

OSCE & OSPE



Objective Structured Clinical Exam Objective Structured Practical Exam

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What is an OSCE / OSPE?

- **O**bjective
- **S**tructured
- **C**linical / **P**ractical
- **E**xamination

Harden RG and Gleeson FA Assessment of clinical competence using an objective structured clinical examination (OSCE) *Medical Education*, 1979, Vol 13: 41-54



Agenda: Overview

- OSCE
 - Format of an OSCE
 - Purpose of an OSCE
 - Advantages & Disadvantages
 - Development Principles
 - Training observers
 - Scoring considerations
- OSPE

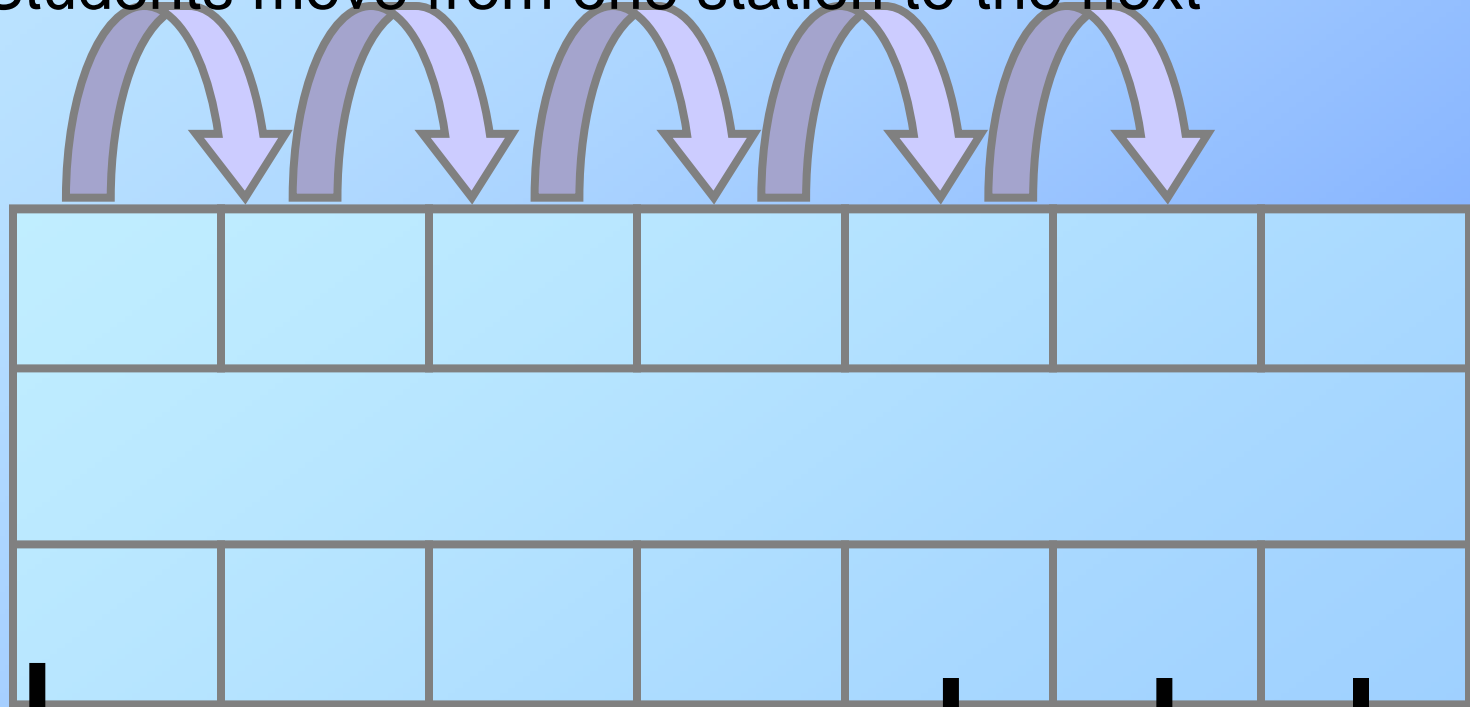


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OSCE Design

Students move from one station to the next



observed stations
clinician examiners
usually located in each
station



What is an OSCE?

