

Panel Discussion: Ear to brain: Auditory processing and its complexities

**Julianne Ceruti , Au.D., Ph.D.; Jennifer
Gonzalez , Au.D., Ph.D.; Melissa Papesh,
Au.D., Ph.D.; Jennifer L. Smart, Ph.D.**

Co-sponsored by ASHA SIG 6, Hearing and Balance Sciences

VA



U.S. Department of Veterans Affairs

Veterans Health Administration
Office of Research & Development

NCRAR

NATIONAL CENTER FOR REHABILITATIVE AUDITORY RESEARCH

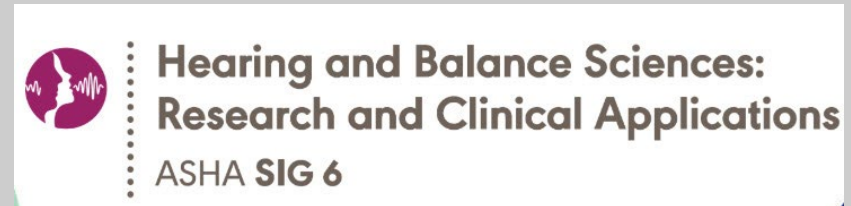
About NCRAR & SIG 6

For more information about the NCRAR monthly seminar series:

[NCRAR Monthly Seminar Series - National Center for Rehabilitative Auditory Research \(NCRAR\) \(va.gov\)](https://www.va.gov/nccrars/)

For more information about Special Interest Group 6:

<https://www.asha.org/sig/06/>



U.S. Department of Veterans Affairs

Veterans Health Administration
Office of Research & Development

NCRAR

NATIONAL CENTER FOR REHABILITATIVE AUDITORY RESEARCH

Disclosures

Julianne Ceruti, Au.D., Ph.D., has the following relevant financial relationships to disclose; she receives a salary from Capital Region Education Council and the United States Army, a speaking fee from the University of Connecticut. She has the following non-financial relationships to disclose; she has an institutional relationship with the Connecticut Academy of Audiology, and a professional relationship with Hearing Health and Technology Matters – Pathways.

Jennifer Gonzalez, Au.D., Ph.D., has the following relevant financial relationships to disclose; she receives a salary from Mayo Clinic and a consulting fee from Salus University as faculty in their Online Au.D. International Bridge Program. She has the following non-financial relationships to disclose; she is a member of the American Speech-Language-Hearing Association (ASHA), holds the ASHA Clinical Certificate of Competence in Audiology (CCC-A), is an elected Member-At-Large for ASHA SIG 6, serves as an Editorial Board Member (EBM) for the American Journal of Audiology (AJA, ASHA Journals), is a member of the American Academy of Audiology (AAA), and holds American Board of Audiology Certification (ABAC).

Melissa Papesh, Au.D., Ph.D., has the following relevant financial relationship to disclose; she receives a salary from the Department of Veterans Affairs (VA), and has no non-financial relationships to disclose.

Jennifer Smart, Ph.D. has the following relevant financial relationship to disclose; she receives a salary from Grand Valley State University, and has no non-financial relationships to disclose.



U.S. Department of Veterans Affairs

Veterans Health Administration
Office of Research & Development

Moderator

Jennifer L. Smart, Ph.D.



U.S. Department of Veterans Affairs

Veterans Health Administration
Office of Research & Development

NCRAR

NATIONAL CENTER FOR REHABILITATIVE AUDITORY RESEARCH

Learner Outcomes

Following this webinar, attendees will be able to:

- Identify which electrophysiological tests may provide additional information for someone with complaints of listening difficulties, despite a normal pure tone audiogram.
- Describe the ways in which electrophysiological tests can support the need for various forms of rehabilitation, including the need for referral.
- Identify how behavioral test results can connect with electrophysiological test results to support improved clinical care in this population.



