

# Enhanced recovery after surgery for colorectal surgery

## Audit and feedback guide

August 2022

Surgical Services Taskforce

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**Produced by:** Surgical Services Taskforce

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**Trim:** ACI/D22/1771

**Date amended:** August 2022

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## Introduction

This guide aims to support NSW Health facilities implementing the [Enhanced recovery after surgery \(ERAS\), key principles for colorectal surgery](#).

Six key principles of the ERAS model have been prioritised for implementation:

- Preoperative patient education
- Appropriate multi-modal analgesia
- Minimally invasive surgery
- Avoidance of nasogastric tube
- Early feeding
- Early mobilisation

A statewide audit tool has been developed to measure these key principles. There is an opportunity for local sites to measure additional elements of their ERAS protocol by adding questions to the tool.

This document provides practical guidance for ERAS leads in local health districts (LHDs) and specialty health networks (SHNs) on how to conduct effective audit and feedback to inform improvements in clinical practice to align with the colorectal ERAS protocol.

The information in this guide has been informed by evidence in the literature, tested and informed by the clinical and project leads at existing and pilot ERAS facilities.

Key evidence that informs this guide indicates the following:

- Data collection (or report generation) alone will not contribute to implementation success. It is important to share process and outcome data with all staff who are involved.<sup>5</sup>
- Compliance with 70 to 80% (or more) of the ERAS protocol elements appears to be important to improve outcomes.<sup>6, 7</sup>
- Sustaining audit and feedback after initial implementation is important to maintain compliance and reduce length of stay.

## Related resources

Information on the aims, key principles and implementation enablers of the initiative should be read before undertaking the audit. Related resources include:

- [\*\*\*Enhanced recovery after surgery: key principles for colorectal surgery\*\*\*](#)
- **QARS audit tool:** designed to focus on six elements of a colorectal ERAS pathway. It is a minimum standard data source for sites to audit. It is available in QARS for local facilities to upload. Please contact your local QARS lead or email [\*\*ACI-Surgery@health.nsw.gov.au\*\*](mailto:ACI-Surgery@health.nsw.gov.au)
- **Presentation slides:** suggested graphs have been developed to assist with supporting the discussion and communication with the ERAS team. Please email [\*\*ACI-Surgery@health.nsw.gov.au\*\*](mailto:ACI-Surgery@health.nsw.gov.au) to request a copy of the slides.

## Background

### The purpose of audit and feedback

Audit and feedback is an important part of implementing and sustaining ERAS protocols.<sup>1</sup> Regular audit and review of clinical practices and outcomes can direct improvement efforts and sustain a high level of patient care.<sup>2</sup>

Audit and feedback work by measuring actual practice that may not be aligned to the perceived level of care. During feedback sessions, this can be a cue for action to change processes and behaviours. For ERAS, it allows review of the pre- intra- and post-operative patient journeys that involve large numbers of health staff delivering many different elements of care.

The complexity of the patient journey makes it difficult to see how each role affects overall patient outcomes and experiences of care. For this reason, presenting the data in a feedback session to everyone involved in the patient care pathway is important.<sup>1</sup>

Audit and feedback have been extensively used and studied internationally as an adjunct to structured ERAS implementation.<sup>2-4</sup>

### Scope of the audit tool

The core audit tool is purposefully brief. This will assist with minimising the burden of collection, assist with integrating the measurement into the pathway and only measure what will help with directing improvement efforts.

Many elements of the ERAS protocol are time dependent, and the compliance with the elements of care are measured in days. Local facilities will have minor differences in accepted timeframes within their agreed ERAS protocols. Therefore, there is an opportunity for local facilities to apply compliance levels to the audit tool to provide results specific to the facility.

[Appendix 1](#) provides a detailed overview of how the ERAS colorectal elements of care have been operationalised for measurement and built into the audit tool. These have been informed by published audit tools, and audit tools developed by existing ERAS facilities.<sup>8</sup>

The sensitivity and specificity of the data elements have been set for quality improvement purposes. The tool has been finalised through consensus from two facilities that have implemented ERAS for colorectal surgery and three facilities that are actively implementing it.

