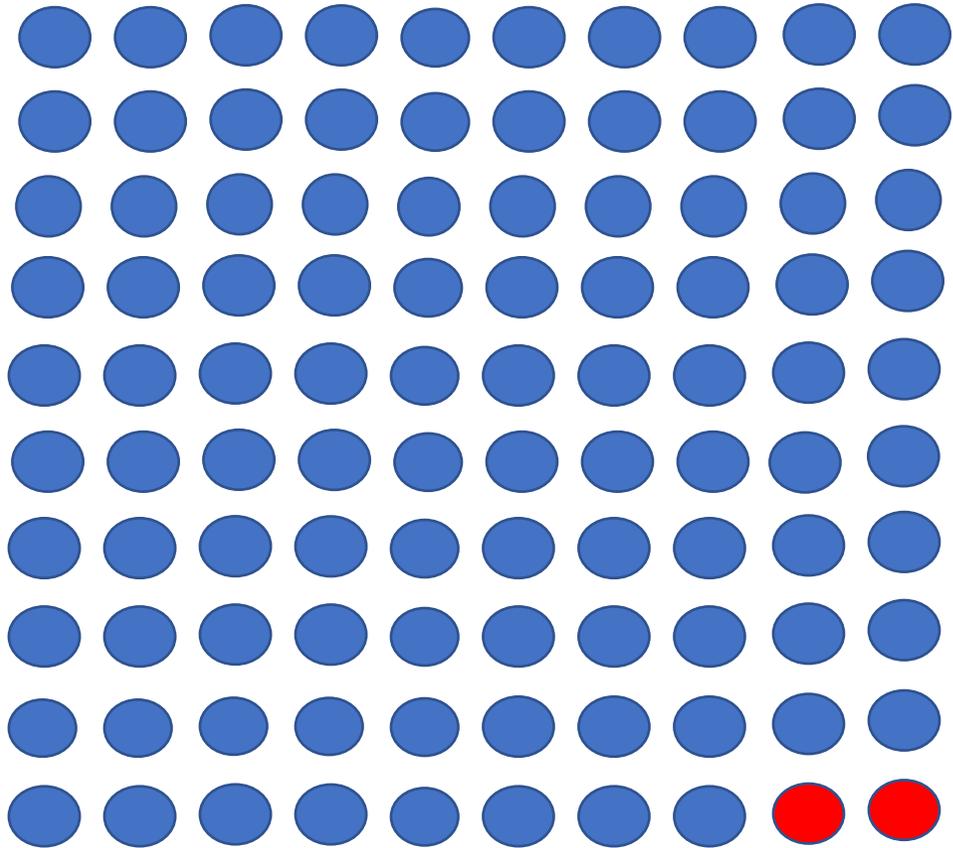


[The Lancet](#)

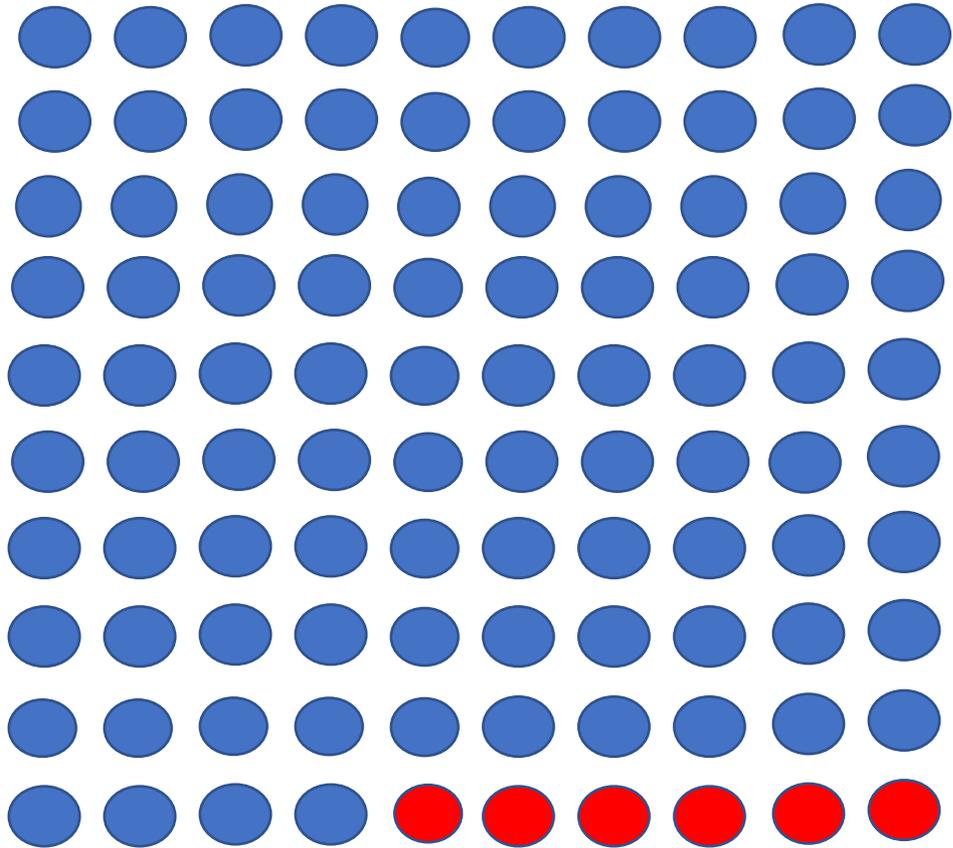
[A two-decade comparison of prevalence of dementia in individuals aged 65 years and older from three geographical areas of England: results of the Cognitive Function and Ageing Study I and II -](#)

Incidence of Dementia by Age

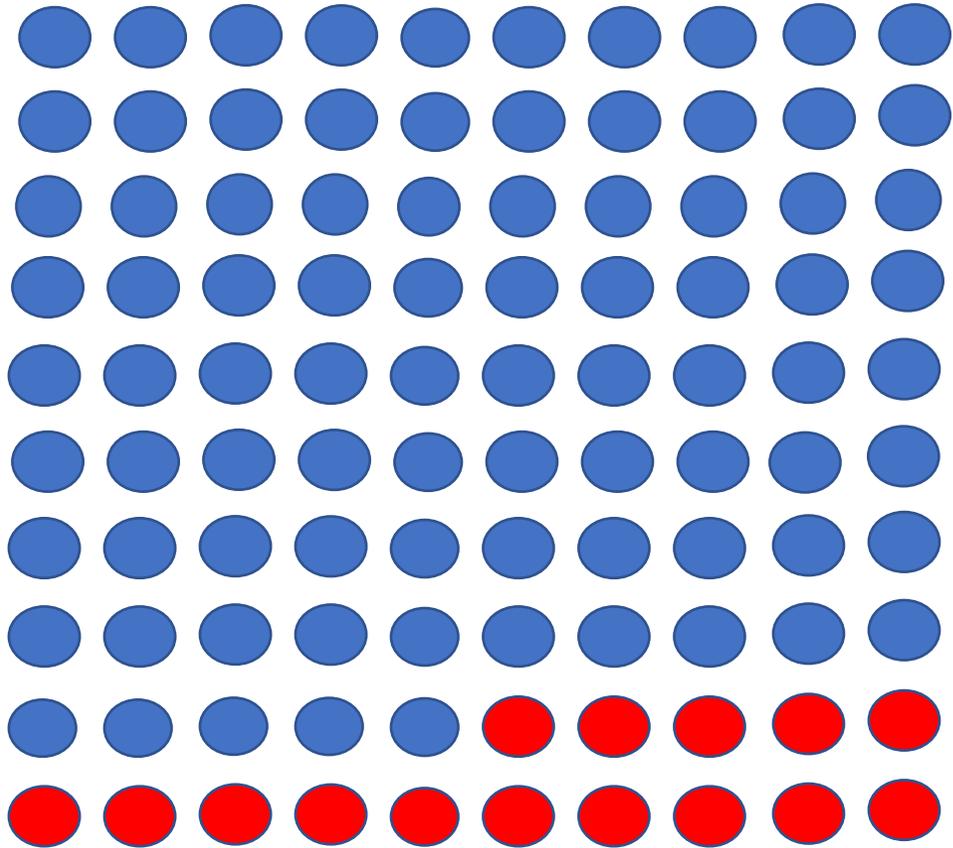




Incidence of
Cognitive Decline
Est age 65 – 2%



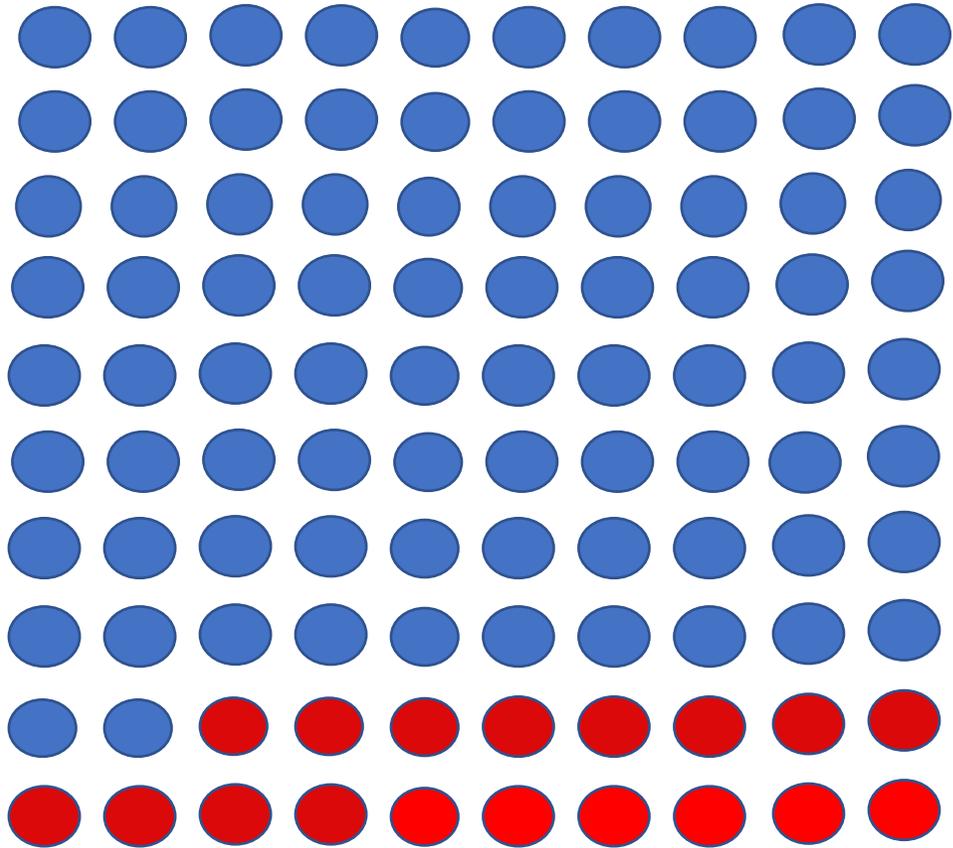
Incidence of
Cognitive Decline
Est age 75 – 6%
(3X more likely than
age 65)



Incidence of Cognitive Decline

Est age 85 – 15%

- 2.5X more likely than age 75 (6%)
- 7.5X more likely than age 65 (2%)



Incidence of
Cognitive Decline
Est age 75 – 6%

Add Moderate
hearing loss and it is
3x more likely (risk
factor) – 18%

Increased Risk with Hearing Loss

- In a study that tracked 639 adults for nearly 12 years, Johns Hopkins expert [Frank Lin, M.D., Ph.D.](#), and his colleagues found that mild hearing loss doubled dementia risk. Moderate loss tripled risk, and people with a severe hearing impairment were five times more likely to develop dementia.
 - Mild – 2X
 - Moderate – 3X
 - Severe – 5X

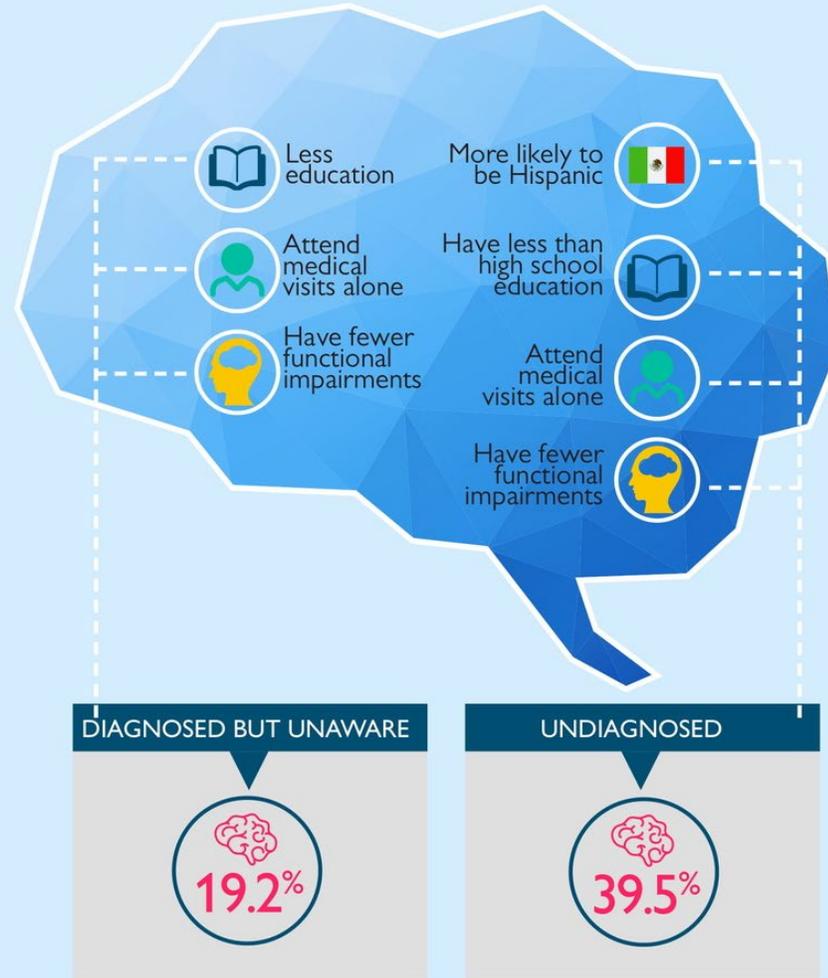


Public Health and Individual Health

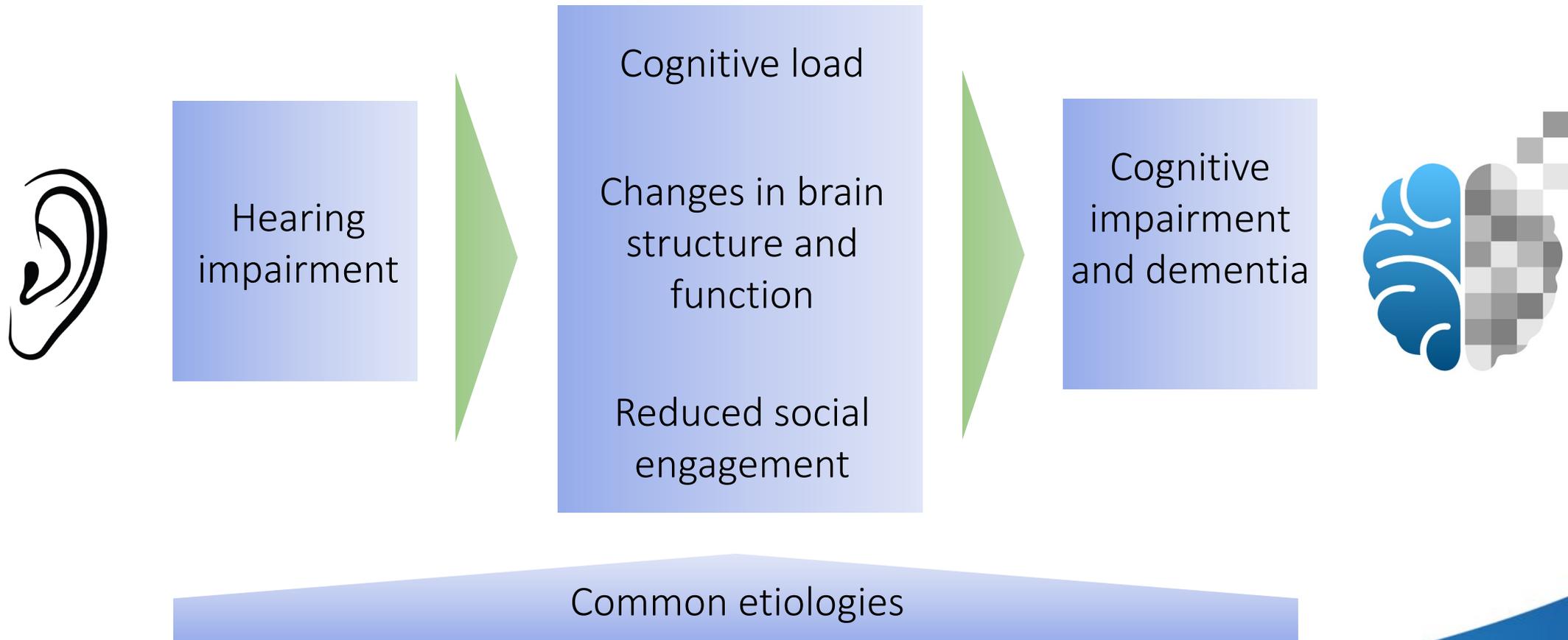
- Public Health Data provides Risk or Odds for an event
- We must assess each patient to see how they are progressing in their journey....it should be monitored over their lifetime

