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Management of Veterans with Severe Hearing Loss, presented in partnership with AVAA

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Funded by VA Health Systems Research



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David R Friedmann, MD, MSc is a neurotologist and research scientist at NYU Grossman School of Medicine and the NY Harbor VA Medical Center. He has published widely on outcomes in cochlear implantation and skull base surgery. His funded work seeks to address complexities in the delivery of hearing care including hearing rehabilitation in primary care settings and the management of severe hearing loss. His research is funded by the National Institutes of Health and VA Health Systems Research.

Disclosures

- **Presenter Disclosure:** Financial: David R. Friedmann is an employee of NYU Grossman School of Medicine and the NY Harbor VA Medical Center. Non-financial: David R. Friedmann has no relevant non-financial relationships to disclose.
- In lieu of an honorarium, a donation has been made to AVAA in the form of AudiologyOnline CEU memberships.
- **Content Disclosure:** This course does not focus exclusively on any specific product or service.
- **Sponsor Disclosure:** This course is presented by the Association of VA Audiologists (AVAA) in partnership with AudiologyOnline.
- Funding through VA Health Systems Research and National Institutes of Aging
- Opinions of authors do not represent those of VA or the US government

Learning Outcomes

After this course, participants will be able to:

- Discuss VA initiatives and support for hearing rehabilitation for Veterans.
- Review best practices in management of Veterans/patients with severe hearing loss.
- Readily identify Veterans/patients who may benefit from additional support to address their hearing loss, such as referral for a cochlear implant evaluation.

Hearing Loss in the Va

- Hearing loss is pervasive in VA, leader in hearing care
 - Common service-connected issue
 - 1 million Veterans receive disability compensation related to HL
- VHA employs >1100 audiologists at >450 clinical sites
- In 2023, 1,000,000 hearing aids dispensed at cost of \$400+ million
- Cochlear implants available at VA centers > 30 years

Motivation

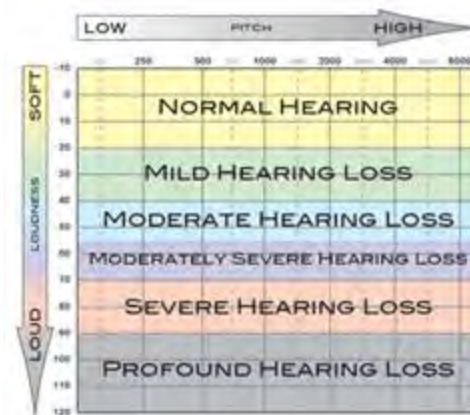
- As a cochlear implant surgeon and researcher, I believe:
- VA is a leader in hearing health care
- Cochlear implants are a life changing therapy in appropriately selected patients
- Many patients who could and would benefit do not receive them— Access? Knowledge? Preferences?
- This is likely true in civilian settings and VA— understanding this gap and addressing it motivates this work

VA Ideal Setting to Study Practice Patterns

- Largest integrated health care system in USA (9 mill)
- Comprehensive audiology services
- Unique data resources to study health services patterns
- VA Audiometric Repository is longitudinal dataset
- Detailed audiologic data available
- Distribution and management of HA, CI, accessories (ROES)
- Can link to VA EHR: Demographic, geographical, medical...
- Insights epidemiology, treatment patterns, and outcomes of Veterans with hearing loss

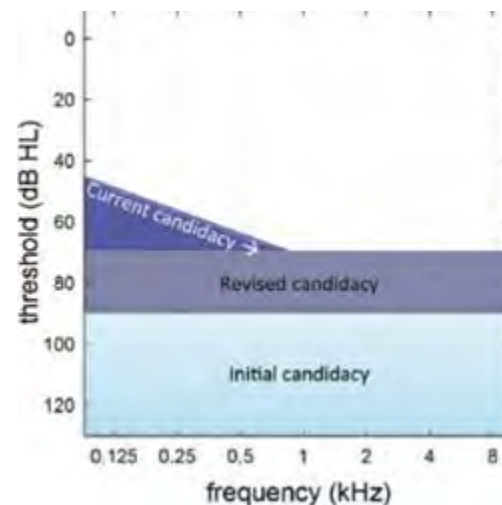
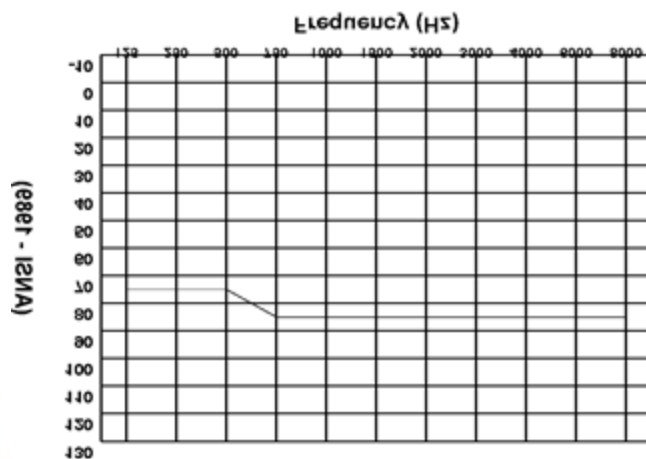
Severe or Worse Hearing Loss is Distinct

1. Audibility from appropriately-fit amplification may be insufficient to facilitate auditory-oral communication
 2. **Aided** benefit in sound field may not be apparent from **unaided** word recognition scores under headphones, MCL
- If we are under-treating severe hearing loss, would that limit non-audiologic benefits of rehabilitation?



