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A Day in the Life of a Vestibular Audiologist

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Ever wonder what it is like to specialize in Vestibular Audiology? In this edition of "Striking the Right Balance," Carolyn Falls, manager of the Centre for Advanced Hearing and Balance Testing at the Toronto General Hospital, describes a day in the life of a Vestibular Audiologist. If you would like to be more involved in all things vestibular, please sign up for the Vestibular Special Interest Group. Joining will give you access to our Facebook page, access to a master contact list of other vestibular specialists across the country, and to a drop box of shared vestibular educational resources. Sign up by simply emailing janine.verge@cdha.nshealth.ca to let us know you want to be a part.

I vividly remember my first impression of vestibular audiology. I was a first year audiology student and had just found out that my first major clinical placement would be at the Centre for Advanced Hearing and Balance Testing at Toronto General Hospital. Intrigued, but essentially oblivious as to what vestibular testing would entail, I looked to others to find out what I was in for.

"Oh, I could never do vestibular work," one well-meaning person offered. "I just wouldn't be able to handle people throwing up on me all the time."

Throwing up on me, *all the time*? I didn't like the sound of that either. Visions of sickness and misery flooded my head. With that, I entered my placement with a considerable amount of trepidation.

Today, I am the manager of that very same hospital unit. Vestibular work thrills me in a way that makes me talk about it with a gratuitous enthusiasm that probably makes other people uncomfortable. Major bonus: thousands of patients later, not a single patient has vomited on me.

I often think back to that first impression and wonder how many audiologists have a similar impression of what vestibular work is, or have been discouraged from exploring vestibular work based on a similar sentiment.

I can really only speak to my own experiences when describing a day in the life of a vestibular audiologist. I am sure that even among the very small population of vestibular audiologists practicing in Canada, there is quite a bit of variety in what we do day-to-day. Admittedly, the work I do is somewhat unique even within the vestibular arena. We are a tertiary and quaternary centre and only see vestibular patients who have already been evaluated by a community otolaryngologist or neurologist. As a result, we don't often see patients with the more common vestibular diagnoses that can be identified in treated in a less specialized setting (e.g., benign Paroxysmal Positional Vertigo: BPPV).

A patient undergoing vestibular assessment will be booked with me for a total of 3–5 hours. It is a

long stretch, but the majority of patients tolerate the testing process very well. I will briefly walk you through our main vestibular tests; we also offer a variety of other tests at the discretion of the referring doctor (e.g., scleral magnetic search coil, electrocochleography):

Videonystagmography (VNG): Most of us (assuming normal vestibular function) can perform a number of largely unconscious oculomotor functions. We can accurately follow moving targets, whether they are moving smoothly or are abruptly changing position in our field of vision. We can hold our gaze when what we want to look at is off to one side. Part of the VNG test probes the oculomotor system to make sure the eyes are moving conjugately and correctly in these scenarios. The VNG also includes tests where we monitor eye movements for signs of abnormalities after positional changes. With the caloric test, we can look at how fast the eyes move in response to cold and warm water (or air) in the ears to determine if the periphery of one side is significantly weaker than the other.

The Video Head Impulse Test (vHIT): You may recall the vestibulo-ocular reflex (VOR), which we rely on to keep images of interest stable in our field of vision, even during fast head rotations. Have you ever you ever felt the vibrotactile sensation from the rumble strips when coming off of the highway but noticed that you could see the road ahead clearly? You have your VOR to thank for that ability.

For the vHIT, we move the patient's head very quickly (up to 300 deg/s) while the patient stares at a target. The eye movement required to keep the image on target should be equal but opposite to the head movement in terms of velocity and position. Patients with VOR deficits will have reduced eye movements compared to the head movement. They will often also have compensatory eye movements that bring their eyes back to the target (known as corrective saccades). We can measure all of these things using ultra lightweight goggles that are equipped with an accelerometer/gyroscope (for measuring head movement) and a camera (for eye movement). For some patients who require the extra precision, we use a scleral magnetic search coil (basically a silicone annulus with copper wire running through it). The coil is placed on the eye and a bite block is used to measure head movements.

Cervical and Ocular Vestibular Evoked Myogenic Potentials (c/oVEMPs): We use the c/oVEMP to test the otolith organs, which are sensitive to linear accelerations in the horizontal and vertical planes. After scrubbing various places on the patient's neck and under the eyes, electrodes are applied and the patient is asked to turn or lift their head while also directing their gaze upwards. We can measure changes in muscle tone that occur in response to the high intensity tone-bursts we present.

Ideally, we like to have the same clinician perform all of the tests for a given patient. This helps with efficiency, but can also be important from a diagnostic standpoint. The results from one test will often have an impact on other tests in the battery (e.g., patients with conductive hearing loss will have absent air-conducted VEMPs due to the inadequate intensity of the signal), and seemingly subtle clinical findings can become more noteworthy in a broader context.

With all of the tests that we have at our disposal, we are able to probe the different components of the vestibular system (and its central connections) to look for pathology. Unfortunately, no single test can rule out vestibular pathology.

The world of vestibular audiology is rich with opportunities to learn, to apply knowledge in complex ways, to develop new innovations, and to contribute to a growing body of research. Unfortunately, the current vestibular audiology landscape in Canada is not conducive to supporting the work of vestibular audiologists. Our students do not get enough education or exposure and there aren't enough vestibular jobs for all of the clinicians who are keen to work in the vestibular

arena. Vestibular units are expensive to open and maintain. In Ontario, OHIP billings continue to decline and as new tests have emerged, new billing codes have not. It is no surprise that many vestibular testing units within hospitals have been shut down.

I believe that we can change all of this, though it will take a push from audiologists to lobby for the importance of vestibular work. In the United States, the practice of vestibular audiology is commonplace and vestibular courses factor heavily in the curricula of audiology programs (granted, this programs are for AuD degrees). It is in the best interest of all audiologists to show the public the diversity of our knowledge and to be as adaptable as possible within our scope of practice.

Our baby boomers are going to need people skilled in vestibular assessment and rehabilitation much in the same way that they are going to need amplification. Perhaps it is time for us to take up the challenge of offering these services across the country for all of the patients who are in desperate need.

If you have any questions or comments, I'd love to hear from you: carolyn.falls@uhn.ca. For more information on the National Vestibular Interest Group or to join the movement, email Janine Verge at vergej@cdha.nshealth.ca.