

PIHL Quarterly Newsletter

Volume 1, Issue 1

January 2020

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Special points of interest:

- ◆ PIHL WG reorganization is underway
- ◆ Be sure to read about the CHASMPAS initiative
- ◆ Don't miss out on the cute puppies and the work being performed by the FETCH-LAB™ USA to assist and assess hearing-impaired animals

CONTACT INFORMATION

Julieta Scalco, PhD, PharmD
Biostatistician for the HCE
J.Scalco@posteo.net

Kate Marshall, PhD
Regional Research Administrator
for the HCE
Kathryn.E.Marshall2.ctr@mail.mil

PIHL Working Group Reorganization

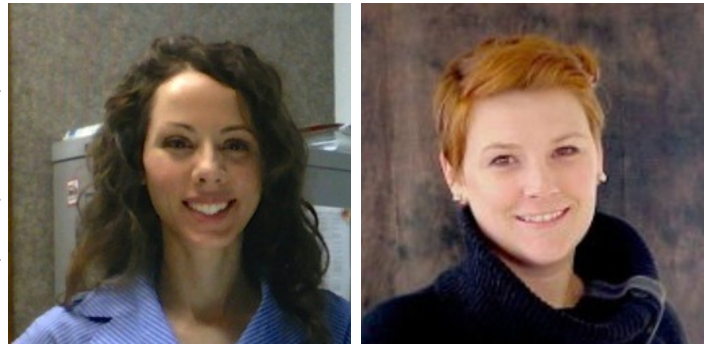
Hello everyone and welcome to the first issue of the Pharmaceutical Interventions for Hearing Loss Working Group (PIHL WG) newsletter!!

As many of you know, former Working Group Chair, Dr. Tanisha Hammill, left the Hearing Center of Excellence (HCE) earlier this year. To continue supporting the valuable contributions of the PIHL WG to the clinical and research communities, the HCE has appointed Drs. Julieta Scalco and Kate Marshall.

We are taking this opportunity to gather input from you, our stakeholders, about how you can best benefit from participation (see **Survey for Subcommittee Topic Areas** article below).

In response to early feedback, we will no longer hold a 90-min quarterly all-hands call to discuss business that may not be relevant to all callers. Instead, we will use this quarterly newsletter to share important information for the community at large, such as funding announcements, subcommittee progress, PIHL-related news, and more.

To make the most of your valuable time, we will reserve all-hands calls for education and/or networking opportunities, such as webinars to present subcommittee knowledge products or to highlight members' research achievements. Reg-



Dr. Julieta Scalco and Dr. Kate Marshall

ular business will still be conducted through monthly meetings of subcommittees, but the committees will be restructured to better align with your top priorities (see below).

The ARO PIHL Social Hour has become a valued networking opportunity, so we are happy to be hosting the event again this year as we launch the updated PIHL WG (see pg 4) and we hope to see you there.

Through its members, the PIHL WG has contributed substantially to creating and disseminating knowledge for the benefit of researchers and clinicians in the public and private sectors, in the US, and abroad. We hope this new format will provide you just as much benefit, and we greatly appreciate your continued participation

-Julieta and Kate

Survey for Subcommittee Topic Areas

Watch your inbox for the SurveyMonkey questionnaire!

We will soon send out a brief survey to get your input on subcommittee topic areas (new and proposed). Please take a few minutes to consider your top interests, how your research might integrate

into PIHL WG efforts, and what benefits you hope to gain from committee participation.

New topic areas already suggested include: Genetics, Patient/Provider Education (online toolkit), and Clinical Monitoring Parameters. Please feel free to add your own interests and expand on what is already listed in the survey .

Characterization of Acute or Short-term acquired Military Population Auditory Shifts (CHASMPAS)

Findings from this study will enhance the knowledge base to:

- ◆ Identify populations that would be most likely to obtain measureable benefit from enhanced prevention strategies, including the use of pharmaceuticals either prophylactically or as a rescue agent.
- ◆ Refine standards for clinical evaluation of acoustic injury
- ◆ Improve strategies for hearing protection in hazardous noise environments
- ◆ Identify populations at increased risk for noise-induced hearing loss
- ◆ Develop improved methods for monitoring small changes in the hearing of at-risk populations.

