Year 3 Case-based Learning 2024-25

Case 3 Part 1 Facilitator Guide

Key Contributors:

Michael Trimble – Academic Lead for Year 3 CBL

Amy Taylor – ADEPT Fellow 2021-22

Contents

Case overview: Acute pain

Part 1:	Back and flank pain
Part 2:	Dyspnoea

Student timeline

This timeline outlines when the Case materials will be released on the portal. Your CBL sessions may not coordinate exactly with this timeline as these details will be decided by each LIC site, but students should have the relevant session content available on the portal for each session.

27/1/25:	Y3 LIC2 begins
21/2/25:	Part 1 information released on portal
From 24/2/25:	Part 1 Independent Session 1
From 3/3/25:	Part 1 Facilitated Session 2
14/3/25:	Part 2 information released on portal
From 17/3/25:	Part 2 Independent Session 1
From 24/3/24:	Part 2 Facilitated Session 2

Part 1 presentation

An 82-year-old man is referred to ED with sudden onset back and abdominal pain.

Summary

An 82-year-old man called George Smyth rings his GP surgery with sudden onset back/abdominal pain. Students first met Mr Smyth in Year 1 CBL when he had suffered an inferior STEMI. He has a past medical history of ischaemic heart disease, type 2 diabetes mellitus and renal stones. He continues to smoke. He is unmarried and lives alone since his sister died 6 years ago.

Dr Carson rings Mr Smyth during morning triage. Mr Smyth last attended the GP five years ago. He does not strictly adhere to his prescribed medication and does not attend for routine care such as flu vaccination. Mr Smyth seems vague on the phone and reports a sore back and dizziness on standing.

Concerned about a severe acute cause, Dr Carson arranges an emergency ambulance to the nearest emergency department (ED).

The ED F2 doctor assesses him and suggests a diagnosis of renal colic with infection. The ED registrar is busy in resus. The patient is referred to the surgical team, but while awaiting their review, he deteriorates and is sent for a CT scan which shows a rupturing abdominal aortic aneurysm. The doctors must display their professional duty of candour and explain to the patient that the original diagnosis was incorrect. He is prepared for emergency surgery and is transferred from Antrim Area Hospital to the Royal Victoria Hospital to access vascular services.

Learning outcomes

Essential

Note that not all of these will be able to be covered in every session, but students should consider:

- When should you think about calling for emergency transfer in the community?
- How might you an approach an acutely unwell patient in both primary and secondary care?
- How might you come up with a differential diagnosis here? Explain your underlying clinical reasoning process.
- Have you heard of using time as a diagnostic tool? How might time affect the evolution of the differential diagnosis?
- In this case, how should we interpret the radiological images and laboratory tests?
- Can you describe the steps required to prepare a patient for emergency surgery?
- Have you thought about medical error here? How might we apply the duty of candour to misdiagnosis?
    - What might be the psychological impact on patients and those close to them?
- What system strategies are present to minimise risk of adverse events?
    - What is the role of Quality Improvement here?
- What is the vascular supply of the abdomen in the context of surgical approaches and techniques?
- Can you describe the pathophysiology and pathology related to aneurysms?
- Discuss screening programmes for AAA
- How is pharmacology relevant to the perioperative patient?
- Why might medicine reconciliation between care facilities be important?

Desirable

- How does clinical decision-making take place when admitting patients from ED?
- Do you remember the innervation of the posterior peritoneum? How does back pain arise in AAA rupture?
- How might behavioural and lifestyle factors contribute to cardiovascular disease risk? How do these provide opportunities for intervention?
    - How might the social determinants of health be relevant here?
- What do you know of vascular screening programmes in NI and the UK?
- Are you aware of secondary prevention strategies for vascular disease?
- Identify the relevance of service location to healthcare needs assessment
- Have you heard of the triple bottom line?
    - How might it apply to procedures and interventions in the patient journey?
- Imagine you were the doctor referring this patient, or the doctor receiving the referral. How should doctors interact over the phone?
- Can you see how clinical care is integrated across different teams in this case?
    - What are the challenges to achieving this?

Student guidance

There are two types of sessions – *independent* and *facilitated*. Students have been provided with a case guide and supporting materials, which includes medical documents and investigations. They should have met prior to the facilitated session and worked through the patient materials as a group, using the framework provided in the general guide to write learning outcomes. These should reflect the cognitive processes underlying the case. Students should also consider any additions they would make to the assessment and why, interpret the investigation results available, formulate a differential diagnosis, and suggest a management plan. They should have agreed how to present their learning to each other and their facilitator ahead of the facilitated session.

