Canadian Audiologist

The Official Publication of the Canadian Academy of Audiology

Striking the Right Balance – Vestibular Audiology for All Audiologists: A Tiered Approach

Published January 18th, 2020

Erica Zaia, MSc

In this edition of "Striking the Right Balance," one of our editors, Erica Zaia, MSc, RAUD, details ways in which all Audiologists can offer Vestibular Services, even the ones of us who were never very much into deciphering eye movements in Grad School.

Michael Vekasi, MClSc, R.Aud, Aud(C), FAAA and Erica Zaia, MSc, RAUD are coordinating the "Striking the Right Balance," feature which will cover the latest information on 'all things vestibular.'

If you would like to be more involved in all things vestibular, please sign-up for the Vestibular Special Interest Group. Sign-up by simply emailing CAAvestibular@gmail.com to let us know you want to be a part. Also, check out our Facebook page for a free list of online vestibular resources at the CAA National Vestibular Special Interest Group page.

As a vestibular audiologist, having spent the entirety of my 25-year career in the field, currently dedicating my time exclusively to it, I am often asked questions about my clinical practice. I appreciate that many of my colleagues may not have had much exposure to vestibular audiology. A number of them mention the memories of water caloric irrigations, how messy it could be, nausea (or worse…) that it would provoke and decipher incomprehensible eye movements. None of these felt very appealing to them as a career choice. Therefore, when colleagues express interest in vestibular, I am always delighted to talk about the advances in the field and how it can be a relatable, interesting and extremely rewarding part of audiology, for ALL audiologists.

So, if you are considering expanding your practice and incorporating aspects of vestibular audiology into it, I invite you to this reflection.

The first and most important decision I would suggest you make is to what extent you would like to offer vestibular services to your community. You may choose to stay at an entry-level and start with:

1. Including questions that pertain to vestibular in your intake questionnaires. Whether you work in pediatrics or with adults, in diagnostics or rehabilitation, there are always relevant questions to be asked. A growing body of research demonstrates that vestibular dysfunction may be present in up to 70% of children with hearing loss.[1] If you see children in your practice, ask about motor development milestones and add a simple balance assessment.[2] If you work with adults, include questions not only about dizziness and vertigo but also about imbalance, difficulties functioning in the dark or walking on uneven ground. Maintaining good balance means relying on a constant

and effective dialogue between the vestibular, visual and proprioceptive systems with several primary and integration areas in the brain. Not only can dysfunction in any one of these areas result in symptoms, but also can these become more noticeable with temporary disruption in the input in an additional system. This is the case when an individual with vestibular loss, who uses visual input heavily, reports great difficulty functioning in the dark. Last, but certainly not least, ask about falls. In a survey conducted by Baxter and colleagues in 2017,[3] most audiologists did not include this simple question in their intake and did not provide any information about falls, even though the evidence for increased risk of falls in individuals with hearing loss has been well established.

2. Educating your client. Use pictures and diagrams and, in simple ways, explain the role of the vestibular system in the inner ear, how it helps with balance and everything else that it gives us – a sense of where we are in space, ability to stand still, move, walk, engage in sports, etc. Contextualize their answers to your questions in this conversation. They will feel listened to, validated and empowered.
3. Now that you have the information you need and your client on board with you, you can proceed to determine the need for further assessment and/or intervention. Survey your community and learn who and where are the professionals offering vestibular assessments and management. Ask about their services, their experience, their approach. Creating a relationship with vestibular audiologists, ENTs/otologists, neurologists, physiotherapists, occupational therapists and any other specialists in the vestibular field in your community will be beneficial to you and your clients. Refer the clients identified by your effective intake to the professionals in your network. I am sure they will appreciate your referral and likely refer clients in need of hearing care to you.
4. Providing basic balance health programs such as information sessions on the vestibular system/balance, highlighting the role of the audiologist in the assessment and management of its disorders; educating your clients on falls prevention, keeping in mind that dizzy adults have a 12 fold increase in their chance of falling[4] – falling is not a concern exclusive to seniors; and sponsoring or hosting sessions that stimulate and maintain balance for all ages, such as Tai Chi and Yoga.

By now, you may be feeling as though you do want to provide more services, perhaps because you have identified an acute need in your community or because you would like to explore the field of vestibular on a deeper level. However, you are not yet committed to buying very expensive equipment and diving too deep. Providing services at the intermediate level may be your best approach. The investment needed for this suggested model of care is relatively low, needed to acquire a physiotherapy or massage bed and goggles that will allow you to see your clients' eyes while removing their ability to see the environment and fixate their vision. While new physiotherapy beds with advanced hydraulic features can be quite expensive, I suggest you to consider purchasing a gently used massage table that you can even store away when you are not seeing clients with dizziness concerns. Websites such as eBay or Facebook Marketplace often list such beds. You may also find them locally, perhaps at a physiotherapy clinic looking to upgrading their equipment or downsizing. As for the goggles, you may opt for inexpensive optical Frenzel glasses such as:

http://www.usneurologicals.com/index.php?app=cms&ns=display&ref=splash
https://www.jedmed.com/products/frenzel-nystagmus-goggles-1
https://www.amazon.com/Frenzel-Lense-Goggle-Fixed-Bulbs/dp/B007MRUISS
http://www.nagashima-med.com/products-lineup/frenzel-goggles/led-frenzel-goggles-nk-1

These will also have a low maintenance cost but carry a major disadvantage: you cannot record the

results of a particular test as you would when using video Frenzel goggles. Using optical Frenzel goggles requires you to learn how to interpret eye movements and make clinical decisions in real-time.