Point of Contact Information:
 Quintin Hecht, Au.D., CCC-A, CPS/A
 CHASMPAS Program Manager, Research Audiologist for the Hearing Center of Excellence.
 Quintin.A.Hecht.ctr@mail.mil

This month we highlight the CHASMPAS study being conducted by the Hearing Center of Excellence, Walter Reed National Military Medical Center, Army Public Health Center, and Massachusetts Institute of Technology—Lincoln Labs.

The purpose of the CHASMPAS study is to comprehensively characterize short-term changes in hearing among military exposed to hazardous noise.

CHASMPAS uses advanced boothless technology to conduct on-site hearing assessments immediately before and after exposure to artillery-range noise. The pre- and post-test battery includes several measures of hearing sensitivity and function (Figure 1), allowing hearing changes to be evaluated in a comprehensive manner.

Similarly, multiple noise exposure measures will be collected, including both personal and environmental dosimetry, and blast overpressure measures, where applicable (Figure 2). These data will be used to correlate noise-hazard exposures with changes to specific aspects of hearing sensitivity and function.

Procedures — Audiometry

Audiometry procedures are tailored to the operational constraints of each subject population mission environment. A battery of tests is available in order to meet constraints such as time, location and space available.

Hearing Measure	Time	Type of Test
Hearing sensitivity	*5-9 mins	*Hughson-Westlake (H-W), Bekesy, pure-tone testing (500 Hz-8 KHz)
High-frequency hearing sensitivity	6 mins	H-W extended high-frequency pure-tone testing (9 KHz-16 KHz)
High-frequency hearing sensitivity	1 min	Fixed-Level Frequency Test (FLFT)
Eardrum status/middle ear function	2 min	Tympanometry
Cochlear outer hair cell integrity	4 min	Distortion-Product Otoacoustic Emissions (DPOAEs)
Speech understanding in noise	*2-8 mins	*Triple-digit speech recognition test, Modified Rhyme Test (MRT), QuickSIN
Higher-level (auditory brainstem) binaural hearing	*2-8 mins	Masking Level Difference (MLD), Oddball Paradigm
Questionnaire	2-3 mins	Acute Auditory Changes Questionnaire (AACQ), Spatial Speech Qualities (SSQ)

Figure 1. Audiometry battery of tests to be conducted. Procedures are listed in order of importance to meet constraints such as time, location, and space available. Not all tests will be conducted for every subject. (Image provide by Quintin Hecht.)

Procedures — Noise and Blast Measurement

Different types of equipment are used for various sound pressure level measurements ranging from industrial/continuous noise, to impulse noise, to blast.

There is a trade-off between the accuracy of characterizing the exposure of each individual, and the ease of measurement; on-body- or behind-the-hearing-protection measurements will be used when possible.

Sound Pressure Level (dB)

← Up to 140 130-185 → >185

Figure 2. Examples of the different types of equipment used to measure various sound pressure levels. On-body and behind-the-hearing-protection measurement devices will both be used when possible.

CHASMPAS is a multi-service, multi-site study involving troops who are exposed to high-noise/blast weapons systems. This study is currently IRB-approved at three sites and there are two additional sites being considered for 2020. Data collection began in fall of 2019 with preliminary data analysis expected in fall of 2020.

Primary aims of CHASMPAS:

- 1) Develop a multi-dimensional characterization of changes in hearing sensitivity and function immediately after exposure to hazardous noise.
- 2) Evaluate whether or not a dose-response relationship exists between noise exposure and changes in hearing performance.
- 3) Identify risk factors that may increase the likelihood of hearing changes after noise exposure.