Key areas of discussion

- Emergency transfer in the community
- Differential diagnosis of flank pain
- Social determinants of health
- Professionalism – duty of candour
- Opportunities for health promotion and intervention

Facilitator guidance

The general guide outlines expectations about how both independent and facilitated sessions should be conducted. Students should present their learning from the independent session at the start of the facilitated session. You have been provided with a copy of the student materials.

In your facilitated session, there are a number of learning areas to be highlighted. The materials have intentional gaps which should be explored. Students should explore these in their discussions, facilitated by their Chair, however, we have *suggested some prompts* to stimulate discussion if required.

GP referral

- Safe community triage: The presence of dizziness is a red flag in this presentation. Emergency transfer, not definitive diagnosis, is required. This a significantly different goal from ED. GPs should not waste time seeing acutely ill patients where these things might be very appropriate in hospital. Students should understand the different clinical management approaches of primary and secondary care.
- Behaviours: The significance of not engaging with the practice is that the patient's routine reviews have not been done, that he hasn't been taking his secondary prevention medication. He must be very worried to contact the surgery now. This is important in terms of 'professional instinct' i.e. high index of suspicion for something significant happening.
- Behavioural science: Attending screening/healthcare review appointments can be seen as a modifiable health-promoting behaviour. Models of health behaviour could help shed light on George's motivations and barriers. Opportunities to engage George and encourage him to attend these appointments would have been beneficial. Specific seldom heard populations may need a variety of approaches regarding engagement with healthcare, such as outreach services.
- Illness cognitions: Students should discuss how some of George's illness cognitions (ideas about illness identity, cause, consequences, cure/control, timeline) might influence how he responds to symptoms, and the impact on help-seeking behaviour. The students should also explore how George's illness beliefs can be identified and modified, so that he understands the cause and consequences of his conditions, increasing adherence to healthcare advice, including recommendations for lifestyle change.

- Lifestyle factors: Following a cardiac episode a number of years earlier, the patient has continued to smoke and has been diagnosed with hypertension and diabetes. Poor health behaviours predict disease development and outcomes, but improving them has been shown to prevent and/or improve cardiovascular disease (CVD) risk factors and prognosis. It has been estimated that up to 80% of cardiovascular events and 90% of new cases of type II diabetes can be attributed to a cluster of specific health behaviours: poor-quality diet, excess energy intake, physical inactivity and smoking (Bacon et al., 2020). The key point is that even in those with high genetic predisposition, adopting good health behaviours may still reduce risk.
- Social determinants of health: *What sociological factors could influence this man's presentation?* Examples include limited social capital e.g. networks & isolation, financial pressures that may be encouraging him to continue farming and the psychological pressures of loneliness. Isolation increases the risk of delaying healthcare access, which may lead to his condition becoming acute.
- Package of care: Students should consider the challenges of encouraging people to accept packages of care, as well as waiting times. *What happens when a patient simply will not accept help? How can this be pragmatically managed?* Students should consider capacity and autonomy within this reflection.
- Repeat medication: The patient was diagnosed with left ventricular dysfunction following his first myocardial infarction 5 years previously, so his medication list represents the traditional therapy guidelines.

ATMIST pre-alert

- Communication: The ATMISTER format was fist encountered in Case 2, a communication framework recommended by NICE. Encourage students to appreciate the benefit of this communication process, where the ambulance service pre-alert the ED about the patient's arrival.

ED flimsy

- Triage: The current (incorrect) working diagnosis of a urological problem allows the patient to be triaged to Majors. However, in reality, if AAA was suspected from the outset the patient would be sent to Resus.