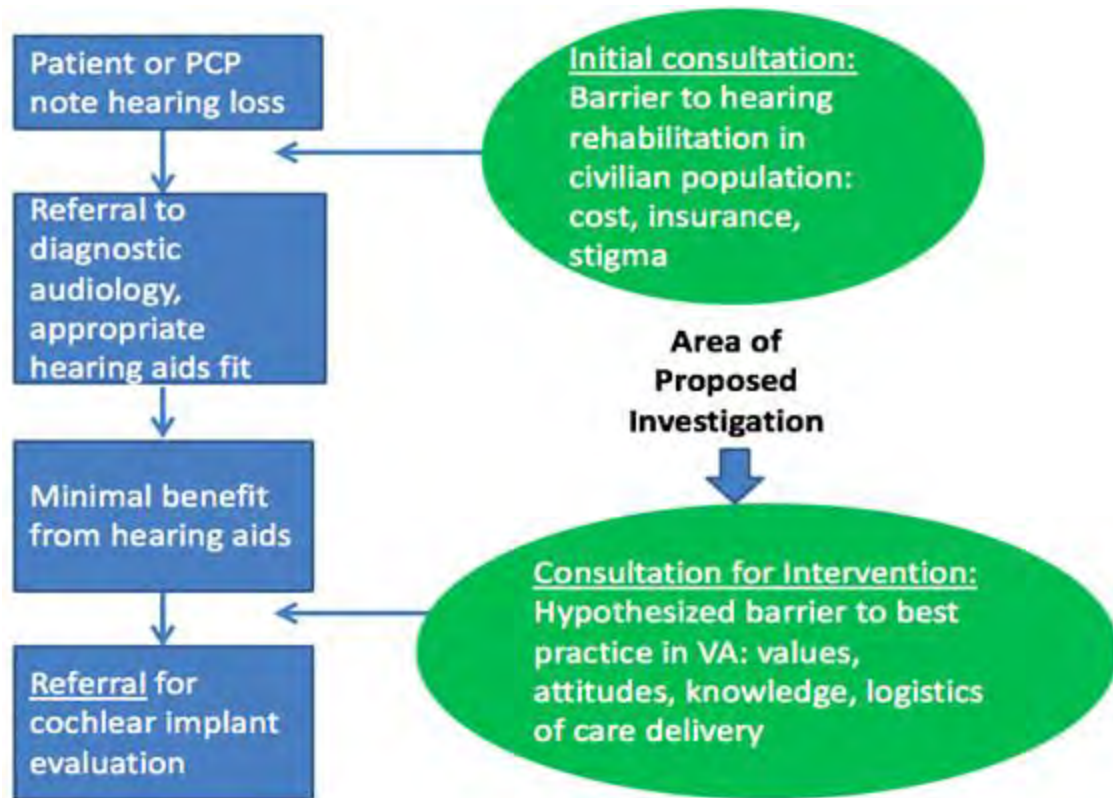
Referral Patterns with Evolving Candidacy

- No standardized protocol for how audiologists assess cochlear implant candidacy before referral is made (CPG).
 - VA Practice Recommendations recently updated--criteria
 - Hearing aids provided for free in VA *
 - Referrals keeping up with changes in candidacy criteria?
- *Outside VA, may be financial incentives to sell hearing aids



Our Question

- For those seeking help for hearing loss, engaged in audiologic care... what drives clinical management of those with severe or worse hearing loss?
- Patient factors?
 - preferences, awareness, comorbidities
- Provider factors?
 - edu, experience)
- Organizational / System factors?
 - rurality, process issues



Hearing Rehab Requires Tailored Approaches

- There are a spectrum of treatments depending on the degree/severity of hearing loss or level of auditory wellness
- Hearing care differs along the spectrum of hearing loss
- Audiology education/training varies – **Aided** benefit in sound field may not be apparent from **unaided** word recognition scores under headphones, MCL
- Similar factors at play in civilian settings* and VA—understanding this gap and addressing it motivates this work

