

Hospital-Acquired Complication **4**

# SURGICAL COMPLICATIONS REQUIRING RETURN TO THEATRE

	HOSPITAL-ACQUIRED COMPLICATION	RATE <sup>a</sup>
1	Pressure injury	10
2	Falls resulting in fracture or intracranial injury	4
3	Healthcare-associated infections	135
4	Surgical complications requiring unplanned return to theatre	20
5	Unplanned intensive care unit admission	na <sup>b</sup>
6	Respiratory complications	24
7	Venous thromboembolism	8
8	Renal Failure	2
9	Gastrointestinal bleeding	14
10	Medication complications	30
11	Delirium	51
12	Persistent incontinence	8
13	Malnutrition	12
14	Cardiac complications	69
15	Third and fourth degree perineal laceration during delivery (per 10,000 vaginal births)	358
16	Neonatal birth trauma (per 10,000 births)	49

a per 10,000 hospitalisations except where indicated  
b na = national data not available

This hospital-acquired complication includes the diagnoses of\*:

- Post-operative haemorrhage/haematoma requiring transfusion and/or return to theatre
- Surgical wound dehiscence
- Anastomotic leak
- Vascular graft failure
- Other surgical complications requiring unplanned return to theatre.



## Why focus on surgical complications?

Each year, nearly 9,000 operating theatre visits involve patients who return to theatre unexpectedly following an earlier operation.<sup>1</sup> When patients experience a haemorrhage they may have pain, bruising discomfort, loss of blood pressure, dizziness and collapse. Wound dehiscence (the reopening of wounds) can be highly traumatic to patients and carers. Needing to return unexpectedly to the operating theatre is distressing to patients and carers, and furthermore subjects the patient to repeated anaesthesia risks.

The rate of unexpected return to the operating theatre in Australian hospitals was 20 per 10,000 hospitalisations in 2015–16.<sup>1</sup> Unexpected returns to the operating theatre extend the length of hospitalisation, which impacts on patients and their families. This increases the cost of admission incurred by the health service. This additional cost may be the result of an increased length of stay, or more complex care requirements.<sup>2</sup> While there is an increased financial cost, the most significant cost is the pain and discomfort experienced by the patient.

\* The hospitals classified in the Principal Referral Hospitals peer group for these purposes was the former Australian Institute of Health and Welfare's definition of major city hospitals with more than 20,000 acute weighted separations and regional hospitals with more than 16,000 acute weighted separations

In many cases, surgical complications are preventable. Significant reductions in return-to-theatre rates are being achieved in some hospitals through preventive initiatives. The rate for return to theatre at Principal Referral Hospitals\* was 25 per 10,000 hospitalisations.<sup>1</sup> If all Principal Referral Hospitals above this rate reduced their rate to 25 per 10,000 hospitalisations, then 1,628 unexpected returns to the operating theatre in these hospitals would have been prevented, and more when other types of facilities are considered.

\* The specifications for the hospital-acquired complications list providing the codes, inclusions and exclusions required to calculate rates is available on the [Commission's website](#) [?](#).



## What is considered best practice for preventing surgical complications requiring return to theatre?

All hospital-acquired complications can be reduced (but not necessarily eliminated) by the provision of patient care that mitigates avoidable risks to patients.



The **health service organisation** providing services to patients at risk of surgical complications requiring return to theatre:

- Has governance structures and systems in place to identify those at risk of surgical complications requiring return to theatre and to support delivery of appropriate care
- Ensures that equipment and devices are available to effectively manage surgical complications.



**Clinicians** caring for patients at risk of surgical complications requiring return to theatre:

- Conduct appropriate risk assessments including identifying patients with coagulopathies and where possible, correcting these pre-operatively
- Provide preventive measures and care in accordance with best practice guidelines.



The National Safety and Quality Health Service (NSQHS) Standards (second edition), in particular the Comprehensive Care Standard<sup>3</sup>, support the delivery of safe patient care.

