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MACARTHUR ENT

Otosclerosis and Stapes Surgery

CO2 laser stapedotomy – options, outcomes and recovery

Please read first – this is general information, not advice about your own situation

- This sheet is a **summary of the published medical literature**. The figures quoted are averages from studies of groups of patients.
- It is **not specific to your condition**. The findings in your ear, your hearing, your general health and your preferences all change which options suit you and what your individual risks are.
- Your ENT surgeon will discuss your own examination, tests and options with you. Please bring any questions to your appointment.

What is otosclerosis?

Otosclerosis is abnormal remodelling of the bone around the inner ear. It most often affects the **stapes** (stirrup), the smallest bone in the body, fixing it in place so it can no longer pass sound vibrations into the inner ear. This causes a gradual **conductive hearing loss**. In some people the inner ear is also affected, adding a nerve (sensorineural) component – a "mixed" hearing loss.

- It usually starts between the ages of 20 and 45, and is about twice as common in women.
- It often starts in one ear but eventually affects both ears in roughly 70–85% of people.
- About 40% of people have a family history. It can be passed on, but not everyone who inherits the tendency develops hearing loss.
- **Pregnancy:** some women notice their hearing worsen during or after pregnancy, but large studies have not shown a clear link. Discuss any change in hearing with your specialist.

Symptoms

- Gradual, painless hearing loss, often starting in one ear
- Tinnitus (ringing or buzzing)
- Sometimes hearing speech better in noisy places than in quiet ones
- Occasionally, unsteadiness

How is it diagnosed?

- **Hearing test (audiogram)** – shows a conductive or mixed loss with an "air–bone gap", sometimes with a typical dip at 2000 Hz (Carhart's notch).
- **Tympanometry and stapedial reflexes** – the eardrum moves normally, but the reflex of the stapes muscle is reduced or absent.
- **CT scan** – not always needed, but can confirm the diagnosis, show the extent of disease and exclude other causes before surgery.

Treatment options

Option	Who it may suit
Monitoring	Mild hearing loss, or people who prefer to wait. Hearing tests track any change.
Hearing aids	Work well for many people with otosclerosis and carry no surgical risk.
Stapes surgery	People with a significant air–bone gap who would like to hear without, or with less reliance on, a hearing aid.
Bone conduction hearing device	People who are not suited to stapes surgery, or who prefer to avoid middle ear surgery.

What does stapes surgery involve?

The operation usually performed is a stapedotomy. The operation is commonly done through a small cut just in front of the ear (an **endaural incision**), under general anaesthetic, usually as day surgery or with one night in hospital. The eardrum is lifted, the fixed upper part of the stapes is removed, and a tiny opening is made in the stapes footplate. A small prosthesis (piston) is placed through this opening to carry sound from the hearing bones into the inner ear. The small incision usually heals to a barely visible scar.

The opening can be made with a CO2 laser, which allows a precise, no-touch opening of the footplate. Systematic reviews suggest laser techniques may cause fewer inner ear complications and footplate fractures than conventional instruments, with similar hearing results.

How well does it work?

- The air–bone gap closes to **within 10 dB in up to about 85–90%** of ears in published series (some large specialist series report over 90%), and to within 20 dB in more than 90%.
- Results are generally **stable over many years**.
- A larger air–bone gap before surgery tends to give a bigger improvement.
- Tinnitus more often improves than worsens after successful surgery.

Possible complications

Complication	What the literature reports
Dizziness	Common in the first days (in a third or more in some series) and almost always settles.
Taste change	The taste nerve runs close to the stapes. Change in taste is reported in about 10–30%, usually temporary; long-term change in a small minority.
Inner ear hearing loss	Significant inner ear hearing loss is reported in about 1% or fewer in modern laser series; complete loss of hearing in the operated ear (“dead ear”) is rare.
Prosthesis problems	Occasional slipping or loosening over time, which can reduce hearing and may need revision surgery.
Rare	Facial nerve injury; inflammation around the prosthesis (granuloma) or a leak of inner ear fluid, which cause sudden hearing loss or severe dizziness and need urgent treatment.

What about the second ear?

When both ears are affected, surgery is done on one ear at a time. The second ear is considered only after the first has healed and its result is known, so that both ears are never at risk at the same time. Many people are happy with one operated ear and a hearing aid in the other.

Recovery

- Hearing is often muffled for the first few weeks while the ear heals; a hearing test is usually done at about 3–6 weeks.
- For about **3–4 weeks**: no flying, no forceful nose blowing (sneeze with your mouth open), no heavy lifting or straining, and keep water out of the ear.
- **Scuba diving:** many surgeons advise avoiding diving long-term after stapes surgery. Please discuss this with your ENT surgeon if you dive.
- The small wound in front of the ear is usually healed within 1–2 weeks; keep it clean and dry until then.
- Most people return to desk work within about a week.

Contact the rooms urgently if you notice

These can signal a problem with the inner ear that needs same-day assessment.

- A sudden drop in hearing in the operated ear
- New severe or worsening dizziness
- Facial weakness, fever or increasing pain

Remember

- The numbers on this sheet summarise the published literature and describe groups of patients, not you as an individual. Your own risks and the best option for you will be discussed at your consultation.
- Appointments: Macarthur ENT, Gregory Hills and Campbelltown – (02) 4625 1682 · macarthurent.com.au. A GP referral is needed for a Medicare rebate.