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# Improving patient safety in Victorian perioperative care

## Better patient safety

Perioperative Harm Prevention

ACORN
AUSTRALIAN COLLEGE OF PERIOPERATIVE NURSES

Victorian Perioperative Consultative Council

Royal Australasian College of Surgeons

ANZCA
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**This report has been endorsed by the Victorian Perioperative Consultative Council, Royal Australasian College of Surgeons - Victorian State Committee, the Australian College of Perioperative Nurses and the Australian and New Zealand College of Anaesthetists.**



Victorian Managed Insurance Authority (VMIA) acknowledges the Traditional Custodians of the land on which we do business, and we pay our respects to Elders past, and present. We acknowledge the important contribution that Aboriginal and Torres Strait Islander peoples make in creating a thriving Victoria.

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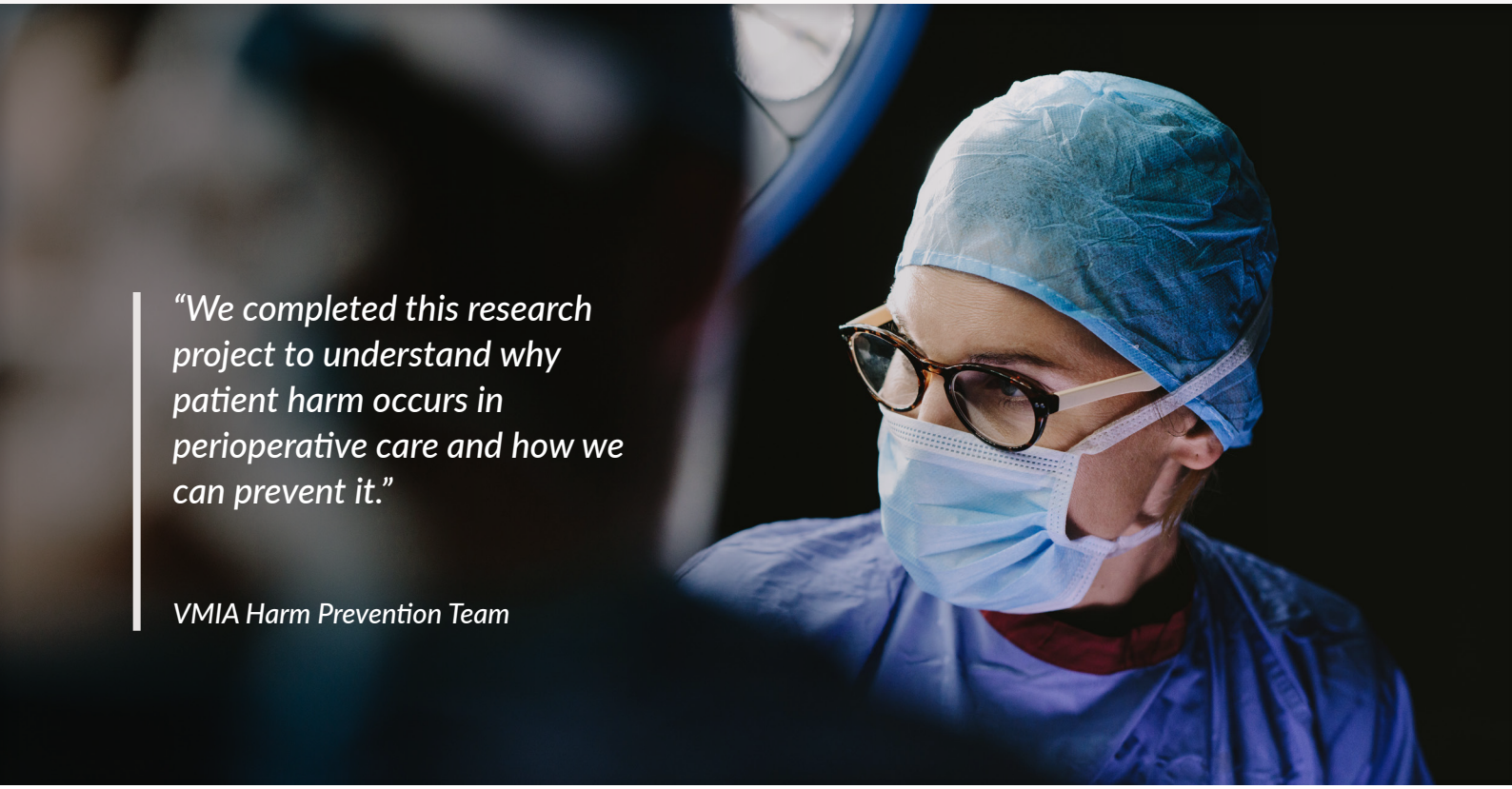
## Heather's Story

