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Role of the Surgical-Ward Nurse in Identifying, Escalating, and Managing Postoperative Anastomotic Leak in Colorectal Patients: A Narrative Synthesis in an Australian Nursing Perspective

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Abstract

Purpose: *Postoperative colorectal anastomotic leak (AL) is one of the most feared complications after colorectal surgery because of its association with sepsis, reoperation, mortality, prolonged hospital stay, delayed adjuvant therapy, and permanent stoma formation. This narrative practice review outlines the frontline role of surgical-ward nurses in the early identification, escalation, and interim management of AL within the Australian acute-care context. Methods*: *A narrative synthesis of contemporary consensus statements, systematic reviews, and observational studies on colorectal AL was undertaken, with a focus on incidence, timing, clinical, and laboratory indicators, imaging strategies, and escalation frameworks relevant to ward-based nursing practice. Australian safety and quality standards for recognizing and responding to clinical deterioration were used as a contextual framework. Results*: *Reported AL rates range from approximately 1–19% depending on specific patient, anatomical, and technical factors, with typical presentation between postoperative days 5–7. Early detection relies on vigilant bedside surveillance of vital signs, abdominal findings, wound, and drain output, gastrointestinal recovery, and neurological and perfusion status, supported by early warning scores and serial laboratory markers (C-reactive protein, white cell count, procalcitonin, lactate, and drain/serum amylase ratio). Structured escalation through standardized communication, sepsis protocols, and prompt computed tomography (CT) imaging—preferably with rectal contrast where indicated—can shorten time to definitive surgical or radiological intervention. Nurses are central to interim resuscitative measures, documentation, patient, and family education, and quality-improvement feedback. Conclusion*: *In colorectal surgery, surgical-ward nurses are pivotal "early detectors" of AL. Embedding AL-focused surveillance into routine ward practice, supported by clear escalation pathways, biomarker monitoring, and multidisciplinary collaboration, can improve the timeliness of diagnosis and the safety of postoperative care.*

Keywords: Anastomotic leak, Australia, colorectal surgery, early warning scores, escalation of care, nursing

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INTRODUCTION

Postoperative colorectal anastomotic leak (AL) remains one of the most serious complications following colorectal resection. Contemporary consensus statements and systematic reviews highlight AL rates of approximately 1–19% depending on the anastomotic level, patient factors, and operative technique, and consistently link leaks with increased sepsis, reoperation, mortality, permanent stoma formation, prolonged length of stay, and delayed commencement of adjuvant therapy [1–4].

Most published guidance focuses on surgical and perioperative strategies to prevent and manage AL, including optimization of perfusion, anastomotic technique, diversion, and emerging intraoperative technologies [1–4, 5]. However, even in optimized systems, some leaks will occur. When they do, the interval between first subtle signs and definitive treatment is a critical determinant of outcome [4, 6, 7].

In Australian hospitals, early recognition and structured escalation of acute deterioration are mandated through the National Safety and Quality Health Service (NSQHS) Recognizing and Responding to Acute Deterioration Standard [5]. This framework positions surgical-ward nurses – who provide continuous bedside surveillance – as key actors in identifying evolving AL and activating timely review.

This narrative practice review summarizes the role of surgical-ward nurses in detecting, escalating, and supporting the management of AL in colorectal patients on the ward, with a focus on the Australian context. It integrates evidence on incidence and timing, early clinical and laboratory indicators, imaging triggers, and structured escalation pathways, and it highlights practical challenges and mitigation strategies for nursing leaders.

INCIDENCE, IMPACT, AND TIMING OF COLORECTAL ANASTOMOTIC LEAK

Reported AL rates vary widely between series due to heterogeneity in definitions, case-mix, and intensity of postoperative surveillance. Nonetheless, systematic reviews consistently report rates between roughly 1–19%, with higher risk in low rectal and coloanal anastomoses, in malnourished or comorbid patients, and after emergency procedures [2–4].

Early and late leaks can be distinguished. Early leaks typically present within the first postoperative week and are often associated with technical or perfusion issues at the anastomosis, whereas late leaks may reflect impaired healing, ongoing sepsis, or local factors [4]. Across time frames, delayed recognition is strongly associated with sepsis, multiorgan failure, reoperation, and increased mortality [4, 6–8].

Metabolic and inflammatory trajectories – particularly dynamic changes in C-reactive protein (CRP), white cell count (WCC), procalcitonin (PCT), and lactate – have been shown to differentiate uncomplicated recovery from evolving AL in the days following surgery [6, 7, 9]. These trends are only meaningful if samples are taken on schedule and interpreted alongside the patient's clinical course, reinforcing the importance of nursing vigilance and collaboration with medical staff.

