**AUSTRALIAN COMMISSION**
ON **SAFETY** AND **QUALITY** IN **HEALTH CARE**

# Hospital-Acquired Complications Information Kit

Fact sheets to support safety and quality in Australian health services
**2018**

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# Hospital-Acquired Complications Information Kit

Fact sheets to support safety and quality in Australian health services
**2018**

# Contents

# Foreword

I am pleased to present this information kit to support health services use the hospital acquired complications (HACs) list to improve the safety and quality of Australian health services.

Australia has one of the best health systems in the world, and it is supported by dedicated clinicians who work hard to ensure that their patients receive safe and high-quality care. However things can go wrong, and ongoing work is needed to reduce the impact of adverse events on Australian patients and their families.

The purpose of this information kit is to provide frontline clinicians, safety and quality professionals, managers and executives, members of governing bodies and others with tools to minimise the occurrence of hospital-acquired complications (HACs) in their health service. The kit also provides insights for patients and carers as to the activities health services are undertaking to ensure safety and quality.

The release of this information kit draws upon consultation with clinicians from across Australia, as well as the latest evidence and clinical guidelines. It brings together information about important safety and quality topics in a way that can be used by frontline clinicians to improve their practice, and by managers and executives to improve the safety and quality of health services.

The information kit provides strategies related to 16 HACs. The fact sheets outline steps clinicians, managers, governing bodies and others can put in place to reduce the occurrence of HACs. The kit also highlights the importance of ongoing monitoring of these HACs; which can provide an indication of the success of a service, or signify safety and quality issues that require improvement.

Given the need to continue work to reduce HACs, I am pleased this kit is now available for use across the health system.

**Professor Villis Marshall** AC
Chair
Australian Commission on Safety and Quality
in Health Care

# Overview

This information kit includes a suite of resources for clinicians, managers and executives, governing bodies and others, to put in place strategies that reduce the occurrence of hospital-acquired complications (HACs). The kit includes three elements:

- The introduction defines the 16 HACs, explains their development, why they are important, and how monitoring and responding to HACs can help provide the best care for patients.

- Detailed fact sheets for clinicians, managers, safety and quality professionals, managers and executives and governing bodies. These include an overview of the governance structures and quality improvement processes needed to minimise the occurrence of a HAC. They also outline key steps to develop and deliver a comprehensive care plan for the patient.

- Fact sheet "lift outs", that can be found inserted within the front of the kit. These short documents are designed for frontline clinicians. They are provided loose to enable you to share these with relevant clinicians as a quick reference guide.

All of these elements are available from the website of the Australian Commission on Safety and Quality in Health Care (Commission) (www.safetyandquality.gov.au ).
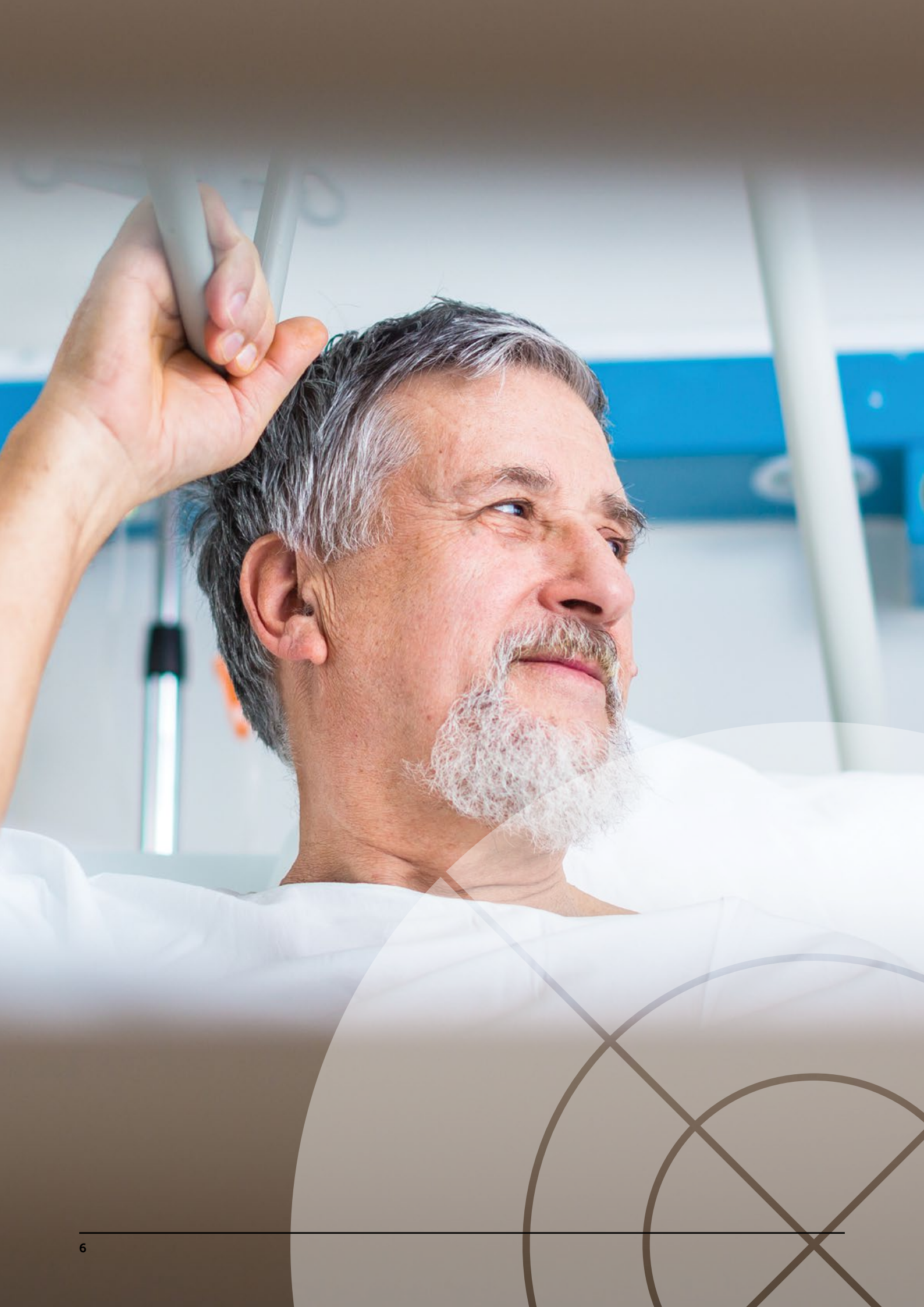
# Introduction

# About hospital-acquired complications (HACs)

## Complications in Australian hospitals

Australians enjoy good health compared to other populations reporting through the Organisation for Economic Co-operation and Development. Significant resources are deployed to ensure that the health system supports the continued good health of Australians [1]. Despite these efforts, an unacceptable proportion of Australian hospital admissions are associated with an adverse event [2]. This means more work is needed to reduce adverse events, including HACs, and improve the quality of care provided to patients.

## What are HACs?

A HAC refers to a patient complication for which clinical risk mitigation strategies may reduce (but not necessarily eliminate) the risk of that complication occurring [3].

## Why are HACs important?

HACs are a problem for patients as they affect a patient's recovery, overall outcome and can result in longer length of stay in hospital [4]. These outcomes also have an impact on the patient's family. HACs are also a concern for health services. This is because a patient's admission costs more if they have a HAC diverting resources away from other patient care activities. [5].

## Why should HACs be monitored?

HACs should be monitored due to their impact on patients, health services and the healthcare system. Further, evidence demonstrates that the provision of relevant and timely clinical information to clinicians and managers is an effective driver of safety and quality improvement [6]. In addition, HACs can be monitored using existing data sources, meaning there is no additional burden associated with data collection.

HACs should be monitored at multiple levels within health services, including by clinicians, managers and governing bodies. Monitoring HACs enables the identification and exploration of issues and implementation of strategies to reduce them. High or rising rates of HACs indicate that efforts are needed to understand and reduce these rates. A high HAC rate might be an indication of a broader safety issue within the service that warrants investigation. Conversely low and falling rates of HACs can signify success stories, which should be shared, to support safety improvement and maintenance.

## What conditions are on the HACs list?

The HACs list includes the following complications:

1. **Pressure injury**
2. **Falls resulting in fracture or other intracranial injury**
3. **Healthcare-associated infection**
4. **Surgical complications requiring unplanned return to theatre**
5. **Unplanned intensive care unit admission**
6. **Respiratory complications**
7. **Venous thromboembolism**
8. **Renal failure**
9. **Gastrointestinal bleeding**
10. **Medication complications**
11. **Delirium**
12. **Persistent incontinence**
13. **Malnutrition**
14. **Cardiac complications**
15. **Third and fourth degree perineal laceration during delivery**
16. **Neonatal birth trauma.**

Each of the HACs has a number of associated diagnoses and codes, which further describe the HAC. The diagnoses are provided within Appendix 1. Specifications for the list, which describe the relevant codes for each HAC using the International Statistical Classification of Diseases and Related Health Problems Australian Modification (ICD-AM) across various revisions, are available on the Commission's website.

# Introduction

## Why focus on the HACs list?

All adverse events and complications in hospitals are important, and impact upon patients and the health service. The development of the HACs list followed a clinician led process to develop a list of complications that are significantly preventable. Further, the HACs focus on serious complications that clinicians can respond to, and put in place clinical risk mitigation strategies to reduce their occurrence. These priority HACs can be used as a trigger for exploration of safety and quality within a health service, and an indication of success of the health service. Clinicians and other experts who developed the list selected these HACs based on preventability, patient impact (severity), health service impact and clinical priority.

## How was the HACs list developed?

Australia's list of 16 HACs was developed by clinical experts with the aim of reducing HACs. It was developed through a comprehensive process that included reviews of the literature, expert clinical advice and testing with public and private hospitals. This process is outlined in more detail in Appendix 2.

# Monitoring and local reporting of HACs

As part of a broad quality improvement approach, the 16 HACs should be monitored by clinicians, safety and quality professionals, managers and executives, and governing bodies to provide insight into the state of safety and quality of a health service.

The HACs have been developed for monitoring using data from patient administrative data, also known as 'admitted patient care' data systems. Data are recorded in these electronic systems by trained medical coders. The coders translate the information that is written by clinicians in healthcare records (also known as medical records) into diagnosis and procedure codes using the ICD-AM and the Australian Coding Standards [11]

The accuracy and quality of the information recorded by clinicians in the healthcare record is paramount. Therefore, efforts should be made to ensure the completeness of the record. The Independent Hospital Pricing Authority (IHPA), in collaboration with the Commission, has developed tools to support such efforts, which can be found on its website. ◪

A health service should have processes in place to monitor and report HACs at regular and meaningful intervals. Ideally, the timeframe for reporting and review should be consistent over time to support monitoring of trends, and short enough so as to be meaningful and allow for timely investigation by clinicians, governing bodies and managers.

Monitoring and reporting of HAC rates requires consideration of the different patient populations being compared. Some population groups have a higher risk of acquiring a complication in hospital and an adjustment should be made to the data to account for this risk if comparisons of HAC rates are made between services.

# Introduction

## Pricing and funding for safety and quality

As a further lever for safety and quality, all Australian Governments have agreed to develop and implement reforms to improve health outcomes for patients and decrease potentially avoidable demand for public hospital services through the National Health Reform Agreement Addendum. The Addendum to the Agreement, released in 2017, sets out governments' commitment to develop and implement reforms to:

• Improve patient outcomes

• Provide an incentive to the system to provide the right care, in the right place, at the right time

• Decrease avoidable demand for public hospital services

• Signal to the health system the need to reduce instances of preventable poor quality patient care, while supporting improvements in data quality and information available to inform clinicians' practice [12].

A key component of these reforms includes developing pricing and funding arrangements for HACs to deliver better health outcomes, improve patient safety and support greater efficiency in the health system. In line with this, in 2017 IHPA released and consulted on a risk adjustment model for HACs [13, 14]. It also introduced an adjustment for the HACs within its 2018–19 *National Efficient Price Determination 2018–19* [15][1]. This will support implementation of an approach for HACs from 1 July 2018 [12].

## Implementing HAC prevention and management strategies

Implementing prevention strategies to achieve and maintain low rates of HACs is a key component of reducing the prevalence and incidence of HACs. The fact sheets within this information kit provide guidance on strategies to prevent or respond to the occurrence of HACs. Prevention strategies should incorporate initial patient assessments and ongoing monitoring of:

• Rates of HACs

• Any differences between current practice and best practice prevention

• Any barriers to reducing HAC rates that need to be addressed.

The information gathered through monitoring HACs rates, clinical practice and assessing barriers is essential to identify whether additional quality improvement efforts are needed. It will also provide baseline information against which to monitor progress and support sustained improvement. Continued monitoring and assessment against this information is key to understanding whether care is improving.

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1   In IHPA's 2018–19 Price Determination, no adjustments are applied to unplanned intensive care unit admission, third and fourth degree perineal laceration during delivery and neonatal birth trauma. This is due to an 'inability to identify unplanned intensive care unit admissions within current data sets; and small patient cohort or other issues which have prevented the development of a robust risk adjustment approach at the time' the determination was released.

## Using this information kit to support safety and quality

This information kit is designed to facilitate the adoption and use of the HACs list to support the provision of safe and high quality health service organisations. The information in the kit:

- Provides strategies to prevent HACs, manage them should they occur and maintain low rates of HACs when they are achieved
- Supports clinicians to include evidence-based prevention strategies in their delivery of comprehensive patient care
- Assists health services to assess the quality and safety of clinical care by monitoring the incidence and prevalence of HACs and identifying opportunities for improvement
- Supports the clinical governance of health services by helping governing bodies to review their structures, processes and clinical outcomes, to identify opportunities for improvement
- Supports health services to evaluate the impact of quality improvement initiatives through clinical audit
- Links HAC reduction strategies to the National Safety and Quality Health Service (NSQHS) Standards [16] and describes how monitoring and responding to HACs can be used as evidence within the accreditation assessment process.

# Introduction

## The link between the HACs and the NSQHS Standards

This information kit has been developed to support health services implement the NSQHS Standards, particularly those actions in the Comprehensive Care Standard [17].

The NSQHS Standards were developed by the Commission in collaboration with the Australian Government, states and territories, clinical experts, patients and carers. The primary aims of the NSQHS Standards are to protect the public from harm and to improve the quality of health service provision. They provide a quality-assurance mechanism that tests whether relevant systems are in place to ensure expected standards of safety and quality are met. The NSQHS standards also provide a nationally consistent statement on the level of care consumers can expect from health services.

The second edition of the NSQHS Standards was released in November 2017, and assessment to them commences from 1 January 2019. The second edition takes into account feedback from across the health sector on how to improve the first edition, as well as new evidence. This has resulted in a set of standards that is simplified, reduces duplication, has increased clinical focus and addresses important clinical gaps. This includes improving care for patients at risk of poor health outcomes, with new content on mental health and cognitive impairment, health literacy, end-of-life care and Aboriginal and Torres Strait Islander health.

Actions in the NSQHS Standards have been mapped to the suggested strategies in the 'Clinical governance structures and quality improvement processes' section of the fact sheets within the back of this book. Documentation relating to monitoring of HACs, and implementing improvement strategies recommended in the fact sheets, can be used by health service organisations as evidence of compliance with relevant actions in the NSQHS standards.

# How to use this information kit

The Commission has developed this information kit following a review of the literature specific to each of the HACs and following consultation with clinicians from across Australia. The fact sheets highlight the impact of HACs on Australian health services and their patients, determined by analysis of the latest data from the Admitted Patient Data Collection National Minimum Data Set (2015–16).

The kit contains two forms of fact sheets developed as resources for health services and clinicians to reduce the prevalence and incidence of HACs. These include:

> **1. Detailed fact sheets**, contained at the back of this book. These fact sheets are designed for use by health service managers, including clinical, quality and service managers. These fact sheets outline:
>
> - Why there is a focus on the particular HAC
> - Best-practice for the condition
> - Tips for the prevention and management of the HAC
> - Clinical governance structures and quality-improvement processes, in line with the NSQHS Standards
> - Steps to develop and deliver the patient's comprehensive care plan
> - How to minimise specific patient harm.
>
> **2. Clinician fact sheets**, which summarise key points from the detailed fact sheets.

While there are 16 HACs, fact sheets have been only been developed for 15 of the HACs. A fact sheet has not been prepared for HAC 5, which relates to 'unplanned intensive care unit admission'. This is because it is not currently possible to identify patients who have had an unexpected admission to intensive care using the Admitted Patient Care National Minimum Data Set, which is used to monitor HACs.

The inclusion of unplanned intensive care unit admission on the HACs list, despite the absence of data, recognises this complication as a priority. It also recognises the burden on the patient, their family and the health service when patients are unexpectedly admitted to intensive care.

# Resources to support adoption of the HACs list

A number of other resources, in addition to this information kit, are available to assist clinicians and health services to implement processes to collect information on and monitor the HACs, and to improve patient safety.

## Resources for monitoring HACs

The following resources are available from the Commission's website to support local monitoring of HACs:

- The **specifications** for the HACs list provide the codes, inclusions and exclusions required to calculate HACs rates. The specifications are provided for a number of editions of the ICD-10-AM. The HACs list and specifications are reviewed and updated regularly, and people are encouraged to sign up for notifications for updates when they download the specifications.

- The Commission and the IHPA have developed Excel and SAS tools to support local monitoring of the HACs. These are known as **groupers**. The groupers can be used by hospitals, health services and system managers to identify and monitor HACs using existing data that is routinely generated from the patient medical record.

The following resource is available from IHPA's website :

- An online portal National Benchmarking Portal  which provides access to costs and activity data from public hospitals across the country, including on HACs. This secure web based application is hosted by IHPA, and access is controlled by jurisdictions.

## Resources to support completeness and accuracy of admitted patient data

The Commission and IHPA have developed an animation which focuses on improving clinical documentation. This short animation outlines the importance of clinicians recording complete and accurate information within the healthcare record. It specifically outlines the relationship between the healthcare record and data-driven health care. 

IHPA is in the process of developing further resources to support improvements in the documentation of medical records, and in turn the clinical coding process. A key upcoming milestone will be the development of an 'app' for clinicians to support accurate documentation. This will be available on IHPA's website once finalised.

# Fact sheets

# 1 Pressure injury

**Selected best practices and suggestions for improvement for clinicians and health system managers**

Hospital-Acquired Complication **1**

# PRESSURE INJURY

| | HOSPITAL-ACQUIRED COMPLICATION | RATE[a] |
|---|---|---|
| 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[b] |
| 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

A pressure injury is a 'localised injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear and/or friction'.[1]

This hospital-acquired complication includes the diagnoses* of:

- Stage III ulcer
- Stage IV ulcer
- Unspecified decubitus ulcer and pressure area.

# Why focus on pressure injuries?

Each year, patients in Australia experience a large number of pressure injuries, with 4,313 pressure injuries occurring in Australian public hospitals in 2015–16.[2] The rate of hospital-acquired pressure injuries in Australian hospitals was 9.7 injuries per 10,000 hospitalisations in 2015–16.[2]

Pressure injuries take a long time to heal, which has consequences for patients' quality of life, as such injuries can cause severe pain, and can involve sleep and mood disturbance as well as susceptibility to infection. They also adversely affect rehabilitation, mobility and long-term quality of life.[3] Pressure injury prevention therefore presents an important challenge in acute care hospitals. A number of best practices have been shown to be effective in reducing the occurrence of pressure injuries, but these practices are not used systematically in all hospitals.[4]

Hospital-acquired pressure injuries extend the length of hospitalisation, which impacts on patients and their families. These injuries also increase 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.[5] While there is an increased financial cost, the most significant cost is the pain and discomfort experienced by the patient.

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\* 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.

Significant reductions in pressure injury rates are being achieved in some hospitals through preventive initiatives.[4] The rate for pressure injuries at Principal Referral Hospitals* was 9.8 injuries per 10,000 hospitalisations in 2015–16. If all Principal Referral Hospitals above this rate reduced their rate to 9.8 per 10,000 hospitalisations, then 727 pressure injuries would have been prevented, and more when other facilities are considered.

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

# What is considered best practice for preventing pressure injury?

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

The **health service organisation** providing services to patients at risk of pressure injuries:

- Has systems for pressure injury prevention and wound management that are consistent with best-practice guidelines
- Ensures that equipment and devices are available to decrease the risk and effectively manage pressure injuries.

**Clinicians** caring for patients at risk of pressure injuries:

- Conduct comprehensive skin inspections in accordance with best-practice time frames and frequency
- Provide pressure injury prevention 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[6], 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.

# Top tips for prevention and management of pressure injury

The following provides key points for clinicians to consider to avoid this hospital-acquired complication

**Assess all patients as soon as possible following admission to service and within a minimum of eight hours (or on initial visit for patients in the community)**
Consult the patient and multidisciplinary team for care planning
Refer to guideline and/or product information for contraindications for therapies

**Conduct PI risk assessment**

**Nutritional screening**
Use a validated tool appropriate to the clinical setting (Grade B)

Is the patient at nutritional risk? — YES →

**Nutritional assessment**
Use a validated tool appropriate to the clinical setting (Grade B)

NO ↓

- Conduct a comprehensive risk assessment including assessment of:
  - Clinical history
  - Mobility and activity
  - Intrinsic and extrinsic risk factors
  - Psychosocial history
  - Continence
  - Cognition
- Use a validated pressure injury risk (PI) assessment scale (Grade B)
- Conduct a complete skin assessment (Grade C).

Does the patient have an existing pressure injury? — NO → Does the patient have high risk of pressure injury? — NO →

YES ↓ (existing) YES ↓ (high risk)

**Implement prevention plan**

**Strategies for patients at high risk**
- Use a high specification foam reactive (constant low pressure) support surface (Grade A) OR consider using an active alternate pressure) support surface (Grade A)
- Implement skin protection strategies
- Provide high protein nutritional supplements (Grade B)
- Consider arginine supplements (Grade C)
- Consider more frequent repositioning (Grade A)
- Patient education.

**Preventative strategies**
- Implement skin protection strategies
- Use constant low pressure redistribution support surfaces (Grade A)
- Regular repositioning (Grade A)
- Patient education.

