

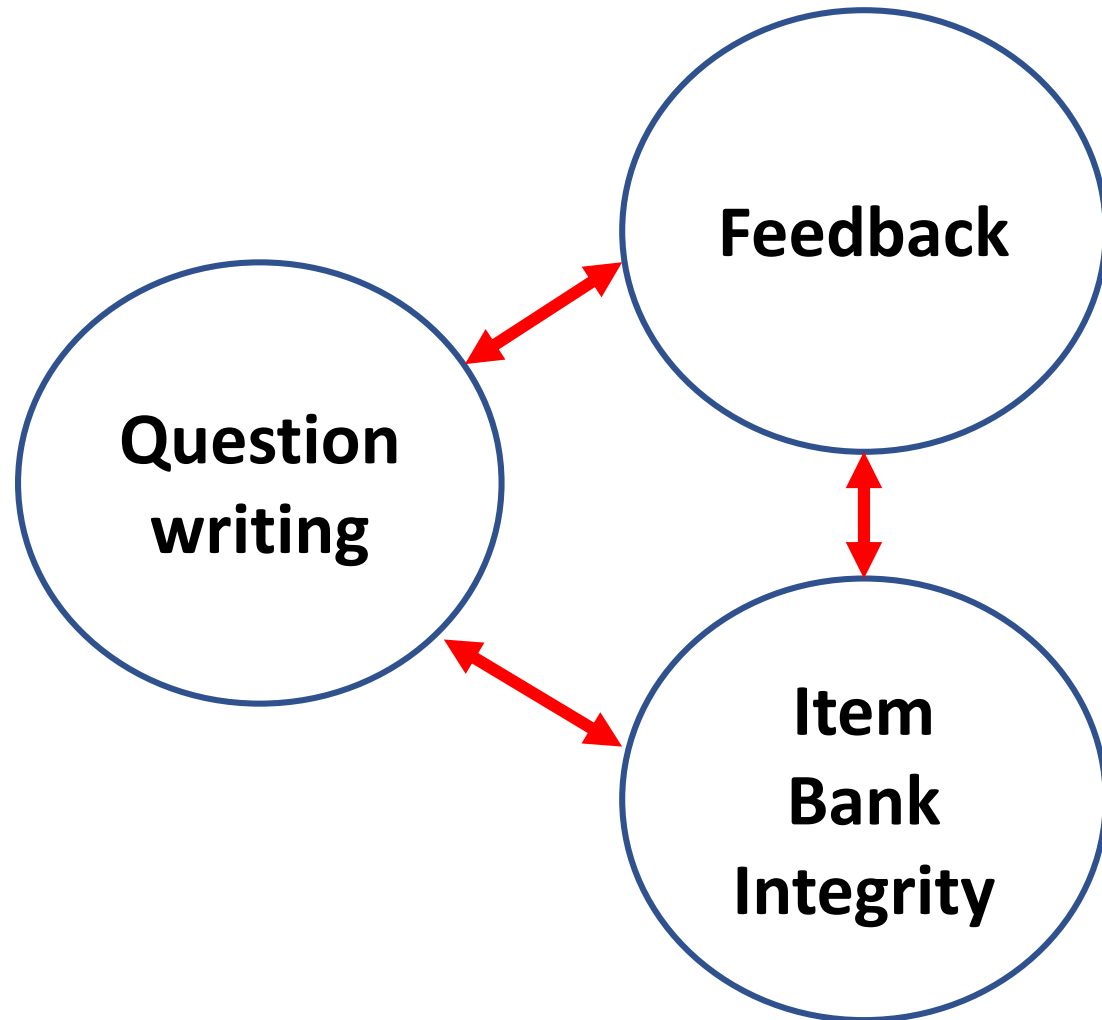
# Introduction of a new online platform for formative and summative assessments in the MBChB programme

