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Scholarly reviews of clinical smartphone applications

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Letter to the Editors

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Dear Editors,

We appreciate and congratulate Wallace and Kanegaonkar for bringing to light the key role of smartphone applications for clinical use, specifically within otolaryngology. In their publication, the authors identified 107 otolaryngology-specific smartphone applications that have potential for implementation in the out-patient setting, 8 of which were highlighted.[1] Importantly, the authors recognise the challenges in identifying and validating clinically useful applications among the ever-increasing number of available applications. Similarly, Wiechmann *et al.* noted that less than 7 per cent of medical applications have clinical relevance.[2]

Currently, many applications – intended for both clinical and learning purposes – are not curated for content. As such, we propose that scholarly journals begin accepting application reviews, wherein clinicians can demonstrate their applicability in clinical practice and in medical education. In this way, clinicians will be able to more easily identify clinically relevant applications. These reviews can be published in the same format as the book reviews already featured in these journals. In this format, experts can provide both anecdotal evidence regarding the utility of the application and review any published studies using the application, if available. Herein, we would like to present the inaugural evaluation of a clinically relevant smartphone application.

Buckingham Virtual Tympanum

Accurate otoscopic diagnosis requires the conjunction of two critical skill sets: (1) the technical ability to visualise the middle ear using an otoscope; and (2) familiarity with middle-ear anatomy and pathology. Previous studies have demonstrated that trainees and clinicians outside of otolaryngology often have difficulty diagnosing middle-ear pathology.[3–5] Traditionally, trainees have learned to recognise common middle-ear pathologies through repeated otoscopic examinations, simulation mannequins and textbook photographs. However, these educational techniques may be inconsistent, inaccessible or expensive.

The Buckingham Virtual Tympanum (Miriam Redleaf, Apple iOS; price $0) provides a series of high-definition microscopic images of actual patients' normal and pathological tympanic membranes. It offers an interactive platform through which users answer a series of questions on each labelled tympanic membrane photograph, which are then verified for correctness. This form of active learning has been demonstrated to significantly increase retention among learners.[6]

The application presents tympanic membrane images in four distinct levels of increasing complexity. Photographs of normal anatomy provide a foundation for otoscopic understanding among undergraduate learners, while more complex pathology challenges residents and clinicians alike. Moreover, the application developers demonstrated that medical students who used the application for eight weeks performed significantly better on pre- and post-test tympanic membrane photograph interpretation compared to controls.[7]

The Buckingham Virtual Tympanum has significantly improved middle-ear anatomy education, and can potentially replace current expensive and bulky educational adjuncts. It is easy to use, and can help clinicians and trainees become more confident in their otoscopic diagnoses. Moreover, it is conveniently available for free on any iOS-based device. One way it can be improved is by updating the collection of tympanic membrane photographs to highlight additional middle-ear pathology. Nevertheless, we have found the application to be an integral supplement to medical education.

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