U.S. Department of Veterans Affairs

Veterans Health Administration
Office of Research & Development

Outline

1. Introduction
2. Lived experiences of our panelists
3. Are there enough audiologists to manage all of the referrals for CAPD?
 - How are school systems or pediatric hospitals managing referrals?
4. When should electrophysiology testing be used in cases where a person was referred for CAPD testing (or has a diagnosis of this already)?
5. Q&A – Panel and Attendees

Introduction: CAPD and it's complexities

- Professionals
- Test batteries and accurate diagnoses
- Addition of other tests to support recommendations or to enhance diagnosis

Lived Experiences: Let's Meet our Panel!

Julianne Ceruti, Au.D. Ph.D.



Jennifer Gonzalez, Au.D. Ph.D.



Melissa Papesh, Au.D., Ph.D.



Are there enough audiologists trained to assess and manage CAPD referrals?

When should electrophysiology testing be used in cases where a person was referred for CAPD testing (or has a diagnosis of this already)?

- Case: Dr. Gonzalez
- Case: Dr. Papesh
- Pediatrics: Dr. Ceruti

(Papesh) Case Study

- Male Veteran, age 52 at first visit
 - Referred to APD clinic by general audiology clinic
- Auditory Complaints:
 - Difficulty hearing in noise & in presence of multiple talkers
 - Difficulty on the telephone
 - Difficulty paying attention to people speaking
 - Confusion of similar sounding words
 - Talks louder than normal
 - Needs TV louder than normal

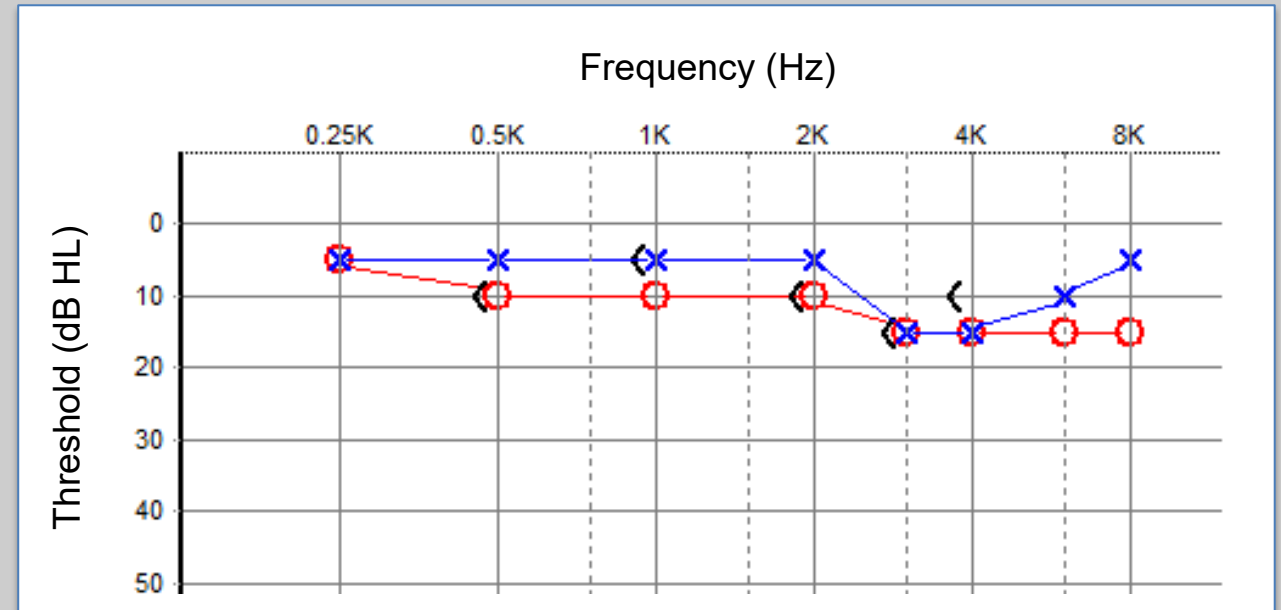
Medical History

- Diagnosed with TBI stemming from blast exposure from IED in 2008
 - 2 additional blast exposures as well
- Had previously undergone Cognitive Rehabilitation treatment in Polytrauma and Speech Language Pathology for concerns related to cognitive difficulties
- Additional medical diagnoses including:
 - PTSD
 - Anxiety
 - Obstructive Sleep Apnea
 - Chronic Headaches
 - Diabetes Mellitus, Type-2
 - Colitis
 - Obesity
 - Nerve compression of arm leading to weakness and numbness
 - Chronic back pain
 - Chronic knee pain
 - Hyperlipidemia
 - Coronary heart disease