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Edinburgh Medical School**

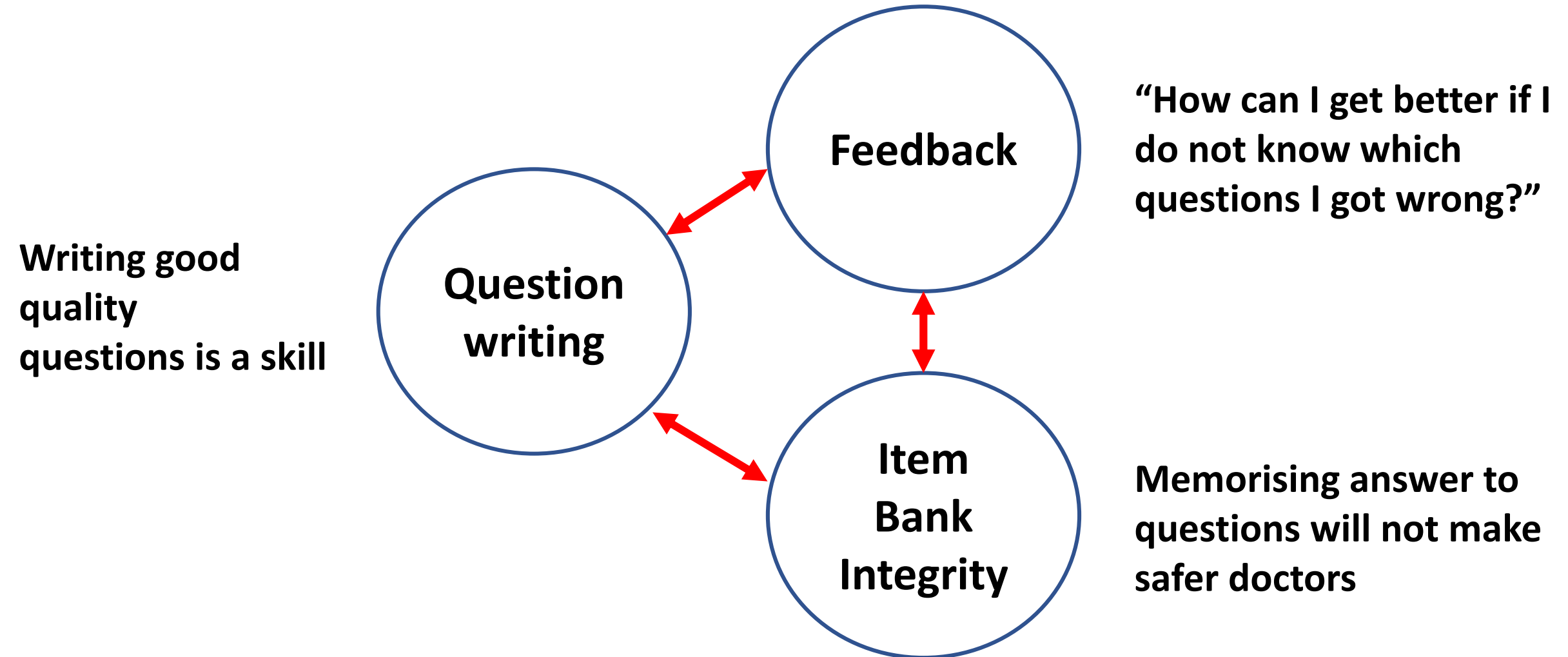
# Assessment Landscape in Medicine

- A regulated programme ensuring students achieve GMC's "Outcome for Graduates"
  - A wide range of knowledge required for safe medical practice
- Single best answer questions have become main method across UK medical schools
  - Collaborative project of the Medical School Council Assessment Alliance producing a national item bank
  - Increasing interest in very short answer questions
- GMC is introducing a national Medical Licensing Assessment in 2022
  - Applied Knowledge Test
  - Clinical Professional Skills Assessment

