

# HEARING FUNCTION: INCORPORATING HEARING ASSESSMENT INTO SPECIALTY CARE AND RESEARCH

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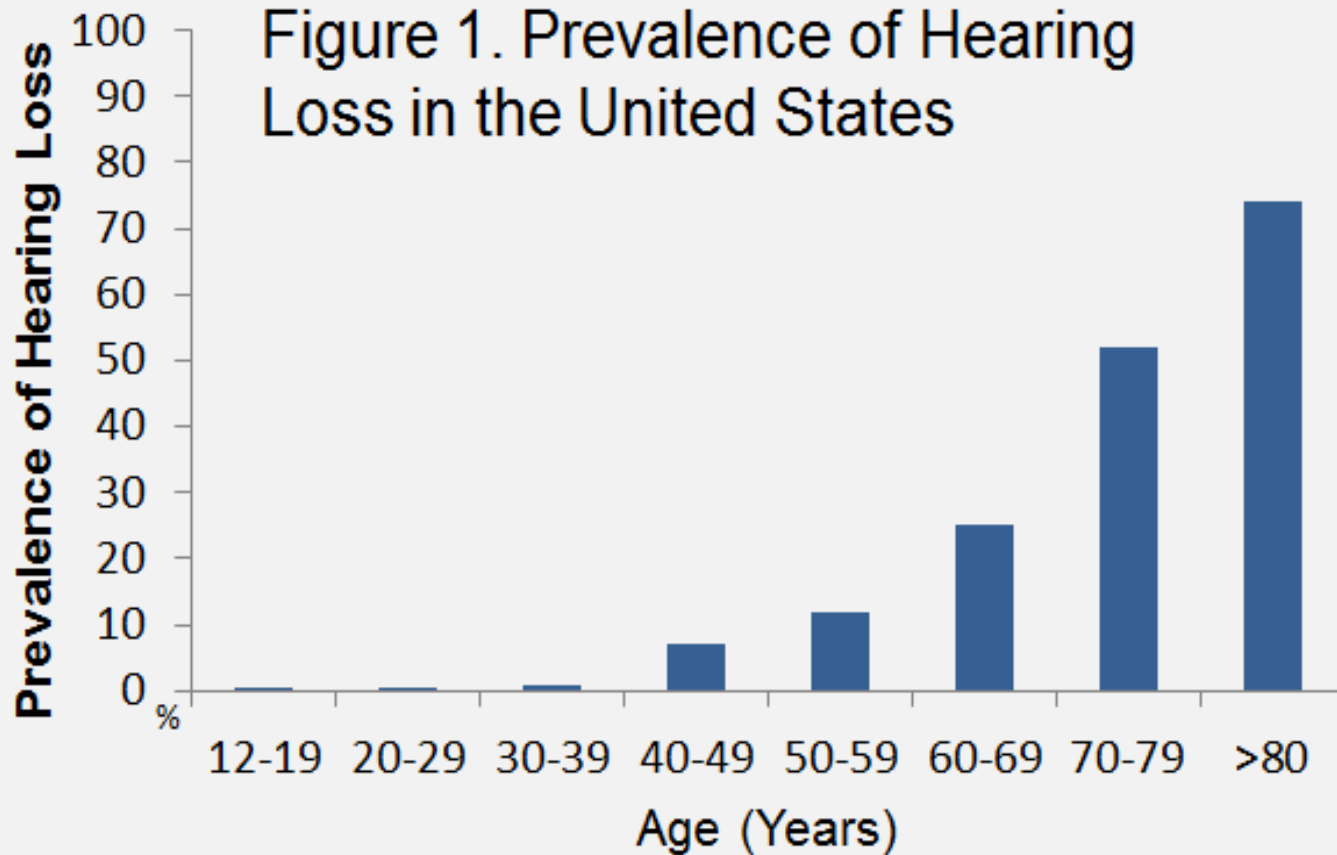
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# Disclosures

