

Master of Medicine (Anaes) Part B OSCE Examination Candidates' Guide for the Investigation Station

1. Purpose of this Document

This purpose of this Guide to help candidates to prepare for the **OSCE Investigation Station** through understanding the range of investigation results within a clinical scenario that may be presented as questions, for which they must demonstrate their competencies to interpret the result, correlate to the patient's clinical needs and describe the management.

2. Purpose and Nature of the Investigation Station

2.1. **Context** This station ascertains the candidate's competency to interpret and respond to a patient's clinical investigation results, especially for results indicating adverse physiological or anatomical derangements, in the following context:

- a. **Clinical context** The investigation was done for a patient in a clinical situation that involves anaesthesiologists.
- b. **Degree of Urgency** The clinical situation requires a response from the anaesthesiologist within 15 minutes, either due to the acuity of the patient's status, or from the need for urgency surgery / procedure requiring anaesthesia. This station complements the "Crisis Management" OSCE Station by additionally testing the candidate on 4 more clinical situations.
- c. **Role of candidate** The candidate answers questions as the Anaesthesiology senior resident present at the scene, where a more senior specialist is reachable only via phone.

2.2 **Format of OSCE** This station will be conducted as a Viva Voce with the following features:

- a. **Timing:** 2 min: Pre-reading for candidate
12 min: Q+A for 4 questions (each question 3 minutes)
- b. The candidate will respond verbally to the questions, no practical actions are required.
- c. Examiners may show investigation results and relevant clinical information (eg. pictures) to the candidate in the following manners:
 - i On computer screen
 - ii Printed on paper

3. Potential Types of Investigation Results for OSCE Questions

The following lists (non-exhaustive) describe the potential investigations vs abnormality / pathology that may be used in the OSCE.

3.1. ECG

Rhythm only		12 lead ECG	
Atrial fibrillation	Fibrillation	Myocardial Ischaemia	Blocks
Atiral flutter	Asystole	AMI (various regions)	WPW
Supra vent	Atrio-vent blocks	Hypertrophic heart	Pulmonary embolism
Tachycardia	Junctional rhythms	Pericarditis	Pulmonary
Ventricular ectopics	Pacemaker	Pericardial effusion /	abnormalities
Ventricular	rhythms	Tamponade	Electrolyte
Tachycardia		Bundle Branch	Abnormalities
Ventricular			Drug effects

3.2. Chest X-Rays

Lung	Mediastinum + Abd	Trauma	Implanted Objects
Pneumothorax Lobar collapses Atelectasis Fluid overload Pulmonary oedema Pleural effusion / Hemothorax Consolidation / Pneumonia Aspiration Pulmonary Embolism Emphysema Tumour	Tracheal pathologies Thyroid pathologies Heart pathologies Pericardial pathologies Vessel pathologies Tumours Mediastinal air Gastric, gut features	Tracheal injuries Subcutaneous emphysema Fracture Ribs Pneumothorax Lung contusion Mediastinal injuries Diaphragm injuries	ETT Tracheostomy tube Vascular lines Chest drain NG Tube IA Balloon Pump

3.3. Arterial Blood Gas

Respiratory derangement	Acid-base derangement
1. High A-a gradient. Types: a. Low PaO ₂ b. Adequate PaO ₂ 2. High PaCO₂, variables. Types: a. acute vs chronic b. Spontaneous respiration c. Controlled ventilation 3. Low PaCO₂, variables. Types: a. Spontaneous respiration b. Controlled ventilation	1. Acidaemia. Types: a. 1° Metabolic + inadeq resp compensation: i. HAG: lactic, DKA, renal, drugs ii. NAG: Hyperchloraemia b. 1° respiratory + inadeq metab compensation: CO ₂ ↓ removal vs ↑ production? c. Mixed metab + resp acidosis 2. Alkalaemia. Types: a. Pure metab alkalosis + inadeq resp compensation - HCO ₃ loss vs excess intake b. Pure resp alkalosis + inadeq metab compensation c. mixed resp + metab alkalosis 3. Deranged acid-base with normal pH. Types: a. Metab acidosis + Resp alkalosis b. Resp acidosis + Metab Alkalosis

3.4. Other types of Investigations

Examples:

- Cervical Spine X-Rays
- CT / MRI scan of brain
- Blood tests: Haematology, Liver Function, Renal Panels, thyroid function.
- Pulmonary Function Tests

3.5. Other Radiological Investigations

- a. Cervical Spine XRs
- b. CT / MRI Scan of:
 - i Brain
 - ii Spinal cord: stenosis/compression, tumours
 - iii Chest – retrosternal compression of trachea or vascular structures, tracheoesophageal fistula, oesophageal pouch, oesophageal diverticula.