Highlights in the Literature

Noise-Induced Hearing Loss: Translating Risk from Animal Models to Real-World Environments

The Journal of the Acoustical Society of America **146**, 3646 (2019)

89 contributing authors

Sponsored by the DoD Hearing Center for Excellence; Editors Colleen Le Prell, Bill Murphy, Tanisha Hammill, JR Stephenson

- ◆ Preface
- ◆ Introduction to drug development for inner ear indications
- ◆ 10 manuscripts describing common species and common pre-clinical noise models used in otoprotection research
- ◆ 12 manuscripts describing at-risk human populations
- ◆ 8 articles describing individual risk factors
- ◆ Comprehensive summary and closing article



Image copyright: The Journal of the Acoustical Society of America

Frontiers in Neuroscience: Delivering Therapeutics to the Inner Ear

<https://www.frontiersin.org/research-topics/8474/delivering-therapeutics-to-the-inner-ear>

112 contributing authors

Sponsored by the DoD Hearing Center for Excellence; Editors Peter Steyger, Larry Hoffman, Ben Shapiro, Sylvain Celanire, Stefan Plontke

- ◆ 1 systematic review describing the current state of the science
- ◆ 8 original research articles describing new techniques to deliver or track exogenous substances to the inner ear
- ◆ 5 reviews and 1 mini review on different methods for delivery of therapeutics to the middle and inner ear

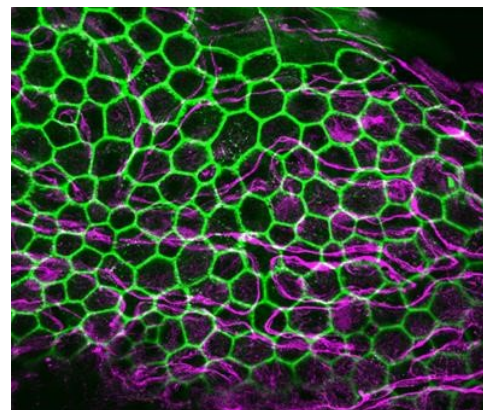


Image copyright: Frontiers in Neuroscience

Member Updates

A little something different

University audiologists assess, assist hearing-impaired animals

The universities of Cincinnati, Northern Colorado, and Akron have collaborated to create FETCHLAB™ USA, a program that enables audiology students to learn about and become certified in administering hearing tests and providing related services to animals.

FETCHLAB™ USA, the Facility for Education and Testing of Canine Hearing & Laboratory for Animal Bioacoustics, was founded in 2007 by its executive director Peter Scheifele, MD, PhD, LCDR USN (Ret.). A former dolphin researcher for the US Navy, Dr. Scheifele decided to give hearing tests to animals for audiological research.



Photo provided by Peter Scheifele

Member Updates Continued

New positions

- ◆ **Dr. Angie Garinis** was promoted to Assistant Professor in the Oregon Hearing Research Center and Oregon Health & Science University and a PI at the VA Portland Health Care System - National Center for Rehabilitative Auditory Research.
- ◆ **Dr. Donna Whitlon** was promoted to Research Professor on Sept 1, 2019, and Named Chair, Research Committee for the American Hearing Research Foundation in May 2019.
- ◆ **Dr. Rolf Herrmann** accepted a new position at Boehringer Ingelheim on Nov 1, 2019. He is now the Clinical Program Leader on projects related to hearing loss.

New Awards

- ◆ **Dr. Angie Garinis** recently was awarded a Cystic Fibrosis Foundation Clinical Award to study genetic markers associated with aminoglycoside-induced ototoxicity in patients with cystic fibrosis.

ANNOUNCEMENTS

Upcoming Conferences

- ◆ **ARO** Mid-Winter Meeting January 25-29, 2020, San Jose, CA
- ◆ **JDVAC** February 10-12, 2020, Rosemont, IL
- ◆ **NHCA** February 20-22, 2020, Destin, FL

Hope to see you there!!

ARO PIHL Social Hour

Monday, January 27, 2020

Please join your fellow PIHL members at an informal social/networking hour to be held from 4-7pm at the Mosaic Restaurant. Just a short walk from the conference center.

Funding Announcement

Hearing Health Foundation's 2020 Emerging Research Grants
Deadline February 10, 2020

<https://hearinghealthfoundation.org/emerging-research-grants>

Thank you to everyone who submitted relevant articles for this first edition of the PIHL WG newsletter.

Julieta and I are working to set up a place on the hearing.health.mil/research/PIHL-Working-Group website as a repository for all of your contributions to the PIHL field.

-Kate Marshall, Editor

WE'RE ON THE
WEB!

[https://
hearing.health.mil/
Research/PIHL-
Working-Group](https://hearing.health.mil/Research/PIHL-Working-Group)

