

# Assessment of competence

L M CAMPBELL

T S MURRAY

## SUMMARY

*While it is essential that professional competence should be maintained, it is equally important that entry to the specialist ranks should be conditional on the demonstration of an acceptable level of competence. Multiple-choice papers and videotaped consultations are two parts of a multi-format approach to assessment which also includes a trainer's report and an audit report. The number of doctors identified as unsatisfactory at the recertification stage could be reduced by these methods, and the system could also provide a template for the introduction of recertification procedures.*

*Keywords: professional competence; summative assessment; recertification.*

## Introduction

THERE is an assumption by the public, shared to some extent by the medical profession, that doctors entering unrestricted practice, either as general practitioners or as consultants, are of proven competence. In recent years, there has been an increasing emphasis on the maintenance of this professional competence, including suggestions that there should be regular recertification for all doctors.<sup>1,2</sup>

While it is essential that professional competence should be maintained once attained, it is equally important that entry to the specialist ranks should be conditional on the demonstration of an acceptable level of competence.<sup>3</sup> In this paper, we will describe the development of an instrument for assessing competence for entry to general practice, and discuss the related issues of validity and reliability. We would suggest that this has relevance for other specialities.

## Historical perspective

In 1975, the Joint Committee for Postgraduate Training for General Practice (JCPTGP) was set up with responsibility for conferring the right to independent practice. The JCPTGP contained representatives from the General Medical Services Committee (GMSC) and the Royal College of General Practitioners (RCGP), with nominees from other bodies, such as the universities. By 1979, doctors had to complete a year as a trainee in general practice to achieve certification, and by 1982 it had become necessary to complete 2 years of approved hospital posts and a trainee year. For each of these posts, the responsible trainer had to complete a statement of 'satisfactory completion'. The meaning of this term was not initially clear, and it was suggested that 'satisfactory' could mean simply completing the appropriate time in the post. The situation was clarified in 1990<sup>4</sup> by the chairmen of the JCPTGP, the GMSC and the RCGP who stated that the doctor should have reached an acceptable standard of competence.

LM Campbell, FRCGP, assistant adviser in assessment; TS Murray, PhD, MD, FRCGP, regional adviser in general practice, Department of Postgraduate Medicine, University of Glasgow.  
Received: 22 January 1996; accepted: 22 April 1996.

© British Journal of General Practice, 1996, 46, 619-622.

## The assessment of competence

Although the above statement made it clear that the trainee had to be competent at the end of training, two questions were left unanswered: (1) What is an acceptable level of competence? and (2) How do we measure it? The General Medical Council (GMC) has defined what a competent doctor is in general terms, but not in sufficient detail to permit accurate assessment. The Royal Colleges, in their membership or fellowship exams, use a peer-referenced approach in which a given percentage of candidates fail the exam. There is little published evidence concerning the relationship between passing the various membership exams and clinical competence, and very little concerning the reliability of the various exams. A fair assessment method for assessing minimum acceptable competence should, if at all possible, be criterion-based rather than competitive, on the principle that, since all candidates may be of acceptable competence, it should be possible for all to pass. This approach adds another dimension of difficulty to developing an assessment instrument.

## Methods of assessing competence

The type of competence being assessed will vary depending on the medical specialty involved, but the required attributes of the assessment process remain the same in all specialties. The method should be reliable, valid and feasible. A reliable method will consistently produce the same results at different times, using different assessment materials and using different assessors where applicable. Validity is probably one of the most abused words in the language of medical education. Fundamentally, it means that the assessment method should be measuring something which is important in terms of the doctor's ability to carry out his job. To paraphrase, it could be said that reliability is about counting what you can measure whereas validity is about measuring what counts.

Any assessment process must be feasible, not simply in the sense that it can be done, since almost anything can be done given sufficient time and money, but in the sense that it can be done with an input of time and resources which is in some way proportional to the outcomes of the process.

## The development of valid and reliable assessment methods

The ideal assessment instrument would predict actual clinical performance. This goal has not yet been reached.<sup>5</sup> Considerable work has gone into establishing the validity and reliability of assessment methods, particularly in the USA,<sup>6</sup> where legal challenge can occur, but also in Australia,<sup>7</sup> Canada, Holland<sup>8</sup> and the UK.<sup>9</sup> There are broadly two types of assessment in use. The first involves written material, the second in engaging in some form of assessed clinical work. The written material may consist of multiple-choice question papers in their various forms, essays of various types or patient-management problems. The assessed clinical work ranges from routine observation in the clinic or operating theatre, to the use of standardized simulated patients, or the structured assessment of doctor-patient interactions in real-time or on videotape.

