Year 3 Case-based Learning 2024-2025

Case 1 Part 2

Facilitator Guide

Key Contributors:

Michael Trimble – Academic Lead for Year 3 CBL

Amy Taylor – ADEPT Fellow 2021-22

Contents

Case summary

A 64-year-old woman presents with PR bleeding and anaemia on a Saturday. She is assessed in ED and admitted to a medical ward. She is reviewed by gastroenterology and investigations reveal colon cancer. She proceeds to an elective right hemicolectomy and suffers a post-operative pulmonary embolism.

Part 1:	Altered bowel habit
Part 2:	Peri-operative care and complications

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.

2/9/24:	Y3 LIC1 begins
6/9/24:	Part 1 information released on portal
From 9/9/24:	Part 1 Independent Session 1 (with facilitator for Case 1)
From 16/9/24:	Part 1 Facilitated Session 2
27/9/24:	Part 2 information released on portal
From 30/9/24:	Part 2 Independent Session 1 (with facilitator for Case 1)
From 7/10/24:	Part 2 Facilitated Session 2

Case 1: Introduction to CBL

The first CBL case introduces students to the change in **process** of CBL from Years 1 and 2. Students have become very proficient at the CBL model, but Year 3 CBL provides new challenges. The format of the first case differs from the rest to support the transition. Students will have a facilitator for all sessions in case 1, aiming to support students with adjustments to the Year 3 framework and clinical reasoning process. The other 3 cases will have independent and facilitated sessions. During the first meeting of the case, students should allocate roles, agendas and agree how to work together as a group.

Part 2 summary

A 64-year-old woman is reviewed as a red flag at the surgical outpatient department after an acute presentation with altered bowel habit and anaemia which led to a diagnosis of right sided colonic adenocarcinoma. Surgical management and the expected perioperative course is discussed. She meets the colorectal specialist nurse and options for social welfare support are considered. She is admitted electively and consented for the operation. The operation note for a laparoscopic right hemicolectomy and the pathology report are provided. She appears stable on the surgical ward round the next day, but deteriorates that afternoon with acute shortness of breath and chest pain. Investigations reveal pulmonary embolus and infection. She deteriorates despite intervention at ward level and is referred to intensive care.

Learning Outcomes

Essential

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

- What is the role of the specialist nurse and multidisciplinary team in supporting a patient with cancer?
- Describe this patient's management plan when admitted for elective surgery.
- What's involved when taking consent for a procedure?
- What are general risks of undergoing an operation, including general anaesthesia? What about the risks of colorectal surgery, including anastomotic leak?
- What is the gross anatomy and lymphatic drainage of the colon?
- How would you approach an acutely unwell postoperative patient?
- What differential diagnoses are important for postoperative symptoms such as breathlessness or chest pain?
- How would you interpret her CXR, ECG and bloods done post-op?
- How should her pathology reports be interpreted?
- How might we identify and apply sources of best medical practice guidelines, particularly in relation to venous thromboembolism?
- When thinking about pain relief in the post-op patient, what pharmacology and therapeutics principles should apply?
- Do you remember your physiology relating to respiratory failure, ventilation/perfusion mismatch, pulmonary embolism, clinical signs and arterial blood gases?

- Why is it important to consider escalation of care early?

Desirable

- How would you go about assessing capacity? What options are available if patients are deemed not to have capacity?
- Why does this patient receive fondaparinux rather than enoxaparin?
- Consider the carbon footprint of healthcare, particularly regarding alternative gases and waste.
- How do we prescribe and deliver oxygen?
- What do you know about healthcare-associated infection?
- How can we apply sustainability in quality improvement (SusQI) and the triple bottom line to decisions regarding escalation of care?
- What options are available for social welfare support for a patient?

Student guidance

Students are advised to work through the patient materials as a group during the first session using the framework provided in the general guide to write learning outcomes. In the CBL model, this first session is the independent session, but facilitators are present for all sessions in this first case. In future cases students will write learning outcomes independently.

