Case Study N: An Alternative Certification Examination (ACE) for Procedural Skills

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This case study describes an integrative examination format which can be used for assessment OF (summative) and FOR (formative) learning of procedural skills in health sciences. It can be used in the clinical years of medical training, namely years three, four and five.

Undergraduate assessment is a prerequisite to licensure, culminating in the awarding of a basic qualification to practice medicine. Medical schools strive to ensure that students have acquired the expected knowledge, skills and attitudes over a broad range of general and speciality medicine to ensure patient safety. Regulatory bodies have a statutory responsibility to set and maintain the standards of basic medical education during undergraduate training and internship. The ultimate aim of all medical schools is to adequately prepare graduates for joining the hospital workforce. An assessment format that reliably measures the breadth of knowledge and clinical skills acquired over the entirety of the medical curriculum is paramount to ensure that only safe students pass. Graduates of medical training must be able to apply the knowledge that they have accumulated during their training. Ultimately, they must demonstrate competence in the domains of professional practice, namely: clinical skills, communication skills, scholarship, professionalism, relating to patients, collaboration and team work, and management (including self). At the core of all requirements is ensuring patient safety and quality of patient care (see Figure 1).

Figure 1 Domains of professional practice (adapted from Irish Medical Council, 2014)
There are many methods of summatively assessing competence in these domains among medical students, with the most common method being an objective structured clinical examination (OSCE). This is a fragmented approach with students moving to different skills and different procedures every six minutes and only “showing” what they know (Miller, 1990, Figure 2). Despite standardisation of assessment of procedural skills with checklists and global raters, the demonstration of competence over a series of independent skills does not, however, guarantee the ability of a student to manage an entire patient episode.

It is believed that acquirement of competence in core procedural skills require a more holistic approach. With this in mind, a new assessment format was devised that requires students to attain information from a variety of sources, assimilate these findings and ultimately translate such findings into a rational diagnosis with a resultant instigation of a management plan. This project was undertaken with the final year medical students in TCD. The intention behind this project was to allow students to integrate the skills into full patient encounters in line with actual clinical practice. From the students’ perspective, feedback from the OSCE format consists of an overall percentage score. With this new integrative format, the students receive qualitative feedback from multiple examiners on their actual levels of performance.

Current undergraduate examination methods robustly assess up to five of the eight required skills. This new assessment format, the alternative certification examination (ACE), assesses all eight of the required domains in surgical cases. The ACE format consists of four sequential patient encounters observed by two independent examiners (see Figure 3). The new format was piloted and ratified by the Curriculum Planning Committee in the School of Medicine at TCD. Further details on the pilot can be found in Morris et al. 2013 and 2014.
Competence in the domains of professional practice are assessed in the following ways within the ACE format:

1. By the ability of the student to score at least 3/5 (barely adequate for Intern/Foundation Year 1 level practice) in all four encounters. Domains assessed: Scholar, Clinical Skills, Relating to patients, Communication skills, Self-management including time and collaboration.

2. By demonstrating the domain of professionalism - i.e. avoiding the following:
   - Inappropriate attire
   - Poor rapport with the patient
   - Displays of disinterest
   - Lack of regard to patient anxiety, discomfort or pain
   - Inappropriate familiarity with the patient - casual approach
   - No attempt to involve patient in the management plan - paternalistic approach
   - Disregard of patient concerns
   A yellow note is applied to the marking sheets to allow for concerns re professionalism and the reasons for same to be listed on the marking sheets under comments. This is a decision made by the examiner in collaboration with the simulated patient.

3. By demonstrating the domain of patient safety and quality of patient care i.e. identifying a critical differential diagnosis during the patient assessment and management.

   The rationale for the inclusion of a patient safety measure as pass criteria is to ensure those achieving a pass mark demonstrate competence in all eight domains, as required by certifying bodies. Students who do not identify the critical differential diagnosis have a red note applied to their marked sheets and are awarded a final score of 2/5 which is a fail. Both examiners make this assessment independent of each other.