## How to audit effectively

### Data collection

There are prospective and retrospective data collection methods that can be used to support a facility's audit. This decision may be informed by facility workflows, resources and volume of surgeries.

- **A prospective process** includes building data collection into existing workflows within the pre-, intra- and post-operative periods; in particular, by individuals who have been tasked with being auditors. Another prospective process may include having a designated data collector that may already be collecting data for other purposes, such as National Surgical Quality Improvement Program (NSQIP).
- **Retrospective collection** may suit smaller facilities to undertake snapshots or point prevalence. For this process, it is important the designated clinical team member dedicates time to complete the collection, as agreed by the broader project team. Frequency of collection will be informed by how often the ERAS team meets to review the data. This may be more frequent during the initial stages of implementation; for example, quarterly to review data. Once improvement targets are attained and maintained, agreement may be to undertake this process less frequently.

### The Quality Audit Reporting System (QARS)

The QARS platform is embedded in every local health district with dedicated assistance from a QARS lead or coordinator to set up and use QARS for audit and feedback.

The QARS lead will be able to advise on local governance to enable a collection process to suit facilities implementing ERAS.

The benefits of using QARS for auditing purposes include:

- being able to use any device (mobile and desktop) for collection, using a QARS link or QR code
- ability to set compliance levels locally and generate percentage compliance automatically.

### Patients completing the colorectal ERAS pathway

The cohort for ERAS includes patients undergoing the following types of elective colorectal surgery (refer to [Appendix 3](#) for detailed intervention codes):

- Colectomy/hemicolectomy
- Rectosigmoidectomy or proctectomy (Hartmann type procedure)
- Anterior resection
- Total proctocolectomy
- Reversal of ileostomy

The types of surgeries may vary according to each site and the surgery they undertake on-site. All patients on the colorectal ERAS pathway are eligible to be audited.

There may be a need for excluding those that have had to exit the pathway due to urgency of surgery (emergency), patient cognition, physical abilities or other reasons agreed by local clinical teams:

- If a patient undergoes multiple surgical procedures at the same time, record the most invasive type of surgery for that episode of care.
- If a patient undergoes a surgical procedure and must return to theatre within the same episode of care, audit the index surgical procedure.
- If a patient has multiple episodes of care, they are both eligible to be audited as multiple audit entries.

## Combining data sources

NSQIP data may be used in lieu of implementing the existing audit tool.

[Appendix 2](#) shows questions that can be added to NSQIP data to collect all ERAS elements detailed in this guide. Your local QARS lead can support you to create a customised tool to be used alongside NSQIP data collection.

Patient-based outcome information that is presented alongside process data can include a subset of the Australian Commission on Safety and Quality in Health Care (ACSQHC) compliance data<sup>9</sup> acquired by the hospital, such as:

- Hospital-acquired complications
- Urinary tract infections
- Surgical wound dehiscence
- Respiratory complications (pneumonia)
- Anastomotic leak
- 30-day re-admission
- Length of stay

Data sources include NSQIP collection/s (if available at the facility), administrative data and the Quality Improvement Data System (QIDS) platform. Facility data managers may be able to provide local governance requirements for access to data.

## QIDS platform for outcome data

The [QIDS platform](#) was developed by the Clinical Excellence Commission. It is a database and web application that contains hospital data and reports relating to the safety and quality of healthcare, as well as project management tools. It can be used to plan, monitor and improve the safety and quality of healthcare.

Health data in QIDS include emergency department and admitted patient data, currently sourced from the Health Information Exchange (HIE), but soon to be sourced from the Enterprise Data Warehouse (EDWARD).

The ACI has developed an ERAS colorectal surgery dashboard in QIDS for sites to use. It contains the following key outcome indicators to monitor ERAS program implementation:

- Number of colorectal procedures
- Average length of stay for colorectal procedures
- Number and rate of hospital-acquired complications for colorectal procedures (healthcare-associated infection, respiratory complications, venous thromboembolism)
- In-hospital mortality rate for colorectal procedures
- Readmission rate to same hospital within 30 days for colorectal procedures

The indicators are provided as trends over time and in comparison, to other deidentified peer hospitals and the NSW state average.