Learning outcomes should reflect the cognitive processes underlying the case. Students should 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. It is likely that facilitators may need to orientate students to the right types of outcomes as they adjust to this new style in Year 3.

Key areas for discussion

The main topics for discussion during this session are:

- Multi-disciplinary care for the patient with cancer
- Risks of surgery and general anaesthesia

- Consent for procedures
- Pathology reports
- Assessment of an acutely unwell postoperative patient
- Prophylaxis and management of venous thromboembolism (VTE)
- Escalation of care

Facilitator guidance

The general guide outlines expectations of how both independent and facilitated sessions should be conducted. Students have been provided with a case guide and supporting materials, which includes medical documents and investigations. They have been advised to work through these together and write learning outcomes to help them prepare for the facilitated session. In the first session, your main role is to keep the students on track and ensure they identify the relevant learning outcomes. Orientate them towards cognitive processes, since after this first case the students will be undertaking this session by themselves. It is not about information delivery, but identifying what information needs to be considered.

In the second session, which is the typical facilitated session, there are a number of learning areas to be highlighted. You have been provided with the same materials as students, and additional materials to share with them in the second session as the case progresses. The materials have intentional gaps which should be explored by the students in their discussions, facilitated by their Chair, however, we have *suggested some prompts* to stimulate discussion if required.

Surgical outpatient letter

- Patient journey: Students should appreciate the patient journey from their medical admission in Part 1 to outpatient review and MDM discussion, to elective surgical admission, and the relevant communication to primary care.
- Specialist nurse: Students should explore the role of the specialist nurse in providing social, psychological and financial support, and link this to this patient's social situation.
- Psychological distress: Distress may occur at different stages of the illness trajectory, alongside the many transitions taking place (initial diagnosis, initial treatment, further treatment, recurrence of cancer, palliative and end of life care). Distress extends along a continuum from common normal feelings of vulnerability, sadness, and fears, to problems that can become disabling, such as depression, anxiety, panic, social isolation, and existential

and spiritual crisis. Distress can interfere with a person's ability to cope effectively with cancer, its physical symptoms and its treatment. Sources of distress include practical problems (childcare, housing, financial, transportation, work/school etc), family problems (dealing with children, partner etc), emotional problems (depression, fear, sadness etc), spiritual and religious concerns, and physical problems (appearance, sleep, breathing, pain….and many more). Adjustment to cancer can best be understood in conjunction with the life context in which the condition occurs and the challenges it poses. Socio-cultural characteristics such as gender, age and social class shape culturally acceptable models of coping and adjustment, as well as placing boundaries around coping resources.

Surgical admission

- Management: The plan in the student materials states 'admit', but students should consider what else is required of a Foundation Doctor undertaking an admission for elective surgery. This should include ECG, baseline bloods, group and hold, VTE prophylaxis (TEDS stockings and clexane), guidance on nutrition (nutrient drinks then fast) and registrar review to consent.

Consent form

- Consent process – Students should consider what is involved in consent, and identify the risks of undergoing any operation, including risks of general anaesthesia.
- Anatomy: Topics such as 'damage to surrounding structures' and 'ureteric injury' can facilitate discussion surrounding anatomy related to the right colon.
- Wound healing: 'Wound infection' and 'anastomotic leak' can facilitate discussion surrounding risks of colorectal surgery, and factors leading to poor wound healing such as diabetes, steroids, malnourishment, and cardiovascular disease.
- Capacity: *How can you tell if the patient can consent for surgery? What are the options for patients who are deemed not to have capacity?*

Operation note

- Key terms: Students may identify new terms in the operation note, such as Hasson technique, and wish to explore these.

- Anatomy: The operation note can also be used to prompt discussion of anatomy relevant to a right hemicolectomy and to colorectal cancer. Lymph drainage of the colon is a particular consideration.
- Carbon footprint: This presents an opportunity for students to consider the carbon footprint of healthcare and consider alternative gases and waste.

