



January 2022 Newsletter

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12484, Oakland, CA 94604-2484. See the back page to sign up and support National HLAA.

Our January meeting will be held January 8. In 2021 Bay Area Walk4Hearing directed it's contribution to the CCHAT Center, a 25 year old program that provides critical listening and spoken language services to more than 300 deaf and hard of hearing children in 23 different school districts and parent/infant programs throughout the greater Sacramento area. We will have a presentation from Licia Green, Development Director, and also a mother of twin graduates from CCHAT. We will learn about CCHAT's program, what strategies they use to teach deaf and hard of hearing children, and her daughters will join her to describe their experience as CCHAT students.

Register for this free event [HERE](https://www.hearinglosseb.org/monthly-meetings-1). Or use this link if you are getting a hard copy of the newsletter: <https://www.hearinglosseb.org/monthly-meetings-1>. After you register, you'll be sent the link to join the meeting. Consider staying after the meeting for AfterWords – a chance to ask more in-depth questions, as well as discuss anything you want with fellow members!

HLAA-EB posts our newsletters to the California State Association webpage and a link on our website. **VOLUNTEER! Contact us to let us know you are available!** Check out our website at: <http://www.hearinglosseb.org/> Contact us at: info@hearinglosseb.org

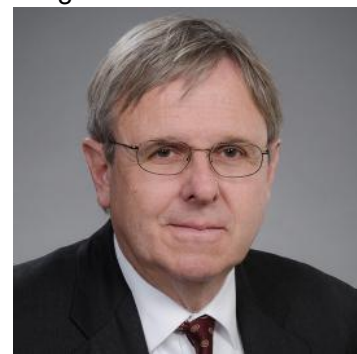
MEETING NOTES: *One Ear, Two Systems: The Relationship between Balance & Hearing*

Introduction:

At our December 11, 2021, meeting, HLAA-East Bay (EB) Chapter members and guests viewed on Zoom



a fascinating webinar originally presented by the Hearing Health Foundation (HHF), entitled “*One Ear, Two Systems: The Relationship between Balance & Hearing.*” The webinar lead presenters were Dr. Jennifer Stone, Ph.D., a research professor of otolaryngology--head & neck surgery at the University of Washington, Hearing Restoration Project member, and Emerging Research Grants alumna, in conjunction with her colleague Dr. James Phillips, Ph.D., research professor in the same department as



Dr. Stone, the director of the Dizziness & Balance Center, and also the director of the Vestibular Diagnostic Laboratory at the University of Washington. Their presentation was divided into three parts: 1) Anatomy & Functions of the Vestibular System; 2) Vestibular Disorders & Treatments; and 3) Research Areas & Cross Talk.

A brief Q & A session and discussion with our audience members followed each of the three parts of the video presentation.

Anatomy & Functions of the Auditory and Vestibular Systems:

After introducing herself, Dr. Jennifer Stone identified her primary research goals: “My goals are to expand our fundamental knowledge about how hearing and vestibular systems work and how they degenerate and how they are repaired, and to train new people to carry on this work in the future.”

Relying on detailed diagrams, Dr. Stone initially described the anatomy and specific functions of the auditory and vestibular systems., as well as the relationship of these two sensory systems, as follows: The auditory system is our sense of hearing, which allows us to communicate and to sense sound and apply these sounds in the environment. The vestibular system is required for us to maintain our balance, to orient ourselves in space, and navigate in our environment. The auditory and vestibular sensory organs do have distinct structures, reflecting the different functions of these two sensory systems. Since both sensory systems are critical for our well-being, damage to either or both of these two important sensory senses can result in serious deficits and degradation of one’s quality of life, impact our work productivity, and have a profound effect on our relationships with other people.

Dr. Stone then explained that similar things may cause damage to both the hearing and the vestibular systems, including:

- *Inherited mutations* (a single gene mutation may disrupt development of both sensory systems).
- *Ototoxic drugs* (e.g., antibiotics, such as gentamycin & streptomycin; antitumor drugs, such as cisplatin).
- *Exposure to prolonged or intense noise* (particularly when noise is a very high pressure or concussive).
- *Microbial infections* (e.g., CMV, Epstein-Barr virus, or meningitis).
- *Aging* (presbycusis in the case of hearing loss & presbystasis in the case of the balance system).

