

# Future healthcare and its impact on education: A personal view

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*“Today, because of rapid advances in healthcare, schools have to prepare students for jobs that have not yet been created, technologies that have not yet been invented and problems that we don't yet know will arise.” With apologies to Andreas Schleicher, OECD Education Directorate 2010.*

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The past is often seen through the rosy glow of hazy recollection and medicine is no exception. Senior doctors of each generation opine that young trainees are not as proficient as they were. Of course this is nonsense but today's medical student will face a very different healthcare delivery system than in the past. Previously training was long and the arduous hours worked were excessive. The advantage of these working practices was that doctors saw many different patients and because patients often stayed in hospital for weeks at a time, trainees could observe the evolution of disease and test the accuracy of their original diagnosis. The teaching was delivered locally and face to face. Medical practice was slow to change and often based on personal prejudices. Patients were generally compliant and mostly grateful.

Contrast this with modern healthcare. Now some conditions are rarely admitted to hospital at all and patients are increasingly cared for in a community setting by their primary care or family doctor. Those patients who are admitted are inpatients for much shorter times (the average length of stay for an uncomplicated myocardial infarct in the UK is less than 5 days). Doctors working hours are (rightly) much reduced. New diseases are described and patients expect more from treatment and their medical attendants. Additional challenges for today's doctors include global migration and a changing patient demographic. Increasingly patients are older with

multiple conditions and may have accompanying intellectual decline.

How can medical education address these challenges in order to ensure new graduates are equipped to work in such a changing work environment? In this personal view I will describe two initiatives to demonstrate how, at the University of Leeds, we are utilising technology to support 21<sup>st</sup> century medical student learning.

## I. NEAR PATIENT LEARNING

In 2010 we provided all year 4 and 5 students with a smart phone. Colleagues at other medical schools were mystified and made derisory comments about gimmicks to attract students. However, it was a deliberate strategic decision to support student learning when away from campus on clinical placements. We reasoned that students often wanted to look up information about patients and their treatment who they spoke to whilst on the wards and in the clinics. However, despite their best intentions when returned home they frequently forgot or were too busy with other things to look up the answers to their questions or to investigate learning points. We felt if we could help them look up these queries whilst with the patient they would cementing the learning experience. We not only gave the students the devices but also a range of learning resources were loaded onto them together with an e-portfolio app. Additionally these devices provided the ability to record workplace based

assessments which were automatically uploaded to the University and effectively put an end to the previous blizzard of paper work associated with this type of test.

The use of mobile phones to allow learners to access a range of learning resources whilst in the clinical environment has been a great success with students. However, it took longer for staff to become enthusiastic! Six years later, this has changed and clinical staff frequently get students to look up drug dosages or guidelines for them on their phones. Patients too have become accustomed to seeing students using their devices during clinical interactions and are no longer concerned they might be using social media.

More recently we have installed the University Wi-Fi Eduroam service in the majority of our clinical placements. The result is that students have moved to using their own devices and with the money saved from buying the hardware we have been able to invest in more licences; now all students on the undergraduate course can have access to the learning resources. In the future, as patient records become digitised, students and trainees could be given access to follow the course of a patient's illness who they have seen and admitted even though they may not be actually seeing or caring for that patient any longer. This would mean that learning from the patient's journey through their illness and treatment would never-the-less be possible.

## II. POINT OF CARE ULTRASOUND (POCUS)

In 1816, French physician René Laennec used a rolled sheet of paper to auscultate the chest of a female patient with suspected tuberculosis. Laennec went on to make his first stethoscope from two pieces of hollow wood: one of which was placed against the physician's ear and the other was placed on the patient's chest. In the intervening 200 years improvements in Laennec's invention have centred around refining the acoustics. Is this the best we can do? Surely advancements in modern technology can support the doctor in providing better detection of the physical signs of disease in the 21<sup>st</sup> century. In their recent article in the Lancet on The Art of Medicine Barrett and Topol (1) describe the medical profession's resistance to Laennec's invention and take this analogy forward in looking at the potential for point of care ultrasound.

Ultrasound is a safe and common modality used to image many different areas of the body. Improvements in technology have meant that ultrasound machines are now available as handheld devices. Although these handheld devices, such as the Lumify (Philips, USA) or the Vscan (GE Healthcare), are unlikely to be an exclusive

alternative to formal echocardiography, evidence suggests that their diagnostic accuracy is better than that of the stethoscope alone. In addition, they can be used to image other parts of the body to support the diagnosis of acute abdominal conditions or to aid cannulation of arteries and veins. The implications of this new technology are important for education. At Leeds we have introduced a five-year theme integrating the use of ultrasound into the curriculum. Students now start to use ultrasound to help them learn anatomy in addition to the traditional methods of dissection. They progress to using ultrasound as part of their clinical skills programme and finally on the wards to help with clinical examination. Will there be similar resistance to the routine adoption of ultrasound in clinical examination as there was to Laennec's invention? Well certainly not in Leeds Medical School.

My point is that it is not only important to use technology to support student education but also that medical schools must be aware of the ways in which technology will revolutionise the practise and delivery healthcare in years to come. It is our professional responsibility as educators to ensure our graduates are prepared to enter this exciting and challenging environment. Welcome to the revolution.

## References

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Barrett, P. M., & Topol, E. J. (2016). The Art of Medicine: To truly look inside. *The Lancet*, 387, 1268-1269.

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