

## **Micro-OSCE for Assessment of Undergraduates**

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Medical teachers have always been concerned about the assessment of students in examination. Traditionally, clinical case presentation (CCP) has been used for assessing clinical skills and reasoning power. A drawback of CCP is that unless the examiner makes an extra effort and spends more time, the psychomotor skills of the student cannot be assessed, and the affective domain does not come into the purview at all. Assessment by CCP is also very subjective. This concern has led to an attempt to improve the reliability and objectivity of clinical examination with the introduction of objective structured clinical examination(OSCE)(1).

The recommendations of the sub-committee of the MCI emphasize the importance of developing the three domains of knowledge. Evaluation finally determines, the way in which students will study. We, believe that OSCE stimulates the students to develop the 3 domains. Since 1997, we have been using OSCE along with CCP for the formative assessment of final year students.

There is a change in the pattern of posting of students following the latest MCI

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regulations and introduction of semester system in the MBBS curriculum. Students are now posted in the department of Pediatrics during the Vth, VIIIth and IXth semesters. During one academic year, 20-24 batches of students are posted in our department. At the end of each posting, internal assessment needs to be done.

Students come to Pediatrics in Vth semester after completing their initial clinical postings in the departments of Medicine, Surgery, and Gynecology. They do not have in-depth clinical or theoretical knowledge of Pediatrics. We thought CCP would not be an efficient means of formative assessment. The next option was OSCE. Conducting a full-fledged OSCE with several stations was not practical; the large logistic support and manpower required was difficult to provide. We looked for an alternative that would assess their proficiency in the methodology of history taking and clinical examination and would at the same time be easy to conduct. The micro-OSCE, a modified OSCE was devised with these aims in mind. We report our experience using micro-OSCE to assess students of semester V.

The short posting of 28 days during semester V is utilized in getting the students acquainted with simple, basic tasks like taking a good case history and examination of children, with stress on anthropometry. On the first day, they are provided with a schedule of the teaching activities of the entire month. Daily, they have a lecture / tutorial session when history taking, clinical examination and basic topics (*e.g.*, growth, development, nutrition, diarrheal disorder and immunization) are dealt with, followed by bedside

clinics. The concept of OSCE is also explained to them. The importance of developing the 3 domains of knowledge is conveyed. They are advised to consider these aspects when they see patients and work-up cases.

**Material and Methods**

The examination is conducted in two parts. First, the students take a multiple-choice question (MCQ) examination on basic topics related to child health; second is the micro-OSCE, which is conducted as follows. Cases are allotted to the students by drawing lots. Each student gets tasks to be performed on each patient; the tasks are displayed on the card kept at the bedside. The tasks are (1) history-taking and (2) procedure.

**History taking station**

Each student is asked to take a particular aspect of history in detail, (e.g., antenatal and natal history, immunization history, dietetic history, relevant history in a child with diarrhea, etc.). At the end of the allotted time, the student presents the history to the observer when he is evaluated. Here the student is also expected to ask the child's name, age, mention who the informant is, and comment on his / her reliability. *Table I* shows a typical task-and-check list for a history station. At the end of this session, the examiner puts across 1 or 2 questions about the patient to the student. The student has to elicit the relevant answers from the mother or the child. The way in which the student interacts with the mother and child is observed and assessed by the examiner during this time.

**Procedure station**

After presenting the history, the student is asked to perform certain tasks while the examiner is observing. Part I is on anthropometry (e.g., taking the length, midarm circumference, weight). Part II deals with

**TABLE I—Task and Checklist of History Station**

Take history of gross motor development of this child

Milestones	Student 1	Student 2	Student 3	Maximum Marks
Name				½
Age				½
Informant				½
Reliable				½
Head control				1
Turning over				1
Sits with support / without support				1
Stand with support / without support				1
Walk with support / without support				1
Interaction with the mother / child				2
Bonus, if any				

Total marks for the station (excluding bonus) 9

systemic pediatrics (e.g., examining for signs of dehydration, eliciting pyramidal tract signs in the lower limbs, looking for mediastinal shift). The task should be demonstrated to the examiner who evaluates each student as per the checklist provided. (*Table II*). The checklist awards points to establishment of rapport and attention to detail while conducting physical examination.

There are usually 24 students in each batch; one examiner evaluates 6 students who have been allotted the same set of questions by drawing lots. An examiner spends 5-7 minutes with each student. Three or 4 examiners are needed to assess a batch of 24-26 students; in 30 minutes all the students are examined. Once the case presentation is over, the student is immediately told of the omissions and mistakes. After the examination, a feedback is taken from the students.

**TABLE II—Task and Checklist of Procedure Station**

Measure the height of this child				
Points to be observed	Student 1	Student 2	Student 3	Maximum Marks
Rapport and consent				2
Made to stand erect against a hard surface				1
Heels touch the wall				1
Both feet together				1
Chin up				1
Use scale/non flexible material to mark the top				1
Value of height				2
Bonus if any				
Total marks for the station (excluding bonus)				9

During semesters VIII and IX, the students get sufficient exposure to Pediatrics. Now the emphasis shifts to acquiring analytical and problem solving skills. At the end of these postings, they have a theory paper, a conventional OSCE and CCP. The final internal assessment examination is conducted on the lines of the University examination.