After arranging access to QIDS via local QIDS administrators, the ACI can provide access to the ERAS dashboard. Please contact the ACI Evidence Data Manager for access: [ACI-Evidence@health.nsw.gov.au](mailto:ACI-Evidence@health.nsw.gov.au)

### Key considerations:

- QIDS users must comply with the terms of access.
- All data in QIDS should be treated with caution – the data quality depends on the quality and accuracy of the source data and its currency.
- Data is constantly being updated, and therefore changing, particularly in the past three months.
- Data collected over time is subject to changes in coding practice and changes in the policy measures being applied.
- Users of QIDS should undertake local validation and be cautious when interpreting low volume data.

## Analysis plan and triangulating data

A nominated team member who has an interest and capability in analysis should be allocated time to combine the information into a presentation. This team member should be part of (or informed by) a senior clinical lead on what is to be included in the presentation.

## Comparators

Comparing the data over time to an achievable target, or against other facilities, is an important element in analysis. It is what allows the data to be interpreted and contextualised.

- **Over time:** point prevalence will demonstrate changes over time, and hopefully improvements as implementation and sustainment are achieved of the ERAS protocol.
- **What is achievable:** data can be compared against the agreed 'standard' to achieve agreement of what is an appropriate standard to achieve for each ERAS element.
- **Other facilities:** benchmarking is possible when there is a like-for-like comparison; however, it needs to be interpreted with caution because of the many differences that may not be accounted for in the data.

A template feedback presentation is available to enable consistency in data reporting. Email [ACI-Surgery@health.nsw.gov.au](mailto:ACI-Surgery@health.nsw.gov.au) to request a copy.



## How to provide effective feedback

Sharing and discussing the results of the audit is where changes to practice occur.<sup>10</sup>

Feedback evidence shows that higher compliance occurs when feedback is presented with a combination of visuals/graphics and key messages. There have been data feedback innovations in ERAS, such as a [Greenie board](#).<sup>11</sup>

### Planning feedback sessions

Effective feedback sessions include the following:

- All staff involved with ERAS pathways are included. This may involve multiple sessions or one large session.

**Tip! It may be useful to map the stakeholders you need to include before organising the sessions.**

- It is facilitated (or co-facilitated) by a senior clinical lead (a peer) who can establish and communicate the credibility of the information and credibility of ERAS as an evidence-based protocol.

- Establish an environment of psychological safety with a focus on all participants having the opportunity to provide constructive input.
- The presentation is tailored to reflect main take-away messages for the team. This ensures there is time to discuss improvement opportunities, explore the root cause and identify any barriers and agree on what to do differently to overcome any barriers and issues.

**Tip! Allow enough time to make the meeting productive – time to reflect on the audit data as a team; find a shared understanding on what it means; and discuss what to do next.**

- Audit data and key messages are shared with the whole team following the meeting, to reinforce the discussion, insights and agreed actions.

**Tip! Aim to be brief with your summary.**

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## Acknowledgements

The ACI gratefully acknowledges the following people who contributed to this guide and the audit tool:

- James Toh, Western Sydney LHD
- Jessica Bresolin, Illawarra Shoalhaven LHD
- Kerilee Kirkwood, Nepean Blue Mountains LHD
- Megan Dunstall, Nepean Blue Mountains LHD
- Melissa Armstrong, St Vincent's Health Network
- Natasha Spicer, Illawarra Shoalhaven LHD
- Tony Shakeshaft, Nepean Blue Mountains LHD

## Appendix 1: Devising the audit tool, compliance, and key insights from best practice recommendations<sup>12, 13</sup>

Element of care and purpose	Audit question	Compliance	Additional notes
<p><b>Pre-operative patient education</b> aims to reduce patient stress and anxiety prior to surgery</p>	<p><b>Q1: Has the patient received pre-admission education?</b></p> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> <li>• Not documented</li> </ul>	<p><b>Numerator:</b> number of patients receiving pre-admission education</p> <p><b>Denominator:</b> total number of patients audited x100% to gain compliance.</p> <p><b>Compliant = yes</b></p> <p>Patient was provided with counselling on what to expect on the surgery pathway and their recovery.</p> <p><b>Non-compliant = no</b></p> <p>Pre-admission clinic appointment unless the clinic incorporates specific education on ERAS journey.</p> <p>Pre-day procedure instructions (e.g. admission instructions, fasting, how will they get home, COVID-19 screen)</p> <p><b>Non-compliant = not documented</b></p> <p>If it isn't documented, it didn't happen</p>	