Basic Audiometry

- Normal pure tone thresholds
- Type A tymps
- Acoustic reflexes WNL
- DPOAEs present from 750 – 8000 Hz
- WRS of 100% in both ears



APD Test Measures

- SCAN-A (all subtests)

- Filtered Words
- Auditory Figure Ground
- Competing Words
- Competing Sentences

All Normal

- Gaps-in-Noise

- Right ear
- Left ear

Thresholds of 8 to 10 ms in each ear =

Abnormal

- Pitch Pattern Test

- Right Ear
- Left Ear

52% Correct = Abnormal

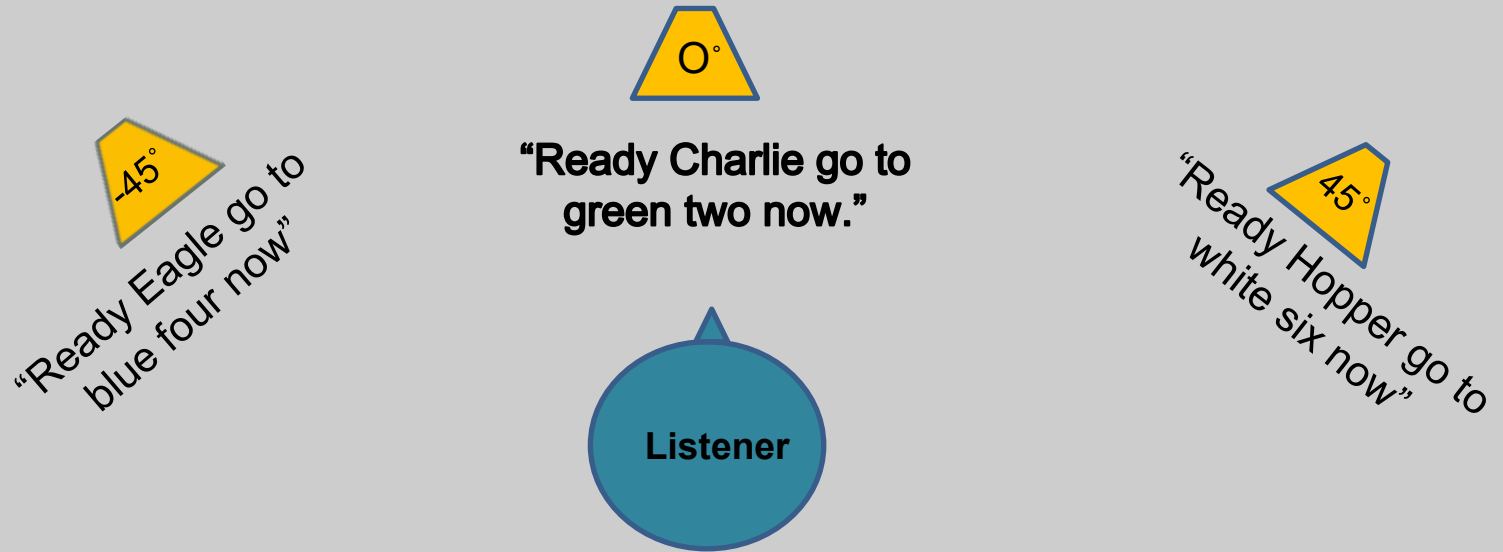
80% Correct = Abnormal

APD Test Measures cont.

