



التعليم الطبي
للدراستات العليا
MEPgS

SAUDI BOARD
SB
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THE MULTIPLE-CHOICE QUESTION



WHY WE USE THEM

Sample widely

Objective

Rapid scoring

Easily stored

Computer delivery

Multimedia enhancement

Benchmarking

Formative value

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THE COMPONENTS

The Scenario

The Question line

A. }
B. }
C. } The Options
D. }



A 18 year-old woman presents to the Emergency Room with acute lower abdominal pain for 6 hours. There is no past medical history of significance. On examination she is pale, in obvious pain and has marked tenderness over the whole lower abdomen

Blood pressure	80/40 mmHg	<input type="checkbox"/>
Heart rate	110 /min	<input type="checkbox"/>
Respiratory rate	22 /min	<input type="checkbox"/>
Temperature	37.8°C	<input type="checkbox"/>

What is the most likely diagnosis?

- A. Acute appendicitis
- B. Torsion of ovarian cyst
- C. Ruptured ectopic
- D. Salpingitis



A 18 year-old woman presents to the Emergency Room with acute lower abdominal pain for 6 hours. There is no past medical history of significance. On examination she is pale, in obvious pain and has marked tenderness over the whole lower abdomen

Blood pressure	80/40 mmHg	
Heart rate	110 /min	
Respiratory rate	22 /min	
Temperature	37.8°C	
Oxygen saturation	95% on room air	

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SCENARIO

Like clinical notes, complaint – history - examination

State age, gender, ethnicity or race only if necessary!

Point of care – if this makes a difference

**DO NOT ADD LAB DATA, VITAL SIGNS OR X-RAY
REPORTS IN THE MIDDLE OF A SCENARIO**

(see lab results and X-ray)

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Q1.



A 24 year-old driver was involved in a motor vehicle accident. She was admitted unconscious (see X-ray and lab results)

Blood pressure 80/40 mmHg

Heart rate 110 /min

Respiratory rate 14 /min



ALIGN COLUMNS

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Blood pressure 120/70 mmHg
Heart rate 72 /min
Respiratory rate 18 /min
Temperature 38.3°C



Test	Result	Normal values
Hb	80	120-180 g/L
MCV	78	80-96 fl
Hct	32	42-46 v/v



DO NOT MAKE MCQS LIKE THIS!!

Short stem & lead-in

A. Long option

B. Long option

C. Long option

D. Long option

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ABBREVIATIONS, UNITS

SCHS will issue a list of acceptable abbreviations

Do not put the full noun plus the abbreviation

Use SI units

Do not put unnecessary lab data

Avoid using lab / radiological or other reports

Vital signs – lab data – extra tests, for example . .

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A 42 year-old woman presented to her family doctor with tiredness and feeling light headed. The doctor arranged for some routine tests (see lab results).

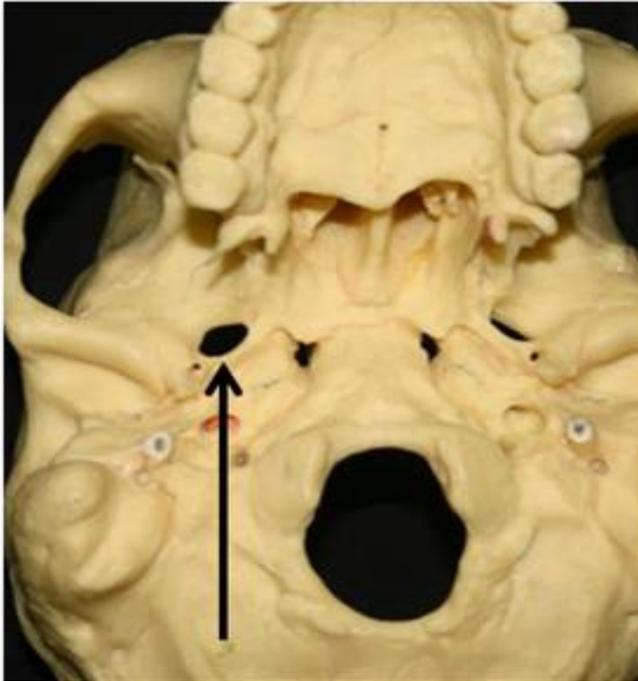
Test	Result	Normal Range
Hb	80.0	120-160 g/L
MCV	82	86-98 fL
MCHC	240	320-360 g/L
MCH	24	28-33 pg
TIBC	43	45-66 mmol/L

A blood film was reported to show poikilocytosis and anisocytosis.