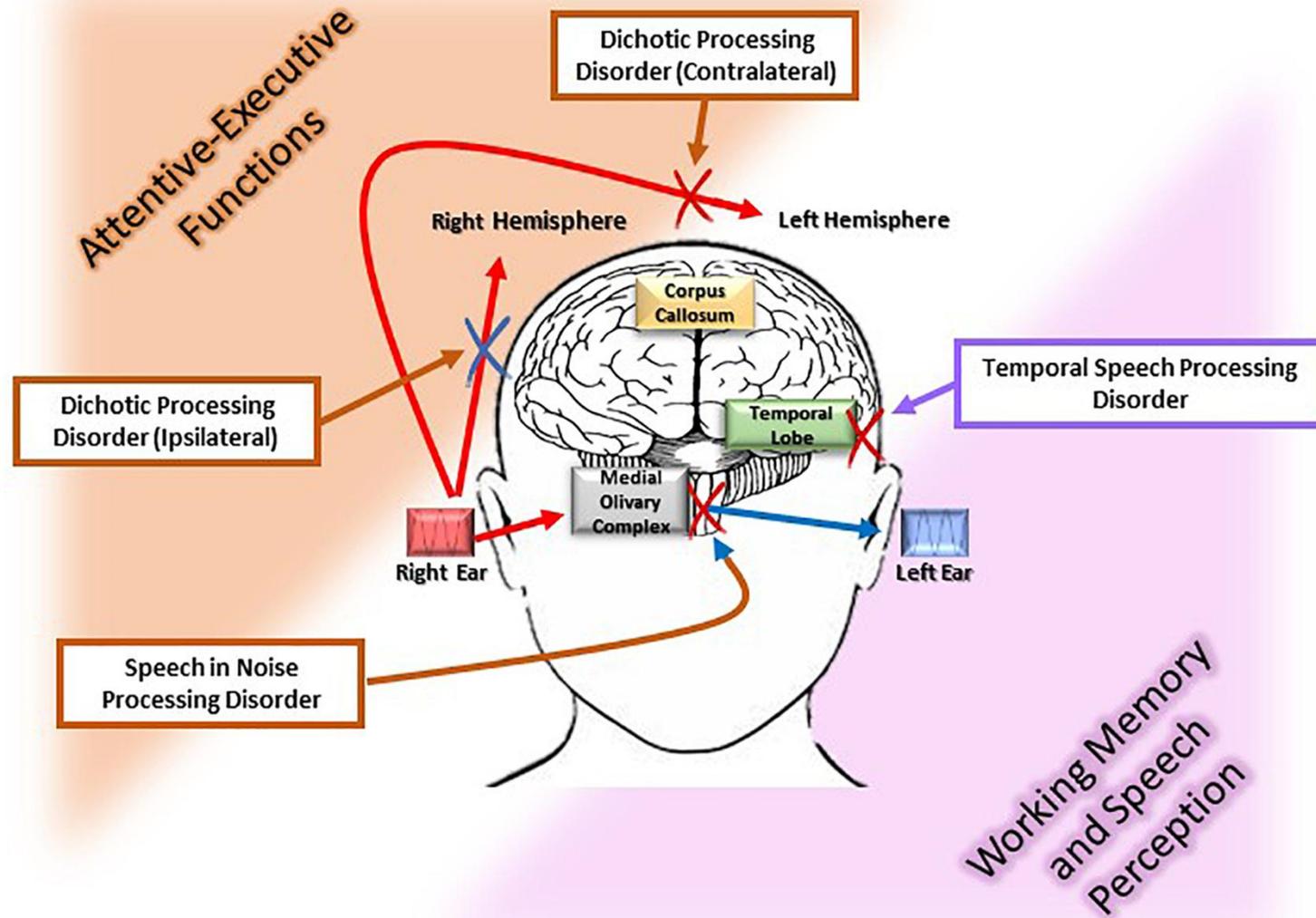
PROBABLE DEMENTIA

585 adults ages 65 and older from the National Health and Aging Trends Study, started in 2011, who met criteria for probable dementia and had three years of continuous, fee-for-service Medicare claims prior to 2011.



The impact of hearing impairment on cognitive performance





The Age-Related Central Auditory Processing Disorder: Silent Impairment of the Cognitive Ear

Rodolfo Sardone^{††} et.al, Front. Neurosci., 14 June 2019

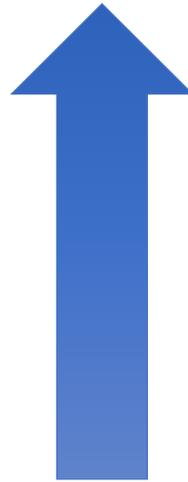
The role of cognition in processing sound

Bottom-up processing

Afferent nervous system

➤ Audibility

- Hearing machinery sends sound information to the brain for instant recall
- Lightning fast
- Lacks context



Top-down processing

Efferent nervous system

➤ Cognition

- Brain uses working memory and contextual clues to rapidly recognize sounds
- Deliberative
- Interpretive



Audiogram

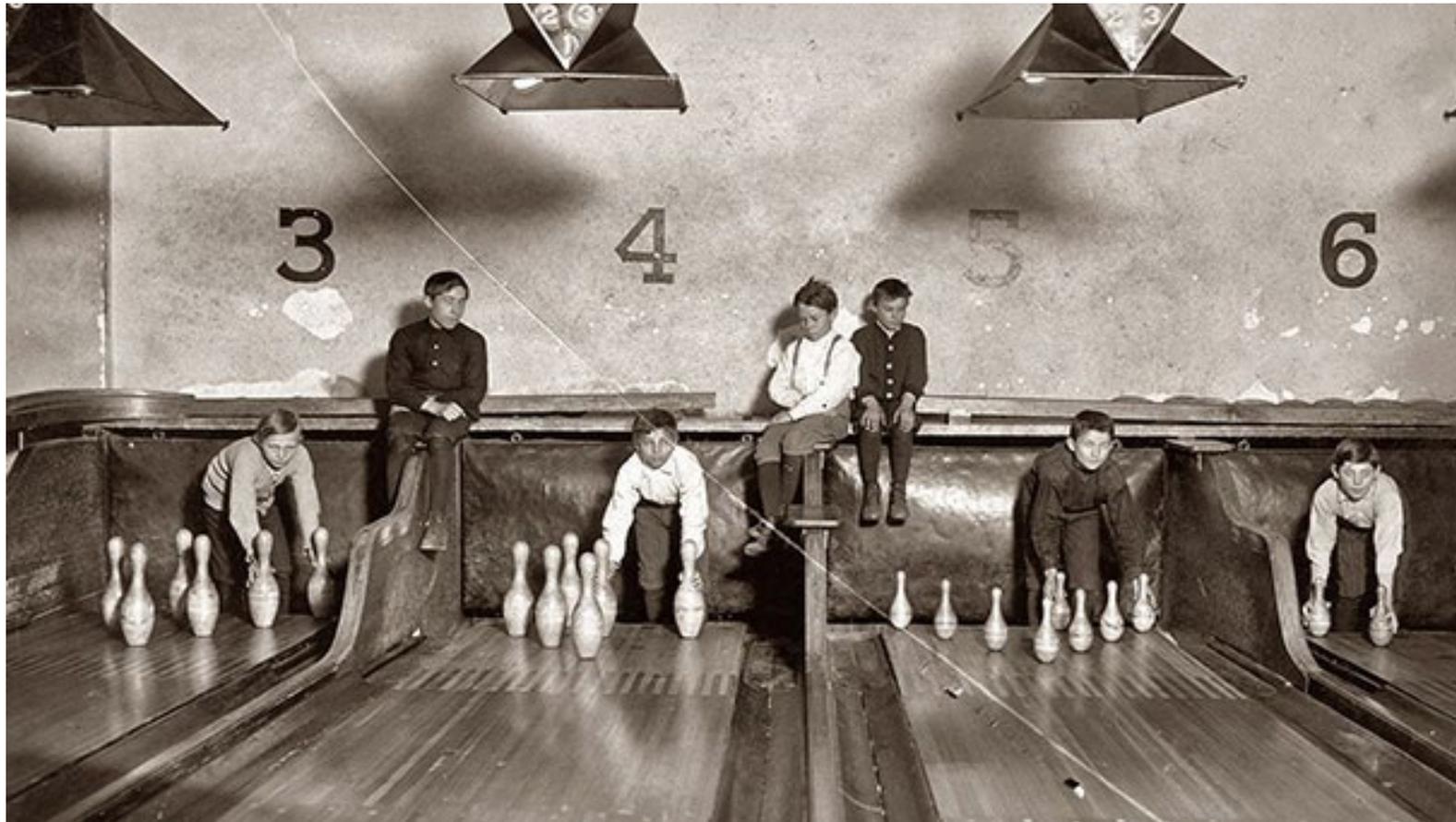
Cognitive screening

- Patients with hearing loss are more dependent on top-down processing to compensate for a degraded sound signal
- Understanding what cognitive resources the patient is starting with can help the audiologist set expectations when embarking on a hearing intervention

When Hearing Loss is Treated:

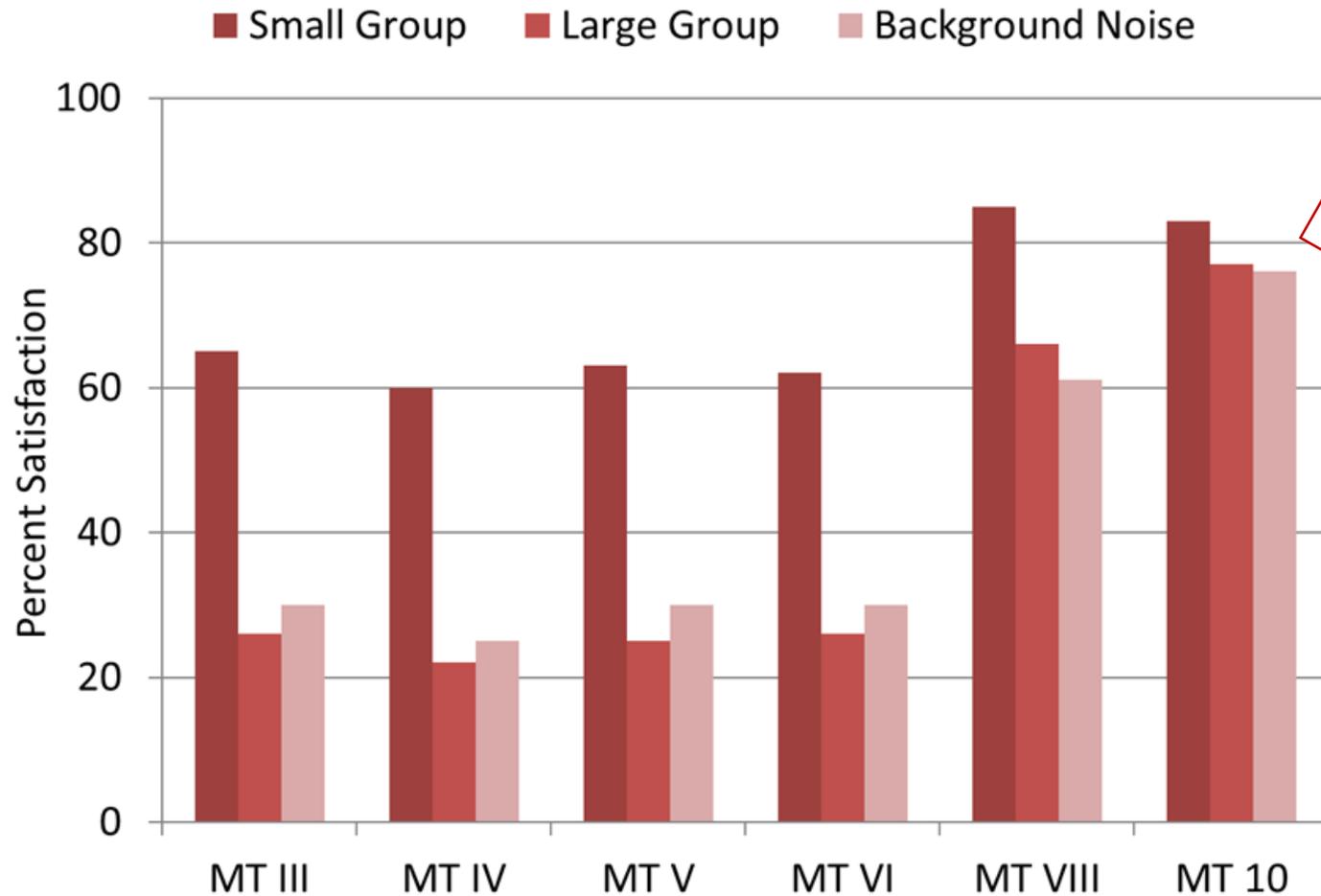
- Patients report benefits that include:
- Better relationships with their families
- Better feelings about themselves
- Improved mental health
- Greater independence and security
- Improved income/earnings
- Quality of life enhancements