Pathology results

- Pathology: Students should demonstrate understanding of adenocarcinoma and TNM cancer staging, referenced in the pathology report. Encourage students to review normal histology and the changes pertaining to dysplasia and colorectal adenocarcinoma.
- Cell biology: Advise students to review epithelial cell biology, cell-cell junctions and how normal epithelial sheets are disrupted in cancer.

F1 urgent review

Students should critique and develop the patient assessment, differential diagnosis, investigations and management.

- Assessment: Students should critique the review and identify that a more detailed history of the acute event would be beneficial to clarify the nature of the pain. Other important respiratory or cardiac symptoms should also be identified and documented. The ABCDE assessment provided is limited.
- Differential diagnosis of postoperative shortness of breath and chest pain: This should include infection (lower respiratory tract infection, hospital acquired pneumonia, aspiration pneumonia), pulmonary embolus, pulmonary oedema, exacerbation of underlying respiratory condition, pneumothorax, myocardial infarction. Students should be able to present their clinical reasoning for each suggestion and its likelihood based on their present evidence. They should identify what further information is required.
- Management: Students should suggest a management plan to include oxygen, IV access and urgent bloods, ABG, urgent CXR and discussion with senior. They should consider VTE risk assessment, diagnosis and treatment and relevant guidelines.
- Physiology: Students should review Virchow's triad and the increased risk of thrombosis in cancer and in the post-operative state.

- Basic research: The discussion on Virchow's triad within physiology could be linked to basic research into thrombosis and vascular occlusion. For example, *how do we investigate vascular thrombosis in the lab using human cells or microfluidic devices?*
- Pharmacology/therapeutics: Students should consider anticoagulant use to treat VTE in the presence of GI tract and other cancers. Note that enoxaparin is made from pig intestines so some people who are Muslim would not accept this. Fondaparinux is usually prescribed instead (as in this case).
- Microbiology: Would you cover the patient with antibiotics? Encourage students to reflect on the evidence to support their answer. There is a level of uncertainty here and the students should weigh up risk and benefit. They might consider potential causative organisms in lower respiratory tract infection and the issues of penicillin allergy, with the potential for cross reactivity with other beta-lactam based antimicrobials.
- Kardex and pharmacology: This is provided to familiarise students with documentation of VTE risk assessment, oxygen prescription, and typical post-op drugs (analgesia and antiemetics). Regarding pharmacology and therapeutics, students should specifically review pain relief, particularly in the context of post-operative patients with compromised bowel.

Investigations

- Bloods: Changes are relatively non-specific. Students should consider the relevance of post-operative blood results in an acute illness. The key abnormalities are high CRP, mildly raised WCC and ALT/AST, and raised D dimer. They should consider why NT po-BNP and Troponin T were sent given the presenting complaints.
- ABG: Type 1 respiratory failure, respiratory alkalosis. Students should consider comparing and contrasting the physiological mechanisms behind type 1 and 2 respiratory failure.
- ECG: Sinus tachycardia (most common ECG finding in PE). Students may identify that the ECG looks different to the ECG in Part 1. A reasonable explanation for this might be the variation in lead positions applied, which is a common cause,
- CXR: Students should revise their approach to CXR interpretation. This CXR shows basal atelectasis. Atelectasis describes small areas of collapsed lung/areas of lung that are not fully expanded, usually seen on CXR as small volume linear shadows peripherally or at the lung bases. This likely represents dependent atelectasis posteriorly due to patients lying for long periods and not fully expanding their lungs.

Additional materials for facilitated session

Registrar review

This presents a more thorough assessment which should help students critique their own suggestions. It supports the learning areas highlighted above in the F1 review.

- Assessment: This history contains more detail about the nature of pain and associated symptoms. Examination of respiratory distress, fluid status and rapid neurological and abdominal assessments are more complete.
- Management: Procalcitonin is an additional test to assess for sepsis. Students could consider why the assessing doctor is opting to send investigations to screen for infection and cover the patient with antibiotics, given how unwell the patient is and the uncertainty of diagnosis at this stage. The management plan also acknowledges that the patient would be for escalation if they become more unwell.