# Applied Knowledge Tests



# Applied Knowledge Tests



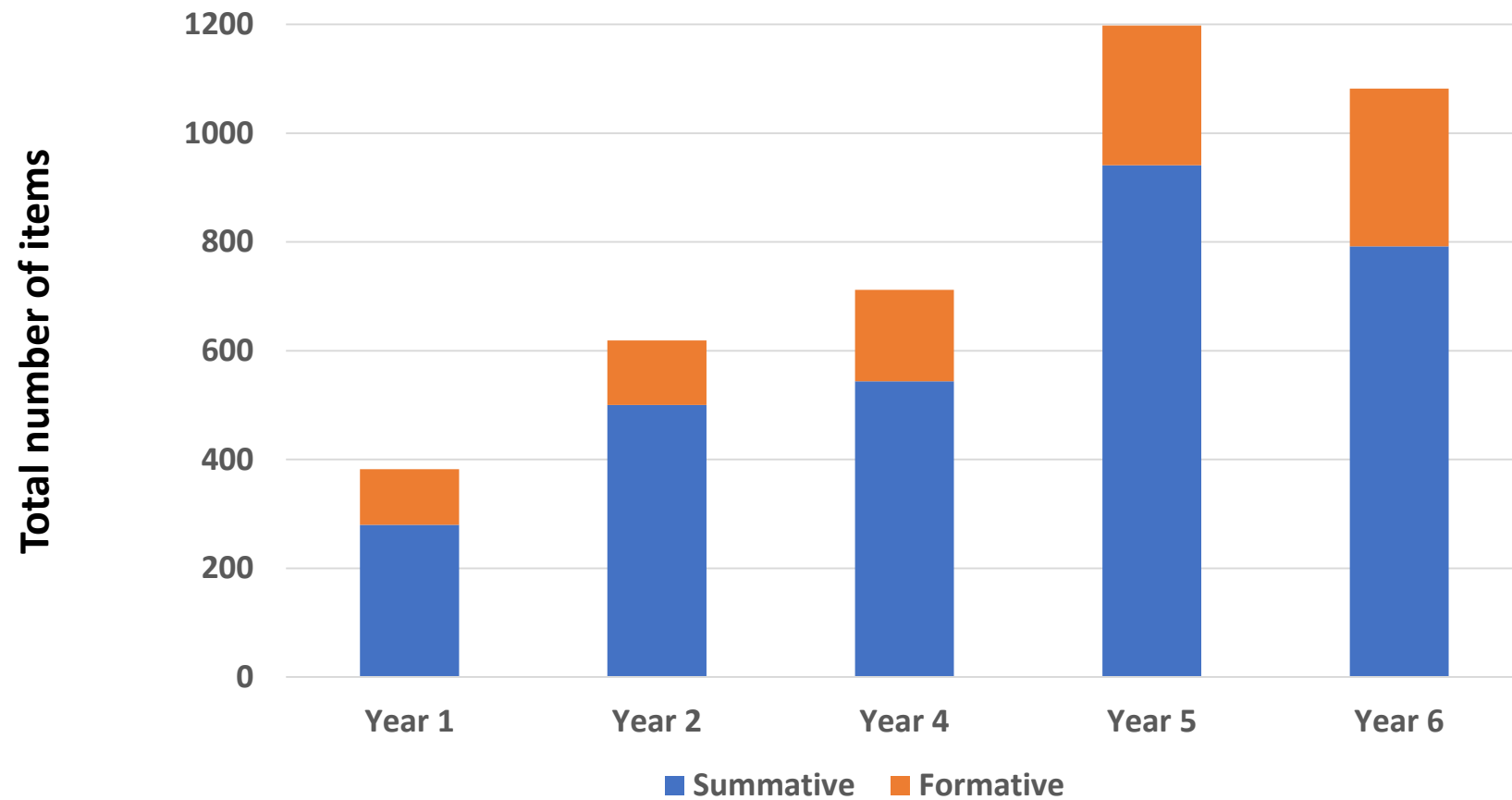
# Main Educational Requirements

- Deliver summative and formative assessments online both in computer labs and remotely
- Allow more detailed feedback after exams
- Produce a searchable item bank across the programme
- Reliable delivery that can cope with network failures
- Enable standard setting and post-exam review
- Can also be used for clinical assessment

# Pratique: Fry-IT

- Used by a number of UK medical schools and Royal Colleges for exams
- Imported questions from existing system-OSCA
  - Three months spent editing to house style
  - Setting up initial question blueprinting
  - All years given a formative assessment in semester 1
- Searchable item bank

# Item bank for MBChB 2018



# Blueprinting

- Year of programme, e.g. Year 1, 2 etc
- Year of writing
- Summative/Formative
- Specialty, e.g. cardiology, haematology etc
- Skill, e.g. diagnosis, investigations, pharmacology etc



