

**Methods:** I searched the pubmed database using terms “tympanic retraction” OR “cholesteatoma” AND “epidemiology”. 708 articles were returned. Titles and abstracts were screened for relevance. Only longitudinal prospective or retrospective studies were included. Articles on syndromic or special populations were excluded. 24 articles were included for review, and the full text of these articles was evaluated to identify further references.

**Results:** Differing populations and definitions make meta-analysis inappropriate. There is no evidence of association of acute otitis media with risk of squamous disease. Presence and duration of chronic otitis media with effusion is associated with risk of subsequent squamous disease. Tympanic membrane retraction shows variable chronology, with many retractions resolving, and development of new retractions rare. Cholesteatoma remains a rare complication, and is predisposed to by TM retraction, but almost certainly also arises de novo, perhaps in those with subclinical disease. There is no evidence that grommet insertion reduces risk. These relationships can be constructed into a map of the inter-relation of disease, akin to the landscape map for mucosal otitis media I have previously constructed (Audiol Neurotol 2014;19:210–223).

**Conclusions:** Existing epidemiological studies can be used to construct a map of the relation of mucosal to squamous forms of otitis media, and so help to better understand epidemiological correlates, and to hypothesise pathophysiological relations.

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#### ID: IP018

### Distinguishing Between Conductive and Sensorineural Extended High-Frequency Hearing Loss Following Middle Ear Surgery

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**Learning Objectives:** 1. Appreciate the issues regarding bone conduction in high frequencies. 2. Recognise the risk of extended high frequency hearing loss with middle ear surgery and its possible significance.

**Introduction:** Permanent hearing loss in the extended high-frequency range (8–16 kHz) occurs in up to 50% of patients following otherwise successful middle ear surgery. The mechanisms of this high-frequency loss are poorly understood, but hypotheses include suprphysiological ossicular movement and noise exposure from drilling and suctioning. High-frequency loss could also be conductive and result from physical changes to the conductive mechanism. Previous research has been limited by difficulties measuring high-frequency bone-conduction thresholds, and thus distinguishing between conductive and sensorineural loss. We present a small pilot study demonstrating that high-frequency

hearing loss can be composed of both conductive and sensorineural components.

**Methods:** A giant magnetostrictive transducer was modified for audiometric use and testing was conducted to establish the reliability and validity of thresholds measured using the device. Air- and bone-conduction audiometric thresholds at 0.5–16 kHz were then measured preoperatively and at 1 week, 1 month, and 3 months postoperatively in four patients; three undergoing stapedectomy and one ossiculoplasty.

**Results:** Testing in normal hearing listeners showed that the modified transducer could be used to measure high-frequency bone-conduction thresholds with a level of reliability comparable to standard bone-conduction testing. The pilot study identified two clear cases in which an initial transient conductive high-frequency loss was documented concurrently with a persistent high-frequency sensorineural loss.

**Conclusions:** These results suggest that extended high-frequency hearing thresholds as measured using the modified bone-conduction transducer are a more sensitive measure of operative trauma to the cochlea that may be used to determine the efficacy of interventions to protect the ear from surgical trauma.

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### The use of titanium to repair the external ear canal: sheeting vs. mesh

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**Learning Objectives:**

**Introduction:** Titanium sheeting and mesh have been used in this centre from 2008 to repair EAC defects, succeeding previous porous hydroxylapatite techniques. The purpose of this presentation was to evaluate and compare the outcomes from each material.

**Materials and Method:** Titanium sheeting (0.12 mm, 99% pure, annealed) was used in 111 cases, and fine mesh (Biomet) in 74. Surgical techniques were intact canal wall mastoidectomy in 130 cases, mastoidectomy reconstruction in 55. The titanium was used as a support layer, applied to the medial aspect of the bony ICW wall and overlaid with cartilage. In reconstruction cases the titanium was covered with a middle temporal flap, but with only occasional cartilage supplements.

Ossiculoplasties employed Grace Alto devices, alternatively Gyrus Spanner struts if the malleus-stapes angulation was favourable.

**Results:** Sheetting results were excellent for both the ICW and reconstruction roles. Mesh was disappointing. Dehiscences of the overlying tissue occurred in 16% of