- Current Support:
  - National Institutes of Health (NIA/NINR)
  - Veterans' Health Administration
  - New York State Department of Health
  - SCAN Health Plan, Long Beach, CA
- No conflicts of interest to report

# Background

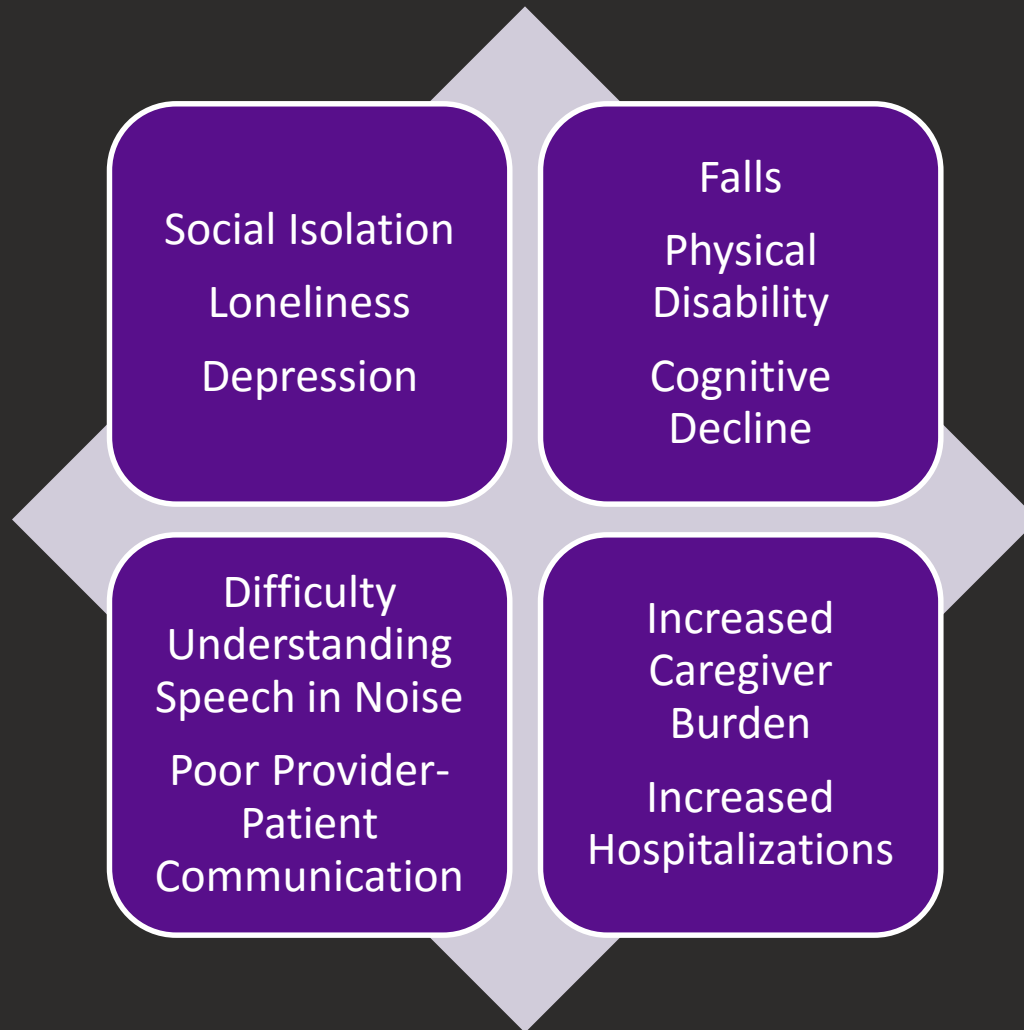


**Figure 1:** Prevalence of hearing loss in the United States by age, 2001-2008. Hearing loss is defined by a pure tone average of 0.5-4 kHz thresholds in the better hearing ear > 25 dB HL. Yamasoba et al. *Hearing Research*: 2013; v303

