

FExNet 2026

Collated SAQs: Radiology — USS and CT

QUESTION BOOKLET

20 short-answer questions covering the ACEM Fellowship curriculum on emergency imaging — point-of-care ultrasound, CT applications, plain-film interpretation, and radiation/contrast safety. Sub-questions labelled a) b) c) state the required number of responses. Click in any answer field and type your answer.

20 questions • 212 marks

ACEM-aligned format. Sub-questions labelled a) b) c). Mark allocations indicative; references cited in the Answer Booklet. Question and answer indexes are clickable.

Question Index

Click any entry to jump to its question. Marks shown right.

Q1. POCUS in Adult Cardiac Arrest	12	Q11. Cervical Spine Clearance — NEXUS / CCR	10
Q2. FAST in Blunt Abdominal Trauma	14	Q12. Imaging in Suspected Pulmonary Embolism	12
Q3. POCUS for Ruptured AAA	11	Q13. Imaging in Suspected Appendicitis	10
Q4. Lung Ultrasound — Pneumothorax	10	Q14. CT KUB for Renal Colic	10
Q5. Lung Ultrasound — B-Line Patterns	11	Q15. CT in Small Bowel Obstruction	10
Q6. POCUS for Lower-Limb DVT	10	Q16. Acute Mesenteric Ischaemia	10
Q7. POCUS in First-Trimester Bleeding	12	Q17. Plain CXR — Interpretation of PTX and Effusion	10
Q8. POCUS for Acute Cholecystitis	10	Q18. Imaging in Pregnancy	10
Q9. USS-Guided Fascia Iliaca Block — #NOF	10	Q19. Iodinated Contrast — Risk and Mitigation	10
Q10. CT Head — Indications in Adult Head Injury	10	Q20. Paediatric Head Injury — PECARN	10

Question 1 | POCUS in Adult Cardiac Arrest (12 marks)

A 58-year-old man is brought to your ED in cardiac arrest after a witnessed collapse at home. Bystander CPR was commenced. On arrival he is in PEA. ALS is in progress. Your registrar asks how POCUS should be incorporated into the resuscitation.

a) List 3 recognised general uses of POCUS in adult cardiac arrest. (3 marks)

b) List 5 reversible causes of cardiac arrest with the SPECIFIC sonographic finding for each. (5 marks)

c) State 4 principles for integrating POCUS into ALS without compromising CPR quality. (4 marks)

Question 2 | FAST in Blunt Abdominal Trauma (14 marks)

A 32-year-old female restrained driver is brought to your trauma bay after a high-speed MVC. HR 118, BP 92/56, GCS 14, abdomen tender in the left upper quadrant. You decide to perform a FAST scan.

a) Name the 4 standard windows of the FAST examination. (4 marks)

b) List 4 advantages of FAST over CT in initial assessment of haemodynamically unstable blunt trauma. (4 marks)

c) List 3 important limitations of FAST. (3 marks)

d) State the management decision for each scenario: (3 marks)

Question 3 | POCUS for Ruptured AAA (11 marks)

A 72-year-old male is brought in by ambulance with severe central back and abdominal pain, pale, sweaty. HR 130, BP 78/42 (palpable brachial only). You suspect a ruptured abdominal aortic aneurysm and your registrar performs a bedside ultrasound.

- a)** State the threshold aortic diameter on POCUS that defines an abdominal aortic aneurysm, AND state the diameter above which surgical repair is generally indicated. (2 marks)

- b)** List 3 sonographic features supporting AAA on bedside ultrasound. (3 marks)

- c)** List 3 limitations of POCUS in suspected ruptured AAA. (3 marks)

- d)** State 3 immediate resuscitation priorities BEFORE theatre for a haemodynamically unstable patient with confirmed AAA on POCUS. (3 marks)

Question 4 | Lung Ultrasound — Pneumothorax (10 marks)

A 24-year-old male sustains penetrating chest trauma. He is tachypnoeic, hypoxic on supplemental oxygen, and your registrar performs bedside lung ultrasound.

a) Name 4 sonographic findings used to assess for pneumothorax. (4 marks)

b) List 3 advantages of lung ultrasound over supine CXR for pneumothorax detection. (3 marks)

c) List 3 conditions OTHER than pneumothorax that abolish lung sliding (false-positive findings). (3 marks)

Question 5 | Lung Ultrasound — B-Line Patterns (11 marks)

A 76-year-old man presents with acute dyspnoea. He has a history of hypertension, ischaemic heart disease, and was discharged from hospital 2 weeks ago after a 'chest infection'. You are uncertain whether he has acute pulmonary oedema or pneumonia.