The use of written material is the most convenient in terms of resources, which is presumably why it forms the mainstay of most exams. Written material is also potentially reliable to an extent which is very difficult to attain with the assessment of

clinical work. The coefficient alpha is the most used measure of reliability in this kind of material and basically relates to the ability of the test to produce consistent results. Written material, particularly multiple-choice papers, can be made reliable. The question is: how valid are they? This is vital since there is no point in having an extremely reliable assessment tool with no validity. Much work has been done in attempting to look at the reliability of written material,<sup>10</sup> but much less in terms of validity.<sup>11</sup> There appears to be only a modest correlation between performance in written tests and in clinical rating scales.<sup>12</sup>

When we come to look at observation of performance, the problems of validity and reliability are reversed. If we watch a doctor at work, there is a *prima facie* case that the assessment is valid because we are looking at real performance. Clearly, we have to be sure that we are measuring adequate and appropriate aspects of performance, but provided we get that right, we can at least claim face validity. However, it is here that reliability becomes much more difficult to achieve,<sup>13</sup> although there is good reason to suppose that reasonable reliability can be attained.<sup>14</sup> There are several factors which tend to reduce reliability in tests of clinical competence. One factor is marker variance. This can be minimized by the use of well-defined marking schedules and intensive examiner training. An example of this is the oral examination for membership of the RCGP. A recent paper has described in detail the training of examiners and the development of marking schedules,<sup>15</sup> but unfortunately it has produced very little data to support a resulting increase in reliability. Further problems are the apparent lack of consistency of candidates in performing different tasks<sup>16</sup> and the need for large numbers of test items<sup>17</sup> to deal with this.

### The assessment of minimal acceptable competence for entry into general practice

Before attempting to decide on specific instruments, it is necessary to define the attributes to be tested, since it is clearly impossible to decide if a doctor is competent without first deciding what aspects of knowledge, skills and behaviour make up competence. This is particularly difficult in the area of general practice because of the wide-ranging nature of the job.

The JCPTGP set out the following basic attributes required in a doctor at the end of training:

- adequate knowledge
- adequate problem-solving skills
- adequate clinical competence
- adequate consulting skills
- adequate skills in producing a written report of practical work in general practice, and
- adequate performance of skills, attitudes and knowledge.

These criteria are not defined in absolute terms and require judgements to be made as to what is adequate in any given situation. It became clear that no single method would assess these attributes, and we proposed a multi-format approach<sup>18</sup> containing the following components:

- a multiple true/false paper
- a trainer's report
- submission of an audit report, and
- submission of videotaped consultations.

The development of a structured trainer's report has been reported in detail elsewhere.<sup>19</sup> The audit report is also discussed elsewhere.<sup>20</sup> Therefore, we shall concentrate on the development of the multiple true/false paper and the assessment of videotaped consultations in this paper.

### The multiple true/false paper

Multiple-choice papers provide a score for each candidate and confer the ability to rank candidates. For summative assessment purposes, we needed an additional step because it was necessary to derive a pass mark which equated with the minimum acceptable knowledge base. This process consisted of using the Angof<sup>21</sup> and Hofstee<sup>22</sup> techniques, in which a group of experienced GP principals analysed the paper question by question, and produced a figure for the percentage of trainees of minimum acceptable competence whom they would expect to answer the questions correctly. By this means, a preliminary pass mark was determined which could then be further modified. It would be simple to fail the bottom 5% or so, but this would be unfair, at least in theory, and probably politically unacceptable.

### Consulting competence

The ideal method would involve assessment of performance in a situation where the doctor was unaware that the assessment was taking place. Work has been done in this area, particularly in Holland, using simulated patients,<sup>23,24</sup> and it may become acceptable to assess doctors in this way for certification purposes in due course. Apart from political problems, there are difficulties with this method. Performance depends on such aspects as booked appointment lengths, which are not within the control of the trainee. In addition, there are difficulties caused by the fact that such a patient would have to be treated as a temporary resident in the UK. For these reasons, we decided to carry out the assessments with the knowledge of the trainees. A variety of methods were available at the time we commenced our work and more have become available subsequently.<sup>25,26,27</sup> None of these scales had been designed specifically for the identification of the non-competent GP and most produced their results in a numerical format which then required a relatively arbitrary decision as to the cut-off point for minimum acceptability. For these reasons, we developed an instrument for summative assessment purposes based on broad criteria with a yes/no answer as regards competence. No trainee fails the process until their performance has been reviewed by at least six assessors, two of whom are from outside the local region. The reliability of the instrument has been tested in real patient consultations and found to be adequate, and 359 trainees have now been assessed with a failure rate of around 5%.<sup>28</sup>