The advice contained in the hospital-acquired complication fact sheets aligns with the criteria in this standard, which are as follows:

- Clinical governance structures and quality-improvement processes supporting patient care
- Developing the comprehensive care plan
- Delivering the comprehensive care plan
- Minimising specific patient harms.

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# POST-OPERATIVE HAEMORRHAGE/ HAEMATOMA REQUIRING TRANSFUSION AND/OR RETURN TO THEATRE

Haemorrhage or haematoma, otherwise commonly known as a 'bleed', occurring after an operation can be a medical emergency that requires a return to theatre or a blood transfusion if severe. This poses additional clinical risk for patients, with the possibility of fluid-load-related complications, in addition to risks relating to the use of blood and blood products.



## Clinical governance structures and quality improvement processes

to support best practice in prevention and management of post-operative haemorrhage

Health service organisations need to ensure systems are in place to prevent post-operative haemorrhage through effective clinical governance and quality improvement.

The NSQHS Standards (2nd ed.) describe actions that are relevant to the prevention and management strategies outlined below. These actions are identified in brackets.

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### Policies, procedures and protocols

Health service organisations ensure policies, procedures and protocols are consistent with national evidence-based guidelines for the risk assessment, prevention and management of post-operative haemorrhages. **(1.27, 7.1a)**

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### Best-practice screening and management

Health service organisations:

- Agree on the process and criteria for bleeding risk screening **(5.10, 7.1a, 7.4b)**
- Inform the clinical workforce of screening requirements **(7.1a)**
- Identify a format for bleeding risk assessment (such as preadmission clinic assessment) **(7.1a)**
- Identify a format for prevention plans for high-risk patients **(5.7, 5.12, 7.4)**
- Identify a management plan format for patients with a post-operative haemorrhage. **(7.6)**

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### Identification of key individuals/governance groups

Health service organisations identify an individual or a governance group that is responsible for:

- Monitoring compliance with the organisation's post-operative management policies, procedures and protocols **(1.25, 7.2)**
- Presenting data on the performance of post-operative bleeding prevention and management systems to the governing body **(1.25b, 1.9)**
- Overseeing the peri-operative care system. **(5.14)**

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## Training requirements

Health service organisations:

- Identify workforce training requirements **(1.20a)**
- Train relevant staff on the use of bleeding risk screening, prevention plans and haemorrhage management plans **(1.20b, 1.20c)**
- Ensure workforce proficiency is maintained. **(1.20d, 1.22, 1.28b)**

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## Monitoring the delivery of prophylaxis and care

Health service organisations ensure mechanisms are in place to:

- Report post-operative haemorrhage **(1.11)**
- Manage risks associated with post-operative haemorrhage prevention and management **(7.1b)**
- Identify performance measures and the format and frequency of reporting **(5.2c)**
- Set performance measurement goals **(1.1, 1.3)**
- Collect data on compliance with policies **(1.7b)**
- Collect data about bleeding risk screening activities, including whether risk assessment is leading to appropriate action **(7.1b, 7.2)**
- Identify gaps in systems for screening patients for post-operative haemorrhage and collect data on incidence, prevalence and severity of post-operative haemorrhage **(7.2)**
- Provide timely feedback and outcomes data to staff. **(1.9)**

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## Quality-improvement activities

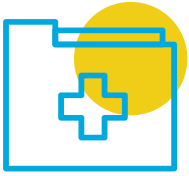
Health service organisations:

- Implement and evaluate quality-improvement strategies to reduce the frequency and harm from post-operative haemorrhage **(7.2)**
- Use audits of patient clinical records and other data to:
  - identify opportunities for improving bleeding prevention plans **(7.2)**
  - identify gaps and opportunities to improve the use of bleeding prevention plans **(7.2)**
  - monitor the overall effectiveness of systems for prevention and management of post-operative haemorrhage **(7.2)**
- Use audits of patient clinical records, transfer and discharge documentation and other data to:
  - identify opportunities for improving haemorrhage management plans **(5.2, 7.2)**
  - assess compliance with haemorrhage management plan requirements **(7.2)**
- identify strategies to improve the use and effectiveness of haemorrhage management plans. **(7.2)**

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## Equipment and devices

- Health service organisations facilitate access to equipment and devices for the prevention and management of haemorrhage. **(1.29b)**



# Developing the patient's comprehensive care plan

to support best practice in post-operative haemorrhage prevention and management

Clinicians should collaborate with patients, carers and consumers in assessing risk, in providing appropriate information to support shared decision making, and in planning care that meets the needs of patients and their carers.