THE SURGICAL-WARD NURSE'S FRONTLINE ROLE IN EARLY DETECTION

Continuous Clinical Surveillance

Ward nurses are uniquely placed to detect early decompensation because they are at the bedside around the clock. Core surveillance responsibilities for post-colorectal patients include:

- Serial vital signs (heart rate, blood pressure, respiratory rate, temperature, oxygen saturation)
- Regular pain assessment and focused abdominal examination (tenderness, guarding, distension, bowel sounds).
- Inspection of wounds and drains (volume, color, consistency, and odor of output).
- Accurate fluid balance charting (intravenous and oral intake, urine output, drain losses, stoma output, and insensible losses where applicable).
- Monitoring gastrointestinal recovery (nausea/vomiting, passage of flatus, stool frequency and character).
- Neurological and perfusion checks (level of consciousness, capillary refill, urine output trends, mottling, and peripheral warmth).

These data feed into institutional early warning systems (e.g., track-and-trigger charts, NEWS2-style scores), which specify thresholds for escalation in line with the NSQHS Recognizing and Responding to Acute Deterioration Standard [5].

Recognizing Early Signs and Symptoms

Many early manifestations of AL are non-specific and can resemble an expected postoperative course. Maintaining a high index of suspicion is, therefore, critical. Nurses should be particularly alert to:

- New or worsening abdominal pain, especially pain that appears disproportionate to the expected postoperative trajectory.
- Fever or rising temperature (>38.0°C or a clear upward trend).
- New tachycardia (e.g., heart rate > 100 beats/min) or progressively rising heart rate.
- Hypotension or a significant fall from baseline systolic blood pressure.
- Increasing respiratory rate or new oxygen requirement.
- Abdominal distension, tense abdomen, or evolving ileus pattern.
- Delayed return of bowel function beyond the expected timeframe for the specific operation.
- Changes in drain or wound output, particularly new purulent, bilious, or faeculent fluid, or a sudden increase in volume or malodor.

Trend recognition – rather than isolated readings – is often the earliest clue. A patient whose heart rate, CRP, and abdominal discomfort are all gradually worsening over several hours may be "declaring" a leak even before overt peritonism is present.

Laboratory Monitoring and Biomarkers

Nurses play a key role in ensuring that routine postoperative blood tests and additional investigations are performed on time and in understanding how results contribute to escalation decisions. Important parameters include CRP, WCC, PCT (where available), serum lactate, and drain/serum amylase ratio.

CRP, WCC, PCT, and Lactate

CRP is widely used as a screening biomarker after colorectal surgery. Many centers obtain CRP on postoperative day (POD) 3 and occasionally beyond, using threshold ranges (for example approximately 140–180 mg/L) to trigger closer clinical review or imaging [2, 4, 7]. No single cut-off is universally accepted; trends and clinical context remain crucial [2, 6, 7, 9].

WCC and lactate are traditional markers of inflammation and perfusion. Leukocytosis (e.g., WCC > 12 × 10^9/L) or an upward trend, especially in conjunction with rising lactate (>2 mmol/L), should prompt concern about sepsis and tissue hypoperfusion possibly related to AL [6, 7].

Procalcitonin has been investigated as a potentially more specific marker of severe bacterial infection and AL. A triad of PCT, CRP, and WCC has shown promise for improving predictive accuracy, with rising values beyond the early postoperative window suggesting a complicated course [9].

Drain/Serum Amylase Ratio and Other Emerging Markers

Novel biomarkers are being evaluated to further improve early detection. Among them, the drain/serum amylase ratio (d/s amylase) has attracted interest as an adjunctive predictor of AL. Elevated d/s amylase ratios (e.g., >2.5) in the early days after surgery have been associated with a higher likelihood of leak in colorectal cohorts [10–13].

Other inflammatory markers, such as interleukin-6, remain largely confined to research settings but may in time contribute to more refined risk stratification [6, 7]. For bedside nurses, the practical message is to ensure timely sampling, recognize abnormal or rising trends, and escalate when clinical concern is supported – not contradicted – by laboratory data.

STRUCTURED ESCALATION AND EARLY MANAGEMENT FOR NURSES

Activation of Medical Review and Sepsis Protocols

When early warning scores, clinical assessment, or laboratory trends meet local escalation criteria, nurses should initiate prompt review using structured communication tools, such as ISBAR (Identify, Situation, Background, Assessment, Recommendation). Key steps include:

- Contacting the appropriate medical officer (surgical registrar, consultant, or rapid response team) with a concise summary of changes and specific concerns about AL.
- *Initiating Local Sepsis Pathways:* Obtaining blood cultures and other indicated samples, commencing broad-spectrum intravenous antibiotics as prescribed, and starting fluid resuscitation and oxygen therapy according to protocol.
- Escalating to senior decision-makers without delay if the patient continues to deteriorate or if initial response is inadequate.