**Assess existing PI**

**Pressure injury assessment**
Use a validated pressure healing assessment scale (Grade C)

**Pressure injury classification**
Use NPUAP/EPUAP pressure injury classification system

**Pain assessment**
Use a validated pain assessment tool (Grade C)

**Treat existing PI**

**Pain management**
- Develop an individualised pain management plan including regular analgesia
- Consider topical opioids when debriding (Grade C).

**Additional management options**
- Consider electrotherapy (Grade B).

**Wound management**
- Debride the wound as indicated
- Treat infection – consider using iodine (Grade C)
- Select a wound dressing
- Consider negative pressure wound therapy (Grade C).

**Monitor and document**

Ongoing risk assessment
At least weekly pressure injury healing assessment

**Document**
All assessments
All management plans
All interventions

Ongoing risk assessment

Recommendation grades: Evidence based recommendations
**Grade A** = Excellent evidence - body of evidence can be trusted to guide practice
**Grade B** = Good evidence - body of evidence can be trusted to guide practice in most situations
**Grade C** = Some evidence - body of evidence provides some support for recommendation(s) but care should be taken in its application
**Grade D** = Weak evidence - body of evidence is weak and recommendation must be applied with caution
Source: Reproduced with the permission of the Australian Wound Management Association

# Clinical governance structures and quality-improvement processes

**to support best practice in pressure injury prevention and management**

> Health service organisations need to ensure systems are in place to prevent pressure injuries through effective clinical governance and quality-improvement processes.

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

| | |
|---|---|
| **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 pressure injuries. **(5.1a, 5.21)** |

**Best-practice screening and management**

Health service organisations:

- Agree on the process and criteria for pressure injury risk screening **(5.19, 5.7)**
- Inform the clinical workforce of screening requirements **(5.1c)**
- Identify a format for comprehensive skin inspections **(5.7)**
- Identify a format for prevention plans for high-risk patients **(5.7)**
- Identify a management plan format for patients with a pressure injury **(5.22)**
- Implement a wound management system. **(5.21)**

**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 pressure injury policies, procedures and protocols **(5.5b)**
- Responsible for presenting data on the performance of pressure injury prevention and management systems to the governing body **(5.5b, 1.6, 1.25)**
- Responsible for overseeing the wound management system. **(5.5)**

**Training requirements**

Health service organisations:

- Identify workforce training requirements **(5.1c)**
- Train relevant staff on the use of risk screening, prevention plans and pressure injury management plans **(5.1)**
- Ensure workforce proficiency is maintained. **(1.28, 1.27, 1.22)**

| | |
|---|---|
| **Monitoring the delivery of prophylaxis and care** | Health service organisations ensure mechanisms are in place to:<br><br>• Report pressure injuries **(1.1, 1.9)**<br><br>• Manage risks associated with pressure injury prophylaxis and management **(5.1)**<br><br>• Identify performance measures and the format and frequency of reporting **(1.9)**<br><br>• Set performance measurement goals **(1.8)**<br><br>• Collect data on compliance with policies **(1.7b)**<br><br>• Collect data about screening activities for pressure injury risk, including whether risk assessment is leading to appropriate action **(1.8)**<br><br>• Identify gaps in systems for screening patients for pressure injury **(1.8)**<br><br>• Collect data on incidence, prevalence and severity of pressure injuries (see Checklist ) **(1.8a)**<br><br>• Ensure a root cause analysis is conducted for each occurrence of Stage III or IV pressure ulcer **(1.11c, 1.11d)**<br><br>• Provide timely feedback and outcomes data to staff. **(1.9b, 5.2c)** |
| **Quality-improvement activities** | Health service organisations:<br><br>• Implement and evaluate quality-improvement strategies to reduce the frequency and harm from pressure injuries **(1.8, 5.2a, 5.2b)**<br><br>• Use audits of patient clinical records and other data to: **(1.16d)**<br><br>  – identify opportunities for improving pressure injury prevention plans **(5.2)**<br><br>  – identify gaps and opportunities to improve the use of pressure injury prevention plans (such as increasing the number of at-risk patients who have pressure injury prevention plans implemented) **(5.2)**<br><br>  – monitor the overall effectiveness of systems for prevention and management of pressure injuries **(1.11g, 1.13c, 1.14g)**<br><br>• Use audits of patient clinical records, transfer and discharge documentation and other data to:<br><br>  – identify opportunities for improving pressure injury management plans **(5.2)**<br><br>  – assess compliance with pressure injury management plan requirements **(5.2)**<br><br>  – identify strategies to improve the use and effectiveness of pressure injury management plans. **(5.2)** |
| **Equipment and devices** | Health service organisations facilitate access to equipment and devices for the prevention and management of pressure injuries. **(5.23b)** |

# Developing the patient's comprehensive care plan

to support best practice in pressure injury prevention
and management

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

| | |
|---|---|
| **Identifying risk factors for pressure injuries** | Clinicians identify risk factors for pressure injuries which include[8]:<br>• Impaired mobility<br>• Impaired activity<br>• Impaired sensory perception<br>• Malnutrition or obesity<br>• Compromised skin integrity<br>• Increasing age<br>• Compromised or reduced blood supply to pressure points<br>• Severely compromised status of health. |
| **Implement risk assessment screening** | Clinicians use relevant screening processes at presentation to assess the risk of pressure injury and requirements for prevention strategies. |
| **Clinical assessment** | Clinicians comprehensively assess:<br>• Conditions<br>• Medications<br>• Risks identified through screening process.<br><br>Clinicians undertake routine comprehensive skin inspections for patients at risk of pressure injury and document skin inspections in the clinical record. |
| **Informing patients with a high risk** | Clinicians provide information about pressure injury prevention and management to high-risk patients and their carers. |
| **Planning in partnership with patients and carers** | Clinicians inform patients, family and carers about the purpose and process of developing a pressure injury management plan and invite them to be involved in its development. |
| **Collaborating and working as a team** | Medical, nursing, pharmacy and allied health staff work collaboratively to perform pressure injury risk assessment and clinical assessment. |

| Documenting and communicating the care plan | Clinicians document in the clinical record and communicate:<br>• The findings of the screening process<br>• The findings of the clinical assessment process including skin inspections<br>• The pressure injury prevention plan. |

# Delivering comprehensive care

**to prevent and manage pressure injury**

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

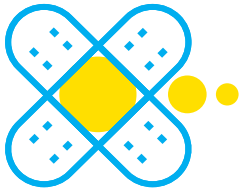| Collaborating and working as a team | Medical, nursing, pharmacy and allied health staff collaborate to deliver pressure injury prophylaxis and management. |
| Delivering pressure injury prevention strategies in partnership with patients and carers | Clinicians, patients and carers work in partnership to use the comprehensive care plan to deliver pressure injury prevention strategies where clinically indicated, for example by:<br>• Re-positioning and/or mobilising regularly<br>• Reducing pressure, friction, or shear<br>• Managing pain<br>• Protecting skin, reducing moisture and optimising skin hygiene and temperature<br>• Providing adequate nutrition and hydration<br>• Managing continence. |
| Delivering pressure injury management in partnership | Clinicians, patients and carers work in partnership to manage patients who have pressure injuries according to best-practice guidelines. |
| Monitoring and improving care | Clinicians should:<br>• Monitor the effectiveness of these strategies in preventing pressure injury and reassess the patient if pressure injury occurs<br>• Review and update the care plan if it is not effective or is causing side effects<br>• Engage in reviewing clinical outcomes, identifying gaps and opportunities for improvement. |

# Minimising specific patient harm

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

**Nutrition and hydration**

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

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## Checklist for measuring and monitoring pressure injury

☐ Incidence and prevalence measures are frequently monitored

☐ Pressure injury rates are examined on a monthly basis

☐ Information on rates is disseminated to key stakeholders and staff

☐ Root cause analysis is conducted for each occurrence of a Stage III or IV pressure ulcer.

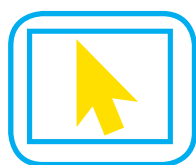**Notes on Incidence and Prevalence**

Two types of measures can be monitored: **incidence** and **prevalence rates**.

**Incidence** describes the number or percentage of people **developing** a new ulcer while in your facility or on your unit. Therefore, incidence only counts pressure injuries developing after admission. Incidence rates provide the most direct evidence of the quality of your care. Therefore, your quality improvement efforts should focus on incidence rates.

**Prevalence** describes the number or percentage of people **having** a pressure ulcer while on your unit. It may reflect a single point in time, such as on the first day of each month. This is known as **point prevalence**. However, it can also reflect a prolonged period of time, such as an entire hospital stay. This is known as **period prevalence**. Both types of prevalence rates (point and period) include pressure injuries present on admission as well as new ulcers that developed while in your facility or on your unit. Therefore, prevalence rates can provide a useful snapshot of the pressure injury burden but they say less about your quality of preventive care than do incidence rates.

Make sure everyone looking at the data understands the difference between incidence and prevalence. Incidence rates capture only new pressure injuries developing during an admission. Prevalence rates include all pressure injuries present in a group of patients – those that developed during a hospital stay as well as those that developed elsewhere.

There is no single 'right' approach to measuring pressure ulcer rates. Every approach has advantages and disadvantages. While we make specific recommendations above, the most important thing is to be consistent. Rates calculated by one approach or methodology cannot be compared to rates calculated another way.

# Additional resources

Australian Commission on Safety and Quality in Health Care. Safety and Quality Improvement Guide Standard 8: Preventing and Managing Pressure Injuries. ⬀ (October 2012). Sydney: ACSHQC; 2012.

Agency for Healthcare Research and Quality (US). Preventing Pressure Ulcers in Hospitals: A Toolkit for Improving Quality of Care: PSI 032016. ⬀

Australian Wound Management Association. Pan Pacific Clinical Practice Guideline for the Prevention and Management of Pressure Injury. ⬀ Osborne Park, WA: Cambridge Media; 2012.

Clinical Excellence Commission (AU). Pressure Injury Prevention and Management Policy Implementation Guide. ⬀ Sydney: CEC; 2014.

Clinical Excellence Commission (AU). Clinical Excellence Pressure Injury Prevention Project Monitoring & Auditing Framework, 2014. ⬀

National Institute for Health and Care Excellence (UK). Pressure ulcers: prevention and management. ⬀ Clinical Guideline 179 [Internet]. 2014 23 April 2014.

National Institute for Health and Care Excellence (UK). Pressure ulcers. ⬀ Quality Standard 89. 2015 11 June 2015.

National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel, and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers: Quick Reference Guide. ⬀ Osborne Park, Australia: Cambridge Media; 2014.

NSW Agency for Clinical Innovation. Pressure Injury Prevention for Critically Ill Adults ⬀ (SHPN ACI 140009). Chatswood: ACI; 2014.

NSW Health. Pressure Injury Prevention and Management. ⬀ NSW Health Policy Directive2014; (PD2014_007).

# 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.

# References

1.  Australian Commission on Safety and Quality in Health Care. Safety and Quality Improvement Guide Standard 8: Preventing and Managing Pressure Injuries (October 2012). Sydney: ACSHQC; 2012. (Accesed June 2017).

2.  Independent Hospital Pricing Authority (AU). Activity Based Funding Admitted Patient Care 2015–16, acute admitted episodes, excluding same day.

3.  Clinical Excellence Commission (AU). Pressure Injury Prevention Project. (Accessed June 2017).

4.  Miles SJ, Fulbrook P, Nowick T, Franks C. Decreasing pressure injury prevalence in an Australian general hospital: A 10-year review. Wound Practice & Research: Journal of the Australian Wound Management Association 2013;21:148–56.

5.  Independent Hospital Pricing Authority, Pricing and funding for safety and quality – Risk adjustment model for hospital acquired complications – version 3, March 2018, IHPA: Sydney.

6.  Australian Commission on Safety and Quality in Health Care. National Safety and Quality Health Service Standards (second edition). Sydney 2017.

7.  Australian Wound Management Association. Pan Pacific Clinical Practice Guideline for the Prevention and Management of Pressure Injury. Osborne Park, WA: Cambridge Media; 2012. Available from: http://www.woundsaustralia.com.au/publications/2012_AWMA_Pan_Pacific_Guidelines.pdf.

8.  Gillespie BM, Chaboyer WP, McInnes E, Kent B, Whitty JA, Thalib L. Repositioning for pressure ulcer prevention in adults. Cochrane Database of Systematic Reviews. 2014(4).

# 2

Falls resulting in fracture or intracranial injury

Selected best practices and suggestions for
improvement for clinicians and health system managers

Hospital-Acquired Complication **2**

# FALLS RESULTING IN FRACTURE OR INTRACRANIAL INJURY

| | HOSPITAL-ACQUIRED COMPLICATION | RATE[a] |
|---|---|---|
| 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[b] |
| 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 covers falls occurring in hospital which result in a fracture or intracranial injury resulting in diagnoses of intracranial injury, fractured neck of femur or other fractures.*

## Why focus on falls?

Each year, patients in Australian hospitals experience a large number of falls, which collectively cause significant harm. In 2015–16, 1,756 such falls occurred in public hospitals.[1] This equates to 4 falls causing harm per 10,000 hospitalisations in 2015–16[1] in Australian public hospitals.

Fall-related injury is one of the leading causes of hospital-acquired morbidity and mortality in older Australians, and leads to pain, bruising and lacerations and fractures. Falls can also lead to intracranial bleeding, which can cause confusion, drowsiness, clouding, loss of consciousness and headache.[2] A fall can instil a fear of falling, in turn leading to a loss of confidence and decline in mobility, and an injurious fall can increase the likelihood of discharge to a residential aged care facility.

Falls in hospital which cause harm such as intracranial injury, fractured neck of femur and other fractures, also result in a prolonged hospital stay. This impacts on patients and their families. Falls experienced in hospital also increase 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.[3] While there is an increased financial cost, the most significant cost is the pain and discomfort experienced by the patient.

In many cases, falls causing harm are preventable. Significant reductions in injurious falls rates are being achieved in some hospitals through preventive initiatives. The rate of falls at Principal Referral Hospitals[†] was 4 per 10,000 hospitalisations in 2015–16. If all Principal Referral Hospitals above this rate reduced their rate to 4 per 10,000 hospitalisations, then 251 falls causing harm would have been prevented, and more when other types of facilities are considered.[1]

---

\*  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 ⬀.

†  Hospitals were classified in the Principal Referral Hospitals peer group for these purposes according to the Australian Institute of Health and Welfare's former definition of major city hospitals with more than 20,000 acute weighted separations and regional hospitals with more than 16,000 acute weighted separations.

# What is considered best practice for preventing falls?

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

The **health service organisation** providing services to patients at risk of falls:

- Has systems that are consistent with best-practice guidelines for:
  – falls prevention
  – minimising harm from falls
  – post-fall management
- Ensures that equipment, devices and tools are available to promote safe mobility and manage the risks of falls.

**Clinicians** caring for patients at risk of falls:

- Conduct comprehensive falls risk assessments in accordance with best practice
- Provide falls prevention and care in accordance with best-practice guidelines
- Provide patients, families and carers with information about reducing falls risks and falls prevention strategies.

The National Safety and Quality Health Service (NSQHS) Standards (second edition), in particular the Comprehensive Care Standard[4], 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.

# Top tips for prevention and management of falls resulting in fracture or intracranial injury

The following provides key points for clinicians to consider to avoid this hospital-acquired complication

## Conduct risk assessment

- Conduct a comprehensive risk assessment
- Identify risk factors such as:
  - Agitation, delirium, confusion or impaired judgement
  - Gait instability
  - Lower limb weakness
  - Urinary incontinence, frequency or need for assisted toileting
  - Previous falls
  - Prescription of 'culprit' drugs, particularly central acting sedative hypnotics
  - Older age.

**For a patient at risk, develop a prevention plan as part of a comprehensive care plan**

## Develop prevention plan

Clinicians, patients and carers develop an individualised, comprehensive prevention plan to prevent falls that identifies:
- Goals of treatment consistent with the patient's values
- Any specific nursing requirements, including equipment needs
- Any allied health interventions required, including equipment needs
- Observations or physical signs to monitor and determine frequency of monitoring
- Laboratory results to monitor and determine frequency of monitoring
- If specialist assistance is required.

## Deliver prevention plan

Where indicated, deliver falls prevention strategies such as:
- Assess cognition and screen for delirium
- Manage continence, such as toilet frequently
- Review medications
- Monitor orthostatic blood pressure
- Implement fall injury prevention strategies where clinically indicated, which could include:
  - using a validated falls risk assessment that includes a standardised cognitive assessment tool
  - ensuring consistent and complete communication between all care providers
  - providing a buzzer or call bell to patients to contact nurses for assistance
  - having a protocol in place to address extra precautions needed for patients with dementia or other diseases that affect memory.

## Monitor

- Monitor the effectiveness of any fall prevention strategies, and reassess the patient if falls 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
- Put referrals in place in order to minimise future falls and address deconditioning.

# Clinical governance structures and quality-improvement processes

**to support best practice in falls prevention and management**

> Health service organisations need to ensure systems are in place to prevent falls through effective clinical governance and quality-improvement processes.

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

| | |
|---|---|
| **Policies, procedures and/or protocols** | Health service organisations ensure policies, procedures and/or protocols are consistent with national evidence-based guidelines for the risk assessment, prevention and management of falls. **(1.27, 5.1a, 5.24)** |
| **Best-practice screening and management** | Health service organisations:<br>• Agree on the process and criteria for falls risk screening using a validated falls risk screening tool **(5.7)**<br>• Inform the clinical workforce of screening requirements **(5.1c)**<br>• Identify a format for prevention plans for high-risk patients **(5.1b, 5.4)**<br>• Identify a management plan format for patients with a fall. **(5.12, 5.13)** |
| **Identification of key individuals/ governance groups** | Health service organisations identify an individual or a governance group that is:<br>• Responsible for monitoring compliance with the organisation's falls policies, procedures and protocols **(1.7, 5.2a)**<br>• Responsible for presenting data on the performance of falls prevention and management systems to the governing body. **(1.25b, 5,5b)** |
| **Training requirements** | Health service organisations:<br>• Identify workforce training requirements **(1.20a)**<br>• Train relevant workers in the use of risk screening, prevention plans and falls management plans **(1.20b, 1.20c**)<br>• Ensure workforce proficiency is maintained. **(1.20d, 1.22, 1.28b)** |

| | |
|---|---|
| **Monitoring the delivery of prevention and care** | Health service organisations ensure mechanisms are in place to:<br>• Report falls **(1.9, 5.2)**<br>• Manage risks associated with falls prevention and management **(5.1b, 5.26)**<br>• Identify performance measures and the format and frequency of reporting **(1.8a)**<br>• Set performance measurement goals **(1.8a)**<br>• Collect data on compliance with policies **(1.7b)**<br>• Collect data about falls-risk screening activities including whether risk assessment is leading to appropriate action **(1.8, 5.1b, 5.2)**<br>• Identify gaps in systems for screening patients for falls **(5.2b)**<br>• Collect data on falls incidence **(1.11, 5.2)**<br>• Ensure root cause analysis is conducted for any deaths arising from a fall in hospital **(1.11, 5.2)**<br>• Provide timely feedback and outcomes data to staff. **(1.9)** |
| **Quality-improvement activities** | Health service organisations:<br>• Implement and evaluate quality-improvement strategies to reduce the frequency and harm from falls **(1.8, 5.2**)<br>• Use audits of patient clinical records and other data to:<br>  – identify opportunities for improving falls prevention plans **(5.2)**<br>  – identify gaps and opportunities to improve the use of falls prevention plans (such as increasing the number of at-risk patients who have falls prevention plans implemented) **(5.2)**<br>  – monitor the overall effectiveness of your systems for prevention and management of falls **(5.2)**<br>• Use audits of patient clinical records, transfer and discharge documentation and other data to: **(1.16d)**<br>  – identify opportunities for improving falls management plans **(5.2)**<br>  – assess compliance with falls management plan requirements **(1.7b)**<br>  – identify strategies to improve the use and effectiveness of falls management plans. **(1.8, 5.2)** |
| **Equipment and devices** | Health service organisations facilitate access to equipment and devices for the prevention and management of falls. **(1.29b, 5.25)** |

# Developing the patient's comprehensive care plan to support best practice in falls prevention

Clinicians should partner 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 falls** | Clinicians assess for risk factors associated with falls including[5,6]: <br>• Agitation, delirium, confusion or impaired judgement <br>• Gait instability <br>• Lower limb weakness <br>• Urinary incontinence, frequency or need for assisted toileting <br>• Previous falls <br>• Prescription of 'culprit' drugs, particularly central acting sedative hypnotics <br>• Older age. |
| **Implement risk assessment screening** | Clinicians use relevant screening processes at presentation to service to assess the risk of falls and requirements for prevention strategies. |
| **Clinical assessment** | Clinicians comprehensively assess: <br>• Conditions <br>• Medications <br>• Cognition <br>• Risks identified through screening process. |
| **Informing patients with a high risk** | Clinicians provide information to high-risk patients and their carers about falls prevention and management. |
| **Planning in partnership with patients and carers** | Clinicians inform patients, family and carers about the purpose and process of developing a falls management plan and invite them to be involved in its development. |
| **Collaborating and working as a team** | Medical, nursing, pharmacy and allied health staff work collaboratively to perform falls risk assessment and clinical assessment. |
| **Documenting and communicating the care plan** | Clinicians document in the clinical record and communicate: <br>• The findings of the screening process <br>• The findings of the clinical assessment process <br>• The falls prevention plan. |

# Delivering comprehensive care to prevent and manage falls

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

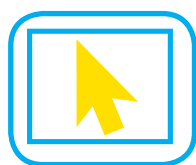| | |
|---|---|
| **Identifying risk factors for falls** | Medical, nursing, pharmacy and allied health staff work collaboratively to deliver falls prevention and management. |
| **Delivering falls prevention strategies in partnership with patients and carers** | Clinicians work in partnership with patients and carers to use the comprehensive care plan to deliver falls prevention strategies where clinically indicated, for example:<br>• Assess cognition and screen for delirium<br>• Manage continence, such as toilet frequently<br>• Review medications<br>• Monitor orthostatic blood pressure<br>• Implement fall injury prevention strategies where clinically indicated, for example:<br>  – use a validated falls risk assessment that includes a standardised cognitive assessment tool<br>  – undertake regular clinical risk assessment and modify prevention measures accordingly (reassess, monitor and document)<br>  – systematise communication during transitions of care to ensure consistent and complete communication between all care providers<br>  – address toileting issues by proactive rounding if needed for at risk patients<br>  – educate on potential medication issues that increase risk<br>  – provide a buzzer or call bell to patients to contact nurses for assistance<br>  – have a protocol in place to address extra precautions needed for patients with dementia or other diseases that affect memory. |
| **Delivering falls management in partnership** | Clinicians work in partnership with patients and carers to ensure patients who have falls are managed according to best-practice guidelines. |
| **Monitoring and improving care** | Clinicians should:<br>• Monitor the effectiveness of these strategies in preventing falls and reassess the patient if a fall occurs<br>• Review and update the care plan if it is not effective or is causing side effects<br>• Engage in reviewing clinical outcomes, identifying gaps and opportunities for improvement<br>• Put referrals in place in order to minimise future falls and address deconditioning. |

# Additional Resources

American Geriatrics Society, British Geriatrics Society. Clinical Practice Guideline for Prevention of Falls in Older Persons. ⬀ 2010.