## Identifying risk factors for post-operative haemorrhage

Clinicians identify risk factors for post-operative haemorrhage, which include<sup>4</sup>:

- Patients taking anti-platelet medicines
- Patients taking anti-coagulants
- Liver disease
- Family history
- Patients with anaemia prior to surgery.

## Implement risk assessment screening

Clinicians use relevant screening processes at or prior to presentation, such as pre-admission clinic, to assess the risk of haemorrhage and requirements for prevention strategies.

## Clinical assessment

Clinicians comprehensively assess:

- Conditions
- Medicines
- Risks identified through screening process.

Clinicians undertake routine comprehensive clinical assessments, routine observations including heart rate and blood pressure, urine output, as well as (when indicated) laboratory investigations including haemoglobin and coagulation studies; clinicians also document the results in the clinical record.

## Informing patients with a high risk

Clinicians provide information for high-risk patients and their carers about bleeding prevention and management, including warnings about interference with dressings.

## Planning in partnership with patients and carers

Clinicians inform patients, family and carers about the purpose and process of developing a bleeding prevention and management plan, and invite them to be involved in its development.

## Collaboration and working as a team

Medical, nursing, pharmacy and allied health staff work collaboratively to perform bleeding risk assessment and clinical assessment.

Medical and nursing work together to ensure rapid escalation of clinical concern when haemorrhage is identified.

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## Documenting and communicating the care plan

Clinicians document in the clinical record and communicate:

- The findings of the screening process
- The findings of the clinical assessment process including bleeding risk factors
- The post-operative monitoring plan.



## Delivering comprehensive care to prevent and manage post-operative haemorrhage

Safe care is delivered when the individualised care plan, that has been developed in partnership with patients, carers and family, is followed.

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## Collaboration and working as a team

Medical, nursing, pharmacy and allied health staff collaborate to:

- Deliver haemorrhage prevention and management
- Monitor and respond to early warning signs including:
  - restlessness and anxiety
  - frank bleeding and bruising
  - tachycardia
  - diminished cardiac output and dropping central venous pressure
  - reductions in urine output
  - swelling and discoloration of the extremities
  - at-risk patients identified during structured interdisciplinary bedside rounds (SIBR) and clinical handover.

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## Delivering haemorrhage prevention strategies in partnership with patients and carers

Clinicians work in partnership with patients and carers to use the comprehensive care plan to deliver haemorrhage prevention strategies where clinically indicated, for example by:

- Determining if and when discontinuation of antiplatelet/anticoagulant medication prior to the procedure or surgery is appropriate<sup>5,6,7</sup>
- Checking dressings frequently<sup>6</sup>; if disturbed, consider a more secure dressing or barrier to limit disturbance or access to dressing
- Applying pressure to the site
- Routine observation of heart rate, blood pressure and urine output.

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## Delivering haemorrhage management in partnership with patients and carers

Clinicians work in partnership with patients and carers to ensure patients who have a post-operative haemorrhage are managed according to best-practice guidelines. If anti-platelet or anti-coagulant medicines are ceased due to haemorrhage, consider using mechanical forms of thrombo-prophylaxis.

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**Monitoring and improving care in partnership with patients and carers**

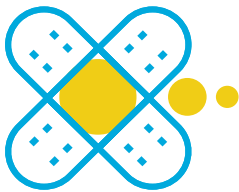
Clinicians in partnership with patients and carers:

- Monitor the effectiveness of these strategies in preventing post-operative haemorrhage and reassess the patient if post-operative haemorrhage occurs
- Review and update the care plan if it is not effective or is causing side effects
- Engage in reviewing clinical outcomes, identifying gaps and opportunities for improvement.