Heather, a 44-year-old female presented to hospital for elective bowel surgery which was performed without incident. On day 2 post-surgery, she had intense pain, an increased heart rate and decreased blood oxygen levels. Her abdomen was tender but she had active bowel sounds. She was prescribed intravenous antibiotics. Her treating team considered sending her for a CT scan but decided to watch and wait.

Heather continued to deteriorate, and bowel sounds became absent. A CT was done two days later and showed fluid around the anastomosis (internal repair) site. The team decided to continue with non-operative management and monitor Heather's condition. The next day, she got worse and was taken back to the operating theatre where faecal matter was found throughout her abdomen.

She needed a temporary stoma and was required to stay in hospital for an additional two weeks. Heather had significant adjustments to her work and personal life to manage her stoma. Further surgery was required to reverse the stoma which required more leave from work and assistance with minding her children.

*This patient story is for illustrative purposes only and is not based on actual events.*



*"We completed this research project to understand why patient harm occurs in perioperative care and how we can prevent it."*

*VMIA Harm Prevention Team*

## What we can learn

Relevant data can help clinicians identify frequently occurring complications of different types of surgery and the rate at which those complications are occurring. Accessing and understanding this information allows teams to learn from what has happened in the past. This can help them to identify and manage risks early to prevent avoidable adverse patient safety events.

When complication rates can be risk-adjusted and benchmarked, outlier good and poor performing institutions or units can be identified to promote learning and potential changes in practice.

In this case, anastomotic leak necessitating an unplanned return to theatre and formation of a stoma is a complication that patients should be informed of prior to surgery. It's not always easy to diagnose an anastomotic leak particularly as the abdominal signs can be due to a variety of possible causes.

Surgical teams rely on interpreting these clinical signs, including the progress or lack thereof in recovery, and the results of investigations from blood tests and scans. Scans are not always easy to interpret in the early days after surgery but are still worth performing and a second opinion from a trusted colleague is invaluable.

While this was a disappointing outcome, it was fortunate that the surgical team reoperated and the patient's life was saved. Unfortunately, once an anastomosis leaks, there is often little alternative to taking it down and forming a temporary stoma.

# Why we're involved

Despite a focused effort on quality and safety in healthcare, one in every ten patients admitted to an Australian hospital will suffer from an adverse patient safety event (APSE). At least half of these are preventable.

APSEs can occur anywhere across the perioperative pathway, from before surgery, to during an operation, or after discharge from hospital.

The operating theatre is a complex, high pressured environment where clinical care for vulnerable and often unwell patients happens. It's therefore no surprise that research has shown that APSEs occur at a higher rate in surgical patients than those in the general hospital population.

The devastating effects of APSEs impact patients, their families and carers, clinicians involved, as well as the reputations and budgets of health services.

Up to 10-15% of healthcare expenditure can be attributed to healthcare related harm. In Victorian public health services, this can account for $511 million annually. These costs do not include the human costs such as pain and suffering, loss of income for patients and their families, and long-term health issues.

VMIA surgical small claim costs have increased significantly in recent years, from $16.9 million in FY2015 to $33.4 million in FY2020. Specialties with the largest increases are Orthopaedics, General Surgery and Gynaecology.

