

**QUESTION 1:** What sequences should be obtained on magnetic resonance imaging (MRI) to evaluate vestibular schwannomas before and after surgery?

**TARGET POPULATION:** Adults with vestibular schwannomas.

**RECOMMENDATIONS:** Initial Preoperative Evaluation Level 3: Imaging used to detect vestibular schwannomas should use high-resolution T2-weighted and contrast-enhanced T1-weighted MRI. Level 3: Standard T1, T2, fluid attenuated inversion recovery, and diffusion weighted imaging MR sequences obtained in axial, coronal, and sagittal plane may be used for detection of vestibular schwannomas. Preoperative Surveillance Level 3: Preoperative surveillance for growth of a vestibular schwannoma should be followed with either contrast-enhanced 3-dimensional (3-D) T1 magnetization prepared rapid acquisition gradient echo (MPRAGE) or high-resolution T2 (including constructive interference in steady state [CISS] or fast imaging employing steady-state acquisition [FIESTA] sequences) MRI. Postoperative Evaluation Level 2: Postoperative evaluation should be performed with postcontrast 3-D T1 MPRAGE, with nodular enhancement considered suspicious for recurrence.

**QUESTION 2:** Is there a role for advanced imaging for facial nerve detection preoperatively (eg, CISS/FIESTA or diffusion tensor imaging)?

**TARGET POPULATION:** Adults with proven or suspected vestibular schwannomas by imaging.

**RECOMMENDATION:** Level 3: T2-weighted MRI may be used to augment visualization of the facial nerve course as part of preoperative evaluation.

**QUESTION 3:** What is the expected growth rate of vestibular schwannomas on MRI, and how often should they be imaged if a "watch and wait" philosophy is pursued?

**TARGET POPULATION:** Adults with suspected vestibular schwannomas by imaging.

**RECOMMENDATION:** Level 3: MRIs should be obtained annually for 5 yr, with interval lengthening thereafter with tumor stability.

**QUESTION 4:** Do cystic vestibular schwannomas behave differently than their solid
TARGET POPULATION: Adults with vestibular schwannomas with cystic components.

RECOMMENDATION: Level 3: Adults with cystic vestibular schwannomas should be counseled that their tumors may more often be associated with rapid growth, lower rates of complete resection, and facial nerve outcomes that may be inferior in the immediate postoperative period but similar to noncystic schwannomas over time.

QUESTION 5: Should the extent of lateral internal auditory canal involvement be considered by treating physicians?

TARGET POPULATION: Adult patients with vestibular schwannomas.

RECOMMENDATION: Level 3: The degree of lateral internal auditory canal involvement by tumor adversely affects facial nerve and hearing outcomes and should be emphasized when interpreting imaging for preoperative planning.

QUESTION 6: How should patients with neurofibromatosis type 2 (NF2) and vestibular schwannoma be imaged and over what follow-up period?

TARGET POPULATION: Adult patients with NF2 and vestibular schwannomas.

RECOMMENDATION: Level 3: In general, vestibular schwannomas associated with NF2 should be imaged (similar to sporadic schwannomas) with the following caveats: 1. More frequent imaging may be adopted in NF2 patients because of a more variable growth rate for vestibular schwannomas, and annual imaging may ensue once the growth rate is established. 2. In NF2 patients with bilateral vestibular schwannomas, growth rate of a vestibular schwannoma may increase after resection of the contralateral tumor, and therefore, more frequent imaging may be indicated, based on the nonoperated tumor's historical rate of growth. 3. Careful consideration should be given to whether contrast is necessary in follow-up studies or if high-resolution T2 (including CISS or FIESTA-type sequences) MRI may adequately characterize changes in lesion size instead.

QUESTION 7: How long should vestibular schwannomas be imaged after surgery, including after gross-total, near-total, and subtotal resection?

TARGET POPULATION: Adult patients with vestibular schwannomas followed after surgery.

RECOMMENDATION: Level 3: For patients receiving gross total resection, a postoperative MRI may be considered to document the surgical impression and may occur as late as 1 yr after surgery. For patients not receiving gross total resection, more frequent surveillance scans are suggested; annual MRI scans may be reasonable for 5 yr. Imaging follow-up should be adjusted accordingly for continued surveillance if any change in nodular enhancement is demonstrated. The full guideline can be found at https://www.cns.org/guidelines/guidelines-management-patients-vestibular-schwannoma/chapter_5.

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