A multi-station, multi-task assessment process



There can be clinical or practical tasks

Harden et al. Assessment of clinical competence using objective structured examinations. BMJ 1975; 1:447-451



Variety & Mix of OSCE Stations

 Patient-based  Clinical task  Written task

Traditional OSCE



SP-based test



Station couplets



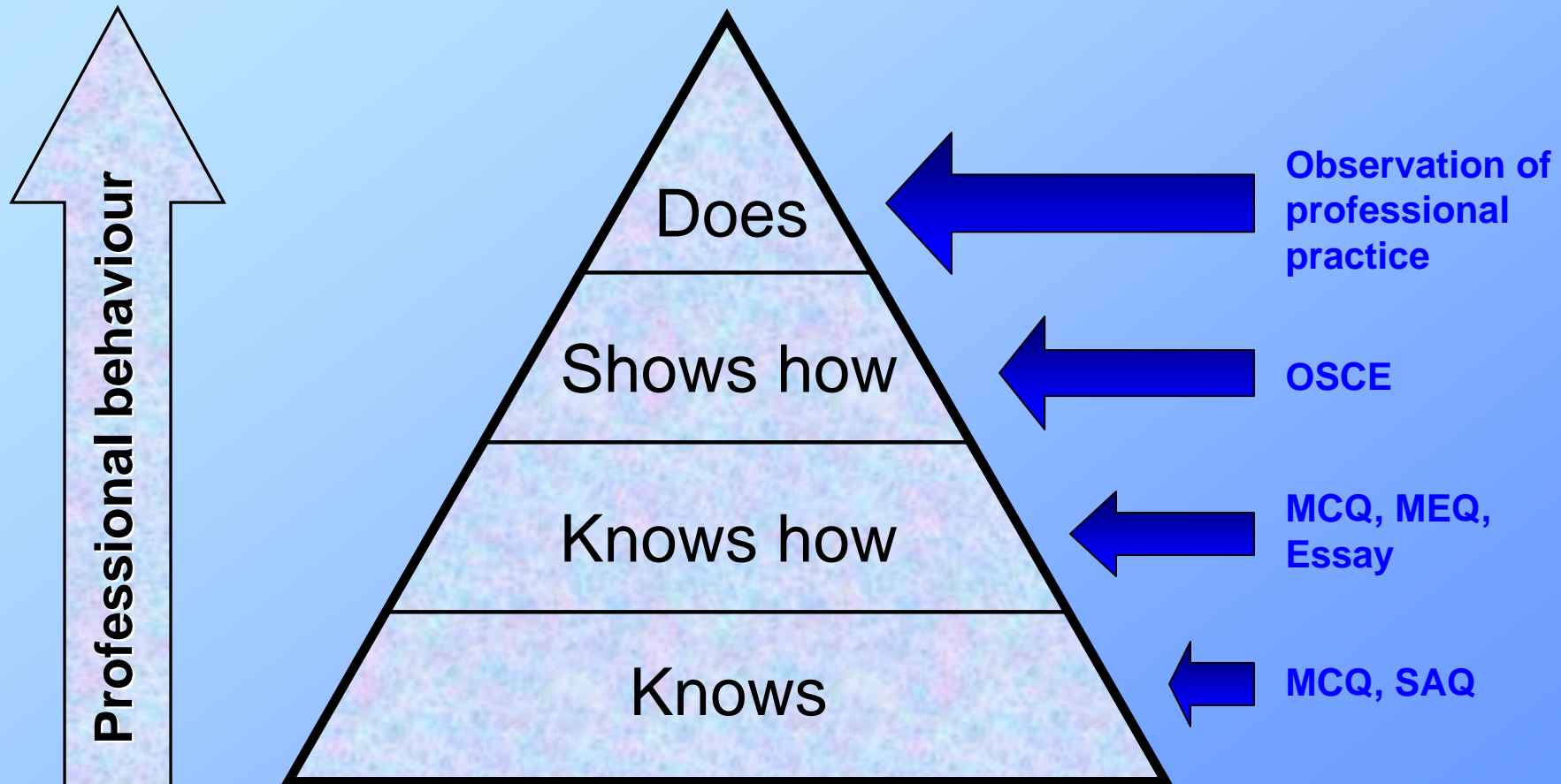


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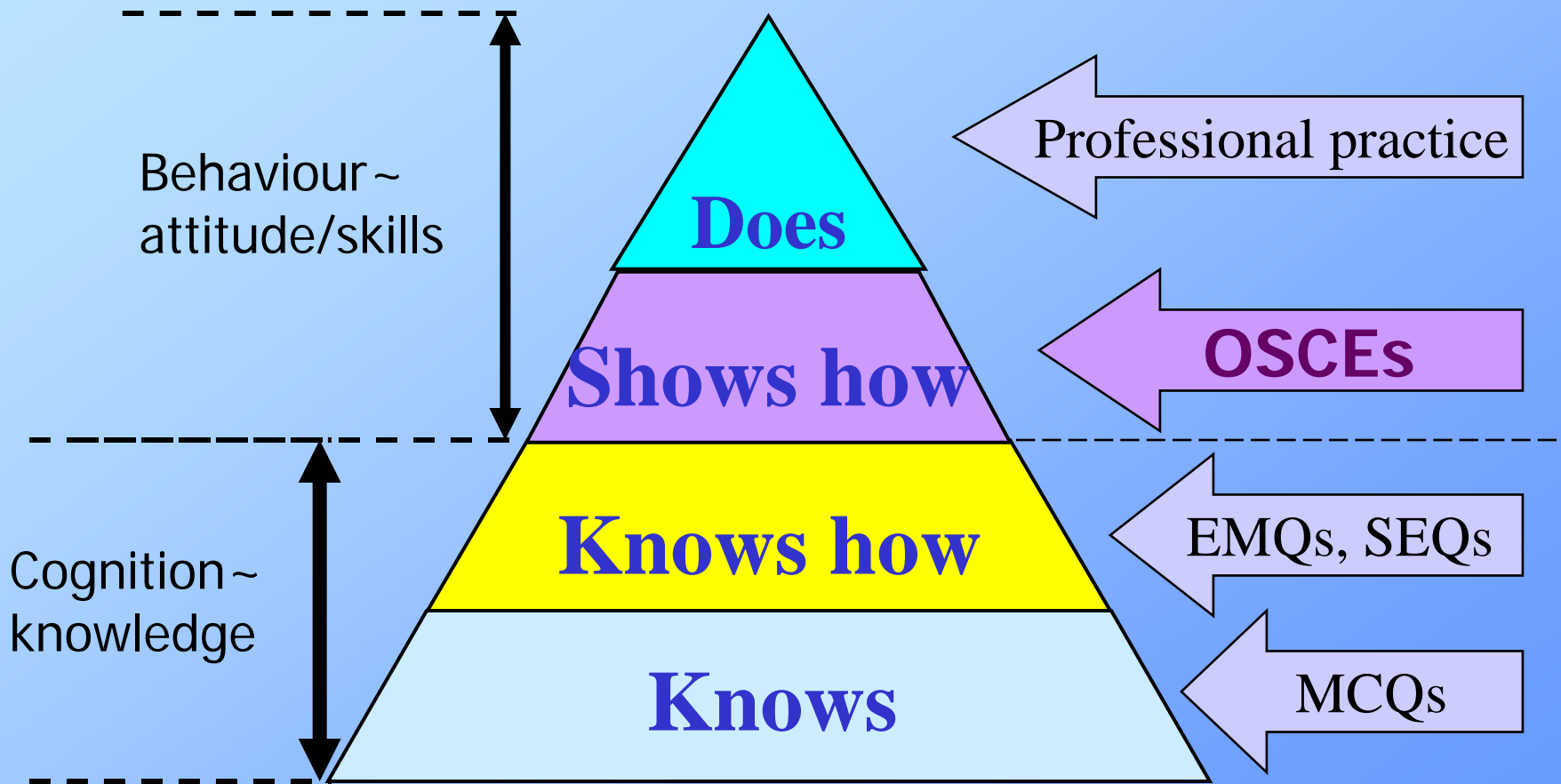
Measuring Clinical (Behavioral) Skills



Miller GE. The assessment of clinical skills/competence/performance. Academic Medicine (Supplement) 1990; 65: S63-S67.



