

Preparing medical students for the realities of NHS prescribing



Professor Simon Maxwell is medical director of the Prescribing Safety Assessment (PSA) and professor of student learning at the University of Edinburgh Medical School. He is also a consultant physician at the Western General Hospital in Edinburgh. He talks to Kate Stewart about the PSA and the impact it is having on prescribing education in the UK and beyond.

Simon Maxwell admits that his earliest passion was Nottingham Forest, his football team. As a schoolboy in the 1970s, he discovered that, with true grit and determination, you can ultimately achieve your goals.

He says: "When I was growing up in Nottingham, the local team went from obscurity to being Champions of Europe twice

(in 1979 and 1980). I literally saw the whole miraculous story unfold before my eyes as I travelled around the football grounds of England."

Professor Maxwell applied a similar determination to his career. He graduated with honours from University of Birmingham Medical School in 1986 where, inspired by the mentorship of Professor Martin Kendall, he developed his passion for clinical pharmacology and therapeutics.

He recalls: "At that time, I became very interested in knowledge transfer and developing effective teaching materials for medical students. I remember at an early stage in my medical career plastering the walls of the ward office with diagrams that would now be called 'infographics'. I was only just out of medical school but I found the concept of organising thoughts, and trying to make the complex more accessible to learners, fascinating. I was clear in my mind that one of the things I wanted to focus on in my future career was medical education."

Professor Maxwell stayed in Birmingham for six years while he completed his MD and PhD and, after a brief spell as a consultant in Leicester, he landed in Edinburgh. There he embarked on a

20-year journey to develop novel tools that might help to support medical students as they trained to be future prescribers. His perseverance has paid off with the emergence of the Prescribing Safety Assessment (PSA),¹ an online assessment of medical students' competencies in relation to the safe and effective use of medicines. A collaboration between the British Pharmacological Society and the Medical Schools Council, the PSA was originally conceived in 2010, and now passing the assessment is a requirement for all new foundation year 1 doctors.

What is the thinking behind the need for the PSA?

Professor Maxwell points to studies including EQUIP² PROTECT³ and PRACtice⁴ that found there was a demonstrable prescribing error rate among doctors straight out of medical school. "The causes were obviously multifactorial and often included failings in the systems in which doctors and other prescribers work. Nonetheless, given that these factors will always militate against the best result, it seemed obvious that new graduates should begin their careers as well-trained as possible in the complex area of prescribing and supervising medicines use.

"These independent studies also implied that prescribing had been under-represented in undergraduate training, and medical students, junior doctors and their supervisors expressed concerns that they were not adequately prepared for the realities of being NHS prescribers."

The aim of the PSA was to provide a mechanism to enable medical students to demonstrate they have achieved the basic competencies in prescribing outlined by the GMC, he explains. "It seemed the best way to do this was to bring together all the relevant expertise from around the UK to create an equitable and fairly applied national assessment, as well as encouraging a minimum basic standard of practice for the benefit of patient safety.

"I also hoped that the PSA might provide the first large-scale validated metric in the area of prescribing and therapeutics. This would be of obvious value to medical educators trying to understand how to deliver effective training pathways and might help us understand what works for learners and what doesn't."

Is there evidence that the PSA is making a difference in terms of patient care?

"The honest answer is 'not yet' but no one involved in the PSA is shying away from that fundamental question," stresses Professor Maxwell. A research group has been set up to address this as well as the many other questions that have arisen from the data and experience gathered over the past few years.

"However, it has to be acknowledged that delivering conclusive evidence of patient benefit will be very challenging because

of the many other confounding factors involved. For instance, recent years have seen further stretching of NHS services, greater prescriber workloads and increasingly complex treatment protocols. Reliably picking out the impact of a single assessment among all those other factors will require a very big study.

"Nevertheless, I think there are already a lot of 'surrogate markers' of benefit. Based on the feedback that the thousands of students who take the PSA each year provide, it's evident that students are doing more prescribing as part of their training and the gradually improving

performance in the PSA supports this. There are also many reports of staff being given more time to ensure that students are properly prepared to take the PSA. For that reason, the PSA team tries to make sure that preparing for the PSA is directly relevant to preparing for real-world practice. All of our authors and reviewers work hard to ensure that the assessment content reflects the knowledge, skills and judgements made by foundation doctors in practice.