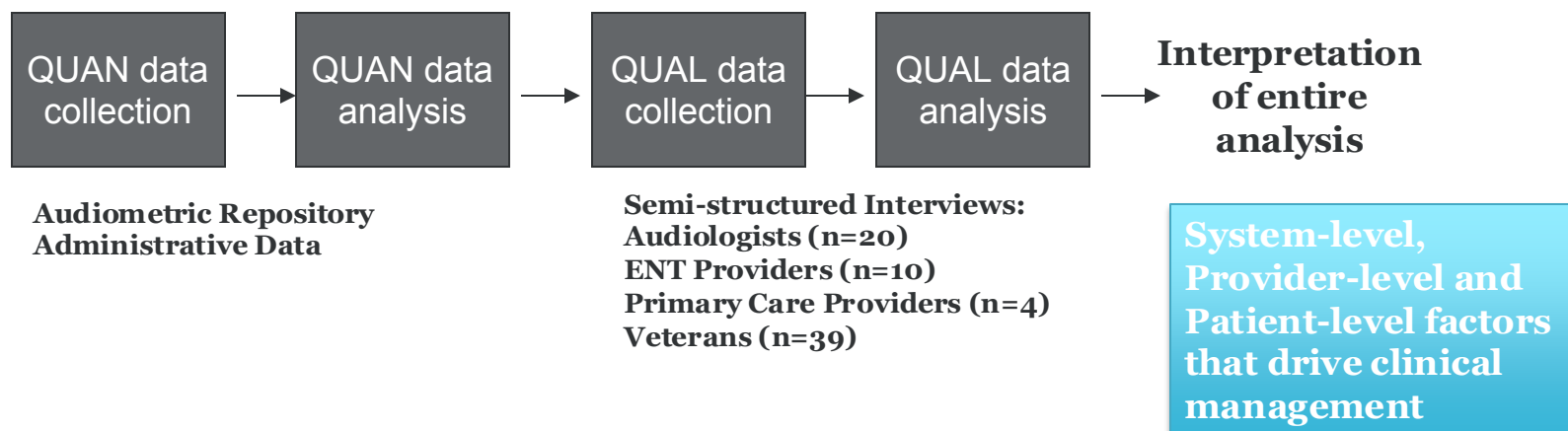
*Outside VA, may be financial incentives to sell hearing aids

Va Hearing Care

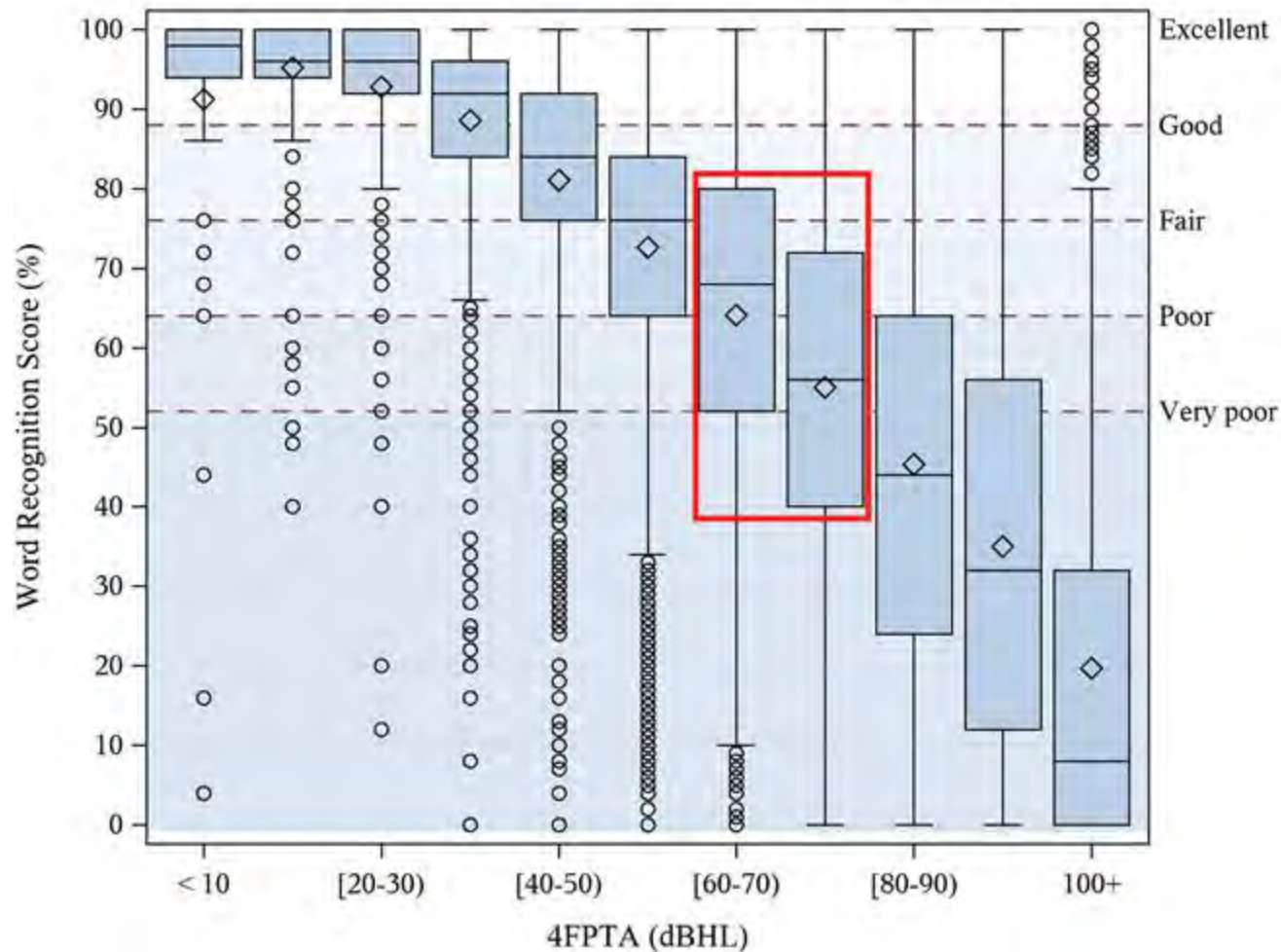
- Diagnostic audiology integrated into VA healthcare
- Hearing aids provided as part of VA care
- If hearing aids/ access to hearing care not the barrier here...
- *For those seeking hearing care, what drives clinical management of severe hearing loss?*
- Access? Knowledge? Preferences?
- Patient-, provider-, system-factors?

