Part 3: Selected Tools for Assessing the CanMEDS Competencies

3.1 Medical Expert: knowledge-based competencies

Glen Bandiera

Definition

As Medical Experts, physicians integrate all of the CanMEDS Roles, applying medical knowledge, clinical skills and professional attitudes in their provision of patient-centred care. Medical Expert is the central physician Role in the CanMEDS framework.

Key competencies

Physicians are able to …

1. Function effectively as consultants, integrating all of the CanMEDS Roles to provide optimal, ethical and patient-centred medical care;
2. Establish and maintain clinical knowledge, skills and attitudes appropriate to their practice;
3. Perform a complete and appropriate assessment of a patient;
4. Use preventive and therapeutic interventions effectively;
5. Demonstrate proficient and appropriate use of procedural skills, both diagnostic and therapeutic;
6. Seek appropriate consultation from other health professionals, recognizing the limits of their expertise.

Overview

The Medical Expert Role is central to overall physician competence and, as such, is the Role most familiar to those who assess medical learners. This Role can be manifested both in what learners know and in what they do. Attitudes, while affecting eventual performance, are harder to assess but are usually manifested in a learner’s behaviour. Competence in this Role involves obtaining a body of factual knowledge deemed relevant, current and appropriately comprehensive, as well as problem-solving through the application of this knowledge. Finally, the Medical Expert Role implies an ability to coordinate one’s performance of the other six CanMEDS Roles to maximize the effectiveness of clinical practice for each patient and the community served.

This chapter does not address the assessment of procedural competency in the Medical Expert Role; this topic is specifically addressed in the next chapter.
Preferred tools

1. Direct observation and in-training evaluation reports
Most Medical Expert key competencies are amenable to assessment through direct observation. Observation of clinical care allows learners to demonstrate their application of knowledge and higher-order thinking. Questioning during patient encounters or teaching sessions (such as ward rounds) permits direct observation of factual knowledge. The indications, complications and steps pertaining to procedures can be evaluated. Finally, a learner’s ability to integrate all CanMEDS Roles into clinical care is best assessed during the day-to-day clinical care of patients. Ideally, ITERs will be completed on the basis of repeated observations over time, with each observation resulting in feedback to the learner to foster the development of competence.

Much has been written about the design of ITERs and the ability of observers to be objective in their assessments of multiple dimensions of performance. Well-designed ITERs are specific to the behaviours of interest, have clear descriptors for each level of performance and promote the use of the entire assessment scale. However, most ITER-based systems still have problems with recall bias, the halo effect and central tendency. Training assessors will reduce but not eliminate these concerns.

2. Written examinations
Written tests have long been central to the assessment of a learner’s knowledge base. They can test factual knowledge and, when properly designed, higher-order problem-solving and diagnostic reasoning. Multiple-choice questions (MCQs) and short-answer questions (SAQs) are preferred over essays and other forms of narrative response in view of their higher reliability and more objective marking parameters. Although properly designed MCQs and SAQs are hard to develop, they can be highly reliable and thus are used on many certification examinations. Written tests appeal to learners because they serially gauge the developing knowledge base and help prepare learners for a component of the certification examination experience.

Written examinations cannot assess actual clinical performance; rather, they assess the foundational knowledge on which performance is based.

3. Oral examinations
Oral examinations are time- and resource-intensive. They are, however, one of the best methods for assessing a learner’s ability to apply knowledge to clinical scenarios. Although written tests are efficient at assessing pure factual knowledge, oral examinations are appropriate for assessing integration of facts, formation and prioritization of differential diagnoses, development of management plans and difficult decision-making. Oral examinations allow learners to interact with the assessor and demonstrate their ability to thoroughly assess and manage patient problems.
To maximize reliability, exam material must be standardized, and oral examiners need to be trained in the delivery of information and the assessment of responses. Without these steps, oral examinations can have marginal reliability as a result of assessor variability, loss of focus on intended subject areas, and impaired learner performance due to inappropriate examiner disclosure or questioning.

4. **Objective structured clinical examinations (OSCEs)**

OSCEs are effective assessment tools for a variety of clinical domains. However, since they are resource- and time-intensive they should be used only for scenarios in which other assessment tools are less appropriate. OSCEs are useful for testing the application of knowledge in specific clinical settings that are high-risk, difficult to observe in practice, or rare.

OSCEs are intended to provide multiple “samples” of a learner’s ability; however, they suffer from limited generalizability in that performance in a given clinical scenario does not necessarily reflect performance in all related areas. OSCE stations require global-rating scales, checklists or standardized patient feedback to generate assessment data.

