



Walter Reed
National Military
Medical Center

Innovation Award

Douglas Brungart
Hearing Conservation Research at the
National Military Audiology and Speech Pathology Center

February 6, 2026





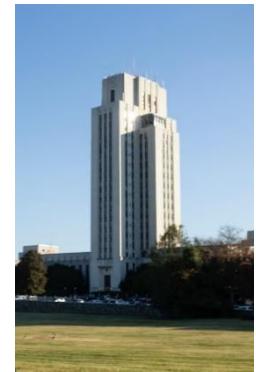
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National Military Audiology and Speech Pathology Center

- Originated in 1940's as Army Audiology and Speech Center
- Influential in early development of Profession of Audiology
- Moved to Bethesda in 2011
- Partnered with Auditory Studies Investigation Group at Defense Centers for Public Health- Aberdeen
- Has Broad mission to improve operational hearing and hearing health in the military





Team Members



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Team Members

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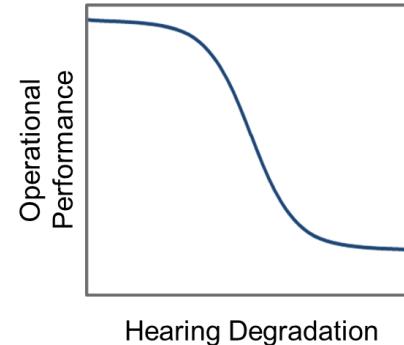
Other Collaborators
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Hearing Loss and Operational Performance

Hearing loss is of great interest to military:

- Military activity is very damaging to hearing, and
- Hearing acuity is critical to military operations



Many of our studies have focused on this relationship

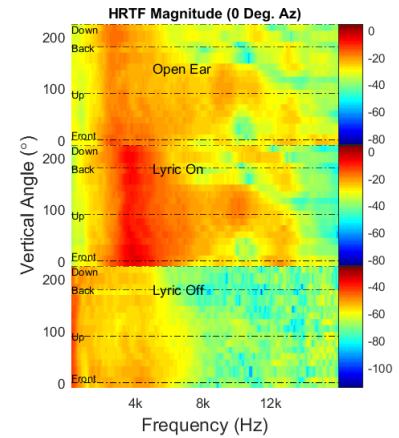
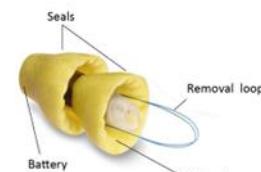
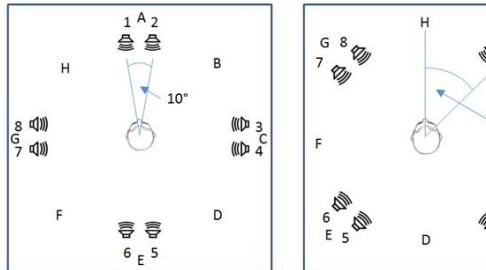




Situational Awareness with Hearing Protection

The ability to localize with hearing protection is critical

- Developed Localization Test for ANSI S3.71-2019
- Evaluated Extended-Wear Hearing Aids as HPDs
- Conducted field studies with HPDs
- Identified localization defect in commercial HPD





Methods for Large-Scale Hearing Studies

DOW has world's largest hearing conservation program

More than 1M research-grade audiograms collected per year

QR Code methods was used to add research data to Audiogram

More than 50,000 SMs have volunteered for hearing studies





Fitness-for-Duty Evaluation

Fitness-for-Duty testing places great burden on occupational audiologist

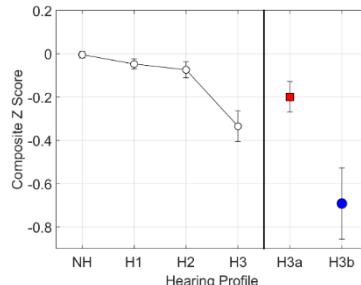
- Must determine if individual is safe to continue without guidelines