3.6. Echocardiographic / Ultrasonographic Findings

- a. Transthoracic echocardiography:

2D Transthoracic Views	Pathology – Dynamic Images
Parasternal Long Axis	Hypovolaemia
Parasternal Short Axis	Myocardial Ischaemia – Global EF & RWMA
Apical 4 Chamber	Pericardial Effusion
Subcostal 4 Chamber	Pericardial Tamponade
Subcostal IVC	Pulmonary Embolism
	Aortic Dissection

- b. Lung Ultrasound Findings: Pneumothorax, pleural effusion

3.7. Other Investigations

- a. Haematological tests
- b. Liver Function Tests
- c. Lung Function Tests

4. Design of the OSCE Question

4.1. Clinical Scenario

- a. Scenario with urgency Describe a clinical scenario for which the investigation result was obtained. The scenario will generally include the following:
 - i The candidate is the most senior anaesthesiologist on scene, and the his/her senior can only be reached by phone.
 - ii The urgency of the scenario requires the candidate to interpret the results himself/herself, and precludes consulting a senior or other specialists.

4.2. Potential scenarios may include the following (suggestions welcomed):

Context	Scenario
Pre-Anaesthesia	<ol style="list-style-type: none"> 1. In PACE: abnormal results in screening investigations 2. Pre-op Assessment for emergency surgery (in ward / OT induction room): <ol style="list-style-type: none"> a. Abnormal routine investigation results (eg. High K in renal patient) b. symptoms / signs requiring urgent investigation (ECG for chest pain) c. Inx to assess status for complex issues (eg. pacemaker, Cx spine in RA)
During Anaesthesia	<ol style="list-style-type: none"> 1. Acute event / derangements requiring urgent investigation 2. Pre-emptive investigations as part of anaesthesia or surgery (eg. prolonged period, surgical bleeding, clamping of vessels, bypass)
Post Anaesthesia	<ol style="list-style-type: none"> 1. Intraop events requiring investigations 2. Acute event in PACU requiring urgent investigation
Emergency Dept	Anaesthesiologist in ED (eg. airway management, poly-trauma patient), and presented with abnormal investigations.

Context	Scenario
HD, ICU	<ol style="list-style-type: none"> 1. Reviewing investigations for patient just admitted into ICU after surgery 2. Acute deterioration/event requiring help of anaesthesiologist. 3. ICU/HD patient requiring urgent surgery

4.3. Competencies to be Assessed

Every question will assess competency **A**, and a variable combination of competencies **B** to **E**.

No.	Competency	Expected performance from candidate
A	Interpret results	<ol style="list-style-type: none"> 1. Diagnosed and conclude if there is an abnormality (or normal result). 2. The interpretation may involve the following: <ol style="list-style-type: none"> a. spot diagnosis of abnormality(ies) (eg. ECG rhythm, CXR finding) b. description of the diagnostic features (eg. ECG waveform, CXR features) c. Analysis (eg. ABG, Lung function parameters) d. Calculations (eg. ABG) 3. Normal investigations may be used to test candidate's analysis of complex results (eg. pacemaker ECG, cervical spine XR) – for decisions making.
B	Describe clinical implications	Describe the potential clinical implications and/or needs of the patient as indicated by the investigation results.
C	Correlate results with patient's actual status	Proactively elicit clinical information to ascertain patient's status, eg: <ol style="list-style-type: none"> a. Symptoms and relevant history b. Physical signs c. Monitoring parameters
D	Perform other relevant investigations	Request for and interpret other pertinent investigations to aid in making a definitive diagnosis and/or excluding differentials.
E	Management of patient	These may involve the following levels of management: <ol style="list-style-type: none"> a. Immediate resuscitation to prevent further deterioration and prevent death. b. Continued Physiological support to sustain patient's physiology c. Definitive therapy for underlying pathology.

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