Matching Assessment Formats to Intended Constructs





OSCE - Objective

- All the candidates are presented with the same test
- Specific skill modalities are tested at each station
 - History taking
 - Explanation
 - Clinical examination
 - Procedures

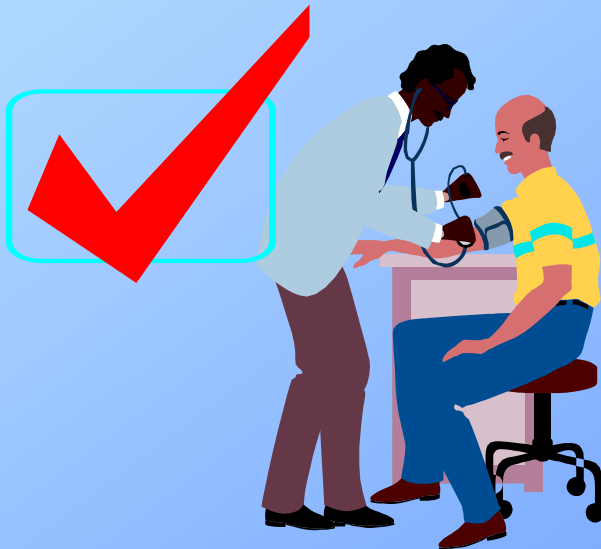


OSCE - Structured

- The marking scheme for each station is structured
- Structured interaction between examiner and student

OSCE – Clinical Examination

- Test of performance of clinical skills
 - candidates have to demonstrate their skills, not just describe the theory





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Advantages of OSCE for Assessing Clinical Competence

Wider sampling than traditional methods



Every candidate does same examination



Greater opportunity for objectivity



OSCE Stations are re-useable



Better psychometrics than traditional methods





Quality of an Assessment

Utility = (is a function of the instrument's)

- Reliability
- Validity
- Educational impact
- Acceptability
- Feasibility

Van der Vleuten, C. The assessment of professional competence: developments, research and practical implications, *Advances in Health Science Education*, 1996, Vol 1: 41-67



Advantages of OSCEs

- Careful specification of content = **Validity**
- Observation of wider sample of activities = **Reliability**
- Structured interaction between examiner & student
- Structured marking schedule
- Each student has to perform the same tasks = **Acceptability**



Disadvantages of OSCEs

Costly

Time consuming to construct & administer

Needs space

Training needed to achieve reliability

Experience to administer

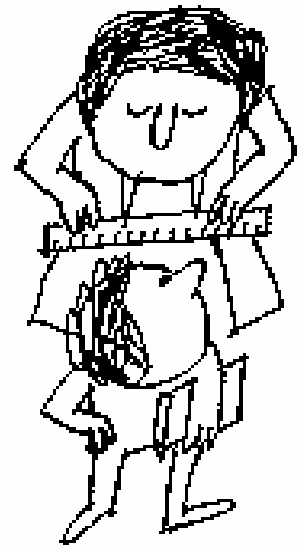
If students not familiar with OSCEs, must be oriented to this assessment format





Importance of Reliability

- **Reliability** of a test / measure
 - reproducibility of scores across raters, questions, cases, occasions
 - capability to differentiate **consistently** between good & poor students





Reliability

- Competencies are **highly domain-specific**
- **Broad sampling** is required to obtain adequate reliability
 - across content, i.e., range of cases/situations
 - across other potential factors that cause error variance, i.e.,
 - testing time, number of cases, examiners, patients, settings, facilities

