

## *Assessment in undergraduate medical education*

This advice was originally produced to supplement our previous standards for undergraduate education contained in *Tomorrow's Doctors* (2009).

While the supplementary advice continues to provide information which medical schools and students will find helpful, readers should refer to our current standards and outcomes documents:

- [\*Promoting excellence: standards for medical education and training\*](#)
- [\*Outcomes for graduates\*](#) - the outcomes we set for medical students who undertake undergraduate medical education in the UK.

# Assessment in undergraduate medical education

Advice supplementary to *Tomorrow's Doctors* (2009)

## Contents

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	Page		Page
<b>Key points</b>	<b>02</b>	<b>Processes</b>	<b>18</b>
<b>Introduction</b>	<b>02</b>	Supporting examiners	18
Background to the GMC's production of supplementary advice	02	The timing of examinations	19
What does <i>Tomorrow's Doctors</i> (2009) say about assessment?	03	Reasonable adjustments	19
Purpose of the supplementary advice	04	Standard setting	20
Who is the advice for?	04	Marking and making decisions	21
<b>Overview</b>	<b>04</b>	Feedback	22
Ensuring a clear strategy	04	Cross-school arrangements	24
Assessing against outcomes	05	<b>Annexes</b>	<b>24</b>
Governance and management	08	Extracts on assessment from <i>Tomorrow's Doctors</i> (2009)	24
Seeking improvement	10	The 16 high-level outcomes from <i>Tomorrow's Doctors</i> (2009)	25
External examiners	11	<b>Related documents</b>	<b>25</b>
Information for students and staff	11	<b>Glossary</b>	<b>27</b>
<b>Methods</b>	<b>12</b>	<b>References</b>	<b>27</b>
Tools for knowledge testing	12		
Tools for skills testing	14		
Tools for performance testing	15		
Assessment of professionalism	17		

## Key points

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The GMC's requirements for assessment in undergraduate medical education are set out in *Tomorrow's Doctors* (2009) in Domain 5 at paragraphs 81, 85–90 and 111–21. There are also requirements in Domains 2 and 7.

This document sets out supplementary advice. It does not include any new regulatory requirements or standards.

The advice includes the following major components.

- a** Medical schools should take an overarching strategic and systematic approach to assessment that fits with the rest of the curriculum (paragraph 19).
- b** In developing and reviewing assessment methods, medical schools should consider validity, reliability/generalisability, feasibility, fairness, educational impact, cost-effectiveness, acceptability and defensibility (paragraph 32).
- c** Compensation can be appropriate but should not be used in ways that would allow students to graduate who are unable to demonstrate all the high-level outcomes and the practical procedures (paragraph 39).
- d** Absence, illness or other extenuating circumstance is not a reason for allowing students to graduate without demonstrating achievement of the outcomes (paragraph 40).
- e** A cross-departmental board should have overall and final responsibility for assessment and be transparent: that is, accountable through published processes and criteria (paragraph 45).
- f** Medical schools should provide clear, accessible and timely information to students and staff (paragraph 60).
- g** Medical schools legitimately choose various methods of standard setting, but all should fully implement a robust, transparent and consistent approach that satisfies the requirements in *Tomorrow's Doctors* (2009) (paragraph 111).

- h** Good feedback will be effective in improving learning and performance (paragraph 126).

For further advice, see the Annex on 'Related documents' and in particular:

- a** GMC, *Standards for curricula and assessment systems* (for specialty including GP training), revised 2010
- b** QAA, *Code of practice for the assurance of academic quality and standards in higher education*, updated in sections
- c** Tim Swanwick (ed), *Understanding Medical Education: Evidence, Theory and Practice*, Wiley-Blackwell, 2010.

## Introduction

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### Background to the GMC's production of supplementary advice

- 1** The GMC sets requirements for medical schools in *Tomorrow's Doctors*. The 2009 edition reflects lessons from the first full cycle of the GMC's process of Quality Assurance of Basic Medical Education (QABME) and responds to issues that emerged since the 2003 edition. It aims to ensure that new graduates will be fit to practise and prepared for training in the Foundation Programme and employment in the NHS and for their further education and training beyond that. The 2009 edition followed an extensive period of development, engagement and consultation and drew on research on the preparedness of graduates commissioned by the GMC.
- 2** Medical schools are required to comply with the standards and outcomes in *Tomorrow's Doctors* (2009) by academic year 2011/2012.
- 3** The GMC has supported medical schools in implementing the new requirements. This has involved a series of implementation workshops across the UK and asking schools to produce Enhanced Annual Returns (EARs) on their progress. The workshops brought together

representatives from the medical schools in a region as well as students, postgraduate training bodies and employers. They provided an opportunity for schools to discuss their progress in becoming compliant with *Tomorrow's Doctors* (2009) and to highlight any challenges they were facing.

- 4 It became clear that the schools felt that they needed extra advice from the GMC as to how certain requirements in *Tomorrow's Doctors* (2009) should be taken forward.
- 5 The GMC has therefore developed a series of advisory documents supplementary to *Tomorrow's Doctors* (2009) in the following areas:
  - assessment
  - clinical placements, particularly student assistantships
  - developing teachers and trainers
  - involving patients and the public.

The documents have been developed with drafting advice from experts in these fields. Their support is gratefully acknowledged.

- 6 The advice contains some examples of local arrangements, as described by the medical schools or institutions involved or as set out in previous publications. These are included as snapshots which may be of interest and use to other schools as they develop arrangements appropriate for their own needs and circumstances.
- 7 Schools are free to make use of this advice insofar as they find it helpful in light of local circumstances. It covers relevant issues and includes suggestions. The advice is expressed as steps that schools 'could' or 'should' take, but it does not indicate any new regulatory requirements or standards.

### What does *Tomorrow's Doctors* (2009) say about assessment?

- 8 The most relevant section of *Tomorrow's Doctors* (2009) is Domain 5 on 'Design and delivery of the curriculum, including assessment'.

- 9 The overall Standard for Domain 5 is at paragraph 81:

*81. The curriculum must be designed, delivered and assessed to ensure that graduates demonstrate all the 'outcomes for graduates' specified in Tomorrow's Doctors.*

- 10 The criteria relating to assessment are reproduced as an Annex to this advice and cover:
  - a feedback to students (paragraph 85)
  - b ensuring that only students who meet the outcomes are permitted to graduate and that assessments are fit for purpose (paragraph 86)
  - c guidance to students (paragraph 87)
  - d examiners and assessors (paragraph 88)
  - e standard setting systems (paragraph 89)
  - f disability (paragraph 90).
- 11 *Tomorrow's Doctors* (2009) also sets out 'Detailed requirements and context' at paragraphs 111 to 121. These cover:
  - a feedback to students (paragraph 111)
  - b ensuring that all students achieve all the outcomes (paragraph 112)
  - c using a range of assessment techniques that are valid, reliable and appropriate to the curriculum (paragraph 113)
  - d information for students (paragraph 114)
  - e training and guidelines for examiners (paragraph 115)
  - f mechanisms to ensure comparability of standards and to share good practice including external examiners (paragraph 116)
  - g standard setting (paragraph 117)
  - h disability (paragraph 118)
  - i the *Code of Practice* published by the Quality Assurance Agency (QAA) (paragraph 119).
- 12 Assessment also features in Domain 2 on 'Quality assurance, review and evaluation' and Domain 7 on 'Management of teaching, learning and assessment'.

## Purpose of the supplementary advice

- 13 This advice is intended to help medical schools meet the mandatory standards in *Tomorrow's Doctors* (2009) and does not include new requirements or impose uniformity in approaches to assessment.
- 14 The advice reflects the importance of the continuum of medical education covering undergraduate medical education, the Foundation Programme and specialty including GP training. Following the merger of PMETB with the GMC in April 2010, the advice has been heavily influenced by documents originally developed by PMETB.
- 15 This advice should contribute to confidence of the public, and of doctors' employers, in the assessment of medical students. In the past, medical schools may have made decisions based on traditional methods without adequate guidance from experts. There is interest in the extent of variability between medical schools, in the competence of their graduates and in whether all UK medical students are prepared for practice and entry to the Foundation Programme. From this perspective, there have been some calls for the introduction of a national licensing examination.
- 16 To address these concerns, the 2009 version of *Tomorrow's Doctors* is more detailed and prescriptive than previous editions in relation to assessment and the outcomes required of new graduates. In addition, the Medical Schools Council has taken initiatives to enhance the effectiveness and consistency of assessment (see the section on Cross-school arrangements). This advice is a further step towards that goal.
- 17 The reports of the QABME reviews from 2003 to 2009, which are published on the GMC website, demonstrate the interest taken by GMC visitors in the assessment arrangements at medical schools. The issues are addressed in this guidance. We recognise the significant progress made by medical schools since the QABME reviews took place.

## Who is the advice for?

- 18 The advice reflects the views of experts and practitioners in the field. Many schools will have little to learn from the advice. But we anticipate that it will assist some schools as they seek to improve their assessment systems and that it will be of particular use to individuals who are relatively new to this field. This includes:
  - a those developing and designing assessment strategies and tools
  - b members of assessment boards or committees
  - c members of teaching and learning committees
  - d academic and clinical professionals involved in assessing students
  - e external examiners
  - f medical students.