A Mixed Methods Approach

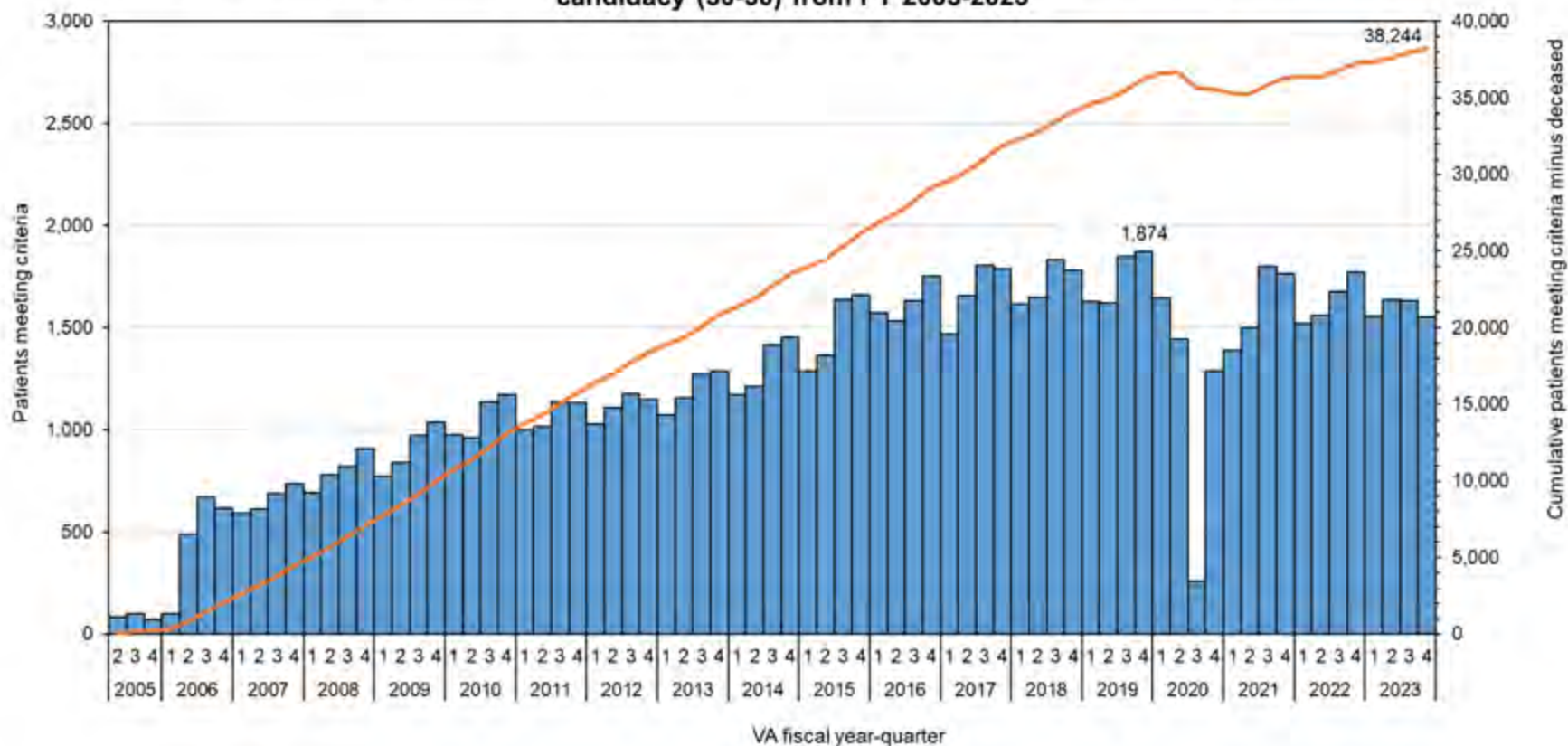
- Use quantitative (VA data sets) and qualitative data (interviews with stakeholders) describe patterns of treatment, identify facilitators and barriers
- Sequential explanatory design