Australian Commission on Safety and Quality in Health Care. Guidebook for Preventing Falls and Harm From Falls in Older People: Australian Hospitals 2009. ⬀ Sydney: ACSQHC; 2009.

Australian Commission on Safety and Quality in Health Care. Preventing Falls and Harm From Falls in Older People: Best Practice Guidelines for Australian Hospitals 2009. Sydney: ACSQHC; 2009.

Cameron ID, Gillespie LD, Robertson MC, Murray GR, Hill KD, Cumming RG, et al. Interventions for preventing falls in older people in care facilities and hospitals. Cochrane Database of Systematic Reviews [Internet]. 2012; (12).

Clinical Excellence Commission (AU). Falls Prevention in Hospitals. ⬀

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Ganz DA, Huang C, Saliba D, Shier V. Preventing falls in hospitals: a toolkit for improving quality of care. ⬀ Rockville, MD: Agency for Healthcare Research and Quality; 2013.

National Institute for Health and Care Excellence (UK). Falls in older people: assessing risk and prevention. ⬀ Clinical Guideline 161. 2013 12 June 2013.

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NSW Health. Falls – Prevention of Falls and Harm from Falls among Older People: 2011–2015. ⬀ NSW Health Policy Directive 2011; (PD2011_029).

Panel on Prevention of Falls in Older Persons, American Geriatrics Society, British Geriatrics Society. Summary of the Updated American Geriatrics Society/ British Geriatrics Society Clinical Practice Guideline for Prevention of Falls in Older Persons. ⬀ Journal of the American Geriatrics Society [Internet]. 2011; 59(1):[148–57 pp.].

Safer Healthcare Now! (CA). Reducing Falls and Injuries From Falls: Getting Started Kit. ⬀ 2013.

# 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 Independent Hospitals Pricing Authority may differ due to their methodology, which applies different inclusion/exclusion criteria.

# References

1.  Independent Hospital Pricing Authority (AU). Activity Based Funding Admitted Patient Care 2015–16, acute admitted episodes, excluding same day.

2.  Australian Commission on Safety and Quality in Health Care. Preventing Falls and Harm From Falls in Older People: Best Practice Guidelines for Australian Hospitals 2009. Sydney: ACSQHC; 2009.

3.  Independent Hospital Pricing Authority, Pricing and funding for safety and quality – Risk adjustment model for hospital acquired complications – version 3, March 2018, IHPA: Sydney.

4.  Australian Commission on Safety and Quality in Health Care. National Safety and Quality Health Service Standards (second edition). Sydney 2017.

5.  Taylor E, Hignett S. The SCOPE of Hospital Falls: A Systematic Mixed Studies Review. Health Environments Research & Design Journal. 2016;9(4):86–109. Epub 2016/06/01.

6.  Australian Commission on Safety and Quality in Health Care. Safety and Quality Improvement Guide Standard 10: Preventing Falls and Harm from Falls 2012. Available from: https://www.safetyandquality. gov.au/publications/safety-and-quality-improvement-guide-standard-10-preventing-falls-and-harm-from-falls-october-2012/.

**AUSTRALIAN COMMISSION**
**ON SAFETY AND QUALITY IN HEALTH CARE**

# 3 Healthcare-associated infections

**Selected best practices and suggestions for improvement for clinicians and health system managers**

Hospital-Acquired Complication **3**

# HEALTHCARE-ASSOCIATED INFECTIONS

| | HOSPITAL-ACQUIRED COMPLICATION | RATE[a] |
|---|---|---|
| 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[b] |
| 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[*]:

- Urinary tract infection                                                                page 41
- Surgical site infection                                                                page 44
- Pneumonia                                                                              page 46
- Bloodstream infection                                                                  page 48
- Central line and peripheral line associated bloodstream infection                      page 49
- Multi-resistant organism                                                               page 51
- Infection associated with prosthetics/implantable devices                              page 53
- Gastrointestinal infection.                                                            page 54

**Healthcare-associated infections and hospital-acquired infections**

Healthcare-associated infections are infections that are acquired in healthcare facilities (known as nosocomial infections) or that occur as a result of healthcare interventions (known as iatrogenic infections). Healthcare-associated infections may become evident after a person leaves the healthcare facility.[1]

A hospital-acquired infection is a type of healthcare-associated infection and refers specifically to infections that are acquired in hospital.

# Why focus on hospital-acquired infections?

Each year, a large number of hospital patients in Australia experience a healthcare complication in the form of a hospital-acquired infection. In 2015–16, 60,037 hospital-acquired infections were diagnosed in Australian public hospitals,[2] affecting one in every 74 hospitalisations.[†2] Hospital-acquired infections are one of the most common complications affecting hospital patients, and greatly increase morbidity and mortality, as well as the risk of readmission within 12 months.[3] For example, an intensive care unit patient with

* 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 ⧉.

† Data reported within the hospital-acquired complications fact sheet are derived from the admitted patient care national minimum data set. Data on healthcare-associated infections are also monitored through hospital-based laboratory information systems. The rates produced using these two data sources may differ due to the purpose of the data set, method of data collection and way in which the data are analysed and reported. Having multiple sources of data is important for quality improvement, as it allows for the identification of an issue through one data set, and then investigation of the issue through a more detailed or focused source of data and clinical engagement.

a bloodstream infection is two to three times more likely to die than those without such an infection[3], and a patient's risk of mortality is at least three times greater if they acquire an infection in hospital.[4]

A hospital-acquired infection may occur in the presence or absence of an invasive procedure or device. Depending on the site of infection, patients with this complication may experience a range of distressing symptoms including fevers, chills, pain, hypotension and dizziness, tachycardia, collapse, delirium, cough, shortness of breath, urinary frequency, diarrhoea, purulent discharges, wound breakdown, and even death.

A hospital-acquired infection often also results in a prolonged hospital stay which impacts on patients and their families. These infections increase 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.[5] While there is an increased financial cost, the most significant cost is the pain and discomfort experienced by the patient.

Preventing hospital-acquired infections therefore presents an important challenge to clinicians and health service managers. Significant reductions in hospital-acquired infection rates are already being achieved in some hospitals through preventative initiatives. The rate for hospital-acquired infections at Principal Referral Hospitals* was 148 per 10,000 hospitalisations in 2015–16.[2] If all Principal Referral Hospitals above this rate reduced their rate to 148 per 10,000 hospitalisations, then 7,165 hospital-acquired infections would be prevented, and more when other types of facilities are considered.

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

# What is considered best practice for preventing hospital-acquired infections?

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 hospital-acquired infections:

- Has safety and quality systems in place for the prevention, surveillance, management and control of hospital-acquired infections
- Has processes in place to apply standard and transmission-based precautions that are consistent with national best-practice guidelines[6,7]
- Ensures clinicians have access to relevant national best-practice guidelines
- Supports the workforce to undertake ongoing training relevant to the prevention and control of hospital-acquired infections
- Ensures that:
  - suitable equipment, devices and products are available to minimise and effectively manage hospital-acquired infections
  - reusable equipment, instruments and devices are reprocessed in a manner consistent with relevant national and international standards and in conjunction with manufacturer's guidelines
- Ensures a clean and hygienic environment

- Has systems for the safe and appropriate prescribing and use of antimicrobials as part of an antimicrobial stewardship program.

**Clinicians** caring for patients at risk of hospital-acquired infections:

- Conduct comprehensive clinical assessments in accordance with best practice time frames and frequency
- Practice standard precautions when caring for all patients in accordance with best-practice guidelines. This includes:
  - perform hand hygiene before and after every patient contact
  - use personal protective equipment when there is a risk of blood or body fluid exposure
  - use and dispose of sharps safely
  - perform routine environmental cleaning
  - clean and reprocess shared patient equipment
  - follow respiratory hygiene and cough etiquette
  - use of aseptic technique
  - handle and dispose of waste and linen safely
- Assess infection risks and employ transmission-based precautions, based on the risk of transmission of infectious agents, in accordance with best practice guidelines
- Prescribe antimicrobials safely and appropriately
- Partner with patients to involve them in their own care.

# URINARY TRACT INFECTION

Urinary tract infection (UTI) refers to an infection affecting the bladder, urethra, ureters or kidneys.

Symptoms of a urinary tract infection may include localised symptoms, such as dysuria, frequency, suprapubic pain, gross haematuria, costovertebral angle tenderness or new or worsening urgency or urinary incontinence, or systemic symptoms such as fever, rigors or delirium.[8]

Hospital-acquired UTIs are one of the most common hospital-acquired complications that occurs in Australian hospitals and a longer length of stay increases the likelihood of developing a UTI.

In 2015–16, hospital-acquired UTIs accounted for 26.6% of all hospital-acquired infections.[2] Hospital-acquired UTIs extend the length of hospitalisation, which impacts on patients and their families. These infections increase 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.[5] While there is an increased financial cost, the most significant cost is the pain and discomfort experienced by the patient.

The rate for hospital-acquired UTIs at Principal Referral Hospitals* was 47.1 per 10,000 hospitalisations in 2015–16.[2] If all Principal Referral Hospitals above this rate reduced their rate to 47.1 per 10,000 hospitalisations, then 2,757 hospital-acquired UTIs in these hospitals would have been prevented, and more when other types of facilities are considered.

* Hospitals were classified in the Principal Referral Hospitals peer group for these purposes according to the AIHW's former definition of major city hospitals with more than 20,000 acute weighted separations and regional hospitals with more than 16,000 acute weighted separations.

Catheter-associated UTIs (CAUTI) are the most prevalent of all hospital-acquired UTIs in Australia, accounting for 80% hospital-acquired UTIs.[9] The main risk factor for a CAUTI is unnecessary catheterisation.[10] However CAUTIs are the most preventable types of UTIs. The duration of catheterisation and the place where catheter was inserted in the hospital, as well as gender (female) and other comorbidities (diabetes), also may increase a patient's risk of acquiring a CAUTI during their hospital stay.[11] For a CAUTI to occur, microorganisms need to enter the catheter system either extraluminally (contamination of the catheter at the time of insertion by microflora and other organisms from perineal region) or intraluminally (contamination caused by the manipulation of the catheter or drainage system post insertion).

Key strategies to prevent CAUTIs include[12]:

- Insert catheters only for clinically appropriate indications
- Select most appropriate catheter for the patient in terms of size, length, material and drainage system
- Ensure that catheter insertion is done only by clinicians who have demonstrated competence in aseptic technique and catheter insertion
- Insert catheters using aseptic technique
- Clearly document the indication for the catheter insertion, review or removal time, and details of the insertion, that is person inserting the catheter, date, time and gauge of catheter
- Following catheter insertion:
  - ensure the catheter is secured to the patient
  - maintain a closed drainage system and unobstructed urine flow (that is, no kinking, no backflow, drainage bag should not more than ¾ full at any time)
  - catheters and the drainage system should only be handled using aseptic technique and sampling port should be used to collect urine samples if needed
  - ensure that the insertion site and peri-urethral care is washed and checked daily
- Leave the catheters in place only for as long as needed and regularly review the need for catheterisation at least daily.

Consider adopting quality-improvement initiatives to enhance appropriate use of indwelling catheters and reduce the risk of CAUTI, such as[13,14]:

- Use of portable ultrasound devices to assess urine volumes
- Pre-insertion decision support tool and catheter restriction protocols
- Checklists for urinary catheter insertion and maintenance urine specimen collection decision support tool
- Alerts or reminders
- Stop orders
- Protocols for nurse-directed removal of unnecessary catheters
- CAUTI surveillance with feedback to clinical services.

Practices that are not recommended:

- Changing urethral catheters at routine, fixed intervals (clinical indications include infection, obstruction, or compromise of closed system)
- Routine antimicrobial prophylaxis for catheter insertion
- Bladder irrigation with antimicrobials
- Routine screening for asymptomatic bacteriuria.

HEALTHCARE-ASSOCIATED INFECTIONS

**Risk factors for CAUTI**[15,16]

**Host factors**

- Female
- Increasing age
- Impaired immunity
- Diabetes mellitus.

**Modifiable factors**

- Prolonged catheterisation
- Disconnection of drainage system
- Lower professional training of inserter
- Placement of catheter outside operating theatre.

**Issues to monitor for prevention and management**

- Document clinical need for catheterisation
- Ensure insertion site and peri-urethral care is cleaned as part of daily hygiene
- Ensure there are no kinks or blockages in the catheter.

**ACSQHC resources**

National Health & Medical Research Council, Australian Commission on Safety and Quality in Health Care. Australian Guidelines for the Prevention and Control of Infection in Healthcare. ⬀ Canberra: Commonwealth of Australia; 2010.

Australian Commission on Safety and Quality in Health Care. Healthcare Associated Infection. ⬀ Sydney. ACSQHC; (2016)

Australian Commission on Safety and Quality in Health Care. Infection Prevention and Control Online Modules. ⬀

# SURGICAL SITE INFECTION

> Surgical site infection refers to an infection that occurs in the region of the body where prior surgery has been performed. It may or may not be associated with an indwelling device, such as a surgical drain.

Surgical site infection is one of the most common complications associated with surgery. In Australia, infection of the surgical site occurs in approximately 3% of surgical procedures.[17] Each year, patients in Australia experience a large number of hospital-acquired surgical site infections, with 5,596 occurring in public hospitals in 2015–16.[2]

Surgical site infections can cause significant distress for patients as they may experience drainage of pus or unpleasant smelling fluid from the wound, as well as localised heat, swelling, redness, pain and tenderness to touch, as well as systemic symptoms of fevers, sweats and chills, nausea and vomiting, as well as confusion.

Surgical site infections also prolong length of stay. A patient with a surgical site infection may need additional antimicrobial treatment, or may require further surgery, particularly if grafts or implants have been compromised, or may need to be readmitted to hospital which involve considerable physical and emotional burden for the patient. Additionally, there is also a higher risk of mortality associated with surgical site infections, particularly among elderly patients.[17]

Hospital-acquired surgical site infections extend the length of hospitalisation, which impacts on patients and their families. These infections increase 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.[5] While there is an increased financial cost, the most significant cost is the pain and discomfort experienced by the patient.

The rate for hospital-acquired infections at Principal Referral Hospitals* was 13.9 per 10,000 hospitalisations in 2015–16.[2] If all Principal Referral Hospitals above this rate reduced their rate to 13.9 per 10,000 hospitalisations, then 786 hospital-acquired surgical site infections in these hospitals would have been prevented, and more when other types of facilities are considered.

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\* Hospitals were classified in the Principal Referral Hospitals peer group for these purposes according to the AIHW's former definition of major city hospitals with more than 20,000 acute weighted separations and regional hospitals with more than 16,000 acute weighted separations.

| **Risk factors[18]** | **Host factors** |
| | • Existing infection |
| | • Low serum albumin |
| | • Increasing age |
| | • Obesity |
| | • Malnutrition |
| | • Smoking |
| | • Immunosuppression |
| | • Diabetes mellitus and glucose control |
| | • Excessive alcohol consumption |
| | • Intravenous drug use |
| | • Chronic liver disease |
| | • Chronic renal failure |
| | • Ischaemia secondary to vascular disease or radiation. |
| | **Procedural factors** |
| | • Site of wound and wound class |
| | • Presence of drains |
| | • Extent of wound |
| | • Prolonged surgery |
| | • Interference with wound or dressing intra or postoperatively |
| | • Inappropriate use of antimicrobial prophylaxis. |
| **Preoperative patient optimisation may include, depending on procedures** | • Glucose and ulcer control in diabetic patients |
| | • Controlling nidi of infection |
| | • Addressing malnutrition and obesity |
| | • Optimising skin condition |
| | • Improving vascular status |
| | • Smoking cessation |
| | • Modifying intake of immunosuppressive drugs |
| | • Short preoperative hospital stay such as admission on day of surgery.[19] |
| **Intra-operative patient optimisation may include, depending on procedures[20]** | • Antibiotic prophylaxis for caesarean section and hernia repair |
| | • The timing of prophylactic intravenous antibiotics administered before caesarean incision |
| | • Not using adhesive curtains. |
| **Postoperative patient optimisation may include, depending on procedures[21]** | • Ensuring wound dressings are not interfered with |
| | • Control blood glucose during the immediate postoperative period. |

**ACSQHC resources**

National Health & Medical Research Council, Australian Commission on Safety and Quality in Health Care. Australian Guidelines for the Prevention and Control of Infection in Healthcare. ☒ Canberra: Commonwealth of Australia; 2010.

Australian Commission on Safety and Quality in Health Care. Healthcare Associated Infection. ☒ Sydney. ACSQHC; (2016).

Australian Commission on Safety and Quality in Health Care. Infection Prevention and Control Online Modules. ☒

Australian Commission on Safety and Quality in Health Care. Approaches to Surgical Site Infection Surveillance: For acute care settings in Australia. ☒ Sydney: ACSQHC; 2017.

# PNEUMONIA

Pneumonia refers to an infection of the lungs.

Each year, patients in Australia experience a large number of episodes of hospital-acquired pneumonia, with 17,854 occurring in public hospitals in 2015–16.[2]

Pneumonia can cause significant distress for patients as they may experience cough producing phlegm that may be streaked with blood, laboured breathing, chest pain, increased heart rate, as well as systemic symptoms of fevers, sweats and chills, fatigue, anorexia, nausea and confusion. While hospital-acquired pneumonia frequently presents with generic symptoms it is associated with a high mortality rate.[22]

Hospital-acquired pneumonia also prolongs length of stay, which impacts on patients and their families. These infections increase 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.[5] While there is an increased financial cost, the most significant cost is the pain and discomfort experienced by the patient.

The rate for hospital-acquired pneumonia at Principal Referral Hospitals* was 46.6 per 10,000 hospitalisations in 2015–16.[2] If all Principal Referral Hospitals above this rate reduced their rate to 46.6 per 10,000 hospitalisations, then 2,830 episodes of hospital-acquired pneumonia in these hospitals would have been prevented, and more when other types of facilities are considered.

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\* Hospitals were classified in the Principal Referral Hospitals peer group for these purposes according to the AIHW's former definition of major city hospitals with more than 20,000 acute weighted separations and regional hospitals with more than 16,000 acute weighted separations.

| | |
|---|---|
| **Risk factors for pneumonia**[23] | **Host factors**<br>• Severity of underlying illness<br>• Presence of multiple co-morbidities<br>• Increasing age<br>• COPD<br>• Multi-trauma<br>• Poor general condition<br>• Diabetes<br>• Malignant diseases<br>• Immunosuppression<br>• Smoking<br>• Colonization of the oropharynx with pathogenic organisms.<br><br>**Modifiable factors**<br>• Mechanical ventilation for >48 hours<br>• Admission to an ICU<br>• Duration of hospital or ICU stay. |
| **Additional risk factors for ventilator-assisted pneumonia (VAP)** | **Host factors**<br>• Supine positioning<br>• Extensive burns<br>• Mechanical ventilation,<br>• Cardiothoracic surgery<br>• Airway Respiratory Distress Syndrome<br>• Head trauma.<br><br>**Modifiable factors**<br>• Nasogastric tubes and condensate in ventilator tubing<br>• Acid-suppressing medications, such as antacids and H2 blockers, that are employed to prevent stress ulcer bleeding in ventilated patients.[22] |
| **Prevention strategies**[24] | • Appropriate vaccines where indicated, such as influenza and pneumococcal vaccine<br>• Allied health interventions including chest physiotherapy and swallowing assessment and management<br>• Positioning (for VAP)<br>• Maintaining good oral hygiene (for VAP).[25] |
| **Issues to monitor for management and prevention of pneumonia** | • Early identification of the possibility of pneumonia in a hospitalised patient and undertaking appropriate investigations, as clinically indicated, which could include:<br>  – Respiratory rate<br>  – Monitor for signs of sepsis: temperature, heart rate, blood pressure<br>  – White cell count, C reactive protein<br>  – Arterial blood gases where indicated. |

**ACSQHC resources**

National Health & Medical Research Council, Australian Commission on Safety and Quality in Health Care. Australian Guidelines for the Prevention and Control of Infection in Healthcare. ⬏ Canberra: Commonwealth of Australia; 2010.

Australian Commission on Safety and Quality in Health Care. Healthcare Associated Infection. ⬏ Sydney. ACSQHC; (2016).

Australian Commission on Safety and Quality in Health Care. Infection Prevention and Control Online Modules. ⬏

**Note**: Further information on aspiration pneumonia can be found in the Hospital-Acquired Complication fact sheet: 6 − Respiratory Complications.

# BLOODSTREAM INFECTION

Bloodstream infection refers to the presence of live pathogens in the blood, causing an infection.[6]

Each year, patients in Australia experience a large number of hospital-acquired blood stream infections, with 15,238 occurring in public hospitals in 2015−16.[2]

Bloodstream infections can cause significant distress for patients as they may experience increased heart rate, palpitations, fevers and chills, dizziness, postural hypotension, extreme weakness and lethargy, skin rash, altered mental status with impaired focus and agitation. Bloodstream infections may be a secondary infection as a result of having a CAUTI, surgical site infection or pneumonia.[26]

Hospital-acquired blood stream infections also prolong length of hospitalisation, which impacts on patients and their families. These infections increase 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.[5] While there is an increased financial cost, the most significant cost is the pain and discomfort experienced by the patient.

