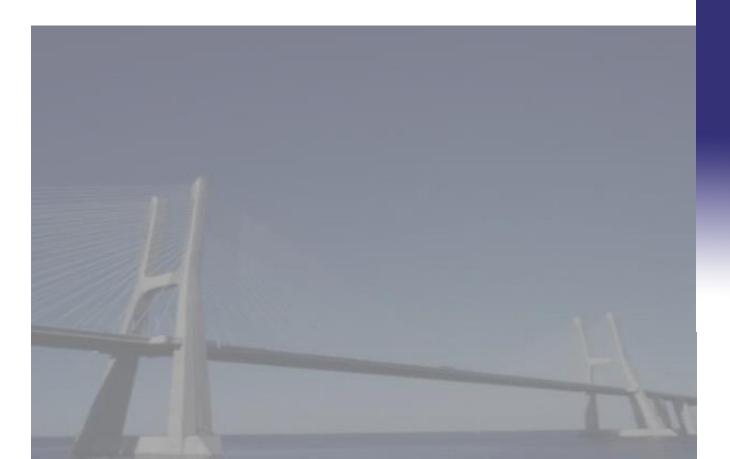
# OSCEs

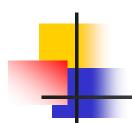
R.Ghaffari, MD, M.M.ED, PhD





## OSCE

- تعریف
- تاریخچه
- موارد مورد استفاده
- مزایا و محدودیت ها
- گامها و مراحل طراحي
- نحوه اجرا و پیاده سازي
  - ملزومات
  - روايي و پايايي



### تعريف

bjective tructured linical xamination



## 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 ــ

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



## OSCE: Advantages

- 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
- z. can be used to assess communication or practical skills



## OSCE: Disadvantages

- 1. Expensive
- 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

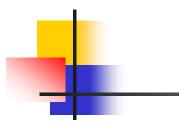
# OSPE

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
- Lists of skills, behaviors and attitudes to be assessed
- Criteria for scoring the assessment (marking scheme of checklist)
- 5. The examinees
- The examiners
- Examination site
- 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
- Timekeeper, time clock and time signal
- 11. Contingency Plans
- 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

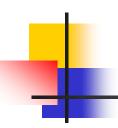
Based on

- .curriculum
- .course objective
- .examination goals



- Checklist preparation
- Use of concise & unambiguous words

<u>S</u>	Situation/Couplet		
	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



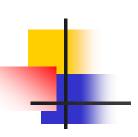
#### Station 15 - Day 1

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.



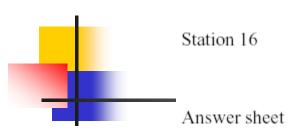
ITEMS	Max Score	Check if Obtained
Age	1	
Onset of symptoms	2	
<ul><li>Duration of cough</li></ul>	2	
Day vs. night cough	2	
Cough productive/non-productive	2	
Wheezing	2	
Aggravating factors - exercise	1	
cold	1	
noxious fumes	1	
Environment	1	
Chest pain	1	
Duration of s.o.b.	2	
Orthopnea	2	
Deep breathing	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



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.

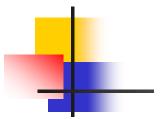
#### PULMONARY FUNCTION TESTS



#### Station 16

POSITION DURING TESTS Erect ( ) Supine ( )	Predicted Normal	Obser Valu		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 <u>ml/min</u> CAPACITY mmttg	)	32.71	17.71	54	

#### Station 16



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

Interstitial lung disease		
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, Wagne	r's	1
	External allergic alveolitis		1
	Idiopathic pulmonary fibrosis		1
Ν	laximum Total Score	(28	3)

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



1.

2.

	Scoring Key		
ITEM	Done	Done	Comments
	Correctly	Incorrectly	
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	
PALPATION			
Patient supine, arms behind hea	d 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 foss	a 1	0	
If only one breast examined		-1	
Maximum Total Score (11)			
Examiner			
Patient			
Total Mark			



#### 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

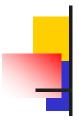
1. What is your differential diagnosis? Which is most likely?

What action should a specialist take at this time?

 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

What is your differential diagnosis? Which is most likely?

FIBROCYSTIC DEASE (1)

CARCINOMA (1)

FIBROCYSTIC DIEASE MOST LIKELY (1)

What action should a specialist take at this time?

ASPIRATION (1)

MAMMOGRAPHY OF BOTH BREASTS (1)

BIOPSY IF ASPIRATION UNSUCCESSFUL (1)

 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

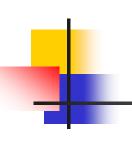
A 34-year old right-handed lawyer comes to your office complaining of a fiveweek history of lightheadedness and unsteadiness on her feet. Over the last ten days, she has had mild incoordination of the left side of the body. Yesterday her left side became noticeably weaker and more clumsy. She has been 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 NAW AND I.D. NUMBER ON <u>EACH</u> PAGE.

- List 5 possible diagnoses.
- What is the most likely lesion?

- 3. Why is this lesion your first choice?
- 4. Give 2 management options open to a specialists.