**Results**

In the last 3 years we have conducted micro-OSCE for 3 batches comprising a total of 300 students. Hundred and eighty of these

students have also completed their semester VIII posting at the end of which they underwent conventional - OSCE. The marks scored by the students of 2 groups ( $n = 93$  and  $n = 87$ ) were analyzed (*Table III*). In both the groups, the marks scored in micro-OSCE were significantly more than the marks scored in conventional OSCE. We feel this is because they are tested in a limited field, unlike at the end of VIII semester, when the syllabus covered by the OSCE is quite vast. The marks scored by the groups for micro-OSCE were not significantly different where as the marks scored by the 2 groups for conventional-OSCE were found to be significantly different. The feedback from the students is that they like this mode of examination, which they feel, also helps improve the doctor -patient relationship. The majority believes that examiner bias is eliminated.

**Discussion**

Our aim is to give sound training in the basic aspects of Pediatrics in semester V with stress on history taking and clinical examination including anthropometry. At the same time we also want the students to develop good psychomotor and affective skills. Because the students realize they would be assessed on the three domains, they try to develop all these skills.

The objective of the history-taking station is to assess the history taking ability of the student. Since the task assigned could be eliciting any part of the history, the students

**TABLE II—Comparison of Marks in Micro-OSCE and Conventional OSCE**

	Batch A (n = 93)		Batch B (n = 87)	
	Micro-OSCE	Conventional OSCE	Micro-OSCE	Conventional OSCE
Mean ± SE	84.7 ± 1.2	69.0 ± 1.2	81.4 ± 1.4	65.4 ± 1.3
Variance	134.4	141.7	178.1	145.6
Range	42-100	44-94	40-100	47-85

### Key Messages

- Micro-OSCE is a satisfactory method for formative assessment of semester V students, where the thrust is on the methodology of history taking and clinical examination.
- The students get a immediate feedback, so that they can correct their mistakes.
- Students enjoy the process, as seen from their feedback.
- Like the conventional OSCE, micro-OSCE needs planning, but is easily executed.

have to be well versed with taking a detailed history, in order to perform well. Not only, the components of the history, but also the manner in which the student elicits response from the mother is assessed. This station also helps to assess the cognitive domain, as the student has to know what needs to be included in the relevant history. The ability of the student to establish a rapport with the patient and the informant is also observed enabling an assessment of the affective domain.

The performance station assesses the psychomotor domain. During the process, the student's interaction with the mother and child and examining skills are observed. The student's cognitive knowledge is also tested. For example, for the question "take the weight of this child," either a sick child who has to be weighed while being carried by his mother, or a bigger child who can stand independently on the weighing scale, or an infant who has to be weighed on a pan balance, can be chosen, to assess whether the student knows the method to adopt and his performance. Unlike in CCP, the student is not expected to analyze the history or physical findings; only the methodology is critically observed.

When the checklist is prepared, the Faculty decides what the student "must know"(1). Bonus marks are incorporated in the checklist, to be given if a student performs "desirable to know" tasks. For example, if the task to be performed is 'taking immunization

history', the student is expected to ask in detail about the vaccines included in the national immunization program ("must know")(2). If he also elicits history about pulse polio immunization and optional vaccines ("desirable to know"), he is given bonus marks. Maximum bonus marks are fixed as 10-20% of the total marks for that station. Preparing the checklist for both the stations in advance, after discussion among the Faculty, eliminates examiner bias.

Within a short time, utilizing 2 stations, the cognitive, affective and psychomotor domains of knowledge can be reasonably well assessed in the limited fields of history taking and examination including anthropometry. Assessing a batch of 24 students hardly requires 30-40 minutes, provided there are 3-4 observers. Since the time required is short, it is possible to spare 3-4 of the staff-members. This is especially true there where there are no PG students or residents to help in the conduct of conventional OSCE. Micro-OSCE is easier to conduct than CCP and also takes less time.

There are certain practical problems, which we think can be solved. In micro-OSCE the same examiner does not assess all students. One examiner examines only 5-6 students. To overcome possible examiner bias, preplanned checklist is given to each examiner. As with the CCP, there is an element of luck, in that, all students do not get the same tasks. We try to minimize this 'luck factor' by taking care that

all the tasks are simple(3). Since the students are given separate cases, 24 “cases” are needed. If there is a shortage of patients, simulated patients (children who are relatively well, or awaiting discharge) can be planted to assess various skills(4).

In conclusion, we believe micro- OSCE is a satisfactory means of formative assessment of Vth semester students where the thrust is on the methodology of history taking and clinical examination. The three domains of knowledge can be tested. However, it cannot be used as a means to assess the overall clinical competence of medical students especially in semesters VIII and IX.

#### **Acknowledgement**

The authors thank our former and present Heads of Department, Drs. Komalavally and Parvathy V.K., for having permitted us to go forth with this idea, and our colleagues, Drs. Ramaraj S., Muralidharan T.D., Purushothaman K.K., Parvathy M., Anandakesavan, Sheela T.A. and Usha M. for their cooperation in the smooth conduct of micro-OSCE.

*Contributors:* LM conceived the idea of Micro-OSCE, provided the overall framework and drafted the manuscript. She will act as guarantor for the paper. JM helped in the conduct of the examination and drafting of the manuscript. NSM helped in the initial stages of planning, conduct of the examination and tabulation and analysis.

*Funding:* None

*Competing interests:* None stated

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