

Assessing undergraduates' practical clinical skills

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Abstract

A list of practical skills to observe or learn was included in an undergraduate child health core curriculum. The ability of students to perform these tasks was assessed in a short objective test. This testing has encouraged them to become more proficient in these important skills.
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The way in which medical students are trained has been widely criticised and the General Medical Council has been expressing its concerns for many years.¹ In its most recent set of recommendations an important innovation is the inclusion of 'skills objectives'.² Students will have to show proficiency in essential practical procedures before they can graduate.

Paediatrics as a clinical discipline provides an excellent opportunity to incorporate various practical clinical skills in the undergraduate curriculum. We have developed a syllabus of practical tasks to observe or learn and a method of assessing students' abilities in these tasks.

Methods

In Cardiff, students receive their clinical experience in paediatrics over an eight week period. To aid their learning during this time they are given a handbook defining the core curriculum. Included in this is a list of the special skills and practical tasks to learn or that require observation during their clinical attachment and are judged by members of the department to be especially relevant to paediatric practice.

At the end of this time, students (between 30 and 35 individuals) are assessed by

continuous assessment (a consultant mark and case commentary mark), written examination (multiple choice questions with a problem solving paper), and clinical examination to give a final combined mark.

The clinical examination comprises 20 minutes of short cases that takes place on the paediatric wards, and then a 10 minute practical task assessment in a single side room in the paediatric outpatient department. A total of 16 tasks have so far been devised (table 1). Four tasks are selected at the end of each rotation in which students are examined. The students are unaware before the examination which tasks they will be asked to do. Each student is required in 10 minutes to perform two practical tasks and allowed a maximum of five minutes for each task. They are all marked according to an objective scoring system by medical staff using structured marking sheets. An example of the question asked by the examiner to the candidate and the scoring system used is shown in table 2. Marks are given between 0 and 5 for each task. Each student is asked to perform a practical clinical task by a postgraduate member of the Department of Child Health and then scored according to the objective scoring system while observed performing the task. Two students are assessed separately at any one time by two examiners.

Results

A total of 150 students have been assessed using this method. Marks given for each task (mean and standard deviations) are shown in table 1. The correlation coefficient, when the practical tasks were compared with the final combined examination mark for the student attachment, was 0.37 and this was significant when analysed by *t* test ($p < 0.001$). Also significant was the correlation between the practical tasks mark and short case clinical examination ($r = 0.33$, $p < 0.001$) while there was no significant correlation between the practical tasks mark and written examination mark ($r = 0.10$, $p > 0.2$).

Students are offered the opportunity to comment on their examination methods by a written questionnaire and oral comments at

Table 1 List of practical clinical skills tested and mean (SD) mark obtained in each task

	Mean (SD) mark
1. Peak flow measurement	3.9 (0.83)
2. Asthma inhaler technique	3.3 (1.1)
3. Measurement of height	3.5 (0.8)
4. Measurement of head circumference	3.3 (1.3)
5. Measurement of temperature	3.9 (0.96)
6. Performing a hearing distraction test	3.5 (0.5)
7. Examination of a squint	3.27 (1.1)
8. Lumbar puncture technique	2.4 (1.8)
9. Paediatric drug prescribing	3.8 (1.2)
10. Making up oral rehydration solutions	3.4 (1.0)
11. Making up infant milk feeds	3.4 (1.3)
12. Blood glucose measurement	3.2 (1.4)
13. Urine analysis	3.9 (1.1)
14. Blood pressure measurement	4.0 (0.58)
15. Neonatal hip examination	3.6 (0.69)
16. Immunisation requirements and technique of administration	4.2 (1.0)

Table 2 Example of an objective scoring system for measurement of a child's height

Question to candidate:	Mark
using the equipment in this room measure this child's height	
Equipment available: Harpenden Stadiometer (Holtain)	
Correct procedure	
(a) Child in stockings feet	1
(b) Heels of feet abutting onto wall	1
(c) Head in correct plane	1
(d) Stretching of neck	1
(e) Correct measurement to nearest 0.5 cm	1

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the end of their clinical attachment. Practical task assessment appears to be accepted by students as a fair method of assessment.

Discussion

We had noted previously that our methods of assessment had not tested the students' grasp of practical skills needed in paediatric practice. We had clearly defined in our teaching handbook and core curriculum which of these we judged to be relevant and appropriate to the competence level required by a junior doctor treating children. Thus, in order to encourage students to learn these tasks, assessment was included in their examinations to help focus learning. Students are known to pay attention to topics that they know will feature in examinations.³ It is our subjective opinion that students are more likely, during their clinical attachment, to make themselves aware of practical skills since the introduction of this means of assessment. We intend to build on the 16 tasks so far incorporated into our core curriculum.

The test has proved acceptable to both examiners and students. It is feasible to run, requires minimal resources supervised by a member of middle grade junior staff and a lecturer in paediatrics, and can be marked as the assessment is performed. It does not require a large amount of organisation, a problem associated with

the use of more formal objective structured clinical examinations.

It is now recognised that a range of methods is needed to assess a range of clinical skills⁴ and practical tasks form one part of this. The correlation between the practical task mark with the clinical short case examination and final marks, although statistically significant, is small. This suggests that the practical tasks are assessing other abilities that may not have been covered by previous methods of examining students and this we believe improves our overall assessment of undergraduates.

Proficiency in clinical practical skills has been identified as an important part of the way in which medical students should be trained.² We have to incorporate these skills in our paediatric curriculum and assess students' ability in performing these tasks as part of our range of methods for assessing students.

Details of the other 15 clinical skills tested with their objective scoring system are available on request from the authors.

- 1 General Medical Council. *Recommendations as to the medical curriculum*. London: GMC, 1957.
- 2 General Medical Council. *Tomorrow's doctors: recommendations on undergraduate medical education*. London: GMC, 1993.
- 3 Newble DI, Jaegar K. The effect of assessments and examinations on the learning of medical students. *Med Educ* 1983; 17: 165–71.
- 4 Jolly B, Wakeford R, Newble D. Requirements for action and research in certification and recertification. In: Newble D, Jolly B, Wakeford R, eds. *The certification and recertification of doctors: issues in the assessment of clinical competence*. Cambridge: Cambridge University Press, 1994: 231–43.