

UNUSUAL UTILISATION OF MOBILE TECHNOLOGY IN MEDICINE

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The popularity of mobile technology has grown rapidly over the last few years¹ and the integration of mHealth is transitioning from a curiosity to an accepted part of health-care delivery. With the growing number of mHealth applications, systematic reviews have highlighted limitations in evidence for their benefits². Despite the paucity of high-quality evidence, the unpublished and grey literature is littered with excellent examples of innovative applications and implementations of mHealth that may benefit patients and be of interest for future research. This has spurred interest from developers to think “outside the box” when trying to solve healthcare issues. We bring to the reader’s attention some of these ‘unusual’ applications and the exciting potential offered by new developments.

With iPhone adoption being as high as 59% amongst anaesthetists³, it is a field that ripe for interesting applications of mobile technology. Like other specialties, there are an extensive number of apps and attachable peripherals for the device^{3–5}. One particularly innovative use of the device involves the utility of the accelerometer built into the phone⁶. Reversal from neuromuscular blockade is best measured with a Train-of-four ratio technique, which requires a nerve stimulator and a measurement device for the force generated, such as an accelerometer⁷. The nerve stimulator causes a short burst of muscle twitches the force of which is related to the degree of muscle paralysis⁷. Whilst nerve stimulators are easily accessible, accelerometers are generally more difficult to access in the clinical setting. By combining the built in accelerometer in the iPhone along with the iSeismology app (Figure 1), clinicians have developed an alternative way of measuring the aforementioned ratio⁶.

Recent interest in augmented reality (AR) technology have resulted in several novel applications.

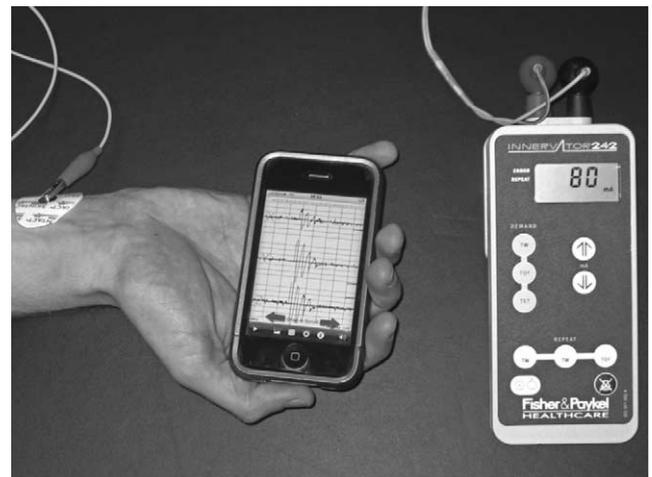


Figure 1: Nerve stimulator and iSeismology app being used to check Train of Four ratio (6)

DoctorMole™ is a dermatology smartphone app that aims to aid the assessment of skin moles and diagnosing malignancies. The app can assess a mole through the phone's camera and analyse the image via an algorithm for symmetry, border, colour & diameter to estimate the risk of a suspicious lesion being malignant⁸. Whilst such applications have been shown to have varying degrees of accuracy, potentially resulting in incorrect diagnoses⁹, it serves as an example for the future potential for AR use.

AR is also being utilised for medical education. The newly unveiled Google Glass™ has featured prominently in technology news and has now been utilised during surgery. A percutaneous endoscopic gastroscopy was performed by a surgeon with the live video feed used to educate doctors in training on how to perform the procedure. The device allowed for an "operator view" and the sharing of the endoscopic view as well to enable a better understanding of the procedure for the trainee¹⁰.

One of the most unusual applications that has been reported involves the development of highly specialised patient slippers. Termed "smart slippers," these devices use pressure sensors to analyse gait and identify possible medical issues or high falls risk. The device would then be able to alert the patient's clinician of such risks or falls via a transmitter¹¹.

These imaginative and unusual applications of mobile technology highlight the potential for further development in the field of mHealth. Furthermore, they help spark the creativity that is essential to such novel implementations of mHealth that will one day become mainstream. We recognise that there will be an inherent limitation in the amount of clinical data available with such developments in the early phases of development, however providing robust clinical data to support the use of any medical technology should be the ultimate endpoint of development. Here at the Journal of Mobile technology in Medicine, we encourage sharing of these new developments with other mHealth researchers through our news section, and eventually with original research data published in the journal.

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