OSCEs

R.Ghaffari, MD, M.M.ED,PhD

OSCE

- تعريف
- تاريخچه
- موارد مورد استفاده
- مزايا و محدوديت ها
- گامها و مراحل طراحي
- نحوه اجرا و پياده سازي
- ملزومات
- روايي و پايايي

تعريف

Objective

Structured

Clinical

Examination

History

- First described by Harden et al from Dundee (1975)
- First reported from Dundee and Glasgow

  (Harden and Gleeson, 1979)
- First widespread adoption in North America
- Widely adopted in the UK in the 90s

موارد مورد استفاده براي ارزيابي :

- History taking
- Physical examination
- Laboratory, radiographic, and other data interpretation
- procedural skills
- Communication skills
- Some ethical issue
- Clinical reasoning skills (sp)

OSCE: Advantages

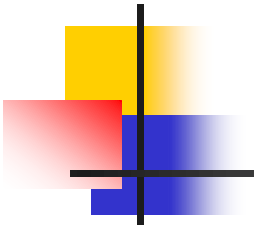
1. *objectivity and validity*
2. *testing in conditions akin to professional practice*
3. *a wide range and variety of facts can be tested at a time*
4. *can be repeated within an academic year without risk of a trend toward increasing scores.*
5. *detailed feedback for students and teachers*
6. *no unintended cues*
7. *can be used to assess communication or practical skills*

OSCE: Disadvantages

1. *Expensive*
2. *takes long time to construct a SPO case and a scoring checklist*
3. *time-consuming*
4. *technical limitations (limited generalizability ; weak linkages to the curriculum)*
5. *some concepts, such as continuity of care, are difficult to evaluate*
6. *opportunity provided for improvement in examinees' skills; and others*
7. *when shorter than 4 to 6 hours per student it is less reliable*

OSPE

- The objective structured practical examination (OSPE) is adapted from OSCE and is used as an objective instrument for assessment of laboratory exercises in preclinical sciences. These exams usually comprised of short "stations" designed to assess a single discrete skill.



مراحل طراحي

The major components are:

1. The (examination) coordinating committee
2. The examination coordinator
3. Lists of skills, behaviors and attitudes to be assessed
4. Criteria for scoring the assessment (marking scheme of checklist)
5. The examinees
6. The examiners
7. Examination site
8. Examination stations
   - 8.1 Time and time allocation between stations
   - 8.2 Anatomic models for repetitive examinations (Breast, Pelvic/Rectum)
   - 8.3 Couplet Station
   - 8.4 Examination Questions
   - 8.5 Environment of Exam Station
   - 8.6 Examination Station Circuit (Figure 1.)
9. Patients Standardized or Simulated
   - 9.1 Instruction to Patients
10. Timekeeper, time clock and time signal
11. Contingency Plans
12. Assessment of Performance of the OSCE

The (examination)coordinating committee

- Determine the content of the examination
- Determine the development
- Determine the implementation

The (examination)coordinating committee

for the development of the examination should be formulated. A recommended schedule follows: 3-6 months prior: need for an OSCE identified; coordinator appointed; committee formulated. 2-3 months prior: content finalized; stations developed; standardized patients recruited 1 month prior: stations finalized; artifacts obtained; standardized patients trained 7 days prior: walk-through; standardized patients confirmed; faculty confirmed.

The examiner coordinator

- Facilitate the smooth working of the committee in developing, implementing of the exam
- Supervise the exam (during and after)

content

- Based on

.curriculum

.course objective

.examination goals

Criteria for scoring the assessment (checklist)

- Checklist preparation
- Use of concise & unambiguous words

Situation/Couplet		Type
1.	Well Baby Care	H/Ps
2.	Vaginal bleed	H/Ps
3.	Breast Examination	P/Ps
4.	Level of Consciousness	P/Ps
5.	Shortness of Breath	P/Ps
6.	Shortness of Breath	H/Ps
7.	Diarrhea	H/Ps
8.	Intermittent Claudication	P/Ps
9.	Extracellular Fluid volume	H-P/Ps
10.	Back Injury	P/Ps
11.	Left Lower Quadrant Pain	P/Ps
12	Pregnancy	H/Ps
13.	heart Murmur (pediatric)	S/Ps
14.	Anemia	H/Ps
15.	Splenomegaly	P/Ps
16.	Knee Examination	P/Ps
17.	Chest Pain	H/Ps
18.	Left Flank Pain	H/Ps
19	Spinal Cord Injury	P/Ps
20.	Thyroid	P/Ps
21.	Back Pain	Lab/Ps

Station 15 - Day 1

Instructions to Candidate

This woman presents to your office with a complaint of cough and shortness of breath.