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**Audit documentation**

Clinicians monitor completion of wound observation charts and physiological observation charts.



## Minimising specific patient harm

Patients at risk of specific harms are identified, and clinicians deliver targeted strategies to prevent and manage these harms.

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**Hydration**

Ensure the fluid requirements of the patient are planned, delivered and adjusted as appropriate and the patient's intake and output is monitored.

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# SURGICAL COMPLICATIONS DUE TO WOUND DEHISCENCE, ANASTOMOTIC LEAK AND/OR VASCULAR GRAFT FAILURE

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## Clinical governance structures and quality-improvement processes

to support best practice in prevention and management of  
surgical complications

Health service organisations need to ensure systems are in place to prevent surgical complications through effective clinical governance and quality improvement.

The NSQHS Standards (2nd ed.) describe actions that are relevant to the prevention and management strategies outlined below. These actions are identified in brackets.

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### Policies, procedures and protocols

Health service organisations ensure policies, procedures and protocols are consistent with national evidence-based guidelines for the risk assessment, prophylaxis and management of surgical complications. **(1.27, 5.1a)**

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### Best-practice screening and management

Health service organisations:

- Agree on the process and criteria for surgical risk assessment **(5.7)**
- Inform the clinical workforce of risk assessment requirements **(5.1c)**
- Identify a format for surgical risk assessment, e.g. pre-admission clinic assessment **(5.4)**
- Identify a format for post-operative management plans for high-risk patients **(5.4)**
- Identify a management plan format for patients with a surgical complication. **(5.12, 5.13)**

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### Identify key individuals/ governance groups

Health service organisations identify an individual or a governance group that is responsible for:

- Monitoring compliance with the organisation's peri-operative care policies, procedures and protocols **(1.7b, 5.2a)**
- Presenting data on the performance of surgical complications prevention and management systems to the governing body **(1.9, 5.2c)**
- Overseeing the care of peri-operative patients. **(5.5b)**



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## Training requirements

Health service organisations:

- Identify workforce training requirements **(1.20a)**
- Train relevant staff on the use of risk assessment, prevention plans and post-operative management plans **(1.20b, 1.20c)**
- Ensure workforce proficiency is maintained. **(1.20d, 1.22, 1.28b)**

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## Monitoring the delivery of prophylaxis and care

Health service organisations ensure mechanisms are in place to:

- Report surgical complications **(1.9, 5.2)**
- Manage risks associated with surgical care **(5.1b, 5.11)**
- Identify performance measures and the format and frequency of reporting **(1.8a)**
- Set performance measurement goals **(1.8a)**
- Collect data on compliance with policies **(1.7b)**
- Collect data about peri-operative risk assessment activities, including whether risk assessment is leading to appropriate action **(1.8, 5.1b, 5.2)**
- Identify gaps in systems for screening patients pre-operatively, and collect data on incidence, prevalence and severity of surgical complications **(5.2)**
- Provide timely feedback and outcomes data to staff. **(1.9)**

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## Quality-improvement activities

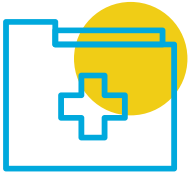
Health service organisations:

- Implement and evaluate quality-improvement strategies to reduce the frequency and harm from surgical complications **(5.2)**
- Use audits of patient clinical records and other data to:
  - identify opportunities for improving peri-operative care plans **(5.2)**
  - identify gaps and opportunities to improve the use of peri-operative care plans **(5.2)**
  - monitor the overall effectiveness of systems for prevention and management of surgical complications **(5.2)**
- Use audits of patient clinical records, transfer and discharge documentation and other data to:
  - identify opportunities for improving post-operative management plans **(5.2)**
  - assess compliance with post-operative management plan requirements **(5.2)**
  - identify strategies to improve the use and effectiveness of post-operative management plans. **(5.2)**

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## Equipment and devices

Health service organisations facilitate access to equipment and devices for the prevention and management of surgical complications. **(1.29b)**



## Developing the patient's comprehensive care plan

to support best practice in the prevention and management of surgical complications

Clinicians should collaborate with patients, carers and families in assessing risk, in providing appropriate information to support shared decision making, and in planning care that meets the needs of patients and their carers.