## Overview

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### Ensuring a clear strategy

- 19 Medical schools should take an overarching strategic and systematic approach to assessment that fits with the rest of the curriculum, delivers assessment methods that are valid, reliable and otherwise appropriate and is led by assessment experts with psychometric support and the necessary authority within the governance systems. There are risks in devolving decisions to particular leads in specialties or years who are not tied into a coordinated and strategic approach. An unstructured and devolved approach may compromise the school's ability to monitor students' progression and to ensure that outcomes are appropriately assessed. It may lead to disproportionate emphasis on particular specialties or perspectives.
- 20 In the GMC's 2010 report on *The state of basic medical education*,<sup>1</sup> Dr Katharine Boursicot writes:

*Medical schools have had to scrutinise their own assessment strategies and have endeavoured to move away from disjointed, localised,*

*inconsistent, outmoded and often unmonitored (ie not quality assured) assessments in various parts of their courses, and take an overview of assessment over the whole curriculum. This movement has been variably successful and requires more work to ensure that students are fairly and adequately assessed over their whole undergraduate course. The development and implementation of a coherent and consistent assessment strategy in each institution is still a major challenge.*

21 The GMC report also states:

*Reports from QABME reviews highlighted the coordination and central leadership of assessment across a programme as an area for improvement. Many schools separate the management of assessment into years or phases, but without strong oversight and coordination, which can lead to inconsistencies. During QABME reviews, many teams agreed on the benefit to assessment systems of a central, coordinating leadership group, or assessment-focused unit, with a strong remit to work on assessment across modules and years in order to build a consistent approach to assessment throughout the course.*

22 The strategy should cover formative as well as summative assessment. The latter is the formalised assessment on which decisions about progression are made. Formative assessment is informal, frequent, dynamic and non-judgemental. It is primarily for the benefit of the student's learning, not the institution's need to track progress. It should be built into the design of all teaching modules. Schools should make a sustained attempt to discourage students from treating formative assessments as tests to pass rather than opportunities for learning. Students should become accustomed to seeking maximum benefit from feedback, self-assessment, reflection and the development of lifelong learning skills.<sup>2</sup> This will enable students to fulfil their responsibilities as set out in paragraph 6 of *Tomorrow's Doctors* (2009) and paragraph 19 of *Medical students: professional values and fitness to practise*; and to achieve the outcomes set out in paragraph 21 of *Tomorrow's Doctors* (2009). It will also prepare them for training and workplace based assessment

(WPBA) in the Foundation Programme and beyond.

23 The overall assessment strategy should be documented in a clear and accessible manner with accountabilities clearly allocated. The strategy should also demonstrate how the school's approach is based on a sound understanding of the evidence base, academic literature and good practice in assessment. Schools could consider circulating the strategy to stakeholders to reassure them about the robustness of the examination processes.

#### **St George's medical school – an assessment strategy**

“ St George's, University of London developed and implemented a comprehensive assessment strategy in tandem with the development of a new curriculum. This was achieved by central planning, involving teachers, administrators and student representatives and adhering to an overall structured plan for all assessments across all years of the course. Modern assessment pedagogy was applied, with blueprinting, item writing, standard setting and feedback.”

### **Assessing against outcomes**

24 *Tomorrow's Doctors* (2009) requires that: 'All the "outcomes for graduates" will be assessed at appropriate points during the curriculum, ensuring that only students who meet these outcomes are permitted to graduate. Assessments will be fit for purpose – that is: valid, reliable, generalisable, feasible and fair' (paragraph 86).

25 In the 2009/10 Enhanced Annual Return, two-thirds of medical schools said they were already compliant with that requirement.

26 *Tomorrow's Doctors* (2009) goes on to say:

*112. Medical schools must ensure that all graduates have achieved all the outcomes set out in Tomorrow's Doctors, that is:*

- *each of the five outcomes under 'The doctor as a scholar and a scientist'*

- each of the seven outcomes under 'The doctor as a practitioner'
- each of the four outcomes under 'The doctor as a professional'
- every practical procedure listed in Appendix 1.

*This must involve summative assessments during the course that cumulatively demonstrate achievement of each outcome. The medical school must have schemes of assessment that map the outcomes to each assessment event and type, across an appropriate range of disciplines and specialties ('blueprinting'). Students' knowledge, skills and professional behaviour must be assessed. There must be a description of how individual assessments and examinations contribute to the overall assessment of curricular outcomes, which must be communicated to staff and students.*

- 27** For the avoidance of doubt, it is the contribution of individual assessments and examinations to the overall assessment that must be communicated – not just a description of the overall assessment.
- 28** A blueprint can be defined as a template used to define the content of a given test. In medical education, it is often designed as a matrix or a series of matrices.
- 29** Based on this definition, we can advise as follows.
- a** Blueprinting of assessments against the curriculum and the outcomes of *Tomorrow's Doctors* (2009) enables a systematic approach to assessment and provides a basis for sampling. The outcomes in *Tomorrow's Doctors* (2009) provide a structure against which everything else can be planned and evaluated. Some outcomes cover more ground than others and so will require more extensive testing.
  - b** When blueprinting, medical schools should choose an appropriate assessment format for each outcome. For example, multiple choice questions (MCQs) may be appropriate for testing knowledge and

objective structured clinical examinations (OSCEs) for testing skills. Schools should also consider the potential role of WPBA and approaches to the assessment of professionalism. Overlap of the formats used for particular outcomes is both inevitable and desirable, providing confirmation of performance through triangulation.

- c** Medical schools should be able to show that every assessment has been designed to test a particular aspect, or aspects, of the curriculum or an appropriate outcome, or outcomes, in *Tomorrow's Doctors* (2009).
- 30** The Medical Schools Council surveyed assessment practice in May 2010 and found that 11 schools (one in three) blueprinted their final examinations against *Tomorrow's Doctors* (2009) either on its own or in combination with internal documents.
- 31** *Tomorrow's Doctors* (2009) states: '...Assessments will be fit for purpose – that is: valid, reliable, generalisable, feasible and fair' (paragraph 86). Other criteria include: educational impact (the effect of assessments, positive and otherwise, on students' learning and development), cost-effectiveness, acceptability (the attitudes of students and others to the assessments) and defensibility. In practice, each method has its own strengths and weaknesses, calling for a complementary and balanced approach to choosing assessment methods bearing in mind the various criteria.
- 32** Medical schools should be able to demonstrate how their assessment arrangements meet relevant criteria including the requirements of *Tomorrow's Doctors* (2009) and how they can be improved in this light.

For example:

Criteria	Examples of evidence
Validity <i>Doctors</i>	<ul style="list-style-type: none"> <li>• Blueprinting against <i>Tomorrow's Doctors</i> (2009) outcomes</li> <li>• Assessment tools drawing on clinical contexts</li> <li>• High correlations between tests intended to measure the same characteristic</li> <li>• The performance of graduates</li> </ul>
Reliability /	<ul style="list-style-type: none"> <li>• Psychometric evidence relating to the generalisability use of particular items, examiners or sites</li> <li>• Use of methods that are relatively reliable per hour of testing time (for example, MCQs rather than open-ended questions or essays)</li> </ul>
Feasibility	<ul style="list-style-type: none"> <li>• Reality checks, for example through feedback from assessment organisers, examiners and candidates</li> <li>• Logging of practical problems that arise</li> <li>• The affordability and proportionality of the overall assessment process</li> </ul>

Criteria	Examples of evidence
Fairness and/or	<ul style="list-style-type: none"> <li>• Monitoring of student outcomes assessors in respect of equality and diversity</li> <li>• Action being considered and taken as appropriate including reasonable adjustments for disability or changes to items in regard to cultural sensitivity</li> <li>• Annual reports on assessment with monitoring data and summaries of action considered and taken.</li> </ul>
Educational	<ul style="list-style-type: none"> <li>• An educational strategy that covers the impact effects of assessment for example on students' learning priorities and incorporates reviews of assessments in this light</li> <li>• A structured approach to formative assessment and feedback</li> <li>• Instilling in students a commitment to lifelong learning and reflection</li> </ul>

Cost-effectiveness

- Appropriate use of more expensive assessment tools such as OSCEs
- Collaboration with other medical schools where appropriate

Acceptability

- Feedback from students, for example through the National Student Survey
- Feedback from examiners
- Where appropriate, feedback from patients or simulated patients (actors)

Defensibility challenges

- Consideration of the risk of from students internally through university processes or externally, particularly through the Office of the Independent Adjudicator

**33** Further examples of evidence are set out by Steven Downing, along with a discussion of their relevance to written assessments and performance examinations.<sup>3</sup> However, he takes a different approach to categorising criteria for considering assessments, drawing on the American Standards for Educational and Psychological Testing.<sup>4</sup>

**34** Paragraph 86 of *Tomorrow's Doctors* (2009) states that all the outcomes will be assessed and this is reinforced at paragraphs 112 and 117. As paragraph 112 states, students must achieve all of the 16 high level outcomes. Each high level outcome has a paragraph number in *Tomorrow's Doctors* (2009) from paragraphs 8 to 23, for example paragraph 12: 'Apply scientific method and approaches to medical research'. This creates room for sampling among the 106 lower level outcomes (which each has a sub-paragraph letter; for example paragraph 12 has lower level outcomes (a) to (d) including 12(d): 'Understand the ethical and governance issues involved in medical research'). In addition, graduates must be competent in all the 32 practical procedures listed at Appendix 1 of *Tomorrow's Doctors* (2009).