OBTAIN A **FOCUSED** HISTORY.

At the next station you will be asked to answer some questions from information you have acquired from this patient or from information that will be provided.

ITEMS	Max Score	Check if Obtained
Age	1	____
Onset of symptoms	2	____
Duration of cough	2	____
Day vs. night cough	2	____
Cough productive/non-productive	2	____
Wheezing	2	____
Aggravating factors - exercise	1	____
cold	1	____
noxious fumes	1	____
Environment	1	____
Chest pain	1	____
Duration of s.o.b.	2	____
Orthopnea	2	____
Deep breathing	1	____
Hemoptysis	2	____
Exercise tolerance	2	____
Swelling of ankles	2	____
Paroxysmal nocturnal dyspnea	2	____
Allergies - past	1	_____
- family	1	_____
Pets/Birds	1	_____

Smoking history	2	_____
Arthritis	2	_____
Skin lesions	1	_____
Dysphagia	1	_____
Use of drugs	2	_____
Acts courteously and respectfully to the patient	1	

Maximum Total Score (41)

Examiner_____

Patient_____

Total Score_____

Station 16

Answer sheet

1. Review the chest x-ray provided and list two abnormal findings.

2. Interpret the pulmonary function tests. Next page)

3. List three possible diagnoses in order of likelihood.

PULMONARY FUNCTION TESTS

Station 16

POSITION DURING TESTS Erect ( ) Supine ( ) Normal	Predicted Normal	Observed Value	Percentage of normal	Post-Bronchodil. Observed %
Forced Vital Capacity	L	5.20	3.41	66
Forced Expiratory Volume 1 - second	L	4.03	2.81	70
Ratio of FEV1/FVC	%	78	83	
Lung Volumes:				
Functional Residual Capacity	L	3.51	2.50	71
Residual Volume	L	2.03	1.43	71
Total Lung Capacity	L	7.01	5.30	76
Ratio of RV/TLC	%			
CARBON-MONOXIDE (SS) DIFFUSING CAPACITY	ml/min mmttg	32.71	17.71	54

ANSWER SHEET

Station 16

1. Review the chest x-ray provided and list two abnormal findings.

Interstitial lung disease	5
Bilateral hilar lymphadenopathy	5

2. Interpret the Pulmonary Function tests.

Normal expiratory flows	1
Decreased lung volumes	1
Low DLCO	1
Restrictive disease	1

3. List three possible diagnoses in order of likelihood.

Sarcoidosis	4
Lymphoma	3
Lymphangitic carcinomatosis	2
Collagen vascular disease, Wagner's	1
External allergic alveolitis	1
Idiopathic pulmonary fibrosis	1
Maximum Total Score	(28)

If sarcoidosis is the #1 diagnosis - score 2 additional marks.

If lymphoma or lymphangitic carcinomatosis is #1 diagnosis - score 1 additional mark.

If others are #1 diagnosis - no additional marks.

Station 7

Instructions to Candidate

This woman is concerned about a possible lump in her left breast.

CONDUCT A SYSTEMATIC PHYSICAL EXAMINATION OF BOTH BREASTS. DESCRIBE TO THE EXAMINER WHAT YOU ARE DOING AND YOUR FINDINGS.

At the next station you will be asked questions related to the patient's problem.

Station 7

Breast Lump

	ITEM	Scoring Key: Done Correctly	Done Incorrectly	Comments
1.	INSPECTION			
	Patient sitting, arms at slides	1	0	
	Patient sitting, arms above head	1	0	
	Patient leaning forward	1	0	
	If only one breast examined		-1	
2.	PALPATION			
	Patient supine, arms behind head	1	0	
	Systemic palpation of the four quadrants and tail	3	0	
	Palpation of nipple, areola	1	0	
	Palpation of axillary nodes	2	0	
	Palpation of supraclavicular fossa	1	0	
	If only one breast examined		-1	

Maximum Total Score (11)

Examiner_____

Patient_____

Total Mark_____

Station 8

Instructions to Candidate:

A 42-year-old premenopausal woman presents to your office with a tender mass in her left breast. It is not associated with any other symptoms or signs. She has had "cysts" in the breasts in the past but is now concerned because her Mother (age 62) has recently had a mastectomy for carcinoma.

Your examination shows multiple thickenings in both breasts with a discrete, smooth, well-defined in the upper outer quadrant of the left breast. There are no other findings.