- Words-in-Noise (WIN) → Threshold of 4.4 dB SNR= Normal
- QuickSIN → Threshold of -0.5 dB SNR: Normal
- Dichotic Digits
 - Right ear → 97.5% Correct
 - Left ear → 97.5% Correct} Normal
- Staggered Spondaic Words → 4 total errors: Normal

APD Test Measures cont.

- **Spatial Release from Masking – Speech**
 - 2 conditions: co-located and 45° spatial separation
 - Threshold difference between the conditions = spatial release from masking



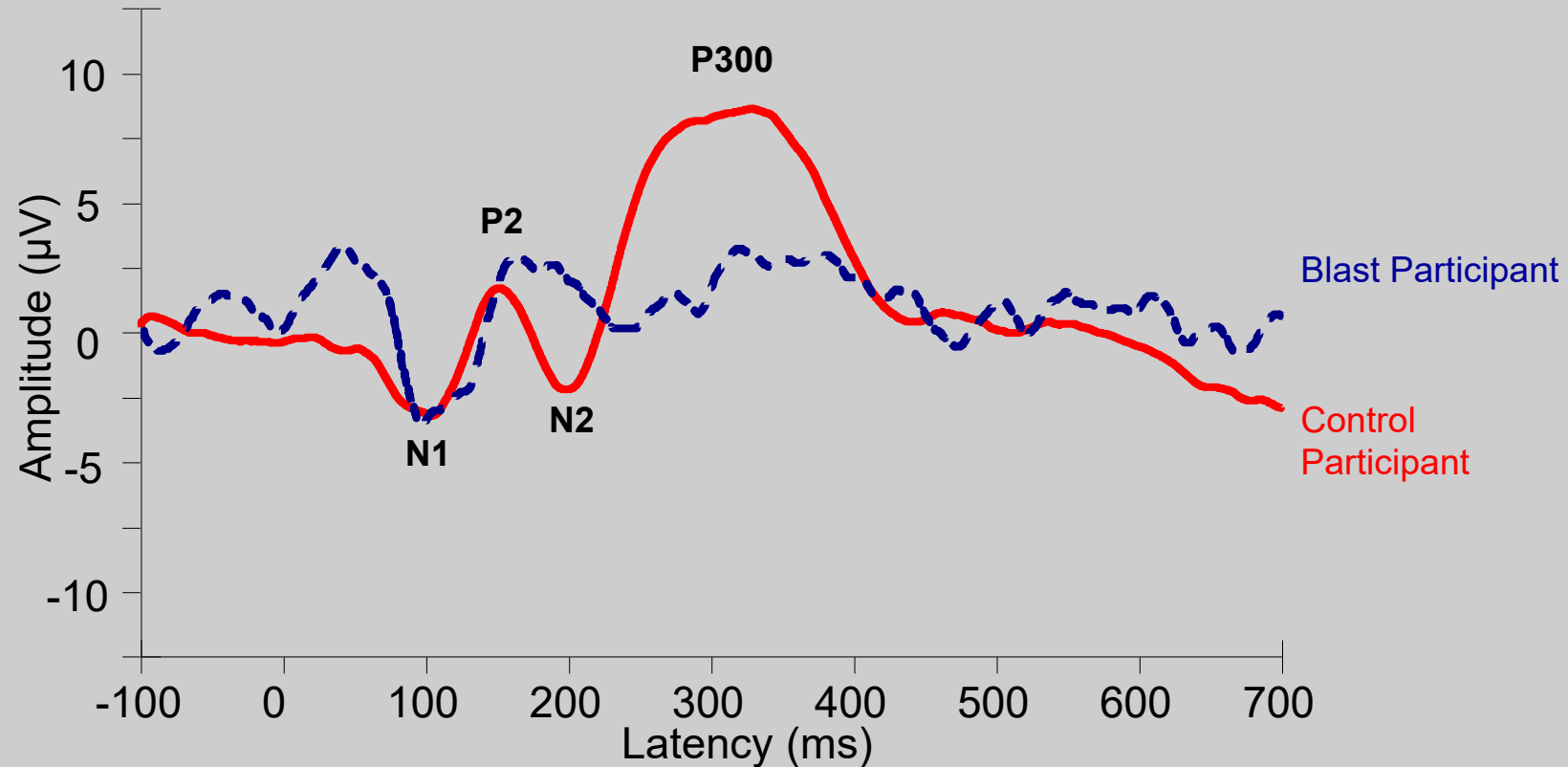
- Control listeners achieve an average spatial release of **~7 dB**