Risks to the Profession



Extinct Professions and Services

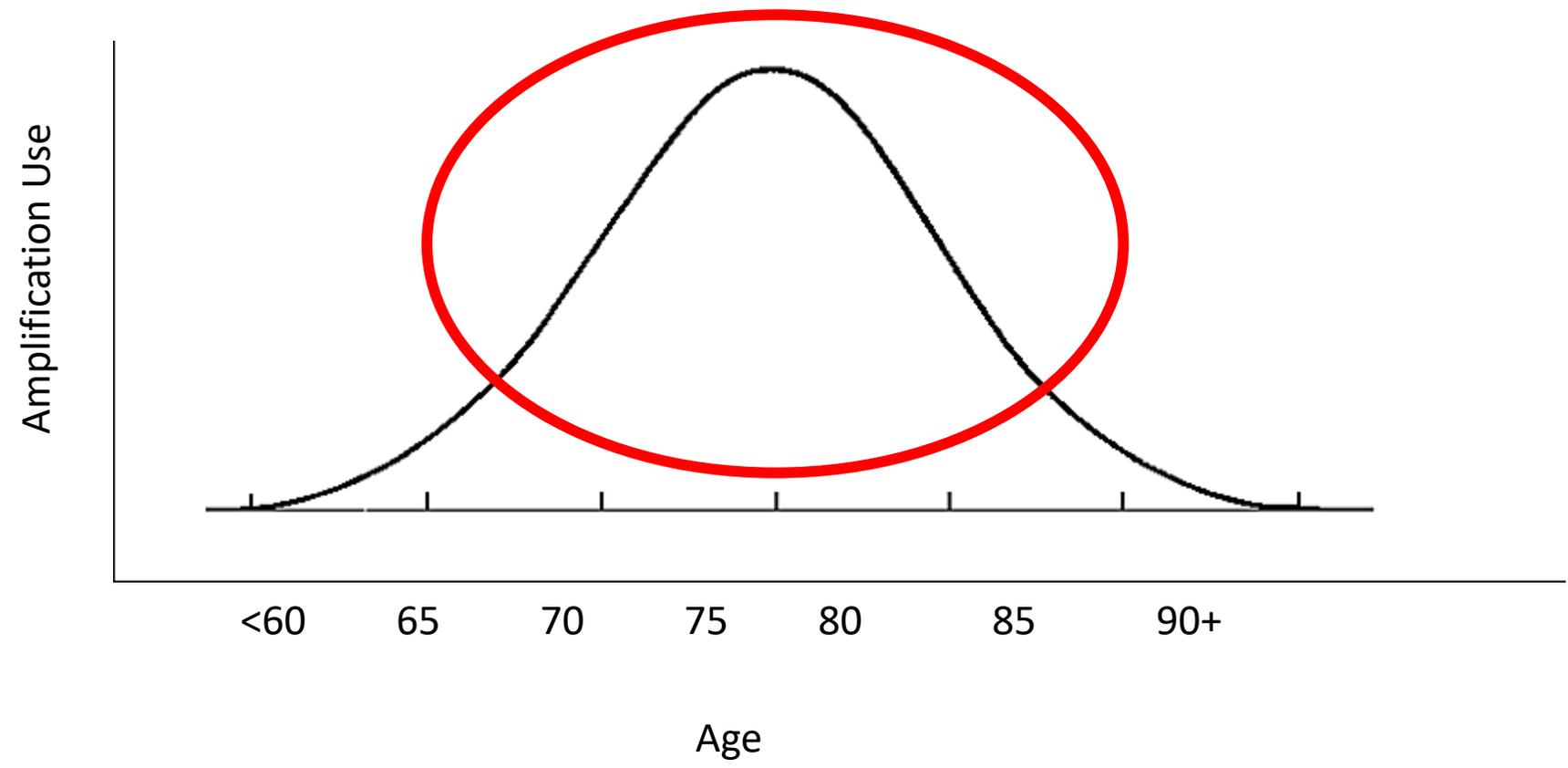
We've come a long way, baby!



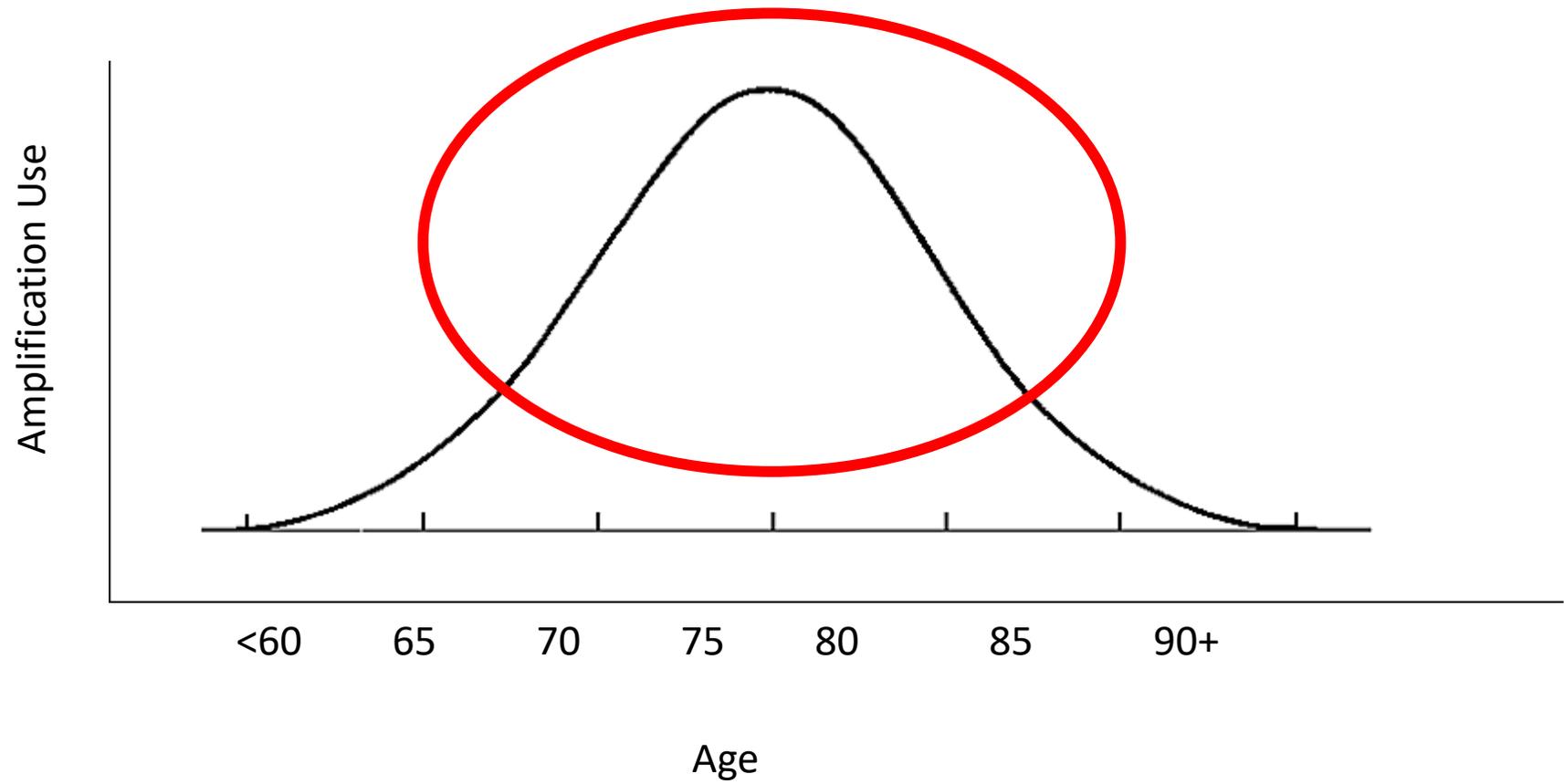
Approaching satisfaction of those with normal hearing?

Note the especially huge increase over time for large group and background noise

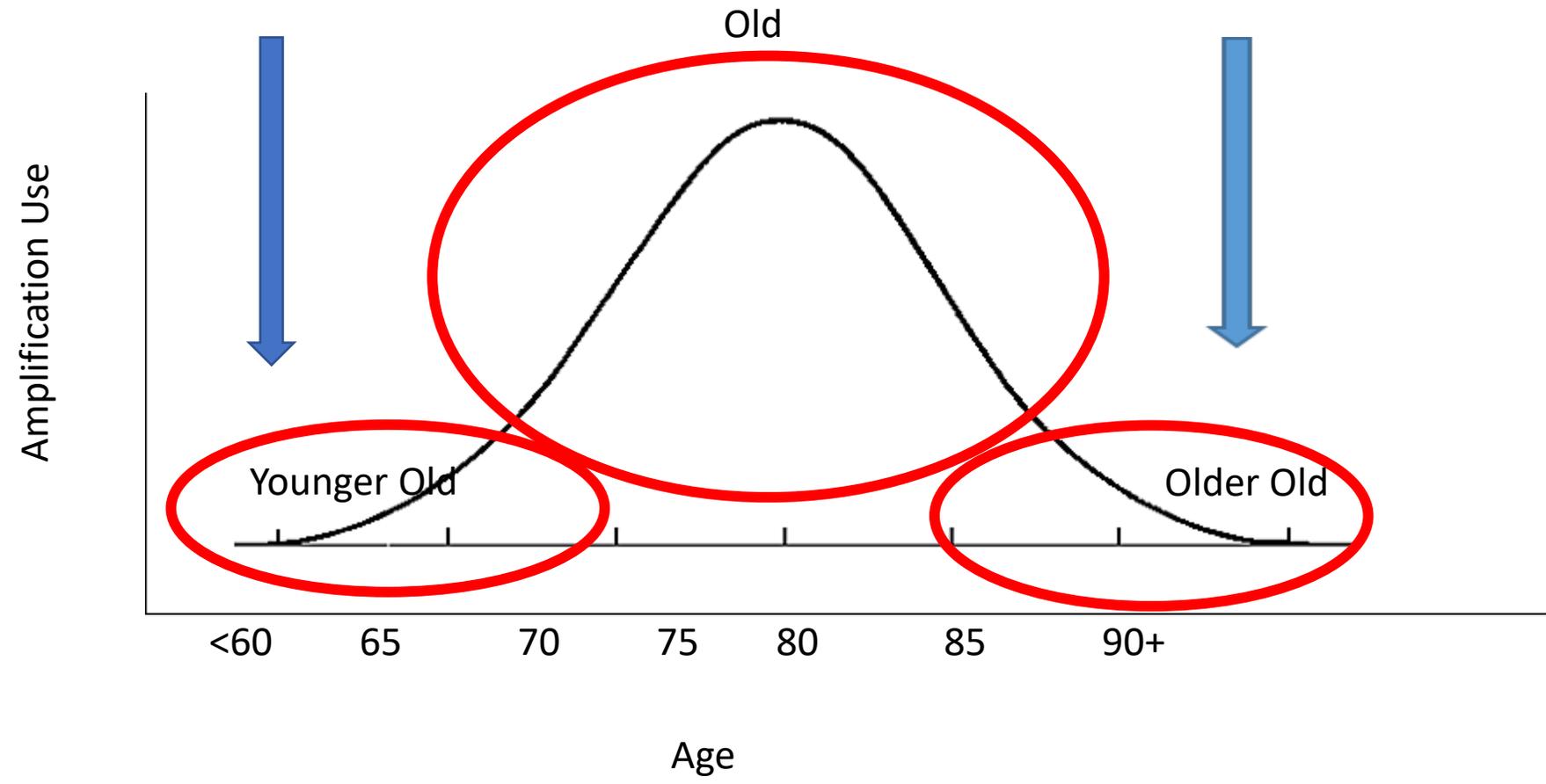
Hearing Aids



Hearing Aids +



Hearing Aids +
Basic Devices Cochlear Implants Alternative Devices

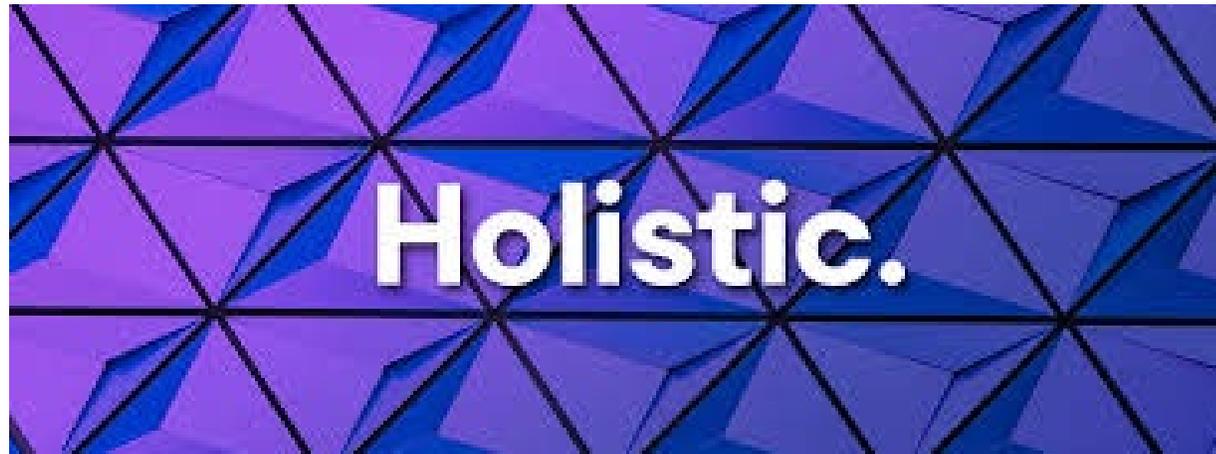


What might a Medical Management Protocol look like?

Functional Status

Two approaches:

1. Ability to communicate in daily activities
2. Health-related quality of life



Step 1: Daily Activities Involving Communication

Goal	Hardly Ever	Occasionally	Half the Time	Most of the time	Almost Always
To enjoy my visits with family at dinners		C		<input checked="" type="checkbox"/>	E
To become more actively involved in my church group meetings	C		<input checked="" type="checkbox"/>		E

Patient Expectations Worksheet

MODIFIED VERSION OF THE CLIENT ORIENTED SCALE OF IMPROVEMENT (COSI)

Modified from Dillon, H., James, A., & Ginis, J. (1997). Client Oriented Scale of Improvement (COSI) and its relationship to several other measures of benefit and satisfaction provided by hearing aids. Journal of the American Academy of Audiology, 8(1), 27-43.

Take a moment to think about what goals you would like to achieve during the group program. Write down your goals in the table below and then number them in the box according to their order of importance.

Name: _____

Date Needs Established: _____

Date Outcome Assessed: _____

SPECIFIC NEEDS

Indicate Order of Significance

- 1** To enjoy the conversations with my friends at weekly social outings
- 2** To become more actively involved in my church group meetings
- 3** To appreciate and laugh at the punch lines on Netflix comedies
- 4** To enjoy my visits with family at dinners

DEGREE OF CHANGE				
<i>Worse</i>	<i>No Difference</i>	<i>Slightly Better</i>	<i>Better</i>	<i>Much Better</i>

Isn't Health-Related
Quality of Life more
than communication
ability?

Hearing Loss and Quality of Life - What Clinicians Need to Know
Brian Taylor Presentation 2021

Quality of Life =
The Human
Performance of
the Individual



Taylor, Brian - Hearing Loss and Quality of Life - What Clinicians
Need to Know, Presentation 2021

Quality of Life

“Multidimensional Construct Involving Physical, Mental, Emotional, And Social Function” – US Dept of Health and Human Services

- Several facets:
 - “in touch” with your environment
 - Physical health
 - Mental or cognitive health
 - Emotional or psychological health
 - Ability to socialize with others
 - Work-related activities
 - Ability to get around and do things independently

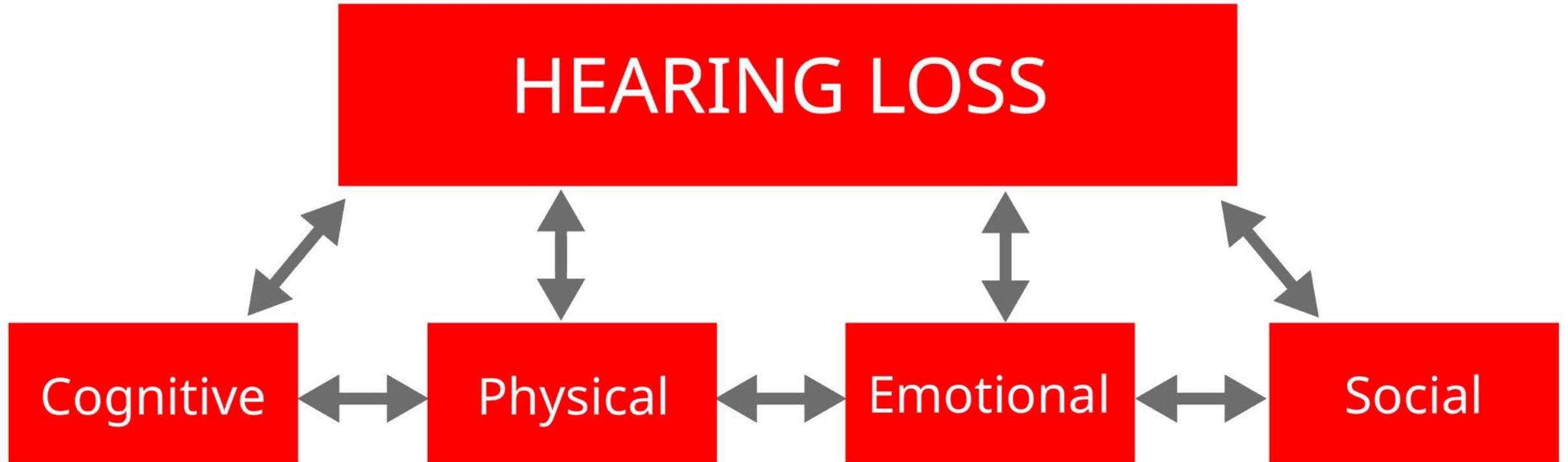
The Ultimate Outcome because it captures well-being and independence

Hearing Loss and Quality of Life

Three population- based studies

1. 2003 study from the Beaver Dam group:
 - Greater levels of hearing loss were equated with poorer overall QofL
2. 2007 study from the Blue Mountains group had similar findings:
 - The greater the hearing loss, the poorer the overall QofL scores.
3. 2012 Italian study indicated:
 - **39%** of people between 60 and 90 years of age with self-reported **hearing loss** report excellent QofL compared to **68%** of people the same age with self-reported **normal hearing**.