- Assessment: A notable gap is social history, a crucial step in deciding fitness for surgery or escalation of care. In this narrative, the patient is a current smoker, takes minimal alcohol, lives alone, and requires assistance x1 with activities of daily living. Social history should also assess the patient's support system. This patient never married and has no children. Identifying his occupation helps ascertain his income and housing, building a picture of the social determinants of his health.
- Differential diagnosis: Encourage students to evaluate their differential list, which should include medical and surgical diagnoses, such as pyelonephritis, renal colic, pancreatitis, diverticulitis, etc. Their list at this stage may, or may not, include AAA (the true diagnosis). In this narrative, the patient is incorrectly triaged as renal colic. Whatever their list, ask students to rationalise why some possibilities are more or less likely.
- Management plan:
  Which specialty should the ED doctor call? Encourage consideration of the professional and medicolegal implications of giving advice to a colleague over the phone.
  Should the patient be admitted? Encourage students to discuss the approach to deciding to admit a patient from ED.
  This plan would include bloodwork, MSU, IVF, antibiotics, imaging, and surgical review. In this narrative, if ED's working diagnosis is renal colic, a surgical/urological consult over the phone would advise CTKUB. Whatever students suggest, enquire into their reasoning for each part and ensure they critique their own plan, including the decision about admission.
- Investigations: Blood work – *How do the blood results help diagnosis? What do they rule in or out?* Any abnormalities are relatively non-specific on purpose and Hb has dropped to reflect the bleeding source.

Surgical review

- Waiting times: Encourage students to identify the timeline of first presentation to subsequent reviews. The first surgical review is over 5 hours after the initial ED review and is expedited because the patient's pain worsens. The patient remains in ED throughout all of Part 1 and students should consider such an impact on the service and the patient.
- Reassessment: The patient is referred surgically and is awaiting a scan when he deteriorates further. Highlight the importance of repeat review, which may change the management plan.

- Differential diagnosis: *Does this review provide additional information that changes your differential diagnosis?*
- Management plan: This may include prescriptions (IV fluids, antibiotic cover), procedures (urinary catheter) and instructions (nil by mouth, group and hold). Students should identify that a CT2 doctor should discuss this patient with their senior. Regarding imaging, the priority is to rule out worst case scenario. CT aortic angiogram is indicated to detect AAA. US imaging is not recommended for definitive diagnosis.
- Investigations:

- Urine screen and culture: Microscopic haematuria will often be present in AAA. Encourage students to explore the significance of positive urine screens, which can lead to the incorrect diagnosis of UTI.
- VBG: This identifies a slight further drop in Hb. It is likely too early for blood tests to reflect an acute bleed, but students should note this is a fast and useful test to monitor. High lactate is concerning. Highlight the link between metformin and lactic acidosis, so this patient's metformin would be held.
- Imaging: Normal CXR and AXR - students should consider why a CXR should be requested as well as an AXR in this surgical emergency. CT images - axial, sagittal and coronal planes, showing a rupturing AAA. US should not be used to diagnose AAA, but can be a useful adjunct in ED to expedite CT scans.
- Students should determine their clinical reasoning behind any additional investigations they would request.

Error and duty of candour

- Minimising error: Students should consider the number of interactions the patient has had with different professionals to minimise the risk of an incorrect diagnosis. Please highlight to students that there are many safety factors now in place as a result of significant adverse incidents (SAIs) regarding missed AAAs. An example is the Royal College of Emergency Medicine standard that all patients aged 70 years and over with abdominal pain should have a senior review.
- The ideal patient journey: This case aims to highlight when things go wrong. In the ideal world, this patient will be identified as having a potential AAA and therefore be placed in a high-risk category by all involved. (Or even better, they could have been screened for AAA prior to this presentation.) These high-risk patients may be phoned into ED via a Standby Call

from NIAS, as seen before in Year 3 Case 2. If the hospital does not have on-site vascular support, they will be assessed in ED, who organise the CT and hospital transfer to Vascular Surgery. The local general surgery team are not required. If suspicion is high from the outset, the ED will ask HALO (an ambulance liaison service who coordinate the ambulance entrance to ED) to hold the ambulance if possible and the patient will be briefly assessed and scanned on the ambulance trolley when they come in on, and ideally exit straight back to the ambulance.