The rate for hospital-acquired blood stream infections at Principal Referral Hospitals* was 39.5 per 10,000 hospitalisations in 2015−16.[2] If all Principal Referral Hospitals* above this rate reduced their rate to 39.5 per 10,000 hospitalisations, then 2,757 hospital-acquired blood stream infections in these hospitals would have been prevented, and more when other types of facilities are considered.

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\* Hospitals were classified in the Principal Referral Hospitals peer group for these purposes according to the AIHW's former definition of major city hospitals with more than 20,000 acute weighted separations and regional hospitals with more than 16,000 acute weighted separations.

| Risk factors[27] | **Host factors** |
|---|---|
| | • Immunosuppression |
| | • Increasing age |
| | • Diabetes mellitus |
| | • Debility |
| | • Hypoproteinaemia including hypoalbuminaemia |
| | • Chronic renal failure, in particular haemodialysis |
| | • Chronic liver disease. |
| | **Modifiable factors** |
| | • Surgical procedures |
| | • Indwelling devices, such as vascular devices and urinary catheters. |
| **Prevention strategies** | • Use best-practice guidelines relevant to the procedure |
| | • Use aseptic technique. |
| **ACSQHC resources** | National Health & Medical Research Council, Australian Commission on Safety and Quality in Health Care. Australian Guidelines for the Prevention and Control of Infection in Healthcare. ⬈ Canberra: Commonwealth of Australia; 2010. |
| | Australian Commission on Safety and Quality in Health Care. Healthcare Associated Infection. ⬈ Sydney. ACSQHC; (2016). |
| | Australian Commission on Safety and Quality in Health Care. Infection Prevention and Control Online Modules. ⬈ |
| | Australian Commission on Safety and Quality in Health Care. Implementation Guide for Surveillance of Staphylococcus aureus Bacteraemia. ⬈ 2013. |

# CENTRAL LINE AND PERIPHERAL LINE ASSOCIATED BLOOD STREAM INFECTION

Central line and peripheral line associated blood stream infection refers to a blood stream infection caused by introduction of pathogens into the blood stream via a central or peripheral line.

Each year, patients in Australia experience a large number of hospital-acquired central line and peripheral line associated blood stream infections (CLABSI), with 4,416 occurring in public hospitals in 2015–16.[2]

Blood stream infections associated with intravascular devices can cause significant distress for patients as they may experience increased heart rate, palpitations, fevers and chills, dizziness, postural hypotension, extreme weakness and lethargy, skin rash, altered mental status with impaired focus and agitation. They may also experience tenderness, redness swelling and heat at the insertion site.

Hospital-acquired line associated blood stream infections also prolong length of stay. Patients with a hospital-acquired CLABSI remain in hospital for 16.8 days longer on average than patients without this hospital-acquired complication.[2] As the national average cost per admitted acute overnight stay is $2,074[5] each hospitalisation involving a hospital-acquired infection may be associated with $34,843 in extra costs.

The rate for hospital-acquired infections at Principal Referral Hospitals* was 11.9 per 10,000 hospitalisations in 2015–16.[2] If all Principal Referral Hospitals above this rate reduced their rate to 11.9 per 10,000 hospitalisations, then 804 hospital-acquired CLABSIs in these hospitals would have been prevented, and more when other types of facilities are considered.

\* Hospitals were classified in the Principal Referral Hospitals peer group for these purposes according to the AIHW's former definition of major city hospitals with more than 20,000 acute weighted separations and regional hospitals with more than 16,000 acute weighted separations.

| | |
|---|---|
| **Risk factors** | **Host factors** |

**Host factors**

- Heavy microbial colonisation of the insertion site that contaminate the catheter during insertion and migrate along the cutaneous catheter track.

**Modifiable factors**

- Prolonged hospitalisation before the intravascular device is inserted
- Prolonged placement of the device
- Heavy microbial colonisation of the insertion site that contaminate the catheter during insertion and migrate along the cutaneous catheter track
- Heavy microbial colonisation of the cannula/catheter hub, usually secondary to contamination from healthcare workers' hands during care interventions such as injections
- Antibiotic use during catheterisation.[28]

**Core prevention strategies**[6,29-31]

- Develop guidelines for vascular access device use, insertion and maintenance
- Clearly document the details of the insertion; that is the person inserting the catheter, date and time
- Insert vascular access devices only for appropriate indications
- Leave vascular access devices in place only for as long as needed
- Standard infection control precautions including hand hygiene and aseptic technique when inserting and maintaining vascular access devices
- Use an appropriate skin preparation
- Choose appropriate dressings and change dressings as indicated
- Use full barrier precautions during central line insertion including sterile drapes, gown and gloves.

**ACSQHC resources**

National Health & Medical Research Council, Australian Commission on Safety and Quality in Health Care. Australian Guidelines for the Prevention and Control of Infection in Healthcare. Canberra: Commonwealth of Australia; 2010.

Australian Commission on Safety and Quality in Health Care. Healthcare Associated Infection. Sydney. ACSQHC; (2016).

Australian Commission on Safety and Quality in Health Care. Infection Prevention and Control Online Modules.

Australian Commission on Safety and Quality in Health Care. Implementation Guide for Surveillance of Central Line Associated Bloodstream Infection. 2015.

# MULTI-RESISTANT ORGANISMS

Multi-resistant organism (MRO) refers to bacteria that are resistant to one or more classes of antimicrobial agents and usually are resistant to all but one or two commercially available antimicrobial agents.[6]

Each year, patients in Australia develop a large number of hospital-acquired multi-resistant organisms (MROs), with 3,768 occurring in public hospitals in 2015–16.[2]

Patients with MROs experience challenges related to failure to respond to routine antibiotics, causing prolonged therapeutic regimens and use of antimicrobials with potentially problematic side effect profiles.

Hospital-acquired MROs extend the length of hospitalisation, which impacts on patients and their families. These infections increase 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.[5] While there is an increased financial cost, the most significant cost is the pain and discomfort experienced by the patient.

The rate for hospital-acquired MROs at Principal Referral Hospitals* was 8.9 per 10,000 hospitalisations in 2015–16.[2] If all Principal Referral Hospitals above this rate reduced their rate to 8.9 per 10,000 hospitalisations, then 791 hospital-acquired MROs in these hospitals would have been prevented, and more when other types of facilities are considered.

## Risk factors

**Host factors**

- Increasing age
- Co-morbidities.

**Modifiable factors**

- Prolonged hospital admission
- Prolonged intensive care unit (ICU) admission
- Exposure to affected patients or their surroundings.

## Strategies to prevent transmission of MROs

- Develop guidelines for management of patients colonised or infection with MROs
- Practicing standard precautions including hand hygiene, environmental cleaning and cleaning of patient care
- Practicing transmission based precautions where appropriate
- Implementing strategies to prevent transmission from patients known or suspected to be colonised or infected with MROs including isolation of affected patients. **Note**: Ensure patients are appropriately supported if isolation precipitates anxiety.

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* Hospitals were classified in the Principal Referral Hospitals peer group for these purposes according to the AIHW's former definition of major city hospitals with more than 20,000 acute weighted separations and regional hospitals with more than 16,000 acute weighted separations.

Further measures may include:

- Alerts for MRO
- Targeted screening in accordance with agreed protocols
- MRSA decolonisation protocols
- MRO surveillance and timely feedback to appropriate services
- Agreed protocol for MRO clearance
- Auditing of compliance with standard or transmission based precautions
- Communicating infection risk.

| | |
|---|---|
| **ACSQHC resources** | National Health & Medical Research Council, Australian Commission on Safety and Quality in Health Care. Australian Guidelines for the Prevention and Control of Infection in Healthcare. ⬀ Canberra: Commonwealth of Australia; 2010.

Australian Commission on Safety and Quality in Health Care. Healthcare Associated Infection. ⬀ Sydney. ACSQHC; (2016).

Australian Commission on Safety and Quality in Health Care. Infection Prevention and Control Online Modules. ⬀

Australian Commission on Safety and Quality in Health Care. Recommendations for the control of carbapenemase-producing Enterobacteriaceae (CPE). A guide for acute care health facilities. ⬀ Sydney: ACSQHC; 2017.

Australian Commission on Safety and Quality in Health Care. Information for clinicians – Carbapenemase-producing Enterobacteriaceae (CPE). ⬀ 2017.

Australian Commission on Safety and Quality in Health Care. Information for patients being screened for Carbapenemase-producing Enterobacteriaceae (CPE). ⬀ 2017.

Australian Commission on Safety and Quality in Health Care. Information for ward staff and after-hours managers Carbapenemase-producing Enterobacteriaceae (CPE). ⬀ 2017.

Australian Commission on Safety and Quality in Health Care. Information for clinicians and health service managers on the management of Carbapenemase-producing Enterobacteriaceae (CPE). ⬀ 2017.

National Health & Medical Research Council. Healthcare Associated Infection – Methicillin Resistant Staphylococcus aureus (MRSA): Consumer factsheet. ⬀ 2013.

National Health & Medical Research Council. Healthcare Associated Infection – Vancomycin Resistant Enterococci (VRE): Consumer factsheet. 2013. Available from: https://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/cd33_vre_brochure_131106.pdf. ⬀ |

# INFECTION ASSOCIATED WITH PROSTHETICS AND IMPLANTABLE DEVICES

Infections associated with prosthetics and implantable devices refers to infections that are complications related to the insertion and care of medical devices, such as shunts, cochlear implants, pacemakers and insulin pumps.

Each year, patients in Australia experience a large number of hospital-acquired infections associated with prosthetics and implantable devices, with 6,835 occurring in public hospitals in 2015–16.[2]

Infections associated with prosthetics and implantable devices can cause local symptoms pf pain, swelling, tenderness to touch, and redness, as well as systemic symptoms of fevers, sweats and chills, palpitations, dizziness, postural hypotension, decreased urine output, extreme weakness and lethargy, skin rash and altered mental status with impaired focus, confusion and agitation.

Hospital-acquired infections associated with prosthetics and implantable devices extend the length of hospitalisation. This impacts on patients and their families. These infections increase 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.[5] While there is an increased financial cost, the most significant cost is the pain and discomfort experienced by the patient.

The rate for hospital-acquired infections related to implantable devices or prostheses at Principal Referral Hospitals* was 18.1 per 10,000 hospitalisations in 2015–16.[2] If all Principal Referral Hospitals above this rate reduced their rate to 18.1 per 10,000 hospitalisations, then 1,126 hospital-acquired infections associated with prosthetics and implantable devices in these hospitals would have been prevented, and more when other types of facilities are considered.

\* Hospitals were classified in the Principal Referral Hospitals peer group for these purposes according to the AIHW's former definition of major city hospitals with more than 20,000 acute weighted separations and regional hospitals with more than 16,000 acute weighted separations.

| | |
|---|---|
| **Risk factors for infections of implantable cardiac devices**[32] | • Diabetes mellitus<br>• Underlying heart disease<br>• Use of more than one lead<br>• Early second procedure. |
| **Risk factors for infections in prostheses** | • Bleeds into prosthetic joint<br>• Duration of procedure<br>• Requirement for re-operation<br>• Increasing age. |
| **Issues to monitor for prevention and management** | • Fevers or rigors<br>• Observations: temperature, heart rate, blood pressure<br>• Wound ooze/dehiscence. |

| **ACSQHC resources** | National Health & Medical Research Council, Australian Commission on Safety and Quality in Health Care. Australian Guidelines for the Prevention and Control of Infection in Healthcare. ⬈ Canberra: Commonwealth of Australia; 2010. |

Australian Commission on Safety and Quality in Health Care. Healthcare Associated Infection. ⬈ Sydney. ACSQHC; (2016)

Australian Commission on Safety and Quality in Health Care. Infection Prevention and Control Online Modules. ⬈

Australian Commission on Safety and Quality in Health Care. National Infection Control Guidance: Non-tuberculous Mycobacterium associated with heater-cooler devices. ⬈ 2017; Second release.

# GASTROINTESTINAL INFECTIONS

Gastrointestinal infections refer to infections of the gastrointestinal tract that may be acquired in hospital, especially Clostridium difficile, rotavirus and norovirus.

Each year, patients in Australia experience a large number of hospital-acquired gastrointestinal infections, with 2,863 occurring in public hospitals in 2015–16.[2] The rate of hospital-acquired gastrointestinal infections in Australian hospitals was 6.42 per 10,000 hospitalisations in 2015–16.[2]

Gastrointestinal infections can cause significant distress for patients as they may experience abdominal cramps, nausea and vomiting, diarrhoea, fatigue, lethargy and dehydration.[33]

Hospital-acquired gastrointestinal tract infections also prolong length of stay which impacts on patients and their families. These infections increase 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.[5] While there is an increased financial cost, the most significant cost is the pain and discomfort experienced by the patient.

The rate for hospital-acquired gastrointestinal infections at Principal Referral Hospitals* was 6.9 per 10,000 hospitalisations in 2015–16.[2] If all Principal Referral Hospitals above this rate reduced their rate to 6.9 per 10,000 hospitalisations, then 540 hospital-acquired gastrointestinal infections in these hospitals would have been prevented, and more when other types of facilities are considered.

\* Hospitals were classified in the Principal Referral Hospitals peer group for these purposes according to the AIHW's former definition of major city hospitals with more than 20,000 acute weighted separations and regional hospitals with more than 16,000 acute weighted separations.

| **Risk factors[33]** | **Host factors** |

- Immunosuppression.

**Modifiable factors**

- Exposure to pathogens spread by faecal oral route
- Failure to ensure enteric precautions are followed
- Prolonged hospital admission
- Exposure to antibiotics.

| | |
|---|---|
| **Transmission based precautions** | • Practicing standard precautions and relevant transmission based precautions, depending on the pathogen suspected or confirmed, such as:<br>  – if Clostridium difficile infection is suspected or confirmed – contact precautions are recommended<br>  – if norovirus is suspected or confirmed – contact and droplet precautions are recommended. |
| **Issues to monitor for prevention and management** | • Routinely document hydration status including a fluid balance (intake and output)<br>• Routinely complete a stool chart<br>• Where indicated, appropriate blood tests including electrolytes and renal function<br>• Assess for admission screen<br>• Prior clinical history including:<br>  – recently travelled overseas<br>  – recent surgery<br>  – admission to a residential aged care facility. |
| **ACSQHC resources** | National Health & Medical Research Council, Australian Commission on Safety and Quality in Health Care. Australian Guidelines for the Prevention and Control of Infection in Healthcare. ☐ Canberra: Commonwealth of Australia; 2010.<br><br>Australian Commission on Safety and Quality in Health Care. Healthcare Associated Infection. ☐ Sydney. ACSQHC; (2016)<br><br>Australian Commission on Safety and Quality in Health Care. Infection Prevention and Control Online Modules. ☐<br><br>Australian Commission on Safety and Quality in Health Care. Implementation Guide for Surveillance of Clostridium difficile Infection. ☐ 2013.<br><br>Australian Commission on Safety and Quality in Health Care. Recommendations for the control of carbapenemase-producing Enterobacteriaceae (CPE). A guide for acute care health facilities. ☐ Sydney: ACSQHC; 2017.<br><br>Australian Commission on Safety and Quality in Health Care. Information for clinicians – Carbapenemase-producing Enterobacteriaceae (CPE). ☐ 2017.<br><br>Australian Commission on Safety and Quality in Health Care. Information for patients being screened for Carbapenemase-producing Enterobacteriaceae (CPE). ☐ 2017.<br><br>Australian Commission on Safety and Quality in Health Care. Information for ward staff and after-hours managers Carbapenemase-producing Enterobacteriaceae (CPE). ☐ 2017.<br><br>Australian Commission on Safety and Quality in Health Care. Information for clinicians and health service managers on the management of Carbapenemase-producing Enterobacteriaceae (CPE). ☐ 2017.<br><br>National Health & Medical Research Council. Healthcare Associated Infection – Vancomycin Resistant Enterococci (VRE): Consumer factsheet. ☐ 2013. |

The National Safety and Quality Health Service (NSQHS) Standards (second edition), in particular the Comprehensive Care Standard[1], 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.

# Clinical governance structures and quality-improvement processes

**to support best practice in prevention and management of hospital-acquired infections**

Health service organisations need to ensure systems are in place to prevent hospital-acquired infections 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.

| **Policies, procedures and protocols** | Health service organisations ensure policies, procedures and protocols are consistent with national evidence-based guidelines for the risk assessment, prevention, surveillance, management and control of hospital-acquired infections. **(1.27, 1.7, 3.19)** |
|---|---|
| **Best-practice screening and management** | Health service organisations: <br> • Agree on the process and criteria for hospital-acquired infection risk assessment **(3.4, 5.7)** <br> • Inform the clinical workforce of risk assessment requirements **(3.1b, 5.1b, 5.1c)** <br> • Identify a format for prevention plans for high-risk patients **(5.4)** <br> • Identify a management plan format for patients with a hospital-acquired infection. **(5.12, 5.13)** |
| **Identification of key individuals/ governance groups** | Health service organisations identify an individual or a governance group that is responsible for: <br> • Monitoring compliance with the organisation's infection control policies, procedures and protocols **(1.7b, 3.2)** <br> • Presenting data on the performance of infection prevention and control systems to the governing body **(1.9, 3.2c)** <br> • Designing and implementing surveillance relevant to the activities of the hospital **(3.4)** <br> • Overseeing the infection prevention and control system. **(1.25, 1.26, 1.6)** |

| **Training requirements** | Health service organisations should: |
| --- | --- |
| | • Identify workforce training requirements **(1.20a)** |
| | • Train relevant staff on the use of risk assessment, hand hygiene protocols, aseptic technique, use of personal protective equipment, and infection prevention and management plans **(1.20b, 1.20c, 5.1c)** |
| | • Ensure workforce proficiency is maintained. **(1.20d, 1.22, 1.28b)** |
| **Monitoring the delivery of prophylaxis and care** | Health service organisations ensure mechanisms are in place to: |
| | • Report hospital-acquired infections **(1.9, 3.4)** |
| | • Manage risks associated with prevention and management of hospital-acquired infections **(3.1b)** |
| | • Identify performance measures and the format and frequency of reporting **(1.9, 3.4)** |
| | • Set performance measurement goals **(1.8a)** |
| | • Collect data on compliance with policies **(1.7)** |
| | • Collect data about hospital-acquired infection risk assessment activities, including whether risk assessment is leading to appropriate action **(3.1, 3.1b, 3.2)** |
| | • Identify gaps in systems for screening patients for hospital-acquired infections, collect data on incidence, prevalence and severity of hospital-acquired infections **(3.2)** |
| | • Provide timely feedback and outcomes data to staff. **(3.2c)** |
| **Quality-improvement activities** | Health service organisations: |
| | • Implement and evaluate quality-improvement strategies to reduce the frequency and harm from hospital-acquired infections **(3.2)** |
| | • Use audits of patient clinical records and surveillance and other data to: |
| |   – identify opportunities for improving hospital-acquired infection control plans **(3.2c)** |
| |   – identify gaps and opportunities to improve the use of hospital-acquired infection control plans **(3.2c)** |
| |   – monitor the overall effectiveness of systems for prevention, management and control of hospital-acquired infections. **(3.2c)** |
| **Equipment and devices** | Health service organisations facilitate access to equipment and devices for the prevention and management of hospital-acquired infections. **(3.10)** |

# Developing the patient's comprehensive care plan

**to support best practice in the prevention and management of hospital-acquired infection**

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 hospital-acquired infections** | Clinicians identify risk factors for hospital-acquired infections related to interventions and devices which include[3]:<br>• Age – premature babies and very sick children<br>• Age – the frail and the elderly<br>• Medical conditions, such as diabetes<br>• Immunosuppression<br>• Increased length of stay<br>• Invasive procedures and surgery<br>• Wounds due to incisions, burns and ulcers<br>• Medical devices such as urinary catheters, infusions, respiratory equipment and drainage tubes<br>• High-risk areas such as ICU<br>• Antibiotic use<br>• Hand-washing techniques and access to facilities. |
| **Implement risk assessment screening** | Clinicians use relevant screening processes at presentation to assess the risk of hospital-acquired infections and requirements for prevention strategies. |
| **Clinical assessment** | • Clinicians comprehensively assess:<br>  – conditions<br>  – medicines<br>  – risks identified through risk assessment process<br>• Clinicians undertake routine clinical assessments for patients at risk of hospital-acquired infections and document these in the clinical record. |
| **Informing patients with a high risk** | Clinicians provide information for high-risk patients and their carers about prevention and management of hospital-acquired infection. |
| **Planning in partnership with patients and carers** | Clinicians inform patients, family and carers about the purpose and process of developing a hospital-acquired infection 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 hospital-acquired infection risk assessment and clinical assessment. |
| **Documenting and communicating the care plan** | Clinicians document in the clinical record and communicate:<br>• The findings of the risk assessment process<br>• The findings of the clinical assessment process<br>• The infection prevention and management plan. |



# Delivering comprehensive care

**to prevent and manage hospital-acquired infections**

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

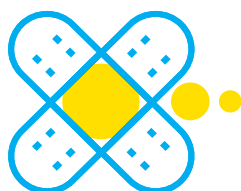| | |
|---|---|
| **Collaboration and working as a team** | Medical, nursing, pharmacy staff and allied health staff collaborate to deliver prevention and management of hospital-acquired infections. |
| **Delivering infection prevention strategies in partnership with patients and carers** | Clinicians work in partnership with patients and carers to use the comprehensive care plan to deliver infection prevention strategies where clinically indicated, for example by:<br>• Practising standard precautions<br>• Practising excellent hand hygiene<br>• Practising aseptic technique during interventions<br>• Utilising appropriate personal protective equipment<br>• Implementing strategies to prevent and control transmission. |
| **Delivering infection management in partnership** | Clinicians work in partnership with patients and carers to ensure patients who have hospital-acquired infections are managed according to best practice guidelines. |
| **Monitoring and improving care** | Clinicians:<br>• Monitor the effectiveness of these strategies in preventing hospital-acquired infections and reassess the patient if they develop an infection<br>• Review and update the care plan if it is not effective or is causing side effects<br>• Engage in reviewing clinical outcomes, identifying gaps and opportunities for improvement. |

# Minimising specific patient harm

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

**Nutrition and hydration**

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

## 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.
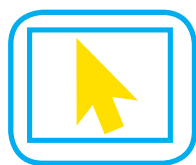
## Additional resources

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**AUSTRALIAN COMMISSION**
**ON SAFETY AND QUALITY IN HEALTH CARE**

# 4 Surgical complications requiring return to theatre

**Selected best practices and suggestions for improvement for clinicians and health system managers**

Hospital-Acquired Complication **4**

# SURGICAL COMPLICATIONS REQUIRING RETURN TO THEATRE

| | HOSPITAL-ACQUIRED COMPLICATION | RATE[a] |
|---|---|---|
| 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[b] |
| 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.[1] 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.[1] 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.[2] 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.[1] 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[3], 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.