### Identifying risk factors for surgical complications

Clinicians identify risk factors for surgical complications, which include<sup>8,9</sup>:

- Anaemia
- Hypo-proteinaemia, including hypoalbuminaemia
- Jaundice
- Male gender
- Overweight
- Increasing age
- Infection
- Poor nutrition
- Diabetes
- Smoking
- Malignancy
- Chronic pulmonary disease
- Presence of prior scar or radiation at the incision site
- Noncompliance with postoperative instructions, such as early excessive exercise, lifting heavy objects or interfering with the wound
- Increased pressure within the abdomen due to: fluid accumulation (ascites); inflamed bowel; severe coughing, straining, or vomiting
- Long-term use of corticosteroid medications
- Procedure related:
  - emergency surgery
  - types of surgery (clean versus contaminated)
  - surgical error.

Risk factors for wound dehiscence<sup>10</sup>:

- Increasing age
- Diagnosis of carcinoma
- Chronic obstructive pulmonary disease
- Malnutrition
- Smoking
- Sepsis
- Obesity
- Radiation or chemotherapy
- Diabetes
- Medications such as steroids
- Interference with the wound.

Patient risk factors for anastomotic leak include<sup>11</sup>:

- Male gender
- Smoking
- Obesity
- Alcohol abuse
- Pre-operative steroid and non-steroidal anti-inflammatory drugs use
- Long duration of operation
- Pre-operative transfusion
- Local sepsis
- Poor nutrition
- Immunosuppression
- Radiation exposure.

They are also associated with technical factors including<sup>11</sup>:

- Ischaemia
- Tension
- Poor technique
- Stapler malfunction.

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**Implement risk assessment screening**

Clinicians use relevant screening processes at presentation to assess the risk of surgical complications and requirements for prevention strategies.

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**Clinical assessment**

Clinicians comprehensively assess:

- Conditions
- Medications
- Risks identified through screening process.

Clinicians undertake routine wound inspections for patients at risk of surgical complications and document results in the clinical record.

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**Informing patients with a high risk**

Clinicians provide information for patients with high risk and their carers about prevention and management of surgical complications, including warnings about interference with dressings.

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**Planning in partnership with patients and carers**

Clinicians inform patients, family and carers about the purpose and process of developing a management plan and invite them to be involved in its development.

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**Collaboration and working as a team**

Medical, nursing, pharmacy and allied health staff work collaboratively to perform peri-operative risk assessment and clinical assessment.

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**Documenting and communicating the care plan**

Clinicians document in the clinical record and communicate:

- The findings of the screening process
- The findings of the clinical assessment process including signs of localised or systemic infections
- The peri-operative management plan.



## Delivering comprehensive care

### to prevent and manage surgical complications

Safe care is delivered when the individualised care plan, that has been developed in partnership with patients, carers and family, is followed.

#### Collaboration and working as a team

Medical, nursing, allied health staff and pharmacists collaborate to deliver surgical complication prevention and management.

#### Delivering surgical complication prevention and management strategies in partnership with patients and carers

Clinicians, patients and carers work in partnership to use the comprehensive care plan to deliver surgical complication prevention strategies where clinically indicated, for example by:

- Reducing the incidence of surgical site infections:
  - administer timely and appropriate antibiotics preoperatively and postoperatively (according to current evidence-based guidelines)
  - wound dressings as per evidence based protocol
- Postoperative wound assessment:
  - assess the surgical wound postoperatively and documents any findings of wound infection or dehiscence
- Clinical assessment for anastomotic leak:
  - localised physical assessment of the affected area combined with
  - a comprehensive systematic assessment of the patient’s clinical status
- Early intervention and escalation:
  - evidence based protocolled assessment
  - recognition and response criteria for early initiation and clinical intervention to effectively manage wound dehiscence, anastomotic breakdown or vascular graft failure
  - avoid the addition of new medicines that may exacerbate bleeding.