Element of care and purpose	Audit question	Compliance	Additional notes
<b>ASA status</b> is a classification level based on patient health status and co-morbidities. Evaluation is based on clinical decision and is a useful proxy measure of complexity of patient health status	<b>Q2: What ASA Physical Status Classification System has been assigned to the patient?</b>	<p><b>Compliance not required for this data point.</b></p> <p>Displays the percentage distribution of patients with ASA status.</p> <p><b>Numerator:</b> each ASA level 1 to 5</p> <p><b>Denominator:</b> total number of patients audited x100% to gain compliance</p>	
<b>Anaesthesia</b> aims to control pain while minimising excessive opioid usage and promote early mobilisation	<p><b>Q3: What was the complementary anaesthesia technique to open surgery:</b></p> <ul style="list-style-type: none"> <li>• General only</li> <li>• Spinal</li> <li>• Epidural</li> <li>• Regional</li> <li>• Local</li> <li>• Monitored anaesthesia care/IV sedation</li> <li>• Other</li> </ul>	<p><b>Compliance to the type of preferred anaesthesia (to be agreed locally)</b></p> <p><b>Numerator:</b> preferred type of anaesthesia</p> <p><b>Denominator:</b> total number of patients audited x100% to gain compliance</p>	Thoracic epidural anaesthesia is part of the latest guideline recommendations. However, in Australia and NSW, there has been less support to use this anaesthetic intervention. Alternative modalities, such as continuous wound infusions of local anaesthetic, may be an alternative modality in improving short-term outcomes. <sup>13</sup>
<b>Minimally invasive surgery</b> aims to reduce the risk of complications and postoperative pain	<p><b>Q4: Was the operation performed laparoscopically?</b></p> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>	<p><b>Numerator:</b> Yes + started laparoscopically converted to open</p> <p><b>Denominator:</b> total number of patients audited x100% to gain compliance</p>	A minimally invasive approach to colon and rectal cancer has clear advantages for improved and more rapid recovery, reduced general complications, reduced

Element of care and purpose	Audit question	Compliance	Additional notes
	<ul style="list-style-type: none"> <li>Started laparoscopically converted to open</li> <li>planned hybrid procedure</li> </ul>	<p><b>Compliant</b> = yes</p> <p><b>Compliant</b> = laparoscopic converted to open</p> <p><b>Non-compliant</b> = No</p> <p><b>Non-compliant</b> = planned hybrid</p>	<p>wound-related complications, including incisional hernia and fewer adhesions.<sup>1</sup></p> <p>Cross reference this data point on the operation report. There will be planned, and actual surgery performed that may have started laparoscopically but converted to open.</p> <p>For reversal of ileostomies, the option to select is 'Yes'.</p>
<p><b>Avoidance of NG tubes, catheters and drains</b> aims to reduce pain, discomfort, and risk of pneumonia while promoting resumption of oral feeding</p>	<p><b>Q5. When was the abdominal drain removed following surgery?</b></p> <ul style="list-style-type: none"> <li>Patient did not have a drain</li> <li>Day 0</li> <li>Day 1</li> <li>Day 2</li> <li>Day 3</li> <li>Day 4</li> <li>Day 5</li> <li>Day &gt;5</li> </ul> <p><b>Q6. When was the transurethral catheter removed following surgery</b></p>	<p><b>Compliance for days to be set locally</b></p> <p><b>Numerator:</b> add together the data points that are compliant (e.g. patient did not have a drain + Day 0 + Day 1)</p> <p><b>Denominator:</b> total number of patients audited x100% to gain compliance.</p>	<p>Pelvic and peritoneal drains show no effect on clinical outcome and should not be used routinely.</p> <p><b>Question specific information:</b></p> <p>Day 0 is within 24 hours post procedure.</p> <p>Select Day &gt;5 if removal did not occur within 5 full days.</p> <p>If the patient is transferred to ICU, the notes may be in ERIC and not in EMR.</p>