# 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.

| | |
|---|---|
| **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)** |
| **Best-practice screening and management** | Health service organisations:<br>• Agree on the process and criteria for bleeding risk screening **(5.10, 7.1a, 7.4b)**<br>• Inform the clinical workforce of screening requirements **(7.1a)**<br>• Identify a format for bleeding risk assessment (such as preadmission clinic assessment) **(7.1a)**<br>• Identify a format for prevention plans for high-risk patients **(5.7, 5.12, 7.4)**<br>• Identify a management plan format for patients with a post-operative haemorrhage. **(7.6)** |
| **Identification of key individuals/ governance groups** | Health service organisations identify an individual or a governance group that is responsible for:<br>• Monitoring compliance with the organisation's post-operative management policies, procedures and protocols **(1.25, 7.2)**<br>• Presenting data on the performance of post-operative bleeding prevention and management systems to the governing body **(1.25b, 1.9)**<br>• Overseeing the peri-operative care system. **(5.14)** |

| | |
|---|---|
| **Training requirements** | Health service organisations: <br> • Identify workforce training requirements **(1.20a)** <br> • Train relevant staff on the use of bleeding risk screening, prevention plans and haemorrhage management plans **(1.20b, 1.20c)** <br> • Ensure workforce proficiency is maintained. **(1.20d, 1.22, 1.28b)** |
| **Monitoring the delivery of prophylaxis and care** | Health service organisations ensure mechanisms are in place to: <br> • Report post-operative haemorrhage **(1.11)** <br> • Manage risks associated with post-operative haemorrhage prevention and management **(7.1b)** <br> • Identify performance measures and the format and frequency of reporting **(5.2c)** <br> • Set performance measurement goals **(1.1, 1.3)** <br> • Collect data on compliance with policies **(1.7b)** <br> • Collect data about bleeding risk screening activities, including whether risk assessment is leading to appropriate action **(7.1b, 7.2)** <br> • 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)** <br> • Provide timely feedback and outcomes data to staff. **(1.9)** |
| **Quality-improvement activities** | Health service organisations: <br> • Implement and evaluate quality-improvement strategies to reduce the frequency and harm from post-operative haemorrhage **(7.2)** <br> • Use audits of patient clinical records and other data to: <br>   – identify opportunities for improving bleeding prevention plans **(7.2)** <br>   – identify gaps and opportunities to improve the use of bleeding prevention plans **(7.2)** <br>   – monitor the overall effectiveness of systems for prevention and management of post-operative haemorrhage **(7.2)** <br> • Use audits of patient clinical records, transfer and discharge documentation and other data to: <br>   – identify opportunities for improving haemorrhage management plans **(5.2, 7.2)** <br>   – assess compliance with haemorrhage management plan requirements **(7.2)** <br> • identify strategies to improve the use and effectiveness of haemorrhage management plans. **(7.2)** |
| **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[4]:<br>• Patients taking anti-platelet medicines<br>• Patients taking anti-coagulants<br>• Liver disease<br>• Family history<br>• 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:<br>• Conditions<br>• Medicines<br>• Risks identified through screening process.<br><br>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.<br><br>Medical and nursing work together to ensure rapid escalation of clinical concern when haemorrhage is identified. |

| | |
|---|---|
| **Documenting and communicating the care plan** | Clinicians document in the clinical record and communicate:<br>• The findings of the screening process<br>• The findings of the clinical assessment process including bleeding risk factors<br>• 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.

| | |
|---|---|
| **Collaboration and working as a team** | Medical, nursing, pharmacy and allied health staff collaborate to:<br>• Deliver haemorrhage prevention and management<br>• Monitor and respond to early warning signs including:<br>  – restlessness and anxiety<br>  – frank bleeding and bruising<br>  – tachycardia<br>  – diminished cardiac output and dropping central venous pressure<br>  – reductions in urine output<br>  – swelling and discoloration of the extremities<br>  – at-risk patients identified during structured interdisciplinary bedside rounds (SIBR) and clinical handover. |
| **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:<br>• Determining if and when discontinuation of antiplatelet/anticoagulant medication prior to the procedure or surgery is appropriate[5,6,7]<br>• Checking dressings frequently[6]; if disturbed, consider a more secure dressing or barrier to limit disturbance or access to dressing<br>• Applying pressure to the site<br>• Routine observation of heart rate, blood pressure and urine output. |
| **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. |

| **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. |

| **Audit documentation** | Clinicians monitor completion of wound observation charts and physiological observation charts. |
|---|---|
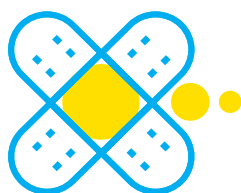
# Minimising specific patient harm

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

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

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



## 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.

| | |
|---|---|
| **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)** |
| **Best-practice screening and management** | Health service organisations:<br>• Agree on the process and criteria for surgical risk assessment **(5.7)**<br>• Inform the clinical workforce of risk assessment requirements **(5.1c)**<br>• Identify a format for surgical risk assessment, e.g. pre-admission clinic assessment **(5.4)**<br>• Identify a format for post-operative management plans for high-risk patients **(5.4)**<br>• Identify a management plan format for patients with a surgical complication. **(5.12, 5.13)** |
| **Identify key individuals/ governance groups** | Health service organisations identify an individual or a governance group that is responsible for:<br>• Monitoring compliance with the organisation's peri-operative care policies, procedures and protocols **(1.7b, 5.2a)**<br>• Presenting data on the performance of surgical complications prevention and management systems to the governing body **(1.9, 5.2c)**<br>• Overseeing the care of peri-operative patients. **(5.5b)** |

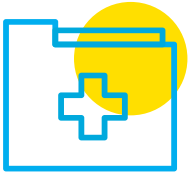| Training requirements | Health service organisations: |
|---|---|
| | • Identify workforce training requirements **(1.20a)** |
| | • Train relevant staff on the use of risk assessment, prevention plans and post-operative management plans **(1.20b, 1.20c)** |
| | • Ensure workforce proficiency is maintained. **(1.20d, 1.22, 1.28b)** |
| **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)** |
| **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)** |
| **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[8,9]:

- 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[10]:

- 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[11]:

- 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[11]:

- Ischaemia
- Tension
- Poor technique
- Stapler malfunction.

| | |
|---|---|
| **Implement risk assessment screening** | Clinicians use relevant screening processes at presentation to assess the risk of surgical complications and requirements for prevention strategies. |
| **Clinical assessment** | Clinicians comprehensively assess:<br>• Conditions<br>• Medications<br>• Risks identified through screening process.<br><br>Clinicians undertake routine wound inspections for patients at risk of surgical complications and document results in the clinical record. |
| **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. |
| **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. |
| **Collaboration and working as a team** | Medical, nursing, pharmacy and allied health staff work collaboratively to perform peri-operative risk assessment and clinical assessment. |
| **Documenting and communicating the care plan** | Clinicians document in the clinical record and communicate:<br>• The findings of the screening process<br>• The findings of the clinical assessment process including signs of localised or systemic infections<br>• 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.

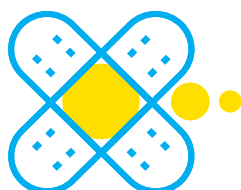| | |
|---|---|
| **Monitoring and improving care** | Clinicians:<br>• Monitor the effectiveness of these strategies in preventing surgical complications and reassess the patient if a surgical complication occurs<br>• Review and update the care plan if it is not effective or is causing side effects<br>•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

| | |
|---|---|
| **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).

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

## 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.

# References

1. Independent Hospital Pricing Authority (AU). Activity Based Funding Admitted Patient Care 2015–16, acute admitted episodes, excluding same day.

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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# 6 Respiratory complications

**Selected best practices and suggestions for improvement for clinicians and health system managers**

Hospital-Acquired Complication **6**

# RESPIRATORY COMPLICATIONS

| | HOSPITAL-ACQUIRED COMPLICATION | RATE[a] |
|---|---|---|
| 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[b] |
| 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 respiratory failure and acute respiratory distress syndromes requiring ventilation and aspiration pneumonia.*

## Why focus on respiratory failure?

Each year, patients in Australia experience more than 10,600[1] respiratory complications while in hospital. Patients with respiratory failure and acute respiratory distress syndromes experience profoundly distressing symptoms including increasing shortness of breath to the point of air hunger and overwhelming anxiety. Patients with aspiration pneumonia may also experience worsening shortness of breath, cough, purulent phlegm, fevers, sweats, fatigue and drowsiness.

The rate of hospital-acquired respiratory complications in Australian hospitals was 24 per 10,000 hospitalisations in 2015−16.[1] Hospital-acquired respiratory complications extend the length of hospitalisation, which impacts on patients and their families. These complications also increase 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.[2] While there is an increased financial cost, the most significant cost is the pain and discomfort experienced by the patient.

In many cases, respiratory complications are preventable. Significant reductions in respiratory complications rates are being achieved in some hospitals through preventative initiatives. The rate for respiratory complications at Principal Referral Hospitals[†] was 30 per 10,000 hospitalisations in 2015−16.[1] If all Principal Referral Hospitals above this rate reduced their rate to 30 per 10,000 hospitalisations, then 1,555 respiratory complications during hospitalisation 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.

† Hospitals were classified in the Principal Referral Hospitals peer group for these purposes according to the Australian Institute of Health and Welfare's former definition of major city hospitals with more than 20,000 acute weighted separations and regional hospitals with more than 16,000 acute weighted separations.

# What is considered best practice for preventing respiratory complications?

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 respiratory complications:

- Has systems for prevention of respiratory complications and ventilatory failure management that are consistent with best-practice guidelines
- Ensures that equipment and devices are available to effectively manage respiratory complications.

**Clinicians** caring for patients at risk of respiratory complications:

- Conduct comprehensive assessments in accordance with best practice
- Provide aspiration prevention 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[3], 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.

# Top tips for prevention and management of respiratory failure including acute respiratory distress syndromes requiring ventilation

The following provides key points for clinicians to consider to avoid this hospital-acquired complication

## Conduct risk assessment

- Conduct a comprehensive risk assessment
- Identify risk factors such as: chronic obstructive pulmonary disease, impaired mobility and inability to elevate head, recent surgery, abdominal and chest wounds, obesity, nutritional status and hydration, impaired swallow and/or cough reflex, recent chest infection with ongoing production of secretions, respiratory centre depressants, such as opioids, benzodiazepines and post anaesthetic, respiratory muscle weakness due to neuromuscular conditions and/or severely compromised states of health
- Undertake routine observations of respiratory function where appropriate, including respiratory rate and monitoring of oxygen saturation for patients at-risk of respiratory failure and document these observations in the clinical record.

▼

**For a patient at risk, develop a prevention plan as part of a comprehensive care plan**

▼

## Develop prevention plan

Clinicians, patients and carers develop an individualised, comprehensive prevention plan to prevent respiratory failure that identifies:

- Goals of treatment consistent with the patient's values
- Any specific nursing requirements, including equipment needs
- Any allied health interventions required, including equipment needs
- Observations or physical signs to monitor and determine frequency of monitoring
- Laboratory results to monitor and determine frequency of monitoring
- If specialist assistance is required.

▼

## Deliver prevention plan

Deliver respiratory failure prevention strategies where clinically indicated, such as:

- Re-position and/or mobilise routinely
- Elevate bed head to sitting position
- Provide supplementary oxygen as per medical orders
- Active humidification for medical gases and appropriate administration of fluids according to the patients clinical history and situation
- Active and passive chest physiotherapy
- Manage pain effectively
- Monitor physiological status including oxygen saturation and auscultate chest routinely
- Establish baseline measures and diagnostic images for ongoing evaluation of the patient's respiratory status and lung fields
- Obtain sputum samples for microscopy and sensitivities to determine the most effective antibiotic regime when required.

▼

## Monitor

- Monitor the effectiveness of the respiratory failure prevention strategies , and reassess the patient if respiratory failure 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.

# RESPIRATORY FAILURE INCLUDING ACUTE RESPIRATORY DISTRESS SYNDROMES REQUIRING VENTILATION

## Clinical governance structures and quality-improvement processes

**to support best practice in respiratory failure prevention and management**

> Health service organisations need to ensure systems are in place to prevent respiratory failure 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.

| | |
|---|---|
| **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 respiratory failure. **(1.27, 1.7, 3.19, 5.13f)** |
| **Best-practice risk assessment and management** | Health service organisations:<br>• Agree on the process and criteria for respiratory failure risk assessment **(3.4, 5.10)**<br>• Inform the clinical workforce of screening requirements **(5.1a, 5.1c)**<br>• Identify a format for respiratory action plans for high-risk patients **(5.1b, 5.7, 5.12, 5.13a)**<br>• Identify a management plan format for patients with respiratory failure **(5.12, 5.13a, 5.13e)**<br>• Apply criteria to trigger early recognition of deterioration and appropriate clinical intervention. **(8.1a, 8.4)** |
| **Identification of key individuals/ governance groups** | Health service organisations identify an individual or a governance group that is responsible for:<br>• Monitoring compliance with the organisation's respiratory failure procedures and protocols **(1.25, 3.2)**<br>• Presenting data on the performance of respiratory failure prevention and management systems to the governing body **(1.25b, 1.9)**<br>• Overseeing the care of patients at risk of or with respiratory failure. **(5.14)** |

| **Training requirements** | Health service organisations: |
|---|---|
| | • Identify workforce training requirements **(1.20)** |
| | • Train relevant workers on the use of risk assessment, respiratory action plans, and respiratory failure management **(1.20, 3.1a)** |
| | • Ensure workforce proficiency is maintained. **(1.20, 1.22, 1.28b)** |
| **Monitoring the delivery of prophylaxis and care** | Health service organisations ensure mechanisms are in place to: |
| | • Report respiratory failure **(1.11)** |
| | • Manage risks associated with prevention and management of respiratory failure **(3.4, 5.1b)** |
| | • Identify performance measures and the format and frequency of reporting **(1.9, 5.2c)** |
| | • Set performance measurement goals **(1.1, 1.3)** |
| | • Collect data on compliance with policies **(1.7c)** |
| | • Collect data about respiratory risk-assessment activities, including whether risk assessment is leading to appropriate action **(1.11, 5.1b, 5.2)** |
| | • Identify gaps in systems for risk-assessing patients for respiratory failure, collect data on incidence and severity of respiratory failure **(5.2)** |
| | • Provide timely feedback and outcomes data to staff. **(1.9)** |
| **Quality-improvement activities** | Health service organisations: |
| | • Implement and evaluate quality-improvement strategies to reduce the frequency and harm from respiratory failure **(3.2)** |
| | • Use audits of patient clinical records and other data to: |
| | – identify opportunities for improving respiratory action plans **(3.2c)** |
| | – identify gaps and opportunities to improve the use of respiratory action plans (such as increasing the number of at-risk patients who have respiratory action plans implemented) **(3.2c)** |
| | – monitor the overall effectiveness of systems for prevention and management of respiratory failure **(3.2c)** |
| | • Use audits of patient clinical records, transfer and discharge documentation and other data to: |
| | – identify opportunities for improving respiratory action plans **(3.2c, 3.7)** |
| | – assess compliance with respiratory action plan requirements **(3.2c, 3.7)** |
| | – identify strategies to improve the use and effectiveness of respiratory action plans. **(3.2c, 3.7)** |
| **Equipment and devices** | Health service organisations facilitate access to equipment and devices for the prevention and management of respiratory failure. **(3.10)** |

# Developing the patient's comprehensive care plan

**to support best practice in prevention and management of respiratory 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 respiratory failure** | Hospital-acquired type 1 respiratory failure occurs because of lung complications such as sputum retention, atelectasis, aspiration, fluid overload and nosocomial pneumonia that impair gas exchange and lung mechanics. This manifests as respiratory distress, falling oxygen saturation levels ($SpO_2$) and increasing requirements for supplemental oxygen. |

Hospital-acquired type 2 respiratory failure (hypercapnoea, hypoxaemia) can occur because of the adverse effects on respiratory drive of narcotics, sedatives and high flow oxygen (in some patients) or because of respiratory muscle fatigue in patients with severe type 1 respiratory failure. The identification of type 2 respiratory failure is sometimes delayed because the main clinical feature can be drowsiness and low $SpO_2$ might be masked by supplemental oxygen. Arterial blood gases are required to diagnose type 2 respiratory failure.

Clinicians identify risk factors for respiratory failure which include[4,5]:

- Chronic Obstructive Pulmonary Disease
- Impaired mobility and inability to elevate head
- Recent surgery, abdominal and chest wounds
- Obesity
- Nutritional status and hydration
- Impaired swallow and/or cough reflex
- Recent chest infection with ongoing production of secretions
- Respiratory centre depressants, such as opioids, benzodiazepines and post anaesthetic
- Respiratory muscle weakness due to neuromuscular conditions
- Respiratory muscle fatigue
- Severely compromised states of health.

| | |
|---|---|
| **Implement risk assessment screening** | Clinicians use relevant risk-assessment processes at presentation to assess the risk of respiratory failure and requirements for prevention strategies. |

| Clinical assessment | Clinicians comprehensively assess: |
| --- | --- |
| | • Conditions |
| | • Medicines |
| | • Risks identified through risk assessment process. |
| | Clinicians undertake routine observations of respiratory function where appropriate, including respiratory rate and monitoring of oxygen saturation for patients at risk of respiratory failure and document these observations in the clinical record. |
| **Informing patients with a high risk** | Clinicians provide information for patients with high risk and their carers about prevention and management of respiratory failure. |
| **Planning in partnership with patients and carers** | Clinicians inform patients, family and carers about the purpose and process of developing a respiratory action 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 respiratory failure risk-assessment and clinical assessment. |
| **Documenting and communicating the care plan** | Clinicians document in the clinical record and communicate: |
| | • The findings of the risk assessment process |
| | • The findings of the clinical assessment process including routine observations of respiratory rate and oxygen saturation monitoring |
| | • The respiratory action plan. |



# Delivering comprehensive care
## to prevent and manage respiratory 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, pharmacy staff and allied health staff collaborate to deliver prevention and management of respiratory failure. |
| --- | --- |

| | |
|---|---|
| **Delivering respiratory failure prevention strategies in partnership with patients and carers** | Clinicians work in partnership with patients and carers to use the comprehensive care plan to deliver respiratory failure prevention strategies where clinically indicated, for example by[6,7,8,9]:<br><br>• Re-position and/or mobilise the patient routinely<br>• Elevate bed head to sitting position<br>• Provide supplementary oxygen as per medical orders<br>• Active humidification for medical gases and appropriate administration of fluids according to the patients clinical history and situation<br>• Active and passive chest physiotherapy<br>• Manage pain effectively<br>• Monitor physiological status including oxygen saturation and auscultate chest routinely<br>• Establish baseline measures and diagnostic images for ongoing evaluation of the patient's respiratory status and lung fields, including Arterial Blood Gas if risk of hypopoventilation, and to assess ventilatory reserve<br>• Obtain sputum samples for microscopy and sensitivities to determine the most effective antibiotic regime when required<br>• Ventilatory support for ventilatory failure. |
| **Delivering respiratory failure management in partnership** | Clinicians work in partnership with patients and carers to manage patients who have respiratory failure according to best-practice guidelines. |
| **Monitoring and improving care** | Clinicians:<br><br>• Monitor the effectiveness of these strategies in preventing respiratory failure and reassess the patient if respiratory failure occurs.<br>• Review and update the care plan if it is not effective or is causing side effects<br>• Engage in reviewing clinical outcomes, identifying gaps and opportunities for improvement. |

# Top tips for prevention and management of aspiration pneumonia

The following provides key points for clinicians to consider to avoid this hospital-acquired complication

## Conduct risk assessment

Conduct a comprehensive risk assessment

Identify risk factors such as:

- Impaired swallow and/or cough reflex
- Strokes or other neuromuscular conditions
- Cancers affecting cranial nerves or the recurrent laryngeal nerve
- Poorly controlled nausea and vomiting
- Excessive alcohol consumption.

**For a patient at risk, develop a prevention plan as part of a comprehensive care plan**

## Develop prevention plan

Clinicians, patients and carers develop an individualised, comprehensive prevention plan to prevent aspiration pneumonia:

- Goals of treatment consistent with the patient's values
- Any specific nursing requirements, including equipment needs
- Any allied health interventions required, including equipment needs
- Observations or physical signs to monitor and determine frequency of monitoring, including temperature, respiratory rate and chest auscultation – and document findings in the clinical record
- Laboratory results to monitor and determine frequency of monitoring
- If specialist assistance is required.

## Deliver prevention plan

Where clinically indicated, deliver aspiration pneumonia prevention strategies, such as:

- Speech pathology review
- Drinking thickened fluids
- Sitting upright when eating
- Safe swallowing strategies.

## Monitor

- Monitor the effectiveness of the aspiration pneumonia prevention strategies, and reassess the patient if aspiration pneumonia 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.