**35** The lower-level outcomes cover a wide variety of knowledge, skills and behaviour at different



levels of generality. They will therefore require a range of assessment methods so that it will sometimes be impossible to take a solely arithmetic approach to determine whether candidates have achieved specific higher-level outcomes. The school should have a transparent assessment mechanism to demonstrate how these decisions are made.

- 36** *Tomorrow's Doctors* (2009) does not mandate or specify particular assessment methods, for example the use of simulation or involvement of real patients. It is for schools to determine the assessment method or methods that are most suited for particular outcomes or procedures. Nor does *Tomorrow's Doctors* (2009) mandate separate examinations for each outcome, which would destroy the integrated nature of many systems. Rather, schools should be able to demonstrate that all the outcomes are incorporated into blueprints and that the marking schemes and standard setting arrangements are such that students seriously inadequate in any one outcome are not able to graduate.
- 37** Summative assessments throughout the course can cumulatively demonstrate outcomes: they do not all have to be demonstrated in Finals or in the final year of the course. While it may not be appropriate or possible to add results together arithmetically for a particular outcome, the consideration of performance in various assessments throughout the course may make it easier to reach sound decisions about individuals' fitness to practise and preparedness. However, university regulations may make this impossible where a student has been deemed fit to progress from one year to the next.
- 38** For some outcomes it may be possible to complete summative assessments early in the course. In that case schools should be able to demonstrate good grounds for confidence that the students' knowledge, skill or behaviour in that respect has been maintained or enhanced throughout the rest of the course.
- 39** Paragraph 117 of *Tomorrow's Doctors* (2009) goes on to state: '...There must be no compensatory mechanism which would

allow students to graduate without having demonstrated competence in all the outcomes'. Again, this refers to the 16 high level outcomes and the 32 practical procedures. Compensation can be appropriate but should not be used in ways that would allow students to graduate who are unable to demonstrate all the high-level outcomes and the practical procedures. Ideally, students would be assessed against a high-level outcome or a procedure on a number of occasions allowing a judgement to be made on this triangulated basis, rather than relying solely on an isolated and perhaps untypical performance in, say, a Finals OSCE. It is also acceptable to the GMC for students to graduate without being able to demonstrate achievement of all the lower-level outcomes set out in *Tomorrow's Doctors* (2009). Individual medical schools may properly require students to demonstrate particular lower-level outcomes in accordance with their own curricular priorities.

- 40** Absence, illness or other extenuating circumstance is not a reason for allowing students to graduate without demonstrating achievement of the outcomes.
- 41** While all students seeking graduation must demonstrate achievement of the outcomes, reasonable adjustments should be made to assessment arrangements to enable disabled students to do so.

## Governance and management

- 42** Domain 7 of *Tomorrow's Doctors* (2009) covers 'Management of teaching, learning and assessment'. This twice refers explicitly to assessment:

*151. A management plan at medical school level will show who is responsible for curriculum planning, teaching, learning and assessment at each stage of the undergraduate programme, and how they manage these processes...*

*155. Medical schools should have supervisory structures that involve individuals with an appropriate range of expertise and knowledge.*

*Lines of authority and responsibility must be set out. This will allow medical schools to plan curricula and associated assessments, put them into practice and review them. Having people with educational expertise in a medical education unit can help this process.*

- 43** The 2009/10 Enhanced Annual Return to the GMC found that schools vary in whether or not there is an active overall management committee or group to direct and manage assessment across the whole course.
- 44** Clear lines of authority and allocation of responsibilities, drawing on appropriate expertise and exercised in a transparent and consistent manner, are important for the determination and implementation of the assessment strategy, control of assessment data and critical decisions about the progression and graduation of individuals. Standard operating procedures can determine aspects of assessments that need to be checked and by whom. The relationship with the university assessment processes should be clear and explicit. Medical schools should work with the universities with the aim of ensuring that sound decisions relating to clinical competence do not conflict with university regulations.
- 45** Arrangements could include:
- a** a cross-departmental board with overall and final responsibility for assessment which is transparent: that is, accountable through published processes and criteria. The board should coordinate the assessments within and between years to ensure that assessments have a logical sequence and are set at an appropriate level
  - b** a senior member of faculty with overall responsibility for assessment matters
  - c** a dedicated administration system for assessment
  - d** a single postholder with responsibility for all assessment data and data management protocols to collate data sets for all students, covering all stages of processing and incorporating robust verification systems, security and data protection
  - e** psychometric staff and assessment experts to contribute to the identification and development of assessment methods, report after every assessment and produce overarching reports periodically
  - f** an annual report on assessment for formal consideration by the relevant committees, demonstrating how the school ensures that students achieve the outcomes in *Tomorrow's Doctors* (2009)
  - g** procedures for development and control of any bank of assessment items
  - h** arrangements for the involvement of students and staff in the development and implementation of assessment, with appropriate minority ethnic representation on any groups that are established for this purpose.
- 46** The QAA *Code of Practice*<sup>5</sup> includes as Precept 4: 'Institutions publicise and implement effective, clear and consistent policies for the membership, procedures, powers and accountability of assessment panels and boards of examiners'. The QAA advise that where there is more than one board or panel, their relative responsibilities should be clear. There should be ample opportunities for members to declare personal interests and involvement or relationships with students being assessed. Institutions may wish to give guidance on student anonymity. There should be clear records of decisions and it is good practice to keep minutes that track details of decision-making.
- 47** Precept 13 states: 'Institutions review and amend assessment regulations periodically, as appropriate, to assure themselves that the regulations remain fit for purpose.' Regulations or guidelines may need to be amended to reflect the developing curriculum and 'changing professional practice'. As QAA advise: 'The involvement of as wide a range of people as possible in reviewing assessment regulations may help to assure their appropriateness, especially when major changes are likely.'

### Brighton and Sussex medical school – School Secretary involvement

“ The BSMS Deputy School Secretary sits on the Y5 Phase Examination Board to provide help and guidance for the Board members on application of School and University Regulations pertaining to student performance in assessments and ability to progress and obtain the medical degree. Her help has been very valuable when dealing with complex cases often including mitigating circumstances that have affected student performance. The Deputy School Secretary or a colleague now sits on all Phase Boards to provide similar advice when needed. ”

### Seeking improvement

48 Domain 2 of *Tomorrow's Doctors* (2009) covers 'Quality assurance, review and evaluation'. It mentions assessment at various points:

40. *Management systems will be in place to plan and monitor undergraduate medical education (including admissions, courses, placements, student supervision and support, assessment and resources) to ensure that it meets required standards of quality.*

43. *Quality data will include:*

(a) *evaluations by students and data from medical school teachers and other education providers about placements, resources and assessment outcomes...*

49. *Quality management must cover all aspects of undergraduate medical education, not just teaching. This covers planning, monitoring and the identification and resolution of problems, and includes...*

- *appraisal of, and feedback to, students*
- *pastoral and academic support for students*
- *assessment of students...*

51. *There must be procedures in place to check the quality of teaching, learning and assessment, including that in clinical/vocational placements, and to ensure that standards are being maintained...*

54. *Given the importance of assessment, including placement-based assessments, there must be specific quality-control standards and systems in place to ensure the assessments are 'fit for purpose'.*

49 Peer support and review are important in designing assessments including the necessarily iterative process of writing questions. Question writers could consult the USA National Board of Medical Examiners guidance on *Constructing Written Test Questions*.<sup>6</sup> Mechanisms should ensure that questions are appropriately edited, reviewed and approved. It can then be possible to develop a searchable bank of assessment items structured in line with the curriculum outcomes and the outcomes in *Tomorrow's Doctors* (2009).

50 The 2009/10 Enhanced Annual Return to the GMC found that not all schools carry out statistical analysis on examinations. Routine review of all assessments, especially just after they have been used, is very valuable. Assessment instruments can be improved by regular review of how assessment items perform, refining them as appropriate and eliminating poorly performing items. Software packages can help, alongside review of data by a psychometrician. However, the review should not be restricted to quantitative analysis of reliability and should also cover criteria such as validity and educational impact. Those involved in the development of tests should also contribute to their review.

51 Where sufficient numbers of students are involved in a particular examination, opportunities should be taken to monitor the performance of students categorised by race, gender, social background and/or other aspects of diversity.

