

Department of Defense Hearing Center of Excellence NEWSLETTER

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Honoring 10 Years of Collaboration, Dedicated to Hearing Health

Colonel LaKeisha Henry,
HCE Division Chief

It's been such an honor to serve since March 2017 as Division Chief of the Department of Defense Hearing Center of Excellence! During my tenure, I've been humbled and amazed by the multiple, ongoing collaborations among HCE, the military Services, Department of Veterans Affairs (VA), our national and international partners, as well as those within the academic and industry communities, which have directly contributed to improvement of military hearing and balance health outcomes.

It's hard to believe the HCE has been in existence for 10 years, but we've reached that key milestone. Hearing is a critical sense for our Service members and Veterans. In recognition of this fact, the DoD established the center in response to the National Defense Authorization Act for Fiscal Year 2009 (P.L. 110-417, Sec 721), and HCE was officially stood up in December 2010, when Air Force Col. (ret) Dr. Mark Packer took the helm. The HCE's mission is to provide



Colonel (Dr.) LaKeisha Henry, HCE Division Chief.
U.S. Air Force photo

support to enhance operational performance, medical readiness, and quality of life through collaborative leadership and advocacy for hearing and balance health.

Above all, my staff and I are grateful to our national and international collaborators for 10 years of focused dedication to the hearing health of our Service members, Veterans, and military families as HCE has worked toward achieving three priority goals:

1. **Best Practices:** Develop, disseminate, and facilitate implementation of best practices
2. **Research:** Coordinate, encourage, and facilitate conduct of research
3. **Delivery:** Help coordinate VA rehabilitation benefits and services to former Service members

This special 10th anniversary edition will highlight benchmarks we've achieved in close collaboration with each of you, along with plans for our future journey. Each of our branches will share highlights of our joint victories, but I'll take a moment to spotlight a few exceptional achievements.



HCE researchers Sarah Sullivan, Dr. Kelly Watts, and Sara Murphy take part in a facility tour February 2014, led by Dr. Ron Jackson, Naval Medical Center San Diego, who discussed the facility's vivarium safety procedures and sterilization techniques.
U.S. Navy photo

One of these successes is an overall decrease in hearing impairment for all DoD components, which is considered to be associated with the implementation of multifaceted Hearing Conservation Programs administered by each Service, and HCE's Comprehensive Hearing Health Program, known as CHHP. According to a recently released tri-service hearing health review, Service members with hearing impairment fell from 21 percent in CY12 to 15 percent in CY18. The percent of DoD civilians enrolled in Service hearing conservation programs with hearing impairment also decreased from 51 percent in CY12 to 40 percent in CY18.

This is remarkable and encouraging news—and a trend we anticipate will continue with ongoing emphasis on DoD hearing loss prevention strategies.

Establishing a solid, evidence-based foundation through research is essential to develop hearing and balance health best practices. To provide unity of research efforts across the auditory science network, the HCE established and actively maintains a collaborative research network of 225 auditory researchers and stakeholders who have strategically aligned DoD/VA/National Institutes of Health research sponsors; tactically integrated DoD/VA research labs, clinics and hearing conservation elements; and executed translational research pathways all in support of addressing hearing and balance research gaps, critical for determining best practices.

The Collaborative Auditory Vestibular Research Network (CAVRN) continues to bring hearing and balance health solutions to our Combatant Commands and their Service members and to Veterans.

When Congress mandated the creation of HCE, it called for a registry to document and track Service member hearing loss and auditory system injury and to share this information with the VA. Ultimately, the registry is a critical tool that allows DoD and VA to assess the impact that best practices are having on Service member and Veteran hearing and balance health outcomes. I'm pleased to report that the Joint Hearing Loss and Auditory System Injury Registry reached full operating capability (FOC) on Jan. 31, 2020. The registry's benefits will continue to expand with the creation of new functionalities that provide an even broader resource for Service member and Veteran hearing and balance health data.

In support of Combatant Commands, HCE, tri-service representatives and associated DoD laboratories have researched the impact of hearing loss on mission performance.

The long-term goals of these efforts are to establish DoD accession and retention hearing profile standards and to research new ways to bring hearing health care to the operational environment through boothless audiometry (hearing testing) and hearing protection device (HPD) fit check systems.

10 YEAR HIGHLIGHTS

- Service members with hearing impairment fell from 21 percent in CY12 to 15 percent in CY18
- DoD civilians enrolled in Service hearing conservation programs with hearing impairment also decreased from 51 percent in CY12 to 40 percent in CY18
- The CAVRN network is comprised of 225 auditory researchers and stakeholders
- The Joint Hearing Loss and Auditory System Injury Registry reached full operating capability (FOC) on Jan. 31, 2020
- HCE, through other key partnerships, is developing an HPD Evaluated Products List that will enable warfighters to select the best HPDs for specific operational tasks and individual needs
- A recent pilot demonstrated a portable, boothless screening capability and effective assessment and diagnoses of hearing-related injuries on the battlefield

“Provide support to enhance operational performance, medical readiness, and quality of life through collaborative leadership and advocacy for hearing and balance health.”