Four Quality of Life Factors



Taylor, Brian - Hearing Loss and Quality of Life - What Clinicians Need to Know, Presentation 2021

Step 2: Assess self-reported difficulties (emotional and social)

Hearing Handicap Inventory Screening Questionnaire for Adults

1) Answer **No**, **Sometimes** or **Yes** for each question.

2) Do not skip a question if you avoid a situation because of a hearing problem.

3) If you use a hearing aid, please answer according to the way you hear with the aid.

	No	Sometimes	Yes	
1. Does a hearing problem cause you to feel embarrassed when you meet new people?	0	2	4	
2. Does a hearing problem cause you to feel frustrated when talking to members of your family?	0	2	4	
3. Do you have difficulty hearing / understanding co-workers, clients or customers?	0	2	4	
4. Do you feel handicapped by a hearing problem?	0	2	4	
5. Does a hearing problem cause you difficulty when visiting friends, relatives or neighbors?	0	2	4	
6. Does a hearing problem cause you difficulty in the movies or in the theater?	0	2	4	
7. Does a hearing problem cause you to have arguments with family members?	0	2	4	
8. Does a hearing problem cause you difficulty when listening to TV or radio?	0	2	4	
9. Do you feel that any difficulty with your hearing limits or hampers your personal or social life?	0	2	4	
10. Does a hearing problem cause you difficulty when in a restaurant with relatives or friends?	0	2	4	
Totals:				

* Adapted from: Ventry, I, Weinstein, B. "Identification of elderly people with hearing problems" American Speech-Language-Hearing Association. 1983, 25, 37-42. *

Largest predictors of hearing aid use



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Totals:			

See the recent Ear & Hearing article by Larry Humes on Auditory Wellness and my HHIE.



Largest predictors of hearing aid use



* Adapted from: Ventry, I., Weinstein, B. "Identification of elderly people with hearing problems" American Speech-Language-Hearing Association. 1983, 25, 37-42. *

Step 3: Assess overall health (broadly)

EQ-5 self-report of overall health

Under each heading, please tick the ONE box that best describes your health TODAY.

MOBILITY

- I have no problems in walking about
- I have some problems in walking about
- I am confined to bed

SELF-CARE

- I have no problems with self-care
- I have some problems washing or dressing myself
- I am unable to wash or dress myself

USUAL ACTIVITIES (e.g. work, study, housework, family or leisure activities)

- I have no problems with performing my usual activities
- I have some problems with performing my usual activities
- I am unable to perform my usual activities

PAIN/DISCOMFORT

- I have no pain or discomfort
- I have moderate pain or discomfort
- I have extreme pain or discomfort

ANXIETY/DEPRESSION

- I am not anxious or depressed
- I am moderately anxious or depressed
- I am extremely anxious or depressed

Step 3: Assess mental health (depression)

PHQ – 9 Screening for Depression

TABLE 3

PHQ-9 Screening Instrument for Depression

Over the past two weeks, how often have you been bothered by any of the following problems?	Not at all	Several days	More than half the days	Nearly every day
Little interest or pleasure in doing things	0	1	2	3
Feeling down, depressed, or hopeless	0	1	2	3
Trouble falling or staying asleep, or sleeping too much	0	1	2	3
Feeling tired or having little energy	0	1	2	3
Poor appetite or overeating	0	1	2	3
Feeling bad about yourself—or that you are a failure or have let yourself or your family down	0	1	2	3
Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
Moving or speaking so slowly that other people could have noticed; or the opposite—being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

Scoring: 1 to 4 points = minimal depression, 5 to 9 points = mild depression, 10 to 14 points = moderate depression, 15 to 19 points = moderately severe depression, 20 to 27 points = severe depression.

PHQ = Patient Health Questionnaire.

Adapted from Patient Health Questionnaire (PHQ) screeners. <http://www.phqscreeners.com>. Accessed February 8, 2018.

Consider Cognivue

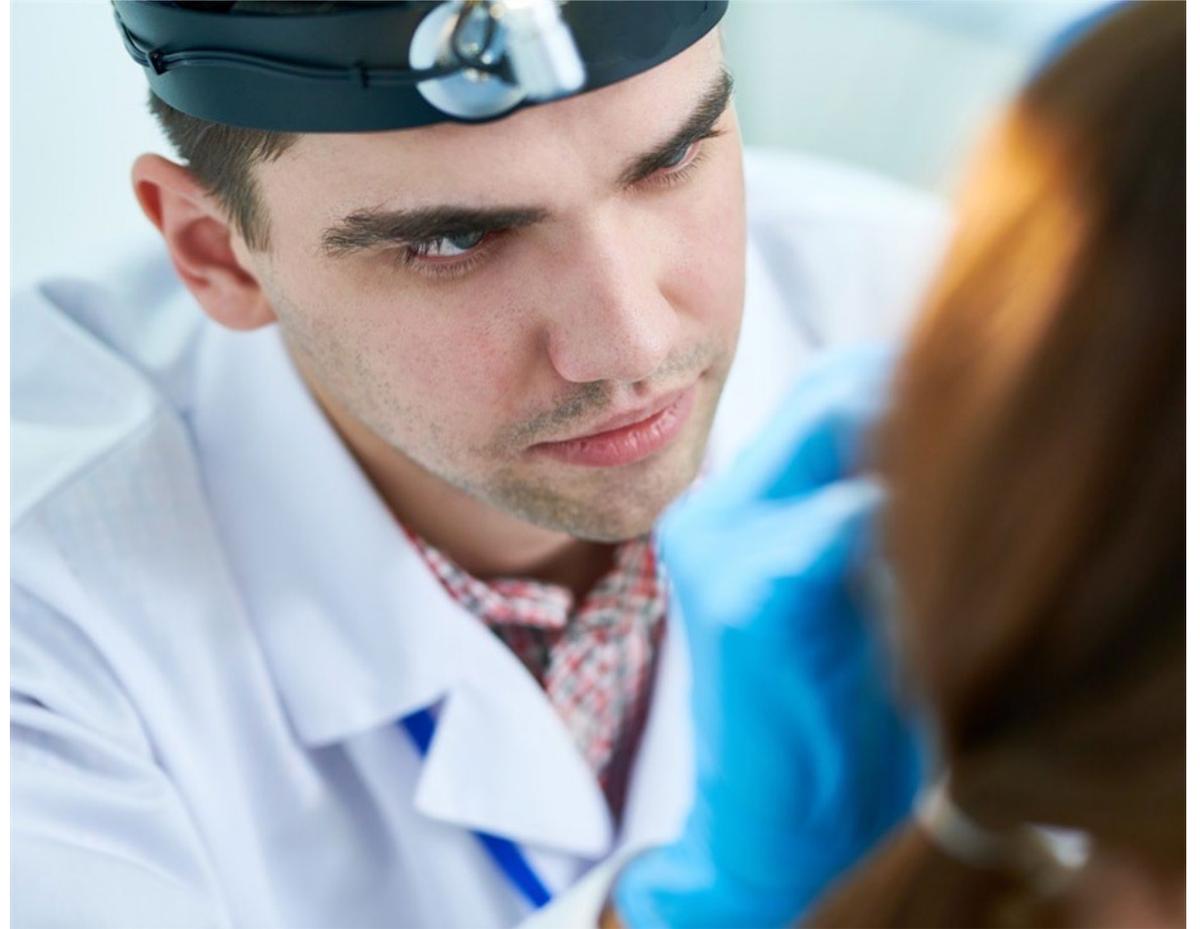


Why is it worth your time assessing Quality of Life?



Reason 1

- Holistic care
- Stand apart from on-line retailers and OTC



Reason 2

- Individualize treatment goals and long-term(life-time) follow-up



Reason 3

- Document improvements to quality of life from your intervention



A Couple More Things....

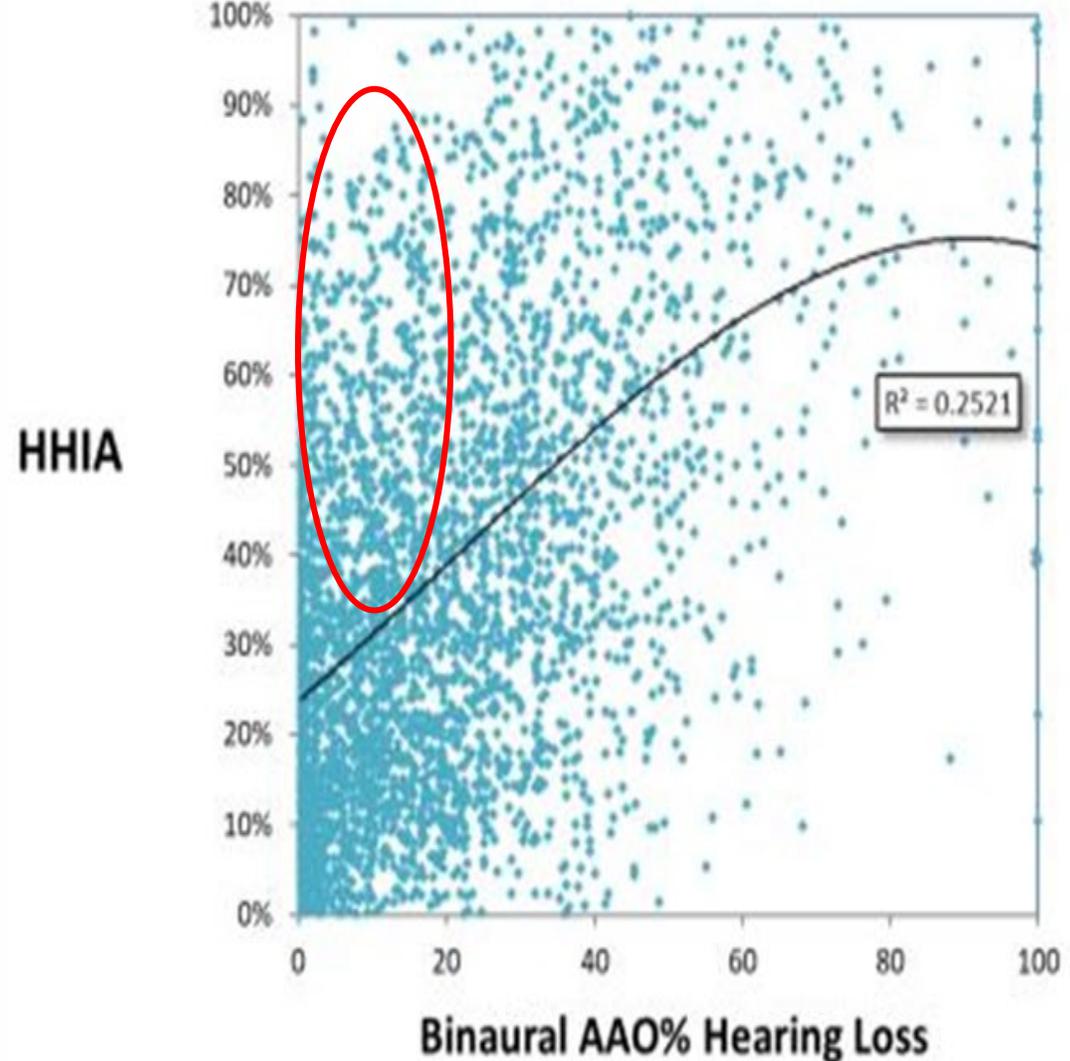
HHIA scores from 5333 patients with age or noise related hearing loss.

The higher the HHIA score, the greater the self perceived hearing difficulty.

Notice the variation in HHIA scores in individuals with 0% AAO Hearing Impairment.

Sometimes hearing difficulties can occur with little or no hearing loss.

Communication issues with no HL



APD Testing and Auditory Training



Amptify



HEARING HEALTH REIMAGINED

The World's First Digital Therapeutic for Hearing Loss

Amptify is an evidence-based hearing healthcare program that uses a proprietary digital toolkit to provide ongoing and personalized hearing rehabilitation from our world-class specialists to your diverse population.

Amptify

Discover Effective Listening

20 Sessions

Control Your Listening Experience

20 Sessions

Manage Communication Breakdowns

20 Sessions

Stamp Out Those Unhelpful Strategies

20 Sessions

Plan For Reading Lips

20 Sessions

Maintain Your Auditory Brain Skills

20 Sessions

Calm The Mind, Enhance Your Performance

20 Sessions

Boost Your Confidence

20 Sessions

Choose A Conversational Style

20 Sessions

The Power of Positive Thinking

20 Sessions

Staying Connected

20 Sessions

Your Communication Partners

20 Sessions

Hearing Loss and Speech Understanding

20 Sessions

Nutrition to Prevent Hearing Loss and Relieve Tinnitus

20 Sessions

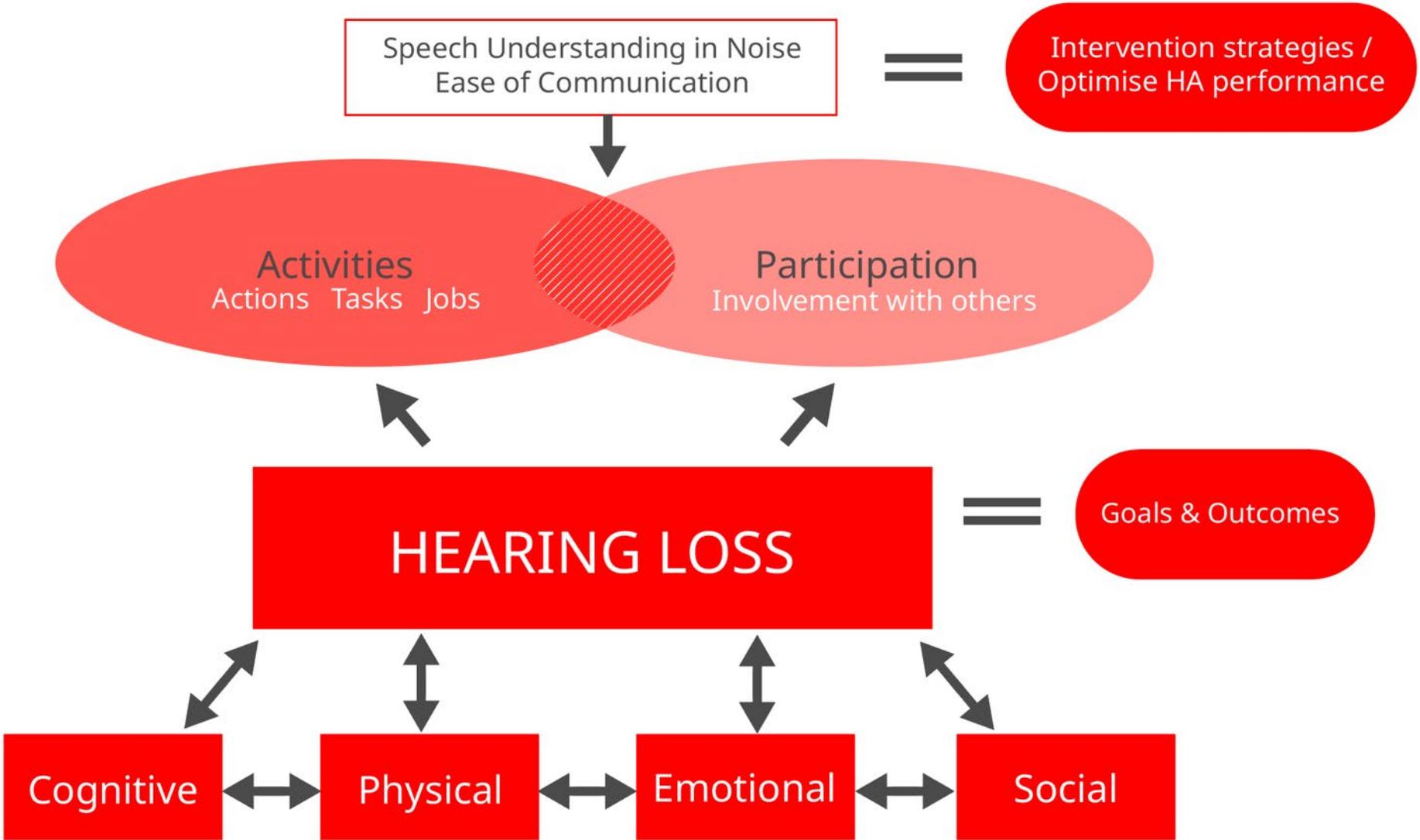
Medical Concerns and Preventing Hearing Loss

