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MACARTHUR ENT

Vestibular Schwannoma (Acoustic Neuroma)

What it is, what to expect, and the treatment choices available

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

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

This sheet explains what a vestibular schwannoma is, what to expect, and the treatment choices available.

What is a vestibular schwannoma?

A vestibular schwannoma (also called an “acoustic neuroma”) is a benign – not cancerous – tumour that grows on the balance nerve, which runs alongside the hearing nerve from the inner ear to the brain. It does not spread to other parts of the body. It grows slowly, in the narrow bony canal that carries the hearing and balance nerves, and may gradually press on nearby structures such as the hearing nerve, the facial nerve (which moves the face), and eventually the brainstem if it becomes large.

Being diagnosed with a “tumour” understandably sounds frightening, but this is a benign growth, not a cancer. Many people live with a small, stable vestibular schwannoma for years without ever needing surgery.

How does it usually show up?

Most people are diagnosed after noticing one or more of the following, usually on one side only:

- Gradual hearing loss in one ear – often first noticed on the phone or when lying with the “good” ear against a pillow
- Ringing or buzzing in one ear (tinnitus)
- Unsteadiness or mild imbalance, rather than spinning-room vertigo, since the brain slowly adapts to the nerve changes
- Occasionally, numbness of the face or headache if a tumour has grown large before being found

Some tumours are found “by accident” on a scan done for an unrelated reason.

What does it mean if the tumour is “growing”?

Growth simply refers to the tumour getting bigger on repeat MRI scans, usually measured as an increase of 2 mm or more in diameter. It does not mean the tumour has become cancerous – these tumours do not turn into cancer. Growth matters because a larger tumour is more likely to affect hearing, balance or nearby nerves, and very large tumours can eventually press on the brainstem.

Not all tumours grow. Studies that simply watched untreated tumours over several years found that only about 22–48% showed measurable growth. Larger studies using more precise volume-based scanning found growth in a higher proportion, with the fastest-growing tumours expanding by more than 100% in volume per year – but even here, roughly one-third of tumours remained stable or even shrank. Tumours that are already extending outside the bony canal, or that are found alongside new hearing loss, tend to be more likely to grow further; tumours that stay confined inside the canal, or that are found without recent hearing change, are more likely to stay stable.

What are the treatment options?

Approach	What it involves	Tumour control	Main risks / trade-offs
Watchful waiting (“wait-and-scan”)	Regular MRI and hearing tests instead of immediate treatment; usually chosen for smaller tumours (under about 1.5 cm)	Most small tumours stay stable for years, though hearing often declines gradually over time regardless of tumour growth	Requires ongoing scans; treatment is still needed later if the tumour grows or symptoms worsen

Approach	What it involves	Tumour control	Main risks / trade-offs
Stereotactic radiosurgery (e.g. Gamma Knife)	A single outpatient session (occasionally a few sessions) delivering tightly focused radiation to stop the tumour growing, without open surgery; usually offered for tumours under about 3 cm	Growth is prevented in more than 90% of cases at 10 years; the tumour usually remains visible on MRI indefinitely, and temporary swelling can occur in the first 1–3 years before it often shrinks	See "Risks of radiation treatment" below
Microsurgical removal	An operation to remove some or all of the tumour, under general anaesthesia with a hospital stay	Generally offers the best long-term tumour removal/control, especially for larger tumours	The risks of any brain surgery, including risk to hearing, facial nerve weakness, balance disturbance, spinal fluid leak, and a longer recovery

The right choice depends on tumour size, how fast it has grown (if at all), current hearing, symptoms, age and personal preference – this is a decision made together with your treating ENT surgeon and/or neurosurgeon.

Risks of radiation treatment (stereotactic radiosurgery)

Although radiosurgery avoids an open operation, it is not risk-free. The chance of each side effect depends on the dose used and how large the tumour is:

- **Facial weakness:** with modern low-dose techniques, permanent facial nerve weakness occurs in roughly 1% or fewer of patients, though some series report rates up to about 15% with older, higher-dose approaches.
- **Facial numbness or pain (trigeminal nerve effects):** occurs in under about 5% of patients with modern dosing, though this rises with larger tumours or higher doses, and can reach 25% in some long-term series.
- **Hearing decline:** this is the most common lasting effect. Useful ("serviceable") hearing is preserved in roughly 50–70% of patients over 3–5 years, but hearing tends to decline gradually over many more years afterwards, especially in ears that received a higher radiation dose to the cochlea.
- **Brain swelling, hydrocephalus and cysts:** temporary swelling around the tumour can occur in the first 1–3 years; a build-up of fluid around the brain (hydrocephalus) needing drainage occurs in a small percentage of patients, more often with larger tumours, and delayed cyst formation affects around 2–3%.
- **Treatment failure:** if the tumour keeps growing despite radiation, further radiation or surgical removal may still be needed later.
- **Malignant transformation:** turning into a cancer after radiation is very rare – estimated at roughly 0.02–0.25% by 15 years – but this risk does not appear until several years after treatment and can occur even decades later, which is why long-term follow-up continues even after a tumour has shrunk.