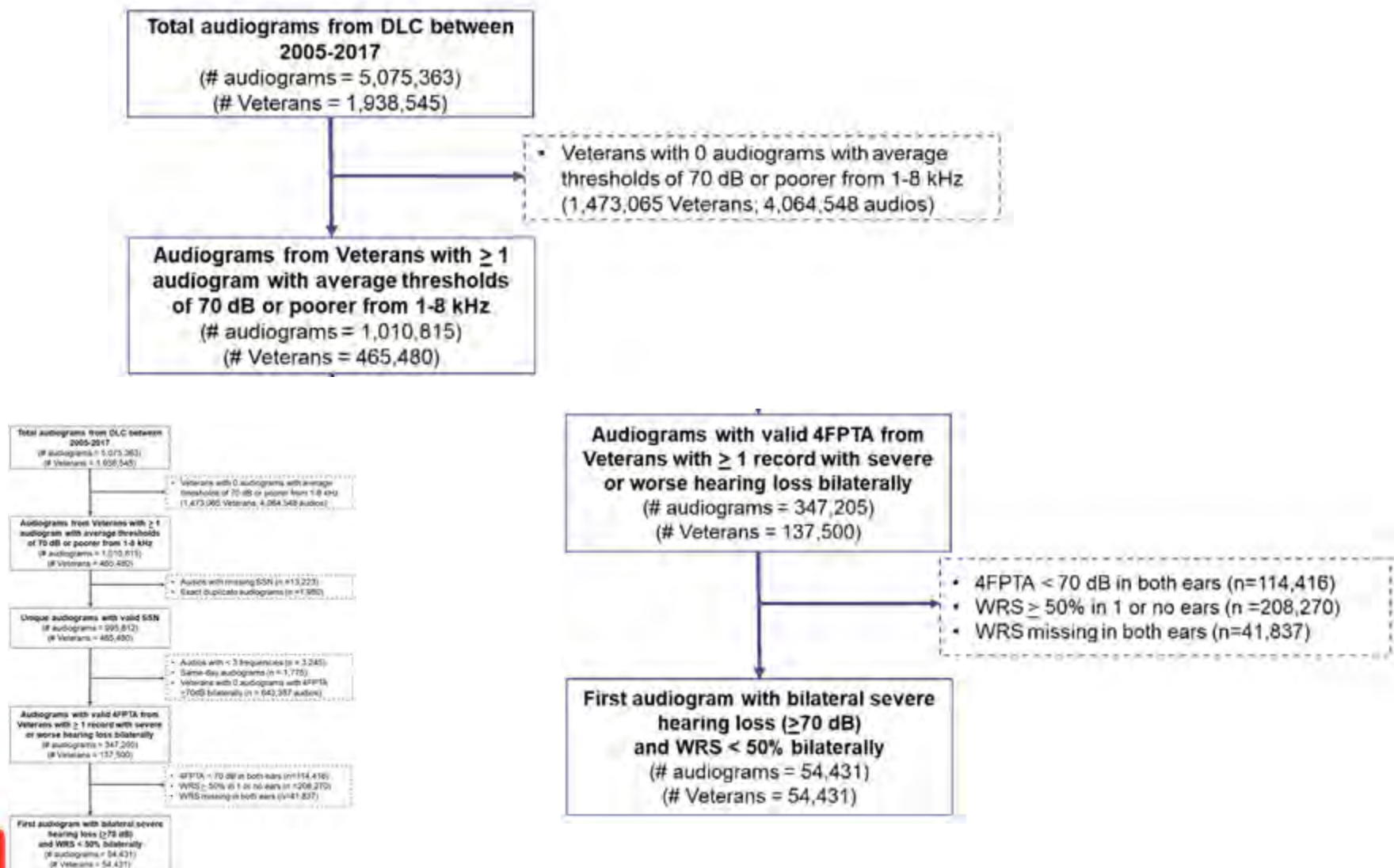
Relationship of Hearing Loss to Unaided Speech Perception (N= 1,645,747) Individual Ears)



Quarterly and cumulative (removing those deceased) number of patients meeting criteria for CI candidacy (50-50) from FY 2005-2023