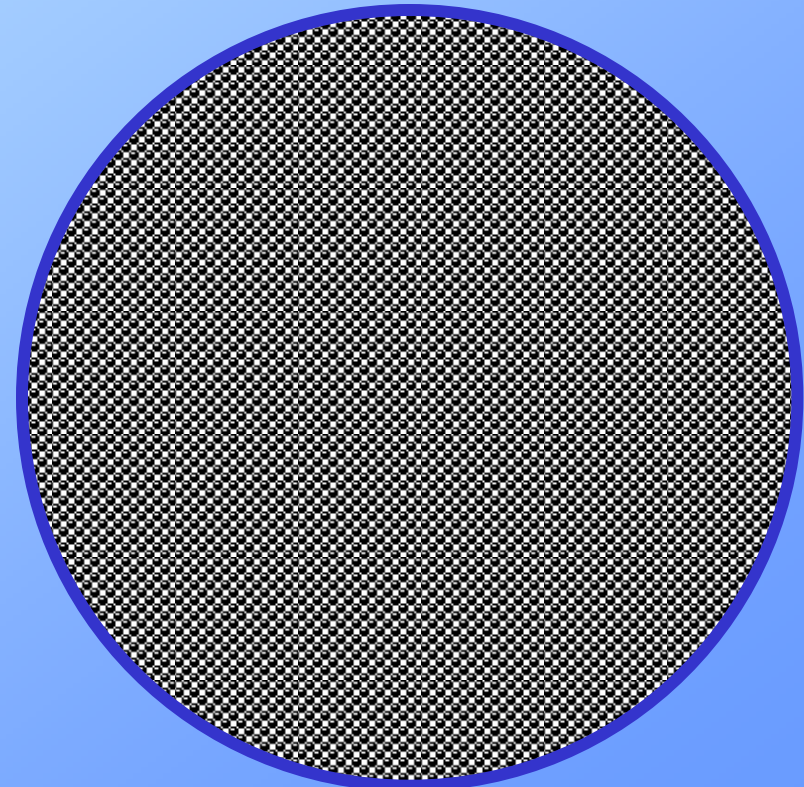
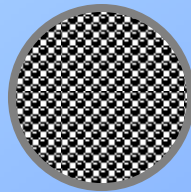
Sampling

Domain of Interest

Test Sample



Test Sample





Reliability of a 20 Station OSCE in Surgery

****TEST STATISTICS****

NUMBER OF EXAMINEES	156
TOTAL SCORE:	
MEAN	139.16
VARIANCE	76.62
STANDARD DEVIATION	8.75
ALPHA	0.5327
S.E. OF MEASUREMENT	5.9840



As number of stations affects reliability, often overall OSCE's reliability is quite low because often can't practically run more than 20 stations



OSCE Reliability

Factors influencing reliability of OSCEs

1. The length of the whole OSCE
2. The length of stations
3. The number of stations
4. The diversity of skills
5. Training the examiners
6. Non-standardised patients
6. Standardised patients
7. SP examiners
8. Combining tests
9. Check lists
10. Global rating (scales)



How Many Stations & for How Long?

1. The length of the whole OSCE
2. The length of stations
3. The number of stations





How Many and for How Long?

The decision is a practical issue. 20 stations plus rest stations take over two hrs at five minutes per station

If task can be done in five minutes by a majority of candidates, adding extra time makes station no more reliable or valid

Some tasks take longer than 5 minutes. To use such stations consider first the implications.



Validity of an Assessment

- **Validity** of a test / measure
 - Content is deemed appropriate by relevant experts
 - Test measures the characteristic (e.g. knowledge, skills) that it is intended to measure
 - Performance of a particular task predicts future performance



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How to Start

- Decide what tasks you
 - want to
 - can
 - shouldtest in an OSCE format

- OSCEs test **performance**, not **knowledge**



Blueprinting

- Content of the **assessment** should align with the **learning objectives** of the course
- **Blueprinting**
 - allows mapping of test items to specific learning outcomes
 - ensures adequate sampling across subject area and skill domains



OSCE blueprint: *systems-based*

	Hx taking (incl. diag)	Phys exam (incl. diag)	Procedures	Counseling/ Education	Ordering investigs
CVS					
Endocrine					
Gastro					
H & N					
Haem & LN					
Musculoskl					
etc					



OSCE blueprint: *discipline*-based

	Hx taking (incl. diag)	Phys exam (incl. diag)	Procedures	Counseling/ Education	Ordering investigs
Anaes & CC					
Clin Pharm					
Comm Health					
Emergency med					
Family med					
Musculoskel					
etc					



What Skills can be Tested and How?

	Hist from SP	Phys exam -SP	Procedures	Counseling	X-ray Diagnosis	Forms	Tests
Gen Surgery		✓✓✓		✓	✓	✓	✓
Vascular	✓						
Urology			✓				
Neurosurgery		✓		✓			
Critical care			✓		✓		
Minor Ops			✓				
Orthopaedics	✓	✓			✓✓	✓	
Radiology					✓		





Possible Stations

Communication – a telephone conversation

Counseling – a trained SP

Breaking bad news – a trained SP

Reading a CVP – special equipment

Intubation – anaesthetic manikin

Excision biopsy – a pig skin and equipment

Breast palpation – silicon simulations

Form completion – a collection of forms

CPR – Resus Annie

Suturing – RCS suture jig

Assembling equipment – IV infusion set

Traction – SP and equipment

Bandaging – masses of crepe bandage





History Taking Stations

Incorporating questionnaire is useful and is more objective; questions should not be trivial

Suggestions:

1. What was the strongest evidence for you diagnosis?
2. What other family members might have the same problem?
3. Give two components of the physical examination would you wish to test
4. What urgency would you give this patient's problem?
5. If you reviewed this patients X-ray what would you expect to see?