20 Sessions

Going Forward

20 Sessions

At the End of the Day...Focus on Functional Abilities



Jill Davis, AuD

Owner & Clinical Director, Victory Hearing and Balance

Dr. Jill Davis holds a Doctor of Audiology and a Bachelor's Degree in Communication Sciences and Disorders from the University of Cincinnati. She specializes in advanced digital hearing aid fittings and has extensive training and experience working with all major hearing aid manufacturers. Dr. Davis has a passion for improving communication for patients and believes music has a significant impact on our ability to understand speech. She always adheres to Best Practices (established by the recognized professional organizations AAA, ADA, and ASHA), using comprehensive diagnostic assessment protocols.



Private Practice

Services

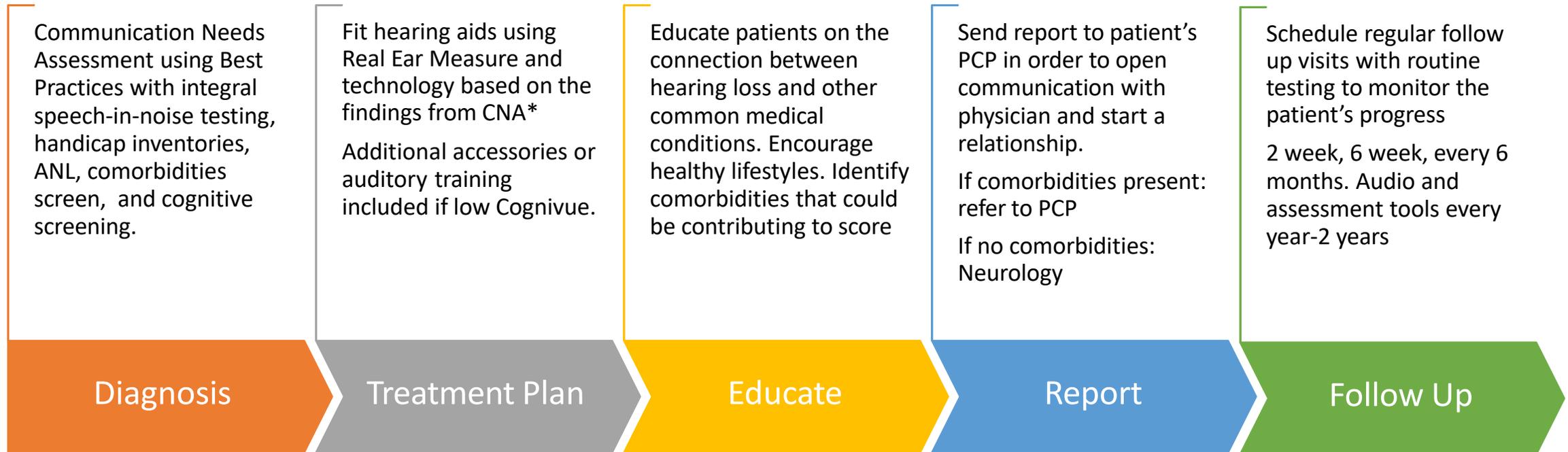
- Hearing testing- adults and some children
- Auditory Processing Disorder testing- adults and children
- Cochlear Implant Evaluations and Services
- Balance screening-BPPV testing and treatment
- Tinnitus testing and treatment
- Hearing aid fittings and services
- Noise protection, ear plugs, musician monitors
- Auditory training- unique music-based auditory training program

Referral Sources

- **2019:**
 - Web: 111 (31%)
 - Physician: 80 (22%)
 - Insurance: 50 (14%)
 - Patient referral: 41 (11%)
- **2020:**
 - Web: 111 (32%)
 - Physician: 112 (33%)
 - Insurance: 25 (7%)
 - Patient: 50 (15%)
- **2021:**
 - Web: 69 (26%)
 - Physician: 120 (45%)
 - Patient referral: 48 (18%)
 - Audiologists: 25 (9%)



Patient Experience



Patient Cohorts

Perceive loss (no loss)
and LOW Cognivue

10% of population

- Differential diagnosis:
BRAIN ISSUE
- Recommend APD
testing
- Initiate Auditory
Training
- Refer to PCP

Hearing loss and
NORMAL Cognivue

30% of population

- Differential diagnosis:
EAR ISSUE
- Treat hearing loss
- No Auditory Training

Hearing loss and *LOW*
Cognivue

55% of population

- Differential diagnosis:
EAR AND BRAIN ISSUE
- Treat hearing loss and
re-test
- If normal: **EAR ISSUE-**
monitor closely
- If remains low: **BRAIN ISSUE-**
auditory training and referral
to PCP

5% normal hearing and
normal Cognivue

Diagnosis Tools

Recipe for Success:

Communication inventory HHIA: Motivation

COSI: Communication goals

PHQ-9: Depression screening

Speech in noise test Q-SIN: Real World Experience

ANL : Tolerance to amplification

Cognitive screening: EAR or BRAIN

Comorbidities: OTHER CONDITIONS THAT IMPACT PERFORMANCE

Treatment Plan

Normal Cognivue

- Audiogram: severity and pattern can determine number of channels
- ANL: can determine level of technology
- Lifestyle: accessories, Bluetooth, budget, music, tinnitus, etc.
- What does the patient want?

Low Cognivue

- Remote microphones/FM systems
- Auditory training
- Slow attack/release?
- Less channels?
- PCP involvement
- Family counseling

Patient Education

Better Hearing is Better Healthcare

VICTORY
HEARING & BALANCE

Improving overall health and wellness through better hearing, one person at a time

Share Your Health History. Help Us to Help You Hear and Live Better. Date _____

Name _____ Date of Birth ____/____/____ Primary Care Provider _____

	YES	NO
Has your short-term memory decreased in recent years? Have you or a family member been diagnosed with Dementia or Alzheimer's?	<input type="checkbox"/>	<input type="checkbox"/>
Have you become more unsteady on your feet and fallen in recent years? Do you suffer from dizziness, vertigo or arthritis?	<input type="checkbox"/>	<input type="checkbox"/>
Do you have diabetes? Do you have a family history of diabetes?	<input type="checkbox"/>	<input type="checkbox"/>
Do you have any form of heart disease? Do you have high blood pressure or a family history of heart disease?	<input type="checkbox"/>	<input type="checkbox"/>
Is your vision checked annually? Do you have glaucoma or any type of chronic eye disease?	<input type="checkbox"/>	<input type="checkbox"/>
Have you experienced episodes of social isolation? Have you been treated for clinically diagnosed depression?	<input type="checkbox"/>	<input type="checkbox"/>
What medications do you take daily or weekly? _____ Have you received cancer treatment in recent years?	<input type="checkbox"/>	<input type="checkbox"/>
Do you have kidney disease? Is your doctor concerned about your kidney function or do you have anemia?	<input type="checkbox"/>	<input type="checkbox"/>
Do you have a family history of hearing loss? Do you have difficulty hearing at home, work or play?	<input type="checkbox"/>	<input type="checkbox"/>

Do you have thyroid disease? Y N Don't Know

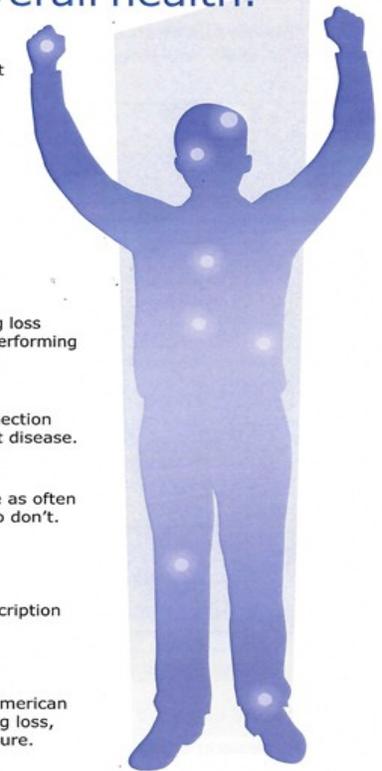
Do you have sleep apnea? Y N Don't Know

Additional Notes _____

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Connections Matter. Learn how hearing loss relates to overall health.

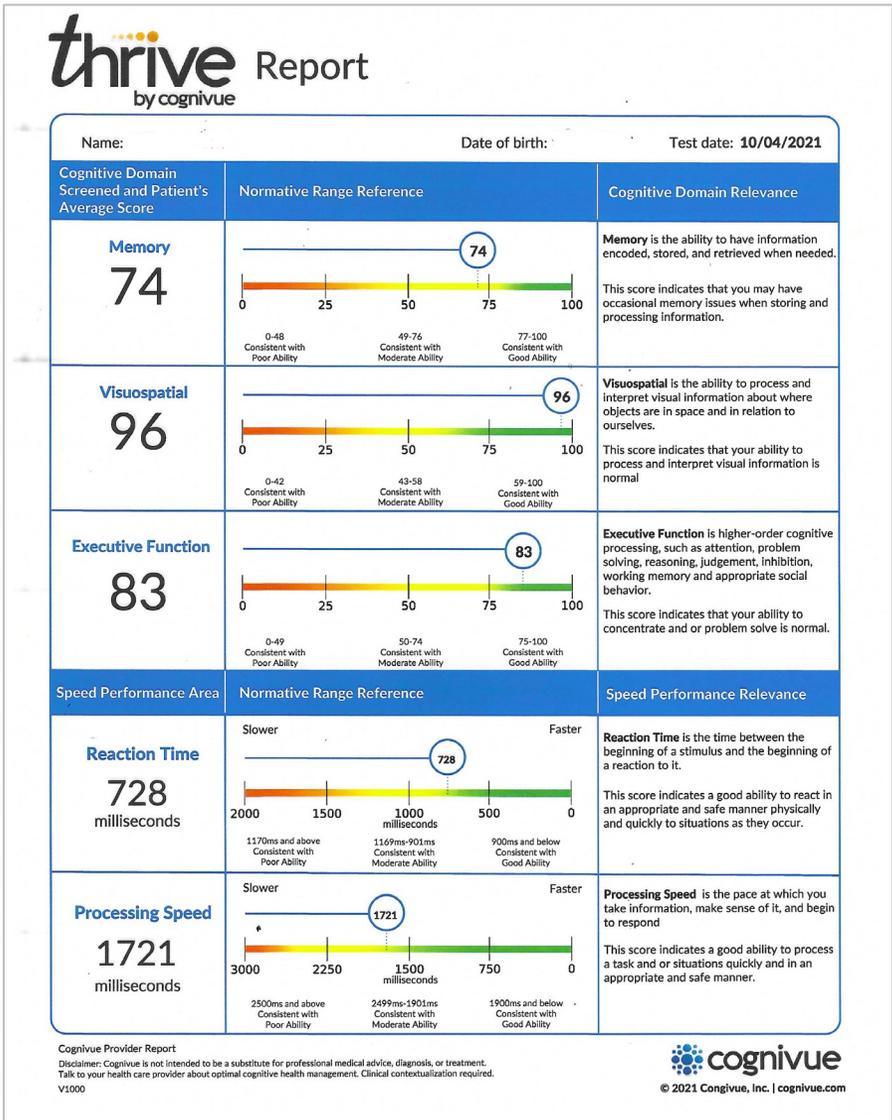
- AGING** Age-related hearing loss is permanent but treatable with hearing devices.
- DEMENTIA** Research indicates the severity of hearing loss is closely related to the risk of dementia.
- DEPRESSION** Untreated hearing loss may lead to social isolation and sensory overload.
- VISION LOSS** Untreated vision and hearing loss can increase the risk of falls and difficulty in performing activities of daily living.
- HEART DISEASE** Studies suggest a connection between low-frequency hearing loss and heart disease.
- DIABETES** Hearing loss occurs almost twice as often in adults who have diabetes than in those who don't.
- OTOTOXICITY** More than 100 classes of commonly used over-the-counter and prescription drugs can cause damage to the inner ear.
- KIDNEY DISEASE** An estimated 54% of American adults with chronic kidney disease have hearing loss, possibly caused by toxins related to kidney failure.
- RISK OF FALLS** Those with hearing loss often have diminished spatial orientation awareness, impaired brain pathways or reduced attention capacity - which can increase the risk of falls.



Don't wait years,
take care of your ears.

VICTORY
HEARING & BALANCE
512.443.3500
victoryhearing.com

Patient Reports – Reduced Cognitive Screening



- Send referral after I've treated the hearing loss and tested the patient again. I rarely send the patient for a cognitive workup after our first meeting unless they were referred to me for cognitive screening or screening results are very low.
 - Hearing should be addressed before patient is given verbal instructions somewhere else
 - Patient's brain needs time to adjust to new stimulation
- Referral:
 - If comorbidities present: send to PCP to address
 - If no comorbidities: send straight to Neurology

Follow-up

- GRADUATION appointment occurs after 60 days (differs for every clinic, state law is 30 days)
- Patient decides if they will keep or return their hearing aids
 - Review aided handicap inventory (scores will improve)
- Re-test unaided QuickSIN (most improve) and test aided QuickSIN (improves)
- Re-test Cognivue
 - Results of all 3 help reinforce the benefit of the hearing aids and I have a 0% return rate
 - Even if Cognivue doesn't improve, at least the others do and the patient can hear the improvement

65-year-old Male

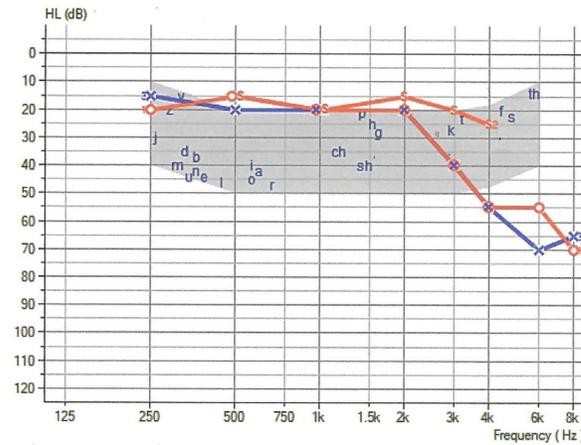
Victory Hearing & Balance Center
3811 Bee Cave Road Ste 101
Austin, TX 78746



Jill Davis, Au.D.

