Prescribing safety: ensuring that new graduates are prepared

Prescribing drugs is central to the work of trainee doctors. Newly graduated doctors write a large proportion of hospital prescriptions (medication orders) and the task has high stakes for all concerned. For patients, drugs are a major factor affecting present and future health outcomes. For doctors and hospitals, prescribing represents an important source of clinical risk and cost, and is arguably one of the most complex intellectual challenges new graduates face. Prescribers have to select the correct drug, dose, and route and frequency of administration, sometimes in the face of diagnostic uncertainty, while taking into account predicted individual variability in drug handling and response as a result of comorbidity, genetics, and interacting drugs.[1] In view of the different wishes of individual patients and the uncertain outcome of any prescription, the doctor needs to counsel the patient and plan an appropriate strategy for monitoring and follow-up to obtain evidence of benefit and harms.

Perhaps unsurprisingly, widespread evidence exists that prescribing by newly graduated doctors is frequently suboptimum. Studies have reported that 7–10% of the prescriptions written by newly graduated doctors in UK hospitals contain errors ranging from minor to life-threatening.[2,3] Senior doctors also make errors, albeit at a lower rate.[2–4] Similar concerns regarding drug prescription have been expressed internationally.[5] Many factors are associated with prescribing errors. The systems in which prescribers must work are often high-pressured, full of distractions, have a heavy burden of administration, and require continuous multi-tasking, which results in prescribers being more error prone. The number, age, and vulnerability of hospital patients have also progressively increased, as has the complexity of the treatment regimens for common disorders.

One might therefore expect that new graduates would be thoroughly prepared to begin prescribing in these demanding work environments. However, a clear theme from studies[2,6] was that students and new graduates often felt underprepared for and anxious about prescribing, a concern echoed by their supervisors.[7]

Against this background, and wider concerns that therapeutics had become less visible in undergraduate training,[8,9] the UK Medical Schools Council convened a Safe Prescribing Working Group in 2007 that brought together key stakeholders, including the General Medical Council, health-care employers, postgraduate educators, and the British Pharmacological Society. The group made several important recommendations as part of a plan for improved undergraduate training.[10] First, a clear definition of the outcomes in relation to the use of drugs expected of students at the point of graduation should exist that is accepted by all stakeholders. Second, a national e-learning strategy should exist to support students in achieving these outcomes. Third, a reliable and valid assessment should be developed to enable final-year medical students and medical schools to show that the required learning outcomes have been met and that new doctors have the necessary competencies to begin prescribing independently.

The last recommendation resulted in a collaboration between the UK Medical Schools Council and British Pharmacological Society, leading to the development of the UK Prescribing Safety Assessment (PSA). The assessment blueprint identifies eight sections containing item styles that cover different aspects of drug use, based in any one of seven different clinical settings and relevant to the work of a newly qualified doctor (figure). The assessment is open book but time-limited, with candidates having access to the *British National Formulary* throughout its duration. The PSA is delivered online, offering the advantage of automated marking of candidate prescriptions and

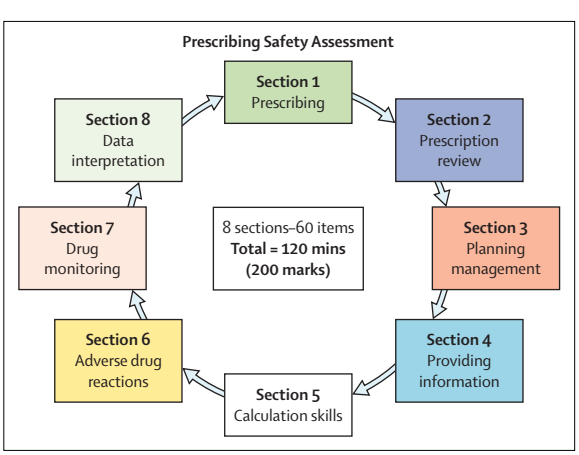

Figure: **The structure of the Prescribing Safety Assessment**
Clinical settings being assessed are internal medicine, surgery, elderly care medicine, paediatrics, psychiatry, obstetrics and gynaecology, and general (family) practice. Further details are available at the Prescribing Safety Assessment website.

For the **Prescribing Safety Assessment website** see https://prescribingsafetyassessment.ac.uk

other items, and the flexibility to set up and deliver PSA events in many academic and health-care locations. The process enjoys the input of item authors, editors, peer reviewers, standard setters, and psychometric support drawn from all of the UK's 33 medical schools.

After 4 years of development and piloting, 7494 final year students from all of the UK's medical schools and five overseas schools participated in PSA events between February and June, 2014. The overall pass rate among UK candidates was 94%, with most of those who failed passing a re-sit of the assessment after a period of remediation. All candidates provided feedback on their experience, with most agreeing that the PSA is a relevant and appropriate test of prescribing skills at graduation level and that the assessment interface was easy to use. Many commented that the experience of preparing with online practice papers and participation in the assessment had engendered an enhanced sense of confidence about their future prescribing of drugs. PSA events are scheduled to run again in all UK medical schools beginning in February, 2015.