Guidelines emphasize that delays in escalation and source control for AL are associated with poorer outcomes [1, 4, 6, 13]. Nurses, therefore, have a professional responsibility to advocate for timely review and intervention when concern persists.

Imaging and Multidisciplinary Decision-Making

Cross-sectional imaging, most commonly contrast-enhanced CT of the abdomen and pelvis, is central to confirming or excluding suspected AL after colorectal surgery [7, 8]. Radiological features may include peri-anastomotic air or fluid collections, extravasation of contrast, or more diffuse manifestations of intra-abdominal sepsis [7, 8].

Evidence suggests that CT with intraluminal rectal contrast improves sensitivity and negative predictive value for AL compared with CT without rectal contrast, particularly for low pelvic anastomoses [11, 12]. However, CT can still miss a proportion of clinically significant leaks, so imaging should not override strong bedside clinical concern [8, 11, 12].

Nurses contribute to the safety and efficiency of imaging by preparing the patient (e.g., fasting, venous access, allergy checks), ensuring rapid transfer, and monitoring hemodynamic status before and after scanning. They also help to communicate evolving information between radiology, surgery, and anesthesia teams.

Interim Nursing Management While a Waiting Definitive Treatment

Definitive management of AL may involve relaparotomy or laparoscopy, percutaneous or surgical drainage of collections, construction of a diverting stoma, or endoluminal therapies, in combination with antimicrobial and organ-supportive therapies [1, 4, 13]. While these decisions are made by medical and interventional teams, ward nurses play a vital interim role:

- *Supporting Airway and Breathing:* Monitoring oxygen saturation, titrating supplemental oxygen, and escalating to higher-acuity settings as required.
- *Stabilizing Circulation:* Administering ordered fluid boluses, vasopressors (in monitored settings), and closely tracking urine output and vital signs.
- Managing analgesia and antiemetics to optimize comfort without masking deterioration.
- Maintaining strict asepsis for wound, stoma, and drain care.
- Coordinating timely transfer to theatre, interventional radiology, or intensive care as indicated.
- Providing clear explanations and emotional support to patients and families during periods of rapid deterioration and decision-making.

Core surgical texts stress the importance of the integrated approach of early recognition, resuscitation, antimicrobial therapy, and source control in AL management [1, 13]. Nursing actions are interwoven with each of these pillars.

COMMUNICATION, DOCUMENTATION, EDUCATION, AND QUALITY IMPROVEMENT

High-quality documentation is both a clinical and medico-legal imperative. Nurses should record baseline observations, evolving vital-sign trends, abdominal findings, fluid balance, laboratory results, changes in wound and drain output, and all escalation actions, including time of calls, responses, and subsequent interventions.

Structured handover frameworks (e.g., ISBAR) at shift change and before transfers (ward to theatre, ICU, or another hospital) help ensure that red-flag signs and pending investigations are clearly communicated.

Nurses also contribute to patient and family education. Before discharge, colorectal patients should be taught to recognize warning signs, such as fever, new or worsening abdominal pain, abnormal wound or stoma output, diarrhea, vomiting, or feeling acutely unwell. Clear written instructions about when and how to seek urgent review can facilitate earlier representation if a late leak develops after discharge.

At a ward or organizational level, nursing leaders should be involved in morbidity and mortality meetings, audit of AL cases, and quality-improvement projects (, e.g., standardized post-op observation protocols, nurse-initiated lab orders on specific postoperative days, or decision-support tools embedded in electronic medical records) [1, 2, 4, 13–15]. These activities close the loop between individual patient care and system-level learning.

CHALLENGES FOR SURGICAL-WARD NURSES AND POTENTIAL MITIGATIONS

Early AL can be difficult to distinguish from an uncomplicated postoperative course. Nonspecific signs, such as mild tachycardia, low-grade fever, ileus, or abdominal discomfort are common in colorectal patients, and not every abnormal CRP or WCC reflects a leak. Nurses can feel uncertain about when to escalate. Regular education, simulation, and case-based discussion can build pattern recognition and confidence in raising concern.

Biomarker thresholds vary across institutions and patient populations, and no single laboratory parameter can rule AL in or out [2, 4, 6, 7, 9, 10]. Emphasizing trends, clinical context, and the principle of "escalate if in doubt" helps avoid over-reliance on any one number.

Diagnostic imaging is imperfect: even high-quality CT with rectal contrast can miss up to a quarter of leaks in some series [8, 11, 12]. Nurses should be aware of this limitation and continue close surveillance after "reassuring" scans if the patient's trajectory remains concerning.