#### Institute appropriate monitoring

Clinicians implement monitoring of clinical and laboratory indicators including early warning signs:

- Restlessness and anxiety
- Frank bleeding and bruising
- Tachycardia
- Diminished cardiac output and dropping central venous pressure
- Reductions in urine output
- Swelling and discoloration of the extremities.

#### Delivering surgical complication management in partnership

Clinicians work in partnership with patients and carers to ensure patients who have surgical complications are managed according to best-practice guidelines.

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## Monitoring and improving care

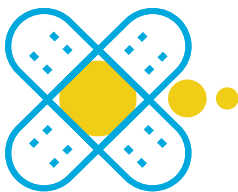
Clinicians:

- Monitor the effectiveness of these strategies in preventing surgical complications and reassess the patient if a surgical complication occurs
- Review and update the care plan if it is not effective or is causing side effects
- Engage in reviewing clinical outcomes, identifying gaps and opportunities for improvement.

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## Audit documentation

Monitor completion of wound observation charts and physiological observation charts.



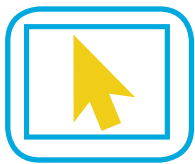
## Minimising specific patient harm

Patients at risk of specific harms are identified, and clinicians deliver targeted strategies to prevent and manage these harms.

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## Nutrition and hydration

Clinicians ensure the nutritional and fluid requirements of the patient are planned, delivered and adjusted as appropriate and the patient's intake is monitored.



## Additional resources

Victorian Surgical Consultative Committee and the Victorian Consultative Council on Anaesthetic Mortality and Morbidity. [Victorian Hospitals Post-Operative Orders Form](#). [Victorian Department of Health & Human Services \(AU\)](#).

Harris CL, Kuhnke J, Haley J, Cross K, Somayaji R, Dubois J, et al. [Best Practice Recommendations for the Prevention and Management of Surgical Wound Complications](#). [Canada: Canadian Association of Wound Care; 2017](#).

Agency for Healthcare Research and Quality. [Toolkit for Using the AHRQ Quality Indicators How To Improve Hospital Quality and Safety, Selected Best Practices and Suggestions for Improvement – PSI 09: Postoperative Hemorrhage or Hematoma 1 Tool D.4f](#). [Rockville \(US\)](#).

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Institute for Healthcare Improvement. [Anticoagulant Toolkit: Reducing Adverse Drug Events](#). [\(US\)](#).

American Academy of Family Physicians. [Recommended Curriculum Guidelines for Family Medicine Residents: Care of the Surgical Patient 2013](#). [\(revised\)](#).

Rose A. [Periprocedural and Regional Anaesthesia Management with Antithrombotic Therapy – Adult – Inpatient and Ambulatory– Clinical Practice Guideline](#). [University of Wisconsin – Health \(US\) 2015](#).

Mohabir PK, Gurney J. [The Merck Manual for Health Care Professionals: Postoperative Care 2015](#). [\(revised\)](#).

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## Note on data

The data used in this sheet are for hospital-acquired complications recorded during episodes of care in Australian public hospitals in 2015–16. Data are included where hospitals were able to identify that the complication had arisen during an admission using the condition onset flag. Figures reported by the Independent Hospitals Pricing Authority (IHPA) may differ due to the IHPA's methodology, which applies different inclusion/exclusion criteria.

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## References

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2. Independent Hospital Pricing Authority, Pricing and funding for safety and quality – Risk adjustment model for hospital acquired complications – version 3, March 2018, IHPA: Sydney.
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8. Agency for Healthcare Research and Quality. Toolkit for Using the AHRQ Quality Indicators: Postoperative Wound Dehiscence, Tool PSI 14 Rockville MD (US) 2016; Available from: <http://www.ahrq.gov/professionals/systems/hospital/qitoolkit/index.html>.
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11. Campbell WB, Tambour LJ, Geens VR. Local complications after arterial bypass grafting. *Annals of the Royal College of Surgeons of England* 1994;76(2):127–31. Epub 1994/03/01.

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