DoD Hearing Center of Excellence
Mission Statement

Fit check systems are used to verify that Service members are receiving the desired protection from hazardous noise with their issued HPD. As we have come to understand, a Service member’s dual need to protect hearing while maintaining situational awareness (this includes use of auditory information, with other sensory information, to understand/have an awareness of their environment) for operational performance, makes wearing hearing protection an ongoing challenge.

To address this need, HCE, through other key partnerships, is developing an HPD Evaluated Products List that will enable warfighters to select the best HPDs for specific operational tasks and individual needs. This initiative will develop and implement standardized methodology to evaluate hearing protection and tactical hearing protective systems, enabling selection based upon hearing critical tasks and hearing protection characteristics. To date, HCE and its partners have:

- Created and disseminated the Evaluated Passive Hearing Protection Device poster and guidebook to enable hearing health professionals, industrial hygienists, and safety professionals to better select passive hearing protection appropriate for the noise environment and hearing critical tasks Service members perform
- Developed and published a national standard that provides methods for assessing sound localization performance for the open ear and with head-worn devices (ANSI/ASA S371-2019).

With improved HPD selection and continued hearing health education, our warfighters will be more inclined to use HPDs and we’ll continue to witness a reduction of hearing loss across all Services.

In collaboration with Walter Reed National Military Audiology and Speech Pathology Center, Army Public Health Center, and small business industry partners, HCE has developed and validated a tablet-based audiometry platform based on the Tablet



Members of the Collaborative Auditory & Vestibular Research Network pause for a group photo at Massachusetts Institute of Technology Lincoln Laboratory during the 2019 CAVRN meeting. Photo by Mr. Glen Cooper, MIT Lincoln Laboratory

Speech-in-Noise-Test. The Integrated Platform for Clinical Assessment and Monitoring system was successfully piloted in 2019 by an Army audiologist supporting the XVIII Airborne Corps at Fort Bragg, N.C., during a deployment to Iraq. The benchmark pilot demonstrated a portable, boothless screening capability and effective assessment and diagnoses of hearing-related injuries far forward on the battlefield!

In 2019, HCE was awarded a DoD/VA Joint Incentive Fund Project to develop and implement a Joint DoD-VA Hearing Technician Training and Certification Program, aimed at improving Service member and Veteran access to hearing health care. The training and certification program will create a clearly defined scope of practice for DoD and VA hearing technicians and support the hearing health mission of both organizations.

Over the last decade, our Clinical Care Branch has partnered with a cadre of researchers and clinicians from DoD and VA to help develop, disseminate, and implement clinical best practices across DoD and VA that serve as force multipliers at every echelon of care. Example topics of these best practices include; however, not limited to:

- Acoustic Trauma and Hearing loss, part of the Joint Trauma System Clinical Practice Guidelines
- Pharmaceutical Interventions of Hearing Loss
- Vestibular assessment and rehabilitation
- Central auditory processing disorder
- Adult tinnitus management

The branch has also informed the development of new, clinically useful tools through Small Business Innovative Research (SBIR) and Small Business Technology Transfer (STTR) funding via the Army Medical Research & Development Command. As a result, several SBIR and STTR topics have been funded for development by small businesses. A sampling of these ongoing projects include mobile applications for aural rehabilitation and tinnitus management; transtympanic medication delivery systems for battlefield use; technology solution to reduce or eliminate hearing protection device occlusion effects; and compact speaker array systems for use in typical sound booths.

I am in awe of the critical work we pursue and accomplish together. United, we will continue to deliver solutions centered on auditory-vestibular system care—from prevention and research through rehabilitation. Thank you for all that you do, and I’m truly proud to serve with you!

RESEARCH HIGHLIGHTS

- HCE has sponsored and coordinated seven annual CAVRN meetings at various MTFs and federal laboratories
- In the past 10 years, the Research Coordination branch has created and disseminated more than 218 knowledge products
- In the past 10 years, the Research Coordination branch has supported more than 100 research projects
- With support from the Research Coordination Branch, the HCE created the PIHL working group, currently composed of more than 200 subject matter experts from the DoD, VA, FDA, NATO partner nations, industry, and academia
- To date, the HCE and NCRAR NOISE study team have enrolled over 1,000 subjects and have collected over 1,200 annual follow-up assessments
- To date, the CHASMPAS study has collected prospective audiologic data and noise/blast measurements on 2 cohorts from Camp Lejeune, totaling 34 participants

Research Coordination Branch Updates

Elsa Granato, Senior Research Administrator

The mission of the Research Coordination Branch is to lead an advanced, collaborative effort to unify the individual mission objectives of DoD and VA research organizations, academia, and industry. Our priority is to identify and address knowledge gaps between auditory-vestibular health and injury, knowledge, and need.

Over the last decade, we have facilitated collaboration and synchronization between DoD and VA researchers, academia, and industry to address shared research objectives. We have coordinated with DoD research funding programs, supported the development of knowledge products (published papers, conference presentations, etc.), and shared findings and opportunities to ensure that researchers have the tools they need. The information we create and share supports gap analyses and research objectives to expand prevention, diagnostics, therapies, and rehabilitation, and to identify devices that can treat and prevent hearing loss and auditory-vestibular injuries. Below are just a few examples that highlight our accomplishments over the last 10 years.