The development of the PSA raises some important questions. Can a dedicated assessment of prescribing really be justified when the present educational philosophy emphasises integration in teaching and assessment? We believe that the assessment is justified, and necessary, on the basis of the unique position of prescribing among the wide range of activities required of new graduates. Few other activities are done so frequently (often with minimum supervision), have such immediate implications for patient health outcomes,[5] have such clearly documented rates of error in modern health care,[2–5] or have such a clear training–practice deficit.[2,7]

Will the PSA actually improve prescribing? Little doubt exists that assessment hurdles are a powerful driver, both of learner and institutional behaviour. The PSA has undoubtedly already prompted improved training experiences in the UK with additional prescribing practice, development of new educational materials, new faculty appointments, and a generally increased visibility of prescribing for students in undergraduate training. Inevitably, so-called teaching to the test will happen, and so every effort has been made to create an assessment that is relevant to clinical practice. Evidence of the assessment's external validity will have to await studies that link PSA performance to subsequent prescribing outcomes.

Although medical schools and hospitals have developed local prescribing assessments, at present no widely accepted measure of prescribing performance in medical education exists. We believe that a national prescribing assessment that all students have to pass will serve to raise and unify prescribing standards, promote improved training experiences, and enhance patient safety. Moreover, at a time when concerns exist about the equivalence of outcome from different training pathways,[11] the PSA will serve to ensure that all new prescribers, whether trained in the UK or overseas, meet a similar basic prescribing standard before they begin working in the NHS. This aspiration also chimes with the objective stated by the General Medical Council on Sept 25, 2014, to investigate the merit of development of a UK National Licensing Examination that will ensure those minimum standards extend across a wide range of outcomes.[12]

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Uterine transplant: new medical and ethical considerations

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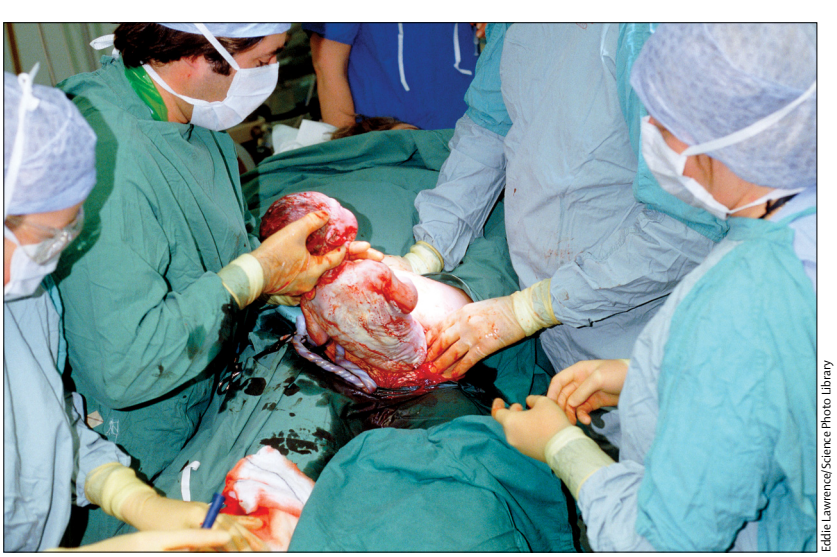
In *The Lancet*, Mats Brännström and colleagues report the first successful birth of a child following uterus transplantation.[1] The recipient, a 35-year-old woman lacking a uterus (Rokitansky syndrome), received a cryopreserved embryo 1 year after transplantation, leading to a livebirth by caesarean section. This report marks an important development that will give women with congenital or surgical absence of the uterus an opportunity to give birth to a child. However, it also brings to light important clinical and ethical considerations that need to be addressed. With the development of any innovative medical procedure, it is crucial to prepare for issues that might arise during clinical application. The need for careful analysis is especially salient in the context of uterus transplantation, in which key issues related to medical research and innovation intersect with issues related to reproduction and women's health.[2]

Since uterus donation is an elective procedure, all donors must understand the risks and benefits of the decision to undergo removal of the uterus. For this to occur, an effective informed consent process must be in place. Previous reports have documented the potential and observed risks for the donor, such as risks of bleeding, infection, and organ injury. In the case of uterine transplant, the risk of ureteral complications and subsequent fistula development is also present.[3] Additionally, as reported by Brännström and colleagues, uterine procurement takes slightly longer than 10 h to be completed. Thus, a longer period of time is required for uterine procurement than for many other organ transplant procedures. This aspect of the procedure raises specific concerns about the risks to the donor from prolonged operative and anaesthetic times. Moreover, the accompanying report[1] also raises a new set of considerations for the donor. Ideally, the donor would be a woman who has completed childbearing—indeed, in the case reported here, the donor was a menopausal woman. Because of the uterine changes that occur with menopause, the decision was made for her to use combined oral contraceptives for 90 days beforehand to optimise the uterine vasculature. Although the intention was to increase the chances of success for the recipient, this approach places the donor at increased risk of thromboembolic events before and immediately following surgery.

Recipients must also be made aware of the practical considerations of the procedure. As stated in the report,[1] two of the nine women who underwent uterine transplant subsequently required removal of the transplanted organ because of arterial thrombosis and intrauterine infection. This report also sheds light on another important set of issues directly related to the goals of the transplant procedure. Data indicate that inherent challenges might exist in conducting ovarian stimulation in intended recipients with Rokitansky syndrome[4]—a patient population known to present specific challenges to in-vitro fertilisation procedures. The number of oocytes and cleaving embryos are lower



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