What type of problem does this patient have?

- A. Anaemia of chronic disease
- B. Vitamin B₁₂ deficiency
- C. Thalassaemia trait
- D. Iron deficiency

HEADING



The base of the skull with the foramen ovale indicated, through which courses an important structure.

Which of the following structures passes out through the foramen?

- A. Facial nerve
- B. Ophthalmic vein
- C. Meningeal artery
- D. Mandibular nerve

Is the image or text it really needed?



DO NOT REPEAT AND OVERLAP

How much blood loss will cause irreversible organ damage?

- A. 30-40% of blood volume
- B. 20-30% of blood volume
- C. 10-20% of blood volume
- D. 5-10% of blood volume

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TRIM DOWN THE OPTIONS

What percentage loss of the blood volume will cause irreversible organ damage?

- A. 5-10
- B. 11-20
- C. 21-30
- D. 31-40

DO NOT INTERPRET THE DATA – 2 FLAWS

A patient who was known to have tuberculosis would have been expected to have a cough and possibly slight dullness to percussion at one or both apices of the lungs, but this patient had evidence of stony dullness at his right lung base.

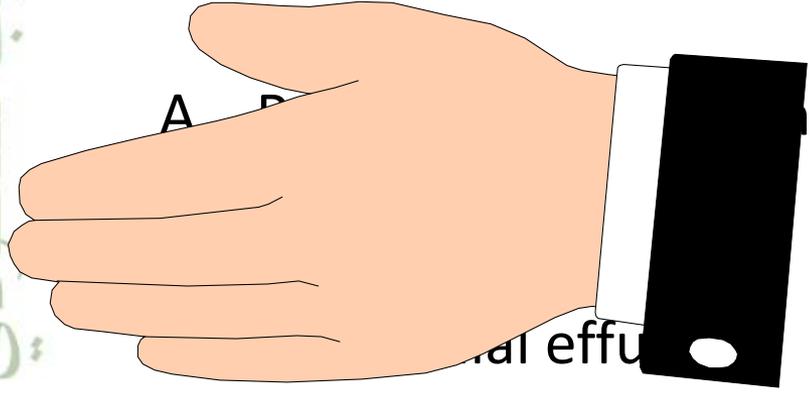
What are these findings confirmation of?

- A. Pneumonic consolidation
- B. Tuberculous effusion**
- C. Liver enlargement
- D. Pleural thickening

THE HAND COVER TEST

A car driver was involved in a head-on collision and received a severe blow to his chest over the sternum. He was admitted to the hospital and during the first survey of his condition the doctor noticed that he has a markedly raised JVP.

How is this clinical feature best explained?



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A 58 year-old man had epigastric pain radiating into his back for three months and now came to see his family doctor. The man has lost eight kilos in weight during the same period and on examination appeared anorexic, jaundiced and pale. The doctor was very concerned and arranged a referral for the patient to the hospital and an urgent specialist's opinion.

What was the most likely diagnosis?

- A. Chronic pancreatitis
- B. Obstructive jaundice
- C. Viral hepatitis
- D. Pancreatic carcinoma

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Which of the following is the most likely diagnosis?

A.

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HOW LONG IS TOO LONG?

Simple scenario without lab data – 70-80 wpi

Complex scenario with data – 100-110 wpi

Complex item \leq 130 wpi

BEWARE OF COPYRIGHT ISSUES

We do have plagiarism software!!

NEVER SAY TO YOUR SECRETARY *“Here is the book
please copy the questions from it”*

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SUMMARY

Structure

Presentation – format

Images

Tables and data

Option and distractors

Question lines and HCTs

How long is too long

Who owns the copyright?

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A 54-year-old patient on glipizide who reports for extraction of teeth, suddenly complains of lethargy, polydipsia, polyphagia, and polyuria. Laboratory results are as follows:

Test	Patient's Results	Normal Values
pH of arterial blood	7.22	7.4
PaCO ₂	24 mmHg	40 mmHg
HCO ₃	12 mmol/L	25 mmol/L
Na	130 mmol/L	135 – 147 mmol/L
Cl	93 mmol/L	99 – 106 mmol/L
K	4.5 mmol/L	3.5 – 5.5 mmol/L
Glucose	33.3 mmol/L	> 10 mmol/L

What should be the immediate treatment for this patient?