Collaborative Auditory and Vestibular Research Network (CAVRN)

The HCE established and actively maintains a collaborative research network composed of over 225 auditory researchers and stakeholders from the DoD, VA, international bodies, industry, and academia. The CAVRN network serves in a scientific advisory capacity for programmatic research reviews, supports the development of research roadmaps, and brings hearing and balance health solutions to the Combatant Commands and their Service members. The CAVRN provides unity of effort across the auditory science network by promoting gap awareness and by integrating collaborative, coordinated translational solutions for end-user dissemination, implementation, and evaluation. With assistance from the Research Coordination Branch, the HCE has sponsored and coordinated seven annual CAVRN meetings at various military treatment facilities and federal laboratories.

Knowledge Product Development and Dissemination

Over the last 10 years, the branch has created and disseminated more than 218 knowledge products to include conference presentations, journal articles, newsletters, technical reports, webinars, guidebooks, and book chapters. These contributions have been shared with audiences spanning the military and Veteran health care system, including presentations at the highly attended Military Health System Research Symposium (MHSRS) and Joint Defense Veterans Audiology Conference (JDVAC), and a multitude of published reports in key journals such as the Journal of Military Medicine, the Journal of the Acoustical Society of America, and the International Journal of Audiology. Recently, we collaborated with other DoD and VA experts to publish a review of risk factors and clinical care considerations for auditory processing disorder in Service members and Veterans, which was selected by the American Speech Language and Hearing Association to anchor a special collection.

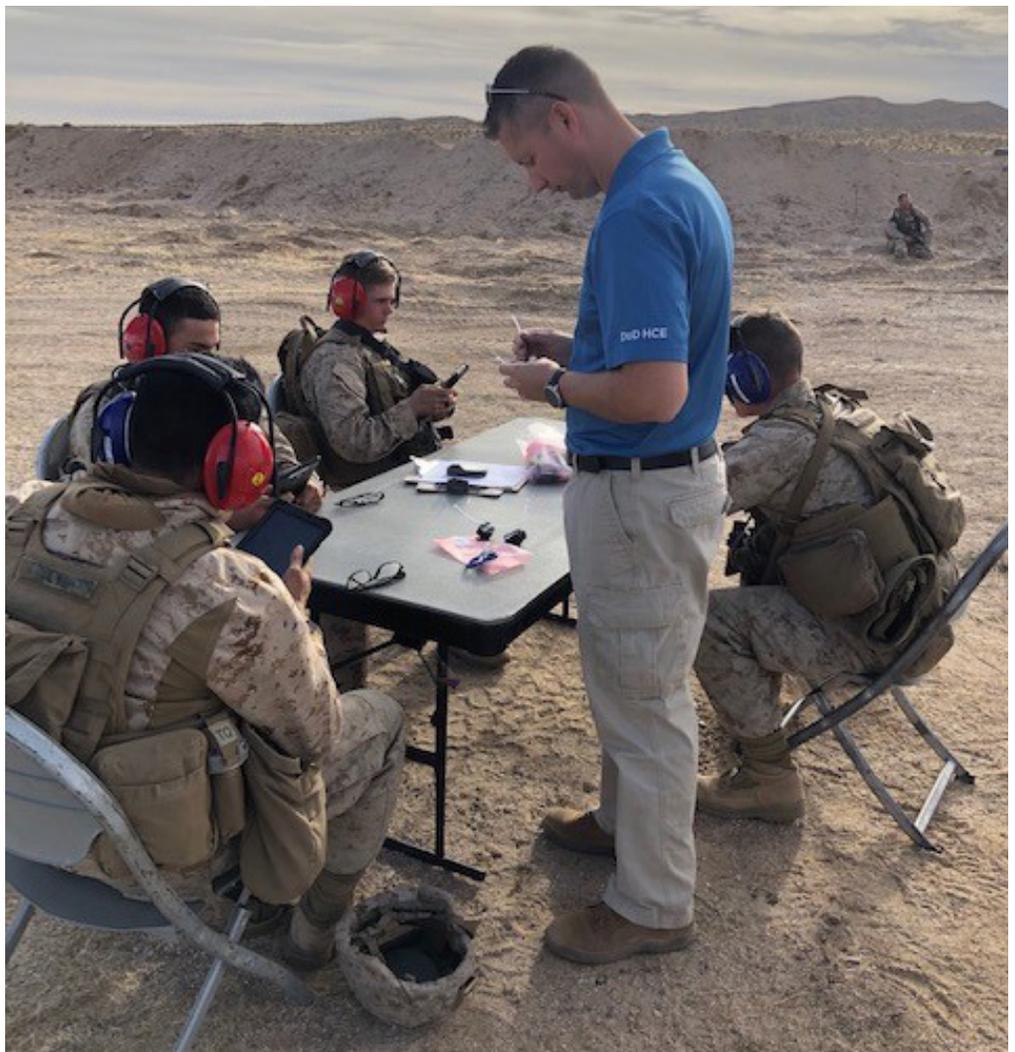
Research Coordination and Facilitation

Our research administration team provides on-site support at six military research and treatment facilities around the United States. Over the last decade, this team has supported a combined average of more than 100 research projects. HCE research administrators have supported multiple HCE roll-out activities (dissemination and implementation), assisting execution of prevention and readiness; clinical, rehabilitation and restoration; and information management activities in support of DoD and VA quality improvement/process improvement program assessments, education, and training initiatives. The team also maintains awareness of dozens of ongoing extramural projects through DoD portfolio management coordination.