Male

Audiometry



Left	125	250	500	750	1k	1.5k	2k	3k	4k	6k	8k
AC		15	20		20		20	40	55	70	65
FF											

Right	125	250	500	750	1k	1.5k	2k	3k	4k	6k	8k
AC		20	15		20		20	40	55	55	70
FF			15		20		15	20	25		

- 1 ○ Air Conduction, AI=70%, PTA=18, HFA=32
- 2 □ Free Field, AI=91%, PTA=17, HFA=20
- 3 × Air Conduction, AI=70%, PTA=20, HFA=32

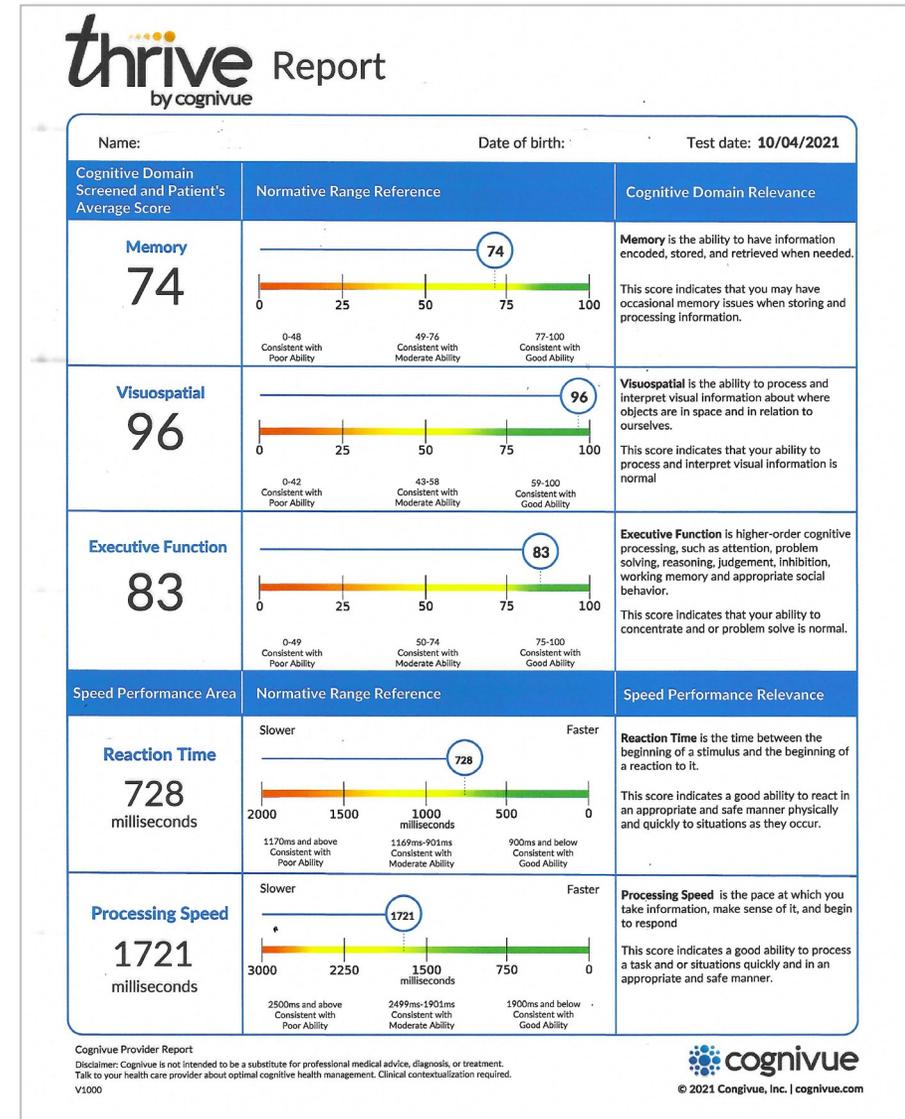
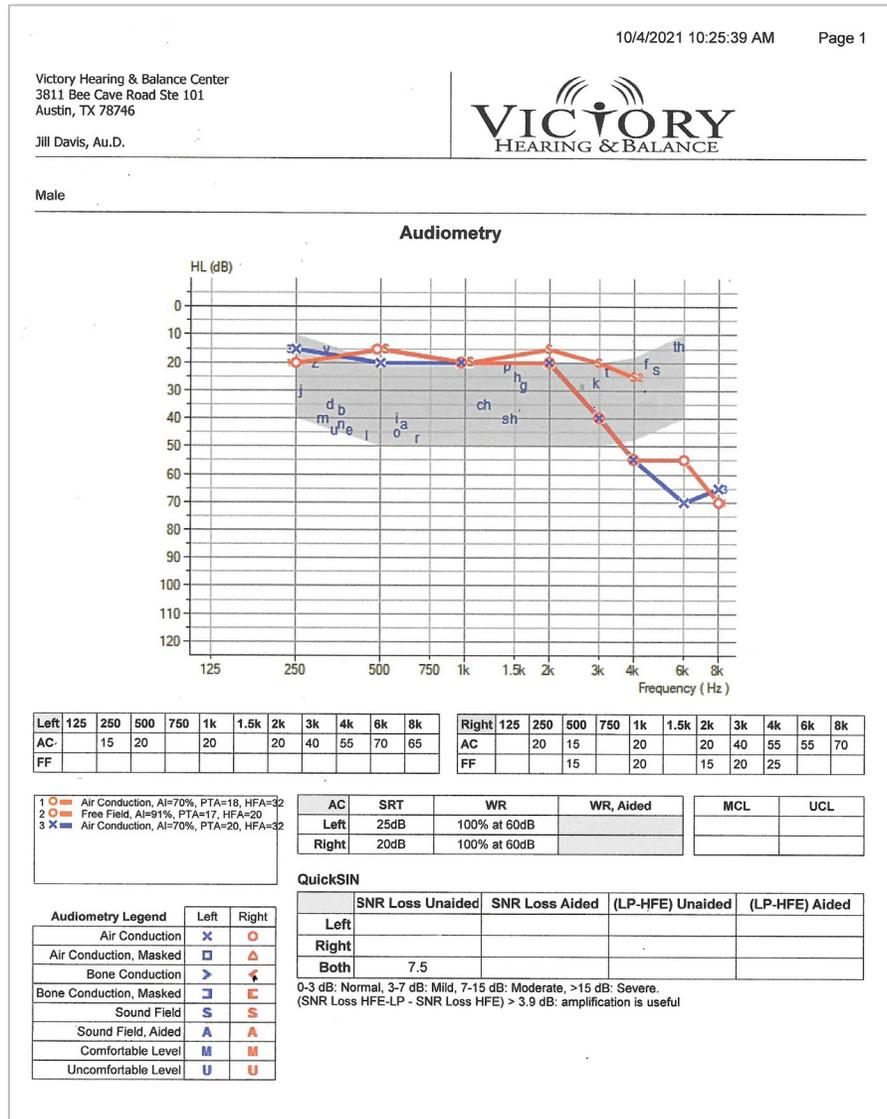
	AC	SRT	WR	WR, Aided	MCL	UCL
Left	25dB		100% at 60dB			
Right	20dB		100% at 60dB			

Audiometry Legend	Left	Right
Air Conduction	×	○
Air Conduction, Masked	□	△
Bone Conduction	>	+
Bone Conduction, Masked	∩	∪
Sound Field	S	S
Sound Field, Aided	A	A
Comfortable Level	M	M
Uncomfortable Level	U	U

	SNR Loss Unaided	SNR Loss Aided	(LP-HFE) Unaided	(LP-HFE) Aided
Left				
Right				
Both	7.5			

0-3 dB: Normal, 3-7 dB: Mild, 7-15 dB: Moderate, >15 dB: Severe.
(SNR Loss HFE-LP - SNR Loss HFE) > 3.9 dB: amplification is useful

65-year-old Male, HHIA:56



69-year-old Female,

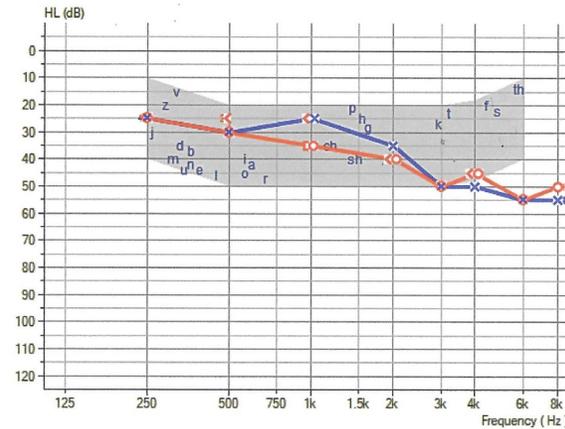
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Austin, TX 78746



Jill Davis, Au.D.

Audiometry



	125	250	500	750	1k	1.5k	2k	3k	4k	6k	8k		125	250	500	750	1k	1.5k	2k	3k	4k	6k	8k	
Left AC		25	30		25		35	50	50	55	55		Right AC		25	30	35	40	50	45	55	50		
Left BC													Right BC			25	25	40		45				
Left BC-Mask													Right BC-Mask			25	35	40		45				
Left Mask													Right Mask Oppos			40								

- 1 ○ Air Conduction, AI=39%, PTA=35, HFA=40
- 2 ○ Bone Conduction, PTA=33, HFA=40
- 3 ○ Bone Conduction, PTA=30, HFA=37
- 4 × Air Conduction, AI=50%, PTA=30, HFA=37

	AC	SRT	WR	WR, Aided	MCL	UCL
Left	40dB		100% at 75dB			
Right	40dB		100% at 75dB			

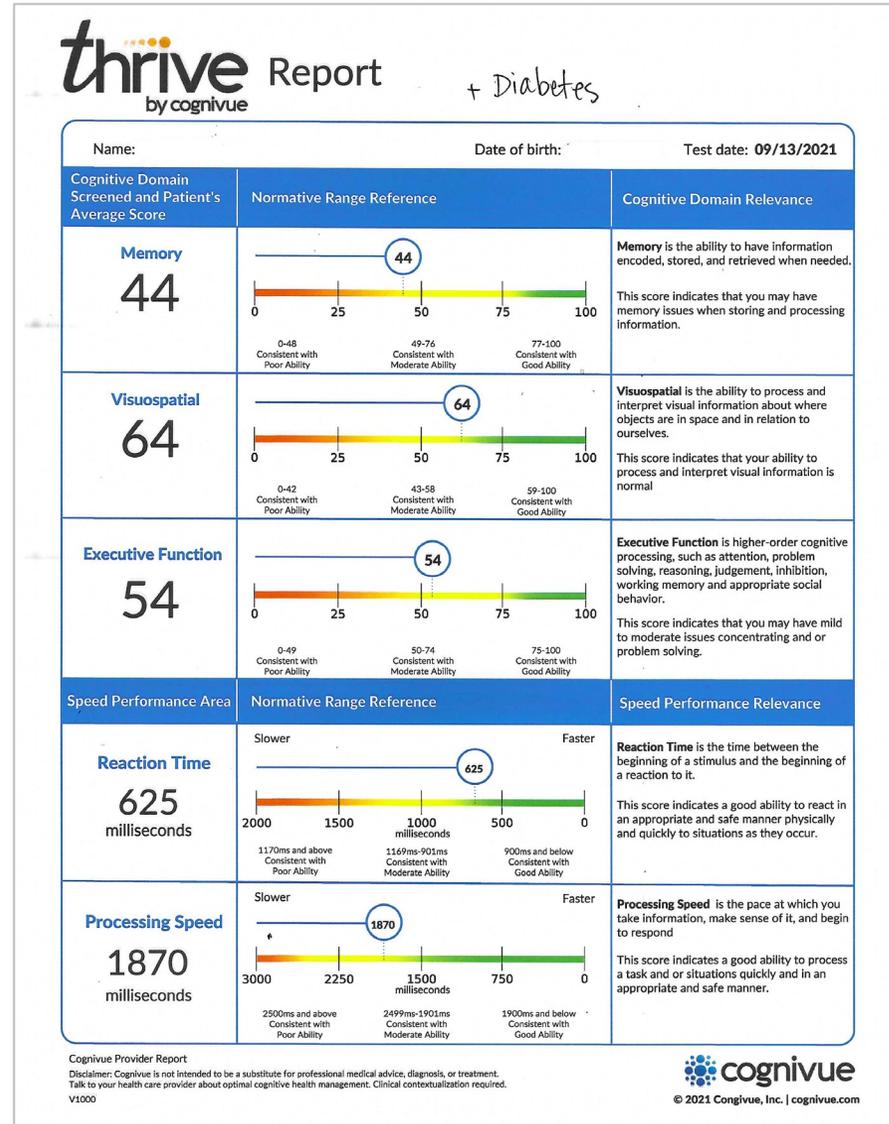
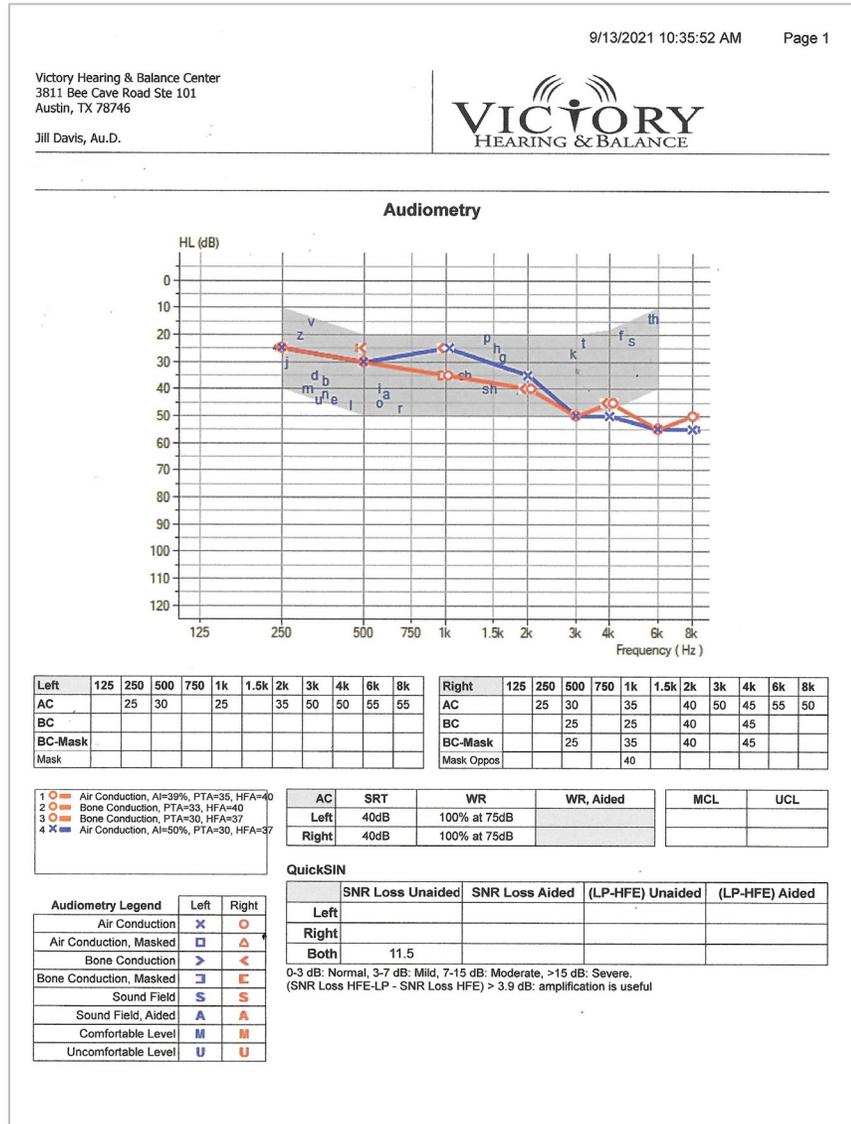
Audiometry Legend	Left	Right
Air Conduction	×	○
Air Conduction, Masked	□	△
Bone Conduction	>	<
Bone Conduction, Masked	▢	▤
Sound Field	S	S
Sound Field, Aided	A	A
Comfortable Level	M	M
Uncomfortable Level	U	U

	SNR Loss Unaided	SNR Loss Aided	(LP-HFE) Unaided	(LP-HFE) Aided
Left				
Right				
Both	11.5			

0-3 dB: Normal, 3-7 dB: Mild, 7-15 dB: Moderate, >15 dB: Severe.
(SNR Loss HFE-LP - SNR Loss HFE) > 3.9 dB: amplification is useful

69-year-old Female, HHIA:10

Patient has uncontrolled Diabetes. Referred for further cog. Eval.