Surgery carries its own separate set of risks (listed in the table above), and no treatment – including watchful waiting – is entirely risk-free.

Comparing the two main surgical approaches

When surgery is chosen, it is usually done through one of two routes into the skull. The choice depends mainly on tumour size, remaining hearing and surgeon experience.

Approach	How it reaches the tumour	Effect on hearing	Facial nerve outcome	Other notable risks
Translabyrinthine	Through the inner ear / mastoid bone behind the ear	Remaining hearing in that ear is always sacrificed as part of the approach	Good facial function (near-normal or mild weakness) in roughly 90–95% of patients in modern series	Lower rates of spinal fluid leak needing repair (about 2% vs about 10%), less post-operative imbalance and a shorter hospital stay than the alternative approach
Retrosigmoid	Behind the mastoid bone, further from the ear canal	The only approach with a realistic chance of preserving useful hearing (roughly 50–55% in appropriately selected patients)	Similar good facial function once tumour size is accounted for, though slightly higher weakness rates are reported in some series	Higher rates of spinal fluid leak, wound problems and post-operative imbalance; a meta-analysis found roughly five-fold higher rates of hydrocephalus needing drainage

Neither approach has been shown to be clearly "safer" overall – each trades a different set of risks, and the choice is individualised to the patient and tumour.

Does tumour size change the risk to the facial nerve?

Yes. Larger tumours are harder to separate from the facial nerve and carry a higher chance of nerve injury regardless of which surgical approach is used.

Tumour size at surgery	Chance of good facial function (near-normal or mild weakness) afterwards
Smaller tumours (under about 3 cm)	About 90–95%
Larger tumours (over about 3 cm)	About 80–81%, with roughly 3–7 times higher odds of facial weakness than smaller tumours

This is one of the main reasons surgeons discuss the risks and benefits of early treatment versus continued observation once a tumour is found to be growing – the facial nerve is generally easier to protect while a tumour is still small.

Watchful waiting is not risk-free either

Choosing to monitor rather than treat avoids the immediate risks of surgery or radiation, but it carries its own risks over time:

- **Hearing decline:** even without tumour growth, hearing can decline during observation. In one large population study, only about 31% of patients who started with useful hearing still had useful hearing after 10 years of watching. Patients who start with excellent hearing (100% word recognition) tend to do better, with roughly 88% retaining reasonably useful hearing at 10 years, but this is not guaranteed.
- **Tumour growth:** roughly 22–48% of watched tumours show measurable growth over an average of about 3–7 years of follow-up; larger initial size and faster growth both increase the chance of eventual hearing loss.
- **Delayed need for treatment:** if growth or worsening symptoms occur, surgery or radiation may eventually be needed anyway, sometimes when the tumour is larger and technically harder to treat than if addressed earlier.

In short, every option – watching, radiation and surgery – carries trade-offs, and “doing nothing” is itself a choice with its own risks to hearing and, less commonly, to tumour growth and neurological function.

What follow-up scans are needed if the tumour is watched?

A typical monitoring schedule for an untreated, stable tumour looks like this (your own schedule may differ):

1. Repeat MRI and hearing test at 6 months after diagnosis.
2. If there is no growth, yearly scans for the next several years.
3. If still stable after about 5 years, scans can often be spread out to every other year.
4. Because tumours can occasionally grow after a long period of stability, some monitoring is generally recommended long-term, although the chance of new growth becomes very low the longer a tumour stays the same size – by around 7–10 years of proven stability, the remaining lifetime risk of growth drops below 1%.

Contact your care team promptly if you notice

These could be signs that closer evaluation is needed sooner than your next scheduled scan.

- New or worsening hearing loss
- New facial numbness or weakness
- Worsening balance
- New headaches

Key takeaways

- This is a benign tumour, not cancer, and does not spread in the body.
- Not every tumour grows, and “growth” does not mean it has become malignant.
- Watching, radiation-based treatment and surgery are all valid options, each with a different balance of tumour control and risk to hearing, balance and facial movement.
- Regular follow-up scans and hearing tests are how the care team tracks the tumour and decides if or when treatment is needed.

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.