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## Systematic Review of Hearing Preservation After Radiotherapy for Vestibular Schwannoma.

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**OBJECTIVE:** To determine the long-term hearing preservation rate for spontaneous vestibular schwannoma treated by primary radiotherapy.

**DATA SOURCES:** The MEDLINE/PubMed, Web of Science, Cochrane Reviews, and EMBASE databases were searched using a comprehensive Boolean keyword search developed in conjunction with a scientific librarian. English language papers published from 2000 to 2016 were evaluated.

**STUDY SELECTION:** Inclusion criteria: full articles, pretreatment and posttreatment audiograms or audiogram based scoring system, vestibular schwannoma only tumor type, reported time to follow-up, published after 1999, use of either Gamma Knife or linear accelerator radiotherapy.

**EXCLUSION CRITERIA:** case report or series with fewer than five cases, inadequate audiometric data, inadequate time to follow-up, neurofibromatosis type 2 exceeding 10% of study population, previous treatment exceeding 10% of study population, repeat datasets, use of proton beam therapy, and non-English language.

**DATA EXTRACTION:** Two reviewers independently analyzed papers for inclusion. Class A/B, 1/2 hearing was defined as either pure tone average less than or equal to 50db with speech discrimination score more than or equal to 50%, American Academy of Otolaryngology-Head & Neck Surgery (AAO-HNS) Hearing Class A or B, or Gardner-Robertson Grade I or II. Aggregate data were used when individual data were not specified.

**DATA SYNTHESIS:** Means were compared with student t test.

**CONCLUSIONS:** Forty seven articles containing a total of 2,195 patients with preserved Class A/B, 1/2 hearing were identified for analysis. The aggregate crude hearing preservation rate was 58% at an average reporting time of 46.6 months after radiotherapy treatment. Analysis of time-based reporting shows a clear trend of decreased hearing preservation extending to 10-year follow-up. This data encourages a future long-term controlled trial.

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