

# Connect Hearing!

## Hearing loss and diabetes



### Background and epidemiology

Hearing impairment is about twice as prevalent among adults with diabetes than among those who do not have the condition<sup>1,2</sup>. The association between diabetes and hearing impairment can emerge as early as age 30<sup>1</sup> and seems to be independent of known risk factors for hearing impairment, such as noise exposure, ototoxic medication use, smoking<sup>1</sup>, and age<sup>2</sup>.

### Causes of hearing loss

The pathophysiology underlying diabetes-associated hearing loss is most likely a multifactorial process, and further research is required to determine the true cause of hearing loss in diabetes. Following are the current physiologically plausible theories<sup>3</sup>:

Microangiopathic processes that follow deposition of glucoprotein due to hyperglycemia in small blood vessels impact neurological function.

Peripheral auditory function was found to be more affected than central function, most likely due to glycosylation of myelin in the peripheral nervous system. Repeated hyperglycemia may lead to chronic cochlear damage or impaired endolymph homeostasis.

Exposure to elevated blood glucose levels can lead to nerve fibre loss and central auditory pathway demyelination and degeneration.

Higher levels of serum protein oxidation products, nitric oxide and enzymatic antioxidant activity were found to be higher in patients with type 2 diabetes compared to controls.

### Signs & symptoms

- Muffling of sounds
- Difficulty understanding words, especially against background noise or in a crowd of people
- Trouble hearing consonants
- Frequently asking others to speak more slowly, clearly and loudly
- Needing to turn up the volume of the television or radio
- Withdrawal from conversations
- Avoidance of some social settings



## Risk factors

Low HDL, coronary heart disease, peripheral neuropathy, and generally poor health are potentially preventable correlates of hearing impairment for people with diabetes<sup>4</sup>.

Glycemic control, years since diagnosis, and type of glycemic medication were not associated with hearing impairment in a study conducted in 2001<sup>4</sup>. However, a recently conducted Japanese study found that cardiometabolic risk factors such as elevated HbA1C levels and high BMI were associated with an increased risk for hearing loss in the general population<sup>5</sup>.

## Impact of hearing loss

Several studies have shown that uncorrected hearing loss gives rise to poorer quality of life, related to isolation,

reduced social activity, and a feeling of being excluded, leading to an increased prevalence of symptoms of depression. It may also be a cause of cognitive decline<sup>7</sup>.

This indicates the importance of early identification of hearing loss and offers of rehabilitative support, where the fitting of hearing aids is usually an important component.<sup>7</sup>

## Diagnosis and next steps

It's essential to assess patients with diabetes if they are having trouble hearing or understanding. Patients should be screened at initial diagnosis or initial assessment as well as every year thereafter<sup>8</sup>, this should include a physical examination to exclude any blockage, fluid or infection and a tuning fork test.

A hearing loss checklist attached (also available online) can be used with all patients. If any of the situations are familiar to them, refer them to Connect Hearing for further audiological assessments.

Health Care Professionals are encouraged to refer their patients to a Hearing Care Specialist at a Connect Hearing centre, so patients who are found to be at risk can get more extensive testing, and a fitting for hearing aids if needed.

**Note that Diabetes NSW & ACT members receive full hearing assessment, valued at \$110 free of charge at any of the Connect Hearing centres.**

**Call us on 1800 693 277 or go to [connecthearing.com.au](http://connecthearing.com.au) for further information**

## References

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6. Mayo Clinic Staff. (2015, September 3). Hearing loss: Symptoms [www.mayoclinic.org/diseases-conditions/hearing-loss/symptoms-causes/syc-20373072](http://www.mayoclinic.org/diseases-conditions/hearing-loss/symptoms-causes/syc-20373072)

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## Hearing Loss Checklist

People affected by hearing loss often find it difficult to recognize and accept it. In most cases hearing loss develops over a long period of time. Therefore, it often takes a while before the symptoms are identified. Are any of the following situations familiar to you? Please check the boxes for the situations that apply.

- I sometimes feel that people are not speaking clearly (mumbling).
- When people address me from behind or from a few feet away, I have difficulty understanding them.
- I feel tired or even a little irritated after a long conversation.
- Sometimes I have to ask people to repeat themselves because I did not hear what they said.
- In situations with a high noise level, e.g. in restaurants, on the train, or at parties, I have difficulty understanding other people.
- I find it hard to hear birds singing, footsteps, running water, and other soft everyday sounds.
- I sometimes fail to hear the doorbell or telephone.
- I have trouble talking over the phone.
- I turn the television or radio up louder than other people.
- When someone else controls the volume, I have problems understanding.
- Other people have told me that I don't hear well.