In fact, people with hearing loss are much more likely to experience balance disorders than those who do not have hearing loss. According to a John Hopkins study, about 35% of persons over age 40 will experience a balance disorder. Although little is actually understood about some of the causes of vestibular problems, as well as how to diagnose, treat, or prevent them, the primary organs for both hearing and balance are located in the inner ear in a common space and share similar biological and physiological features. Therefore, the same things that cause hearing loss, also probably induce vestibular deficits and vice versa. Hence, solutions for either of these problems will likely impact the other system.

In summary, Dr. Stone reminded us that the auditory system and the vestibular system are intertwined and share some important features. Each of the two sensory systems function differently and similarly, but they work together and also often fail together.

Vestibular Disorders & Treatments:

After introducing himself, Dr. James Phillips proceeded to pick up where Dr. Stone left off and moved to telling us first about vestibular disorders and then about possible treatments. He noted that vestibular problems are quite common. He stated that approximately one-third of visits to a doctor are based on a primary complaint of a balance or vestibular problem. Fortunately, many of these complaints end up being transient and can be easily treated or even resolved without any treatment in some cases.

Yet, a significant number of people have vestibular problems that are chronically debilitating, and can affect one or both ears. After providing a detailed tour of the structures of the vestibular system, Dr. Phillips warned us that what you might experience with a vestibular problem if it becomes acute is the sense that something is horribly wrong. A vestibular disorder can also gradually sneak up on a person and progressively grow worse over a long period of time. Furthermore, those individuals with a vestibular disorder are significantly more likely to have a hearing loss and vice versa, since the two sensory systems frequently share common pathology.

Dr. Phillips then offered a rather long list of specific problems that you may experience if you have a vestibular disorder, as follows:

- ✓ *Dizziness* (an altered sense of spatial orientation).
- ✓ *Vertigo* (a false sense of movement, as if you or the world are moving).
- ✓ *Imbalance* (an inability to maintain your posture and difficulty walking).
- ✓ *Falls* (a leading cause of death in older adults).
- ✓ *Oscillopsia* (the sense of motion of the visual world & blurred vision when your head moves).
- ✓ *Cognitive challenges* (trouble concentrating, memory problems & brain fog).
- ✓ *Inability to encode information* (laying down new memories & sense of conscious awareness).
- ✓ *Depression & anxiety* (there's a high correlation between vestibular loss & psychopathology).
- ✓ *Autonomic dysfunction* (nausea, vomiting, hypotension & difficulty with blood pressure regulation).

As noted by Dr. Phillips, the question remains regarding how patients can recover from vestibular loss. In discussing this important issue of treatment, he cited the following four ways that vestibular disorders are often addressed:

- *Self-limitation*: Most vestibular disorders are self-limited, meaning that the primary cause of the vestibular issue seems to have been resolved; however, the central nervous system may have alerted other compensatory mechanisms to restore vestibular function such as those identified below.
- *Compensation*: The central nervous system may be able to restore symmetry to the central structure's activity based on unbalanced unilateral input as it relies on commissural connections from one side of the brain to the other.
- *Adaption*: The brain is typically able to monitor the central circuits' activity & resulting behaviors even though the input is still impaired.
- *Substitution*: The brain may substitute input from vision, somato sensation, kinesthetic sense, touch & hearing to restore function.

Although these compensatory strategies often work, Dr. Phillips commented that they are imperfect and simply do not fully compensate for vestibular loss, and sometimes they even fail entirely.

Research Areas & Cross Talk between Auditory & Vestibular Research

In moving to the third part of their presentation, Dr. Stone and Dr. Phillips made it very clear that there exists a great need for new vestibular therapies. However, there are not presently any non-experimental restorative therapies available for the loss of vestibular hair cells. Nevertheless, comparable approaches are being shared by both auditory and vestibular researchers to treat both hearing loss and vestibular problems. Therefore, the advances in one field may potentially be beneficial to the scientists in the other field.

Meanwhile, there is research being presently conducted that may eventually assist researchers who are pursuing solutions to both auditory and vestibular problems. For example, Dr. Phillips described a vestibular neuro-prosthesis, which looks like a cochlear implant, that is now being developed in their U of W laboratory as well as John Hopkins and in Europe. He explained that the device will send motion information to the balance portion of the inner ear and also concurrently send sound information to the hearing portion of the inner ear.

Dr. Stone then followed up with a brief overview of some of her personal research that focuses on attempting to identify ways to restore damaged hair cells. She went on to explain that both auditory and vestibular hair cells in humans degenerate due to ototoxins, injury, infections, and aging. She has been studying hair cell regeneration in other mammals such as guinea pigs, in order to develop potential treatments for hair cell regeneration that would potentially improve or even reverse hearing and/or vestibular deficits in humans.