### Peninsula medical school – evaluation

“ Assessment processes are monitored and evaluated first by the relevant assessment theme steering group using, inter alia, statistical information provided

by the psychometrics team. These steering groups feed into the Medical Programmes Management Committee. Assessment Panels and Progress and Award Board which include external examiners also provide feedback. The College produces an Annual Report on Assessment. ”

## External examiners

- 52** Paragraph 116 of *Tomorrow's Doctors* (2009) states: 'Medical schools must have mechanisms to ensure comparability of standards with other institutions and to share good practice. The mechanisms must cover the appointment of external examiners. The duties and powers of external examiners must be clearly set out.'
- 53** External examiners are a well-established arrangement in the UK across the university sector. The QAA has published two editions of a section of its *Code of Practice* on external examining and has more recently been developing minimum expectations for their role. In addition, Universities UK has led a review of external examiners. Richard Hays and Lindsay Bashford have itemised the scope of assessment practices that may be viewed by external examiners and the characteristics of good external examiners.<sup>7</sup> Medical schools will wish to develop their own arrangements informed by these initiatives.
- 54** External examiners should contribute to the review and development of assessment strategies, providing advice from an overarching perspective. Their role should be strategic and at the level of reviewing processes and systems, rather than the examination of individual students.
- 55** Medical schools should be able to demonstrate that comments from expert examiners are reviewed and that recommendations are considered and acted upon (or not, with justifications, as the school thinks appropriate).
- 56** Medical schools should have a demonstrable process for appointing external examiners which applies across the school, rather than separate arrangements for individual departments. Role specifications should be used in appointments. They should include requirements in relation to expertise and experience in the design and delivery of assessment. Medical schools should also have explicit processes for briefing external examiners and, where appropriate, for training and personal development.
- 57** Medical schools should not rely solely on external examiners to provide externality and moderation of their assessment programmes. Input from students, patients and the public, Foundation Schools, postgraduate deaneries, medical Royal Colleges and employers could all assist, as could liaison with assessment experts for example through the Medical Schools Council, the Association for the Study of Medical Education, the Academy of Medical Educators, the Higher Education Academy and international bodies. To avoid any perception of conflict or collusion, the GMC's Visitors do not provide advice but its quality assurance reviews assist in identifying where progress can be made.

## Information for students and staff

- 58** Paragraph 87 of *Tomorrow's Doctors* (2009) states:

*Students will receive timely and accurate guidance about assessments, including assessment format, length and range of content, marking schedule and contribution to overall grade.*

- 59** In their 2009/10 Enhanced Annual Return to the GMC, almost all schools were confident that they were fully compliant with that requirement.
- 60** More specifically, clear, accessible and timely information to students and staff could cover:
- a** the assessment programme

- b** assessment format, length, the range of content and the contribution of an individual assessment to the overall programme
- c** the marking process, including the marking schedule and methodology, the moderation and verification of marks and who is involved in marking (including the role of external examiners)
- d** the scope for reasonable adjustments for students with disabilities and how to apply for these to be made
- e** the assessment environment
- f** extenuating circumstances
- g** protocols for considering borderline cases
- h** how conclusions are reached about the progression or graduation of students
- i** handling transcripts
- j** when results are made available and the circumstances in which they may be provisional
- k** feedback to students
- l** appeals and the role of the Office of the Independent Adjudicator
- m** arrangements for students to raise concerns and questions and how these are considered and acted upon when appropriate
- n** student involvement in the evaluation of assessment
- o** the roles, responsibilities and lines of accountability of staff involved in assessment
- p** pastoral care and support as they relate to assessment
- q** retakes and resubmissions of work for assessment
- r** students' responsibilities, the steps taken to deter cheating and the consequences if detected.

- 61** As paragraph 114 of *Tomorrow's Doctors* (2009) states: 'Students must have guidance about what is expected of them in any examination or assessment. No question format will be used in a summative assessment that has not previously been used in a formative assessment of the student concerned.' Students should understand the assessment criteria and marking schemes for all tests they face, and know who will be assessing their work in the case of WPBA.
- 62** Oral briefings prior to examinations should be considered alongside publication of information electronically and in hard copies.
- 63** Students should be involved in the development of assessment arrangements and the information made available. Where there is a high proportion of minority ethnic students, they should be appropriately represented in any groups set up to secure student involvement in the development of assessment.

## Methods

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- 64** Assessment methods should be chosen and developed by drawing on expertise, published studies and good practice.

## Tools for knowledge testing

- 65** Medical schools should be wary of using true/false question formats and QABME visiting teams have welcomed progress at medical schools in this respect. Dichotomous choices are rare in medical practice and it is difficult to frame questions for these formats which are both unambiguous and sufficiently challenging to discriminate between candidates. The use of true/false question formats can result in assessing trivial knowledge and encourage guessing among candidates.<sup>8</sup>
- 66** Oral assessments or vivas should not be used summatively given the evidence of their unreliability.<sup>9</sup> Vivas have sometimes been used in the consideration of borderline cases but they cannot give confidence that passing candidates are fit to practise or that failing candidates have

been considered fairly. Similarly, essays should also generally be avoided given their unreliability and content specificity although they may be used to test ability to sustain a clear written argument. The reliability of both oral assessments and essays can be improved by clear marking schemes, creating sufficient time and involving more assessors.

- 67** Student selected components (SSCs) can pose particular challenges given the range of subjects that may be covered. Clear marking criteria could be established covering aspects such as presentation, analysis of findings, formulation of hypotheses and the outcome of tested hypotheses. Where the report of an SSC is marked initially by an individual who has overseen or been involved in the student's work, another assessor can be involved to ensure the marking is appropriate. However, limiting the number of examiners involved can help to secure consistency in marking. Panels of SSC examiners could meet to be briefed together, to consider reports on how SSCs are being marked and to discuss emerging issues. It might be helpful to investigate the relationship between SSC scores and progression more generally.

#### **Edinburgh medical school – online Safety in Practice and Prescribing Examination (SIPP)**

“ The Safety in Practice Examination was introduced to the Edinburgh curriculum in 2003 as a key element in year five of the new MBChB programme. It transferred to an online format, using a delivery system developed in-house in the Edinburgh Medical School, in 2006. In 2007 it was modified to incorporate more questions specifically related to safe prescribing. From the beginning, the essential concept of the examination has been to cover a range of common clinical scenarios which graduates would meet as a Foundation Doctor. A range of possible actions are given for each scenario; students are required to grade them as essential, neutral or harmful. The most recent examination included over 100 such questions. The on-line format allows the use of radiological images, laboratory reports,

prescription charts and other resources. The pass standard is set with a cut-score which takes account of the requirements of safe patient care – normally around 80%. Every student must pass the examination in order to graduate. The average failure rate at first sitting is 2%. Students who fail can resit after appropriate feedback and remedial study. Our evaluations suggest that this examination drives appropriate learning, and reassures graduates and their employers that they can deliver safe patient care. ”

#### **Cambridge medical school – online assessment of prescribing**

“ Assessment of practical prescribing comprises an online learning package of six modules:

- a. Introduction
- b. Prescribing in special circumstances,
- c. Safe and legal prescribing
- d. Calculation skills
- e. Identifying and reporting adverse drug reactions
- f. Drug interactions.

Students are also required to complete four student drug charts for patients encountered within their clinical experience to the standard described in the Cambridge University Hospitals NHS Foundation Trust guidelines on good prescribing. These are marked and returned with feedback.

The prescribing skills examination takes one hour and consists of thirty five multiple choice (best of five) questions in total which must be completed successfully for entry into Final MB. Students are allowed the use of a BNF [British National Formulary] and a calculator but regulations forbid the use of any other reference text or web-based reference. The assessment can be delivered on paper or online.

”

## Tools for skills testing

- 68** 'Long case' assessments using just one case can be criticised on grounds of poor generalisability, reliability and validity, as well as the time required.<sup>10</sup>
- 69** Assessment systems involving a series of patients such as the Objective Structured Long Examination Record (OSLER) generally have good validity but it can be difficult to ensure sufficient cases to provide reliability.
- 70** Shortcomings in Objective Structured Clinical Examinations (OSCEs) have been reported by QABME visitors. Key to increasing the reliability or generalisability of OSCEs is providing a sufficient number of separate cases or stations. The 2010 GMC report on *The state of basic medical education* records that QABME teams 'often discussed issues around ensuring consistency and comparability between examinations run on different sites or days, and with different examiners. Real and simulated patients are often used in clinical examinations, which adds another variable that needs to be carefully monitored to ensure that there is not unacceptable variation which could impact on student performance and results.'<sup>11</sup>
- 71** Examiners, other staff, patients and simulated patients should be briefed and monitored to maximise consistency and appropriate behaviour. There should be a lead person or persons responsible for arranging this briefing and monitoring. Consent should be obtained from patients in line with GMC guidance.
- 72** The dignity of patients should be respected at all times, for example through the use of curtains and screens, and their feedback about the conduct of the examination session should be collected and acted upon. Regular changeover of patients can prevent fatigue but reduces reliability. Confidentiality and anonymisation should be secured where possible, for example in examination data and in feedback from the patients on their experience. All this would be in line with *Good Medical Practice* which states that doctors must 'treat patients with dignity' and 'respect patients' privacy and right to confidentiality' (paragraph 21).
- 73** Environments should be conducive to good performance. Schools should avoid facilities which are cramped or subject to noise contamination.
- 74** It is important to capture aspects of students' fitness to practise which emerge in clinical examinations but are not reflected in the marks recorded. There should be clear arrangements for examiners and patients, real or simulated, to note concerns, and procedures for considering and acting on those concerns. These arrangements and procedures should be transparent to the student. However, it should be remembered that incidents occurring in the highly charged atmosphere of a summative examination may not reflect usual practice.
- 75** While it is important not to stereotype, some groups of minority ethnic students/trainees, and also male students/trainees, appear in general to perform less strongly than other groups in relation to interactional skills and self-presentation. There may be subtle culturally-specific communicative norms followed in some examinations which do not reflect the ethnically and linguistically diverse population of the UK. This is worth bearing in mind when considering how students may differ in their need for preparation for summative assessments and therefore the extent of the formative assessments provided for them.
- 76** Also, schools should seriously consider including OSCE stations where cultural or linguistic differences are a major focus. This would enable assessment of students' cultural/linguistic awareness which is increasingly important as the population becomes more diverse in these respects.<sup>12, 13</sup>
- 77** OSCEs are a good tool to ensure that students are assessed in relation to their engagement with patients, covering communication, empathy and sensitivity.