All students receive a written copy of their coded marked assessment sheets with examiners comments.
Student evaluations of the ACE format
As part of the pilot of this format, all students (n = 137) completed an evaluation form on the ACE exam format. The evaluation form utilised was devised by the research team and included a five-point Likert scale and the opportunity for free text. Students were asked to compare the ACE format with an OSCE.

<table>
<thead>
<tr>
<th>Question</th>
<th>Statement</th>
<th>Median Score 1-5 (Inter Quartile Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I found the ACE exam process a useful learning experience</td>
<td>4 (4:4)</td>
</tr>
<tr>
<td>2</td>
<td>The ACE exam helped me identify my strengths and weaknesses</td>
<td>4 (4.5:5)</td>
</tr>
<tr>
<td>3</td>
<td>The ACE exam format is better than the OSCE exam for clinical skills</td>
<td>4 (4.5:5)</td>
</tr>
<tr>
<td>4</td>
<td>Being examined by two examiners simultaneously is better than one examiner</td>
<td>4 (4.5:5)</td>
</tr>
<tr>
<td>5</td>
<td>The ACE exam helped me be more integrative i.e., join the dots between</td>
<td>4 (4.5)</td>
</tr>
<tr>
<td></td>
<td>history, exam, investigation, and case management</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>The ACE exam format prepares me better for managing a patient in clinical</td>
<td>4 (4:4)</td>
</tr>
<tr>
<td></td>
<td>practice when compared to the OSCE exam format</td>
<td></td>
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Example of open-ended responses included:

“This exam looks at the bigger picture of managing a patient episode, not just doing a history or doing a cannula.”

“I think it’s a more suitable exam to determine who will be a safe doctor.”

“Good format as it’s helped me direct my study.”

“Good as the format allowed you to formulate your own management plan including follow-up.”

This alternative integrative approach to assessing clinical skills, ACE, had a marked effect on participant's self-reported confidence in their ability to undertake the intern role. Participants reported very positive attitudes to this new method of assessment, specifically relating to the integration of previously acquired knowledge and skills. In summary, participants were very positive about this new assessment approach stating that it “drew all the information together” and highlighted their need to manage an entire patient episode, "which was a scary albeit real concept".

Summary
The ACE format was reported by examiners as an acceptable examination methodology for formative or summative assessment of surgical cases at the end of a primary medical degree. In summary, the ACE exam format is standardised, integrative and has excellent inter-rater reliability. The ACE overtly assesses the domains of professionalism and maintenance of patient safety. The ACE shows potential as an alternative examination to the OSCE in assessing all eight domains of professional practice. Reliability is an essential component of the validity of any assessment. The ACE format proved a reliable assessment, achieving an inter-rater reliability (IRR) of 0.907 (CI 0.766, 1) Cronbachs Alpha.

The ACE shows potential as an alternative assessment format to traditional methods. Ensuring specificity in clinical skills examination in medicine remains a challenge to educators. The results of
the pilot study for this format indicate that students and examiners found the ACE format comprehensive and discriminatory by identifying those not yet at a level expected to provide safe patient care. Inclusion of the identification of critical differential diagnoses in the examination standard setting programme may increase specificity.

**Enablers and challenges to this approach**

The ACE format has great potential for use as an alternative to an OSCE in all health sciences and is currently being piloted by the School of Dentistry at TCD.

With regards to cost of running, it is less expensive to run when compared to an OSCE.

The ACE format assists the early identification of students who are struggling to attain proficiency and allows for targeted remedial teaching to ensure the required levels of competence are attained by the end of the training programme.

The quality of feedback to students is much improved. Students report that the feedback from the ACE assists them focus on areas for revision and improvement.

The ACE assessment is a fair assessment as it is standardised, thus all students experience cases of equal complexity.

This assessment format is currently in use in Year 3 and 5 as assessment FOR learning and there is a plan to utilise it as assessment OF learning in 2017.

**References**


ENHANCING PROGRAMME APPROACHES TO ASSESSMENT AND FEEDBACK IN IRISH HIGHER EDUCATION:

Case Studies, Commentaries and Tools | https://tinyurl.com/NFprogramme

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