QUESTIONS

1. What is your differential diagnosis? Which is most likely?

2. What action should a specialist take at this time?

3. Review the mammogram. Describe the abnormality seen, and state the most likely diagnosis.

Marker_____

Total Score_____

Station 8

Scoring Key

A 42-year-old premenopausal woman presents to your office with a tender mass in her left breast. It is not associated with any other symptoms or signs. She has had "cysts" in the breasts in the past but is now concerned because her Mother (age 62) has recently had a mastectomy for carcinoma.

Your examination shows multiple thickenings in both breasts with a discrete, smooth, well-defined nodule in the upper outer quadrant of the left breast. There are no other findings.

QUESTIONS

1. What is your differential diagnosis? Which is most likely?

   FIBROCYSTIC DEASE (1)

   CARCINOMA (1)

   FIBROCYSTIC DIEASE MOST LIKELY (1)

2. What action should a specialist take at this time?

   ASPIRATION (1)

   MAMMOGRAPHY OF BOTH BREASTS (1)

   BIOPSY IF ASPIRATION UNSUCCESSFUL (1)

3. Review the mammogram. Describe the abnormality seen, and state the most likely diagnosis.

   IRREGULAR 2 CM MASS IN BREAST (1)

   CARCINOMA (1)

   Maximum Total Score (8)

STATION B1

This is a problem-solving station.

Your task will be outlined in the information and/or materials provided.

YOU HAVE 10 MINUTES TO READ THE INFORMATION AND ANSWER THE QUESTIONS. PLEASE ANSWER EACH QUESTION ON THE PAGE PROVIDED.

WRITE CLEARLY.

STATION B1

NEUROSCIENCE PROBLEM-SOLVING QUESTIONS

A 34-year old right-handed lawyer comes to your office complaining of a five-week history of lightheadedness and unsteadiness on her feet. Over the last ten days, she has had mild incoordination of the left side of the body. Yesterday her left side became noticeably weaker and more clumsy. She has been able to continue working at her job without any significant loss of efficiency. She is able to compensate for the left-sided clumsiness most of the time, tending only to scuff the left foot when she walks rapidly. She has some difficulty in the exercise classes that she attends three times per week. She denies headache.

On examination, she appears in good general health. You confirm that the abnormal physical findings are limited to the central nervous system. She is alert, oriented and cooperative. The visual fields are full to confrontation testing. There is no inattention to bilateral visual stimuli. The optic fundi are normal and good venous pulsations are seen. The pupils are equal and react to light. The external ocular movements are full and conjugate and there is no nystagmus.

With the arms in the outstretched posture, there is a mild drift of the left hand. The left grip is slightly weaker than the right. Strength in the legs is normal. The tendon reflexes in left are slightly accelerated with respect to the others which are normal. The plantar responses are flexor. On walking briskly in the hall she tends to scuff the left good and does not swing the left arm as much as the fright.

The sensory examination to light touch and pin prick sensation is normal. There is slight impairment of position sense in the left hand and she is intermittently inattentive to the left-sided stimulus on bilateral tactile sensory testing.

Her CT scan is provided.

ANSWER THE FOUR QUESTIONS THAT FOLLOW IN THE SPACE PROVIDED.

PLEASE REMEMBER TO WRITE CLEARLY AND TO PLACE YOUR NAM AND I.D. NUMBER ON EACH PAGE.

1. List 5 possible diagnoses.

2. What is the most likely lesion?

3. Why is this lesion your first choice?

4. Give 2 management options open to a specialists.

Maker_____

Total Score_____

STATION B4

INSTRUCTIONS TO CANDIDATE

This 20-year-old woman comes to office requesting information regarding contraception.

TAKE A RELEVANT HISTORY AND ADVISE THE PATIENT ON CONTRACEPTION OPTIONS.

Station B4

This 20-year-old woman comes to your office requesting information regarding contraception. TAKE A RELEVANT HISTORY AND ADVISE THE PATIENT ON CONTRACEPTION OPTIONS.

THIS RATING SCALE TO BE USED FOR CATEGORIES A TO H:

3 marks - carried out all or most of the item under this heading in an adequate manner

2 marks - carried out at least half of the item under this heading in an adequate manner.

1 mark - carried out less than half of the items under this heading in an adequate manner.

1 ,marks - did not carry out any of the item and/or behaved in the incompetent and inefficient manner.