- 78** The supplementary advice from the GMC on involving patients and the public discusses their role in skills testing (and is due for publication in spring 2011).
- 79** The ASME guidance on *Structured assessments of clinical competence* provides helpful practical advice covering:
- a** blueprinting
  - b** station development and piloting
  - c** examiner training
  - d** simulated patient training
  - e** organisation.<sup>14</sup>

#### King's medical school – OSCEs

“ The Phase Five OSCE is an integrated clinical examination of 18 typical tasks faced by a FY1 doctor (a mix of practical skills, history taking, communication management and examination tasks), each marked on its components and globally. It continues to evolve in response to today's circumstances, increasingly focusing on process skills and patient safety.

The extension OSCE, introduced in 2008, is for those candidates who fail the main OSCE or whose marks are borderline, allowing additional scrutiny of the candidates' ability, and an opportunity for them to recover from an isolated bad performance. The marks of the two OSCEs are added together to increase reliability. ”

#### Cardiff medical school – OSCE briefings

“ Simulated patients (actors) are used to assess communication skills in year three, four and five OSCEs. A briefing paper and training sessions from clinicians are provided for the actors prior to the OSCE. This clarifies the clinical role for the actors and helps to standardise the student assessment. ”

#### St George's medical school – simulated patients

“ Simulated patients receive a general briefing on the level of the students and the

structure of the day. They then role-play their own station to standardise their performance including their response to the first question. The first question is typically open-ended and the response needs to be standardised in the amount and quality of the information given. The response needs to sound natural but not contain information that needs to be specifically elicited as part of the task. The simulated patients also try to standardise their 'emotional state' so that different candidates are not confronted by different emotional responses to the same questions (eg one bursting into tears, one becoming aggressive etc). Also, the simulated patients meet their examiners to discuss questions about the stations and discuss any ambiguities, to achieve maximum consistency of performance across circuits. At the end of the examination, simulated patients are given an opportunity to feed back on examiner behaviour. New or complex stations are piloted and rehearsed in advance of the OSCE. ”

#### Tools for performance testing

- 80** There are limits to the effectiveness of current arrangements for considering the performance of students and trainees in clinical settings. However, medical schools and providers of postgraduate training are investing considerable effort in addressing the issues.
- 81** Schools should be exploring methods of WPBA and could prepare their students by using the methods established in the Foundation Programme: Mini-CEX (Mini-Clinical Evaluation eXercise), DOPS (Direct Observation of Procedural Skills), CbD (Case-based Discussion) and Mini-PAT (Mini-Peer Assessment Tool)<sup>15</sup>. WPBA approaches can enable identification of concerns about individual students and combining scores can produce student performance profiles. Schools should carefully evaluate such initiatives and consider the scope for moving towards arrangements which are appropriate for summative as well as formative assessment. However, schools should be wary



of undermining the educational potential of WPBA and remember that students' practical competences may develop speedily in their final year. It would be helpful if schools could share information about successes and challenges of this form of assessment. They could seek contributions to the development or quality assurance of their arrangements for WPBA from outside the school. *The state of basic medical education* includes a case study on the introduction of WPBA at Leeds medical school.

- 82** John Norcini discusses challenges in his *Workplace based assessment in clinical training*, covering:
- a** reliability, which can be affected by the number of encounters observed, the number of assessors and the aspects of performance being evaluated
  - b** equivalence, which can be enhanced by using a common problem list, a number of assessors for each trainee and good faculty development
  - c** stakes, in that high grades tend to be awarded when the assessment is for an important purpose
  - d** relationships between assessors and trainees, the dangers from which can be reduced by using external assessors and providing anonymity for assessment by peers
  - e** the case for combining WPBA with other forms of assessment
  - f** feasibility, given resource constraints in workplace settings.<sup>16</sup>
- 83** A particular challenge is ensuring that assessors are consistent in their contributions to WPBA. Both the positive impact of feedback and the weight that can be attached to these assessments depend in large part on the training, briefing and monitoring of the assessors.
- 84** Paragraph 8.2 of the *Standards for curricula and assessment systems* (for specialty including GP training)<sup>17</sup> covers WPBA requirements and methods and may help medical schools

to develop a comprehensive approach, while recognising that arrangements for employees may not work well for students.

**In the postgraduate context:**

*Workplace Based Assessment: A guide for implementation*, available on the GMC website, makes the following points or suggestions among many others.

- a** More senior, expert staff tend to be more objective assessors.
- b** Narrative information should be recorded by assessors.
- c** If possible, assessments should be subject to audit and review and feedback should be given to assessors.
- d** Professional advice and support for assessors is important, particularly in relation to identifying and defending judgements of poor performance.
- e** Quality management should be in place: a checklist is provided.

- 85** Paragraph 111 of *Tomorrow's Doctors* suggests the use of clinical logbooks and personal portfolios to 'allow students to identify strengths and weaknesses and to focus their learning'. Schools should consider how to make best use of portfolios to have a positive impact on learning and whether they should play any role in relation to summative assessment. For example, keeping a portfolio might be required in order to take an examination. But using the content of portfolios for summative assessment is likely to compromise their potential to support reflection and identify weaknesses.
- 86** Simulated environments can also provide effective assessment opportunities. As *Tomorrow's Doctors* (2009) states at paragraph 100: 'Medical schools should take advantage of new technologies, including simulation, to deliver teaching'; and at paragraph 102: 'Opportunities should also be provided for students to learn with other health and social care students, including the use of simulated

training environments with audiovisual recording and behavioural debriefing'. Simulation can be appropriate to assess both technical and non-technical skills.

#### **Dundee medical school – mini-CEX and DOPS**

“ The University of Dundee Medical School is piloting the use of Mini-CEX and DOPS as part of final year teaching and assessment. Now established in postgraduate training we have modified the assessment templates for undergraduate use defining the level of descriptors for competence required as that of a final year medical student who meets the standard to progress to Foundation year 1. In the pilot, students were required to undertake four Mini-CEX's in their Foundation apprenticeship blocks and DOPS for peripheral cannula insertion, blood cultures, arterial blood gas sample and urinary catheterisation. These are included as part of the required work for these placements in their portfolio. Feedback was positive. Students valued the feedback opportunity these exercises provided and examiners for the portfolio found the objective assessment information useful. These assessments are at present being piloted for formative purposes. This is to look partly at logistics of delivery but realistically we do not expect them (particularly Mini-CEX) to be used summatively as we feel most benefit may be gained from formative use and we are unlikely to be able to get each student enough opportunities to make it reliable for summative use. ”

#### **Dundee medical school – ward simulation exercise**

“ The University of Dundee ward simulation exercise creates a standardised clinical environment in which final year students can be assessed on a number of clinical, professional and patient safety areas including prioritisation and organisation, team-working, communication with patients and colleagues, situational awareness, leadership, health & safety and safe prescribing. The 25 minute

exercise is run in a purpose-built 3 bedded simulated ward in the Clinical Skills Centre. During the exercise the student who takes on the role of a year 1 Foundation doctor, works with a nurse to manage the ward. The exercise runs to one of a number of standardised scripts which involve three simulated patients in which there are timed interruptions and events eg deterioration in a patient's condition, call from pharmacy. The student is observed, via video linkage, by two assessors who score independently against defined criteria prior to reaching consensus on performance. Students review their recorded exercise and self-score and reflect on their performance prior to receiving individual feedback. The recording on DVD and the assessment sheets are included in the student's portfolio. ”

### **Assessment of professionalism**

- 87** Aspects of professionalism can be tested through knowledge, skills and performance testing. The Medical Council of Canada has successfully assessed professionalism through MCQs in its Part 1 knowledge-based examination which is the first part of the prerequisite to licensure in Canada.<sup>18</sup>
- 88** In addition, students' conscientiousness could be considered through their record of attendance, meeting deadlines, taking part in voluntary activities and other objective evidence. Feedback from staff and from other students may also be useful. Medical schools may take a purely formative approach in early years but there is a risk that this might give professionalism insufficient importance in the eyes of the student.<sup>19</sup>
- 89** Information about aspects of professionalism may also be obtained through use of a Situational Judgement Test.
- 90** In addition, students' professional behaviour may be considered through the school's arrangements for pastoral care and student support and, where necessary, through formal

fitness to practise arrangements. Schools may have arrangements to take a holistic view of each student's fitness to practise prior to graduation. These issues are discussed in *Medical students: professional values and fitness to practise*, published by the GMC and the Medical Schools Council.<sup>20</sup>

#### St George's medical school – assessing professionalism

“St George's, University of London has a longitudinal professionalism assessment throughout the course with multiple assessments by multiple assessors. Repeated poor performance leads to referral to the Professional Behaviour Committee. The emphasis is on remediation as a first step, and disciplinary action only if that fails. In years one and two, assessment is formative and around 5% of students are seen by the committee. In the clinical years the assessment is summative, with separate assessment of attendance. Again, remediation is the first approach. A student who fails the assessment in the clinical years cannot progress.”