Below are a few examples that highlight our research collaborations.

For nearly 5 years, the HCE has been facilitating the VA/DoD collaborative Noise Outcomes in Service member Epidemiology (NOISE) study. This longitudinal study, led by the National Center for Rehabilitative Auditory Research, collects information to estimate and describe the prevalence, etiology, and effects of early-onset tinnitus and hearing loss among active-duty Service members and newly-separated Veterans as well as document the prevalence of common comorbidities and accompanying factors affecting the severity of these conditions. Data collected for the study include noise and ototoxicant exposures, audiometric measurements, pre-existing medical conditions including history of TBI, mental health conditions, and perceived quality-of-life effects. To date, the HCE and NCRAR NOISE study team have enrolled over 1,000 subjects and have collected more than 1,200 annual follow-up assessments.

The Characterization of Acute or Short-term acquired Military Population Auditory Shifts (CHASMPAS) study is a multi-site study designed to comprehensively characterize short-term changes in hearing among military personnel exposed to hazardous noise/blast. HCE collaborators include Walter Reed National Military Medical Center, the Army Public Health Center and the Massachusetts Institute of Technology – Lincoln Labs. Current test sites include Marine Corps Base Camp Lejeune, Marine Corps Base Quantico and Ft. Benning. The CHASMPAS study uses advanced boothless technology to conduct field hearing assessments immediately before, immediately after, and two weeks after exposure to high-noise/blast exposures. The CHASMPAS study also employs personal and environmental dosimetry, as well as blast overpressure measures. Additionally, the CHASMPAS study methods include a retrospective data component to examine participants' auditory-related ICDs and occupational audiogram results (DOEHRS-HC). To date, the CHASMPAS study has collected prospective audiologic data and noise/blast measurements on 2 cohorts from Camp Lejeune, totaling 34 participants. Additional data collections are projected throughout the year at Camp Lejeune as well as at Quantico and Ft. Benning. Preliminary data analysis is underway.



HCE research audiologist Dr. Quintin Hecht, adjusts a blast overpressure gauge while monitoring four Marines undergoing CHASMPAS auditory testing in the Mojave desert, at the Marine Corps Air Ground Combat Center 29 Palms, in January 2020.
Photo by Erin Cesario, DoD HCE

Pharmaceutical Interventions for Hearing Loss (PIHL) Working Group

With support from the Research Coordination Branch, the HCE created the PIHL working group, currently composed of more than 200 subject matter experts from the DoD, VA, FDA, NATO partner nations, industry, and academia. The PIHL working group is focused on the advancement of pharmaceutical interventions for hearing loss. A key finding by this group is that a successful drug therapy for hearing loss would benefit an estimated 27,000 Service members annually, substantially improving medical readiness and reducing costs associated with hearing injury. Through the PIHL working group, the HCE has been able to support contract funding activities, resulting in a U.S. Army Medical Research & Development Command award for Pharmaceutical Intervention for Noise-induced Hearing Loss research.

Most recently, the PIHL working group Noise Committee developed The Journal of the Acoustical Society of America Special Issue titled “Noise-Induced Hearing Loss: Translating Risk from Animal Models to Real-World Environments.” The special issue includes articles from 89 contributing authors that provided an introduction to drug development for inner ear indications, summaries of common species and common pre-clinical noise models used in otoprotection research, and described at-risk human populations and individual risk factors. This special issue will be a critical resource that will inform future funding investments, researchers, medical providers, and patients regarding the future of pharmaceutical interventions for hearing loss.

If you have questions or would like more information, please contact HCE at: <https://hearing.health.mil/hcehome/Contact-Us>

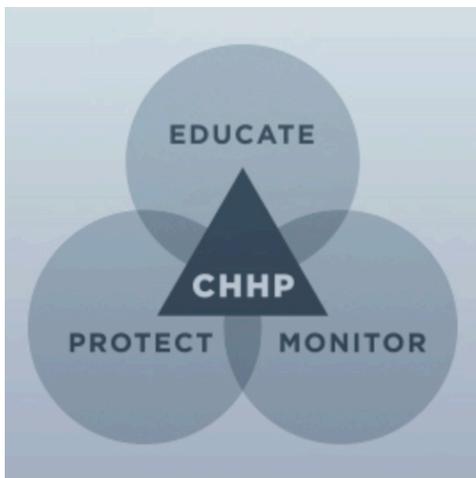
Prevention and Surveillance Branch Updates

Dr. Theresa Schulz,
Branch Chief

Since the center's inception 10 years ago, the branch has championed efforts to enhance operational performance, mission readiness, and quality of life by collaborative leadership and advocacy for hearing and balance, through its programs and initiatives in education, training, outreach, and delivery of hearing health services across the DoD and VA.

