



# Sound Source

Physician Newsletter | October 2023

## Audiologic Management of the Diabetic Patient

### DIABETES AND THE INNER EAR

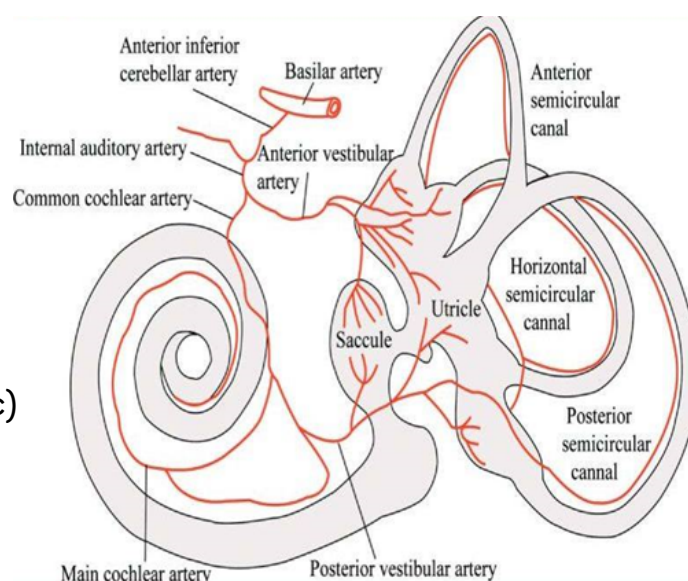
The CDC reports that individuals with diabetes mellitus (DM) are more than twice as likely to develop hearing and balance disorders compared to those without diabetes (Taylor et al., 2013). Nerve damage resulting from diabetes can lead to hearing and balance disorders; **this can occur in both Type 1 and Type 2 diabetes**. Furthermore, the detrimental effects of noise exposure and aging can be exacerbated for individuals with DM. Even those with prediabetes have a 30% higher rate of hearing loss than those with normal blood sugar levels.

Diabetes can harm the delicate structures of the hearing and balance systems, resulting in hearing loss and/or balance disturbances. Our ears, eyes, and feet all work together to maintain equilibrium. With diabetes, all three systems can be affected and can cause dizziness (internal sensation), vertigo (hallucination of spinning), or imbalance (unsteadiness). Individuals with DM are at increased risk of falls (39%), even if they do not experience peripheral neuropathy or retinopathy (Hewston & Deshpande, 2016).






Hearing loss and balance dysfunction greatly impact quality of life and can lead to isolation, reduced activity, and mortality. Early detection and management of audiological and vestibular deficits may help decrease the risk of falls, depression, and dementia.

### KEY HEARING AND BALANCE SYMPTOMS

- 👂 Ringing in the ears (tinnitus)
- 👂 Gradual decrease in hearing acuity
- 👂 Increased difficulty understanding speech
- 👂 Dizziness, vertigo, or imbalance (acute or chronic)



## Next Steps

-  Referral to an audiologist for a baseline hearing and balance assessment
-  Medical management as needed
-  Monitor symptoms; if hearing worsens or new balance symptoms arise, refer back to audiologist for further evaluation
-  Return to audiologist for:
  - Hearing loss treatment (hearing aids, etc.)
  - Information about hearing/ear protection
  - Annual audiologic testing
-  If balance disorder is diagnosed, referral to physical therapy for vestibular rehabilitation

## Common Diagnostic Tests

### Hearing

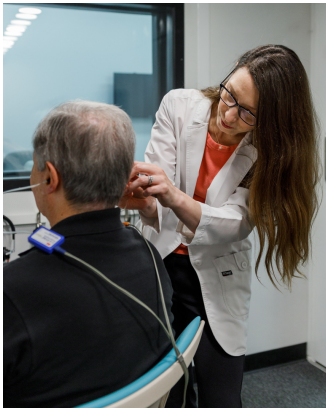


Pure tone audiometry  
Speech audiometry  
Middle ear measures (tympanograms)  
Otoacoustic emissions

### Balance



Videonystamography (VNG)  
Functional balance assessment (i.e., mCTSIB, Gans SOPT)  
Vestibular evoked myogenic potential (cVEMP, oVEMP)  
Dix-Hallpike test for BPPV



## Resources

1. American Diabetes Association (2019). Statistics about diabetes, March 22nd, 2018. <http://www.diabetes.org/diabetes-basics/statistics/>
2. Hewston, P. & Deshpande, N. (2016). Falls and balance impairments in older adults with type 2 diabetes: Thinking beyond diabetic peripheral neuropathy, *Canadian Journal of Diabetes*, 40(1): 6-9.
2. Taylor, B., McKoy, J., Flow, J., & Watley, S. (2013). Diabetes and hearing loss: A roundtable discussion, *Audiology Practices*, 5(3).
3. The Audiology Project. (2018). Healthy Ears - Take Charge of Your Diabetes Flyer. <https://www.theaudiologyproject.com/education-materials>
4. Mujica-Mota, Mario A., et al. "Hearing loss in type 1 diabetes: Are we facing another microvascular disease? A meta-analysis." *International Journal of Pediatric Otorhinolaryngology*, vol. 113, Oct. 2018, pp. 38–45, <https://doi.org/10.1016/j.ijporl.2018.07.005>.
5. Picture: Kim, J. & Lee, H. (2009). Inner ear dysfunction due to Vertebrobasilar ischemic stroke, *Seminars in Neurology*, 29(5): 534-540, Fig. 2.

If you have any questions or would like more information, please contact [Christina.Campbell1@utdallas.edu](mailto:Christina.Campbell1@utdallas.edu)