After describing some of their relevant research interests, Dr. Stone and Dr. Phillips emphasized that there is yet so much we don't know about the vestibular system, and that the work will help us in the long run to

understand and treat both the auditory and vestibular sensory systems. They then suggested that we need more research and funding to support the research on the following critical topics:

- ❖ Fundamental biology of how the vestibular system develops, functions, & degenerates.
- ❖ Better diagnostics for improving genetic testing, imaging of the inner ear, & tests of vestibular function.
- ❖ Prevention of ototoxicity & other forms of damage.
- ❖ Fixing injured systems, perhaps through stem cells, gene therapy, or pharmaceutical agents in the ear.
- ❖ Identifying better systemic treatments & ways to rehabilitate those with sensory loss.

This excellent three-part presentation by Dr. Stone and Dr. Phillips was followed up by a short question and answer session led by our local HLAA-EB leaders where audience members were able to ask questions and share their own related experiences with auditory and vestibular problems and treatments.

For More Information & Questions: Contact Dr. Jennifer Stone or Dr. James Phillips at the University of Washington for more information or questions about their research. Go to the Hearing Health Foundation (HHF) website or YouTube to view this video presentation.

~ **Kathy Fairbanks**

Tech Talk

By (Ms.) Dale Davis
January, 2022



Welcome to our first column of 2022! To kick off the New Year, we are going to check out this new product that could be right out of the pages of a Sci-Fi novel. There is currently a KickStarter campaign happening to raise money for production. For more information you can check out their YouTube channel here:

<https://www.youtube.com/watch?v=jhEzUZiX8jc>

This is not a product we have seen or been able to review personally, so we are presenting this for entertainment purposes only!



Voice Viewer promises to provide real time Speech to LED (Liquid Emitting Diode) captioning that will display your words on the built in screen of your phone, a mask, or a hat as you talk! Brian Kendall, a Canadian inventor, is about to release hats and masks that will allow the HOH community to navigate the world of Covid-19 just a bit easier. Products are expected to be around \$40. Discounts will be available for KickStarter contributors.

For more information, watch their video on Facebook

<https://www.voiceviewer.net/> or contact them at info@voiceviewer.net



Please Note:

These products and innovations are brought to you for informational purposes only and do not reflect any endorsement by the National Hearing Loss Association of America or the East Bay Chapter. You can follow the links in the column for more in-depth information on the topics presented.

As with all hearing health device decisions, it is always best to consult with a professional Audiologist to find the best solution for your needs.

To contribute to this column, please contact: info@hearinglosseb.org

East Bay Leadership Team

The chapter is run by a Steering Committee, Leader Dale Davis, ddavis94605@gmail.com, who also oversees the Membership Database.

Outreach, National Chapter Coordinator/Liaison: Susan Jeffries Fitzgerald, susanlj29@gmail.com

Treasurer: Len Bridges, lenbridges3993-hlaa@outlook.com

Programs: George Fitzgerald, revcgf@gmail.com; Robin Miller, robin@robinmillerlaw.com

Technology and AfterWords Small Group: George Chin, Sr., 352-1569, georgechinsr@gmail.com

Membership: Connie Gee, cbgee2014@yahoo.com; Marlene Muir, muircmc@comcast.net; Derek Daniels, d.c.daniels262@gmail.com

Newsletter Editors: Nancy Asmundson, nasmundson@comcast.net; Kathy Fairbanks, mkathyfairbanks@att.net

Publicity: Andrea Doehrman, andreadoehrman@gmail.com; George Chin, Sr., georgechinsr@gmail.com

Refreshments: Marie Rhein, Coordinator

Technical/Audio Loop: Peter G. Townsend, peterg.townsend@gmail.com, Steven Ulrich

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Go to this URL to join today: <https://www.hearingloss.org/make-an-impact/become-a-memberrenew/>
OR, if you prefer to pay by check or card thru the mail, Nancy Asmundson has membership forms to send to you, or contact HLAA at 301-657-2248 or e-mail membership@hearingloss.org. Your membership form & payment go to HLAA, 6116 Executive Blvd., Suite 320, Rockville, MD 20852.

COSTS: Regular Membership/year (will receive *Hearing Life* magazine in print and digital format):

Individual - \$45; Couple/Family - \$55; Professional - \$80; Nonprofit - \$80;

Online Membership receives *Hearing Life* mag. in digital format only: Individual - \$35; Student - \$25.

Veteran Membership: Complimentary one-year Regular Membership & Lifetime Online Membership.