Study Cohort Using Conservative CI Criteria

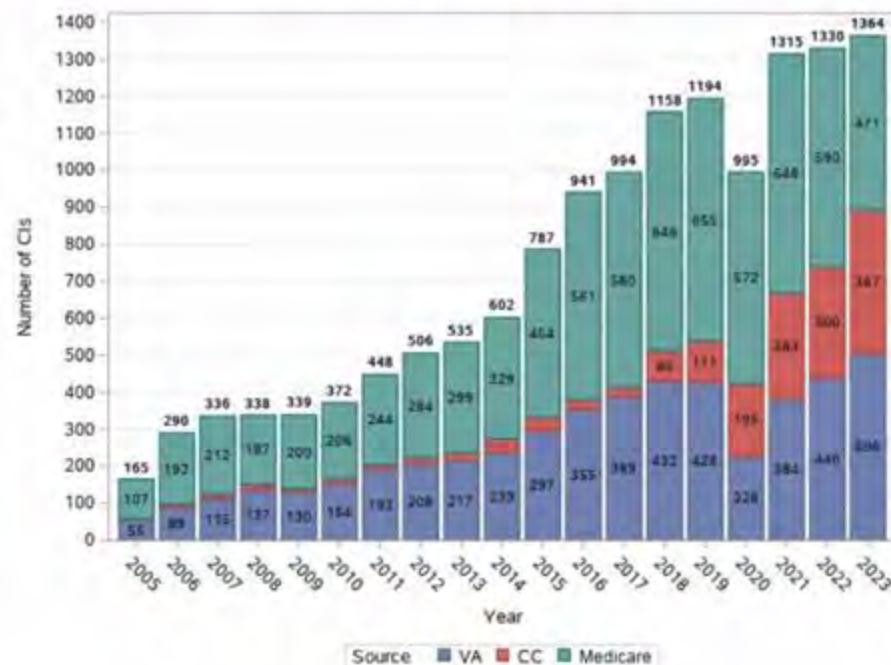


n	Severe or worse 137,500	HA, no CI 113,051	CI 2,633	No management 21,816
Mean age at first severe or worse audio, y (SD)	79.7 (9.7)	79.6 (9.7)	69.7 (9.8)	81.0 (8.9)
Age category at incident audio, n (%)				
≤ 50	924 (0.7)	673 (0.6)	86 (3.3)	165 (0.8)
51-70	23906 (17.4)	20360 (18)	1301 (49.4)	2245 (10.3)
71-85	63785 (46.4)	51899 (45.9)	1110 (42.2)	10776 (49.4)
85+	48885 (35.6)	40119 (35.5)	136 (5.2)	8630 (39.6)
% male	136087 (99)	111986 (99.1)	2570 (97.6)	21531 (98.7)
Race and ethnicity, n (%)				
Non-Hispanic White	107798 (78.4)	90780 (80.3)	2167 (82.3)	14851 (68.1)
Non White	13596 (9.9)	10919 (9.7)	298 (11.3)	2379 (10.9)
Missing	16106 (11.7)	11352 (10)	168 (6.4)	4586 (21)
Rurality, n (%)				
Urban	75501 (54.9)	63279 (56)	1401 (53.2)	10821 (49.6)
Rural or highly rural	58109 (42.3)	49409 (43.7)	1219 (46.3)	7481 (34.3)
Missing	3890 (2.8)	363 (0.3)	13 (0.5)	3514 (16.1)
Total Elixhauser comorbidities, n (%)				
None	15213 (11.1)	12745 (11.3)	368 (14)	2100 (9.6)
1	22023 (16)	18523 (16.4)	516 (19.6)	2984 (13.7)
2	26358 (19.2)	22144 (19.6)	544 (20.7)	3670 (16.8)
3+	69049 (50.2)	55555 (49.1)	1111 (42.2)	12383 (56.8)

Veteran Pathways to Cochlear Implantation

- Relate subjective measures to management strategies, degree of hearing loss
- Geography, rurality, clinical care setting (VA site)
- VA care, Community care, Medicare pathways (CMS data)
- From our cohort

Number of CIs completed 2005-2023, by source of record



Cochlear Implant Center Expansion In Va



2010



2016



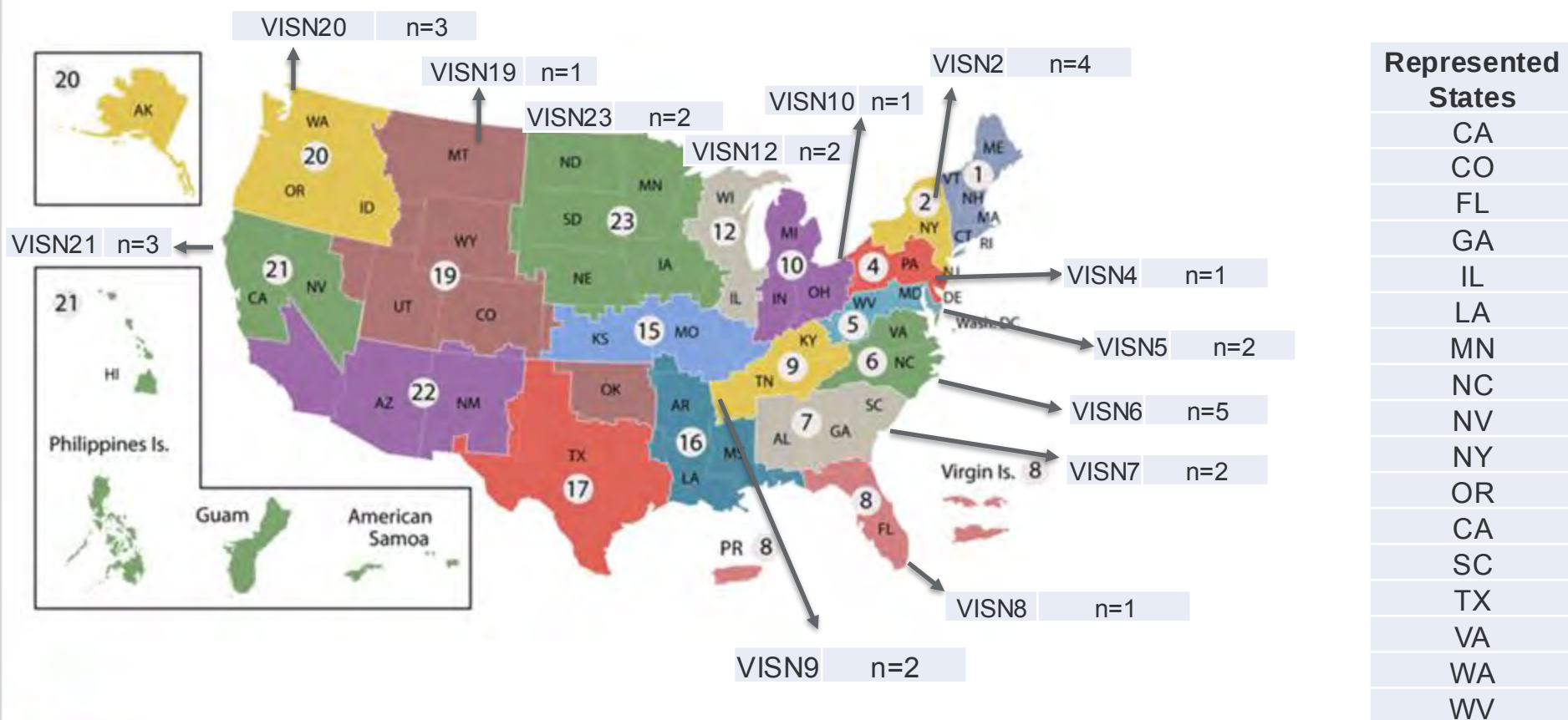
Qualitative Data

- Identify facilitators and barriers by eliciting perspectives of stakeholders to identify system-level, provider-level and patient-level factors influencing clinical management.
- Audiologists, primary care providers, otolaryngologists and affected Veterans.
- Data integration of qualitative and quantitative data may help explain clinical management patterns.