# 1/10

Patients admitted to an Australian hospital will suffer from an APSE [1]

# 38-56%

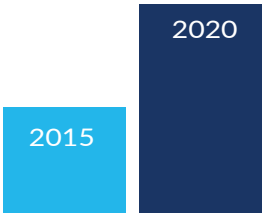
APSEs in surgical patients that are potentially preventable [2,3]

# 10-15%

Healthcare expenditure attributed to healthcare related harm [4]


# $511m

Annual cost of healthcare related harm in Victoria [5]




# $33.4m

VMIA's surgical claim costs in FY2020 compared to $16.9 million in FY2015

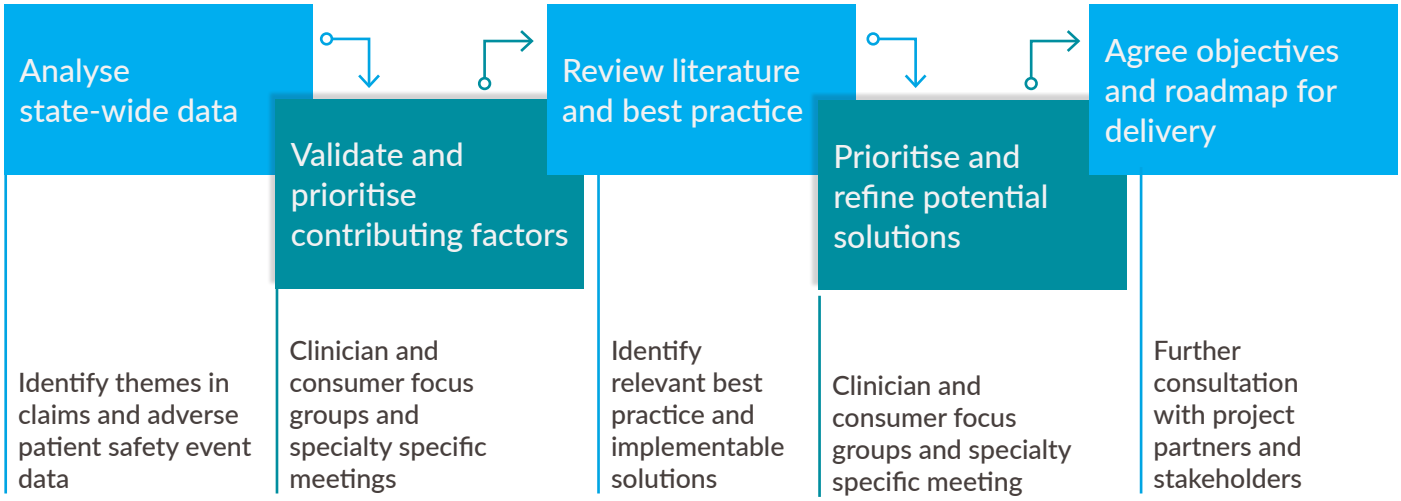

1. Duckett, S., Cuddihy, M. and Newnham, H., 2016. Targeting zero: supporting the Victorian hospital system to eliminate avoidable harm and strengthen quality of care. Department of Health and Human Services (Vic)
2. Anderson O, Davis R, Hanna GB, Vincent CA. Surgical adverse events: a systematic review. Am J Surg 2013;206:253-62. doi:10.1016/j. amjsurg.2012.11.009
3. Rajasekaran S, Ravi S, Aiyer SN. Incidence and preventability of adverse events in an orthopaedic unit: a prospective analysis of four thousand, nine hundred and six admissions. Int Orthop 2016;40:2233-8. doi:10.1007/s00264-016-3282-4
4. Panagioti, M., Khan, K., Keers, R., Abuzour, A., Phipps, D., Kontopantelis, E., Bower, P., Campbell, S., Haneef, R., Avery, A. and Ashcroft, D., 2019. Prevalence, severity, and nature of preventable patient harm across medical care settings: systematic review and meta-analysis. BMJ, p.l4185
5. Ehsani, J., Jackson, T. and Duckett, S., 2006. The incidence and cost of adverse events in Victorian hospitals 2003–04. Medical Journal of Australia, 184(11), pp.551-555

## Our project objectives

Collaborate with our health system partners to:

1. provide clinical and consumer insight into perioperative adverse patient safety events
2. identify common themes and factors contributing to these events
3. identify potential solutions that address the key local challenges
4. develop recommendations and a roadmap to connect Victorian public health services with world leading perioperative patient harm prevention initiatives.

