Undergraduate Medical Education
UNIVERSITY OF TORONTO

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Otoscopy Simulation: A New Paradigm in Undergraduate Medical Education

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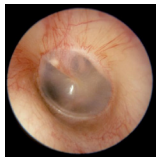
Context

- Otologic complaints are among the most common causes of medical consultation worldwide, especially in children.
- Only 5% of medical students at the end of their Clerkship feel that they could consistently perform a reasonable otoscopic examination *(Jones et al., Pediatr Res. 2003;53(suppl):95A).*
- The accurate diagnosis and appropriate treatment of outer and middle ear pathologies, will have a positive impact on patient care, antibiotic resistance and cost.
- This study proposes a novel otoscopy teaching tool that simulates the technique of otoscope insertion and reinforces the skill of identifying normal and pathological structures directly through the otoscope.

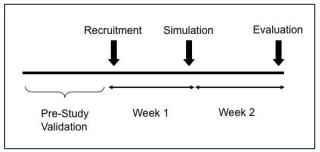


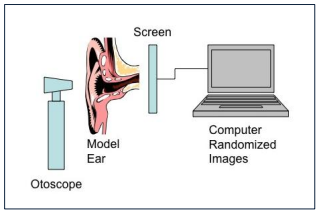
Objectives

1. To apply an otoscopy teaching tool to the Otolaryngology 300 Clerkship course.
2. To assess the impact of otoscopy simulation on the medical students' ability to identify normal ear anatomy and to accurately recognize pathological states.

Project Outline

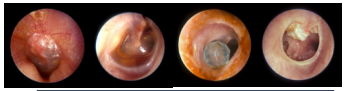
- The study proposal received IRB approval at the Hospital for Sick Children.
- Study participation was offered to third year clinical clerks during all blocks of the 2009-2010 Otolaryngology 300 course.
- Participating students were randomly assigned to a control group (standard curriculum of lectures and notes) or an intervention group (standard curriculum plus a 3 hour otoscopy simulation session).
- At the end of the block, students were assessed with a mock examination using the otoscopy teaching tool.
- The students were asked to describe a series of otoscopy findings that neither group had previously seen. Performance was measured as % accuracy and time to complete the exercise.





Outcomes

Study participant completing the mock examination



Sample panel of pathological states: *(from left to right)* Acute otitis media, otitis media with effusion, foreign body, perforation with cholesteatoma.

The students were presented a panel of 15 pathological states via the otoscope.
The percentage of correct answers and the time to complete the task were recorded.

Evaluation

- 65 Medical students participated in the study.
  - Control (n = 24) vs. simulation group (n = 41)
- The students exposed to the otoscopy simulation tool demonstrated a statistically significant increase in diagnostic accuracy.
- There was no difference in the time taken to complete the mock examination between the two groups.
- However, there was a statistically significant inverse relationship between the time taken to complete the examination and the diagnostic accuracy (R = -0.337, P = 0.006).

	Control	Simulation	P Value
Diagnostic Accuracy (%)	54.3%	78.3%	P < 0.0001
Time to Complete	4 min, 26 sec	4 min, 13 sec	P = 0.487

Dissemination

- The otoscopy simulator improved the otoscopy skills of the participating medical students.
- The simulator will be incorporated into the Otolaryngology Clerkship.
- The educational value of this tool will be shared with the Family Medicine, Paediatrics and Emergency Medicine Clerkship Course Directors to explore the application of this teaching tool.