Case Study Participant: **3 dB** Spatial Release

Electrophysiology Data

P300 oddball paradigm

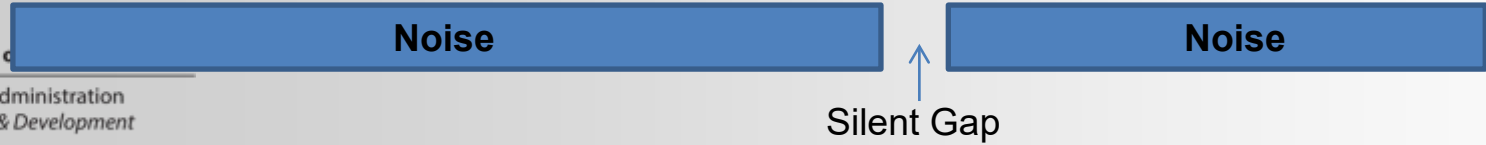
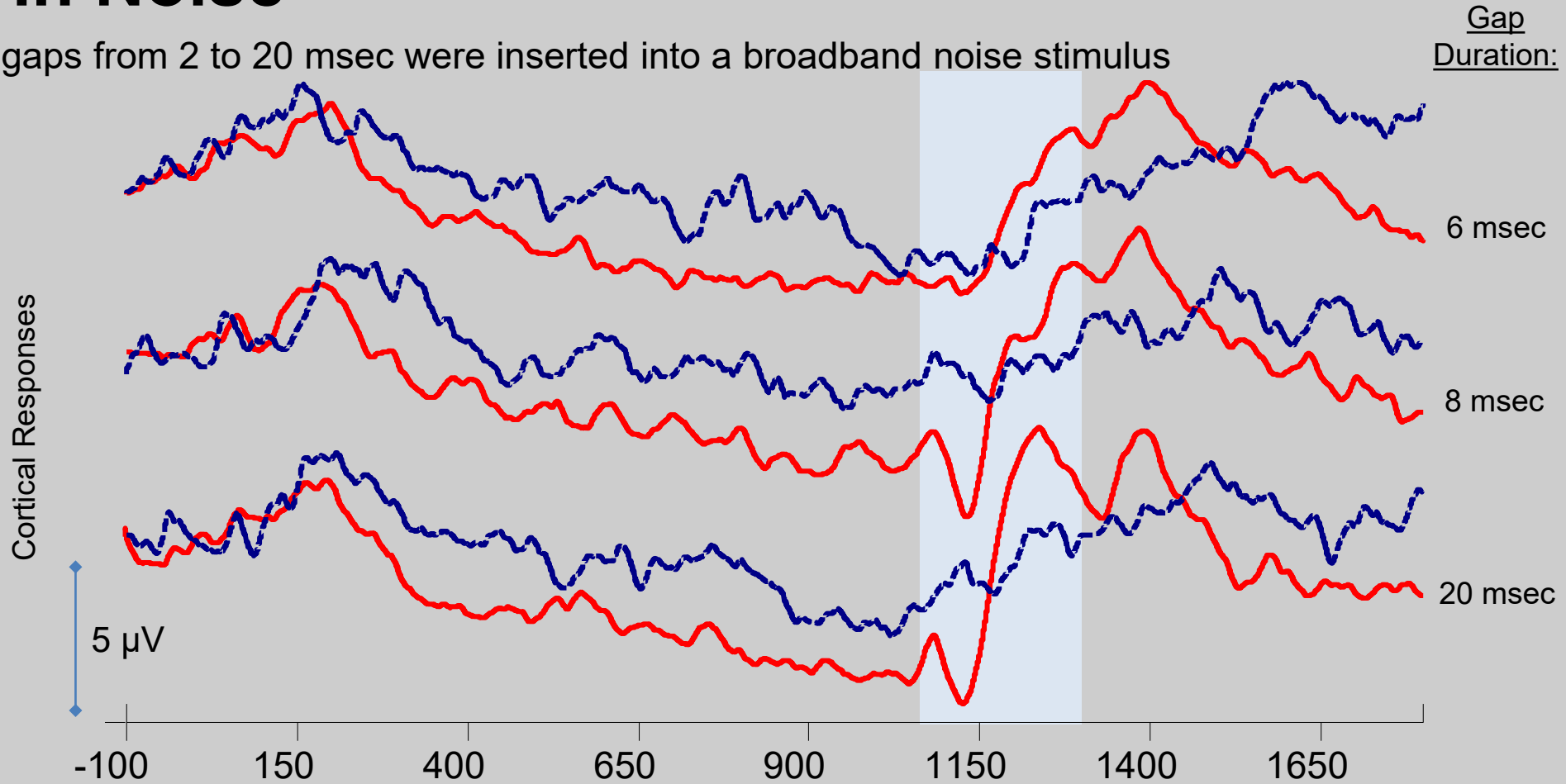
- 500 Hz standard (80% of trials)
- 1000 Hz rare (20% of trials)