Resource constraints – such as limited after-hours access to senior surgeons, radiology, or critical-care beds – can delay investigations or interventions. Within these constraints, nurses can still advocate assertively, document clearly, and use rapid response or medical emergency teams where available.

Finally, communication gaps between teams (e.g., ward, theatre, radiology, ICU) can undermine timely care. Shared protocols, checklists, and routine multidisciplinary huddles focused on high-risk postoperative patients can help to mitigate these gaps.

CONCLUSION

In the Australian colorectal surgical ward, nurses are central to the early detection and management of postoperative anastomotic leak. Continuous bedside surveillance, trend-based interpretation of vital signs and laboratory markers, and proactive activation of escalation pathways can significantly shorten the time between the first subtle signs of deterioration and definitive intervention.

Embedding AL-focused surveillance and escalation into routine practice – through education, standardized protocols, and participation in quality-improvement initiatives – ensures that nursing contributions are systematically harnessed to improve patient safety and outcomes after colorectal surgery.

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Ethics Approval

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Consent to Participate

Not applicable.

Consent for Publication

Not applicable. No individual person's data are included.

Data Availability

No datasets were generated or analyzed during the current study.

Authors' Contributions

The author conceived the topic, reviewed, and interpreted the literature, and wrote and revised the manuscript.

REFERENCES

1. Lázaro-Fontanet E, Clerc D, Girardin T, Martin D, Hübner M, Hahnloser D. Prevention and management of anastomotic leakage after colorectal surgery: A Swiss national consensus. Br J Surg. 2022;109(Suppl 3).
2. Ang ZH, Wong SW. Prevention of anastomotic leak in colorectal surgery: Current knowledge and next steps. Open Access Surg. 2024;17:11–20. doi: 10.2147/OAS.S429415.
3. Chaouch MA, Kellil T, Jeddi C, Saidani A, Chebbi F, Zouari K. How to prevent anastomotic leak in colorectal surgery? A systematic review. Ann Coloproctol. 2020;36(4):213–222. doi: 10.3393/ac.2020.05.14.2.
4. Early and late anastomotic leak after colorectal surgery: A systematic review. Am J Surg. 2022;224(3):627–636. doi: 10.1016/j.amjsurg.2022.02.006.
5. Australian Commission on Safety and Quality in Health Care. Recognising and responding to acute deterioration standard [Internet]. Sydney: ACSQHC; 2017.
6. Jansson D, Oikonomakis I, Hall Strand IEU, Meehan AD, Jansson KS. Metabolism, inflammation and postoperative time are the key to early diagnosis of anastomotic leak. J Surg Surg Res. 2019;5(2):78–85. doi: 10.17352/2455-2968.000078.
7. Jansson D, et al. Diagnostic modalities for early detection of anastomotic leak after colorectal resection. J Surg Res. 2024. doi: 10.1016/j.jss.2024.03.001.
8. Detection of anastomotic leakage following elective colonic surgery: A clinical review. AJR Am J Roentgenol. 2021;217(5):W23–W33. doi: 10.2214/AJR.17.18642.
9. Kokosis G, et al. Role of the triad of procalcitonin, C-reactive protein and white blood cells for anastomotic leak prediction. World J Surg Oncol. 2022;20:1. doi: 10.1186/s12957-022-02506-4.
10. Lee JM, Lee J, Kim T, Kim NK. Early detection of anastomotic leak via the drain/serum amylase ratio in patients undergoing colorectal surgery. Yonsei Med J. 2024. doi: 10.3349/ymj.2024.0431.
11. Marres CCM, et al. The importance of rectal contrast in CT assessment to detect anastomotic leakage after colorectal surgery. Tech Coloproctol. 2017;21(9):709–714. doi: 10.1007/s10151-017-1689-6.
12. Moreno-Lopez N, Mvouama S, Bourredjem A, Fournel I, Perrin T, Flaris A, et al. CT scan for early diagnosis of anastomotic leak after colorectal surgery: Is rectal contrast useful? Tech Coloproctol. 2022;27(10):639–645. doi: 10.1007/s10151-022-02716-8.
13. Prevention, diagnosis, and management of anastomotic leak. In: Surgery. Philadelphia: Elsevier; 2015.
14. The role of antibiotic prophylaxis in anastomotic leak prevention. Antibiotics (Basel). 2022;12(2):397. doi: 10.3390/antibiotics12020397.
15. Advanced innovations in reducing anastomotic leak: A review of emerging biomaterial applications in colorectal surgery. Int J Colorectal Dis. 2025;40:210. doi: 10.1007/s00384-025-04930-w.

