

Ian M St George MD FRACP FRNZCGP

Keywords

✱

Why assess knowledge? Haven't we gone past the protracted multiple-choice questions of medical school? Surely if we are to assess anything we should assess actual clinical performance? Are we not more concerned with what the doctor actually 'does' in practice and less concerned with what a doctor 'knows'?¹ Aren't we properly more concerned with performance than with competence?

At least as far as general practice is concerned, they are on firm evidential ground. Maastricht researchers compared the predictive values of written-knowledge tests and a standardised multiple-station examination (OSCE) for the actual medical performance of general practitioners.⁴ Their subjects underwent a general medical knowledge test, a knowledge test on technical skills, a multiple station examination using standardised patients and a video assessment of a real surgery. The predictive value of medical knowledge tests, (0.43 to 0.56 – Pearson correlation disattenuated), proved to be comparable with the predictive value of the multiple-station examination for actual performance (0.33–0.59). The researchers concluded that medical knowledge tests can predict actual clinical performance as well as a multiple-station examination. A knowledge test may thus be a good alternative to an OSCE for assessing a large number of practising GPs.

Norcini studied intensivists and found *'that performance on a cognitive examination is related to performance in practice. Of course, this type of examination is not a substitute for rigorous evaluation of practice outcomes, nor is it broad enough to include important aspects of competence such as communication skills and professionalism. Nevertheless, until better measures are available for high-stakes use, the cognitive examination is a reasonable alternative.'*¹⁵

million patients.⁶ They looked at existing data on mammography screening rate, continuity of care index, disease-specific and symptom-relief prescribing rate, contraindicated prescribing rate, and consultation rate. They found scores in examinations at the end of medical school showed a sustained relationship with indices of preventive care and acute and chronic disease management.

Evidence of success in knowledge tests in general practice in NZ is College membership, leading to vocational registration; vocationally registered general practitioners are under-represented in competence review statistics here compared with those who remain generally registered.⁷ In Ontario general practitioners without professional affiliations were more likely to be practising at a substandard level.⁸ In the United States, Sharp and others reviewed papers exploring the relationship between Board certification and actual clinical outcomes: of the 33 papers fulfilling their criteria, 16 demonstrated a significant positive association between certification status and positive clinical outcomes.⁹

What tools then, do we use to test knowledge in the Medical Council's competence reviews? We have chosen the case-based oral (CBO, aka chart-stimulated recall, CSR) as our primary assessment tool. This bears little resemblance to written multiple-choice examinations – not that we have any quarrel with MCQs: they are well-established, reliable knowledge tests; but we doubt their acceptability in reviews of practising doctors. Nor does the CBO bear any re-

semblance to the traditional anatomy orals of our youth ('*What we don't cover in the lectures we do cover in the examination*'); there are no silly games or unkind surprises here.

The reviewers examine a sample of the doctor's own files, looking for clinical knowledge in longitudinal care. With the file in front of him or her, the doctor responds to questions exploring knowledge of the conditions encountered. The questions are based on the doctor's own cases. Salvatori and others described the development of the test for reviewing occupational therapists, '*The CSR tool... taps global domains of competence: use of theory, assessment, program planning, intervention, discharge planning, follow-up, program evaluation, clinical reasoning and professional behaviours. ... (it) is not only reliable and valid, but also sufficiently generic to be used in a variety of practice settings as a global measure of on-the-job performance.*'¹⁰

Cognitive dissonance

There may be a mismatch between knowledge and its application. You will recognise this doctor – young, probably overseas-trained, with dispersed thinking.¹⁰ The features of dispersed thinking are:

- The doctor has abundant knowledge – a differential diagnosis list is readily generated, and new ones may be generated for each new finding; but the list is static – it is not challenged by the actual findings;
- The diagnoses are not appropriate in this clinical context – for this patient with these issues; they are not articulated in the context of the patient as a whole;
- The doctor takes a long history, an exhaustive examination, suggests many diagnoses, but no working diagnosis; no clear direction emerges as each symptom and sign is considered; the doctor misses the obvious – cannot see the wood for the trees.
- The reasoning and discourse are dispersed; there is little or no resolution of the problem;

Assessment of such doctors is often difficult – they rightly protest their knowledge is exhaustive, and their dispersed thinking itself impedes their ability to understand its impact on their clinical reasoning.