A. Initiation of the interview

- introduces self to patient 3_____
- Uses name of patient in greeting 2_____
- presents in a positive and attentive manner , establishes rapport 1_____
- attends to patient's comfort 0_____
- defines the purpose of the interview
- is at ease with the patient
- places patient at ease

B. Listening Skills Non/Verbal Communication

- maintains good eye contact
- has appropriate body posture 3_____
- makes empathic gestures 2_____
- is attentive to patient's agenda 0_____
- avoids distracting activities

C. Attitude

- avoids condescending, sychophantic or rude behavior 3_____ 2_____ 1_____
- appropriately congenial and non-judgmental 0_____

D. Questioning Skills

- speaks clearly and fluently
- uses language understandable to patient 3_____
- asks open-ended questions 2_____
- asks one question at a time 1_____
- asks appropriate probing questions 0_____
- uses facilitating techniques
- controls the pace of the interview

E. Organization

- controls the direction of the interview 3_____
- logical flow of questions 2_____
- does not discuss management until history obtained 1_____ 0_____

F. Management Style

- does not make incorrect statements
- determines patient's level of knowledge and educates appropriately 3_____ 2_____ 1_____
  - appropriate instructions are given in a readily understood manner 0_____

G. Management Content

- summarizes risks of oral contraceptive, Succinctly

- recommends oral contraceptives and discusses common and important side effects, breakthrough bleeding, missed pills, drug interactions 3_____ 2_____ 1_____ 0_____

- recommends using condoms until protected by oral contraceptive

- recommends quitting smoking

- should follow-up patient with complete physical and pap smear, as well as checking for compliance with, side effects of medication

H. Closing of Interview

- summarizes what has been said

- formulates a problem list (birth control, smoking, tension headaches)

  - checks out problem list with the patient 3_____
  - books appropriate follow-up appointment 2_____
  - reassures the patient appropriately 1_____
  - checks if there are any patient questions 0_____
  - closes with a social amenity

Station B4

Rating Scale

3 marks - obtains all "must" and "should" items thoroughly

2 marks - obtains most "must" item adequately

1 mark - obtains most "must" items but incomplete

0 marks - omits several "must" items

I. Content of the Interview

a) "must includes:

- attitudes and knowledge regarding Contraception
- gynecological history
- inquiry regarding contraindications to oral contraceptive including smoking 3_____
- past health 2_____
- medications taken at present (none) 1_____
- drug allergies 0_____

b) "should" includes:

- appropriate functional enquiry
- brief social and family history

Examiner_____

Patient_____

Total Score_____

INTERVIEWING-PATIENT EDUCATION

CONTRACEPTION

ACTOR'S INSTRUCTIONS

You are playing the part of Mary Jenkins, a 20-year-old secretary who presents requesting information regarding contraception. You are single and live alone in an apartment. Your boyfriend of 2 months, Bob Peterson, is not happy using condoms and, as a result, you have had unprotected intercourse on several occasions. Your last period was 2 weeks ago. Menarche occurred at age 14. Your period are regular every 28-30 days and last 4-5 days. You have never been pregnant. You have not intermenstrual bleeding, no vaginal discharge, and only mild cramps during menses for which you do not take any medications. Coitarche occurred at age 17 and Bob is your third partner. You have no history of sexually transmitted diseases. You have frequent headaches which are nuchal-occipital, bilateral, come on with fatigue, tension and hunger and are relieved by Tylenol. They are not associated with nausea or visual disturbances. You have no contraindications to the oral contraceptive pill. You believe you would be very compliant in taking the "pill" if asked. You have never had an internal examination or a Pap test. You have not been to a doctor in years.

Past History

You smoke 10 cigarettes a day and drink only socially (2-3 bee/week). You have no hospital admissions and no surgery.

Functional Enquiry

Negative aside from headaches.

Family History

Your parents, in their 50's and sister, 23, have no medical problems. You are not aware of cancer, diabetes, heart attacks or strokes in your extended family. "Everyone seems to die of old age".

Social History

You have lived in Toronto all your life and decided to get your own apartment closer to work when you got your present job at an insurance company two years ago. You get along reasonably well with your family and see them for Sunday dinner every two weeks. You have a large circle of friends, most of them you met in a commercial high school where you finished grade 12. You spend most of your spare time socializing, enjoy dancing and read romance and mystery novels.