# ASPIRATION PNEUMONIA

## Clinical governance structures and quality-improvement processes

**to support best practice in aspiration pneumonia prevention and management**

> Health service organisations need to ensure systems are in place to prevent aspiration pneumonia 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.

| | |
|---|---|
| **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 aspiration pneumonia. **(1.27, 5.1a)** |

**Best-practice screening and management**

Health service organisations:
- Agree on the process and criteria for aspiration risk screening **(5.7)**
- Inform the clinical workforce of screening requirements **(5.1c)**
- Develop and implement a work process for appropriate referral to allied health such as speech pathology for swallowing assessment for patients identified as at-risk of aspiration **(5.5, 5.6)**
- Identify a format for prevention plans for high-risk patients **(5.4)**
- Identify a management plan format for patients who are aspirating. **(5.4)**

**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 aspiration policies, procedures and protocols **(5.2a, 1.7b**)
- Presenting data on the performance of aspiration prevention and management systems to the governing body **(1.9, 5.2c)**
- Overseeing the outcomes of care of patients with aspiration and aspiration pneumonia. **(5.5b)**

**Training requirements**

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

| **Monitoring the delivery of prophylaxis and care** | Health service organisations ensure mechanisms are in place to:<br>• Report aspiration pneumonia **(1.9, 5.2)**<br>• Manage risks associated with aspiration prophylaxis and management **(5.13)**<br>• Identify performance measures and the format and frequency of reporting **(1.8a)**<br>• Set performance measurement goals **(1.8a)**<br>• Collect data on compliance with policies **(1.7b)**<br>• Collect data about risk-screening activities for aspiration, including whether risk assessment is leading to appropriate action **(1.8, 5.1b, 5.2)**<br>• Identify gaps in systems for screening patients for aspiration, and collect data on incidence and severity of aspiration pneumonia **(5.2)**<br>• Provide timely feedback and outcomes data to staff. **(1.9)** |
| --- | --- |
| **Quality-improvement activities** | Health service organisations:<br>• Implement and evaluate quality-improvement strategies to reduce the frequency and harm from aspiration pneumonia **(5.2)**<br>• Use audits of patient clinical records and other data to:<br>  – identify opportunities for improving aspiration prevention plans **(5.2)**<br>  – identify gaps and opportunities to improve the use of aspiration prevention plans (such as increasing the number of at-risk patients who have aspiration prevention plans implemented) **(5.2)**<br>  – monitor the overall effectiveness of systems for prevention and management of aspiration pneumonia **(5.2)**<br>• Use audits of patient clinical records, transfer and discharge documentation and other data to:<br>  – identify opportunities for improving aspiration management plans **(5.2)**<br>  – assess compliance with aspiration management plan requirements **(5.2)**<br>  – identify strategies to improve the use and effectiveness of aspiration management plans. **(5.2)** |
| **Appropriate nutrition** | Health service organisations facilitate access to appropriately thickened beverages and foodstuffs for the prevention and management of aspiration. **(5.27, 5.28)** |

# Developing the patient's comprehensive care plan

**to support best practice in prevention and management of respiratory 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 aspiration pneumonia** | Clinicians identify risk factors for aspiration pneumonia which include:<br>• Impaired swallow and/or cough reflex<br>• Strokes or other neuromuscular conditions<br>• Cancers affecting cranial nerves or the recurrent laryngeal nerve<br>• Poorly controlled nausea and vomiting<br>• Excessive alcohol consumption. |
| **Implement risk assessment screening** | Clinicians use relevant screening processes at presentation to assess the risk of aspiration and requirements for prevention strategies. |
| **Clinical assessment** | Clinicians comprehensively assess:<br>• Conditions<br>• Medicines<br>• Risks identified through screening process.<br><br>Clinicians undertake routine observations including temperature, respiratory rate and chest auscultation for patients at risk of aspiration, and document findings in the clinical record. |
| **Informing patients with a high risk** | Clinicians provide information for patients with high risk and their carers about aspiration prevention and management. |
| **Planning in partnership with patients and carers** | Clinicians inform patients, family and carers about the purpose and process of developing an aspiration management plan and invite them to be involved in its development. |
| **Collaboration and working as a team** | Medical, nursing, pharmacy and allied health staff, especially speech pathology and dietetics, work collaboratively to perform aspiration risk-assessment and swallowing assessments. |
| **Documenting and communicating the care plan** | Clinicians document in the clinical record and communicate:<br>• The findings of the screening process<br>• The findings of the clinical assessment process including where appropriate, the swallowing assessment<br>• The aspiration prevention plan including the thickness of fluid for consumption. |

# Delivering comprehensive care

**to prevent and manage respiratory complications**

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

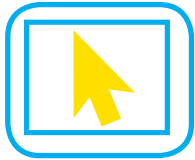| | |
|---|---|
| **Collaboration and working as a team** | Medical, nursing, pharmacy staff and allied health staff, especially speech pathology and dietetics, collaborate to deliver aspiration prophylaxis and management. |
| **Delivering aspiration prevention strategies in partnership with patients and carers** | Clinicians, patients and carers work in partnership to use the comprehensive care plan to deliver aspiration prevention strategies where clinically indicated, for example by:<br>• Speech pathology review<br>• Drinking thickened fluids<br>• Sitting upright when eating<br>• Safe swallowing strategies. |
| **Delivering aspiration management in partnership** | Clinicians work in partnership with patients and carers to ensure patients who have aspiration pneumonia are managed according to best-practice guidelines. |
| **Monitoring and improving care** | Clinicians:<br>• Monitor the effectiveness of these strategies in preventing aspiration pneumonia and reassess the patient if aspiration pneumonia occurs<br>• Review and update the care plan if it is not effective or is causing side effects<br>• Engage in reviewing clinical outcomes, identifying gaps and opportunities for improvement. |

# Minimising specific patient harm

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

| | |
|---|---|
| **Nutrition and hydration** | Clinicians ensure the nutritional and fluid requirements of the patient are planned, delivered and adjusted as appropriate, and that the patient's intake is monitored. |

# Additional resources

Australian Commission on Safety and Quality in Health Care. Track and trigger recognition and response systems. ⬀ Sydney.

Agency for Healthcare Research and Quality. Postoperative Respiratory Failure. ⬀ Rockville (US).

National Institute for Health and Care Excellence. Respiratory conditions. ⬀ London (UK).

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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.

# References

1. Independent Hospital Pricing Authority (AU). Activity Based Funding Admitted Patient Care 2015−16, acute admitted episodes, excluding same day.

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**AUSTRALIAN COMMISSION
ON SAFETY AND QUALITY IN HEALTH CARE**

# 7 Venous thromboembolism

**Selected best practices and suggestions for improvement for clinicians and health system managers**

Hospital-Acquired Complication **7**

# VENOUS THROMBOEMBOLISM

| HOSPITAL-ACQUIRED COMPLICATION | | RATE[a] |
|---|---|---|
| 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[b] |
| 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 pulmonary embolism and deep vein thrombosis.*

## Why focus on venous thromboembolism?

Each year, patients in Australian hospitals experience a large number of venous thromboembolisms (VTEs), with 3,394 occurring in public hospitals in 2015–16.[1] The rate of hospital-acquired VTE was 7.6 per 10,000 hospitalisations in 2015–16.[1]

VTE is one of the leading causes of preventable death in Australia, accounting for almost 10% of all hospital deaths.[2] VTE can cause distressing symptoms in the form of pain, swelling, tenderness, limited mobility and dyspnoea, tachypnoea and/or respiratory distress, tachycardia, arrhythmias, cough or haemoptysis. VTE has an extremely high patient mortality.[3,4]

Hospital-acquired VTE also prolongs the length of hospitalisation, which impacts on patients and their families. These complications increase 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.[5] While there is an increased financial cost, the most significant cost is the pain and discomfort experienced by the patient.

In the majority of cases, hospital-acquired VTE is preventable. There is a strong evidence base for preventive measures and high potential for improvements in patient outcomes.[6] Appropriate intervention, such as pharmacological and mechanical prophylaxis, can significantly reduce the incidence of VTE by 70% for both medical and surgical patients.[7,8]

Significant reductions in VTE rates are being achieved in some hospitals through preventive initiatives. The rate for VTE at Principal Referral Hospitals† was 9 per 10,000 hospitalisations in 2015–16.[1] If all Principal Referral Hospitals above this rate reduced their rate to 9 per 10,000 hospitalisations, then 663 hospital-acquired VTEs in Principal Referral Hospitals would have been prevented, and more when other 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 ↗.

†   Hospitals were classified in the Principal Referral Hospitals peer group for these purposes according to the Australian Institute of Health and Welfare's former definition of major city hospitals with more than 20,000 acute weighted separations and regional hospitals with more than 16,000 acute weighted separations.

# What is considered best practice for preventing VTE?

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

The **health service organisation** providing services to patients at risk of VTE:

- Has systems for VTE risk assessment and prophylaxis that are consistent with best-practice guidelines
- Ensures that equipment and devices are available to decrease the risk and effectively manage VTE.

**Clinicians** caring for patients at risk of VTE:

- Conduct comprehensive VTE risk assessments
- Provide VTE prophylaxis 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[9], 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.

# Top tips for prevention and management of VTE

The following provides key points for clinicians to consider to avoid this hospital-acquired complication

## Conduct risk assessment

- Conduct a comprehensive risk assessment including assessing the patient's baseline risk of VTEs, their risk of bleeding and any contraindications to pharmacological or mechanical prophylaxis
- Identify risk factors related to the individual such as increased age, pregnancy, active malignancy, previous VTE, varicose veins, obesity, immobility, hormone replacement or oral contraceptive use and/or acquired thrombophilia
- Identify medical illness risk factors such as chest infection, heart failure, current myocardial infarction, stroke with immobility, chemotherapy and/or acute inflammatory bowel syndromes
- Identify injury or surgery risk factors such as all surgical procedures and leg injuries.

**For a patient at risk, develop a prevention plan as part of a comprehensive care plan**

## Develop prevention plan

Clinicians, patients and carers develop an individualised, comprehensive prevention plan to prevent VTE that identifies:

- Goals of treatment consistent with the patient's values
- Any specific nursing requirements, including equipment needs
- Any allied health interventions required, including equipment needs
- Observations or physical signs to monitor and determine frequency of monitoring
- Laboratory results to monitor and determine frequency of monitoring
- If specialist assistance is required.

## Deliver prevention plan

Deliver the VTE prophylaxis plan including:

- Maintaining the patient's hydration
- Mobilisation of the patient
- Mechanical compression
- Providing medications.

## Monitor

- Monitor the effectiveness of these strategies in preventing VTE and reassess the patient if VTE 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
- Clinicians develop and document a detailed discharge plan for patients being discharged with VTE prophylaxis and provide this plan to the patient before discharge and to their GP or ongoing care provider within 48 hours of discharge.

# Clinical governance structures and quality-improvement processes

**to support best practice in VTE prevention and management**

> Health service organisations need to ensure systems are in place to prevent VTE through effective clinical governance and quality-improvement processes.

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

| | |
|---|---|
| **Policies, procedures and/or protocols** | Health service organisations ensure policies and procedures, and/or protocols are consistent with evidence-based guidelines for the risk assessment and prophylaxis of VTE. **(1.27, 5.1a)** |
| **Best-practice screening and management** | Health service organisations:<br>• Agree on the process and criteria for VTE risk screening **(5.7)**<br>• Identify a format for VTE risk screening **(5.1c**)<br>• Inform clinical staff of screening requirements. **(5.1c)** |
| **Identification of key individuals/ governance groups** | Health service organisations identify an individual or a governance group that is responsible for:<br>• Monitoring compliance with the organisation's policies, procedures and protocols for VTE prevention **(1.7b, 5.2a)**<br>• Presenting data on the performance of VTE prevention and management systems to the governing body. **(1.20d, 1.22, 1.28b)** |
| **Training requirements** | Health service organisations:<br>• Identify workforce training requirements **(1.20a)**<br>• Train relevant staff on the use of risk screening and prevention plans **(1.20a, 1.20c)**<br>• Ensure workforce proficiency is maintained. **(1.20, 1.22, 1.28b)**. |
| **Monitoring the delivery of prophylaxis and care** | Health service organisations ensure mechanisms are in place to:<br>• Report VTE **(1.9, 1.11, 5.2)**<br>• Manage risks associated with VTE prophylaxis and management **(5.1b)**<br>• Identify performance measures and the format and frequency of reporting **(1.8a)**<br>• Set performance measurement goals **(1.8a)**<br>• Collect data on compliance with policies **(1.7b)**<br>• Collect data about VTE risk screening activities, including whether risk assessment is leading to appropriate action **(1.8, 5.1b, 5.2)**<br>• Identify gaps in systems for screening patients for VTE. **(5.2)** |

**Quality improvement activities**

Health service organisations ensure mechanisms are in place to:

- Implement and evaluate quality improvement strategies to reduce the incidence and harm from VTE **(5.2)**
- Use audits of patient clinical records (such as the National inpatient Medication Chart[10] and transfer and discharge documentation), and other data to:
  - identify opportunities for improving VTE prophylaxis plans **(5.2)**
  - identify gaps and opportunities to improve the use of VTE prophylaxis plans (for example, increasing the number of at-risk patients who have VTE prophylaxis plans implemented) **(5.2)**
  - monitor the overall effectiveness of systems for prevention and management of VTE. **(5.2)**



# Developing the patient's comprehensive care plan

## to support best practice in VTE prevention

Clinicians should partner with patients, carers and families, assessing risk, in providing appropriate information to support shared decision making, and in planning care that meets the needs of patients and their carers. As patients may continue to have an elevated risk of VTE after the time of discharge from hospital, the care plan should, where appropriate, address prophylaxis after the transfer of care.

**Identifying risk factors for VTE**

Clinicians identify risk factors for VTE which include[4]:

- Individual:
  - increasing age
  - pregnancy
  - active malignancy
  - previous VTE
  - varicose veins
  - obesity
  - immobility
  - hormone replacement or oral contraceptive use
  - acquired thrombophilia
- Medical illness:
  - chest infection
  - heart failure
  - current myocardial infarction
  - stroke with immobility
  - chemotherapy
  - acute inflammatory bowel syndromes
- Injury or surgery:
  - all surgical procedures and leg injuries.

| | |
|---|---|
| **Implementing risk assessment screening** | Clinicians use relevant screening processes within 24 hours of admission to assess:<br>• The risk of VTE<br>• Requirements for prevention strategies. |
| **Clinical assessment** | Clinicians comprehensively assess:<br>• Conditions<br>• Medications<br>• Bleeding risk<br>• Other risks identified through screening processes. |
| **Planning in partnership with patients and carers** | Clinicians inform patients, family and carers about the purpose and process of developing a VTE prophylaxis plan and invite them to be involved in its development. |
| **Informing patients with a high risk** | Clinicians provide information to high-risk patients and their carers about:<br>• VTE<br>• Their risk factors<br>• Prevention of VTE<br>• Risks and benefits of prevention<br>• Signs and symptoms of VTE<br>• How patients can minimise their risk. |
| **Collaborating and working as a team** | Medical, nursing, pharmacy, physiotherapy and other allied health staff collaborate to perform VTE risk assessment and clinical assessment. |
| **Documenting and communicating the care plan** | Clinicians document in the clinical record and communicate:<br>• The VTE risk assessment and plan for prophylaxis<br>• The findings of the screening process<br>• The findings of the clinical assessment process<br>• The VTE prophylaxis plan, addressing:<br>  – maintaining hydration<br>  – mobilisation<br>  – mechanical compression<br>  – medications. |
| **Reassessing risk** | Clinicians reassess risk:<br>• At intervals no longer than every seven days<br>• Whenever the patient's clinical situation changes<br>• On discharge from hospital. |

| **Planning for appropriate ongoing care post discharge** | Clinicians develop and document an individualised care plan for the patient at risk of VTE, during or following their hospital stay. The plan includes: |
| | • Details about the patient's individual risk factors for VTE (see Assessing risk of VTE) |
| | • Signs and symptoms of VTE |
| | • What to do if a VTE is suspected |
| | • When the patient will be reviewed. |
| | If the patient is discharged with VTE prophylaxis, the plan should include: |
| | • Details of the type of prophylaxis |
| | • How to use prophylaxis |
| | • The duration of use |
| | • When prophylaxis should be reviewed |
| | • Monitoring requirements |
| | • Possible side effects and what to do if they occur. |
| | The discharge plan should be provided to the patient before they leave hospital and to their general practitioner or ongoing care provider within 48 hours of discharge. |

# Delivering comprehensive care to prevent and manage VTE

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

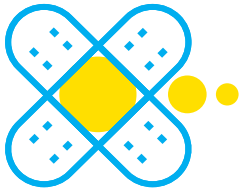| **Collaboration and working as a team** | Medical, nursing, pharmacy, physiotherapy and other allied health staff collaborate to deliver VTE prophylaxis and management. |
| **Delivering VTE prophylaxis and management in partnership** | Clinicians, patients and carers work in partnership, and according to best-practice guidelines, to manage patients who have VTE. |
| **Monitoring and improving care** | Clinicians should: |
| | • Monitor the effectiveness of these strategies in preventing VTE and reassess the patient if VTE 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. |

# Minimising specific patient harms

Clinicians identify patients at risk of specific harms and deliver targeted strategies to prevent and manage these harms.
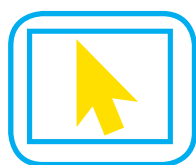
**Nutrition and hydration**

Ensure the nutritional and fluid requirements of the patient are:

- Planned
- Delivered
- Monitored
- Adjusted as appropriate.

## Assessing risk of VTE

Conduct a comprehensive risk assessment to identify patients at risk of VTE:
- Assess the patient's baseline risk of VTE
  - Consider inherited and/or acquired risk factors
- Assess the patient's additional risk of VTE:
  - Account for the reason for hospitalisation:
      surgical procedures
      trauma
      specific medical illness (such as cancer)
- Assess the patient's risk of bleeding
- Consider contraindications to pharmacological or mechanical prophylaxis
- Formulate an overall risk assessment:
  - Consideration of risk of VTE prophylaxis against the benefits
- In consultation with the patient, select appropriate methods of VTE prophylaxis.

# Additional resources

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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 Hospital Pricing Authority (IHPA) may differ due to the IHPA's methodology, which applies different inclusion/exclusion criteria.

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**AUSTRALIAN COMMISSION**
**ON SAFETY AND QUALITY IN HEALTH CARE**

# 8 Renal failure

**Selected best practices and suggestions for improvement for clinicians and health system managers**

Hospital-Acquired Complication **8**

# RENAL FAILURE

| | HOSPITAL-ACQUIRED COMPLICATION | RATE[a] |
|---|---|---|
| 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[b] |
| 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

Renal failure (or acute kidney injury) refers to a hospital-acquired acute renal failure requiring haemodialysis or continuous haemofiltration.*

## Why focus on renal failure?

Each year, a large number of patients develop hospital-acquired renal failure, with 980 people in Australian public hospitals developing renal failure that required haemodialysis in 2015−16.[1] The rate of hospital-acquired renal failure was 2.2 per 10,000 hospitalisations in 2015−16.[1]

Hospital-associated acute kidney injury (also known as acute renal failure) is common[2,3] as it may be caused by impaired renal perfusion due to hypotension or dehydration, medications, recent surgery, radiographic contrast media, or sepsis.

Renal failure may cause distressing symptoms including fluid retention and swelling, dyspnoea, drowsiness, fatigue, cognitive clouding and confusion, persistent nausea, and seizures. The condition also has an extremely high mortality rate of 50%.[3] Early recognition and intervention are important elements of effective treatment.[4]

Hospital-acquired renal failure also prolongs the length of hospitalisation, which impacts on patients and their families. Hospital-acquired renal failure 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.[5] While there is an increased financial cost, the most significant cost is the pain and discomfort experienced by the patient.

Significant reductions in hospital-acquired renal failure rates are being achieved in some hospitals through preventive initiatives. The rate of hospital-acquired renal failure requiring haemodialysis at Principal Referral Hospitals† was 3 per 10,000 hospitalisations in 2015−16.[1] If all Principal Referral Hospitals above this

*   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 ↗.

†   Hospitals were classified in the Principal Referral Hospitals peer group for these purposes according to the Australian Institute of Health and Welfare's former definition of major city hospitals with more than 20,000 acute weighted separations and regional hospitals with more than 16,000 acute weighted separations.

rate reduced their rate to 3 per 10,000 hospitalisations, then 317 episodes of renal failure requiring dialysis during hospitalisation in Principal Referral Hospitals would have been prevented, and more when other facilities are considered.

# What is considered best practice for preventing renal failure?

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

The **health service organisation** providing services to patients at risk of renal failure:

- Has governance structures and systems in place to identify those at risk of renal failure and to support delivery of appropriate care
- Ensures that equipment and devices are available to effectively manage renal failure.

**Clinicians** caring for patients at risk of renal failure:

- Conduct appropriate risk assessments
- 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[6], 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.

# Top tips for prevention and management of renal failure

The following provides key points for clinicians to consider to avoid this hospital-acquired complication

## Conduct risk assessment

- Conduct a comprehensive risk assessment
- Identify risk factors such as: major surgery and trauma, multi-organ failure, increased age, diabetes mellitus, cardiovascular disease and malignancy, chronic kidney disease, sepsis, hypovolemia, hypotension, nephrotoxic medications and/or muscle ischaemia
- Assess patients for renal failure risks, particularly when their hospital episode is associated with:
  - The use of iodinated contrast agents
  - Chronic kidney disease (adults with an estimated glomerular filtration rate less than 60 ml/min/1.73 m$^2$)
  - Oliguria (urine output less than 0.5 ml/kg/hour)
  - Symptoms or signs of nephritis (such as oedema or haematuria)
  - Symptoms or history of urological obstruction, or conditions that may lead to obstruction
  - Neurological or cognitive impairment or disability, which may mean limited access to fluids because of reliance on a carer
  - Deteriorating early warning scores / physiological parameters.

**For a patient at risk, develop a prevention plan as part of a comprehensive care plan**

## Develop prevention plan

Clinicians, patients and carers develop an individualised, comprehensive prevention plan to prevent renal failure that identifies:

- Goals of treatment consistent with the patient's values
- Any specific nursing requirements, including equipment needs
- Any allied health interventions required, including equipment needs
- Observations or physical signs to monitor and determine frequency of monitoring
- Laboratory results to monitor and determine frequency of monitoring
- If specialist assistance is required.

## Deliver prevention plan

Where clinically indicated, deliver renal failure prevention and management strategies, such as:

- Systems to recognise and respond to oliguria and/or deterioration in defined early warning criteria
- Routine consultation with nephrology specialists prior to administering iodinated contrast agents, and consideration of the requirement, and patient suitability, for volume expansion and pharmacological protection
- Fluid resuscitation and management as indicated
- Consideration of pharmacological intervention as appropriate
- Haemodialysis and/or continuous renal replacement therapy if the patient is not responding to medical management, as indicated by hyperkalaemia, metabolic acidosis symptoms and/or complications of uraemia (for example, pericarditis or encephalopathy) and/or fluid overload pulmonary oedema.

## Monitor

- Monitor the effectiveness of renal failure prevention and management strategies, and reassess the patient if renal failure 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.

