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EDITORIAL

Smartphone medical imaging: applications and future considerations

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Journal MTM 3:1:1, 2014
doi:10.7309/jmtm.3.1.1

It is with great privilege that we welcome the third volume of the Journal with an issue that presents original research highlighting innovation and true practical advances in the role of smartphones in medical imaging.

Myung et al, in their back-to-back papers in this edition offer excellent examples of the increasing role of smartphones to capture clinical images in ophthalmology. Their papers not only demonstrate creativity, but offer readers involved in eye care a template to develop their own examination equipment at limited expense. Through their publications the authors have highlighted and addressed practical barriers of cost, and training of health care cadres as major barriers that currently confront many low-resource countries.

Ophthalmology in particular is a specialty that is critically dependent on visual diagnosis. Whilst cataract and refractive error remain the primary causes of blindness globally, there is a rise of posterior segment pathology, chiefly diabetic retinopathy, age-related macular degeneration, and glaucoma.[1] Many of these latter conditions are more indolent in progression which results in patients often presenting only when symptoms of vision loss manifest. This justifies the need for screening and timely referral when subtle changes develop. In the context of diabetic retinopathy, regular monitoring can be facilitated in a cost-effective manner through remote photography and using telemedicine networks.[2] Whilst the attention of global blindness prevention efforts of the past two decades have concentrated on cataract and infectious causes of vision loss (for example, trachoma, and oncocerchiasis) a major barrier to following up and monitoring for other causes of vision loss is affordability of sophisticated imaging equipment such as retinal cameras and ophthalmic slit-lamps. In this context, Myung et al offer a proof-of-concept model to perform anterior segment and retinal imaging. The enormous potential for translation into clinical practice rests with the user-friendliness, minimal training required for users, image resolution that offers the ability to capture clinically important details, and the ability to rapidly store and transfer images.

As with any novel innovation there are practical limitations that offer opportunity for further refinement. In many low-resource settings, there remains a paucity of access to internet and 3G/4G cellular networks outside of major metropolitan centres.[3] Thus, image capture devices must also be accompanied with a platform for safe, ethical and legal storage of data. Thus, in the setting where dynamic transfer and reporting of data cannot occur image capturing technologies would need to advise users on how to temporarily store data (when unable to remotely transfer immediately), and subsequently follow-up on patients who may need urgent referral. These are real challenges that exist in many developing countries where patients may be nomadic, without fixed address, have poor literacy (consent issues), and live far from the point of health care. Despite this, there is clearly a growing body of evidence to support the surge in demand for affordable and accessible medical imaging. Further research into the accuracy, reliability and feasibility of such devices will only enhance their ability to revolutionise the manner in which we deliver healthcare.

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