Qualitative Data Collection & Analysis

- Sample
 - 40 Providers (20 Audiologists, 10 ENTs, 10 PCPs)
 - 39 Veterans with severe hearing loss (analyses ongoing) identified Repository enriched based on **certain characteristics**
- Strategy: Maximum variation sampling
 - Providers: different training, background, regions
 - Veterans: age, gender, ethnicity, rurality, geographic region, severity of hearing loss, treatment modality
- Not hypothesis driven, explore themes
- Semi-structured Interviews: open-ended questions, interview guide
- Data saturation, coded and analyzed with computer software

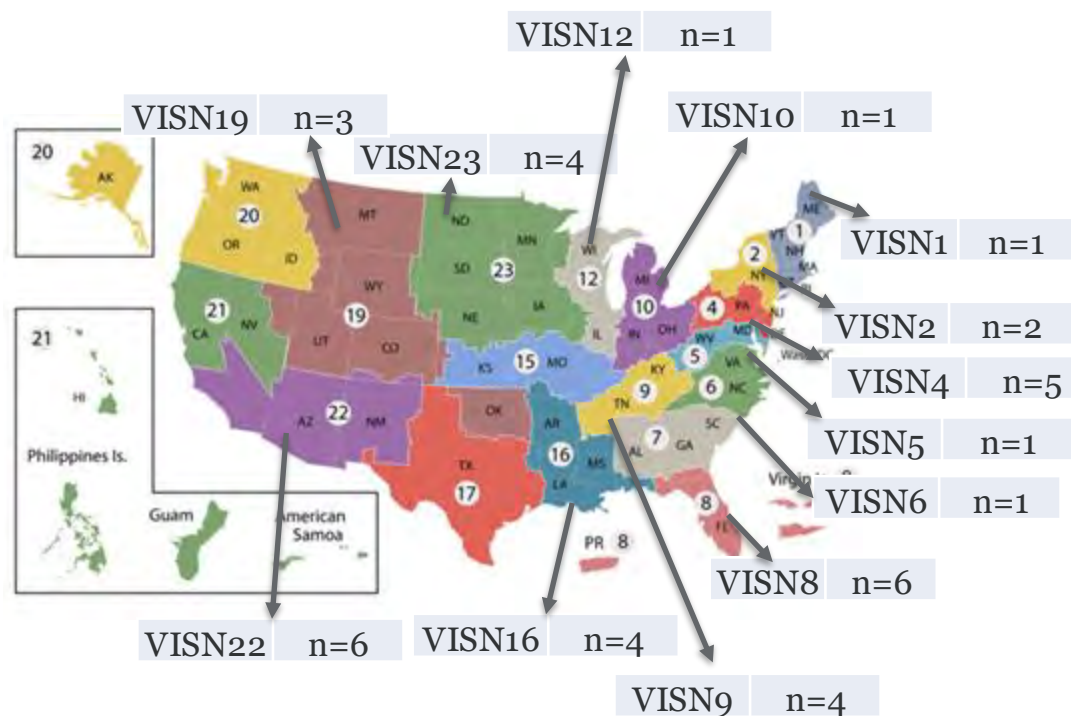
Interviews With VA Audiologists, Otolaryngologists, And Primary Care Providers



Veteran Characteristics who Participated in Interviews

Veterans with severe hearing loss (n=39)

Gender		%	
Male	35	90%	
Female	4	10%	
Age			
51-70	6	15%	
71-85	24	62%	
85+	9	23%	
Race			
White	29	74%	
Non-white	10	26%	
Rurality			
Rural	13	33%	
Urban	26	67%	
Hearing treatment			
Hearing aids only	35	90%	
Cochlear implant	3	8%	
No hearing device	1	1%	



Represented States

AR	TN
AZ	TX
CA	WV
CO	WY
CT	
DE	
FL	
IL	
KY	
LA	
MN	
MN	
MS	
NC	
ND	
NE	
NY	
OH	
PA	

Preliminary Results: Provider Interviews

- *“hearing...low priority....ironically, the silent problem...”*

*“Each VA is different....”
“We have an embedded Audiologist... great collaboration”
“...when I want to refer...the Vet has to travel 3-4 hours...to even talk to someone...”*

*“...see it as surgery on the brain...that can be scary...”
“Some Vets don’t want the aid...I don’t think it’s vanity... more like stigma or denial...I’m old...I’m disabled...”
“The number one motivator is quality of life...to hear the grandkids...or TV...be social...”*

System-level

- Availability of CI programs/specialists
- Referral and workflow
- Candidacy criteria

Patient-level

- Fear
- Stigma
- Family support
- Geography
- Quality of Life

Provider-level

- Knowledge
- Experience
- Clinical determinants

*“I was in a CI practice, I am very comfortable talking to Vet “
“I go by the criteria but also think about the person... what other issues...heart.. dementia...”
“if a Vet has not kept appointments or done the other care prescribed...how will they do what’s needed for the <CI>... I consider that...”*