- A. Insulin and 5% dextrose
- B. Bicarbonate therapy
- C. Glucagon 1 mg IM/IV
- D. 50 ml of 50% dextrose



While anesthetizing a patient with TM joint ankylosis, the anesthetist decides to perform tracheal intubation after inhalational induction, with the patient breathing spontaneously. Within 60 seconds of starting the volatile anesthetic, the patient starts breathing laboriously, with a typical crowing sound and begins desaturating. Which of the following drugs does NOT have a role in relieving this condition?

- A. IV propofol
- B. IV lidocaine
- C. IV suxamethonium
- D. IV fentanyl





ITEM WRITING FLAWS

IWFs

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IWF, WHAT DOES THIS MEAN?

When the correct answer to the question is assisted or provided by a flaw in item construction, or confusion, ambiguity or anything else that is considered to measure *construct irrelevant variance* (CIV), not what is was supposed to test for.

DID YOU KNOW

The 40% - 50% of all questions in high stakes exams have these flaws

If item writers properly trained can be reduced to <5%

Tarrant M, Ware J et al 2006

Ware J, Vik T. 2009

Tarrant M, Ware J. 2010

EXAMPLES OF FLAWS

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Authors	Year	IWFs
Masters et al	2001	76%
Ware et al	2004	46%
Downing SM	2005	46%
Tarrant et al	2006	46%
Ellsworth et al (Guides)	1990	60%
Hansen (Q-Bank)	1997	75%

EXAMPLES OF FLAWS

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Item writing flaw	n	(%)	n=2770
Ambiguous or unclear	208	(7.5)	
Negative word in stem	192	(6.9)	
Implausible distractors	184	(6.6)	
Gratuitous information	169	(6.1)	
More than one correct answer	156	(5.6)	
Longest option is correct	135	(4.8)	
Logical clue in the stem	128	(4.6)	

1280 of all items contained one or more IWFs, 46.2%

EXAMPLES OF FLAWS

أمن صحي .. بتدريب سعودي

Item writing flaw

n (%) n=2770

Word repeats	112 (4.0)
Unfocused stem	87 (3.1)
T/F item	77 (2.8)
AOT	50 (1.8)
Vague terms	48 (1.7)
Absolute terms	47 (1.7)
NOTA	27 (1.0)
Others	63 (2.2)

1280 of all items contained one or more IWFs, 46.2%

Downing SM. 2005

Reviewed 5 med school tests, 33%-46% items flawed, 10%-25% candidates classified as failed would have passed if flawed items removed and results re-computed.

Tarrant M, Ware J. 2009

Reviewed 121 exams taken by 824 examinees. Ten exams met selection criteria: 47% items flawed, which when removed made exams easier, yet pass rate lower, but almost 40% increase in distinctions given ($\geq 80\%$)

A car driver is involved in a head-on collision and receives a severe blow to the chest over the sternum. He is admitted to the hospital and during the first survey of his condition in the emergency room, the doctor notices that he has a markedly raised JVP.

What is the least likely cause?

- A. Pulmonary embolism
- B. Atrial fibrillation
- C. Pericardial effusion
- D. Complete heart block

IWF 1 – *note the revisions*¹

In a head-on collision a car driver receives a severe blow to the sternum. On admission he has a markedly raised JVP.

What is the most likely cause?

- A. Pulmonary embolism
- B. Atrial fibrillation
- C. Pericardial effusion
- D. Complete heart block

A 62 year-old man is referred to a specialist clinic because he is unable to walk upstairs in his villa without pausing several times on the way up. The doctor records his brachial and ankle pressures:

Brachial pressure 140/80 mmHg
Ankle pressure 120/60 mmHg

All are possible causes except:

- A. Coarctation of the aorta
- B. Generalised atherosclerosis
- C. Aortic aneurysm
- D. Absent anterior tibial artery

IWF 3

A patient was admitted with one hour of continuous central crushing chest pain. Serum troponin I was elevated and the ECG showed elevation of the ST segment in anterior chest leads V2-V5.

Where was the pathology located in the heart?