Working with tri-service audiologists and hearing health professionals, the branch spearheaded development of the Comprehensive Hearing Health Program (CHHP). Created in 2013, the CHHP is now being launched across the DoD and VA to reduce the incidence of noise-induced hearing loss through education, protection and monitoring efforts. The education component includes patient-education sessions during audiology and hearing conservation appointments augmented with HCE-designed educational materials such as brochures, work books and flip charts.

"CHHP was implemented to optimize the current DoD hearing conservation programs, and to serve the non-occupationally exposed, since exposure to hazardous noise can occur off-duty yet impact a Service member's performance while on duty," explains Col. LaKeisha Henry, HCE division chief.



Army audiologist then Major William Gottlick, Lyster Army Health Clinic, Fort Rucker Ala., uses the "Interpreting the Audiogram" poster from the CHHP educational materials to counsel a Soldier in 2018, after he received his annual hearing test.
Photo by Jennifer Stripling, Lyster Army Health Clinic

CHHP's primary focus is increasing individual knowledge, attitudes, and beliefs regarding hearing health and hearing loss prevention strategies. CHHP achievements include:

- Development of public service announcements aired on Armed Forces Network radio and television, which garnered the 2015 Media Award from the National Hearing Conservation Association.
- Partnering with Government Printing Office to increase dissemination of CHHP materials to both DoD and VA providers at no cost.
- CHHP materials distributed to 96% of DoD hearing health clinics and 17% of VA providers (so far) for their use in delivering hearing health services.

Future efforts include expanding CHHP to additional DoD providers such as Flight Medicine, Aerospace Medicine, Occupational Health, Preventive Medicine, Industrial Hygiene and Safety. The branch is also researching the impact CHHP has on the knowledge, attitudes, and beliefs around hearing health.

The branch has also facilitated several community outreach events spanning its first decade of service to include:

- Partnered with Songs for Sound, a Nashville based non-profit organization dedicated to sharing the gift of music. Through the Songs for Sound hEARoes Tour, the HCE promoted hearing health and hearing loss prevention by educating attendees at large airshows throughout the United States.
- Conducted outreach at LT Dan Band performances and several military air shows throughout the United States, each with an estimated participation rate of between 5,000 and 200,000 per event.
- Participated in the Audiology Now DiscovEARy Zone (DZ), held at the San Antonio Witte Museum reaching more than 1,000 attendees.
- Conducted hearing health outreach to the Veteran population at two annual American Legion Conventions.
- Placed two full page ads in the 2018 DC Bowl program guide and 2019 Army football program reaching thousands of attendees and readers.



Colonel Amy Blank, Office of the Army Surgeon General, and HCE's Dr. Marjorie Grantham conduct a training in February 2020 at the annual Joint Defense Veterans Audiology Association conference in Chicago, Ill., for U.S. Department of Veterans Affairs audiologists who will serve as certified occupational hearing conservationists practicum instructors, providing the tools needed to be successful as mentors and preceptors. The training officially certified 29 VA audiologists as new preceptors.
Photo by Maj. Malisha Martukovich, DoD HCE

Education and Training

In addition to CHHP, HCE collaborated with the Army Game Studio and subject matter experts from all Services, to develop the Hearing Education and Readiness (HEAR) course to assist those who provide standardized hearing loss prevention education. The tool helps track the annual education requirement for personnel enrolled in a Hearing Conservation Program (HCP), per DoDI 6055.12, Hearing Conservation Program, as well as service-specific HCP regulations.

In 2019, HCE was awarded a DoD/VA Joint Incentive Fund Project to develop and implement a Joint DoD-VA Hearing Technician Training and Certification Program, which is a standardized, distributed learning training to improve Service member and Veteran access to hearing health care. The training will ensure all hearing technicians are trained to the nationally recognized standard of the Council for Accreditation in Occupational Hearing Conservation (CAOHC), and will incorporate best practices in hearing health care delivered across the continuum, from Service member to Veteran status. The hearing technician training and certification program will create a clearly defined scope of practice for DoD and VA hearing technicians and support the hearing health mission of both organizations.

Operational Mission Support

Since 2011, HCE, tri-service representatives and associated DoD laboratories have researched the impact of hearing loss on mission effectiveness with the long-term goals of:

- Establishing DoD accession and retention hearing profile standards.
- Investigating new and novel ways to bring hearing health care to the operational environment through boothless audiometry for increased access to care and Hearing Protection Device (HPD) fit-testing which ensure HPDs worn by individuals are properly sized and fitted.

These initiatives ensure increased access to hearing testing and properly fitted HPDs thereby reducing hearing loss and increasing mission effectiveness.