### Real or simulated patients?

Much of the worldwide work on consulting and clinical assessment has been based on simulated patients.<sup>29</sup> The main advantage of using this technique is that each candidate is presented with the same set of problems to deal with. This is particularly important if it is wished to rank candidates, since the candidates are competing over the same course. Impressive reliability figures can be produced using this system, provided there are sufficient cases used. However, simulations have been used to assess specific skills rather than overall competence in most cases<sup>30,31</sup> and the validity of simulations in complex performance has been questioned.<sup>32</sup> Some work has been reported using genuine consultations.<sup>33</sup> Real consulting sessions have advantages over simulations in that the trainee can record the consulting session at a time of his or her choosing, and the stress of an exam situation is removed since the trainee can try again if the first session is unsatisfactory. The main concern when using real patients is that the case mix may be inappropriate for making judgements, with too many low-challenge consultations, for example, or too many of the same type. However, our results suggest that the skills of

listening, negotiating and making reasonable decisions at the minimum competence level are generic rather than case-specific since we are looking at basic communication and attitudinal attributes rather than skills which are dependent on specific knowledge. To avoid the possibility of a trainee submitting a tape with few challenging consultations, we specify the attributes to be assessed and instruct the candidates to ensure that these are demonstrated on the tape.

### Does the camera alter doctor or patient behaviour?

Concern has been expressed that the presence of the camera might cause trainees to behave inappropriately and that performance would be impaired. Pringle *et al* have demonstrated that the presence of the camera has no effect on doctor behaviour.<sup>34, 35</sup> However, it is a commonly expressed view that doctors are initially conscious of the presence of the camera. Frequent use of video in formative assessment should remove any 'stage fright', and the opportunity to try again if the doctor is unhappy with the original effort should avoid excessive stress.

There has been considerable debate over the years on the effect of the camera on patients and on their vulnerability to coercion. The GMC<sup>36</sup> has now set out guidelines for obtaining informed consent. It has been suggested<sup>37</sup> that consent rates of 4–10% are to be expected when coercion is removed. However, these studies did not involve inviting patients to be videoed. In one case,<sup>38</sup> the authors asked patients to speculate on how they thought they might feel if so invited. In the second study,<sup>39</sup> patients were given leaflets inviting them to volunteer if they wished to be videotaped. The proportion of patients who did not care one way or the other is included in the 90% who were claimed to reject videotaping. Several writers have commented that the 10% consent rate is misleading.<sup>40,41,42</sup> We have demonstrated that patient satisfaction is unaffected by the presence of the video camera.<sup>43</sup> This evidence, along with a consent procedure which gives patients every opportunity to decline to take part, should allay fears that videotaping causes any harm to patients.

### The results

The new system of summative assessment comes into force in the Autumn of 1996 throughout the UK. The current system, which requires certification of competence by the GP and hospital trainers, has produced a failure rate of 0.26%. The summative assessment process has been operational in one region for the past 3 years and 359 trainees have gone through the system. The proportion of trainees failing this process is 5%.<sup>28</sup> Although these figures cannot be extrapolated automatically across the country as a whole, it appears certain that there will be a considerable increase in the failure rate, with the video identifying the largest number of doctors. Although the total number of unsatisfactory trainees identified to date is too small to draw firm conclusions, it would appear that problems arise in the behavioural area rather than in the knowledge base.

### The future

Within the next 3 years, 5000 trainees will have been through the assessment process. This will give the opportunity to assess in more detail the validity and reliability of the method. We will also have identified a cohort of several hundred unsatisfactory trainees. From these, we would hope to identify what characteristics, if any, correlate with failure. It may then be possible to give feedback to postgraduate advisers and the medical schools so

that they can attempt to identify students likely to run into problems. There may even be the possibility that information of value to medical school admission procedures could be obtained.

We began this paper by discussing recertification. We would hope that the system discussed should, if not render recertification unnecessary, at least reduce the number of doctors identified as unsatisfactory at the recertification stage. The system could also provide a template for the introduction of such a recertification procedure.