Element of care and purpose	Audit question	Compliance	Additional notes
	<p>(patient has passed trial of void)?</p> <ul style="list-style-type: none"> <li>• Patient did not have a transurethral catheter</li> <li>• Day 0</li> <li>• Day 1</li> <li>• Day 2</li> <li>• Day 3</li> <li>• Day 4</li> <li>• Day 5</li> <li>• Day &gt;5</li> </ul> <p><b>Q7. When was the nasogastric tube removed post-operatively?</b></p> <ul style="list-style-type: none"> <li>• Patient did not have an NGT</li> <li>• Day 0</li> <li>• Day 1</li> <li>• Day 2</li> <li>• Day 3</li> <li>• Day 4</li> <li>• Day 5</li> <li>• Day &gt;5</li> </ul> <p><b>Q8. Was a nasogastric tube inserted post operatively?</b></p> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul>		

Element of care and purpose	Audit question	Compliance	Additional notes
<b>Appropriate multimodal analgesia</b> aims to control pain while sparing excessive opioid usage	<p><b>Q9. Was paracetamol used post-operatively for pain management?</b></p> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul> <p><b>Q10. Were non-selective NSAIDs used in the intra-op or post op period? (ibuprofen, diclofenac, indomethacin, piroxicam)</b></p> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul> <p><b>Q11. Were selective NSAIDs used in the post op period? (ie. Celecoxib, rofecoxib, parecoxib)</b></p> <ul style="list-style-type: none"> <li>• Yes</li> <li>• No</li> </ul> <p><b>Q12. When was patient-controlled analgesia ceased? (ie. Fentanyl, morphine, hydromorphone)</b></p>	<p><b>Compliant</b> = use of paracetamol</p> <p><b>Compliant</b> = use of selective NSAIDs</p> <p><b>Numerator:</b> yes to Q9 paracetamol</p> <p><b>Denominator:</b> total number of patients audited x100% to gain compliance</p> <p><b>If you wish to avoid non-selective NSAIDs when measuring compliance:</b></p> <p><b>Numerator:</b> no to Q10</p> <p><b>Denominator:</b> total number of patients audited x100% to gain compliance</p> <p>While opioid use cannot necessarily be avoided, reducing time on opioid infusions may be a more appropriate indicator of an opioid sparing approach.</p> <p><b>Numerator:</b> Q12 add together the data points that are compliant (e.g. patient was not given patient-controlled analgesia + Day 0)</p>	<p>Avoid opioids and apply multimodal analgesia in combination with spinal/epidural analgesia or TAP blocks (in open surgery) when indicated.</p> <p>Non-selective NSAIDs are likely to be higher risk than selective NSAIDs.</p> <p><b>Question specific information:</b></p> <p>Day 0 is within 24 hours post procedure.</p> <p>Select Day &gt;5 if removal did not occur within 5 full days.</p> <p>If the patient is transferred to ICU, the notes may be in ERIC and not in EMR.</p>



Element of care and purpose	Audit question	Compliance	Additional notes
	<ul style="list-style-type: none"> <li>• Patient was not given patient-controlled analgesia</li> <li>• Day 0</li> <li>• Day 1</li> <li>• Day 2</li> <li>• Day 3</li> <li>• Day 4</li> <li>• Day 5</li> <li>• Day &gt;5</li> </ul>	<b>Denominator:</b> total number of patients audited x100% to gain compliance	
<b>Early mobilisation</b> aims to support quick return to normal function and reduce the risk of pneumonia and VTE	<b>Q13. When was the patient first mobilised post operatively (with physiotherapist, nurse or independently)?</b> <ul style="list-style-type: none"> <li>• Day 0</li> <li>• Day 1</li> <li>• Day 2</li> <li>• Day 3</li> <li>• Day 4</li> <li>• Day 5</li> <li>• Day &gt;5</li> </ul>	<b>Compliance for days to be set locally.</b>  <b>Numerator:</b> Q13 add together the data points that are compliant (e.g. Day 0 + Day 1)  <b>Denominator:</b> total number of patients audited x100% to gain compliance	<p>Early mobilisation through patient education and encouragement is an important component of enhanced recovery after surgery programmes; prolonged immobilisation is associated with a variety of adverse effects and patients should therefore be mobilised.</p> <p><b>Question specific information:</b></p> <p>Day 0 is within 24 hours post procedure.</p> <p>Select Day &gt;5 if patient was not mobilised within 5 full days.</p> <p>If the patient is transferred to ICU, the notes may be in ERIC and not in EMR.</p>

