Reflections on the assessment of the knowledge and clinical competence of medical graduates in training

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Introduction

The philosophy of medical education and assessment has changed radically in recent years. There have been a number of drivers to this including:

- The continuing explosion of medical knowledge and the development of sub-specialization. It is no longer reasonable (if it ever was!) to expect candidates to know everything about everything. It is necessary to consider carefully what is relevant for the candidate at that particular point in their training.
- The development of much more structured training programs and recognition that any apprenticeship or service role of trainees must be accompanied by formal training which has well defined goals. It is not acceptable to expect candidates to learn purely by experience or osmosis. These are important but must be backed up by explicit statements regarding the knowledge, skill and attitudes required of the candidate.
- A recognition that previous types of assessment were good at assessing knowledge and, perhaps, skills but much less good in other crucial areas such as understanding, ability to apply knowledge in the clinical situation and professional attitudes.
- Acceptance that assessment of competence is not a once and for all event. Formal examinations must continue to have an important role in confirming that trainees have reached a particular level of achievement which means that they are ready to move on to the next stage in their training. All of us, however, must become life long learners and ensure that our knowledge and competences remain up to date. Many medical licensing bodies now require all practitioners to undergo regular appraisal and/or revalidation. The format in different countries varies, but it is essential that all staff, even the most senior, are required to demonstrate their continuing knowledge and competence from time to time. Patients must know that their doctors are capable and safe and continuing competence cannot be assumed for any grade of doctor in any specialty. It is not acceptable to presume competence merely because the doctor has not been subject of any disciplinary or legal process.

Tomorrow's Doctors

Within the United Kingdom, the revolution in medical education was triggered by the publication by the General Medical Council in 1993 of the document *Tomorrow's Doctors*, with an updated version in 2002.[1] *Tomorrow's Doctors* gives guidance to medical schools on the knowledge, skills and attitudes which graduates must possess when they leave the medical course. Although the end points are spelled out, the GMC does not dictate how they are to be achieved. This has led to a variety of course structures and styles being developed in UK Medical Schools.

Similar changes are occurring in the postgraduate sphere. There are much clearer statements of what trainees must know and must be able to do at specific stages in their professional development, developed by national bodies or by international ones such as the European Boards.

Knowledge and clinical skills are crucial – without these being well-developed good clinical practice is impossible. However, on their own they are not enough. Doctors who run into problems or who cause harm to their patients rarely do so only because they don't know enough. Almost always a major factor is some inappropriate behavior or attitude. This may be, for example, inability or unwillingness to

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communicate properly with colleagues or patients, failure to recognize the limits of competence or failure to deal with the impact of personal illness on professional performance.

Activities in many of these areas are still work in progress and there is still much debate about the best forms of assessment.

Guiding principles of assessment

The principles behind assessment are multiple and sometimes in tension with one another. Much training and assessment is becoming competency based – that is it defines what the candidates must demonstrate they can do. Competence is made up of many components, each of which can be tested individually. It is much more difficult to integrate these components to a whole. One way forward is to add assessment of performance in the work place to assessment of competences. Many appraisal systems use at least an element of this kind of assessment.

In evaluating the performance of assessment methods additional important concepts are:

- **VALIDITY** – Does the assessment method assess what we want to assess?
- **RELIABILITY** – Does the assessment achieve an accurate and reproducible result? If a candidate passes or fails can we be sure that the results is a true reflection of their ability and that they haven't been 'lucky' or 'unlucky'? In general, the more items a candidate is assessed on, the greater the reliability though eventually a plateau is reached.
- **FEASIBILITY** – Can the assessment be set up in a way that is cost-effective and does not cause undue disruption, for example to clinical service delivery? Clearly, the demands of reliability and feasibility may be contradictory.
- **STANDARD SETTING** – How is the pass mark decided? In the past many examinations had a fixed and unchanging pass mark or there was a fixed percentage of candidates who would pass. These approaches made no allowance for variability in the difficulty of papers or in the abilities of cohorts of candidates. Increasingly, examinations are moving to 'norm referencing'! In this process, which can be carried out in various ways, a group of experts will define ahead of the examination, the minimum level of performance which is acceptable for a candidate to pass. In the case of some fundamental, core material this may mean a very high pass mark – perhaps even 100%.

MRCP(UK)

The postgraduate exam I am most familiar with is the MRCP(UK). This has undergone a number of changes in recent years to ensure it retains its role as a respected and internationally relevant examination for physicians undertaking general professional training. Detailed and up-to-date information is available from the website.[2]

It has three components which are outlined below.

PART I

This consists of two written papers, each of three hours. Each paper contains 100 multiple choice questions (MCQs). These are in the 'best of 5' format where the candidate must select the best answer from 5 possibilities. The questions test knowledge of a wide range of common and important disorders in General Medicine, and include aspects of Clinical Sciences. The distribution of questions across different specialties and the marking rules are detailed on the website.

PART 2 WRITTEN PAPER

This consists of two papers, each of two and a half hours. Each paper has 100 MCQs in a 'best of 5' or 'n from many' format. (In the 'n from many' questions the questions the candidate chooses 2 best answers from 10). All questions have a clinical scenario and may include results of investigations or be illustrated.

PRACTICAL ASSESSMENT OF CLINICAL EXAMINATION SKILLS (PACES)

The PACES exam has 5 clinical stations. Each is assessed by two independent examiners who use preset criteria and who have agreed, in advance of seeing the first candidate, the clinical findings or crucial points for that particular patient. Though one examiner will take the lead for each part of the examination, both examiners will be present for the whole assessment and both will mark the candidate.

The individual stations are:

1. Respiratory examination (10 minutes)
   Abdominal examination (10 minutes)
2. History taking (20 minutes)
3. Cardiovascular examination (10 minutes)
   Neurological examination (10 minutes)
4. Communication skills and ethics (20 minutes)
5. Skin, locomotor, eye and endocrine examination (20 minutes)

At stations 1, 3 and 5 the candidate receives a short written statement which instructs them what to do. These stations are designed to assess the candidate's ability to examine the patient, detect and interpret physical signs and discuss the case.

Station 2 assesses the candidate's ability to gather information from the patient, assimilate it, and then discuss the case. In the 5 minute interval before the station the candidate receives written instructions for the case, usually in the form of a letter from the patient's GP. Fourteen minutes are allowed for the history taking. After a limited period of reflection, the candidate discusses the case with the examiners for 5 minutes.

The format of Station 4 is similar to that of Station 2. This station assesses the candidate's ability to guide and organize the interview, to provide emotional support for the subject and to discuss the case.

Conclusions

This is a very exciting time of change in undergraduate and postgraduate training. The basis of what we teach, how students or trainees learn it and how we assess it are being scrutinized and researched in an unprecedented way. The greater clarity of definition of the knowledge, skills and attitudes required of practitioners is fairer to candidates and safer for patients. The challenge to assessment is to ensure that it measures, in a consistent and feasible way, the outcomes which have been set. The recent changes to the MRCP(UK) are a good example of how an examination can evolve to reflect changed needs.

Relevant websites

1. General Medical Council. *Tomorrow's Doctors*. London: GMC; 2003. Available from: URL: http://www.gmc-uk.org
2. Federation of the Royal Colleges of Physicians of the UK. *MRCP UK*. London: MRCP UK Central Office; 2004. Available from: URL: http://www.mrcpuk.org