Introduction
Myringotomy and ventilation tube insertion is a common otolaryngologic surgical procedure. It has a steep learning curve for residents. Incorrect placement of incisions, external ear canal trauma are common complications when residents begin learning the procedure. With increasing conservative guidelines on indications of myringotomy tubes, residents have less opportunities to refine this skill on real patients.

The objective is to create a learner centric myringotomy simulator.

Methods
Although the concept of simulation training in myringotomy is not new, we aim to reduce the learning curve by introducing learner guided features on a simulation model. Some of these includes landmarks such as the handle of malleus, the anterior inferior quadrant guide, and modified instruments as part of the simulation.

We worked with the National University of Singapore, Division of Industrial Design team, to produce a library of different variants of ear models, including modified ear canals for teaching. We created a platform to house the different components including an auricle, an external ear canal and a disposable tympanic membrane with landmarks.

Results
The model is accurate with realistic consistency to mimic soft tissues encountered in the myringotomy procedure. The simulator allows for variance in anatomy between the side of the ear and also between adult and paediatric sizes.

Conclusion
It can be used for the training of Otolaryngology residents and will be employed as a proof-of-concept model for the purpose of simulation training. We plan to develop this simulation model further, to allow the residents to practise other otological procedures such as Ossicular Chain Reconstruction and Stapedotomy.

Reference:
1. Sonya Malekzadeh, Glenn Hanna, Brette Wilson, Marieta Pehlivanova, Gregory Milmoe, A Model for Training and Evaluation of Myringotomy and Tube Placement Skills Laryngoscope 121: July 2011,
2. Peter G. Volsky, Brian B. Hughley, Shaym M. Peirce and Bradley W. Kesser Construct validity of a simulator for myringotomy with ventilation tube insertion Otolaryngology -- Head and Neck Surgery 2009 141: 603,