Experienced doctors possess elaborated networks of knowledge fitted to their tasks: these are called scripts. Key features are the elements of a problem that are crucial to its successful resolution. Key feature

problems and examinations are used for testing clinical decision making skills. One such examination is the script concordance (SC) test.¹⁰⁻¹⁵

This examines whether knowledge is efficiently organised for clinical actions. It measures the degree of concordance between examinees' scripts and the scripts of a panel of experts. Charlin and others describe the principles of construction of a SC test.¹⁴ It is a simple and direct approach to testing organisation and use of knowledge. It is relatively easy to construct and use and can be made machine-scorable. It can be either paper or computer-based and with careful preparation can be incorporated into the case based oral:

'OK, you have told us what you were thinking when you managed this case; now, what if the patient had also had joint pains?'...

'Now, what would you think if he told you he had recently been duck shooting in Australia and had suffered a lot of bites by unusually aggressive mosquitoes?'

Disclaimer

These are the author's views, and are not necessarily those of the Medical Council of New Zealand or its members or other staff.

References

1. Miller GE. The assessment of clinical skills/competence/performance. *Acad Med* 1990; 65: S63-67.
2. Turnbull, Cunningham J, Unsell, Norman G, Ferguson B. Cognitive difficulty in physicians with impaired competence. Paper given at the International Physician Assessment Coalition conference, Manly, 2003.
3. National Clinical Assessment Authority: <http://www.ncaa.nhs.uk/toolkit/>.
4. Ram P, van der Vleuten C, Rethans JJ, Schouten B, Hobma S, Grol R. Assessment in general practice: the predictive value of written-knowledge tests and a multiple-station examination for actual medical performance in daily practice. *Med Educ* 1999; 33 (3):197-203.
5. Norcini JJ, Lipner RS. The relationship between the nature of practice and performance on a cognitive examination. *Acad Med* 2000; 75:S68-S70.
6. Tamblyn R, Abrahamowicz M, Dauphinee WD, Hanley JA, Norcini J, Girard N, Grand'Maison P, Brailovsky C. Association between licensure examination scores and practice in primary care. *JAMA* 2002; 288 (23):3019-26.
7. St George IM. Should all general practitioners be vocationally registered? *NZ Fam Physician* 2004; 31: 17-19.7.
8. McAuley RG, Paul WM, Morrison GH, Beckett RF, Goldsmith CH. Five-year results of the peer assessment program of the College of Physicians and Surgeons of Ontario. *CMAJ* 1990; 143 (11):1193-9.
9. Sharp LK, Bashook PD, Lipsky MS, Horowitz SD, Miller SH. Specialty board certification and clinical outcomes: the missing link. *Acad Med* 2002; 77:534-542.
10. Bordage G. Elaborated knowledge: a key to successful diagnostic thinking. *Acad Med* 1994; 69:883.
11. Page G, Bordage G. The Medical Council of Canada's key features project: a more valid written examination of clinical decision-making skills. *Acad Med* 1995; 70:104.
12. Page G, Bordage G, Allen T. Developing key-feature problems and examinations to assess clinical decision-making skills. *Acad Med* 1995; 70: 194.
13. Charlin B, Roy L, Brailovsky C, Goulet F, van der Vleuten C. The script concordance test: a tool to assess the reflective clinician. *Teach Learn Med* 2000; 12: 189.
14. Brailovsky C, Charlin B, Beausoleil S, Cote S, van der Vleuten C. Measurement of clinical reflective capacity early in training as a predictor of clinical reasoning performance at the end of residency: an experimental study on the script concordance test. *Med Educ* 2001; 35:430.
15. Elstein AS, Schwarz A. Clinical problem solving and diagnostic decision making: selective review of the cognitive literature. *BMJ* 2002; 324:729.