# GOOD COMMUNICATION IS CENTRAL TO EFFECTIVE MEDICAL CARE, SUBSPECIALTY CARE, AND BIO-PSYCHOSOCIAL RESEARCH

WE INVEST BILLIONS OF DOLLARS TO ENSURE THAT  
PATIENTS / SUBJECTS UNDERSTAND US AND THAT WE  
UNDERSTAND THEM

# Hearing Loss – Many Negative Health Correlates



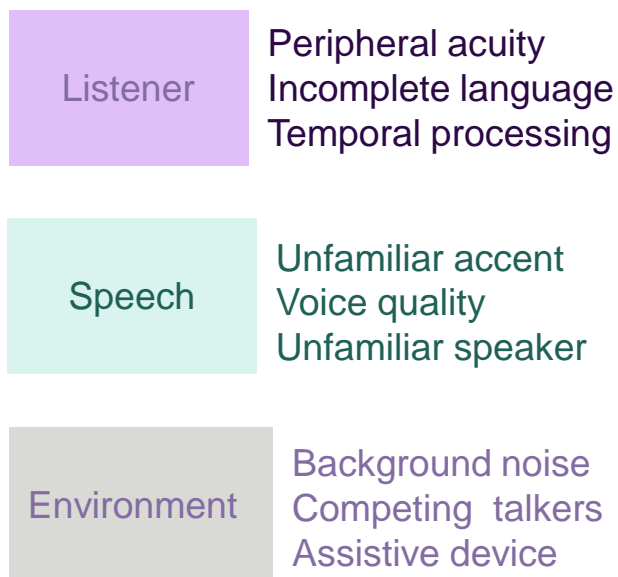
# Do We Consider Hearing Function in Older Patient Communication Research?

- 67 Studies published in English from January 2000 – December 2016 on patients ( $\geq 60$  years) and their communication with physicians
- 16 publications (23%) mentioned hearing loss (6 were mention only)
- 3 publications used hearing loss as an exclusion criteria
- 1 publication profiled the sample with respect to hearing acuity but did not use this otherwise
- 3 publications studied the association between hearing acuity and quality of communication
- Only 1 publication was an intervention to test the effect of hearing mitigation on communication quality

Cohen, et al. *J Am Geriatr Soc* 65:1642–1649, 2017

# Cognitive Consequences of Acoustic Challenges

## Acoustic Challenge



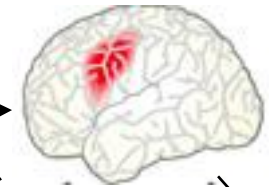
Cognitive fatigue  
Checking out!

Cognitive Demand

x

Motivation

**Neuroimaging**  
fMRI  
EEG/MEG  
Optical imaging



## Listening Effort

**Cognitive Function**  
Memory  
Response times  
Attention

**Physiologic**  
Pupillary dilatation  
Galvanic skin response  
Stress hormones

Adapted from: Peele JE. Listening Effort: How the Cognitive Consequences of Acoustic Challenge Are Reflected in Brain and Behavior. *Ear Hear.* 2018 Mar/Apr;39(2):204-214.

# ARE HEARING AIDS THE ANSWER?



# Hearing Aids (HAs)

- Hearing aids are often not accepted by patients (< 30% that are distributed are used regularly)
- VA provides a compelling “experiment” where hearing assessment and aids are free
  - Some reports suggest that use in VA is even lower despite almost half of Veterans scheduled for a provider ambulatory visit are also scheduled to see an audiologist
- Low Use Attributed To:
  - Stigma
  - Insidious onset of hearing loss
  - Perceived (anticipated and actual) ineffectiveness
  - Insufficient follow-up