A Procedure Station

Examiner and assistant need to train for these stations and don't forget the details

1. Replacement items
2. Commonly found equipment
3. Don't just assemble, use the equipment to do something, like make a CVP measurement
4. Candidates often hesitate at these stations, push them on without prompting
5. Always know the time left, a large wall clock with a second hand – the five minute egg timer!





Physical Examination Station

Key Points

1. Watch closely, very closely
2. Listen carefully, very carefully
3. Prompt only as last resort, not as a continuing commentary to re-affirm what is being done and lead to the next part of the exam
4. Only hand equipment when asked
5. Reassure and make certain candidate knows what s/he is going to do – ask for that affirmation





Feasibility

- Is it a reasonable task to expect the candidates to perform? Is it authentic?
- Can the task be examined at an OSCE station?
 - Match clinical situations as closely as possible
 - Some tasks may require simulated patients
 - Some tasks may require manikins
 - Some tasks simply cannot be examined in this format



Feasibility

- Can task be performed in time allowed?
 - Pilot the stations to see if they are feasible
 - Check equipment /helpers/practicalities



Congruence

- Is the station testing what you want it to test?
- Station construct: describe what station is testing



A Station's Construct

- This station tests the candidates ability to



Congruence

- Ensure that all parts of station coordinate
 - Candidate instructions
 - Marking schedule
 - Examiner instructions
 - Simulated patient instructions
 - Equipment



Candidate Instructions

- State circumstances: e.g. outpatient clinic, ward, A & E, GP surgery
- Specify the task required of the candidate: e.g. take a history, perform a neurological examination of the legs, explain a diagnosis
- Specify tasks NOT required
- Instruct on summing up: e.g. tell the patient, tell the examiner



Candidate Instructions

AT THIS STATION THERE IS A MANIKIN, AN OBSERVER EXAMINER AND VARIOUS EQUIPMENT AND AIDS TO FACILITATE THE CATHETERISATION OF THE MANIKIN.

THROUGHOUT, GIVE A COMMENTARY ABOUT WHAT AND WHY YOU ARE DOING. THE EXAMINER WILL ALSO ASK YOU QUESTIONS.

The manikin represents a 65 year-old man with urinary retention.

Catheterisation of Manikin [8 marks]

|
Q1. What sized catheter would you use for a 25 year-old male?

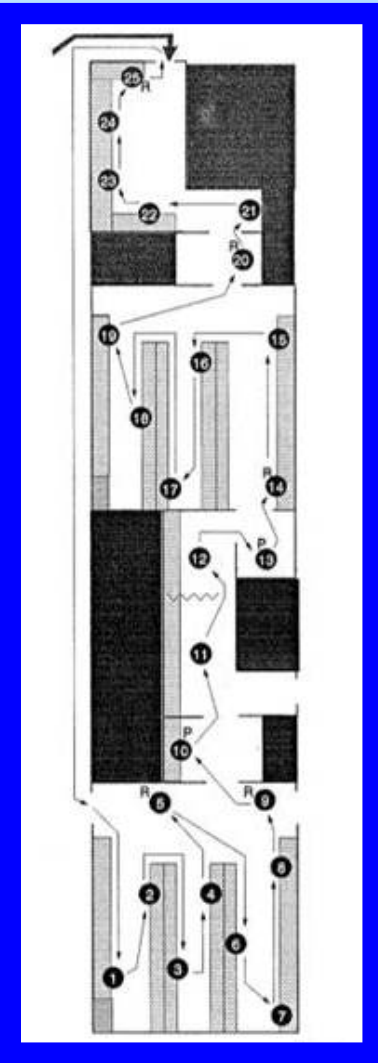
[1 mark]

Q2. Why is a full bladder dull to percussion?

[1 mark]

The OSCE book is very useful for this, but the instructions must also be at the station.