"We may not have delivered the conclusive evidence of patient benefit yet but I think we have 'nudged' this aspect of undergraduate training in the right direction," he adds.

The 'S' in the PSA exam was changed from 'skills' to 'safety'. Does this mean that prescribing issues not directly related to safety take a back seat?

"We took the decision to rebrand as the Prescribing Safety Assessment in 2013 to reflect the increasing focus on patient safety in healthcare. In doing so, we recognised that some might wonder whether we had forgotten about 'effectiveness'. You can be assured that with so many clinical pharmacologists and pharmacists involved in the PSA, we are very clear that good prescribing always involves a careful appreciation of both the benefits and hazards associated with drug therapy."

How is the PSA exam going to be affected by the introduction of a medical licensing assessment (MLA)⁵ for undergraduates?

"I think we recognise that the emergence of a UK MLA might have important implications for our work. I am a strong supporter of the MLA process. While I still believe there should be room for some local institutional freedom in the assessment process, I think that members of the public expect that those trained to enter a *national* health service will have met a basic *national* standard of competence in the most fundamental areas of their training – including prescribing and supervising medicines. Indeed, that principle underpinned much of the thinking leading to the development of the PSA.

"Where the PSA might fit in remains unclear. However, I would like to think that we have set a good example of how a large-scale national competency assessment can be organised and delivered. Whatever its relationship to the MLA, I expect the PSA in its current format to remain relevant to medical students and increasingly to other prescribers."

What are the biggest challenges that prescribing and therapeutics education for medical undergraduates needs to address?

Professor Maxwell continues to believe that delivering effective training in clinical pharmacology, therapeutics and prescribing is probably the most challenging area of the undergraduate medical curriculum. It is 'knowledge-rich' at a time when the factual burden placed on learners is greater than ever, he says. "The 'facts' are in constant evolution because of the emergence of new drugs and evidence about how to use them. It is also difficult to practise as a prescriber because of the concerns around patient safety.

"For all of these reasons, I have been part of various national initiatives to try to overcome the hurdles and offer more learning opportunities [see below]. Here in Edinburgh, we set up near-peer prescribing tutorials that enabled foundation doctors to introduce medical students to some of the prescribing challenges they face and write up 'mock' prescription charts.

"Like the PSA, none of these efforts alone will 'solve' the problem of prescribing errors but are intended to raise the profile of clinical pharmacology and prescribing to a level appropriate to their importance in the life of a foundation doctor."

How does the PSA compare with similar programmes internationally? Have any other countries adopted the PSA?

The PSA is now one of the biggest online medical assessments in the world. Every year, around 10,000 candidates take part in 200 assessment events in various locations all around the UK and overseas, according to Professor Maxwell. "I am not aware of any other providers that have attempted to offer prescribing or related assessments on this scale. As part of the process, close to 100,000 prescriptions are written and automatically marked against a consistent marking scheme.

"Our work has caught the attention of other countries facing similar challenges. For several years, our colleagues in the medical schools of Ireland and Malta have joined in with the UK assessment days. More recently, we have begun to work with groups in Canada, Australia, New Zealand and India."

What about the assessment of junior doctor prescribing?

"Assessment and feedback to clinicians is always a valuable part of continuous professional development for *all* prescribers, not just junior doctors. Gathering appropriate data about prescribers' work and feeding it back to them presents some challenges. Unless the review really understands the full context in which a prescribing decision is made, it is difficult to make judgements or give definitive feedback. Nevertheless, the NHS

should do better at highlighting incidents or poor practice and feeding the information back to those involved."

What could be done to improve quality of medicines use, from foundation year 1 doctors through to registrars?

"My general approaches would be: first, clear leadership around the importance of medicines at unit and institutional level; second, protecting time to consider medicine use on ward rounds; third, more helpful feedback, noting the points I have just made; fourth, more clinical pharmacy involvement at the 'coalface'; and fifth, greater availability of electronic prescribing and near-patient decision support."

Antimicrobial resistance is clearly a massive public health concern – how do current educational programmes address this?

"The importance of increasing awareness of antimicrobial resistance and antimicrobial stewardship is well recognised and most curricula are beginning to reflect that. For prescribers, the basic principles of rational prescribing remain relevant, although there are, of course, many other factors that are also relevant. The PSA has commissioned additional expertise in antimicrobial prescribing to provide more question items in this area."