# Hearing Assessment Interventions

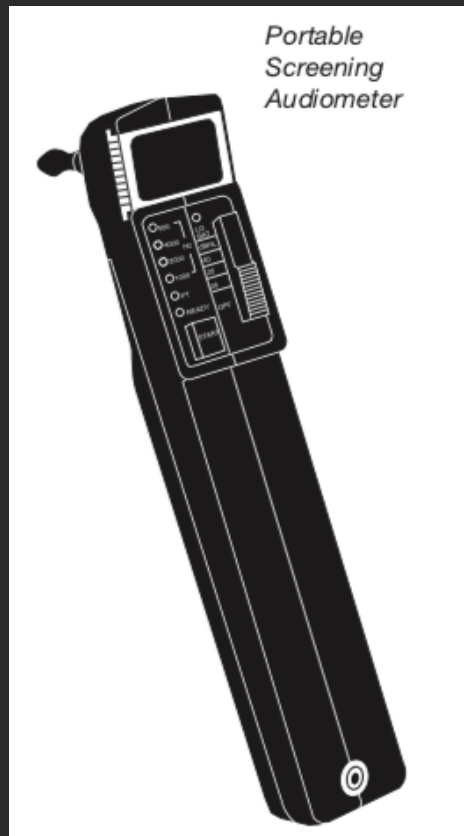


Table 1. Hearing Handicap Inventory for the Elderly – Screening Version (HHIE-S)

1. Does a hearing problem cause you to feel embarrassed when meeting new people?
2. Does a hearing problem cause you to feel frustrated when talking to members of your family?
3. Do you have difficulty hearing when someone speaks in a whisper?
4. Do you feel handicapped by a hearing problem?
5. Does a hearing problem cause you difficulty when visiting friends, relatives, or neighbors?
6. Does a hearing problem cause you to attend religious services less often than you would like?
7. Does a hearing problem cause you to have arguments with family members?
8. Does a hearing problem cause you difficulty when listening to TV or radio?
9. Do you feel that any difficulty with your hearing limits or hampers your personal or social life?
10. Does a hearing problem cause you difficulty when in a restaurant with relatives or friends?

Scores are yes, 4 points; sometimes 2 points; or no 0 points, to each question. Range:0-40

Weinstein BE. Validity of a screening protocol for identifying elderly people with hearing problems. *ASHA*. 1986;28(5):41-45.

# Hearing Handicap Inventory for Elderly - Screen

- HHIE-S predicts propensity to seek hearing evaluation and adopt hearing aid use
- Scores >26 had 7.8 times the odds of being current hearing aid user c/w scores <10; 10-24 were 2.7 times odds compared to those with <10 (cross-sectional)
- HHIE-S discriminates between non-adherents (failed to adopt), rejecters (adopted a hearing aid but failed to use) and accepters (used a hearing aid).
- Prospective study: each additional point on HHIE-S associated with an increase in probability of adopting hearing aid

# ALTERNATIVE SOLUTIONS



# Hearing Loss Interventions



# Implementing Hearing Healthcare

## QI Geriatric Clinic Implementation

- Patients scoring  $> 10$  on Hearing Handicap Inventory (HHIE) were offered PockeTalkers to use during their clinic visit
- Those accepting PockeTalkers completed a 6-item Hearing and Understanding Questionnaire (HUQ) (0=worst to 10=easiest listening and understanding)
- Strategy was deployed by clinic nurses, social worker, attendings and fellows
- 200 patients over four months
  - mean age 78.8; range 64-97 years)

# Implementing Hearing Healthcare

- Of 200 completing the HHIE, 73 (36.5%) scored  $> 10$
- 60.2% (n=44) had been prescribed hearing aids
- Half (21/44) were not using them at time of the visit
- Among the 73 with HHIE $>10$ , 37 (50.7%) accepted use of a PockeTalker
- Of 37 users, 31 (84%) scored  $> 8$  (0-10) on the HUQ
- *Do PockeTalkers improve patient understanding or clinical outcomes?*
- *To what degree does hearing loss serve as an important unmeasured confounder?*



**THANK YOU**





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