## What we did




To understand the causes of perioperative harm, we examined high cost and high severity VMIA surgical claims over ten years (2009 to 2018). We also reviewed Safer Care Victoria's sentinel event data from 2017 to 2021. We identified common themes and contributing factors and grouped these into perioperative phases. We then completed a literature review and horizon scan of clinical best practice to identify interventions targeting the key factors.

We took these findings to expert clinicians within the Victorian public health system to validate the themes and to understand why they occurred. We also discussed the potential opportunities for improvement and sought examples of current best practice.

Our project was guided by a multidisciplinary Steering Committee **(Appendix A)** including expert medical and nursing clinical representatives, delegates from clinical peak bodies, metropolitan and regional health services, government and health sector partners, as well as non-clinical committee members with consumer backgrounds, project management and medical indemnity claims expertise.

# What we found

## Data analysis: Sentinel events and medical indemnity claims

The total cost of closed perioperative medical indemnity claims with year of loss in the ten-year period FY2009-FY2018 was $164 million*. The table below illustrates where the APSE occurred in the perioperative phase.

| Perioperative phase where APSE occurred | Ten-year claims cost (million) |
|---|---|
| Preoperative | $48.04 |
| Intraoperative | $74.60 |
| Postoperative | $41.90 |
| **Total** | **$164.54** |

**date of loss relates to the date of adverse patient safety event*

## Key themes in adverse patient safety events (by perioperative phase)

The table below illustrates the key themes identified from our data and the perioperative phase in which they occurred.

| Preoperative | Intraoperative | Postoperative |
|---|---|---|
| Informed consent | Anaphylaxis | Deteriorating patient |
| Anticoagulation | Unretrieved items | Surgical site infections |
| Assessment | Intraoperative positioning | Anticoagulation |
| Optimisation | Inadvertent surgical injuries | Documentation |
| Documentation | Documentation | |

*See* **Appendix B** *for theme definitions*

## Key findings

- Elective surgery represented 70% of the medical indemnity claims in our qualitative analysis, with the remainder emergency cases. This highlighted that APSE issues did not necessarily arise from the lack of time available in emergency situations.
- Orthopaedics, General Surgery and Gynaecology had the highest number and cost of claims.
- The geographical distribution of claims incidence was in line with the activity split between metropolitan and regional health services.

## Key findings

- The most frequently occurring themes related to the deteriorating patient (recognition and escalation of care), informed consent, assessment and optimisation, inadvertent surgical injury and unretrieved items.
- Issues with documentation were evident across the full patient journey, while anticoagulation planning issues arose both pre and postoperatively.
- Anaphylaxis was relatively infrequent but associated with high severity outcomes, while intraoperative positioning and unretrieved items were seen as more easily avoided events.

## Review of literature and evidence-based best practice

To assist in finding solutions to our validated themes, we conducted a literature review of academic and grey literature. Perioperative clinicians, managers and consumers were also consulted as part of a horizon scan to identify national and international perioperative patient harm prevention initiatives.

To help reduce APSEs in surgical patients, the best available evidence supports the use of two types of interventions:

### 1: Patient directed interventions

#### Shared decision making

is a process that invites clinicians and patients to have frank discussions about the risk and benefits of surgery and how they align with the patients' personal values and preferences. It allows patients and their families to be more informed and involved in the planning of their treatment and can reduce medical indemnity claims.

#### Prehabilitation

is the optimisation of a patients physical and medical state prior to surgery. It involves a multidisciplinary team treating a patient's modifiable risk factors preoperatively to improve postoperative outcomes.

### 2: Clinician and system directed interventions

#### Comprehensive clinical, administrative, and patient reported data

allows detection of trends and identification of areas of concern. Many data collection models enable benchmarking with peer health services so that clinicians and administrators can understand and track the quality of care offered within their service.

#### Simulation based education

in perioperative care involves a team of multidisciplinary clinicians responding to a mock life-threatening emergency. It is a learning method that enhances human factor skills that in turn influence patient safety.