# Clinical governance structures and quality-improvement processes

**to support best practice in renal failure prevention and management**

> Health service organisations need to ensure systems are in place to prevent renal failure through effective clinical governance and quality-improvement processes.

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

| | |
|---|---|
| **Policies, procedures and protocols** | Health service organisations ensure policies, procedures and protocols are consistent with national evidence-based guidelines for the prevention and management of renal failure requiring haemodialysis. **(1.27, 5.1a)** |
| **Best-practice screening and management** | Health service organisations:<br>• Agree on the process and criteria for risk assessment for kidney injury **(5.7)**<br>• Inform the clinical workforce of risk assessment requirements **(5.1c)**<br>• Identify a format for prevention plans for high-risk patients **(5.4)**<br>• Identify a management plan format for patients with acute kidney injury. **(5.12, 5.13)** |
| **Identification of key individuals/ governance groups** | Health service organisations identify an individual or a governance group that is responsible for:<br>• Monitoring compliance with the organisation's renal failure policies, procedures and protocols **(1.7b, 5.2a)**<br>• Presenting data on the performance of kidney failure prevention and management systems to the governing body. **(1.9, 5.2c)** |
| **Training requirements** | Health service organisations:<br>• Identify workforce training requirements **(1.20a)**<br>• Train relevant staff on the use of risk assessment, prevention plans and management plans **(1.20b, 1.20c)**<br>• Ensure workforce proficiency is maintained. **(1.20d, 1.22, 1.28b)** |
| **Monitoring the delivery of prevention and care** | Health service organisations ensure mechanisms are in place to:<br>• Report renal failure **(1.9, 5.2)**<br>• Manage risks associated with renal failure prevention and management **(5.1b)**<br>• Identify performance measures and the format and frequency of reporting **(1.8a)**<br>• Set performance measurement goals **(1.8a)**<br>• Collect data on compliance with policies **(1.7b)**<br>• Collect data about risk assessment activities for risk of renal failure, including whether risk assessment is leading to appropriate action **(1.8, 5.1b, 5.2)**<br>• Collect data on incidence, prevalence and severity of renal failure **(1.11)**<br>• Provide timely feedback and outcomes data to staff. **(1.9)** |

| **Quality-improvement activities** | Health service organisations: |
|---|---|
| | • Implement and evaluate quality-improvement strategies to reduce the frequency and harm from renal failure **(5.2)** |
| | • Use audits of patient clinical records and other data to: |
| |   – identify opportunities for improving renal failure prevention **(5.2)** |
| |   – monitor the overall effectiveness of systems for prevention and management of renal failure **(5.2)** |
| | • Use audits of patient clinical records, transfer and discharge documentation and other data to identify opportunities for improving renal failure management. **(5.2)** |

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

# Developing the patient's comprehensive care plan

**to support best practice in renal failure prevention and management**

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

| **Identify patient risk factors associated with renal failure** | Clinicians use relevant screening processes at, or prior to, presentation to assess the risk of renal failure. Risk factors associated with renal failure include[7]: |
|---|---|
| | • Major surgery and trauma |
| | • Multi-organ failure |
| | • Increased age |
| | • Diabetes mellitus, cardiovascular disease and malignancy |
| | • Chronic kidney disease |
| | • Sepsis |
| | • Hypovolemia |
| | • Hypotension |
| | • Nephrotoxic medications |
| | • Muscle ischaemia. |

| **Risk screening** | Clinicians comprehensively assess the conditions, medications and risks identified through the screening process. |
|---|---|

| Use strategies to prevent and manage renal failure | Assess patients for renal failure risks as indicated, particularly when their hospital episode is associated with[7,8]: |
|---|---|
| | • The use of iodinated contrast agents |
| | • Pre-operative assessment |
| | • Chronic kidney disease (adults with an estimated glomerular filtration rate less than 60 ml/min/1.73 m²) |
| | • Oliguria (urine output less than 0.5 ml/kg/hour) |
| | • Symptoms or signs of nephritis (such as oedema or haematuria) |
| | • Symptoms or history of urological obstruction, or conditions that may lead to obstruction |
| | • Neurological or cognitive impairment or disability, which may mean limited access to fluids because of reliance on a carer |
| | • Deteriorating early warning scores / physiological parameters. |
| **Documenting and communicating the care plan** | Conduct a comprehensive clinical assessment of patients at risk or with acute renal failure and document the following in the clinical notes: |
| | • Clinical history and assessment |
| | • All relevant clinical findings (such as recent surgery, oliguria, generally unwell, recent onset, deterioration of creatinine levels) |
| | • Acute kidney injury when confirmed, not creatinine levels alone |
| | • Confirmation that renal failure developed during the episode of care was not present on admission |
| | • If present on admission, confirmation that the complication was part of the patient's presenting problem, a comorbidity or chronic disease (as in a young patient presenting to the emergency department following recent injection of radiographic contrast media for CT scan, complaining of feeling unwell, nausea and complaining of an inability to pass urine) |
| | • Contributing factors, predispositions or comorbidities that are relevant for the incident (such as recent surgery, dehydration, reaction to contrast media) |
| | • Associated investigations (such as renal ultrasound, X-ray of ureter and pelvis, biochemistry) |
| | • Treatment or care plan (such as fluid management and type of kidney replacement therapy). |
| **Collaborating and working as a team** | Medical, nursing, pharmacy and allied health staff work collaboratively to perform renal failure risk assessment and clinical assessment. |
| **Institute appropriate monitoring** | Implement monitoring of clinical and laboratory indicators including: |
| | • Comprehensive fluid balance charts including input and output |
| | • Monitor serum creatinine and other biochemical levels regularly |
| | • Perform urinalysis and consider suitability for ultrasound |
| | • Increase monitoring and clinical oversight of patients at risk of deterioration and/or acute kidney injury. |
| **Audit documentation** | Monitor completion of fluid balance charts. |

# Delivering comprehensive care to prevent and manage renal failure

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

| | |
|---|---|
| **Working in partnership to deliver the care plan** | Clinicians implement prevention and management strategies as clinically appropriate, including[8]: <br>• Clinical management according to best-practice guidelines <br>• Systems to recognise and respond to oliguria and/or deterioration in defined early warning criteria <br>• Routine consultation with nephrology specialists prior to administering iodinated contrast agents, and consideration of the requirement, and patient suitability, for volume expansion and pharmacological protection <br>• Fluid resuscitation and management as indicated <br>• Consideration of pharmacological intervention as appropriate <br>• Haemodialysis and/or continuous renal replacement therapy if the patient is not responding to medical management, as indicated by hyperkalaemia, metabolic acidosis symptoms and/or complications of uraemia (for example, pericarditis or encephalopathy) and/or fluid overload pulmonary oedema. |
| **Partnering with patients** | Clinicians inform patients, families and carers of the risks, prevention strategies and management of renal failure. |
| **Documentation** | Clinicians document the treatment plan, goals and outcome. |
| **Monitoring impact of plan** | Clinicians monitor the effectiveness of these strategies in preventing renal failure and reassess the patient if acute kidney injury occurs. |
| **Updating care plan** | Clinicians review and update the care plan if it is not effective or is causing side effects. |
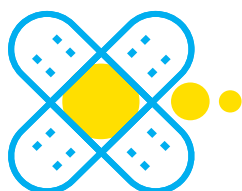
# Minimising specific patient harm

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

| | |
|---|---|
| **Hydration** | Ensure the fluid requirements of the patient are:<br>• Planned<br>• Delivered<br>• Intake is monitored<br>• Adjusted as appropriate. |
| **Preventing delirium and managing cognitive impairment** | Ensure a system is in place to:<br>• Recognise, prevent, treat and manage cognitive impairment<br>• Collaborate with patients, carers and families to support the patient and implement individualised strategies that minimise any anxiety or distress while they are receiving care. |
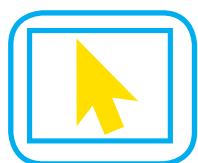
# Additional resources

Kidney Disease Improving Global Outcomes. KDIGO Clinical Practice Guideline for Acute Kidney Injury. Kidney International Supplements [Internet]. 2012; 2(1):[1–138 pp.].

Langham RG, Bellomo R, D' Intini V, Endre Z, Hickey BB, McGuinness S, et al. KHA-CARI guideline: KHA-CARI adaptation of the KDIGO Clinical Practice Guideline for Acute Kidney Injury. Nephrology [Internet]. 2014; 19(5):[261–5 pp.].

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National Institute for Health and Care Excellence. Acute kidney injury, Quality Standard 76. London: NICE; 2014.

Zacharias M, Mugawar M, Herbison GP, Walker RJ, Hovhannisyan K, Sivalingam P, et al. Interventions for protecting renal function in the perioperative period. Cochrane Database of Systematic Reviews [Internet]. 2013; (9).

# 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 Hospital Pricing Authority (IHPA) may differ due to the IHPA's methodology, which applies different inclusion/exclusion criteria.

# References

1. Independent Hospital Pricing Authority (AU). Activity Based Funding Admitted Patient Care 2015–16, acute admitted episodes, excluding same day.

2. Nash K, Hafeez A, Hou S. Hospital-acquired renal insufficiency. American Journal Of Kidney Diseases: The Official Journal Of The National Kidney Foundation 2002;39:930–6.

3. Yarlagadda S, Perazella MA. Acute Renal Failure in the Hospital: Diagnosis and Management.[Internet]. 2006. Available from: http://www.turner-white.com/memberfile.php?PubCode=hp_mar06_acute.pdf.

4. Sedgewick J. Acute kidney injury: responding to the deficits in management and care.[Internet]. 2011. Available from: http://www.renalsociety.org/public/6/files/documents/RSAJ/2011.07/Sedgewick.pdf.

5. Independent Hospital Pricing Authority, Pricing and funding for safety and quality – Risk adjustment model for hospital acquired complications – version 3, March 2018, IHPA: Sydney.

6. Australian Commission on Safety and Quality in Health Care. National Safety and Quality Health Service Standards (second edition). Sydney (AU) 2017.

7. Bouchard J, Mehta RL. Acute Kidney Injury in Western Countries. Kidney Diseases 2016;2:103–10.

8. National Institute for Health and Care Excellence. Acute kidney injury: prevention, detection and management. Clinical Guideline 169. London: NICE; 2013. p. 39.

# 9 Gastrointestinal bleeding

**Selected best practices and suggestions for improvement for clinicians and health system managers**

Hospital-Acquired Complication **9**

# GASTROINTESTINAL BLEEDING

| | HOSPITAL-ACQUIRED COMPLICATION | RATE[a] |
|---|---|---|
| 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[b] |
| 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

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This hospital-acquired complication includes the diagnoses of:

- Haematemesis
- Malaena
- Gastrointestinal haemorrhage
- Gastric ulcer with haemorrhage
- Duodenal ulcer with haemorrhage
- Peptic ulcer with haemorrhage
- Gastrojejunal ulcer with haemorrhage
- Acute haemorrhagic gastritis.*

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## Why focus on gastrointestinal bleeding?

Each year, patients in Australia experience more than 6,185 gastrointestinal bleeds while in hospital.[1] Patients with gastrointestinal bleeds may experience distressing vomiting or diarrhoea with haematemesis and malaena, as well as tiredness, shortness of breath, faintness, dizziness and collapse.

The rate of hospital-acquired gastrointestinal bleeding in Australian hospitals was 14 per 10,000 hospitalisations in 2015–16.[1] Hospital-acquired gastrointestinal bleeds extend the length of hospitalisation, which impacts on patients and their families. These complications also increase 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.[2] While there is an increased financial cost, the most significant cost is the pain and discomfort experienced by the patient.

A majority of gastrointestinal bleeds are preventable. Significant reductions in gastrointestinal bleeding rates are being achieved in some hospitals by preventive initiatives. The rate of gastrointestinal bleeding at Principal Referral Hospitals† was 16 per 10,000 hospitalisations. If all Principal Referral Hospitals above this rate reduced their rate to 16 per 10,000 hospitalisations, then 824 gastrointestinal bleeds during hospitalisation in Principal Referral Hospitals would have been prevented, and more when other 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 ⧉.

†  Hospitals were classified in the Principal Referral Hospitals peer group for these purposes according to the Australian Institute of Health and Welfare's former definition of major city hospitals with more than 20,000 acute weighted separations and regional hospitals with more than 16,000 acute weighted separations.

# What is considered best practice for preventing gastrointestinal bleeding?

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 gastrointestinal bleeding:

- Has systems for prevention and management of gastrointestinal bleeding that are consistent with best-practice guidelines
- Ensures that equipment and devices are available to effectively manage gastrointestinal bleeding.

**Clinicians** caring for patients at risk of gastrointestinal bleeding:

- Conduct comprehensive assessments in accordance with best practice
- Provide bleeding prevention 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[3], 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.

# Clinical governance structures and quality-improvement processes

## to support best practice in the prevention and management of gastrointestinal bleeding

> Health service organisations need to ensure systems are in place to prevent gastrointestinal bleeding 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.

| | |
|---|---|
| **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 gastrointestinal bleeding. **(1.27, 5.1a)** |
| **Best-practice risk assessment and management** | Health service organisations:<br>• Agree on the process and criteria for gastrointestinal bleeding risk assessment **(5.7, 7.1b, 7.4b)**<br>• Inform the clinical workforce of risk assessment requirements **(5.1a, 5.1c, 7.1a, 7.1c)**<br>• Identify a format for gastrointestinal bleeding action plans for high-risk patients or patients with active gastrointestinal bleeding **(5.10, 5.7, 7.4)**<br>• Apply criteria to trigger early recognition of deterioration and appropriate clinical intervention. **(8.4)** |
| **Identification of key individuals/ governance groups** | Health service organisations identify an individual or a governance group that is responsible for:<br>• Monitoring compliance with the organisation's gastrointestinal bleeding procedures and protocols **(1.7b, 7.2)**<br>• Presenting data on the performance of gastrointestinal bleeding prevention and management systems to the governing body **(1.9, 5.2c)**<br>• Overseeing the care of patients at risk of or with gastrointestinal bleeding. **(5.5b, 5.14)** |
| **Training requirements** | Health service organisations:<br>• Identify workforce training requirements **(1.20a)**<br>• Train relevant workers on the use of risk assessment and gastrointestinal bleeding action plans **(1.20b, 1.20c)**<br>• Ensure workforce proficiency is maintained. **(1.20d, 1.22, 1.28b)** |

**Monitoring the delivery of prophylaxis and care**

Health service organisations ensure mechanisms are in place to:

- Report gastrointestinal bleeding **(1.9, 5.2)**
- Manage risks associated with prevention and management of gastrointestinal bleeding **(7.1b)**
- 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 gastrointestinal bleeding risk assessment activities, including whether risk assessment is leading to appropriate action **(1.8, 7.1b, 7.2)**
- Identify gaps in systems for risk assessing patients for gastrointestinal bleeding, collect data on incidence and severity of gastrointestinal bleeding **(7.2)**
- Provide timely feedback and outcomes data to staff. **(1.9)**

**Quality-improvement activities**

Health service organisations:

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

**Equipment and devices**

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

# Developing the patient's comprehensive care plan

**to support best practice in gastrointestinal bleeding prevention and management**

> 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 gastrointestinal bleeding** | Clinicians should identify risk factors associated with gastrointestinal bleeding which include[4,5]:<br><br>• Patients requiring mechanical ventilation<br>• Intensive care unit stay<br>• Platelet dysfunction<br>• Stress ulceration due to sepsis, renal or hepatic insufficiency<br>• Use of steroids and non-steroidal anti-inflammatory medicines<br>• Smoking<br>• Use of anticoagulants and anti-platelet medicines<br>• Burn injuries<br>• Head or spinal trauma<br>• History of peptic ulcer or upper gastrointestinal bleed. |
| **Implement risk assessment screening** | Clinicians use relevant risk assessment processes at presentation to assess the risk of gastrointestinal bleeding and requirements for prevention strategies. |
| **Clinical assessment** | Clinicians comprehensively assess:<br><br>• Conditions<br>• Medicines<br>• Risks identified through risk assessment process.<br><br>Clinicians undertake routine observations, including heart rate and blood pressure, stool charts where appropriate, and document these observations in the clinical record.<br><br>Clinicians monitor haemoglobin levels as clinically appropriate. |
| **Informing patients with a high risk** | Clinicians provide information for high-risk patients and their carers about prevention and management of gastrointestinal bleeding. |
| **Planning in partnership with patients and carers** | Clinicians inform patients, family and carers about the purpose and process of developing a bleeding prevention and action plan and invite them to be involved in its development. |

| | |
|---|---|
| **Collaboration and working in teams** | Medical, nursing, pharmacy and allied health staff work collaboratively to perform gastrointestinal bleeding risk assessment and clinical assessment. |
| **Documenting and communicating the care plan** | Clinicians document in the clinical record and communicate:<br>• The findings of the risk assessment process<br>• The findings of the clinical assessment process including routine observations of heart rate and blood pressure.<br>• The bleeding prevention plan and bleeding action plan. |

# Delivering comprehensive care

## to prevent and manage gastrointestinal bleeding

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, pharmacy staff and allied health staff collaborate to deliver prevention and management of gastrointestinal bleeding. |
| **Delivering gastrointestinal bleeding prevention strategies in partnership with patients and carers** | Clinicians work in partnership with patients and carers to use the comprehensive care plan to deliver gastrointestinal bleeding prevention strategies where clinically indicated, for example by using:<br>• Proton pump inhibitors<br>• Stress ulcer prophylaxis<br>• Early gastric feeding where clinically appropriate<br>• Careful management of anti-coagulants. |
| **Delivering gastrointestinal bleeding management in partnership** | Clinicians work in partnership with patients and carers to ensure patients who have gastrointestinal bleeding are managed according to best practice guidelines. |
| **Monitoring and improving care** | Clinicians:<br>• Monitor the effectiveness of these strategies in preventing gastrointestinal bleeding and reassess the patient if gastrointestinal bleeding occurs<br>• Review and update the care plan if it is not effective or is causing side effects<br>• Ensure clear plan for managing ongoing care once risk factors are no longer present, such as discharge from ICU, which includes considering cessation of proton pump inhibitors<br>• Engage in reviewing clinical outcomes, identifying gaps and opportunities for improvement. |

## Additional resources

National Institute for Health and Care Excellence. <u>Acute upper gastrointestinal bleeding in over 16s Quality standard 141</u>. ⬀ London (UK) 2012.

National Institute for Health and Care Excellence. <u>Acute upper gastrointestinal bleeding in adults Quality standard</u>. ⬀ [QS38] London (UK) 2013.

Strate LL, Gralnek IM. ACG Clinical Guideline: Management of Patients with Acute Lower Gastrointestinal Bleeding. The American Journal of Gastroenterology. 2016;111(4):459−74

Chavalitdhamrong D, Hughes S, Abbitt P. A Multidisciplinary Management Algorithm of Acute Gastrointestinal Bleeding: A Quality Improvement Project. Journal of Gastrointestinal Digestive System. 2016;6:439

Mehta R, Nair P. Management of Upper Gastrointestinal Bleeding. Practical Gastroenterology. 2016:153

Barletta JF, Bruno JJ, Buckley MS, Cook DJ. Stress Ulcer Prophylaxis. Critical Care Medicine. 2016;44(7):1395−405.

Krag M, Perner A, Møller MH. Stress ulcer prophylaxis in the intensive care unit. Current opinion in critical care. 2016;22(2):186−90

Herzig SJ, Rothberg MB, Feinbloom DB, Howell MD, Ho KK, Ngo LH, et al. Risk factors for nosocomial gastrointestinal bleeding and use of acid-suppressive medication in non-critically ill patients. J Gen Intern Med. 2013;28(5):683−90

## 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.

# References

1.  Independent Hospital Pricing Authority (AU). Activity Based Funding Admitted Patient Care 2015–16, acute admitted episodes, excluding same day.

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.

3.  Australian Commission on Safety and Quality in Health Care. National Safety and Quality Health Service Standards (second edition). Sydney 2017.

4.  Victorian Department of Health & Human Services. A Clinical Practice Guide: Stress Ulcer Prophylaxis in surgical patients. (Archived) ed: Victorian Surgical Consultative Council 2013.

5.  Tielleman T, Bujanda D, Cryer B. Epidemiology and Risk Factors for Upper Gastrointestinal Bleeding. Gastrointest Endosc Clin N Am. 2015;25(3):415–28. Epub 2015/07/05.

**AUSTRALIAN COMMISSION**
**ON SAFETY AND QUALITY IN HEALTH CARE**

# 10 Medication complications

**Selected best practices and suggestions for improvement for clinicians and health system managers**

Hospital-Acquired Complication **10**

# MEDICATION COMPLICATIONS

| | HOSPITAL-ACQUIRED COMPLICATION | RATE[a] |
|---|---|---|
| 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[b] |
| 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

Many hospital-acquired complications can arise as a consequence of medication use in hospital. This hospital-acquired complication focuses on the following three main diagnostic groups*:

- Medication-related respiratory complications/respiratory depression
- Haemorrhagic disorder due to circulating anticoagulants
- Hypoglycaemia

High-risk medicines include those referred to in the mnemonic:

**A PINCH**

**A**nti-infectives

**P** otassium

**I** nsulin and oral hypoglycaemics

**N** arcotics and sedatives

**C** hemotherapies

**H** eparin and anticoagulants

## Why focus on medication complications?

Each year, patients in Australia experience a large number of medication-related complications, with 13,503 occurring in public hospitals in 2015–16.[1] The rate of hospital-acquired medication complications in Australian public hospitals was 30 per 10,000 hospitalisations in 2015–16.[1]

Hospital-acquired medication complications prolong the length of hospitalisation, which impacts on patients and their families. These complications increase 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.[2] While there is an increased financial cost, the most significant cost is the pain and discomfort experienced by the patient.

Significant reductions in medication complication rates are being achieved in some hospitals through preventive initiatives. The rate for medication complications at Principal Referral Hospitals[†] was 35 per 10,000 hospitalisations in 2015–16. If all Principal Referral Hospitals above this rate reduced their rate to 35 per 10,000 hospitalisations, then 2,067 medication complications in these hospitals would have been prevented, and more when other types of facilities are considered.[1]

*  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 ⧉.