## Processes

### Supporting examiners

- 91** *The state of basic medical education* summarises findings from QABME reviews: 'Variability in examiner marking, and the importance of having effective training and monitoring for examiners in place, arose in a number of reports, with schools often reporting difficulties in ensuring examiners attended training. Some schools, including the universities of East Anglia, Warwick, and Edinburgh were commended on their examiner training'.<sup>21</sup>
- 92** Paragraph 88 of *Tomorrow's Doctors* (2009) states: 'Examiners and assessors will be appropriately selected, trained, supported and appraised'. Paragraph 115 adds: 'Examiners must be trained to carry out their role and to apply the medical school's assessment criteria consistently...'

- 93** In their 2009/10 Enhanced Annual Return to the GMC, about half the schools reported that they needed to undertake further work to comply with paragraph 88 of *Tomorrow's Doctors* (2009).

#### In the postgraduate context:

*Standards for curricula and assessment systems* (for specialty including GP training) states:

9.2. Unless other arrangements are agreed, trainers, supervisors, assessors and examiners must:

- (a) have relevant qualifications and experience
- (b) undertake appropriate training.

Standard 10 on the 'Role of the assessor' states:

*Standard 10: Assessors/examiners will be recruited against criteria for performing the tasks they undertake.*

*Mandatory requirements.*

10.1. The roles of assessors/examiners will be clearly specified and used as the basis for recruitment and appointment.

10.2. Assessors or examiners must demonstrate their ability to undertake the role.

10.3. Assessors/examiners should only assess in areas where they have competence.

10.4. The relevant professional experience of assessors should be greater than that of candidates being assessed.

10.5. Equality and diversity training will be a core component of any assessor/examiner training programme.

- 94** Characteristics of good educators are set out in the *Professional Standards* of the Academy of Medical Educators.<sup>22</sup> Theme 4 covers 'Assessment and feedback to learners' and covers five areas of knowledge, understanding and practice for those involved:
- a the purpose of the assessment
  - b the content of the assessment

- c the development of assessment
- d selecting appropriate assessment methods
- e maintaining the quality of assessment.

**95** Equality and diversity training could cover:

- a ensuring that students, staff and patients are treated fairly, irrespective of their protected characteristics, in accordance with the Equality Act 2010
- b issues in relation to the assessment of medical students and trainees
- c local equality policies and action plans.

**96** As well as training on equality and diversity, for example through participation in an on-line module, all examiners should have received appropriate training to reach a good level of understanding of assessment principles, the requirements of *Tomorrow's Doctors* (2009), the school's assessment strategy and their responsibilities including, where appropriate, their role in feedback. Training should be provided at the time of selection by the school and periodically thereafter, in addition to briefings prior to examinations. The QAA *Code of Practice* includes a helpful list of possible uses of development opportunities under Precept 10: 'Institutions ensure that everyone involved in the assessment of students is competent to undertake their roles and responsibilities'.<sup>23</sup>

**97** The GMC has prepared separate advice on the training of teachers and trainers generally, due for publication in Spring 2011.

### The timing of examinations

**98** The timing of examinations is critical and schools should review their arrangements and be willing to implement change where feasible.

**99** Schools should consider the case for scheduling examinations to create gaps between them, rather than holding them over a short period. If several examinations are held during the same few weeks, students may place more weight on some rather than others. Also, students may take a cramming approach to their assessment.<sup>24</sup>

**100** There should be a large enough lapse of time between examinations and the board meetings which reach decisions to avoid undue pressure on staff processing data and to allow effective quality control and monitoring.

**101** In addition, schools will wish to consider the opportunity for remediation and resits where appropriate. They must put patient safety first and be confident in the fitness to practise of their new graduates. The 2010 survey of assessment by the Medical Schools Council found that most schools allowed one resit attempt for each single written or clinical final assessment, which seems reasonable to the GMC. Many schools hold Finals at a time which allows those who do not pass to resit before the date of graduation. This also seems reasonable.

**102** Schools may arrange Finals before student assistantships, so that students have acquired the knowledge and skills that they need to practise safely and are not distracted by the need to prepare for examinations. However, other schools will wish Finals to cover the development of practical skills acquired while on student assistantships.

**103** Selection into the Foundation Programme may also be a factor in the timing of Finals.

**104** For a wider context, the QAA offer helpful suggestions in relation to Precept 6 in their *Code of Practice*, that is: 'Institutions ensure that the amount and timing of assessment enables effective and appropriate measurement of students' achievement of intended learning outcomes'.<sup>25</sup>

### Reasonable adjustments

**105** Paragraph 90 of *Tomorrow's Doctors* (2009) states:

*Assessment criteria will be consistent with the requirements for competence standards set out in disability discrimination legislation. Reasonable adjustments will be provided to help students with disabilities meet these competence standards.*

*Although reasonable adjustments cannot be made to the competence standards themselves, reasonable adjustments should be made to enable a disabled person to meet a competence standard.*

- 106** In the 2009/10 Enhanced Annual Return, nearly all schools reported compliance with this requirement.
- 107** Schools will need to ensure that they are compliant with the Equality Act 2010 which is replacing the prior disability discrimination (except in Northern Ireland).
- 108** Full guidance to medical schools, including examples of reasonable adjustments to assessments, is provided in *Gateways to the Professions – Advising medical schools: encouraging disabled students*<sup>26</sup>. This is referenced in *Tomorrow's Doctors* (2009) and a 2010 edition of *Gateways* is available on the GMC website. Examples in *Gateways* of reasonable adjustments in assessment cover aspects relating to documents, allowances, equipment and locations.

## Standard setting

- 109** Paragraph 89 of *Tomorrow's Doctors* (2009) states: 'There will be systems in place to set appropriate standards for assessments to decide whether students have achieved the curriculum outcomes.'
- 110** In the 2009/10 Enhanced Annual Return only a few medical schools reported that they needed to undertake some work to meet that requirement.
- 111** Medical schools legitimately choose various methods but all should fully implement a robust, transparent and consistent approach to standard setting that satisfies the requirements in *Tomorrow's Doctors* (2009). Schools should be able to justify the standard setting methods they have adopted and to explain how they relate to the assessment methods used and the overall assessment strategy. Schools should also evaluate their own experience of standard-setting and develop processes reflecting that evaluation.
- 112** Medical schools should not employ fixed pass marks – that is, pass marks which are the same every year – since these do not reflect variations in the difficulty of examinations over time and therefore could result in individuals of identical ability passing in one year and failing in another. The schools should have processes to establish that standards are stable over time.
- 113** Schools should use approaches to standard setting which ensure concordance with absolute standards.
- 114** Where compatible with the approach adopted, standard setting should take place in advance of the assessments. Post-hoc processes should generally be avoided. However, if the outcome of the assessment appears surprising, and certainly if there is a threat to patient safety, it may be appropriate to amend the standard setting retrospectively. Lessons should then be identified and shortcomings addressed in the standard setting arrangements for future assessments.
- 115** Schuwirth and van der Vleuten argue:
- Any standard set must be:*
- *explicable, through the rationales behind the decisions made*
  - *defensible, to the extent that it can assure the stakeholders about its validity (an issue in this may be 'due diligence', that is demonstrating that good effort was put into setting the standard)*
  - *stable, as it is not defensible that the standards vary from year to year.*<sup>27</sup>
- 116** Miriam Friedman Ben-David stresses the importance of selecting appropriate panellists for standard-setting processes and suggests :
- Panellists should be:*
- *experts in the related field of examination*
  - *familiar with the examination methods*
  - *good problem solvers*
  - *familiar with level of candidates*
  - *interested in education (teachers).*<sup>28</sup>

**117** Standard-setters should be familiar not only with the overall level of the candidates but also with the acceptable breadth of abilities.

**118** The involvement of a variety of individuals, in relation to sex, age, ethnicity, disability and other equality and diversity considerations, as well as a range of experience in academic and healthcare roles, would further establish the defensibility of the standard setting process.<sup>29</sup>

#### Peninsula medical school – standard-setting

“ Standard setting reports are produced by the psychometrics team for all assessments. Clinical and SSC assessments use Angoff, Borderline Group or Hofstee. The School states a preferred method and alternatives in its Assessment Technical Manual. Progress Tests standards are set with reference to an external group of newly-qualified doctors. Assessors undertake training and benchmarking exercises.”

#### GMC – standard setting in PLAB

“ For the written Part 1 of its PLAB examination for International Medical Graduates, the GMC uses the Angoff method of standard setting. This is based on assessors making judgments about the probability of a ‘barely competent’ candidate answering a particular question correctly. The assessors’ mean scores are used to calculate a standard for the case. For the Part 2 OSCE, the GMC regarded the borderline group scoring method as the most appropriate method of standard setting. This involves observing multiple candidates on a single station and giving a global rating for each candidate. Performance is also scored against competencies on the mark sheet. The global ratings are used to establish the future scores that will be used to determine the passing standard.”