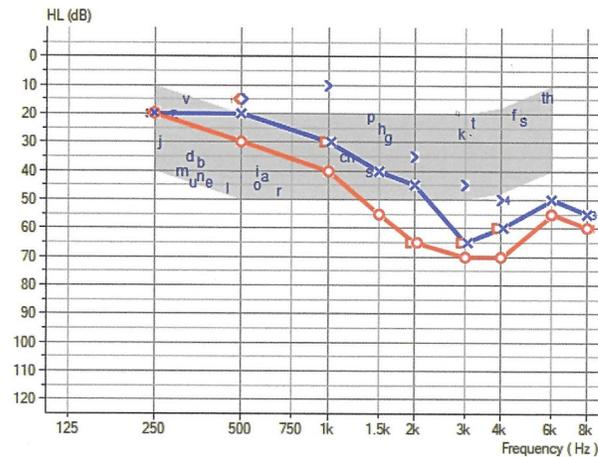
64-year-old Male, HHIA:38

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Jill Davis, Au.D.



Audiometry



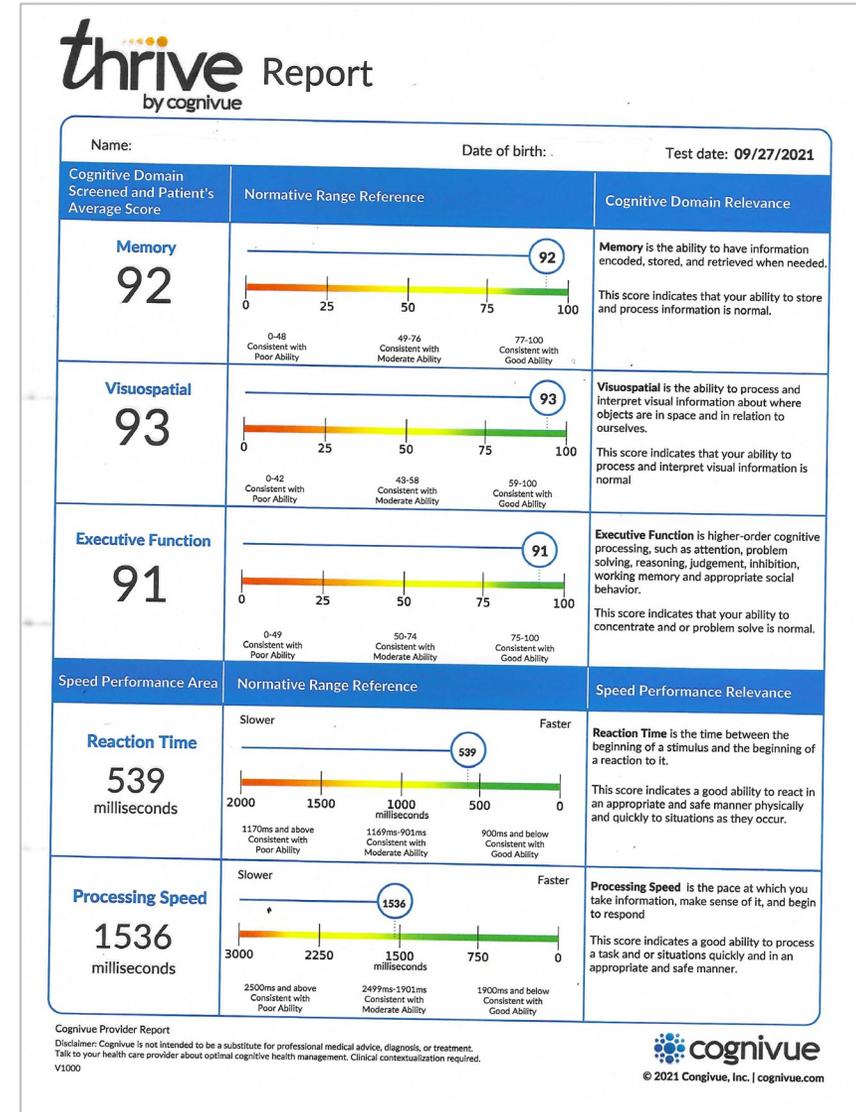
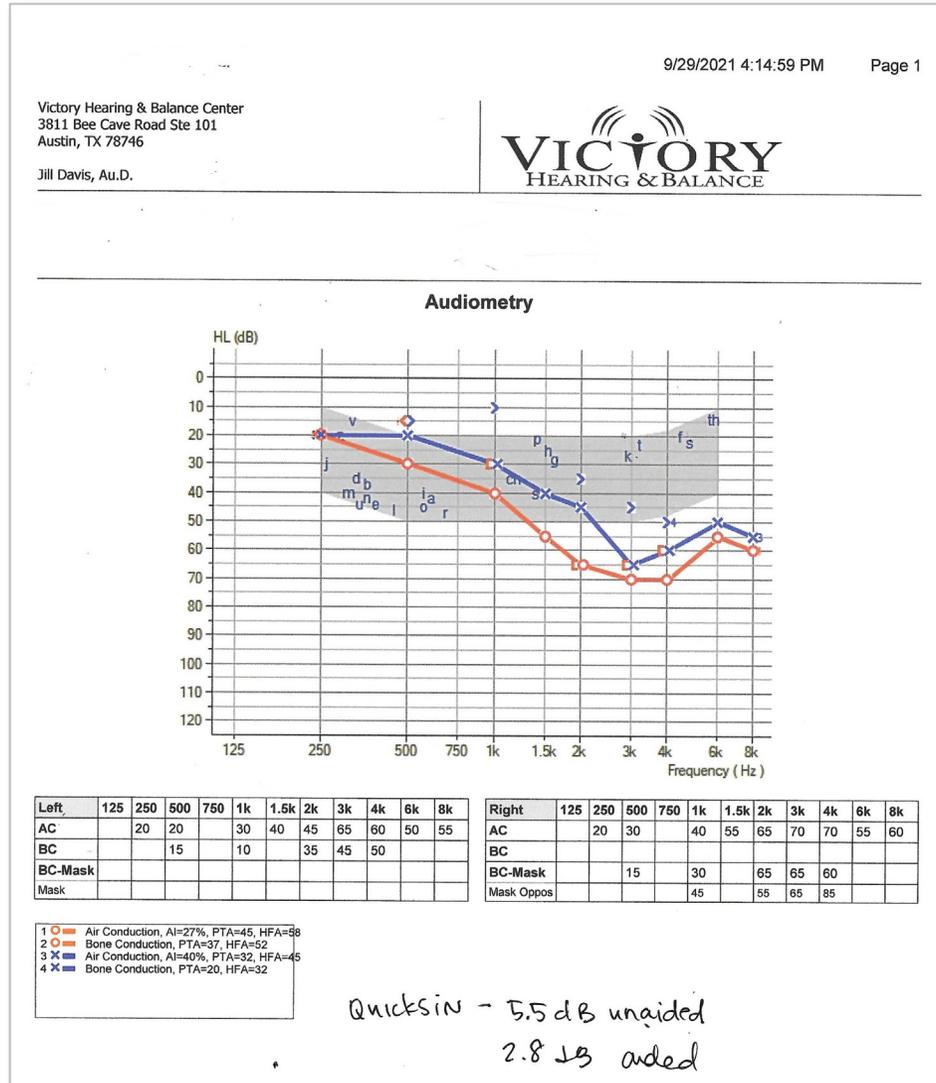
Left	125	250	500	750	1k	1.5k	2k	3k	4k	6k	8k
AC		20	20	30	40	45	65	65	60	50	55
BC			15	10		35	45	50			
BC-Mask											
Mask											

Right	125	250	500	750	1k	1.5k	2k	3k	4k	6k	8k
AC		20	30		40	55	65	70	70	55	60
BC											
BC-Mask			15	30		65	65	60			
Mask Oppos					45	55	65	85			

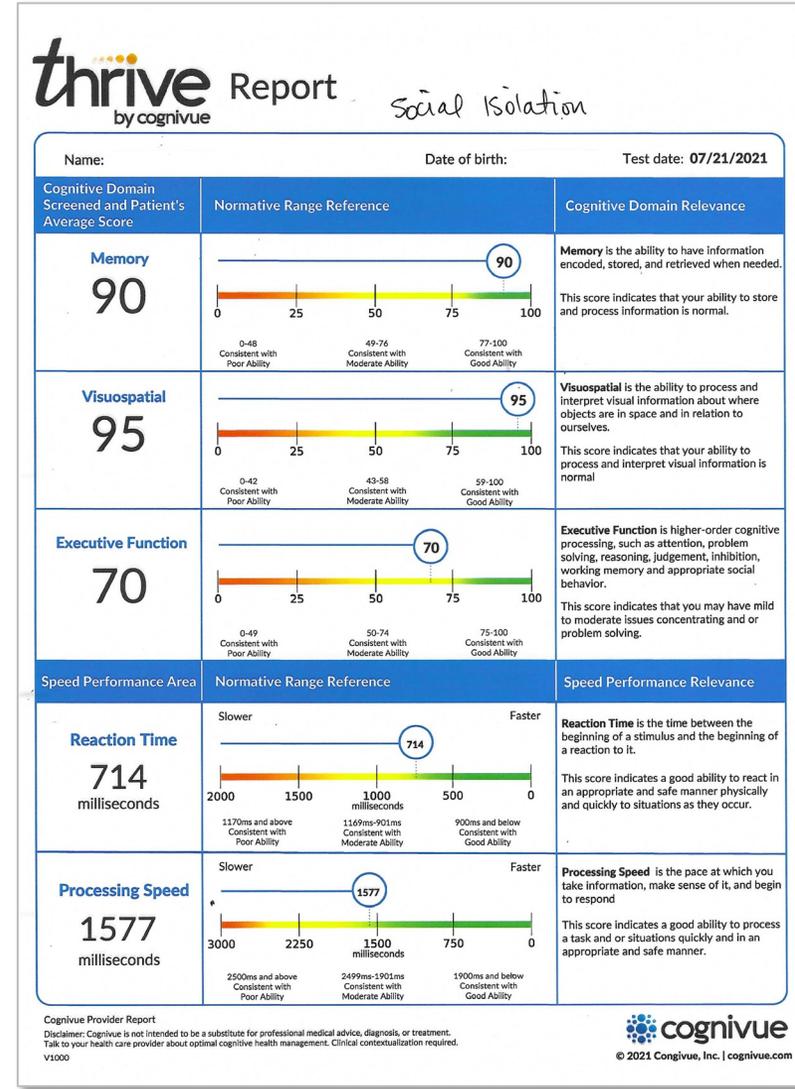
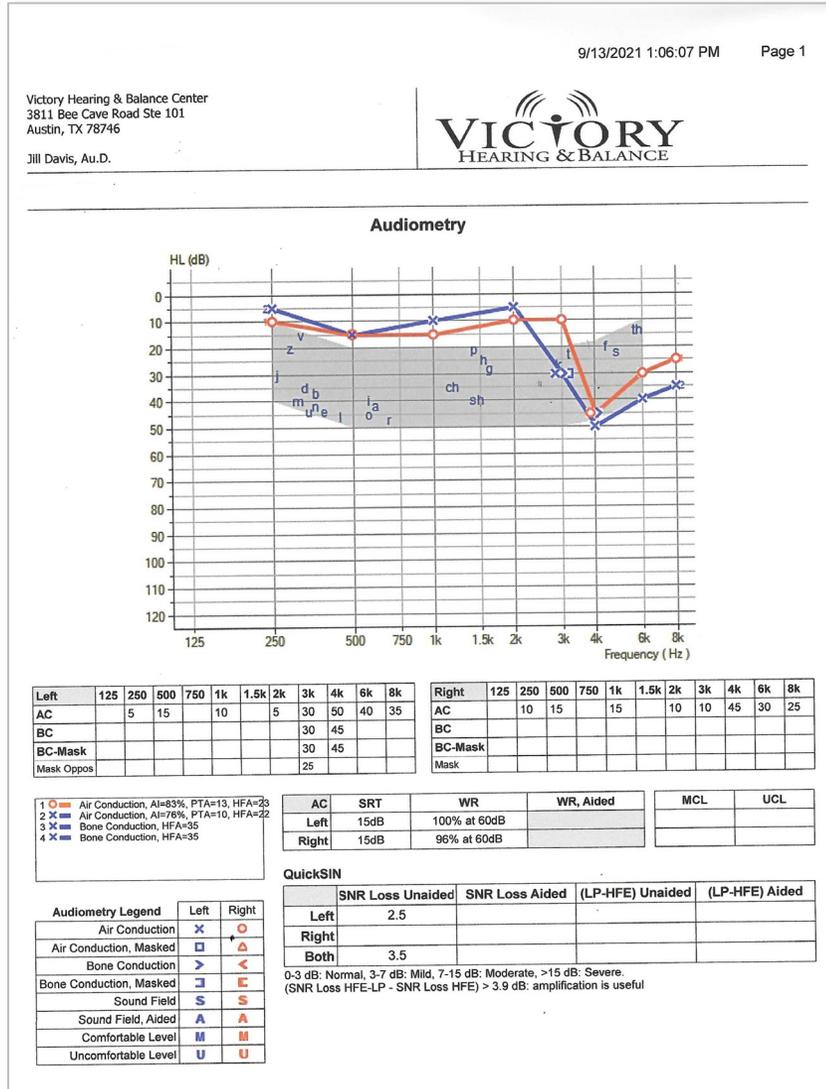
1 ○ Air Conduction, AI=27%, PTA=45, HFA=38
2 ○ Bone Conduction, PTA=37, HFA=62
3 × Air Conduction, AI=40%, PTA=32, HFA=45
4 × Bone Conduction, PTA=20, HFA=32

QuickSIN - 5.5 dB unaided
2.8 dB aided

64-year-old Male, HHIA:38



58-year-old Male, THI:40



60-Day Follow-up

Patient feedback:

The past few days have been amazing! My wife says I stopped asking "say that again".

She no longer suffers with me turning the TV up so loud.

We've been to a few restaurants, and it was so great to be in the conversation without asking my wife "what did they say?".