PREVENTION HIGHLIGHTS

- Created in 2013, the Comprehensive Hearing Health Program (CHHP) is now being launched across the DoD and VA to reduce the incidence of noise-induced hearing loss through education, protection and monitoring efforts
- HCE collaborated with the Army Game Studio and subject matter experts from all Services, to develop the Hearing Education and Readiness (HEAR) course to assist those who provide standardized hearing loss prevention education
- In 2015, the HCE collaborated with the Air Education and Training Command, Air Force Surgeon General, and the 59th Medical Wing, to develop the Air Force baseline audiogram mission (hearing threshold testing) for all Air Force enlisted and officer personnel, at the time of their entrance into the Air Force
- Through a partnership with the Air Force Research Laboratory, Army Research Laboratory, U.S. Army Aeromedical Research Laboratory, Naval Submarine Medical Research Laboratory, National Institute of Occupational Safety and Health, and Program Executive Office Soldier, HCE is developing a hearing protection device evaluated products list to help Service members select hearing protection devices that are best suited to the individual, their noise environment, and the hearing critical tasks of a mission or job

In 2015, the HCE collaborated with the Air Education and Training Command, Air Force Surgeon General, and the 59th Medical Wing, to develop the Air Force baseline audiogram mission (hearing threshold testing) for all Air Force enlisted and officer personnel, at the time of their entrance into the Air Force. Today, this program is fully operational and managed by the Air Education and Training Command. As a result of this effort, all DoD service components conduct baseline hearing health services at Military Basic Training sites.

Future Capabilities

With a focus on early intervention and access to hearing health services, the branch has examined and advocated for the use of boothless audiometry technology. Recently, HCE partnered with manufacturers to conduct boothless audiometry training workshops at the American Speech-Language-Hearing Association and the National Hearing Conservation Association professional conferences to share the capability with our audiology community.

Boothless audiometry increases access to audiometric screening/ monitoring through wellness and periodic checks, resulting in hearing health services throughout a patient's life. This technology also helps audiologists to reach out and involve other health care professionals in the early identification of hearing loss, and when appropriate, referral to the audiologist for evaluation and treatment. Current plans are underway for the HCE to partner with the DoD Diabetes Center of Excellence on a study using boothless audiometry in the diabetes clinic to determine its effectiveness in earlier identification of hearing loss in the diabetic population.

Through a partnership with the Air Force Research Laboratory, Army Research Laboratory, U.S. Army Aeromedical Research Laboratory, Naval Submarine Medical Research Laboratory, National Institute of Occupational Safety and Health, and Program Executive Office Soldier, HCE is developing a Hearing Protection Device Evaluated Products List (HPD EPL) to help Service members select hearing protection devices that are best suited to the individual, their noise environment, and the hearing critical tasks of a mission or job. The list will also improve assessment of HPDs in the areas of noise attenuation, sound localization, and speech intelligibility through consensus standards.



Brian Shearer, HCE Prevention and Surveillance Branch, uses a sound level meter to discuss hearing loss and conservation at HCE's outreach booth during the American Legion 100th National Convention in August 2018.
Photo by Dr. Kathy Gates, DoD HCE

Traditionally, HPDs have been evaluated for protection against noise only, while other human factors, such as the ability to hear soft sounds, localization, and situational awareness, have not been evaluated. Developing consensus-based assessment standards to evaluate HPDs will enable warfighters to select the best HPDs for specific operational tasks. To improve selection, the HPD EPL includes objective information on continuous and impulsive noise attenuation as well as spatial awareness. A poster and guidebook for audiologists, industrial hygienists, and safety professionals were developed to help shift HPD selection from considering noise attenuation only. The HPD EPL addresses the dual needs of protection and maintaining situational awareness by enabling HPDs to be selected for their ability to reduce noise exposure and preserve critical sounds. The HCE continues to work as a unified team with DoD and VA representatives to develop acquisition strategies for the central purchase of hearing protection and tactical communication and protective system devices.

If you have questions or would like more information, please contact HCE at: <https://hearing.health.mil/hcehome/Contact-Us>

Information Management Branch Updates

Trina Morrisette, Branch Chief

The Information Management Branch stood up in October 2012 with the hiring of the Chief Information Officer and a cybersecurity expert. The team has since grown into a small but productive group of professionals and subject matter experts primarily focused on the build of a congressionally-mandated registry, development and deployment of a Military Health System enterprise-wide application for standardization and capture of clinical audiograms, as well as supporting the HCE with information management and cybersecurity related matters. The team also supports a number of initiatives, studies and analyses across the breadth of the HCE mission and all of the HCE branches.