New Military Operational Hearing Test provides validated operational link

- Score on test is known to be correlated with relevant operational scenarios

Adopted as US Army Standard in December 2022

Net result has been a 50% reduction in H3 classifications





Hearing Loss and Blast/Noise Exposure

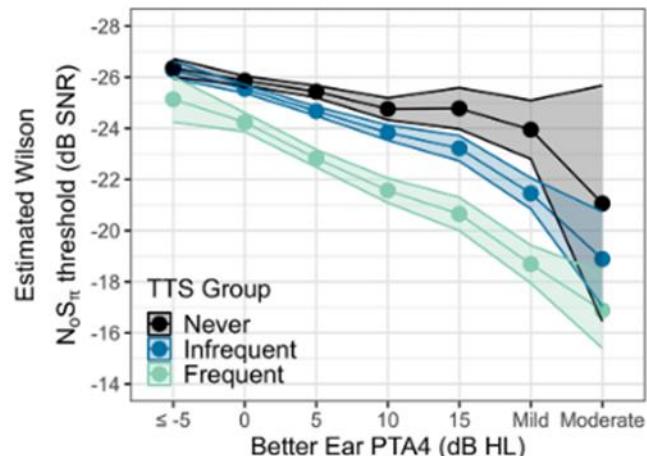
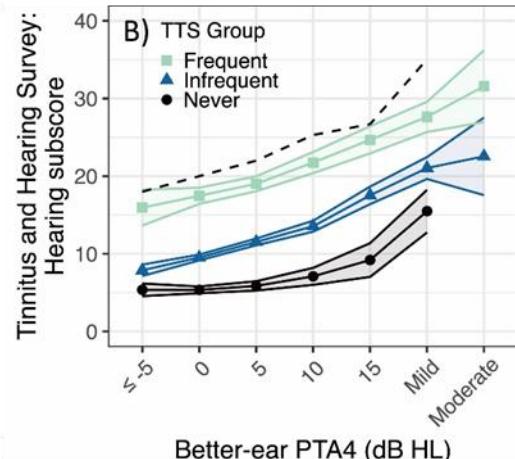
Many noise exposed individuals have hearing complaints but normal thresholds
 Studies show link between TTS symptoms and hearing problems for NH listeners
 Studies also show that low-gain hearing aids can benefit these individuals
 Results consistent with individual differences in susceptibility to cochlear synaptopathy

HVD-MRT triple prot...

Have you ever experienced a temporary change in your hearing (dullness or a muffled sound) after exposure to a loud noise?

Never 35%
 Once in my lifetime 55% (< 1 / Year)
 A few times in my lifetime 10% (> 1 / Year)
 Several times a year
 Several times a month
 Several times a week
 Every Day

Help Submit





The Innovation: Applications of Boothless Audiometry

A historical limitation of audiology is dependence on testing in quiet booth

In late 2010's, we began working with contractor (CREARE) on hearing studies

- They had developed a boothless audiometer as part of an NIH SBIR

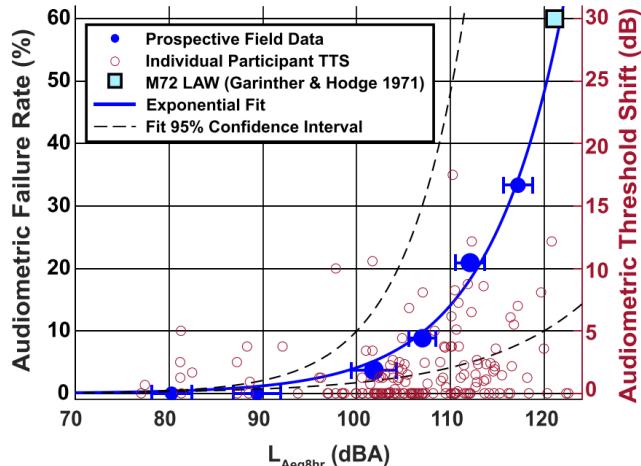
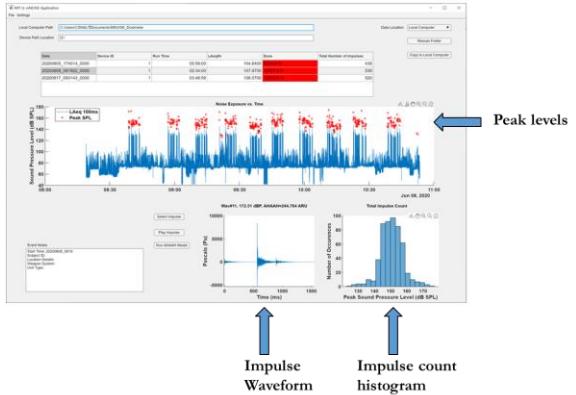
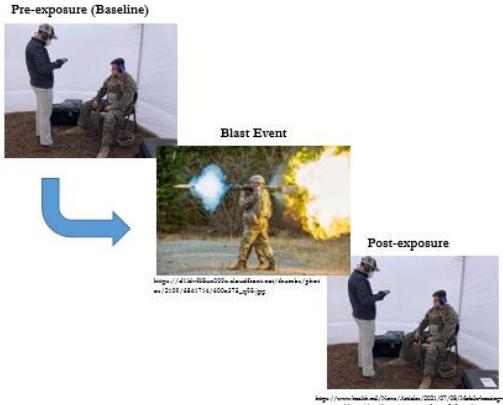
Our contribution was to find ways to utilize boothless capability in military settings





Dose-Response Curve for Blast Exposure

Effects of blast and impulse noise on hearing examined in field studies
 Developed new dosimetry methods and used boothless audiometry
 Identified probability of significant TTS as a function of LAEq8Hr