Barriers and Facilitators of Care

- Audiologist on availability of VA CI programs can influence clinical management *"... we're here in <large urban VA setting>... it's different once you get out there...to a VA in the country...even if <CI> was available in private sector which is unlikely...the Veteran will have to come here to get treatment..."*
- Distance between referring providers and the surgeon limits access. As one Audiologist reported, *"...when I want to refer...the Vet has to travel 3-4 hours...to even talk to someone..."*
- *"We have an embedded Audiologist... great collaboration"*
- *"I was in a CI practice; I am very comfortable talking to the Veteran..."*
- *"I go by the criteria but also think about the person... what other issues...heart.. dementia..."*

Audiology are Viewed as Gatekeepers of Hearing Care

- *ENT: (“... “Audio facilitates so much of that process...they're seeing patients we never see sometimes...they are the ones that capture the candidates and determine candidacy on their end...”*
- *ENT: “There's a group of 4 cochlear implant audiologists...we have monthly meetings and communicate frequently. If other audiologists need anything, they usually go through one of them because they have the most direct line to us. At our VA, speech and audiology are under the same administrative structure...we have a very direct relationship with <administration>...if there's anything on the Administrative side...we have a decent back and forth with them.”*

Comprehensive Care for Severe Hearing Loss

- Our VA data demonstrates that most Veterans with severe or worse hearing loss are managed with hearing aids. How are they doing?
- Cochrane Review for “mild-moderate” hearing loss only
- In 2000, VA/NIDCD RCT in JAMA multi-center studies specifically excluded patients with thresholds in severe range (> 70 dB HL)
- Real ear verification performed, but rarely are speech perception outcomes validated in aided condition (interviews)

Efficacy of 3 Commonly Used Hearing Aid Circuits A Crossover Trial

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for the Participants of the NIDCD/VA Hearing Aid Clinical Trial Group

Context Numerous studies have demonstrated that hearing aids provide significant benefit for a wide range of sensorineural hearing loss, but no carefully controlled, randomized clinical trials comparing hearing aid efficacy have been conducted.

Objective To compare the benefits provided by patients with sensorineural hearing loss by 3 commonly used hearing aid circuits.

Design Double-blind, 3-period, 3-hearing aid crossover trial conducted from May 1998 to February 1999.

Setting Eight audiology laboratories at Department of Veterans Affairs medical centers across the United States.

Patients A sample of 160 patients with bilateral sensorineural hearing loss (mean age, 67.2 years; 57% male; 78.6% white).

Intervention Patients were randomly assigned to 1 of 3 sequences of linear peak-shaper (PCS), compression limiter (CL), and wide-dynamic-range compressor (WDR) hearing aid circuits. All patients wore each of the 3 hearing aids, which were installed in identical conditions, for 3 months.

Main Outcome Measures Goals of tests of speech recognition, sound quality, and subjective hearing aid benefit, administered at baseline and after each 3-month intervention with and without a hearing aid. At the end of the crossover, patients ranked the 3 hearing aid circuits.

Results Each circuit initially improved speech recognition, with greater improvement observed for soft and conversationally loud speech (at 52-dB and 62-dB conditions, $P < .001$). All 3 circuits significantly reduced the frequency of problems encountered by verbal communicators. Some test results suggested that CL and WDR circuits provided a significantly better listening experience than PCS circuits in word recognition ($P = .002$), loudness ($P = .003$), overall liking ($P = .001$), and satisfaction.

Research on Knee Replacement in The VA

- Extensive VA research on knee replacement for treatment of end-stage osteoarthritis. Who gets it, why? Differences based on ethnicity and race, provider-, patient- and system level factors.
- Analogous to severe SNHL?
- *“A decision to decline beneficial therapy based on erroneous, incomplete or outdated information is not an issue of autonomy or preference, but of disparity in knowledge.”* – Said Ibrahim, MD

Veteran Knowledge/Preferences

- Audiologists are the gatekeepers of hearing rehabilitation
- Patients /Veterans trusting relationships with their audiologists
- Cochlear implants like any elective surgery are a preference-sensitive treatment
- Requires shared-decision making, respect of patient choice. True preferences or accuracy of information?
- Making informed choices require good information
- Assessing from Veteran interviews*

Functional Outcomes with Hearing Aids: Clinical Assessment of Benefit

- “Aided benefit” is hallmark of CI evaluation– are hearing aids helping? Is this assessed in clinical practice?
- “Unaided” derived from diagnostic audiogram at MCL
- “Aided” vs “unaided” benefit– often not same for greater levels of hearing loss
- Audiology interviews, “*Real Ear* measures are sufficient” /verify output of hearing aids meet targets, time considerations, no other options...
- Role for enhanced screening for CI candidacy?

Summary

- Hearing loss is an inevitable (but treatable) part of aging and VA is leader in comprehensive hearing care
- VA is leader in comprehensive hearing care with hearing aids widely available
- Our VA data demonstrates that most Veterans with severe or worse hearing loss are managed with hearing aids
- Specific treatment pathways to assess patient reported benefit and measure outcomes with hearing aids may help identify those who would benefit from cochlear implants

Our Research Team

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Thank You!

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