

REVIEW ARTICLE

Simulation in Otolaryngology: A Teaching and Training Tool[☆]



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Abstract Simulation in medical education is an effective method of teaching and learning, allowing standardisation of the learning and teaching processes without compromising the patient. Different types of simulation exist within subspecialty areas of Otolaryngology. Models that have been developed include phantom imaging, dummy patients, virtual models and animal models that are used to teach and practice different skills. Each model has advantages and disadvantages, where virtual reality is an emerging model with a promising future. However, there is still a need for further development of simulation in the area of Otolaryngology.

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PALABRAS CLAVE

Educación;
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Modelos animales;
Fantomas

Simulación en Otorrinolaringología: una herramienta de enseñanza y entrenamiento

Resumen La simulación en los procesos educativos de la medicina constituye un método de enseñanza y de aprendizaje efectivo. Permite estandarizar los procesos de aprendizaje y enseñar sin poner en riesgo al paciente. En Otorrinolaringología existen diferentes tipos de simulación en las distintas áreas de la especialidad. Se han desarrollado modelos tipo fantoma, paciente-maniquí, modelos virtuales y también se utilizan modelos animales para poder enseñar y practicar diferentes habilidades. Cada modelo tiene sus ventajas y desventajas, donde la realidad virtual se posiciona como un modelo emergente y con un futuro prometedor. Sin embargo, aún falta mayor desarrollo de la simulación en el área de Otorrinolaringología.

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Introduction

Simulation in healthcare consists of positioning the student within a context which mimics some aspect of clinical reality.¹

The use of simulation in medical education processes is an effective method of teaching and learning for students to develop a combination of necessary skills which will enable them to achieve their objectives once they have graduated. It offers them the opportunity to gain practise in an environment which is as close as possible to reality and in different on-site teaching areas or settings.²

In otorhinolaryngology, as with other disciplines, there is a growing interest in developing simulation and being able to standardise and replicate surgical procedures by offering higher security to the patient and also greater confidence to the resident doctor or surgeon in his or her clinical practice.

The aim of this document is to disclose the advances in this field of medical education in the field of otorhinolaryngology.

The Need for Simulation in Otorhinolaryngology

Otorhinolaryngology is a medical-surgical speciality in which it is necessary for the professional to develop a series of technical skills for best results. Acquisition of these skills during their professional training is therefore of the utmost importance.

The latest medical advances, limited educational resources, the need for effective teaching times (due also to the active healthcare role of many teachers) and the need for standardised and objective assessment, has driven the development of new teaching tools and brought them into a modern context.³

Simulation facilitates:

- Being able to commit errors without endangering the patient (learning through error).
- Measuring objective performance and processes of standardised learning.
- A "situational context" with an embodiment of the most effective elements structure: treating something abstract or an object as if it were human or possessed life and human skills.⁴

Simulation Systems in Otorhinolaryngology

The simulation setting may comprise phantom imaging, a dummy patient, the use of animals and cadavers, a computerised simulator of a procedure of a hybrid system which combines physical and computerised interfaces.⁵

Below is a description of the advances in simulation systems, according to the different areas of the speciality.

Otology

Otoscopy

There is a Japanese model, the EAR Examination Simulator (Fig. 1), used to teach otoscopy. It provides difference



Figure 1 EAR Examination Simulator II model. The photo is by courtesy of Ashley Lanning, from Kyoto Kagaku America, Inc.

possibilities, such as the sinuous external auditory canal, tympanic perforation, cholesteatoma, acute otitis media and chronic otitis media.⁶

In Canada, a tool for teaching otoscopy was also created, the Otosim simulator (Fig. 2), which is capable of precisely simulating otoscopy technique and illustrating normal and pathological images of the ear. This simulator has been validated by students.^{7,8}

Morris et al., from the University of Virginia in United States, created a commercial model, in conjunction with Nasco, called Life/form[®] Diagnostic and Procedural Ear Trainer (Fig. 3) which facilitates the teaching and assessment of common diagnostic skills in ear pathology and the extraction of foreign bodies. Moreover, if it is combined with the Life/form[®] Pneumatic Otoscopy Kit, pneumatic otoscopy may be undertaken to appreciate the mobility of the tympanic membrane (Nasco, Health Care Catalogue



Figure 2 Otosim model for teaching otoscopy. The photo is by courtesy of Paul L. MacDonald, BA, vice-president of Sales, OtoSim Inc.

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