The next technology level up is video Frenzel goggles. These represent a larger investment but enable you to document and review your findings using the recording feature. As you begin to observe and interpret eye movements, this may be an extremely attractive feature. Not only can you review your tests at a later time, but also can you send the video to a more experienced colleague for supervision on the test findings, for instance. Here are some options available to the Canadian market:

Vestibular First

A major advantage of the Otometrics Natus system is that it can be upgraded to a full VNG and vHIT system, should you decide to move up to offering vestibular services at the advanced level.

Otometrics Natus

This is an excellent binocular video Frenzel that can also be upgraded for advanced testing, not including vHIT though.

Interacoustics Visual Eyes

The Synapsys video Frenzel was commercialized in Canada for while but at this time no Canadian distributor was found online.

Synapsys Video Frenzel

These goggles are available in Europe. It is a very smart, accurate and inexpensive type of video goggles.

?Frenzel

The idea of providing vestibular services at the intermediate level is to add basic vestibular testing to your practice. The systems listed above will not generate nystagmus tracings and will not analyze the results. However, they will enable you to investigate the presence or absence of nystagmus with and without visual fixation. This opens up a large window of opportunity for testing that can provide you with information on how the vestibular system is operating, showing you signs of peripheral vestibular loss, central nervous system involvement, and positional vertigo. You can perform oculomotor testing, positional/positioning testing, and another bedside vestibular testing such as high-frequency head shaking, and vibration-induced nystagmus. With this information in hand, you may decide whether (1) to offer treatment or management, in the form of canalith repositioning maneuvers for peripheral positional vertigo or vestibular rehabilitation exercises for unilateral vestibular loss, for instance, or (2) to refer the client for further vestibular assessment and management, which may involve medical investigation, such as in cases where central nervous system signs are present. Here once again, the connections you have made in your community will be vital to you and your client.

By now, you have likely learned enough to become fascinated with vestibular assessments and management, found that your community is in great need of reliable, specialized, timely and accurate diagnosis for their vestibular concerns and are ready to move on to offering services at the advanced level.

If you have opted for the Otometrics Natus video Frenzel, all you need to do is to purchase the additional modules for recording and analyzing oculomotor, positional/positioning and caloric testing. You can also purchase the vHIT module and with only one set of goggles, offer a wide range of advanced vestibular testing. One disadvantage of this system is the monocular recording of the right eye movements. This is, however, a necessity for the vHIT: the hardware must be

lightweight to prevent goggle slippage and produce accurate results.[5]

ICS Impulse Modules

You can also choose to purchase the Micromedical Visual Eyes system, which will give you excellent binocular recording and analysis of eye movements. This system is very reliable, highly customizable and user-friendly.

Interacoustics Visual Eyes VNG

The vHIT option from Interacoustics is the EyeSeeCam. It features an interchangeable camera, enabling you to record vHIT from either eye, in the rare but possible case that the right eye does not offer reliable information. The software and the analysis of this vHIT system are not as user-friendly and intuitive as the Otometrics Natus system, though.

Eye See Cam vHIT

Another layer of the advanced level in this model of care is VEMP testing. It requires an evoked potential system and therefore if you do have one of these, you will likely only need to purchase the VEMP module. If you are investing in a new system, your options are once again the products offered by Otometrics Natus and Interacoustics.

Interacoustics Eclipse

Otometrics Natus Chartr EP 200

The Interacoustics Eclipse supports the B81 high output bone conductor, which delivers strong stimuli for ocular VEMP testing but it is a more expensive option. The advantage of investing in the VEMP equipment is that you can then also incorporate other auditory evoked potentials into your clinical practice.

A word about whether or not you chose to offer caloric testing. As with everything in clinical practice (and in life), there are pros and cons to consider. While calorics investigate a non-physiological range of vestibular responses, originating only from the lateral semicircular canals, subject to how effective the middle ear is in transmitting the thermal variations, it is still a test that medical doctors are familiar with and use as a reference to diagnose vestibular function. It has a place in the puzzle that is the diagnosis of Meniere's disease and also in identifying chronic, compensated and less marked vestibular asymmetries. And if you are now back to your memories of nauseated individuals going through calorics and thinking again "vestibular is not for me," the good news is that calorics only provokes nausea and emesis in a minority of patients![6]

References

1. Cushing, S Vestibular and balance dysfunction in the pediatric population: a primer for the audiologist. Can Aud 2014;1(4). Available at: http://canadianaudiologist.ca/vestibular-and-balance-dysfunction-in-the-pediatric-population-a-primer-for-the-audiologist/

2. Cushing SL, Papsin BC. Cochlear implants and children with vestibular impairments. Semin Hear 2018;39(3):305–320. doi:10.1055/s-0038-1666820

3. Baxter J, Dunphy L, Song D, Vekasi M, Verge J. Striking the right balance: current fall prevention strategies in audiology practice: a review of the 2017 CAA Fall Prevention Survey Results. Can Aud 2017;4(6). Available at: http://canadianaudiologist.ca/issue/volume-4-issue-6-2017/striking-the-right-balance-4-6-feature/

4. Agrawal Y, Ward BK, and Minor LB. Vestibular dysfunction: prevalence, impact and need for targeted treatment. J Vestib Res Equilib Orientat, 2013;23(3):113–17.

5. Falls C. The Video Head Impulse Test (vHIT) – what is it, why you should care, and some tips

to help you get started. Can Aud 2016;3(6). Available at: http://www.canadianaudiologist.ca/issue/volume-3-issue-6-2016/video-head-impulse-test-feature/

6. Vitkovic J, Paine M, Rance G. Neuro-otological findings in patients with migraine- and nonmigraine-related dizziness. Audiol Neuro-Otol 2008;13(2):113–22. Available at: http://search.ebscohost.com.ezproxy.library.ubc.ca/login.aspx?direct=true&db=mnh&AN=18057875&site=ehost-live&scope=site