### Marking and making decisions

**119** Medical schools should avoid the use of negative marking. This results in candidates’ performance being affected by their confidence in venturing an answer that they are not sure about, as well as their knowledge or skills.<sup>30</sup>

**120** Clear protocols and transparent arrangements are helpful in achieving the following.

- a Reaching consistent, evidence-based and defensible decisions about individual students. It may not be possible to take a purely quantitative or automatic approach: expert judgments, exercised in an accountable and consistent manner, may also be necessary.
- b Identifying borderline candidates, for example by using Standard Error of Measurement (SEM) criteria and covering candidates on both sides of the pass mark in exactly the same way.<sup>31</sup>
- c Exercising discretion in a fair and consistent manner that would withstand challenge on the grounds of due process.
- d Defining any use of compensation, consistent with ensuring that all new graduates have achieved all the outcomes (including performance of the practical procedures) in *Tomorrow’s Doctors* (2009).
- e Taking appropriate consideration of extenuating or mitigating circumstances without compromising patient safety or the outcomes required of graduates. Schools should not award additional marks in these circumstances or change pass/fail decisions. Schools may consider whether the student should be given a further chance or whether a previous attempt is to be discarded and the next attempt counted as the first attempt. Schools may think it appropriate to require students to submit extenuating circumstances before examinations rather than when they find they have failed. Schools should consider how their arrangements allow for appropriate review by external examiners of these decisions.
- f Deciding when students are entitled to resit examinations and the conditions that apply. It is important to ensure that resits are of the same standard as the main examinations.

Also, schools could consider the recent suggestion to combine resit results with the results of the prior failed assessment, thereby increasing the sample size assessed and helping to ensure that robust decisions are made on borderline candidates in the interest of patient safety.<sup>32</sup> However, schools would need to ensure that students understand this situation and do not regard the resit as an entirely fresh attempt. Combining results would not be appropriate where a student is allowed a resit due to extenuating circumstances: this calls for a clean slate since their first attempt may not have been reflective of their true abilities.

**g** Providing remediation appropriate to student needs and the resources available.

**121** Medical schools will need to comply with university regulations which may impact on making decisions about students' progression and graduation. Schools should liaise closely with university authorities since the regulations should accord with good practice in medical education.

## Feedback

**122** Paragraph 85 of *Tomorrow's Doctors* (2009) states: 'Students will have regular feedback on their performance'. Paragraph 111 says:

*Students must receive regular information about their development and progress. This should include feedback on both formative and summative assessments... Feedback about performance in assessments helps to identify strengths and weaknesses, both in students and in the curriculum, and this allows changes to be made.*

**123** In their 2009/10 Enhanced Annual Return to the GMC, almost half the medical schools said they would need to take steps in order to comply with paragraph 85 of *Tomorrow's Doctors* (2009). A lack of staff resource was frequently cited as the reason.

**124** Standard 11 of the *Standards for curricula and assessment systems*<sup>33</sup> (for specialty including GP training) is that 'Assessments must provide relevant feedback to the trainees'. The standard goes on to set requirements for trainees. Modifying these standards to apply to medical students we can advise the following.

- a** The policy and process for providing feedback to students following assessments should be documented and in the public domain.
- b** The form of feedback should match the purpose of the assessment.
- c** Outcomes from assessments should be used to provide feedback to the students on the effectiveness of the education where consent from all interested parties has been given.
- d** Sometimes it may be appropriate to provide no feedback other than the test result. If this is a policy decision then reasons should be stated.

**125** The QAA suggest:

*It may be helpful to consider how different forms of feedback can be used for different purposes. For example, students are likely to find it helpful to receive constructive comments on their work from a range of sources including teachers, personal tutors, peers and, where appropriate, practitioners. Encouraging students to reflect on their own performance, as well as receiving feedback from others, can be a useful part of the learning process, especially when opportunities for self-assessment are integrated in a module or programme.*

**126** Good feedback will be effective in improving learning and performance. Wherever possible feedback should not be given only to students who fail or are struggling as, irrespective of performance, all students can benefit from it. Good feedback:

- a is specific, non-judgemental and descriptive, reflecting on observed behaviours and tasks
  - b is provided within a supportive educational environment in which feedback is embedded, explicitly and implicitly
  - c is delivered in a timely fashion while recognising the need for quality control arrangements after assessments and that delaying feedback can help to improve the information provided. Expectations about the timescale for feedback should be explicit, honoured and monitored
  - d is planned and considered
  - e is ongoing and frequent, part of a sequence rather than a series of isolated episodes
  - f avoids complexity and is restricted in length on any one occasion
  - g is founded on respect for and the credibility of the feedback giver
  - h is built into the assessment strategy and the curriculum
  - i gives students consistent messages (or properly reflects inconsistent performance)
  - j helps clarify good performance
  - k elicits the learner's thoughts and feelings
  - l facilitates the development of self-assessment, reflection and a desire to learn, develop skills and to seek out further assessment and feedback
  - m delivers high-quality information to students about their learning
  - n encourages teacher and peer dialogue around learning
  - o encourages positive motivational beliefs and self-esteem and avoids creation of anxiety
  - p delivers difficult messages about progress in a way which is constructive and could not be construed as bullying
  - q acknowledges that some students may need more detailed feedback, particularly in relation to interactional skills and self presentation where they appear less confident or proficient: consideration should be given to the possibility that cultural or social background and norms may influence both their actions and how they are perceived by others
  - r relates to the student's personal goals and establishes mutually agreed goals and provides opportunities to close the gap between current and required performance
  - s provides information about teachers that can be used to help shape teaching.<sup>34</sup>
- 127** Electronic and automatic feedback can be very valuable but should not replace personal approaches completely.
- 128** Students should be encouraged to rate the feedback (provide feedback on the feedback) and schools may be able to monitor how feedback affects student performance. A systematic approach to providing feedback could involve protocols for recording which would in turn provide an audit trail.
- 129** Schools should also arrange for staff to receive feedback from the results of student assessments relating to their own performance as assessors, teachers and role models.
- 130** Further guidance and models for constructive feedback are referenced in the ASME reports by Diana Wood, John Norcini, and Jean Ker and Paul Bradley (all collected in a book edited by Tim Swanwick – see Related Documents).

**Nottingham medical school – Virtual Learning Environment**

“ The University of Nottingham Medical School is providing personalised exam feedback to students based around learning objectives. These objectives are firstly entered into the VLE (Virtual Learning Environment) to scaffold and guide the learners during the semester. The



academic leads then link each question in an exam (held in the e-assessment system) across to the objectives in the VLE. The students then, after the exam, access reports which show a basic traffic light system of learning objective acquisition: green – good, amber – partial and red – poor. Students get a light corresponding to each sampled learning outcome in each assessment. So if an assessment samples, say, 54 outcomes they see 54 lights.

Each light is hyperlinked back to the curriculum and related learning resources. ”

### Cross-school arrangements

- 131** Medical schools have combined to develop assessment arrangements: in particular the Prescribing Skills Assessment under development by the Medical Schools Council and the British Pharmacological Society; and the development of a common bank of questions by the Medical Schools Council Assessment Alliance, building on the work of the Universities Medical Assessment Partnership (UMAP).
- 132** Such arrangements can bring together experts to produce items and arrangements of a high standard. They may be more cost-effective than separate arrangements at each school. They provide opportunities for comparing the performance of schools and/or students and could provide reassurance to the GMC, employers and the public about the fitness to practise and the preparedness of graduates for employment and for training in the Foundation Programme.
- 133** Such arrangements should be subject to effective test security, internal quality control and external quality assurance. Where appropriate, they should comply with *Tomorrow's Doctors* (2009) and the QAA *Code of Practice* and be informed by this advice and the *Standards for curricula and assessment systems* (although the last were drawn up for specialty including GP training).
- 134** Where cross-school assessment arrangements are robust, medical schools should take advantage of them and take opportunities to contribute to their support, management and development.

## Annexes

### Extracts on assessment from *Tomorrow's Doctors* (2009)

**The overall Standard for Domain 5 is at paragraph 81:**

**81** The curriculum must be designed, delivered and assessed to ensure that graduates demonstrate all the 'outcomes for graduates' specified in *Tomorrow's Doctors*.

**The Criteria relating to assessment state:**

- 85** Students will have regular feedback on their performance.
- 86** All the 'outcomes for graduates' will be assessed at appropriate points during the curriculum, ensuring that only students who meet these outcomes are permitted to graduate. Assessments will be fit for purpose – that is: valid, reliable, generalisable, feasible and fair.
- 87** Students will receive timely and accurate guidance about assessments, including assessment format, length and range of content, marking schedule and contribution to overall grade.
- 88** Examiners and assessors will be appropriately selected, trained, supported and appraised.
- 89** There will be systems in place to set appropriate standards for assessments to decide whether students have achieved the curriculum outcomes.
- 90** Assessment criteria will be consistent with the requirements for competence standards set out in disability discrimination legislation. Reasonable adjustments will be provided to help students with disabilities meet these competence standards. Although reasonable adjustments cannot be made to the competence

standards themselves, reasonable adjustments should be made to enable a disabled person to meet a competence standard.