Candidate Instructions: 5 min. reading time



Until an OSCE begins candidate stress is high, therefore:

Provide instructions for the exam conduct

Think through the unlikely, e.g., a power failure!

Don't forget CLEAR SIGNS



Examiner Instructions

- Ensure they have a copy of candidate's instructions
- Provide specific instructions appropriate to the task:
 - e.g., do not prompt, explicit prompts, managing equipment



Simulated Patient Instructions

- Give as much detail as possible so they can be consistent
 - try to leave as little as possible for them to ad lib!
- Give enough information to enable them to answer questions consistently
- Be specific about affect in each role
- Specify patient demographics
 - i.e., gender, age, ethnicity, social class, etc.



Marking Schedule

- Ensure marks are allocated for tasks the candidates are asked to perform
- Decide relative importance of diagnosis vs process (history taking, examination)
- Separate checklist for process skills



Equipment

- Be detailed
- Think of
 - Chairs + table / couch / bench
 - Manikins - specify
 - Medical equipment
 - Stethoscope, ophthalmoscope, sphyg, suturing materials, etc



Materials

STATION 13

Station Set-up

There shall be two male urinary manikins placed at the station and one technical support staff available to clean the manikin and other equipment before re-use. The manikin should be placed on an examining couch. There should also be a table where equipment can be laid out and the technician shall also maintain order on this table.

The equipment shall be the following:

1. Sufficient KY jell re-labelled with a suitable LA etiquette, suggest Pharmacy can do this.
2. At least seven different sizes of catheter (at least 8, 10, 12, 14, 16, 18, 20F, plus a three way catheter), and at least two samples of each.
3. A metal introducer
4. A choice of several clearly labelled disinfectants for use to clean the manikin's penis. These may need to be topped up by the technician unless dry simulated swabbing is allowed
5. Several urinary bags with spare stoppers.
6. Suitable swabs in packs
7. Several glove packs, which the technician can repack
8. A sterile forceps pack x 4
9. Kidney dish
10. Sterile towel packs, re-useable and re-packed by technician
11. Trolley to place sterile pack etc.
12. An empty 20 ml syringe.
13. 20 ml saline and 20 ml water for irrigation with label.

The Observer-Examiner shall have a clip board and a box to put his completed mark sheets.

Without detailed lists station authors will need to check their own supplies, a process that wastes time and often difficult to organise



Final Word Re Designing Stations

- Use your blueprint
- Be clear what you are testing: define the construct
- Pilot for feasibility



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Training Observers / Examiners

- Examiners must understand the principles of OSCEs
- Training enhances inter-rater consistency
- General Training
- Station specific training



Techniques

- Examiners should train together
 - Watch videos & score performances
 - Practice with live stations
- Compare ratings and discuss marking inconsistencies

Training Examiners

It really is quite simple, you look for the pretty ones and they get your full attention, nothing more and nothing less



This potential source of error and loss of reliability is soluble, but it must be planned for, as Faculty staff are busy people

- 1. Have a plan**
- 2. Train all together**
- 3. Resolve inconsistencies**
- 4. Even use example stations**
- 5. Compliance and Discipline**



Using Standardised Patients (SPs) as Markers



- **SPs can act as the examiner, but will need training**
- **Good correlation with expert observer**
- **Usually use check lists**

Petrusa ER. Taking standardized patient-based examinations to the next level. Teaching and learning in Medicine 2004; 16:98-110

Van der Vleuten CPM and Swanson DB. Assessment of clinical skills with standardised patients: state of the art. Teaching a Learning in Medicine 1990; 2:58-76



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Scoring Considerations

- Global vs checklist scoring
- Weighting
- Standard setting



Scoring with a Checklist

- **Advantages**

- Helps examiner know what station designers are looking for
- Helps examiners be objective
- Facilitates use of non-expert examiners

- **Disadvantages**

- Rewards primarily process/thoroughness
- May not sufficiently reward exceptional candidates
- Ignores examiners' expertise



Global Scoring

- **Advantages**

- Utilises expertise of examiners
- Examiners are in a position to make a (global) judgement about the performance

- **Disadvantages**

- Examiners have to be expert examiners **i.e. trained**
- Examiners must be familiar with expected standards for the level of the test

Scoring Method



Should this skill be assessed with a detailed check list or alternatively have examiner use a global rating?

A COMPROMISE

All tasks have their various components.