Do biological therapies present a problem from an educational perspective?

Biological therapies pose new problems for prescribers and those responsible for training them, notes Professor Maxwell. "They are larger complicated molecules that don't respect the more familiar pharmacology of smaller molecules. They interact with newer, more specific targets that, unlike adrenergic or histaminergic receptors, are less likely to be covered in detail in a standard medical curriculum. At the moment, most are expensive and for specialist use only but the likelihood of the generalist encountering them is growing. At this point, efforts should be focused on developing basic understanding of their behaviour and potential adverse effects."

Are there any differences from an educational or safety perspective between the use of medicines in primary and secondary care?

The fundamental principles of prescribing are similar but, from the perspective of a hospital physician, Professor Maxwell suspects that the challenges in primary care are greater. "The breadth of prescribing is wider, the time for decision making is shorter, the opportunity to review and monitor is more limited, and the peer review from colleagues and other healthcare staff is less. At the moment, the main advantage that primary care prescribers enjoy is that most use better developed electronic systems and decision support."

What other national programmes of work are there that aim to promote quality and safety of prescribing?

"The Prescribe⁶ e-learning project [see Box] has been launched

to support better understanding of the principles of clinical pharmacology. NHS West Midlands has also developed an excellent e-learning package called SCRIPT. It contains interactive learning modules for a range of topics including dosing calculations, basic medication errors and using drugs in pregnancy and breastfeeding," Professor Maxwell remarks.

What are international organisations doing to promote education about prescribing?

Professor Maxwell has worked with various international organisations over a number of years and is currently secretary of the European Association of Clinical Pharmacology and Therapeutics (EACPT) and chairs its Education Working Group. This has allowed him to meet many colleagues from around Europe who share similar interests in prescribing and learn from their experiences. They are currently conducting a pan-European study on assessment and learning pathways for prescribers.

"I chair the education section of the International Union of Pharmacology (IUPHAR)⁷ and co-lead their Pharmacology Education Project, which is intended to be a repository of free online learning materials for students studying the pharmacological sciences. The intended focus is learners in resource-poor countries around the world."

What challenges does the future hold?

"Electronic prescribing will be widely implemented in the not too distant future and that's going to change the challenges for doctors and require new thinking in undergraduate training. It also brings with it the opportunity to implement artificial intelligence in prescribing decisions. There will be many opportunities to shape the decision support tools to support prescribers,"

What is the Prescribe⁶ e-learning project?

The Prescribe e-learning project was recently launched in an effort to provide materials to support better understanding of the theory behind prescribing. Prescribe is a collaboration between the British Pharmacological Society and Health Education England (HEE) e-Learning for Healthcare (e-LfH). It provides e-learning materials to help healthcare students to develop a firm grounding in the principles of clinical pharmacology and use of medicines more generally. The e-learning resource contains both interactive learning sessions and information designed to support students in achieving the relevant knowledge and skills outcomes. Prescribe is intended to complement existing teaching initiatives and is made available free of charge to students registered with UK universities and NHS-affiliated organisations.

Says Professor Maxwell: "The Prescribing Simulator is an extension of the original project. It will provide the opportunity for prescribers to practice in a simulated online environment at any time or place. Users are presented with clinical scenarios that require a prescription on a certain prescription form. The prescription is then automatically scored and feedback is provided to guide the user on where future improvements can be made."

Professor Maxwell observes.

"Another exciting development is that other professional groups are becoming prescribers, notably pharmacists and nurses. This will demand new thinking as to how the traditional approaches to prescribing education might be implemented within rather different curricula.

"I think an overarching challenge is going to be efforts to accommodate polypharmacy. We are getting to a point where we are going to have to ask some hard questions about whether elderly patients really want to be taking 10 different medicines and whether we can better understand if polypharmacy, however well-intentioned and evidence based, is really the best option."

He adds: "So I think my final challenge is going to be how do we make pharmacology and therapeutics more accessible not just to students but to members of the public.

"They are going to have to have a better understanding of the prescribing process to get the best from their medicines and engage in shared decision making. They will need to understand what it means to be on a medicine and what the potential benefits might be.

"I think once that information is made more accessible, there could be some very interesting conversations ahead!"

Further information

Prescribing Safety Assessment website: <https://prescribingsafetyassessment.ac.uk>

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Declarations of interest

None to declare

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