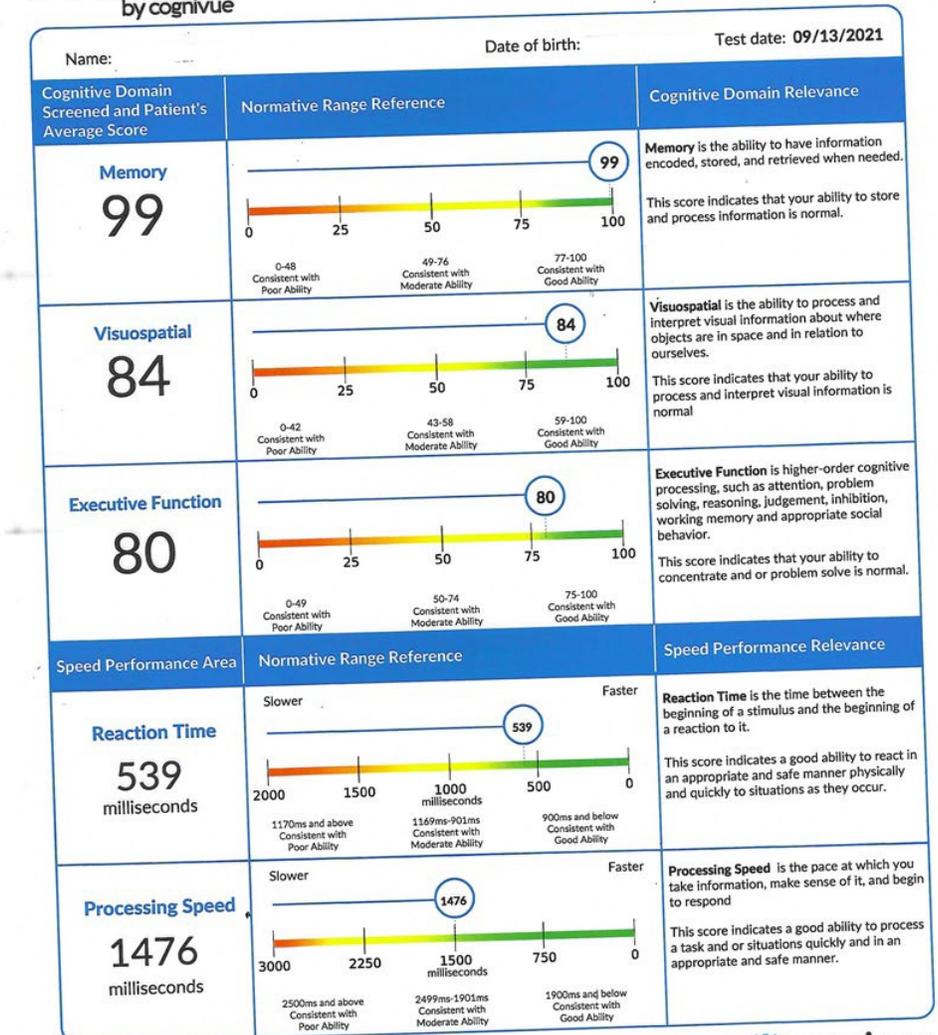
I've heard birds, crickets and other high register sounds that I haven't heard in years.

My tinnitus is a bit less noticeable because I now hear other high-end sounds that "compete" with the tinnitus as opposed to hearing just the tinnitus. (THI 40 down to 4)

When I take them off the world sounds covered in a blanket; I forgot what I was missing.

I don't want to go back to how it was before I came to see you.

thrive Report by cognivue



Cognivue Provider Report
Disclaimer: Cognivue is not intended to be a substitute for professional medical advice, diagnosis, or treatment. Talk to your health care provider about optimal cognitive health management. Clinical contextualization required.
v1.000

How Cognivue Improves Audiology

- Appropriate referrals
 - Building a network of medical professionals for interdisciplinary care and a more holistic approach
- Appropriate counseling and clear direction for patients
- Appropriate treatment plans
 - Correct technology (more research is needed)
 - Reduce follow-up appointments that fill our schedule
 - Treating hearing loss sooner than later to possibly reduce cognitive decline

Research at Victory Hearing

Real World Data Collection

- Started as single site
- Now 15 sites nationwide
- Finding trends in hearing loss and cognition
- Age, gender, underlying conditions, hearing loss, hearing aids, et.

Single Subject Study

- Assess the sensitivity of Cognivue Thrive as a validation tool of hearing aid fittings
- Change compression speed and monitor SIN scores and Cognivue

Music Training

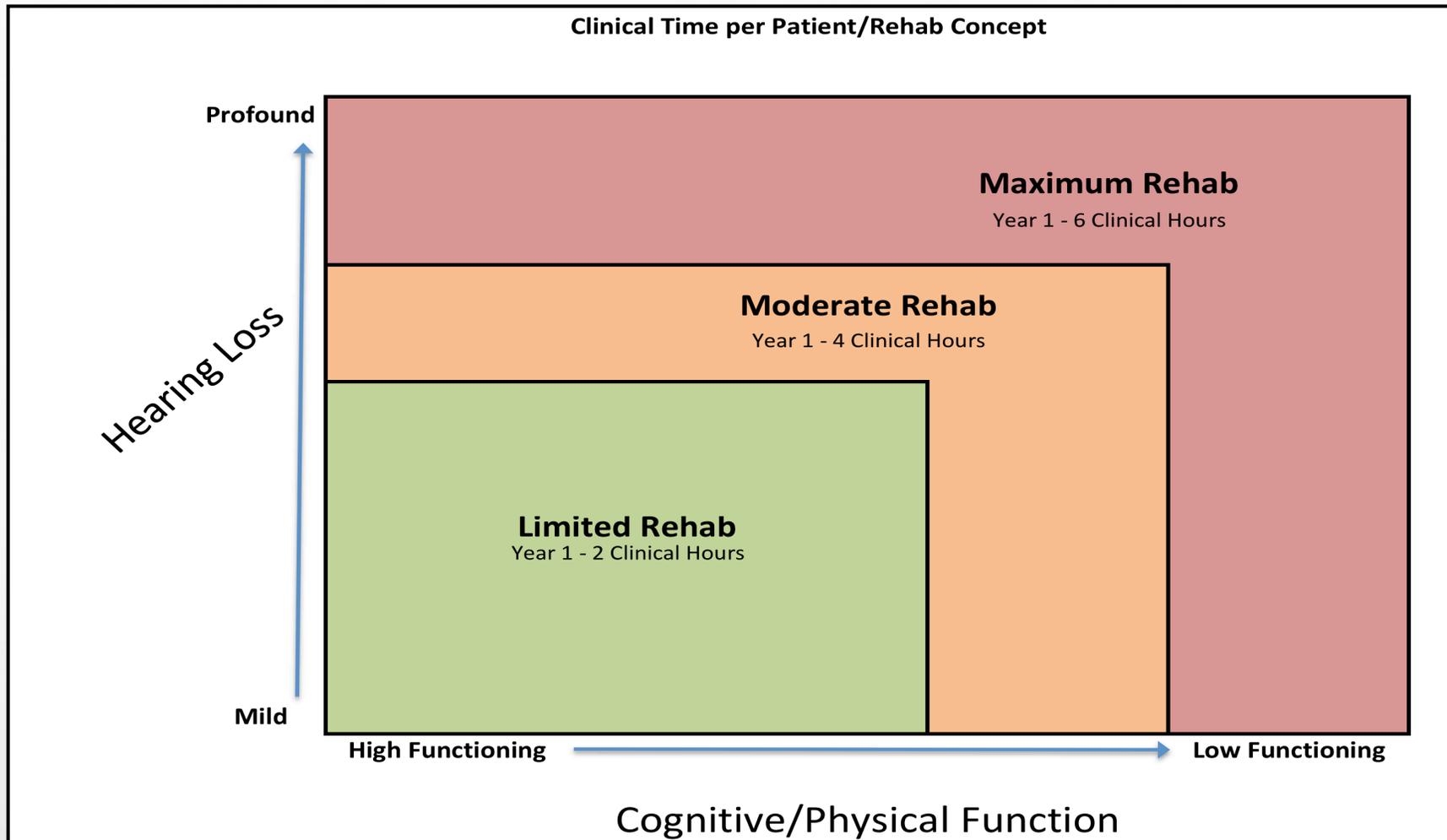
- QuickSIN, HHIA, and Cognivue pre- and post-3-month app-based music training
- Small sample size, ongoing



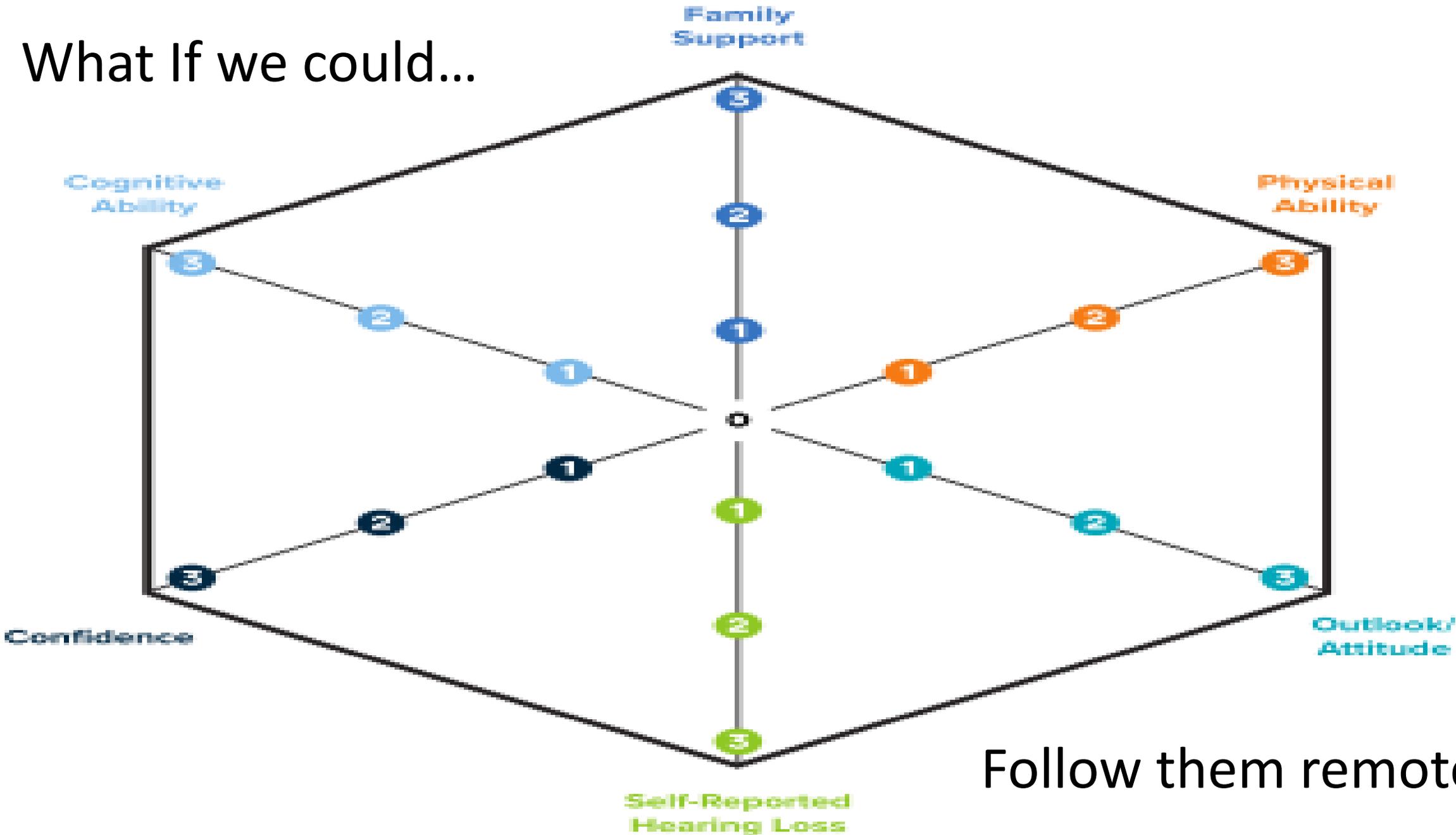
Thank to Jill Davis for
Sharing Your Experience

jdavis@victoryhearing.com

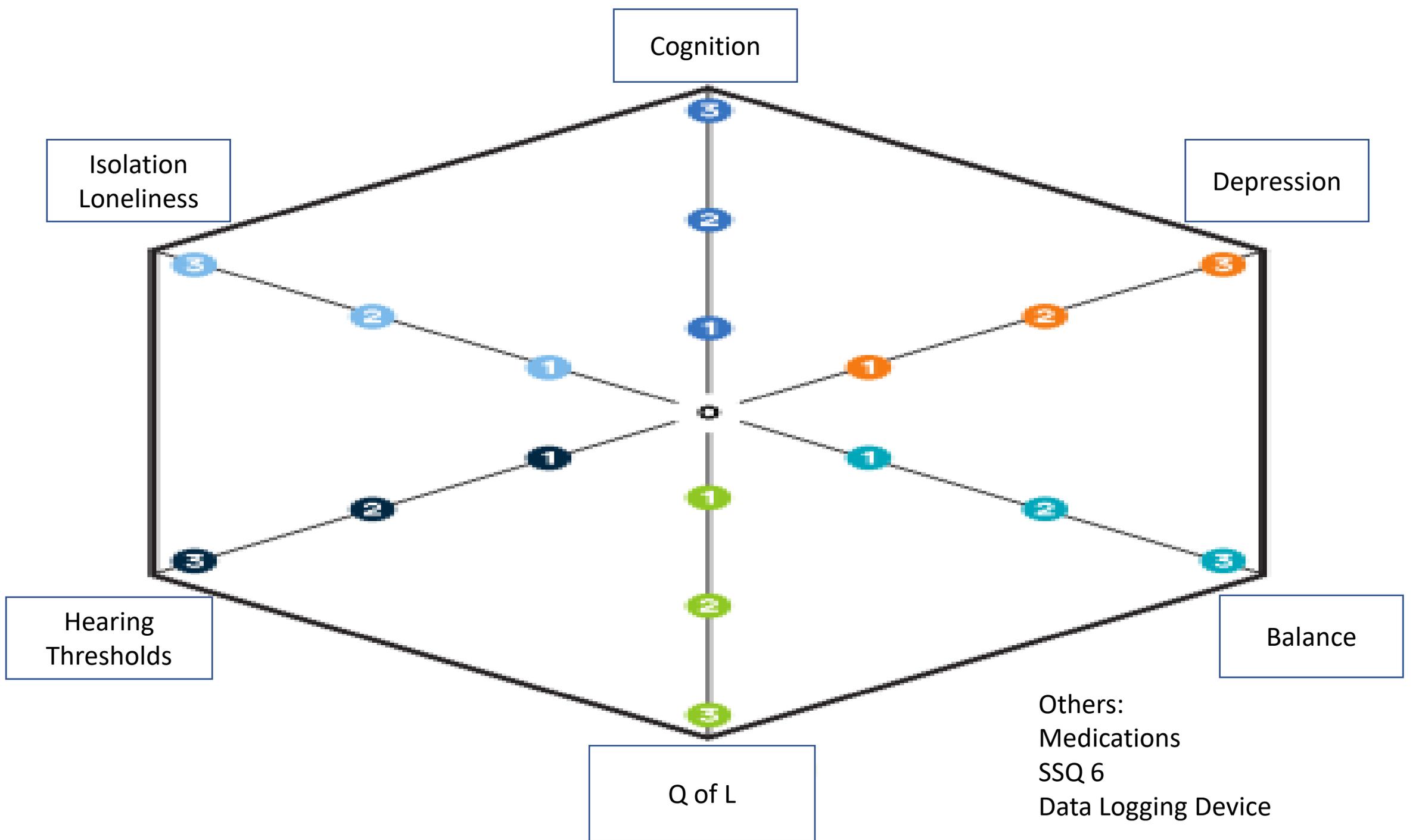
The Current Audiology Conundrum



What If we could...



Follow them remotely?



What Can I Take Back To My Clinic?

1. Review your approach to your patients
 - HHIA – Self Assessment
 - COSI – Personal Communication Goals
2. Incorporate a Holistic Approach
 - Healthcare Questionnaire
 - Investigate adding cognitive screening
 - Medication review
 - Depression screening tool
 - Investigate a tool for measuring Q of L

Contact Us



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Director of Strategic Initiatives

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FUEL