- A. Anterior
- B. Anterolateral
- C. Inferior
- D. Posterior

IWF 4 and 3

The doctor is examining his patient's respiratory system and wishes to listen over the left posterior chest. He listens as far laterally as possible between ICS¹ II-V, where the scapula normally covers the posterior chest wall. He asks the patient to hold his arm(s) so that the scapula moves laterally uncovering the chest wall.

What instruction does he give?

- A. Put your left hand on top of you head
- B. Hold the right shoulder with the left hand, thereby causing the scapula to be winged on that side
- C. Hold both arms upwards above the head
- D. Clasp both hands with arms straight in front of the chest

Which is the last rib to be connected to the sternum by its own costal cartilage?

- A.VIII
- B.XII
- C.IX
- D.VII

A 60 year-old man is brought to the Emergency Room by his wife with difficulty getting his breath for the last week, coughing up yellow-green sputum and sitting in a chair at night. ABGs showed, pH 7.25, $p\text{CO}_2 = 75$, $p\text{O}_2 = 41$ and $\text{HCO}_3 = 15$

What is the correct interpretation of the ABGs?

- A. Respiratory alkalosis
- B. Compensated metabolic acidosis
- C. Decompensated metabolic acidosis
- D. Acute respiratory acidosis

A 50 year-old chronic smoker comes to his family doctor for advice about smoking cessation. Before arranging a time for the patient to be seen by a counsellor the doctor examines his chest and notices that the chest expansion in deep inspiration is limited.

What is the explanation for this?

- A. Can never be due to bronchospasm
- B. May possibly be restrictive lung disease
- C. Always explained by lung hyperinflation
- D. Seldom caused by muscle exhaustion

During an examination of the same patient with arterial disease as in Q56 above, the doctor notes that the veins completely empty and guttering is observed while elevated when some venous filling should have been still observed.

At what height above the horizontal does guttering first become abnormal?

- A. 0-5 cm
- B. 15-22 cm
- C. 10-15 cm
- D. 5-10 cm

The doctor has seen a hot nodule in the thyroid isthmus on a thyroid scan. Now he stands behind his seated patient and palpates the anterior neck below the thyroid cartilage. He wishes to identify the upper border of the thyroid isthmus as accurately as possible. He slides his fingers down the front of the patient's neck:

What landmark does he feel before the thyroid isthmus?

- A. Clavicle
- B. Carotid
- C. Cricoid
- D. Trachea

You are presented with a 58 year-old female in the initial stages of left sided heart failure. As the left atrial pressure increases so does the risk of this patient developing pulmonary oedema.

This occurs at:

- A.7 mmHg
- B.45 mmHg
- C.30 mmHg
- D.15 mmHg

The doctor examines a post operative patient's left chest in the surgical ward on PO Day II. The patient has a LGF otherwise her vital signs were normal. The ward sister says the patient hasn't started a normal diet yet but keeps asking for food as she is hungry.

Chest expansion	reduced
Percussion note	dull
Breath sounds	absent or decreased
Added sounds	none
Vocal resonance	absent or decreased

What is the most likely cause of these findings?

- A. Pneumonia
- B. Atelectasis
- C. Bronchial obstruction
- D. Pleural effusion

IWF 12 and 11

A doctor percussed the patient's right chest and noted that there is reduced resonance below the fifth rib anteriorly. Otherwise, the findings were completely normal.

What is the most likely explanation?

- A. Right lower lobe pneumonia
- B. Massive pleural effusion
- C. Normal liver dullness
- D. All of the above

On general examination of a 35 year-old Indian worker the factory doctor notices he has a corneal arcus and the presence of Xanthelasma.

What blood test should he order?

- A. Blood urea
- B. Fasting blood sugar
- C. Serum troponin I
- D. None of the above

The medical student is having difficulty seeing the “a wave” in his patient. He takes out his stethoscope to listen to the patient’s heart and follow the exact timing when this wave should be seen.

When should he see the “a wave”?

- A. Midway between S1* and S2**
- B. Just before S2
- C. At S2
- D. Just after S2

*, S1, first heart sound and **, S2, second heart sound.

IWF 15

Below are the blood pressures (in mmHg) taken from five adult patients attending a family practitioner's clinic.

Systolic / diastolic (mmHg)

Patient A	180 / 110
Patient B	160 / 90
Patient C	170 / 64
Patient D	130 / 88

Which patient is pre-hypertensive?

- A.D
- B.A
- C.C
- D.B

Thank you