5. **Simulation**

Simulation involves a spectrum of assessment tools, ranging from standardized patients to partial-task trainers to high-fidelity, computer-driven mannequins. All of these tools can be adapted to assess knowledge, procedural skills, clinical reasoning, etc. Simulation can be used alone or as a component of OSCE stations. Used alone, simulation is useful for testing, potentially with a high degree of realism, the application of knowledge in specific clinical settings. Learners are tasked with carrying out a clinical activity designed to assess a specific domain of knowledge. Because of the resource-intensive nature of simulation, it is best reserved for multifaceted tasks involving difficult decisions and clinical reasoning. Application of the fundamental principles of leadership, teamwork and collaboration can also be assessed.

**Key literature**

Comments

This review was carried out by a subcommittee of American program directors to describe the most appropriate methods for assessing clinical skills. They focus on direct observation and simulated patients as the most appropriate methods and offer suggestions as to how to include them in a residency program.


**Tool type**

- Written examination: multiple-choice questions

**Study design**

- Experimental single cohort

**Study population**

- Gastroenterology learners and experts

**Comments**

The authors listened to physicians at various levels of training and practice while they verbally worked through an MCQ examination to determine how they would approach different types of multiple-choice questions. This study lends insight on how a multiple-choice question can test higher-order thinking and how to properly design such questions.


**Tool type**

- Direct observation

**Study design**

- Review

**Study population**

- Medical students and residents

**Comments**

This excellent review article examines the disadvantages and some of the inherent biases of direct observation and discusses challenges in improving this method. Solutions are offered to help increase the degree to which the assessment of actual behaviour is reflected in written reports.

**Tool type**
- Direct observation, ITERs

**Study design**
- Review article

**Study population**
- Medical residents

**Comments**
This is an excellent review of the design and use of rating scales to assess resident performance. It describes the principles of scale design and ways to introduce rating scales to maximize the accuracy of the resulting assessments.


**Tool type**
- Written examinations, direct observation, standardized patients, OSCEs

**Study design**
- Review

**Study population**
- Medical residents

**Comments**
This review article makes the case for multi-modal assessment and explains the ideal roles for various assessment methods in an overall resident assessment program.

**Other literature**


The CanMEDS Assessment Tools Handbook: An introductory guide to assessment methods for the CanMEDS competencies

The first edition of the CanMEDS Assessment Tools Handbook is a valuable resource for medical educators, clinical teachers and others interested in assessing physician competence using the CanMEDS framework. It includes a brief overview of contemporary tools for each of the CanMEDS Roles and highlights key references that educators will find helpful.

(Also available in French: Order # 010002010107F)

<table>
<thead>
<tr>
<th>Order# 01002021106E</th>
<th>CanMEDS Handbook-English 8.5” x 10.75”</th>
<th>Fellows ......................... $20.00</th>
<th>Non-fellows and international .......... $50.00</th>
</tr>
</thead>
</table>

The CanMEDS Generic Posters

The generic CanMEDS pocket card is a handy reference tool to assist physicians and residents when teaching, learning and embodying the CanMEDS Roles.

Each 3.5 X 6 card is laminated (Also available in French: Order # 02001010706F)

<table>
<thead>
<tr>
<th>Order# 03001011106E</th>
<th>CanMEDS Poster-English 11” x 17” (Also available in French)</th>
<th>Fellows ................................ $15.00</th>
<th>Non-fellows and international .......... $20.00</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Order# 03002011106E</th>
<th>CanMEDS Pocket Card-English 3.5” x 6”</th>
<th>Fellows ................................ $2.50</th>
<th>Non-fellows and international .......... $4.00</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Order# 03003011106E</th>
<th>CanMEDS Pocket Card-English 3.5” x 6”</th>
<th>Fellows ................................ $2.50</th>
<th>Non-fellows and international .......... $4.00</th>
</tr>
</thead>
</table>

These posters are also available as mounted posters. Please add “MO” to the end of the order number.

Fellows ................................ $36.00 | Non-fellows and international .......... $50.00

Products are also available in French. Refer to http:\rcpsc.medical.edu

Please note that all prices are stated in Canadian dollars.

You may pay by:
- Bank draft or money order in Canadian funds.
- Cheque drawn on a Canadian or US bank account in Canadian or US funds.
- VISA, MASTERCARD or AMEX.

Name: 

Organization: 

Address: 

City: Province: Postal/Zip Code: Country:

E-mail: 

Tel: ( ) - RC Fellow #: 

Order # Description Quantity Price Total

□ Cheque (Payable to the Royal College) □ AMEX □ MC □ VISA

Signature: 

The Royal College of Physicians and Surgeons of Canada
Le Collège royal des médecins et chirurgiens du Canada
774 promenade Echo Drive, Ottawa, Ontario, Canada K1S 5N8
Tel: (613) 730-8177 Fax: (613) 730-8262
CanMEDS@rcpsc.edu http://rcpsc.medical.org