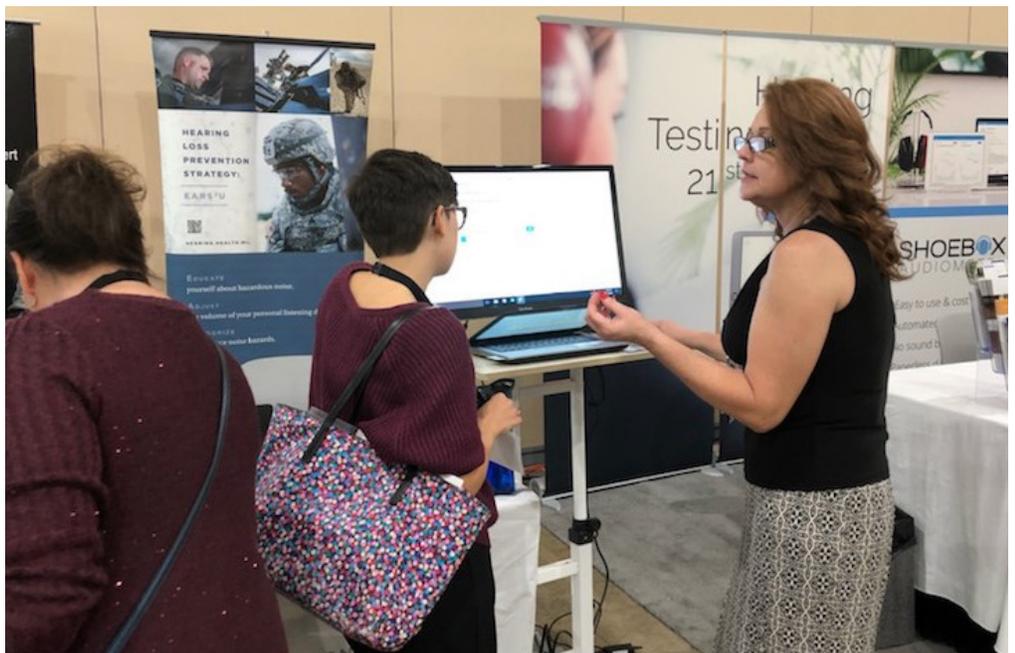
Building the Joint Hearing Loss and Auditory System Injury Registry, known as JHASIR, started with a gap analysis to explore all potential medical systems for a hosting solution. After working through required approval processes, funding requirements, and the transition of the HCE from Air Force to the Defense Health Agency, the contract was awarded in October 2015 to begin development of the registry. Overcoming challenges with registry consolidation actions and data sharing agreement process changes, the registry reached full operating capability on Jan. 31, 2020. The team conducted training for DoD and VA audiologists at the annual Joint Defense Veterans Audiology Conference with a full schedule of sessions planned throughout 2020 and beyond. The registry's benefits will continue to expand through the creation of new functionalities that provide an even broader resource for Service members' hearing health data.

The Enterprise Clinical Audiology Application, known as ECAA, was selected as the enterprise solution for electronic audiogram capture by the clinical audiology community. In December 2013 the IM team began deployment of a commercial-off-the-shelf application to standardize the capture of clinical audiograms, which would become a critical data source for JHASIR.

In 2015, the team consolidated 32 local military treatment facility servers down to five regional servers hosted in the MHS Application Access Gateway datacenters,



HCE's Information Management Branch team.
Photo by Larine Bar, DoD HCE



Stacy Leonard, HCE Information Branch, demonstrates the capabilities of the JHASIR system during the Joint Defense Veterans Audiology Conference in February 2019.
Photo by Larine Barr, DoD HCE

which allowed data sharing of audiograms between locations as well as the three Services. This consolidation effort garnered a cost avoidance of \$1.18 million during the first year, with an additional cost savings of \$680k every year after. To date, the HCE has saved approximately \$4.4 million from server consolidation.

The team recently coordinated an upgrade of ECAA to over 700 workstations across 100+ audiology clinics to incorporate cybersecurity requirements mandated by the Defense Health Agency; this necessary upgrade kept clinics from executing contingency measures if ECAA was removed from DHA and DoD networks. Future developments for ECAA include additional capture of data elements such as vestibular and otoacoustic emissions within the audiology community, identifying and installing at new or renovated sites, and conducting medical device standardization for use with ECAA.

If you have questions about JHASIR or ECAA, or want to schedule JHASIR training, please email the HCE/IM team at: usaf.jbsa.59-mdw.mbx.hcoe-im-audiology@mail.mil

Clinical Care, Rehabilitation, and Restoration Branch Updates

Dr. Amy Boudin-George, Clinical Audiologist & Acting Branch Chief

The Clinical Care, Rehabilitation, and Restoration Branch is dedicated to serving DoD and VA hearing and vestibular health care providers. In the 10 years since the HCE was established, we have been able to partner with researchers and clinicians from both enterprises to bring more visibility to the important work being done to develop and implement clinical best practices.

Continuing Education Support

One of our first national endeavors began in 2015, with monthly webinars to provide continuing education to DoD and VA audiologists. In 2018, we transitioned into offering subscriptions to AudiologyOnline for DoD and VA audiologists. Through these means, there have been more than 30 educational webinars, covering topics relevant for evaluating and treating Veterans and Service members. Additionally, we have provided sponsorship for Military Audiology Workshops (MAWs) for Army, Navy, and Air Force Audiology since September 2014, allowing each Service to provide targeted education to its audiologists regarding the specific needs of its Service members.

Standardization of Clinical Coding

Standardization of clinical coding is a top priority for the Military Health System (MHS), which we have been involved in since 2016. We have coordinated and provided key insight into the MHS Coding Guidance, published in 2019, as well as developed specific guidance for auditory and vestibular communities within the military. The Audiology and Hearing Conservation Common Procedural Terminology Recommendations document was officially released for use in 2019 and will be updated annually to keep up with changing CPT codes and their definitions. The implementation of the use of the code S9476, which indicates when vestibular rehabilitation is provided, was spearhead by our branch, in order to better track service delivery within the MHS. Through the tracking of this code and the services they represent, we will be able to evaluate the needs of the rehabilitation community and the patients they serve.