- a)** State 3 sonographic features that distinguish cardiogenic pulmonary oedema from pneumonia / ARDS on lung ultrasound. (3 marks)

- b)** Name 4 components of an undifferentiated dyspnoea POCUS protocol (e.g. BLUE / RUSH). (4 marks)

- c)** List 4 management priorities for confirmed acute cardiogenic pulmonary oedema. (4 marks)

Question 6 | POCUS for Lower-Limb DVT (10 marks)

A 56-year-old woman returns from a 12-hour flight with a swollen, tender right calf. Wells DVT score 3. You decide to perform a 2-point compression ultrasound at the bedside.

- a)** Name the 2 anatomical sites compressed in 2-point compression ultrasound, and state the single key finding that defines a positive scan. (3 marks)

- b)** List 3 limitations of 2-point compression ultrasound for DVT. (3 marks)

- c)** State 4 elements of management once DVT is confirmed. (4 marks)

Question 7 | POCUS in First-Trimester Bleeding (12 marks)

A 28-year-old woman presents at 7 weeks gestation by LMP with PV bleeding and right iliac fossa pain. Vitals: HR 110, BP 95/60. β -hCG 4500 IU/L. You perform a transabdominal POCUS.

- a)** List the 3 sonographic findings that confirm an intrauterine pregnancy (IUP). (3 marks)

- b)** List 3 sonographic findings concerning for ectopic pregnancy. (3 marks)

- c)** State 3 management priorities for this haemodynamically unstable patient with concern for ruptured ectopic. (3 marks)

- d)** List 3 limitations of transabdominal POCUS in early pregnancy assessment. (3 marks)

Question 8 | POCUS for Acute Cholecystitis (10 marks)

A 48-year-old female presents with 12 hours of right upper quadrant pain, fever, vomiting. WCC 16, CRP 120. You perform a bedside biliary ultrasound.

a) Name 4 sonographic findings supporting acute cholecystitis. (4 marks)

b) List 3 differential diagnoses for thickened gallbladder wall on ultrasound. (3 marks)

c) State 3 management priorities for confirmed acute cholecystitis. (3 marks)

Question 9 | USS-Guided Fascia Iliaca Block — #NOF (10 marks)

An 84-year-old woman presents with a left subcapital fractured neck of femur after a fall. Pain score 9/10. You plan an ultrasound-guided fascia iliaca compartment block.

a) Name 3 nerves blocked by a fascia iliaca compartment block. (3 marks)

b) State 3 anatomical landmarks / structures identified on ultrasound when performing this block. (3 marks)

c) List 4 specific safety steps to minimise risk of local anaesthetic systemic toxicity (LAST) in this elderly patient. (4 marks)

Question 10 | CT Head — Indications in Adult Head Injury (10 marks)

A 38-year-old male presents 2 hours after a witnessed assault to the head. GCS 14 on arrival, vomited once in triage, no focal neurology. Anticoagulated on warfarin for AF (INR 2.5). You apply the Canadian CT Head Rule (CCHR).

a) List 5 high-risk criteria from the Canadian CT Head Rule that mandate CT. (5 marks)

b) List 2 medium-risk criteria from CCHR. (2 marks)

c) State 3 patient-specific factors that should mandate CT in this patient regardless of CCHR. (3 marks)

Question 11 | Cervical Spine Clearance — NEXUS / CCR (10 marks)

A 28-year-old woman presents after a low-speed rear-end MVC. She is alert, GCS 15, complaining of mild neck stiffness. No neurological deficit. You consider clinical clearance of the cervical spine.

- a)** List the 5 NEXUS low-risk criteria that, if ALL absent, permit clinical clearance. (5 marks)

- b)** State 3 high-risk Canadian C-Spine Rule criteria that mandate radiological clearance. (3 marks)

- c)** Name 2 advantages of CT over plain XR for cervical spine clearance in trauma. (2 marks)

Question 12 | Imaging in Suspected Pulmonary Embolism (12 marks)

A 64-year-old woman presents with 2 days of pleuritic chest pain and dyspnoea. She had a knee replacement 3 weeks ago. HR 105, BP 130/80, SpO₂ 94% on room air. Wells score 6 (high risk).

a) State 3 advantages of CTPA over V/Q scan in this patient. (3 marks)

b) State 3 contraindications or cautions to CTPA. (3 marks)

c) Name 3 sonographic features of right ventricular strain on echocardiography in massive PE. (3 marks)

d) List 3 indications for systemic thrombolysis in confirmed PE. (3 marks)