Element of care and purpose	Audit question	Compliance	Additional notes
			First mobilised refers to when notes have recorded patient getting out of bed. No specific parameters have been set on distance and length of time the patients' needs to be mobilising.
<b>Early feeding</b> aims to reduce the risk of insulin resistance.	<b>Q14. When was the patient offered food?</b> <ul style="list-style-type: none"> <li>• Day 0</li> <li>• Day 1</li> <li>• Day 2</li> <li>• Day 3</li> <li>• Day 4</li> <li>• Day 5</li> <li>• Day &gt;5</li> </ul>	<b>Compliance for days to be set locally.</b>  <b>Numerator:</b> Q14 add together the data points that are compliant (e.g. Day 0+ Day 1)  <b>Denominator:</b> total number of patients audited x100% to gain compliance	<p>Most patients can (and should be) offered food and oral nutrition supplements from the day of surgery.<sup>1</sup></p> <p><b>Question specific information:</b></p> <p>Day 0 is within 24 hours post procedure.</p> <p>Select Day &gt;5 if patient did not receive a solid diet within 5 full days.</p> <p>Offered food refers to when a solid diet introduced (may be light, soft, high protein/energy).</p> <p>If the patient is transferred to ICU, the notes may be in ERIC and not in EMR.</p>

## Appendix 2: Mapping ERAS audit tool to National Surgical Quality Improvement Program

ERAS audit tool question	NSQIP question
Has the patient received pre-admission education?	Not recorded
What anaesthetic technique did patient have for open surgery?	Principal anaesthetic technique, additional anaesthesia technique
When was the abdominal drain removed following surgery?	Not recorded
When was the indwelling urinary catheter removed following surgery (passing trial of void?)	Foley removal date
Was paracetamol used post operatively for pain management?	Not recorded
Were selective NSAIDs used in the post operative period?	Not recorded
Were non-selective NSAIDs used in the intra-operative or post operative period?	Not recorded
Not recorded	Date pain controlled with PO medication
When was the nasogastric tube removed post-operatively?	Not recorded
When was the patient first mobilised post operatively?	Date of first mobilisation
When was the patient offered food?	Date of first post-operative intake of solids

## Appendix 3: Cohort specifications

<b>Age</b>	N/A
<b>Admission type</b>	Planned (elective surgery)
<b>Episode care type</b>	Acute care
<b>Cohort surgical codes</b>	
<b>Surgery description</b>	<b>ACHI Procedure Codes (as relevant to each facility)</b>
Colectomy Right hemicolectomy Left hemicolectomy Subtotal colectomy Total colectomy	32000-00 Limited excision of large intestine with formation of stoma 32000-01 Right hemicolectomy with formation of stoma 32000-02 Laparoscopic limited excision of large intestine with formation of stoma* 32000-03 Laparoscopic right hemicolectomy with formation of stoma*  32003-00 Limited excision of large intestine with anastomosis 32003-01 Right hemicolectomy with anastomosis 32003-02 Laparoscopic limited excision of large intestine with anastomosis* 32003-03 Laparoscopic right hemicolectomy with anastomosis*  32004-00 Subtotal colectomy with formation of stoma 32004-01 Extended right hemicolectomy with formation of stoma 32004-02 Laparoscopic subtotal colectomy with formation of stoma* 32004-03 Laparoscopic extended right hemicolectomy with formation of stoma*  32005-00 Subtotal colectomy with anastomosis 32005-01 Extended right hemicolectomy with anastomosis 32005-02 Laparoscopic subtotal colectomy with anastomosis* 32005-03 Laparoscopic extended right hemicolectomy with anastomosis*  32006-00 Left hemicolectomy with anastomosis 32006-01 Left hemicolectomy with formation of stoma