#### Checklists, pathways, and guidelines

draw attention to key components of care and help reduce preventable errors. They are commonly based on best available evidence and help promote standardisation and reduce unwarranted variation between clinicians and health services.

*Link to the full literature review will be made available when published.*

## What we heard

Feedback we received from sector consultation and focus groups relating to data included:

- Large amounts of data are collected within the Victorian health sector.
- Clinical data is not always fed back to clinicians and managers.
- Clinical registries are useful to benchmark performance, however, participation in Victoria is not optimal.
- Data needs to be risk and case mix adjusted for accurate benchmarking.
- It's important to receive patient reported data, including experience measures (PREMs) and particularly outcome measures (PROMs).
- Clinicians need visibility of patient outcomes beyond discharge.

Some other points raised by clinicians and consumers during discussions were:

- Clinical care pathways and guidelines are good so we can match hospital resources to the highest risk patients.
- Optimising a patient's physical and psychological health is a key issue and has shown that if done from the beginning of the surgical journey, can improve patient outcomes.
- In-situ simulation training in theatre is well received as it's in the real clinical environment. It would be great to have a specialist group visit rural areas to train staff for infrequent medical emergency cases.
- Patient "expectation of outcome" for elective surgery often doesn't match actual outcomes. It's important to have realistic informed consent discussions to help understanding.

Patient "expectation of outcome" for elective surgery often doesn't match actual outcomes. It's important to have realistic informed consent discussions to help understanding.

## Akeem's story

Akeem, a 76-year-old male required a transurethral resection of his prostate (TURP) for difficulties with his urinary stream. He also suffered from atrial fibrillation (an irregular heartbeat) and was being treated with a new oral anti-coagulant (NOAC) to minimise his risk of having a stroke. Appropriately his anticoagulant medication was stopped 48 hours prior to surgery as TURP is an operation that has a significant risk of postoperative bleeding.

The procedure on the day of surgery went well but was complicated by bleeding the following day, which required a return to theatre to evacuate a blood clot from inside his bladder. This was successful. Akeem's anticoagulant medication was appropriately not restarted in hospital given the risk of re-bleeding but a plan to restart the anticoagulation was not documented and he was discharged home on day 5 without instructions when to restart his medication.

Twenty-nine days after surgery, Akeem suffered a severe stroke, lost his independence and required long-term care.

*This patient story is for illustrative purposes only and is not based on actual events.*

*An active plan, which can always be modified in the event of bleeding, should be made as to when to stop and when to restart anticoagulants after surgery.*

## What we can learn

It's always a challenge to balance risks when performing surgery on patients with medical conditions requiring anti-coagulation. On the one hand, one wants to minimise the risk of bleeding and on the other, one does not want a patient to suffer from a clot dislodging from the patient's heart to the brain and causing a stroke.

An active plan, which can always be modified in the event of bleeding, should be made as to when to stop and when to restart anticoagulants after surgery.

Patients with atrial fibrillation, or who develop atrial fibrillation during their perioperative stay in hospital are 10 times more likely to suffer a stroke, and this is most likely to occur in the first 30 days after surgery. The complication of bleeding and clot retention contributed to staff overlooking the need to make a plan for restarting anticoagulation therapy. This patient suffered severe harm and impairment as a result, with loss of function and independence.

# What does this mean for patient safety?

## Surgery is a complex specialty. Adding to this complexity, our patient population is ageing and experiencing more health issues.

The challenges we face in perioperative medicine are varied, however, we have identified several opportunities to reduce perioperative patient harm through our research. These interventions were discussed and validated with expert clinicians. We want to initially work on solutions that can address a range of the factors contributing to harm, and to support the work of the sector and partners on other initiatives where appropriate.

The evidence and our consultation indicated an improved understanding of data and clinical outcomes will help health services to recognise what they are doing well and allow for replication of best practice state-wide. Benchmarked data can also be used to identify areas in need of improvement and allow for localised and targeted quality improvement initiatives.

We recognise having meaningful data isn't enough. Implementation will need to consider this and ensure that health services have the capacity, capability, and support to action local quality improvement.