Maker\_\_\_\_\_



#### 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.

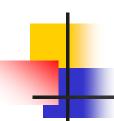


#### Station B4

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

- 3\_\_\_\_\_
- 2\_\_\_\_\_
- 1\_\_\_\_\_
- 0\_\_\_\_\_



#### B. <u>Listening Skills Non/Verbal Communication</u>

- maintains good eye contact
- has appropriate body posture

3\_\_\_\_

- makes empathic gestures

2\_\_\_\_

- is attentive to patient's agenda

0\_\_\_\_

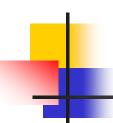
- avoids distracting activities



#### C. Attitude

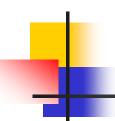
- avoids condescending, sychophantic or 3\_\_\_\_\_
rude behavior 2\_\_\_\_\_

- appropriately congenial and 0\_\_\_\_\_
non-judgmental



#### 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 1\_\_\_\_\_
   obtained 0\_\_\_\_\_

#### F. Management Style

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

## 4

### G. Management Content

summarizes risks of oral contraceptive,

### Succinctly

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

### 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\_\_\_\_

#### 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

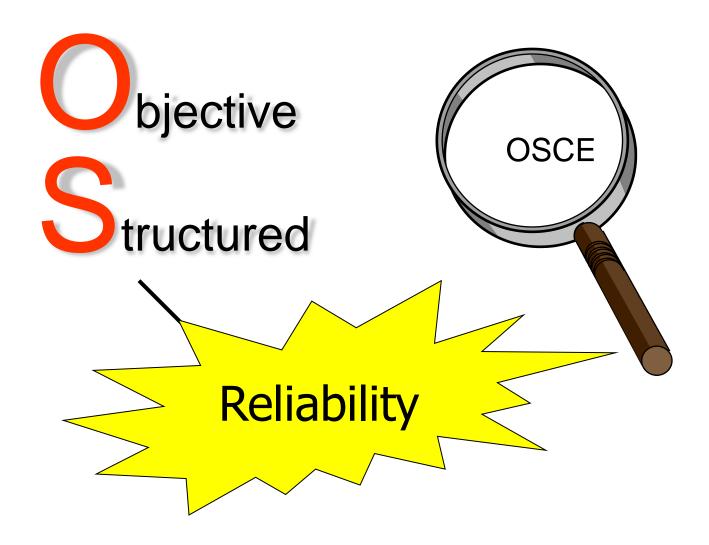
## Validity

Content v.

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

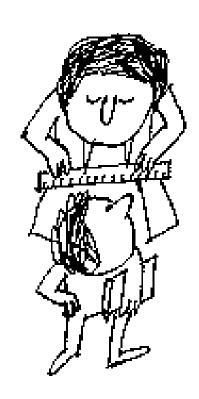
represents the curricular goals and objectives







## What is reliability





### Reliability of sample of different methods

Testing Time in Hours	$MCQ^1$	Case- Based Short Essay <sup>2</sup>	PMP <sup>1</sup>	Oral Exam <sup>3</sup>		OSCE <sup>5</sup>	Practice Video Assess- ment <sup>6</sup>
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

<sup>&</sup>lt;sup>1</sup>Norcini et al., 1985 <sup>2</sup>Stalenhoef-Halling et al., 1990 <sup>3</sup>Swanson, 1987

<sup>&</sup>lt;sup>4</sup>Was et al., 2002 <sup>5</sup>Newble & Swanson, 1987 <sup>6</sup>Ram et al., 1999

## 4

## **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



### 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.....



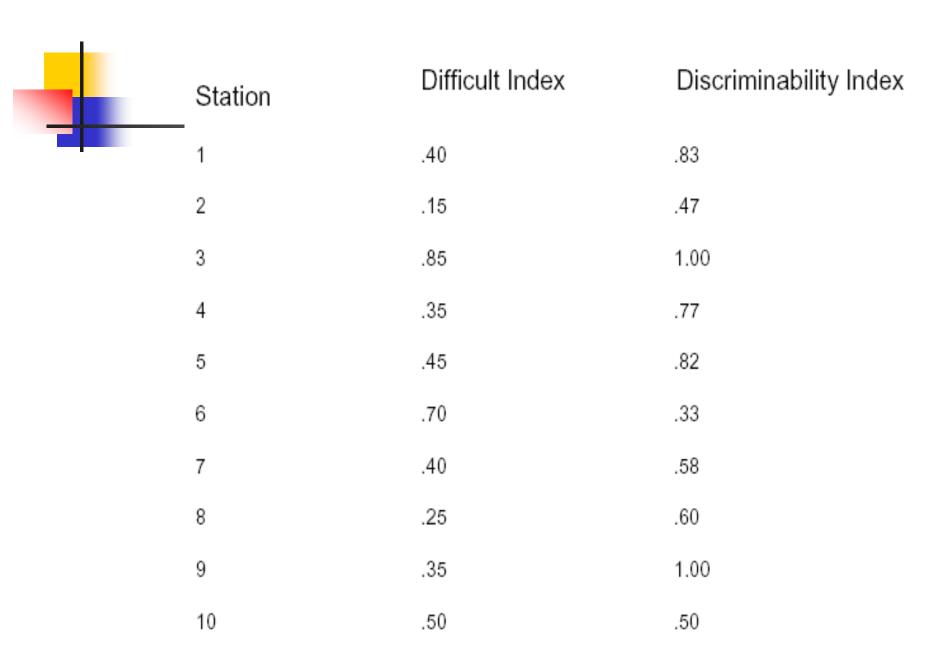
## Item analysis

### Difficulty indexes

Difficulty Index = Number who fail a station

Total number of pass and fail students

$$\frac{20-(10+0)=}{20} = \frac{10}{20} = .50$$





### Conclusions

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