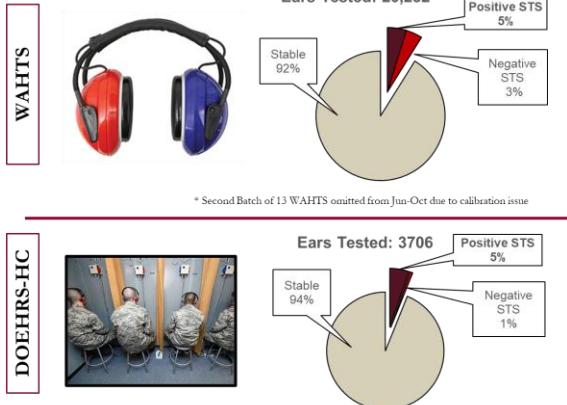


Boothless Audiometry in Hearing Clinic

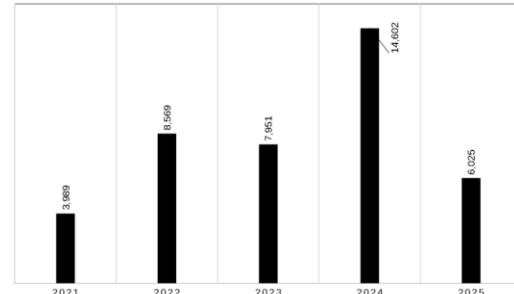
COVID-19 prevented use of multi-man booths for annual hearing tests

FDA-Registered Boothless Audiometer employed by necessity in DOW Clinics

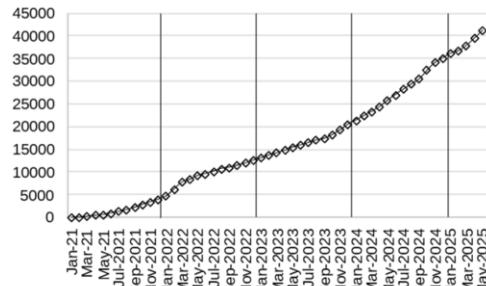
Evaluation of positive and negative STS values used to validate boothless system



Boothless DOEHRS-HC Encounters by calendar Year



Boothless DOEHRS-HC Encounters Across DOD



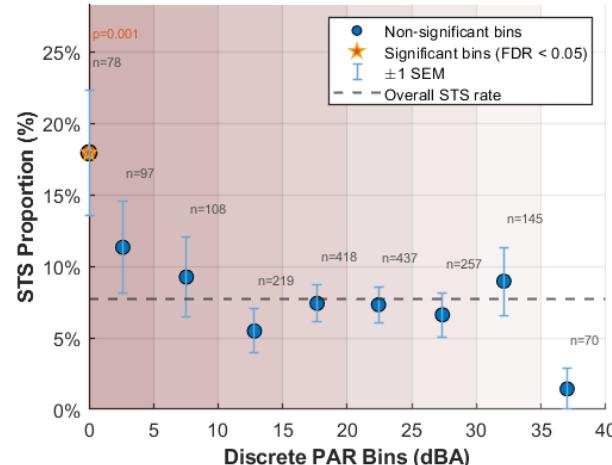
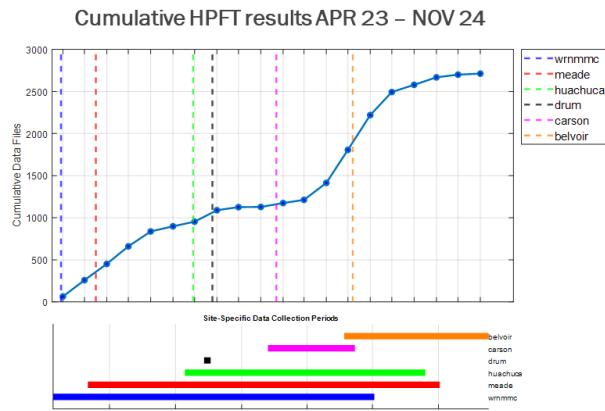


Hearing Protection Fit Testing

Boothless audiometer evaluated as a tool for conducting fit testing

More than 2500 SMs analyzed to compare untrained par to STS rate

Results show significantly higher STS rate for individuals with 0 PAR





The Future: Significance of the Award

Boothless audiometry continues to gain momentum for annual testing in DOW

Findings from studies using boothless audiometry are influencing DOW policy

- Development of new version of MIL-STD-1474 (Risk Criteria for Impulse Noise)
- Possible inclusion of TTS questionnaire data in annual hearing test

Innovation award highlights importance of *continued investment in hearing research*

- Despite long history of military hearing conservation, *there is room for improvement*



Questions