# Blueprinting

- Year of programme, e.g. Year 1, 2 etc
- Year of writing
- Summative/Formative
- Specialty, e.g. cardiology, haematology etc
- Skill, e.g. diagnosis, investigations, pharmacology etc
- Core presentation, e.g. breathlessness, headache etc
- Core condition, e.g. asthma, meningitis etc
- Programme themes

**Question title**

Assessment of hypertension

**Question text**

A 48 year old black British woman visits her GP as a routine assessment of her blood pressure at work was found to be 160/94 mmHg. She has well controlled asthma.

Her blood pressure is 145/95 mmHg. Her BMI is 32.

Investigations

Creatinine 74  $\mu\text{mol/L}$  (60-110)

Cholesterol 5.2 mmol/L (<5.2)

HDL cholesterol 1.2 mmol/L (>1.55)

**What is the most appropriate management?**

## Available answers

- A. Advise weight loss and review blood pressure in 6 months (value: 0.00)
- B. Request 24 hour ambulatory blood pressure and review with result (value: 1.00)**
- C. Start amlodipine (value: 0.00)
- D. Start amlodipine and simvastatin (value: 0.00)
- E. Start lisinopril (value: 0.00)

Item information	Item resources	Blueprinting	Item overview
Blueprint map		Dimension(s)	
Programme Themes		Programme Themes Management-Presentation Diagnosis & Management (PDM)	
Skill		Skill Patient management	
Speciality		Specialty Cardiology Specialty General Practice	
Summative/Formative		Summative/Formative Formative	
Year		Year Year 6	
Year of Writing		Year of Writing 2017	

# Exam construction

- Define exam blueprint
- System will search bank to fit blueprint
- Reality check required by academic staff
- Simple process to replace questions or update/edit

# Exam blueprint-Year 4 exam

## Blueprint constraints

Total number of constraints is 8

Category	Value
Respiratory medicine	25
Cardiology	25
SBA	100
Psychiatry	3
Year 4	100
General Practice	22
Neurosciences	25
Summative	100

# Exam Delivery

- Online via Practique system
- Uses safe exam browser to lock out internet use
  - Can be used with students' own devices
- Not dependent on network access
- Student experience favourable
- Automatically marked in real time

# Student Feedback

- System allows a range of reports to be generated
  - Domain based
  - Question feedback/explanation by author

# Feedback Reports-Summative assessments



## Overall score

Your score

62.63%

Pass

Cohort average

68.00%

Pass

## Questions overall

# Specialty performance

## Analysis

Specialty	No. of questions	Your score	Class average
Anaesthetics & Critical Care	5	60.00%	64.39%
Breast	2	50.00%	73.83%
Cardiology	9	55.56%	65.42%
Chemical Pathlogy	4	50.00%	63.20%
Child life and health	8	100.00%	78.33%
Clinical Genetics	1	100.00%	89.25%
Clinical Pharmacology	2	50.00%	79.91%
Diabetes	3	33.33%	63.24%
Emergency medicine	8	100.00%	81.19%
Endocrinology	6	83.33%	76.25%
ENT	1	0.00%	66.82%
Gastroenterology	2	0.00%	67.76%
General Practice	16	62.50%	65.42%
Haematology	8	75.00%	73.31%
Hepatology	3	100.00%	56.23%
Infectious disease	2	50.00%	51.64%
Medicine of Elderly	5	60.00%	76.45%
Nephrology	8	50.00%	75.29%

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# Specialty performance

Neurosciences	6	83.33%	79.91%
Obstetrics	1	100.00%	61.68%
Oncology	4	50.00%	63.67%
Ophthalmology	1	0.00%	30.84%
Orthopaedics	3	100.00%	72.27%
Palliative care	2	50.00%	81.31%
Psychiatry	1	100.00%	55.61%
Respiratory medicine	7	42.86%	67.56%
Rheumatology	5	80.00%	61.78%
Surgery	10	40.00%	61.82%
Toxicology	4	75.00%	58.18%
Urology	3	66.67%	76.64%
Vascular surgery	4	50.00%	61.45%

