

**Sir,
 Direct ophthalmoscopy should be taught to
 undergraduate medical students**

It is with great interest that we read your controversy regarding whether or not direct ophthalmoscopy should be taught to medical students.^{1,2}

We feel that direct ophthalmoscopy is a fundamental skill that all doctors should be able to perform. However, the skills in ophthalmoscopy must be complemented by a complete ocular examination and not consist of ophthalmoscopy alone (particularly visual acuity measurement, examination of pupils, visual fields and basic eye movements). For example, a doctor may feel that an optic disc appears to be swollen; however, it is only after complementing this assessment by proving the presence of an RAPD that their strength of conviction would grow.

Direct ophthalmoscopy can form part of final year examination assessment at Medical School and several post-graduate membership examinations. Eye problems represent 1.5% of presentations to GPs³ and consultation rates for GP and eye casualty have been recorded at 71.8 per 1000 population per year.⁴

Bruner⁵ developed the theory of the spiral curriculum whereby complex ideas can be taught at simple levels early on and then re-visited at more complex levels later on. This idea of spiral learning underpins many medical school curriculums and encourages independent problem solving. Therefore, one can be exposed to the technique of direct ophthalmoscopy early on during medical school clinical teaching and re-visit situations when the direct ophthalmoscope would aid diagnosis and management in later clinical years. This technique currently underpins much of current clinical teaching today. For example, most medical students learn the 'nut-and-bolts' of a cardio-respiratory examination in the first year of medical school but only contextualise this in later years.

Ideally, when examining a fundus we would want to dilate the pupil and this is rarely done outside of the ophthalmology clinic, because of the fear of inducing angle closure glaucoma. Knowing that the risk of such an event occurring with Tropicamide eye drops is negligible should re-assure doctors. Guidance needs to be integrated within the curriculum allowing use of mydriatics to allow adequate examination. Not doing this would be akin to expecting detection of a murmur through multiple layers of clothing.

Conflict of interest

The authors declare no conflict of interest.

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I Jawaid, SCL Hill and WM Amoaku

Department of Ophthalmology, Queens Medical Centre, Nottingham, UK
 E-mail: drijawaid@gmail.com

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**Sir,
 Direct ophthalmoscopy should be taught within the
 context of its limitations**

I read with interest the controversy articles of Yusuf *et al* and Purbrick and Chong regarding the value of teaching direct ophthalmoscopy to undergraduate students as part of their clinical training.^{1,2} Although no ophthalmologist would dispute the importance of fundus assessment *per se*, I feel most would agree that the direct ophthalmoscope is not the best instrument for the job. Indeed, it is rarely used by many ophthalmologists, myself included. Its most striking weakness that was not touched on by Purbrick and Chong, is the narrow field of view that it affords the user. This is quoted to be around two disc diameters in the emmetropic patient which approximates to 7 mm² of retina simultaneously in focus. This field of view becomes even smaller in the myopic patient.³ Given that the surface area of the average human retina is 1204 mm²,⁴ the user of the direct ophthalmoscope would be required to systematically visualize 172 'fields of view' to be certain not to miss a fairly large lesion measuring up to two disc diameters in size. This is of course completely impractical and leads to the inevitable conclusion that even in the hands of the most experienced practitioner, it is simply not possible to comprehensively examine the fundus with the direct ophthalmoscope. Its high magnification, however, makes this instrument ideally suited to assessment of the optic disc for example. While I believe it is reasonable to teach students direct ophthalmoscopy and its indications, it is equally important to emphasise the significant limitations of the technique, namely narrow field of view, monocularly with consequential lack of stereopsis, lack of access to pre-equatorial retina, and poor view through media opacities. With this in mind, our future colleagues practicing in other areas of medicine may have a better understanding of when specialist ophthalmic referral for funduscopy is appropriate.

Conflict of interest

The author declares no conflict of interest.

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HO Orlans

Moorfields Eye Hospital, London, UK
E-mail: harry.orlans@nhs.net

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Sir,
Comment on: 'Direct ophthalmoscopy should be taught to undergraduate medical students'

We read with interest the controversy surrounding direct ophthalmoscopy.^{1,2} Purbrick and Chong suggests substituting direct ophthalmoscopy with fundus photography.¹ Non-mydriatic fundus photography remains expensive and therefore difficult to disseminate internationally and smartphone applications such as PEEK require more detailed assessment. Although these technologies may hold promise for the future, they do not replace the need for clinical ophthalmic assessment. Perhaps rather than replacing direct ophthalmoscopy, fundal photographs could be used to supplement and aid the teaching of this important clinical skill.

We have shown by using a simple patient assessment tool that in-patients referred to neurology were not appropriately examined—in particular, omission of ophthalmoscopy—before referral.³ We feel this data should not be used as an excuse to stop examining patients. Instead we agree with Yusuf *et al*² that despite advances in non-mydriatic fundus photography, basic skills in ophthalmic assessment are essential and advocate that there is no substitute for appropriate clinical examination.^{4,5}

It is unrealistic to expect undergraduates to be competent at direct ophthalmoscopy at the end of their short ophthalmology attachment. Instead, these skills should be taught early in the clinical curriculum so that they can be practised, reinforced, honed, and (most importantly) assessed during further attachments in neurology and general medicine. This requires the support and collaborative efforts of ophthalmologists, physicians, and educators at undergraduate and

postgraduate levels to ensure these important clinical skills are engrained for the benefit of our patients.

Conflict of interest

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JP Appleton and DJ Nicholl

Department of Neurology, Sandwell and West Birmingham Hospitals NHS Trust, City Hospital, Dudley Road, Birmingham, UK
E-mail: David.nicholl@nhs.net

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Sir,
Response to: 'Direct ophthalmoscopy should be taught to undergraduate medical students'

We would like to respond to the recent controversy regarding the relative merits of teaching direct ophthalmoscopy to undergraduate students.^{1,2}

At the University of Nottingham, direct ophthalmoscopy is considered to be a life-saving examination that all medical students must acquire competency in. It is a widely held view that, direct ophthalmoscopy is an essential skill in the undergraduate ophthalmology curriculum.³ This is reflected in the universal teaching of this skill at an undergraduate level in the UK.³ Indeed, ophthalmoscopy is considered a fundamental competency of the Foundation Programme.⁴

Although it is true that physicians lack confidence in performing direct ophthalmoscopy, the reasons for this are multifactorial. The brevity of undergraduate ophthalmology rotations combined with the lack of practice of ophthalmic examinations by peers (GPs, hospital doctors and so on) may discourage trainees from using an ophthalmoscope when the need arises. The scenario of GPs sending patients with eye complaints to the friendly high street optometrist for evaluation and guidance is also familiar. As ophthalmologists we must