- The professional duty of candour: *Should the initial incorrect diagnosis be explained? How could this impact the doctor-patient relationship?*

Repeat surgical review with CT results

- Healthcare needs assessment: Access to services is relevant since the patient requires hospital transfer for vascular surgery. The triple bottom line refers to sustainable healthcare i.e., considering the financial, social, and environmental implications of transferring this patient for surgery.
- Risk factors: Encourage students to reflect on the patient's initial presentation. *What was this patient's risk of having such a vascular event? How could this risk have been reduced?*
- Screening: Vascular screening services could be considered here. The Northern Ireland AAA Screening Programme offers screening to men over 65. The imaging modality differs from the acute scenario since ultrasound is used. Students may consider the reasons why the patient may not have accessed these.
- Anatomy: If not previously considered, encourage students to review the innervation of the posterior peritoneum and the generation of back pain in AAA rupture.
- Physiology: Review of vascular and blood pressure homeostatic mechanisms and how these may be pathophysiologically altered in the aetiology of aneurysm formation should be considered.
- Preclinical research: Highlight that there are currently animal models available to study the pathogenesis and test new therapies for aortic aneurysms.
- Pathology: Encourage students to review aneurysm formation and the differentiation of tissue ischaemia from infarction. Prompt students to also describe vascular smooth muscle cell structure and function, and how aortic wall structural integrity is disrupted during an aneurysm.

- Pharmacology: Prompt students to consider the relevance of therapeutics, such as the risk of lactic acidosis with metformin, diabetes management in the peri-operative period in a fasted patient, medicine reconciliation between care facilities, and medication review in the context of an acutely unwell perioperative patient.

Operation note

- Anatomy: Students should review the vascular supply of the abdomen with the new context of surgical approaches and techniques, determining the potential for blood supply compromise for kidneys, bowel and lower limbs.
- Post-operative instructions: *What post-operative instructions would be relevant?* These have been left out of the operation note. These may include directions about level of care, drug administration and monitoring. For example, this patient would be for ICU level care, clexane would likely be held and restarted the next day if there was no evidence of post-operative bleeding, and lower limb perfusion would be monitored.

Conclusion

Ask the students to summarise the session and direct them to areas where they should undertake more research. Advise them that the patient survives the operation and is transferred to surgical HDU.

Useful resources

Ayers, S., & de Visser, R. (Eds.). (2021). *Psychology for medicine and healthcare.* SAGE.

Bacon, S. L., Campbell, T. S., & Lavoie, K. L. (2020). Rethinking How to Expand the Evidence Base for Health Behavior Change in Cardiovascular Disease Prevention. *Journal of the American College of Cardiology*, *75*(20), 2619–2622. https://doi.org/10.1016/j.jacc.2020.03.055

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The Royal College of Emergency Medicine. (2016, June). *Safety alert: Abdominal pain.* Safety_Flash_Abdominal_pain_2016.pdf (cloudinary.com)

Learning opportunities for students

Lectures

- Surgery - The Acute Abdomen
- Surgery - Abdominal Aortic Aneurysm
- Medicine - Cardiology - Chest Pain
- Medicine - Cardiology - Hypertension and Vascular Disease

Other opportunities

- Clinical Practice - Cardiology - Aortic Dissection
- Cardiovascular Pathology - Aneurysm, Myocarditis, Pericarditis
- Radiology Primer
- Chest X-rays Made Easy
- Medicine – Chest X-ray
- Medicine – An introduction to ECG interpretation
- Medicine – Practical therapeutics
- Medicine – Using laboratory tests
- Medicine – Clinical decision making
- Surgery - Abdominal Examination Video
- Surgery –Abdominal X-ray
- Emergency Medicine – Abdominal Pain
- Perioperative and Emergency Medicine - Abdominal Pain - Case 3
- Perioperative and Emergency Medicine - Emergency Department Casebook

Foundations for Practice

- Fundamentals of Clinical Science: Illness cognitions, health behaviour, public health, anatomy, pathology, pathophysiology, anatomy
- Blood, Cardiovascular and Respiratory Systems: Smoking cessation, pathology of arterial circulation, health systems

Previous cases

- Case 5, ‘The cows still need milking.’

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Sophie Davidson	General Surgery ST6
Mark McKane	Cardiology ST4
Rick Plumb	Academic Lead C Theme
Mark Harbinson	Academic Lead A Theme
Grainne Kearney	Deputy Academic Lead A Theme
Tom Bourke	Academic Lead T Theme
Helen Reid	Academic Lead T Theme
Diarmuid O'Donovan	Academic Lead G Theme
Nigel Hart	Academic Lead for GP
Vivienne Crawford	Deputy Academic Lead G Theme
Mairead Corrigan	Academic Lead for Equality & Diversity
Noleen McCorry	Lecturer in Population Health & Health Care
Laura McGowan	Lecturer in Nutrition and Behaviour Change

Legacy Subject Science Leads