### The 16 high-level outcomes from *Tomorrow's Doctors* (2009)

The numbering here relates to the paragraphs in *Tomorrow's Doctors* (2009).

#### Outcomes 1 – The doctor as a scholar and a scientist

- 8 The graduate will be able to apply to medical practice biomedical scientific principles, method and knowledge relating to: anatomy, biochemistry, cell biology, genetics, immunology, microbiology, molecular biology, nutrition, pathology, pharmacology and physiology.
- 9 Apply psychological principles, method and knowledge to medical practice.
- 10 Apply social science principles, method and knowledge to medical practice.
- 11 Apply to medical practice the principles, method and knowledge of population health and the improvement of health and healthcare.
- 12 Apply scientific method and approaches to medical research.

#### Outcomes 2 – The doctor as a practitioner

- 13 The graduate will be able to carry out a consultation with a patient.
- 14 Diagnose and manage clinical presentations.
- 15 Communicate effectively with patients and colleagues in a medical context.
- 16 Provide immediate care in medical emergencies.
- 17 Prescribe drugs safely, effectively and economically.
- 18 Carry out practical procedures safely and effectively.
- 19 Use information effectively in a medical context.

#### Outcomes 3 – The doctor as a professional

- 20 The graduate will be able to behave according to ethical and legal principles.
- 21 Reflect, learn and teach others.
- 22 Learn and work effectively within a multi-professional team.
- 23 Protect patients and improve care.

### Related documents

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#### AMEE Medical Education Guides:

Miriam Friedman Ben-David, *Standard Setting in Student Assessment, Guide 18*, 2000

James Shumway and Ronald Harden, *The Assessment of Learning Outcomes, Guide 25*, 2003

#### ASME Understanding Medical Education series:

Katharine Boursicot, Trudie Roberts and William Burdick, *Structured assessments of clinical competence*, 2007

Jean Ker and Paul Bradley, *Simulation in medical education*, 2007

John Norcini, *Workplace based assessment in clinical training*, 2007

Lambeth Schuwirth and Cees van der Vleuten, *How to design a useful test: the principles of assessment*, 2006

Diana Wood, *Formative assessment*, 2007

The series is also available in a book: Tim Swanwick (ed), *Understanding Medical Education: Evidence, Theory and Practice*, Wiley-Blackwell, 2010

#### GMC publications:

*Gateways to the professions – Advising medical schools: encouraging disabled students*, revised 2010:  
[www.gmc-uk.org/education/undergraduate/gateways\\_guidance.asp](http://www.gmc-uk.org/education/undergraduate/gateways_guidance.asp)

*Good Medical Practice*, revised 2006:  
[www.gmc-uk.org/guidance/good\\_medical\\_practice.asp](http://www.gmc-uk.org/guidance/good_medical_practice.asp)

*Medical students: professional values and fitness to practise*, revised 2009: [www.gmc-uk.org/education/undergraduate/professional\\_behaviour.asp](http://www.gmc-uk.org/education/undergraduate/professional_behaviour.asp)

*Reliability issues in the assessment of small cohorts*, revised 2010: [www.gmc-uk.org/Reliability\\_issues.pdf\\_31299860.pdf](http://www.gmc-uk.org/Reliability_issues.pdf_31299860.pdf)

*Standards for curricula and assessment systems*, revised 2010: [www.gmc-uk.org/Standards\\_for\\_Curricula\\_Assessment\\_Systems.pdf\\_31300458.pdf](http://www.gmc-uk.org/Standards_for_Curricula_Assessment_Systems.pdf_31300458.pdf)

*The state of basic medical education. Reviewing quality assurance and regulation*, 2010: [www.gmc-uk.org/QAEME\\_publication.pdf\\_31374226.pdf](http://www.gmc-uk.org/QAEME_publication.pdf_31374226.pdf)

*Tomorrow's Doctors*, 2009: [www.gmc-uk.org/education/undergraduate/tomorrows\\_doctors.asp](http://www.gmc-uk.org/education/undergraduate/tomorrows_doctors.asp)

*Workplace Based Assessments: A guide for implementation*, revised 2010: [www.gmc-uk.org/Workplace\\_Based\\_Assessment.pdf\\_31300577.pdf](http://www.gmc-uk.org/Workplace_Based_Assessment.pdf_31300577.pdf)

#### Key guidance:

Academy of Medical Educators, *Professional Standards 2009*: [www.medicaleducators.org/uploadedcontent/AoME%20Professional%20Standards.pdf](http://www.medicaleducators.org/uploadedcontent/AoME%20Professional%20Standards.pdf)

National Board of Medical Examiners (USA) (Susan Case and David Swanson), *Constructing Written Test Questions For the Basic and Clinical Sciences*, third edition 2002: [www.nbme.org/PDFItemWriting\\_2003/2003IWG\\_whole.pdf](http://www.nbme.org/PDFItemWriting_2003/2003IWG_whole.pdf)

QAA, *Code of practice for the assurance of academic quality and standards in higher education – Section 4: External examining*, second edition 2004; *Section 6: Assessment of Students*, second edition 2006: [www.qaa.ac.uk/academicinfrastructure/codeofpractice/](http://www.qaa.ac.uk/academicinfrastructure/codeofpractice/)

#### Journal articles:

Steven Downing, 'Validity: on the meaningful interpretation of assessment data', *Medical Education*, 37, 830-837, 2003

Susan Fowell, Gillian Maudsley, Philip Maguire, Sam Leinster and John Bligh, 'Student assessment in undergraduate medical education in the United Kingdom 1998', *Medical Education*, 34: Suppl. 1, 1-49, September 2000. doi: 10.1046/j.1365-2923.2000.0340s1001.x

Richard Hays and Lindsay Bashford, 'Being an external examiner: what you need to know and do', *Clinical Teacher*, 6:3, 160-163, August 2009: [www3.interscience.wiley.com/cgi-bin/fulltext/122563389/HTMLSTART](http://www3.interscience.wiley.com/cgi-bin/fulltext/122563389/HTMLSTART)

Richard Hays, Tarun Sen Gupta, and Jan Veitch, 'The practical value of the standard error of measurement in borderline pass/fail decisions', *Medical Education*, 42, 810-815, August 2008. doi: 10.1111/j.1365-2923.2008.03103.x

Gareth Holsgrove, 'What is the right choice?', *Times Higher Education*, 4 May 2001: [www.timeshighereducation.co.uk/story.asp?storyCode=159581&sectioncode=26](http://www.timeshighereducation.co.uk/story.asp?storyCode=159581&sectioncode=26)

Chris Ricketts, 'A new look at resits: are they simply a second chance?', *Assessment & Evaluation in Higher Education*, 35:4, 351-356, April 2010.

Cees van der Vleuten and Lambert Schuwirth, 'Assessing professional competence: from methods to programmes', *Medical Education*, 39, 309-317, 2005

Joost Dijkstra, Cees van der Vleuten and Lambert Schuwirth, 'A new framework for designing programmes of assessment', *Advances in Health Sciences Education*, 15, 379-393, August 2010. doi: 10.1007/s10459-009-9205-z

Cees van der Vleuten et al, 'The assessment of professional competence: building blocks for theory development', *Best Practice & Research Clinical Obstetrics and Gynaecology*, 24:6, 703-719, December 2010. doi:10.1016/j.bpobgyn.2010.04.001

## Glossary

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<b>ASME</b>	Association for the Study of Medical Education.
<b>Assessment</b>	All activity aimed at judging students' attainment of curriculum outcomes, whether for summative purposes (determining progress) or formative purposes (giving feedback). An 'examination' is an individual assessment test.
<b>Blueprint</b>	A template used to define the content of a test that may be designed as a matrix or a series of matrices.
<b>EAR</b>	Enhanced Annual Return – from medical schools to the GMC.
<b>Examiners</b>	All those responsible for marking, assessing or judging students' performance, regardless of the terminology used in any particular medical school.
<b>MCQs</b>	Multiple Choice Questions.
<b>OSCE</b>	Objective Structured Clinical Examination.
<b>Outcomes</b>	Areas or aspects of knowledge, skill or behaviour to be acquired through a period of education or training.
<b>PLAB</b>	Professional and Linguistic Assessments Board – the GMC board that oversees the PLAB test which is the main route by which International Medical Graduates demonstrate that they have the necessary skills and knowledge to practise medicine in the UK.
<b>PMETB</b>	The Postgraduate Medical Education and Training Board, merged with the GMC in April 2010.
<b>QAA</b>	The Quality Assurance Agency.

<b>QABME</b>	Quality Assurance of Basic Medical Education: the GMC's arrangements for regulatory review of undergraduate medical education, to be superseded by the Quality Improvement Framework.
<b>Scheme of assessment</b>	The examinations and assessments that make sure all students have successfully achieved and demonstrated the knowledge, skills and behaviour set out in the curriculum.
<b>SSC</b>	Student Selected Component.
<b>WPBA</b>	Workplace based assessment.

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