Skill	No. of questions	Your score	Class average
Anatomical knowledge	1	100.00%	80.84%
Application of population health principles and method including disease prevention	1	100.00%	79.44%
Diagnosis	32	65.62%	70.12%
Emergency care	15	73.33%	73.93%
Ethical and legal principles	2	50.00%	88.08%
Genetics	2	50.00%	80.84%
Investigations	14	64.29%	70.83%
Microbiology	2	50.00%	57.48%
Pathology	1	100.00%	69.16%
Patient safety & safeguarding	3	33.33%	50.31%
Pharmacology	7	42.86%	69.76%
Physiology	5	40.00%	66.26%
Prescribing	16	62.50%	60.86%
Treatment decisions	23	65.22%	65.83%

# Feedback reports-Formative assessments

- Domain based feedback as above
- Student receive a copy of the paper and an explanation for each question

## Explanation provided for each question

**Q:** Osteoarthritis management

**Your answer:** Start regular oral ibuprofen tablets

**Correct answer:** Advise weight loss and exercise programme

**Examiner notes:** This patient has osteoarthritis. The initial management is to offer advice on activity, exercise and weight loss (Nice Guideline CG177 2014). As pain is being controlled with paracetamol there is no indication to escalate her analgesia. The diagnosis can be made clinically without need for further imaging.

You answered this question  
incorrectly

**116/213 (54.46%)**  
candidates answered this  
question correctly



**Q:** Intermittent claudication assessment

**Your answer:** Arrange ankle brachial pressure index measurement

**Correct answer:** Arrange ankle brachial pressure index measurement

**Examiner notes:** The clinical picture and examination findings fit with peripheral vascular disease and the first stage of assessment is to measure the ankle brachial pressure index. This will confirm the diagnosis and guide subsequent management. The bisoprolol should not be stopped as it has important protective benefits post MI. It remains unclear whether b-blockers worsen walking distance in intermittent claudication. A supervised exercise programme would follow once the diagnosis is confirmed.

You answered this question  
correctly

**178/213 (83.57%)**  
candidates answered this  
question correctly

# Feedback reports-Summative next steps

**Q:** Pneumothorax treatment

**Your answer:** Needle thoracocentesis

**Correct answer:** Needle thoracocentesis

You answered this question  
correctly

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**Q:** Investigation of Coeliac disease in a child

**Your answer:** Start gluten free diet with no further investigations

**Correct answer:** Small bowel biopsy

You answered this question  
incorrectly

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**Q:** Airway management in unconscious patient

**Your answer:** Intubation and mechanical ventilation

**Correct answer:** Intubation and mechanical ventilation

You answered this question  
correctly

**Focus on  
major learning  
point for each  
question**

# Standard setting and post-exam review

- Standard can be entered for each question or for overall exam
- Produces Classical test theory and item response theory psychometric reports

# Very short answer questions

- Typing answers more accurately mirrors clinical decision making
- Increasing interest in use in medical assessments
- Computer marking makes large scale use feasible

**Question title**

Acute breathlessness

**Question text**

A 24 year old man is admitted with a acute onset of shortness of breath and sharp right sided chest pain. He has a history of asthma and takes beclomethasone and salbutamol.

His pulse is 120 bpm, blood pressure 96/80 mmHg, respiratory rate 26 breaths per minute and oxygen saturation 94% on high flow oxygen. His trachea is deviated to the left and percussion is hyper-resonant on the left with absent breath sounds.

**What is the most likely diagnosis?**

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**What is the most likely diagnosis?**

Pneumothorax

Pulmonary embolus

Asthma

Pericarditis

Lobar collapse

**Question title**

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**What is the most likely diagnosis?**

**Responses**

Response	Mark
The Levenshtein threshold is 2.0	
Collapsed lung	1.00
Left sided pneumothorax	2.00
Left sided tension pneumothorax	2.00
Pneumothorax	2.00
Tension pneumothorax	2.00

# Summary

- New online delivery platform for knowledge tests and clinical assessments
- Programme wide item bank and exam production for formative and summative assessments
- Modifiable student feedback reports
- Exam and item review helps inform standard setting and identify cohort strengths and weaknesses
- Introduction of very short answer question