Based on our research, we'll focus on one main program of work (data for improvement) for the next phase of our perioperative patient harm prevention initiative that:

- has demonstrated success locally and in other jurisdictions
- addresses multiple key issues from our research
- leverages existing health system activity
- can be delivered at a state-wide level and tailored for local priorities
- has scope for expansion into other clinical areas.

By focusing our efforts on this initiative, while continuing to partner and support the activity of health sector stakeholders on other priority activities, we can maximise the benefits for the Victorian community in improved perioperative patient safety.

# What we propose

## We prepared the following priority and supportive actions based on the findings of our literature review, data analysis and sector consultation.

We presented these to a range of clinicians, managers and consumers who supported our areas of focus. Our multidisciplinary expert Steering Committee has endorsed these findings and priorities.

### Priority action – Data for improvement

Define and implement a suitable data model(s) to provide meaningful and benchmarked clinical data, patient-reported data and administrative data to frontline managers and clinicians. Use this data to identify opportunities and enable local quality improvement initiatives and system-wide learning.

This can be achieved by:

- exploring existing data and opportunities with partners including Safer Care Victoria, the Department of Health and Victorian Agency for Health Information
- exploring ways to improve participation in existing registries and databases
- assessing feasibility for the Victorian context of data models such as Getting It Right First Time (GIRFT) and the American College of Surgeons National Surgical Quality Improvement Program (NSQIP)
- piloting and evaluating agreed models with our partners.

## Supportive actions

Through our research, several other key themes, improvement opportunities, and examples of leading practice were highlighted. We encourage continued action on these and would like to partner and support appropriate initiatives within the Victorian public health system.

### Guidelines/checklists

Create evidence-based guidelines and enhanced checklists which may include anticoagulation status and intraoperative patient positioning checkpoints on the surgical safety checklist. This concept has also been expanded in the UK to develop a surgical ward round checklist focused on key aspects of care.

### Shared Decision Making (SDM)

Improve informed consent process using certified decision-making aids. An example is Peter MacCallum Cancer Centre's SDM clinic led by a consultant anaesthetist. Queensland Health has developed expanded consent forms for specific procedures to encourage full discussion and informed consent.

### Prehabilitation

Optimisation of patients' physical and mental health preoperatively to reduce postoperative complications.

### Simulation

Expand simulation services to include smaller and regional hospitals, and postoperative surgical wards. In New Zealand, for example, NetworkZ provides multidisciplinary simulation-based team-training program for all surgical teams.

### Documentation

Consider the use of pathways and checklists to improve and standardise documentation.

This project is guided by a multidisciplinary Steering Committee (see Appendix A).

# Appendix A
# Project Steering Committee

Our sincere thanks to the project Steering Committee for their expertise and support.

## VMIA representatives

**Ursula Harrisson (Chair)**
Manager, Harm Prevention Programs

**David Shen**
Claims Specialist

**Dr Ashish Jaison**
Clinical Lead – Harm Prevention

**Lachlan Crowe**
Program Lead – Harm Prevention

**Mardi Durling**
Perioperative Clinician – Patient Safety Project

## Surgical representatives

**Professor David Watters**
Chair, Victorian Perioperative Consultative Council

**Associate Professor Philip McCahy**
Victorian Audit of Surgical Mortality Clinical Director, Royal Australasian College of Surgeons

**Associate Professor Marinis Pirpiris**
Immediate Past President, Australian Orthopaedic Trauma Society

Past Chair of the Victorian Branch of the Australian Orthopaedic Association

**Mr Matthew Hadfield**
Chair, Royal Australasian College of Surgeons Victorian State Committee

Deputy Chair, Victorian Clinical Council, Safer Care Victoria

**Dr Samuel Newbury**
Chair, Royal Australian and New Zealand College of Obstetricians and Gynaecologists Victorian Regional Committee

## Other clinical and non-clinical representatives

**Jen Morris**
Consumer representative

**Dr Nam Lee**
Chair, Victorian Regional Committee, Australian and New Zealand College of Anaesthetists, Anaesthetic Subcommittee Member, Victorian Perioperative Consultative Council

**Rebecca East**
Chief Executive Officer, Australian College of Perioperative Nurses

**Sylvia Barry**
Director, Program Improvement, Health Services & Ageing, Commissioning & Service Improvement, Department of Health

**Megan Goadby**
Acting Director, Centre for Patient Safety and Experience, Safer Care Victoria

# Appendix B
# Theme Definitions

## Preoperative

**Informed consent**
Inadequate information given regarding procedure and the consequences that complications could have on the patient's quality of life.

