

Diabetes - a risk factor for hearing loss

Across the lifespan, an individual's hearing capacity is influenced by genetic, biological, psychosocial and environmental factors. These factors influence the ears and can either lead to hearing loss or protect against it.¹ **Recently, diabetes was recognized as a risk factor for hearing loss.**^{2,3} Diabetes mellitus occurs when raised blood glucose levels persist because the body cannot produce or use insulin effectively. Diabetes can damage many of the body's organs leading to serious complications such as cardiovascular diseases, as well as nerve, kidney, and eye damage.⁴



Prevalence of diabetes⁴

- 537 million adults are living with diabetes
- Rapidly growing prevalence: predicted to rise to 643 million by 2030
- **Type 2 diabetes is the most common:** About 90% of all diabetes cases

Hearing loss and type 2 diabetes:



- Type 2 diabetes is associated with hearing loss.^{5,6,7,8,9}
- Hearing loss is significantly more prevalent in groups with type 2 diabetes, compared to groups without diabetes.^{5,6,7,8,9}
- Individuals with type 2 diabetes are more likely to suffer from mild hearing loss (hearing thresholds above 25 dB HL) at high conventional audiometric frequencies (4-8 kHz), compared to individuals without diabetes.^{5,6,8,9}



For example, a systematic review and meta-analysis of 18 studies⁵ showed that overall, the prevalence of hearing loss was nearly twice as high (1.91x) in the diabetes group.

Indeed, the prevalence of hearing loss ranged between 44% and 70% for type 2 diabetes groups, significantly higher than in control groups (20% to 49%).



It is not yet clear whether the increased prevalence of hearing loss in type 2 diabetes reflects a causal relationship or only a correlation due to shared biological processes.¹⁰ Nevertheless, people with diabetes are at greater risk of hearing loss and as such, their hearing should be monitored with the aim of early identification and rehabilitation in the event of decline.¹

In adults aged 65 or older an estimated 33% have diabetes.¹¹



With a growing prevalence of type 2 diabetes⁴ and a strong level of evidence supporting an association between type 2 diabetes and hearing loss^{5,6,7,8,9}, it is important to screen type 2 diabetes patients for hearing loss and to offer holistic care to those patients – provided by GPs, ENTs and HCPs in close collaboration.



¹ World Health Organization (WHO). 2021. *World report on hearing*. Licence: CC BY-NC-SA 3.0 IGO. <https://www.who.int/publications/i/item/world-report-on-hearing> ² Draznin, B., Aroda, V. R., Bakris, G., Benson, G., Brown, F. M., Freeman, R., ... & Kosiborod, M. (2022). 4. Comprehensive Medical Evaluation and Assessment of Comorbidities: Standards of Medical Care in Diabetes-2022. *Diabetes Care*, 45 (Supplement_1), S46-S59. ³ American Diabetes Association. *Diabetes and Hearing Loss*. Retrieved 29 November, 2022, from <https://diabetes.org/diabetes/diabetes-and-hearing-loss> ⁴ International Diabetes Federation (IDF). 2021. *IDF Diabetes Atlas* (10th ed.). <https://diabetesatlas.org/atlas/tenth-edition/> ⁵ Akinpelu, O. V., Mujica-Mota, M., & Daniel, S. J. (2014). Is type 2 diabetes mellitus associated with alterations in hearing? A systematic review and meta-analysis. *The Laryngoscope*, 124(3), 767-776. ⁶ Li, J., Zhang, Y., Fu, X., Bi, J., Li, Y., Liu, B., & Zhang, L. (2018). Alteration of auditory function in type 2 diabetic and pre-diabetic patients. *Acta Oto-Laryngologica*, 138(6), 542-547. ⁷ Li, Y., Liu, B., Li, J., Xin, L., & Zhou, Q. (2020). Early detection of hearing impairment in type 2 diabetic patients. *Acta Oto-Laryngologica*, 140(2), 133-139. ⁸ Ren, H., Wang, Z., Mao, Z., Zhang, P., Wang, C., Liu, A., & Yuan, G. (2017). Hearing loss in type 2 diabetes in association with diabetic neuropathy. *Archives of Medical Research*, 48(7), 631-637. ⁹ Ren, J., Ma, F., Zhou, Y., Xu, A., Zhang, J., Ma, R., & Xiao, X. (2018). Hearing impairment in type 2 diabetes and patients with early diabetic nephropathy. *Journal of Diabetes and its Complications*, 32(6), 575-579. ¹⁰ Samocha-Bonet, D., Wu, B., & Ryugo, D. K. (2021). Diabetes mellitus and hearing loss: A review. *Ageing Research Reviews*, 71, 101423. ¹¹ Endocrine Society. (2022, January). *Diabetes and older adults*. Retrieved 29 November, 2022, from <https://www.endocrine.org/patient-engagement/endocrine-library/diabetes-and-older-adults>