Major Malisha Martukovich, Air Force audiology liaison for the HCE, tests out the Hearing Education and Readiness (HEAR) course app in 2018.
Photo by Larine Barr, DoD HCE

CLINICAL CARE HIGHLIGHTS

- Since 2015, the Clinical Care Branch has facilitated continuing education for both DoD and VA audiologists
- Providing key insight into the MHS Coding Guidance, published in 2019, as well as developing specific guidance for auditory and vestibular communities within the military
- Members of the branch participate in VA/DoD working groups, which have resulted in publications in several journals and identified opportunities for the development of other knowledge products
- With a focus on training, the HCE has taken over management of the Military Vestibular Assessment and Rehabilitation course, which was created at the former Walter Reed Army Medical Center in 2010
- Through Small Business Innovative Research (SBIR) and Small Business Technology Transfer (STTR) funding (via the Army Medical Research & Development Command), the branch has informed the development of new, clinically useful tools
- Looking ahead, you can expect to see more knowledge products and clinical tools covering various auditory/vestibular disorders, their diagnosis, and management

Strong DoD and VA Collaboration

Members of the branch participate in VA/DoD working groups, covering tinnitus, central auditory processing disorders, and Research Coordination Branch led Pharmaceutical Interventions for Hearing Loss. Through these working groups and by other means, we have collaborated on publications in several journals and identified opportunities for the development of other knowledge products. We contributed to the development of the updated Joint Trauma System Clinical Practice Guidelines, with special content on acoustic trauma and hearing loss.

A member of our branch contributed significant authorship to the Adult Tinnitus Clinical Practice Guideline, published by the American Academy of Otolaryngology–Head and Neck Surgery. Additionally, a supplemental edition of the International Journal of Audiology, titled “Ototoxicity–Special Topics in Clinical Monitoring” was published in 2018. This supplemental edition is a collection of articles from subject matter experts in the Department of Defense, Department of Veterans Affairs, National Institute on Deafness and Communication Disorders, as well as partners from academia and private clinics. It was co-edited by a member of the Clinical Care Branch and sponsored for open access by the HCE.



Lieutenant Colonel Martin Robinette, Army audiology liaison for the HCE, tests out one of several headsets demonstrated by manufacturers during a boothless audiometry workshop in February 2019 at the National Hearing Conservation Association conference in Grapevine, Texas.

Photo by Larine Barr, DoD HCE

Vestibular Training Program

With a focus on training, the HCE has taken over management of the Military Vestibular Assessment and Rehabilitation (MVAR) course, which was co-created by a member of the Clinical Care Branch, while at the former Walter Reed Army Medical Center in 2010. Through this endeavor, the branch has supported expansion of the course to include a biennial Regional Beginner Course, local courses to train multidisciplinary teams in their home clinic, and the addition of a new Advanced Course, which will be offered on the off years of the Beginner Course.



Dr. Karen Lambert, vestibular program manager, HCE Clinical Care Branch, demonstrates vestibular assessment techniques with Lieutenant Colonel Carrie Hoppes, associate professor and deputy director of the Army-Baylor University Doctor of Physical Therapy Program, during a Military Vestibular Assessment and Rehabilitation course at Madigan Army Medical Center in May 2019.

Photo by Dr. Robin Pinto, Walter Reed National Military Medical Center

Innovative Technology Development

Through Small Business Innovative Research (SBIR) and Small Business Technology Transfer (STTR) funding (via the Army Medical Research & Development Command), the branch has informed the development of new, clinically useful tools. As a result, several SBIR topics have been funded for development by small businesses. These projects are ongoing and developments include, but are not limited to: mobile applications for aural rehabilitation, tinnitus management, and vestibular rehabilitation exercises; transtympanic medication delivery systems for battlefield use; compact speaker array systems for use in typical sound booths; in-office vestibular rehabilitation technology with machine-learning; and tympanic membrane repair materials. These tools are designed to create greater access to evidence-based care for Service members and Veterans, beginning at the time of injury through when rehabilitative measures are necessary. Further, they ensure that Service members are receiving state-of-the-science care at every echelon, in some cases hastening recovery time, which will decrease symptoms, improve quality of life, and return individuals to duty quicker than with current means.

On the Horizon

Looking ahead, you can expect to see more knowledge products and clinical tools covering various auditory/vestibular disorders, their diagnosis, and management. There are several products currently under development, such as diagnostic coding recommendations for dizziness and balance disorders, clinical best practices for the management of sudden sensorineural hearing loss, a patient-focused fact sheet for auditory processing disorders, and a summary of best practices for common vestibular and non-vestibular causes of dizziness.

If you would like to send us ideas for products you'd like to be developed for use in your clinic, please contact the Clinical Care Branch at: dha.ncr.j-9.list.hce-clinical-care@mail.mil.



Audiologist Dr. Andrew Fallon, HCE Clinical Care Branch, talks to a Veteran about hearing loss using an ear model during World Hearing Day outreach at Joint Base San Antonio-Lackland in March 2019.

Photo by Larine Barr, DoD HCE

Contact Information

For the latest HCE news and information, visit hearing.health.mil. On-line questions can be submitted at: <https://hearing.health.mil/hcehome/Contact-Us>.

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