**Anticoagulation**
Mismanagement of a patient's coagulation plan; can be over medicated resulting in risk of bleeding in surgery or under medicated resulting in increased risks of clotting.

**Assessment**
Test and diagnostic studies not completed or results not available prior to surgery resulting in lack of information to make medical decisions.

**Optimisation**
Patient's baseline health not improved prior to surgery resulting in increased risk of morbidity or mortality.

**Documentation**
Lack of documentation resulting in poor patient care and indefensibility of medical indemnity claims. Preoperatively may include conversations had with patient, family or other specialties regarding surgery and risk versus benefit discussions.

## Intraoperative

**Anaphylaxis**
An allergic reaction to a medication or substance resulting in an anaphylactic allergic reaction. This medical emergency requires expert and co-ordinated care to effectively treat the condition.

**Unretrieved items**
An item left unintentionally inside a patient after surgery requiring another surgical procedure to retrieve the item.

**Inadvertent injuries (including diathermy)**
An unintentional injury because of surgery. This can be an unavoidable result due to the nature of the procedure or due to surgical technique.

**Intraoperative positioning**
Positioning of the patient with altered consciousness that results in an injury-could be pressure injury or nerve damage.

**Documentation**
Lack of documentation resulting in poor patient care and indefensibility of medical indemnity claims. Intraoperatively may include lack of detail in operation notes, poor postoperative instructions or details of discussions had with other medical specialties.

## Postoperative

**Deteriorating patient**
Delayed recognition of a patient that was becoming unwell after surgery. A failure to recognise and treat symptoms and failure to escalate to senior staff, other medical specialties or a tertiary hospital.

**Surgical site infections**
An infection that presents postoperatively and is directly related to the patient's surgical procedure.

**Anticoagulation**
Mismanagement of a patient's coagulation plan; can be over medicated resulting in risk of bleeding in surgery or under medicated resulting in increased risks of clotting.

**Documentation**
Lack of documentation resulting in poor patient care indefensibility of medical indemnity claims. Postoperatively may include discharge summaries that lack the required information needed to formulate a personalised care plan in the community, no detailed records of conversations had with family or other medical specialties regarding the patient's treatment plans and prognosis and lack of notes relating to patient examinations done after surgery.

# Glossary

**Adverse patient safety event**
An incident that resulted in harm to a person receiving care (Australian Commission on Safety and Quality in Health Care [ACSQHC]). Harm includes disease, suffering, impairment (disability) and death.

**Anastomosis**
A surgical connection made between two parts, in this instance the intestine (bowel).

**Anastomotic leak**
Occurs when fluids leak from the surgical connection made in the intestine (bowel).

**Benchmarked**
To compare results against a standard or a point of reference. In this case, it could be comparing the value of an identifier or metric such as 'length of stay' with its average value from other health organisations.

**Formation of a stoma**
Surgery where part of the bowel is brought to the surface of the abdomen. Waste material such as faeces, exits via the abdomen and is collected in a bag over the stoma. This can be temporary or permanent.

**Outlier**
A value that sits outside most of the other values in a set of data.

**Perioperative**
Refers to the period of time around surgery, from when a person is referred to surgery until that person is discharged from the hospital. It includes care provided before, during and after a person's surgery.

**Perioperative harm**
An adverse patient safety event that occurs during the surgical pathway.

**Risk adjustment**
Risk adjustment (also known as severity adjustment) is the process of statistically accounting for differences in patient case mix that influence health care outcomes.

**Sentinel event**
Wholly preventable adverse patient safety events that result in serious harm or death to individuals. All health services are required to report adverse patient safety events in accordance with the Australian national sentinel event list.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