

Chapter 5: Assessing knowledge

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Knowledge and clinical performance

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?

But just a minute here. You cannot perform well unless you are competent. In Ontario one third of doctors who performed at a substandard level at competence review were found on cognitive testing to be impaired.² That is an important observation if remedial education is to be considered. There is thus at least a theoretical necessity to assess knowledge before anything else, and indeed, the National Competence Assessment Authority in Britain does just that – it requires NHS doctors who are about to undergo a performance assessment to have a specialty-specific knowledge test at the outset.³

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 standardized 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 standardized 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".⁵

In 2002 Quebec researchers examined 912 family physicians who passed the Quebec family medicine certification examination between 1990 and 1993 and entered practice, and their practice performance for 3.4 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

Tools for testing knowledge

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 resemblance 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. Charlton 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 duckshooting in Australia and had suffered a lot of bites by unusually aggressive mosquitos?”

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