### References

1. Scully G. Dealing with duffers. *Lancet* 1995; **346**: 720.
2. Calman K (chairman). *Review of guidance on doctors' performance*. London: Chief Medical Officer, 1995.
3. Carney T. A national standard for entry into general practice [editorial]. *BMJ* 1992; **305**: 1449-1450.
4. Irvine DH, Gray DJP, Bogle IG. Vocational training for general practice: the meaning of 'satisfactory completion' [letter]. *Br J Gen Pract* 1990; **40**: 434.
5. Hojat M *et al*. Is the glass half full or half empty? A re-examination of the associations between assessment measures during medical school and clinical competence after graduation. *Acad Med* 1968; **68** (suppl. 2): S69-S76.
6. Edelstein DR, Ruder HJ. Assessment of clinical skills using videotapes of the complete medical interview and physical examination. *Med Teacher* 1990; **12**: 155-162.
7. Hays RB, Jones BF, Adkins PB, McKain PJ. Analysis of videotaped consultations to certify competence. *Med J Australia* 1990; **152**: 609-611.
8. Pieters HM, Touw-Otten FW, De Melker RA. Simulated patients in assessing consultation skills in general practice vocational training: a validity study. *Med Educ* 1994; **28**: 226-233.
9. Godlee F. RCGP—examining the exam. *BMJ* 1991; **303**: 325-328.
10. Norcini JJ, *et al*. Reliability, validity and efficiency of multiple choice question and patient management problem item formats in assessment of clinical competence. *Med Educ* 1985; **19**: 238-247.
11. Jones TV, Gerrity MS, Earp J. Written case simulations: Do they predict physicians' behaviour? *J Clin Epidemiol* 1990; **43**: 805-815.
12. Dowaliby FJ, Andrew BJ. Relationships between clinical competence ratings and examination performance. *J Med Educ* 1976; **51**: 181-188.
13. Herbers JE, *et al*. How accurate are faculty evaluations of clinical competence? *J Gen Intern Med* 1989; **94**: 202-208.
14. Williams RG, *et al*. Direct, standardized assessment of clinical competence. *Med Educ* 1987; **21**: 482-489.
15. Wakeford R, Southgate L, Waas V. Improving oral examinations: selecting training and monitoring examiners for the MRCGP. *BMJ* 1995; **311**: 931-935.
16. Roberts J, Norman G. Reliability and learning from the objective structured clinical examination. *Med Educ* 1990; **24**: 219-223.
17. Newble DI, Swanson DB. Psychometric characteristics of the objective structured clinical examination. *Med Educ* 1988; **22**: 325-334.
18. Campbell LM, Howie JGR, Murray TS. Summative assessment: a pilot project in the West of Scotland. *Br J Gen Pract* 1993; **43**: 430-434.
19. Johnson N, Hasler J, Toby J, Grant J. Consensus minimum standards for use in a trainer's report for summative assessment in general practice. *Br J Gen Pract* 1996; **46**: 140-144.
20. Lough JRM, McKay J, Murray TS. Audit and summative assessment: a criterion-referenced approach. *Br J Gen Pract* 1995; **45**: 607-609.
21. Livingstone SA, Zieky MJ. *Passing scores*. Princeton, NJ: Education Testing Service, 1982.
22. De Grijter DNM. Compromise models for establishing examination standards. *J Educational Measurement* 1985; **22**: 263-266.
23. Rethans JJ, Sturmans F, Drop R, van der Vleuten C. Assessment of the performance of general practitioners by the use of standardised (simulated) patients. *Br J Gen Pract* 1991; **41**: 97-99.
24. Rethans JJ, Drop R, Sturmans F, van der Vleuten C. A method of introducing standardised (simulated) patients into general practice consultations. *Br J Gen Pract* 1991; **41**: 94-96.
25. Hays RB. Assessment of general practitioner consultations: content validity of a rating scale. *Med Educ* 1990; **24**: 110-116.
26. Cox J, Mullholland H. An instrument for assessment of videotapes of general practitioners' performance. *BMJ* 1993; **306**: 1043-1046.
27. Fraser RC, Mckinley RK, Mulholland H. Consultation competence in general practice: establishing the face validity of prioritized criteria in the Leicester assessment package. *Br J Gen Pract* 1994; **44**: 109-113.