These are assigned a mark, which is awarded by descriptors of achievement (e.g., 2/10):

- A. The complete exam (2/2)
- B. A reasonable alternative (1.5/2)
- C. Significant omission (1/2)
- D. Weak or poor (0.5/2)

Friedlich et al. Structured assessment of minor surgical skills (SAMSS) for family medicine residents. Acad Med 2001; 76:1241-1246



Marking Sheets

Part II Third Professional Examination - OSCE in Surgery
Thursday, 21 April, 2005

<Please affix the label here>

STATION 15

Examiner's Mark Sheet

1.	Gloving and Skin Prep	2 marks				
		0.0	0.5	1.0	1.5	2.0
				✓		

2.	Preparation of syringe	2 marks				
		0.0	0.5	1.0	1.5	2.0
						✓

3.	Choice of LA and syringe load	2 marks				
		0.0	0.5	1.0	1.5	2.0
			✓			

4.	Administration of the LA	2 marks				
		0.0	0.5	1.0	1.5	2.0
					✓	

+

5.	Disposal	2 marks				
		0.0	0.5	1.0	1.5	2.0
				✓		

<input type="checkbox"/> FAIL	<input checked="" type="checkbox"/> BORDERLINE	<input type="checkbox"/> PASS
-------------------------------	--	-------------------------------

Clip board

Simplicity

Note the Borderline Method at bottom

A space for comments



Weighting

- In a checklist, some items may be **weighted** more than others
- Complicates scoring system
- Makes **no difference** to very good & very bad candidates
- Can enhance discrimination at the cut score



Standard Setting

- No perfect method!

Could be criterion-referenced method

- e.g. Angoff, Ebel, etc.
- Consider other standard setting methods for OSCEs



Importance of Planning

- OSCE Team plus an administrator
- Identify physical space and make a map of rooms & order of stations
- Match the blueprint with station design – OSCE Team
- Set deadlines for development by Faculty's OSCE champions
- Collect drafted stations & review
- Collect all needed materials, label & store safely
- Hold Examiners' Training Meetings (1-3)
- Administer OSCE, analyze results (open item analysis) & modify the station if necessary for its next administration



OSPE

Objective Structured Practical Examination



OSPE: Basic Medical Sciences

- A multi station, multi task process of assessment
- Reflect the objectives - construct validity
- Set at an appropriate level
- Understand and apply theory - NOT A SERIES OF MCQs
- Test practical skills (check the objectives first!)
- Developing clinical skills - related to BMS



Why an OSPE Format?

- Better coverage than a practical examination
- Do not need multiple sets of equipment
- Ideal for integrated curricula
- More reliable and in terms of training doctors, more valid
- Usually cheaper than a practical exam
- Shares the same psychometric pluses & minuses as OSCE



Consider these Practical Stations

- Use of a microscope
- Analysis – spectrophotometry, urinalysis
- CBA – histopathology
- Applied anatomy – SPs, X-rays
- Measurement – BMI, lung function tests
- Side Room procedures, if still done
- The ECG – read some recordings
- Elementary clinical skills – integration



EBM OSCE/OSPE Station



See handout



Life Long Learning Yr 2: EBM

OSCE Station - Electronic Database Search

- Print your name on your diskette
- Insert diskette into drive A:
- Open MS Word
 - Start a new document & type in your name & ID
 - Minimise MS Word
- Open IE (Internet Explorer)
 - Type in this URL: <http://tng.ovid.com>
 - Type in this sign-on ID: cuhkexam
 - Type in this password: cuhkexam



Life Long Learning Year 2: EBM

OSCE Station: Electronic Literature Search

How to prepare your answers

- Read the attached instructions and scenario, complete your search and prepared a MSWord softcopy of your
 - Selected Abstract(s)
 - Relevant Citation(s) / Reference(s)
 - OVID Search strategy used
- To make a softcopy
 - Hold left mouse down & drag to **highlight text** in MEDLINE that you want to copy & paste to MSWord
 - Click '**Edit**' and then click '**Copy**'
 - Maximise MSWord
 - Click '**File**' and then click '**Paste**'
- Repeat previous step for each abstract and citation you want and for the search strategy you used
- **Save Word document** using your initials as filename; close Word, **log off OVID, close IE, remove & hand-in floppy disk**



Q & A & Discussion