Examination stations(1)

- Time allocation & time between stations

.time per station=5-20 minute

.time per station should be uniform

.time between station=1-2

.total number=10-25

Examination stations(2)

- Examination station content

  .anatomic models for repetitive examinations (breast, pelvic/rectum)

  .couplet station

  .examination questions

  .environment of exam station

  .examination station circuit

Examination stations(3)

- Number of station is based on

.the skills that are to be evaluated

.the topic areas that are to be covered

.the level of difficulty of each station in the examination

Patient (real) or simulated

- Chronic stable patient
- Simulated patient

Timekeeper, time clock, time signal

- Appropriate personnel
- Unambiguous time signal

Contingency plans

- Reserves of patients
- Patient trainer
- Reserves of station

Assessment of the OSCE

- Validity
- Reliability

Validity

- Predictive v.

  reflects a behavior or some aspect of performance which relates to a score from another measure of the same behavior at a later point in time

Validity

- Concurrent v.

  significant statistical association between the test results with another test or measure designed to assess the same attributes or behaviors.

  the main difference with p.v. is the time element

Validity

- Content v.

  the ability to test what is expected students should know or be able to do.

  represents the curricular goals and objectives

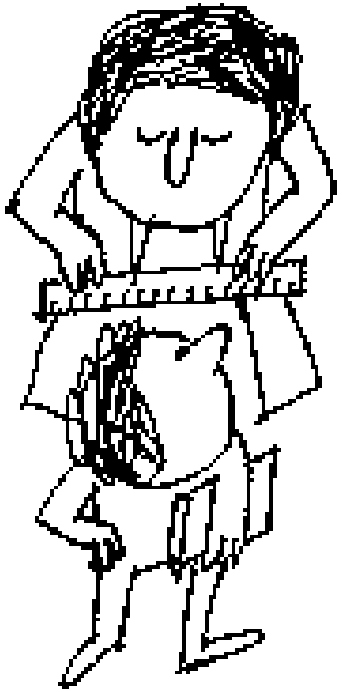
What's in a name?

Objective

Structured

Reliability

What is reliability



Reliability of sample of different methods

Testing Time in Hours	MCQ[1]	Case-Based Short Essay[2]	PMP[1]	Oral Exam[3]	Long Case[4]	OSCE[5]	Practice Video Assess-ment[6]
1	0.62	0.68	0.36	0.50	0.60	0.43	0.62
2	0.76	0.73	0.53	0.69	0.75	0.60	0.76
4	0.93	0.84	0.69	0.82	0.86	0.76	0.93
8	0.93	0.82	0.82	0.90	0.90	0.86	0.93

[1]Norcini et al., 1985
[2]Stalenhoef-Halling et al., 1990
[3]Swanson, 1987
[4]Was et al., 2002
[5]Newble & Swanson, 1987
[6]Ram et al., 1999

Return

Examiner influences

Test length In hours	One examiner per station	Two examiners per station
1	0.43	0.47
2	0.60	0.64
4	0.75	0.78
6	0.82	0.84
8	0.86	0.88

Swanson & Norcini, 1991

Potential threatening factors in OSCEs

- Examiners
- Stations (tasks)
- Structuredness
- Patients
- Other……

Station influences

Average across 13 studies (derived from van der Vleuten & Swanson, 1990)

Test Length in hours	Average number of stations	Average reliability coefficient
1	4	0.43
2	8	0.60
4	16	0.75
6	24	0.82
8	32	0.86

Potential threatening factors in OSCEs

- Examiners
- Stations (tasks)
- Structuredness
- Patients
- Other……

Checklist versus rating scales

Test length In hours	Examiners using Checklists	Examiners using Rating scales
1	0.44	0.45
2	0.61	0.62
3	0.71	0.71
4	0.76	0.76
5	0.80	0.80

Van Luijk & van der Vleuten, 1990

Potential threatening factors in OSCEs

- Examiners
- Stations (tasks)
- Structuredness
- Patients
- Other……

(Simulated) patient influences

Test Length	Same SP	Different SP	Same SP	Different SP
1	0.34	0.33	0.59	0.56
2	0.51	0.50	0.74	0.71
4	0.67	0.67	0.85	0.83
6	0.76	0.75	0.90	0.88
8	0.81	0.80	0.92	0.91

Swanson & Norcini, 1991

Potential threatening factors in OSCEs

- Examiners
- Stations (tasks)
- Structuredness
- Patients
- Other……

Potential threatening factors in OSCEs

- Examiners
- **Stations** (tasks)
- Structuredness
- Patients
- Other……..

Item analysis

- Difficulty indexes

$$\text{Difficulty Index} = \frac{\text{Number who fail a station}}{\text{Total number of pass and fail students}}$$

For Station 1: $\frac{20-(10+0)=}{20}$ $\frac{10}{20} = .50$

Station	Difficult Index	Discriminability Index
1	.40	.83
2	.15	.47
3	.85	1.00
4	.35	.77
5	.45	.82
6	.70	.33
7	.40	.58
8	.25	.60
9	.35	1.00
10	.50	.50

Conclusions

- Coordinating committee selection
- Coordinator selection
- Appointment of content outline
- Station preparation
- Confirmation of checklist
- feedback
- Thank you very much!