

implementation of standardized program of training. It seems crucial to develop alternative methods for surgical training, such as virtual reality (VR) and simulator. The aim of our study was to assess face, content, construct validity of the Voxel-Man<sup>®</sup> TempoSurg VR simulator.

Were included in the study 74 ENT surgeons, splitted in 2 groups according to their level of expertise: the expert group ( $n = 16$ ) and the novice group ( $n = 58$ ). The 2 groups benefited from a simple drilling task to familiarize them with the simulator and then performed four temporal bone dissection tasks. The performance of both groups were assessed by a global score and compared to assess the construct validity of the simulator. Finally, face and content validity were assessed using a five-point Likert-type scale. Experienced surgeons performed better ( $p < .01$ ) and faster ( $p < .001$ ) than novices. However, no differences in the bone volume removed and the number of injury to structures were found between the two groups. All experienced surgeons, except one would recommend the Voxel-Man simulator for anatomy learning (mean score 4.7). Most of them (87.5%) also thought that this simulator could be integrated in surgical training (mean score 4.1).

The Voxel-Man TempoSurg Virtual Reality Simulator constitutes an interesting complementary tool to traditional teaching methods for training in otologic surgery. Although some features require improvements, it allows trainees to acquire a good three-dimensional visualization of ear structures and to learn complex surgical skills. By its ability to distinguish different level of expertise, this simulator could be used as a certification tool, constituting a prior condition for performing real-life surgery.

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## Tympanoplasty (R836)

**ID: 836.1**

### Canal wall up surgery for cholesteatoma patients. When and how to perform ossicular reconstruction

Presenting Author: **Jean-Yves Sichel**

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*Learning Objectives:* TBC

The main goal of cholesteatoma surgery is complete removal of the disease. The secondary goal is to preserve or restore hearing, mostly by ossicular reconstruction. There is no consensus on the best technique and timing (immediate or sequential) for the reconstruction.

The presentation will focus on the factors which influence the decision making: age, extent and location of the cholesteatoma (and need for a second look); status of the ossicular chain and especially the presence or absence of the superstructures of the stapes; inflammatory status of the middle ear during surgery (dry or an active purulent ear); the status of the contralateral ear and others.

According to the literature and the experience of our department we will propose recommendations which may aid in the decision for immediate or staged reconstruction and discuss the different possible technics.

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## Tympanoplasty (R836)

**ID: 836.2**

### The natural history of Tympanic membrane perforations in a large cohort of children and the implications of when to operate

Presenting Author: **Philip Robinson**

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*Learning Objectives:* 2703 tympanic membrane perforations were studied in 1761 children. Data was obtained from a 20 year database containing over 147500 consultations of children seen by the Bristol Paediatric Audiology service. All children who underwent surgical repair of the perforation were excluded from the study. 45% of perforations were related to prior ventilation tube placement. 38% of perforations closed spontaneously within 12 months, 57% by 18 months and 66% by 2 years. 90% of all closures happen within 2.5 years. There is a significant age effect with perforations more likely to close spontaneously in younger children. 90% closure at 2.5 years in children diagnosed <7 years old vs. 75% in children diagnosed aged 7–12 years old. When faced with the clinical question of what period of watchful waiting would be appropriate in monitoring a perforated tympanic membrane, before intervention may reasonably be recommended; there seems to be little advantage in waiting longer than 2.5 years.

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When faced with the clinical question of what period of watchful waiting would be appropriate in monitoring a tympanic membrane perforation before surgical intervention may be reasonably recommended; there seems to be little advantage in waiting longer than 2.5 years.

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## Tympanoplasty (R836)

**ID: 836.3**

### Modified overlay tympanoplasty & autologous Bone-Cartilage Composite Graft Ossiculoplasty

Presenting Author: **Shi Nae Park**