Electrophysiology Data

Gaps in Noise

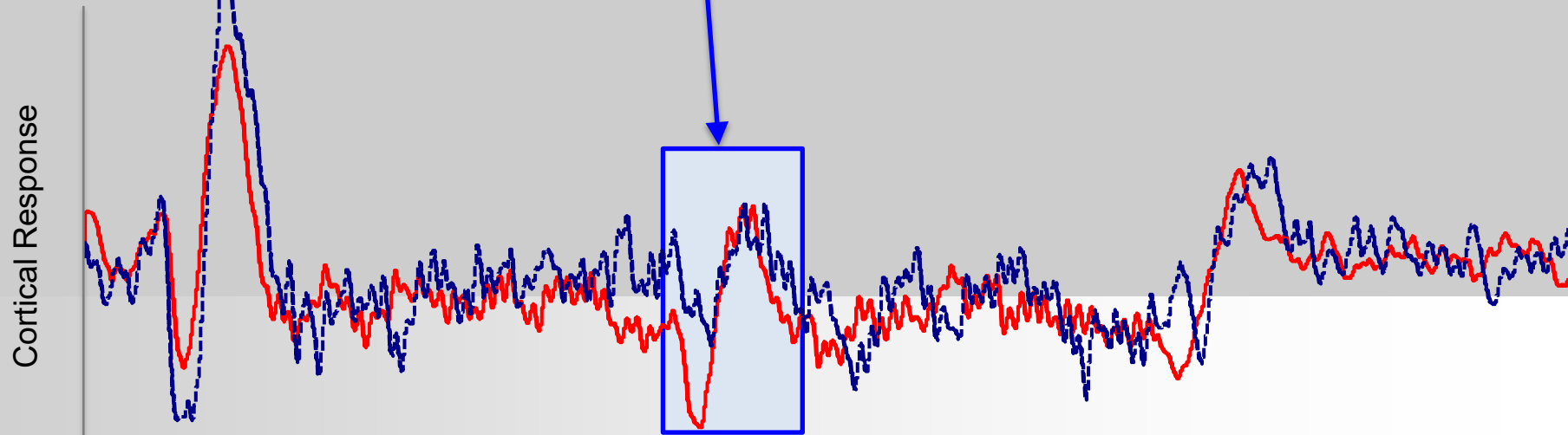
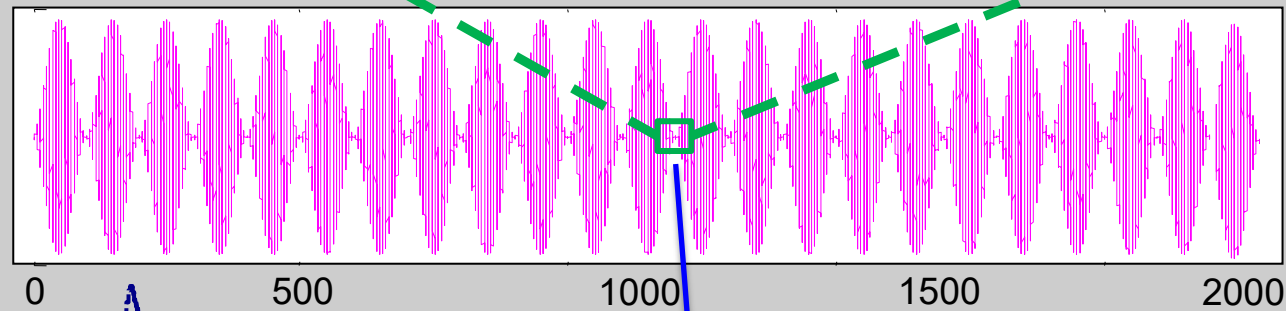
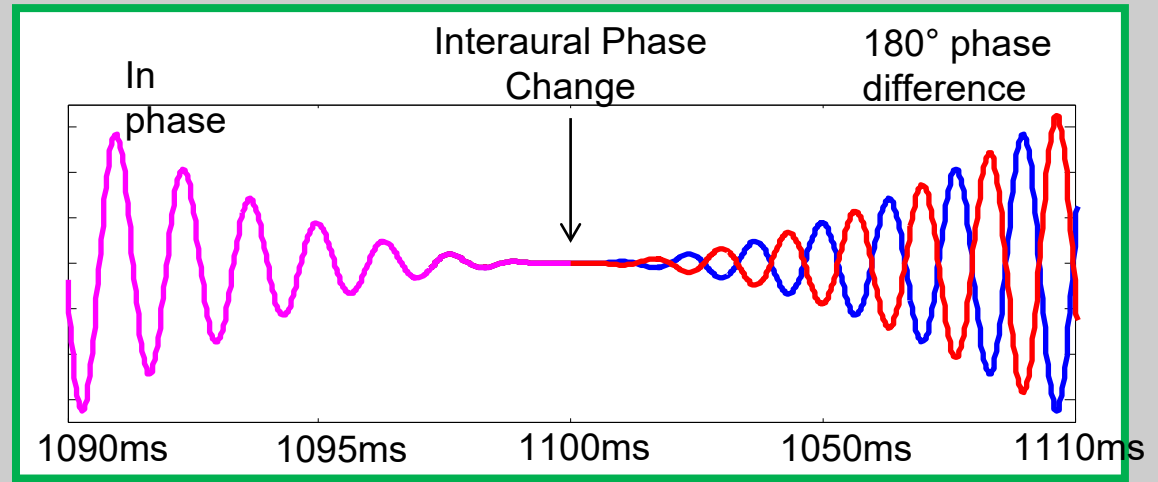
- Silent gaps from 2 to 20 msec were inserted into a broadband noise stimulus



Electrophys. Cont.

Interaural Phase Detection:

- Amplitude modulated 750 Hz carrier tone
- Presented in phase initially, with 180° interaural phase shift occurring at 1100 ms



Audience Discussion

Q & A time!

VA



U.S. Department of Veterans Affairs

Veterans Health Administration
Office of Research & Development

Information for Continue Education

If you attended this panel discussion **LIVE** - please fill out this form to receive a Certificate of Attendance and/or ASHA CEUs:

https://vhaordfedramp.gov1.qualtrics.com/jfe/form/SV_cRTY9wSHC4XYklu

Form must be submitted within 5 days of this event

Email: audiology@asha.org or Marianne.Pierson@va.gov if questions arise*

VA



U.S. Department of Veterans Affairs

Veterans Health Administration
Office of Research & Development