28. Campbell LM, Murray TS. Summative assessment of vocational trainees: results of a 3-year study. *Br J Gen Pract* 46: 411-414.
29. Harden RM, Gleeson FA. Assessment of medical competence using an objective structured clinical examination. *Med Educ* 1979; 13: 39-54.
30. Ferrell BG. Clinical performance assessment using standardised patients. *Fam Med* 1995; 27: 14-19.
31. Williams RG, et al. Direct, standardized assessment of clinical competence. *Med Educ* 1987; 21: 482-489.
32. Cox K. No Oscar for OSCA. *Med Educ* 1990; 24: 540-545.
33. Hays RB, Jones BF, Adkins PB, McKain PJ. Analysis of videotaped consultations to certify competence. *Med J Australia* 1990; 152: 609-611.
34. Pringle M, Robins S, Brown G. Assessing the consultation: methods of observing trainees in general practice. *BMJ* 1984; 288: 1659-1660.
35. Pringle M, Stewart-Evans C. Does awareness of being videorecorded affect doctors' consultation behaviour? *Br J Gen Pract* 1990; 40: 455-458.
36. General Medical Council. *Guidance for doctors on the use of video-recordings of consultations between doctors and patients, and of other medical procedures for the purposes of training and assessment*. London: GMC, 1994.
37. Bain J, Mackay N. Videotaping of general practice consultations [letter]. *BMJ* 1995; 311: 952.
38. Bain JE, Mackay NSD. Patients' assessment of trainee general practitioners. *Med Educ* 1995; 29: 91-96.
39. Servant JB, Mathieson JAB. Video recording in general practice: the patients do mind. *J Roy Coll Gen Pract* 1986; 36: 555-556.
40. Boardman AP, Craig TKJ. Videorecording in general practice. [letter]. *J Roy Coll Gen Pract* 1987; 37: 134.
41. Mackay HAF. Videorecording in general practice. [letter]. *J Roy Coll Gen Pract* 1987; 37: 181.
42. Tylee A. Videorecording in general practice. [letter]. *J Roy Coll Gen Pract*. 1987; 37: 320.
43. Campbell LM, Sullivan F, Murray TS. Videotaping of general practice consultations: effect on patient satisfaction. *BMJ* 1995; 311: 236.

**Address for correspondence**

Dr LM Campbell, Department of Postgraduate Medicine, University of Glasgow, 1 Horselethill Road, Glasgow G12 9LX.

## RCGP CHRISTMAS LECTURE FOR 15-18 YEAR OLDS

### THURSDAY 12 DECEMBER 1996

#### Very General Practitioners: Primary and Secondary Care in Rural Africa Presented by: Drs Richard and Carolyn Rigby MRCGP

The 1996 Christmas Lecture for School V and VI Formers will be held at the RCGP on Thursday 12 December at 2.30pm. The lecture is entitled "Very General Practitioners: Primary and Secondary Care in Rural Africa" and the speakers will talk about their experiences working at the Murambinda Mission Hospital in Zimbabwe, and look at the role of health workers in development.

Entrance is free but by ticket only on application to the RCGP Courses & Conference Unit.

*For further details of the above please contact:*

*RCGP Courses, 14 Princes Gate,  
Hyde Park, London SW7 1PU.  
Tel: 0171 823 9703 Fax: 0171 225 3047*



### THE ROYAL COLLEGE OF GENERAL PRACTITIONERS INTERNATIONAL TRAVEL SCHOLARSHIPS, THE KATHARINA VON KUENSSBERG AWARD & THE JOHN J FERGUSON INTERNATIONAL TRAVEL SCHOLARSHIP

The Royal College of General Practitioners invites applications for international scholarships to enable general practitioners from the UK to travel overseas to study aspects of health care relevant to this country's needs, to assist doctors from overseas who wish to visit the UK to study an aspect of primary care relevant to their own country's needs, or to help countries develop their own systems of primary care. This year thirteen International Travel Scholarships awards were made.

The following awards will also be made:-

**Katharina Von Kuenssberg Award:** The Katharina Von Kuenssberg Award is awarded each year for the most outstanding international travel scholarship application submitted.

**John J Ferguson International Travel Scholarship:** The John J Ferguson International Travel Scholarship was established in 1994 and was made possible by the generous donation to the College of a capital sum by Dr Ferguson FRCGP. This scholarship is awarded each year for the outstanding scholarship application from a doctor undertaking study in relation to the Middle or Far East.

**Value** The value of each scholarship will range from £100 to £1,000.

#### Closing Dates

**Katharina Von Kuenssberg Award** Friday 17 January 1997 (for projects from 1 March 1997 - 1 March 1998)

**International Travel Scholarships** Friday 17 January 1997 (for projects from 1 March 1997 - 1 March 1998)

Friday 15 August 1997 (for projects from 1 October 1997 - 1 October 1998)

**John J Ferguson International Travel Scholarship** Friday 15 August 1997 (for projects from 1 October 1997 - 1 October 1998)

**If you would like further details or an application form please contact:**

**Mrs Mayuri Patel, Assistant Committee Clerk to the International Committee, Royal College of General Practitioners,  
14 Princes Gate, Hyde Park, London, SW7 1PU. Tel: + 44 171 581 3232 Ext 233 Fax: + 44 171 589 3145**

**Contact our website: <http://www.rcgp.org.uk/>**