	<p>32006-02 Laparoscopic left hemicolectomy with anastomosis*</p> <p>32006-03 Laparoscopic left hemicolectomy with formation of stoma*</p> <p>32009-00 Total colectomy with ileostomy</p> <p>32009-01 Laparoscopic total colectomy with ileostomy*</p> <p>32012-00 Total colectomy with ileorectal anastomosis</p> <p>32012-01 Laparoscopic total colectomy with ileorectal anastomosis</p>
Rectosigmoidectomy or proctectomy (Hartmann type procedure)	<p>32030-00 Rectosigmoidectomy with formation of stoma (936)</p> <p>32030-01 Laparoscopic rectosigmoidectomy with formation of stoma(936)*</p> <p>32039-00 Abdominoperineal proctectomy (934)</p> <p>32112-00 perineal rectosigmoidectomy (936)</p>
Anterior resection	<p>32024-00 High anterior resection of rectum</p> <p>32025-00 Low anterior resection of rectum</p> <p>32026-00 Ultra low anterior resection of rectum</p> <p>32028-00 Ultra low anterior resection of rectum with hand sutured coloanal anastomosis</p> <p>32028-01 Ultra low restorative anterior resection of rectum with sutured coloanal anastomosis</p> <p>9220800 Anterior resection of rectum level unspecified</p>
Total proctocolectomy	<p>32015-00 Total proctocolectomy with ileostomy</p> <p>32051-00 Total proctocolectomy with ileo-anal anastomosis</p> <p>32051-01 Total proctocolectomy with ileo-anal anastomosis and formation of temporary ileostomy</p> <p>32051-02 Total proctocolectomy with ileorectal anastomosis</p> <p>32051-03 Total proctocolectomy with ileorectal anastomosis and formation of temporary ileostomy</p>
Reversal of ileostomy	<p>30562-00 closure of loop ileostomy</p> <p>30562-01 closure of ileostomy with restoration of bowel continuity without resection</p> <p>32033-00 Restoration of bowel continuity following Hartmann's procedure</p> <p>32060-00 restorative proctectomy</p>

Hospital acquired complications	
<b>Hospital acquired complications of interest</b>	<b>ICD-10-AM codes with condition onset flag of 1</b> Sourced from: <a href="https://www.safetyandquality.gov.au/publications-and-resources/resource-library/hospital-acquired-complications-hacs-list-specifications-version-31">https://www.safetyandquality.gov.au/publications-and-resources/resource-library/hospital-acquired-complications-hacs-list-specifications-version-31</a>
3. Healthcare associated infection 3.1 Urinary tract infection	N39.0 urinary tract infection, site not specified N30.0 Acute cystitis
3.3 Pneumonia	All in HAC list
4. Surgical complications requiring unplanned return to theatre 4.2 Surgical wound dehiscence	T81.3 Disruption of operation wound, not elsewhere classified
4.3 Anastomotic leak	K91.83 Leak from surgical anastomosis of digestive tract K91.84 Postprocedural bile leak, not elsewhere classified N99.83 Leak from surgical anastomosis of genitourinary tract
Respiratory complications (includes respiratory failure, aspiration pneumonia and pulmonary odema)	All in HAC list
Venous thromboembolism	All in HAC list
Measures of interest in evaluation	
NG tube insertion and replacement	92036-00 Insertion of nasogastric tube 92037-00 Irrigation of nasogastric tube 92078-00 Replacement of (nasogastric or oesophagostomy tube
Minimally invasive surgery types	Procedure codes marked with an * are considered minimally invasive (laparoscopic)
Length of stay	
National weighted activity unit	
Readmission (same LHD)	

Source: Adapted from the ERAS Monitoring and Evaluation Plan (unpublished)