Additional investigations for facilitated session

CTPA images: This CTPA shows a left lower lobe clot (axial and coronal planes).

Case progression

NEWS chart

Students should interpret the NEWS chart and the notable deterioration the patient suffers. This can facilitate discussions of some key ideas.

- Oxygen delivery: *The patient has a non-rebreather mask applied. Is there anything more that can be done at ward-level to support oxygen delivery?* Students should consider the different oxygen delivery systems such as CPAP, BiPAP ad high flow nasal oxygen. They should identify that discussion with respiratory would explore the options available.
- Escalation of care: *If the patient continues to deteriorate despite your interventions, what should the next step be?* This is to encourage the students to think about escalation of care. Given the patient's good functional baseline, ICU referral is appropriate.
  Do you think this patient should be moved to respiratory or intensive care? Encourage students to consider the differences between respiratory ward and ICU management

(nursing ratios better in ICU, single organ verses multi-organ failure, pros and cons of non-invasive verses invasive ventilation).

How is the triple bottom line relevant? The triple bottom line is a framework that helps organisations consider the environmental, social, and financial impact of actions. Sustainable Quality Improvement (SusQI) is a movement that aims to drive incremental change towards a more ethical and sustainable health system.

- Professionalism: *Who else should be contacted at this stage?* Students should identify their professional obligation to update the next of kin with the patient's consent.

Conclusion

Ask the students to summarise the session and direct them to areas where they should undertake more research. The session concludes with the patient being accepted by ICU.

Useful resources

General medical council. (2020, November). *Decision making and consent.* Decision making and consent - GMC (gmc-uk.org)

National Institute for Health and Care Excellence. (2018, March). *Venous thromboembolism in over 16s: reducing the risk of hospital-acquired deep vein thrombosis or pulmonary embolism*. https://www.nice.org.uk/guidance/ng89

National Institute for Health and Care Excellence. (2020, January). *Colorectal cancer*. Overview | Colorectal cancer | Guidance | NICE

National Institute for Health and Care Excellence. (2020, March). *Venous thromboembolic diseases: diagnosis, management and thrombophilia testing.* https://www.nice.org.uk/guidance/ng158

O'Driscoll, B. R., Howard, L. S., Earis, J., & Mak, V. (2017). British Thoracic Society Guideline for oxygen use in adults in healthcare and emergency settings. *BMJ Open Respiratory Research*, 4(1), e000170. https://doi.org/10.1136/bmjresp-2016-000170

Resuscitation Council UK. (2021). *The ABCDE Approach.* https://www.resus.org.uk/library/abcde-approach

Sustainability in quality improvement. (2022). *What is SusQI?* https://www.susqi.org/the-susqi-education-project

Learning opportunities for students

Lectures

- Surgery – Colorectal carcinoma
- Surgery – Patient safety in the perioperative period
- Medicine - Respiratory – Pulmonary embolus
- Medicine – Infections diseases – Infectious diseases 1
- Medicine – Infectious diseases – Infectious diseases 2
- Medicine – Infectious diseases – Infection diseases 4
- Surgery – Postoperative complications
- Surgery – Infection Prevention and Control
- Surgery – Sepsis
- Surgery – Level and care of monitoring

Other opportunities

- Surgery – Videos – Wound management
- Medicine – Case presentations in internal medicine – Breathlessness, Limb swelling, Confusion/Fever

Foundations for Practice

- Fundamentals of Clinical Science: Microanatomy, Cell biology, Infection, Neoplastic pathology, Sociology/Psychology
- Blood, Cardiovascular and Respiratory Systems: Respiratory physiology, Infection
- Musculoskeletal System: Treatment of pain, Infection
- Gastrointestinal, Endocrine, Renal and Reproductive Systems: Anatomy of gastrointestinal tract, histology, infection, chemical pathology
- Sustainable Healthcare and SusQI

Previous cases

- Case 7, 'I hope it's not serious.'

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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
Vivienne Crawford	Deputy Academic Lead G Theme
Nigel Hart	Academic Lead for GP
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