Question 13 | Imaging in Suspected Appendicitis (10 marks)

A 22-year-old female presents with 18 hours of right iliac fossa pain, anorexia, and a low-grade fever. β -hCG negative. Alvarado score 7. Local protocol favours USS first-line.

a) List 3 sonographic findings supporting acute appendicitis. (3 marks)

b) State 3 advantages and 3 disadvantages of CT vs USS in this patient (3 of each). (3 marks)

c) State 4 management priorities once appendicitis is confirmed. (4 marks)

Question 14 | CT KUB for Renal Colic (10 marks)

A 38-year-old man presents with 3 hours of left loin-to-groin colicky pain, microscopic haematuria, vomiting. Vitals stable. Local protocol allows non-contrast CT KUB or POCUS as first imaging.

a) Name 3 sonographic features of obstructive uropathy on POCUS. (3 marks)

b) State 3 advantages of low-dose non-contrast CT KUB over IVP and over USS in renal colic. (3 marks)

c) List 4 indications for urgent urological consultation. (4 marks)

Question 15 | CT in Small Bowel Obstruction (10 marks)

A 67-year-old male with previous open appendicectomy 30 years ago presents with 24 hours of central crampy abdominal pain, vomiting, and absolute constipation. Abdomen distended with tinkling bowel sounds.

a) List 4 CT findings of small bowel obstruction. (4 marks)

b) List 3 CT features suggestive of strangulation / ischaemic bowel that mandate urgent surgical review. (3 marks)

c) State 3 immediate management priorities. (3 marks)

Question 16 | Acute Mesenteric Ischaemia (10 marks)

A 78-year-old male with permanent atrial fibrillation (non-anticoagulated due to recent fall) presents with 6 hours of severe central abdominal pain that is disproportionate to the soft, minimally tender abdomen. Lactate 4.8.

a) List 3 CT findings of acute mesenteric ischaemia. (3 marks)

b) State 3 predisposing conditions for acute mesenteric ischaemia. (3 marks)

c) State 4 immediate management priorities. (4 marks)

Question 17 | Plain CXR — Interpretation of PTX and Effusion (10 marks)

Two patients present to your ED: Patient A: 19-year-old tall thin male with sudden-onset right-sided pleuritic chest pain after coughing. Patient B: 68-year-old female with 2 weeks of progressive dyspnoea, dull right chest, tracheal shift to LEFT.

a) List 3 plain-CXR findings of a simple (non-tension) pneumothorax. (3 marks)

b) List 3 CLINICAL features of a tension pneumothorax that mandate immediate decompression BEFORE confirmatory imaging. (3 marks)

c) Name 4 plain-CXR findings of a large pleural effusion. (4 marks)

Question 18 | Imaging in Pregnancy (10 marks)

A 32-year-old woman at 22 weeks gestation presents with right iliac fossa pain. Possible appendicitis. You are deciding between USS, MRI, and CT.

- a)** State the threshold fetal radiation dose at which deterministic effects (e.g. malformation) become a concern, AND state the typical fetal dose for: (i) CT abdo/pelvis, (ii) CXR. (3 marks)

- b)** List 4 considerations when ordering imaging in a pregnant patient. (4 marks)

- c)** State 3 reasons MRI is preferred over CT in this patient if USS is non-diagnostic. (3 marks)

Question 19 | Iodinated Contrast — Risk and Mitigation (10 marks)

A 66-year-old male diabetic on metformin presents with abdominal pain. Creatinine 165 $\mu\text{mol/L}$ (eGFR 38). The radiologist asks for clarification before performing contrast-enhanced CT abdomen.

a) List 3 patient risk factors for contrast-induced nephropathy (CIN). (3 marks)

b) State 3 strategies to minimise risk of CIN in this patient. (3 marks)

c) State the RANZCR recommendation regarding metformin and iodinated contrast in this patient. (2 marks)

d) List 2 features of severe (anaphylactic) contrast reaction. (2 marks)

Question 20 | Paediatric Head Injury — PECARN (10 marks)

A 3-year-old boy is brought in 1 hour after falling from a 1-metre changing table onto a tiled floor. Brief LOC, no vomiting, no seizure. GCS 15, no scalp haematoma, behaving normally with parents.

a) List 4 PECARN high-risk features in a child <2 years that mandate CT. (4 marks)

b) State 3 reasons paediatric CT head should be limited where possible. (3 marks)

c) State 3 management options for a child with intermediate PECARN risk. (3 marks)