†  Hospitals were classified in the Principal Referral Hospitals peer group for these purposes according to the Australian Institute of Health and Welfare's former definition of major city hospitals with more than 20,000 acute weighted separations and regional hospitals with more than 16,000 acute weighted separations.

# What is considered best practice for preventing medication complications?

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

The **health service organisation** providing services to patients at risk of medication complications:

- Has systems for medication review and reconciliation consistent with best-practice guidelines
- Has systems for managing and monitoring high-risk medicines
- Ensures that equipment and devices are available to decrease the risk of medication complications; for example, insulin pumps, heparin pumps.

**Clinicians** caring for patients at risk of medication complications:

- Perform medication review and reconciliation
- Prescribe, administer and monitor the impact of high-risk medicines according to best practice clinical guidelines.

The National Safety and Quality Health Service (NSQHS) Standards (second edition), in particular the Comprehensive Care Standard[6], 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.

# DIAGNOSTIC GROUP 1: MEDICATION-RELATED RESPIRATORY COMPLICATIONS/ RESPIRATORY DEPRESSION

Respiratory depression and complications from inappropriate dosing and management of sedatives or narcotic medications are serious health concerns. Drowsiness, confusion, myoclonic jerking, and hallucinations may precede the onset of respiratory depression, and hypoxic brain injury and death may result from inappropriate dosing of these medications.

Narcotics and sedatives are recognised as high-risk medicines.[4,5] These medications carry significant risks of complications, including death, when administered in inappropriately high doses.[6]

Pain management and sedation are routine events in hospital and are part of good care. However, there are risks that these routine events may lead to serious hospital-acquired complications when the following medication-related errors occur:

- Doses titrated inappropriately for clinical requirement
- Lack of awareness of appropriate conversions between medications
- Variations between formulations in the strength and duration of action
- Staff inappropriately skilled in sedation resuscitation
- Incorrect or incomplete drug reversal management.[6]

# Top tips for prevention and management of medication-related respiratory depression

The following provides key points for clinicians to consider to avoid this hospital-acquired complication

## Conduct risk assessment

Conduct a comprehensive risk assessment.

Identify key risk factors such as:
- Impaired renal or hepatic function
- Age over 55 years
- History of COPD with $CO_2$ retention
- Polypharmacy with agents that compromise renal or hepatic function
- Severely compromised status of health
- Smoker (>20 pack years)
- History of daytime somnolence or snoring
- Prolonged surgery (>2 hours)
- Thoracic or other large incision interfering with adequate ventilation.

**For a patient at risk, develop a prevention plan as part of a comprehensive care plan**

## Develop prevention plan

Clinicians, patients and carers develop an individualised, comprehensive prevention plan to prevent medication-related respiratory depression that identifies:
- Goals of treatment consistent with the patient's values
- Any specific nursing requirements
- Any allied health interventions required
- Observations or physical signs to monitor and determine frequency of monitoring
- Laboratory results to monitor and determine frequency of monitoring
- If specialist assistance is required.

## Deliver prevention plan

Clinicians, patients and carers work in partnership to deliver analgesia and sedation where clinically indicated.

If medication-related respiratory depression occurs, manage patients who have opioid or sedative toxicity according to best-practice guidelines.

## Monitor

- Monitor the effectiveness of strategies to prevent opioid and sedative toxicity
- Review and update the pain management plan if it is not effective or is causing adverse effects
- Engage in reviewing clinical outcomes, identifying gaps and opportunities for improvement.

# Clinical governance structures and quality-improvement processes

## to support best practice in preventing and managing medication-related respiratory depression

> Health service organisations need to ensure systems are in place to prevent respiratory depression 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.

| | |
|---|---|
| **Policies, procedures and/or protocols** | Health service organisations ensure policies, procedures and/or protocols for analgesia and sedation are consistent with national evidence-based guidelines and legislation. **(1.27, 5.1a)** |
| **Identification of key individuals/ governance groups** | Health service organisations identify an individual or a governance group (such as Drug and Therapeutics Committee) that is:<br>• Responsible for monitoring compliance with the organisation's analgesia and sedation policies, procedures and protocols **(1.7b, 5.2a)**<br>• Responsible for presenting data on the performance of pain management and sedation systems to the governing body. **(1.9, 5.2c)** |
| **Prescribing policies** | Health service organisations:<br>• Consider policies to limit authority to prescribe high-strength opiates (such as fentanyl and hydromorphone) to staff of appropriate seniority or experience; for example, particular specialist groups such as Palliative Care, Anaesthetics and Intensive Care **(4.1a)**<br>• Consider an opioid stewardship program. **(4.15)** |
| **Information technology** | Health service organisations consider electronic medication management systems. **(1.16, 4.1, 4.2)** |
| **Training requirements** | Health service organisations:<br>• Identify workforce training requirements **(4.1c)**<br>• Train relevant staff on the use of analgesics and sedatives **(4.1c)**<br>• Ensure workforce proficiency is maintained. **(4.2)** |

| | |
|---|---|
| **Monitoring the delivery of prophylaxis and care** | Health service organisations ensure mechanisms are in place to:<br><br>• Report medication complications **(4.9)**<br><br>• Manage risks associated with analgesia and sedation **(4.1b)**<br><br>• Identify performance measures and the format and frequency of reporting **(1.9)**<br><br>• Set performance measurement goals **(1.8)**<br><br>• Collect data on compliance with policies and protocols **(1.7b)**<br><br>• Collect data on incidence and severity of medication-related respiratory complications **(4.8)**<br><br>• Provide timely feedback and outcomes data to staff. **(1.9b, 4.2c)** |
| **Quality-improvement activities** | Health service organisations:<br><br>• Implement and evaluate quality-improvement strategies to reduce the frequency and harm from complications of analgesic and sedative use **(4.2)**<br><br>• Use audits of patient clinical records and other data to:<br><br>  – identify opportunities for improving medication review and reconciliation plans **(4.2)**<br><br>  – monitor the overall effectiveness of systems for prevention and management of medication-related respiratory depression **(1.11g, 1.13c, 1.14g)**<br><br>• Use audits of patient clinical records, transfer and discharge documentation and other data to:<br><br>  – identify opportunities for improving analgesic and sedative prescribing and administration (such as audit of junior medical officers' opioid prescribing and feedback to individuals) **(4.2)**<br><br>  – assess compliance with analgesic and sedation protocols **(4.2)**<br><br>  – identify strategies to improve the use and effectiveness of analgesic and sedation protocols. **(4.2)** |
| **Equipment and devices** | Health service organisations facilitate access to equipment and devices for the safe delivery of analgesics and sedatives, such as patient-controlled analgesia pumps. **(1.29b)** |

# Developing the patient's comprehensive care plan

**to support best practice in prevention and management of medication-related respiratory depression**

> Clinicians should partner 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 medication-related respiratory depression** | Clinicians identify risk factors for medication-related respiratory depression, including:<br><br>• Impaired renal or hepatic function<br>• Age over 55 years<br>• History of COPD with CO2 retention<br>• Polypharmacy with agents that compromise renal or hepatic function<br>• Severely compromised status of health<br>• Smoker (>20 pack years)<br>• History of daytime somnolence or snoring<br>• Prolonged surgery (>2 hours)<br>• Thoracic or other large incision interfering with adequate ventilation. |
| **Clinical assessment** | Clinicians routinely monitor physiological observations; for example, respiratory rate, oxygen saturation.<br><br>Clinicians comprehensively assess:<br><br>• Conditions<br>• Risk factors<br>• Medication use, history and allergies.<br><br>Clinicians document risks in clinical record. |
| **Informing patients with a high risk** | Clinicians provide information for patients at high risk and their carers about signs of opioid toxicity and escalation processes. |
| **Collaborating and working as a team** | Medical, nursing, pharmacy and allied health staff work collaboratively to perform clinical assessment. |
| **Documenting and communicating the care plan** | Clinicians document in the clinical record and communicate the findings of the clinical assessment process. |

# Delivering comprehensive care to prevent and manage medication-related respiratory depression

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

| | |
|---|---|
| **Collaborating and working as a team** | Medical, nursing, pharmacy and allied health staff work collaboratively to deliver analgesia and sedation. |
| **Delivering analgesia and sedation in partnership with patients and carers** | Clinicians, patients and carers work in partnership to use the comprehensive care plan to deliver analgesia and sedation where clinically indicated. |
| **Delivering management in partnership** | Clinicians, patients and carers work in partnership to manage patients who have opioid or sedative toxicity according to best-practice guidelines. |
| **Monitoring and improving care** | Clinicians should:<br>• Monitor the effectiveness of strategies to prevent opioid and sedative toxicity<br>• Review and update the pain management plan if it is not effective or is causing adverse effects<br>• Engage in reviewing clinical outcomes, identifying gaps and opportunities for improvement. |

# Minimising specific patient harm

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

| | |
|---|---|
| **Hydration** | Clinicians should ensure the fluid requirements of the patient are planned, delivered and adjusted as appropriate and the patient's intake is monitored to prevent acute kidney injury which may impact opioid metabolism. |

# DIAGNOSTIC GROUP 2: HAEMORRHAGIC DISORDER DUE TO CIRCULATING ANTICOAGULANTS

Haemorrhagic disorder due to inappropriate dosing of anticoagulants can lead to excessive bruising or catastrophic bleeding in the form of localised haemorrhage, haematemesis, haemoptysis, malaena, and epistaxis, and may lead to circulatory collapse, shock, and even death. While anticoagulant overdose itself has no immediate clinical signs, the resulting sequelae of catastrophic bleeding and haemorrhage can occur in the context of common 'low-risk' surgical procedures (such as colonoscopy or dental extraction), accidental falls (such as intracranial haemorrhage) or existing comorbidities (such as gastrointestinal bleeding).

Anticoagulants are recognised as high-risk medicines.[4,5] The multiple indications and frequency of use of anticoagulants increase the risk of complications. These complications may be due to:

- Inappropriate prescribing, including duplication of anticoagulation prescribing
- Incorrect administration
- Inadequate monitoring
- Infuser malfunction.[7]

# Top tips for prevention and management of haemorrhagic disorder due to circulating anticoagulants

The following provides key points for clinicians to consider to avoid this hospital-acquired complication

## Conduct risk assessment

- Conduct a comprehensive risk assessment
- Identify risk factors such as:
  - Impaired renal or hepatic function
  - Coagulopathies or bleeding history (patient or family)
  - Recent bleeding (within 48 hours) or active bleeding
  - Comorbidities including history of hypertension or stroke
  - Active peptic ulcer or ulcerative gastrointestinal disease
  - Polypharmacy with interactions and incompatibilities
  - Concurrent use of other medicines known to increase the risk of bleeding (such as aspirin, non-steroidal anti-inflammatory drugs, clopidogrel, dipyridamole, enoxaparin, warfarin, dabigatran, rivaroxaban, apixaban) or to alter the metabolism of anticoagulants
  - History of heparin-induced thrombocytopaenia
  - Surgical procedure with high bleeding risk, such as intracranial surgery, head and neck surgery.

### For a patient at risk, develop a prevention plan as part of a comprehensive care plan

## Develop prevention plan

Clinicians, patients and carers develop an individualised, comprehensive prevention plan to prevent haemorrhagic disorder due to circulating anticoagulants that identifies:

- Goals of treatment consistent with the patient's values
- Any specific nursing requirements
- Any allied health interventions required
- Observations or physical signs to monitor and determine frequency of monitoring
- Laboratory results to monitor and determine frequency of monitoring
- If specialist assistance is required.

## Deliver prevention plan

- Clinicians, patients and carers work in partnership to deliver anticoagulation and VTE prophylaxis where clinically indicated
- Patients who experience a bleed are managed according to best-practice guidelines.

## Monitor

- Monitor the effectiveness of strategies to prevent excessive anticoagulation
- Review and update the anticoagulation plan if it is not effective or is causing adverse effects
- Engage in reviewing clinical outcomes, identifying gaps and opportunities for improvement
- Ensure appropriate follow-up has been attended.

# Clinical governance structures and quality-improvement processes

## to support best practice in preventing and managing haemorrhage due to circulating anticoagulants

> Health service organisations need to ensure systems are in place to prevent haemorrhage due to circulating anticoagulants 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.

| | |
|---|---|
| **Policies, procedures and/or protocols** | Health service organisations ensure policies, procedures and/or protocols for anticoagulation and VTE prophylaxis are consistent with national evidence-based guidelines. **(1.27, 5.1a)** |
| **Identify key individuals/ governance groups** | Health service organisations identify an individual or a governance group (such as Drug and Therapeutics Committee) that is:<br>• Responsible for monitoring compliance with the organisation's anticoagulation and VTE prophylaxis, procedures and protocols **(1.7b, 5.2a)**<br>• Responsible for presenting data on the performance of anticoagulation and VTE prophylaxis systems to the governing body. **(1.9, 5.2c)** |
| **Training requirements** | Health service organisations:<br>• Identify workforce training requirements **(1.20a)**<br>• Train relevant workforce on the use of anticoagulation and VTE prophylaxis **(1.20b, 1.20c)**<br>• Ensure workforce proficiency is maintained. **(1.20d, 1.22, 1.28b)** |
| **Monitoring the delivery of prophylaxis and care** | Health service organisations ensure mechanisms are in place to:<br>• Report medication complications **(1.9, 5.2)**<br>• Manage risks associated with anticoagulation and VTE prophylaxis **(5.1b)**<br>• Identify performance measures and the format and frequency of reporting **(1.8a)**<br>• Set performance measurement goals **(1.7b)**<br>• Collect data on compliance with policies and protocols **(1.7b)**<br>• Collect data on incidence and severity of haemorrhage due to circulating anticoagulants **(1.8, 5.2)**<br>• Provide timely feedback and outcomes data to staff. **(1.9)** |

| **Quality-improvement activities** | Health service organisations: |
|---|---|
| | • Implement and evaluate quality-improvement strategies to reduce the frequency and harm from complications of anticoagulants **(5.2)** |
| | • Use audits of patient clinical records and other data to: |
| |   – identify opportunities for improving medication review and reconciliation plans **(5.2)** |
| |   – monitor the overall effectiveness of systems for prevention and management of haemorrhage due to circulating anticoagulants **(5.2)** |
| | • Use audits of patient clinical records, transfer and discharge documentation and other data to: |
| |   – identify opportunities for improving anticoagulation and VTE prophylaxis prescribing and administration (such as audit of VTE prophylaxis and anticoagulant prescribing and feedback to individual clinicians) **(5.2)** |
| |   – assess compliance with anticoagulation and VTE prophylaxis protocols **(5.2)** |
| |   – identify strategies to improve the use and effectiveness of anticoagulation and VTE prophylaxis protocols. **(5.2)** |
| **Equipment and devices** | Health service organisations facilitate access to equipment and devices for the safe delivery of anticoagulants, such as infusion pumps. **(1.29b)** |
| **Information technology** | Consider electronic medication management systems. **(1.16, 4.1, 4.2)** |

# Developing the patient's comprehensive care plan

**to support best practice in preventing and managing haemorrhage due to circulating anticoagulants**

> Clinicians should partner 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 bleeding risk factors** | Clinicians identify risk factors for bleeding which include:<br>• Impaired renal or hepatic function<br>• Coagulopathies or bleeding history (patient or family)<br>• Recent bleeding (within 48 hours) or active bleeding<br>• Comorbidities including history of hypertension or stroke<br>• Active peptic ulcer or ulcerative gastrointestinal disease<br>• Polypharmacy with interactions and incompatibilities<br>• Concurrent use of other medicines known to increase the risk of bleeding (such as aspirin, non-steroidal anti-inflammatory drugs, clopidogrel, dipyridamole, enoxaparin, warfarin, dabigatran, rivaroxaban, apixaban) or to alter the metabolism of anticoagulants<br>• History of heparin-induced thrombocytopaenia<br>• Surgical procedure with high bleeding risk, such as intracranial surgery, head and neck surgery. |
| **Clinical assessment** | Clinicians comprehensively assess:<br>• Conditions<br>• Bleeding risk<br>• Medication use, history and allergies<br>• Cognition.<br>Clinicians document risks in clinical record. |
| **Informing patients with a high risk** | Clinicians provide information about signs of haemorrhage and escalation processes to high-risk patients and their carers. |
| **Collaborating and working as a team** | Medical, nursing, pharmacy and allied health staff work collaboratively to perform clinical assessment. |
| **Documenting and communicating the care plan** | Clinicians document in the clinical record and communicate the findings of the clinical assessment process. |

# Delivering comprehensive care

**to prevent and manage haemorrhage due to circulating anticoagulants**

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

| | |
|---|---|
| **Collaborating and working as a team** | Medical, nursing, pharmacy and allied health staff work collaboratively to deliver anticoagulation and VTE prophylaxis. |
| **Delivering anticoagulation and VTE prophylaxis in partnership with patients and carers** | Clinicians work in partnership with patients and carers to use the comprehensive care plan to deliver anticoagulation and VTE prophylaxis where clinically indicated. |
| **Delivering management in partnership** | Clinicians work in partnership with patients and carers work to ensure patients who experience a bleed are managed according to best-practice guidelines. |
| **Monitoring and improving care** | Clinicians should:<br>• Monitor the effectiveness of strategies to prevent excessive anticoagulation<br>• Review and update the anticoagulation plan if it is not effective or is causing adverse effects<br>• Engage in reviewing clinical outcomes, identifying gaps and opportunities for improvement<br>• Ensure appropriate follow up has been attended. |

# DIAGNOSTIC GROUP 3: HYPOGLYCAEMIA

The high prevalence of diabetes in our communities and hospitals, changes to oral intake during hospitalisation and the narrow therapeutic index of some hypoglycaemic agents predispose patients to hypoglycaemia. Hypoglycaemia causes symptoms such as anxiety, dizziness, nausea or vomiting, seizures and coma.[8]

Insulin and oral hypoglycaemics are recognised as high-risk medicines.[4,5]

Hospital-related factors, such as fasting for surgery or investigations, appetite fluctuations due to nausea and vomiting, and other changes to daily routines while in hospital, can all affect blood glucose levels. This can lead to potential complications. Errors such as dose omissions, over-dosage, or wrong-rate errors have also commonly been cited as some of the causes of complications related to insulin usage and resulting hypoglycaemia.[9]

# Top tips for prevention and management of hypoglycaemia

The following provides key points for clinicians to consider to avoid this hospital-acquired complication

## Conduct risk assessment

Conduct a comprehensive risk assessment.

Identify key risk factors such as:
- Illness that impacts on glycaemic activity and metabolism
- Comorbidities or treatment plans that impact on oral intake
  - pre-procedure/investigation fasting
  - emetigenic medications
  - emetigenic treatments (such as radiation)
- Polypharmacy with interactions and incompatibilities.

**For a patient at risk, develop a prevention plan as part of a comprehensive care plan**

## Develop prevention plan

Clinicians, patients and carers develop an individualised, comprehensive prevention plan to prevent hypoglycaemia that identifies:
- Goals of treatment consistent with the patient's values
- Any specific nursing requirements
- Any allied health interventions required
- Observations or physical signs to monitor and determine frequency of monitoring
- Laboratory results to monitor and determine frequency of monitoring
- If specialist assistance is required.

## Deliver prevention plan

- Clinicians, patients and carers work in partnership to deliver a comprehensive care plan to deliver optimal blood glucose management
- Manage patients who experience hypoglycaemia according to best-practice guidelines.

## Monitor

- Monitor the effectiveness of strategies to maintain optimal blood glucose control
- Review and update the diabetes management plan if it is not effective or is causing adverse effects
- Engage in reviewing clinical outcomes, identifying gaps and opportunities for improvement
- Ensure the patient is referred for appropriate support services.

# Clinical governance structures and quality-improvement processes

## to support best practice in preventing and managing hypoglycaemia

> Health service organisations need to ensure systems are in place to prevent hypoglycaemia 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.

| | |
|---|---|
| **Policies, procedures and/or protocols** | Health service organisations ensure policies, procedures and/or protocols for blood glucose management are consistent with national evidence-based guidelines. **(1.27, 5.1a)** |
| **Identification of key individuals/ governance groups** | Health service organisations identify an individual or a governance group (such as Drug and Therapeutics Committee) that is:<br>• Responsible for monitoring compliance with the organisation's policies, procedures and protocols regarding blood glucose management / insulins and oral hypoglycaemics **(1.7b, 5.2a)**<br>• Responsible for presenting data on the performance of blood glucose management systems to the governing body. **(1.9, 5.2c)** |
| **Training requirements** | Health service organisations:<br>• Identify staff training requirements **(1.20a)**<br>• Train relevant staff on the monitoring of blood glucose levels and the use of insulins and oral hypoglycaemics **(1.20b, 1.20c)**<br>• Ensure workforce proficiency is maintained. **(1.20d, 1.22, 1.28b)** |
| **Monitoring the delivery of blood glucose management** | Health service organisations ensure mechanisms are in place to:<br>• Report medication complications **(1.9, 5.2)**<br>• Manage risks associated with insulins and oral hypoglycaemics **(5.1b)**<br>• Identify performance measures and the format and frequency of reporting **(1.8a)**<br>• Set performance measurement goals **(1.7b)**<br>• Collect data on compliance with policies and protocols **(1.7b)**<br>• Collect data on incidence and severity of hypoglycaemic complications **(1.8, 5.2)**<br>• Provide timely feedback and outcomes data to staff. **(1.9)** |

| Quality-improvement activities | Health service organisations: |
|---|---|

Health service organisations:

- Implement and evaluate quality-improvement strategies to reduce the frequency and harm from use of hypoglycaemic agents **(5.2)**
- Use audits of patient clinical records and other data to:
  - identify opportunities for improving medication review and reconciliation plans **(5.2)**
  - monitor the overall effectiveness of systems for blood glucose management **(5.2)**
- Use audits of patient clinical records, transfer and discharge documentation and other data to:
  - identify opportunities for improving insulin and oral hypoglycaemic prescribing and administration (such as audit insulin and oral hypoglycaemic prescribing, completion of insulin/diabetes management/blood glucose management charts and feedback to individuals) **(5.2)**
  - assess compliance with blood glucose management/insulin and oral hypoglycaemic protocols **(5.2)**
  - identify strategies to improve the use and effectiveness of blood glucose management/insulin and oral hypoglycaemic protocols. **(5.2)**

**Equipment and devices**

Health service organisations facilitate access to equipment and devices for the safe delivery of insulin, such as infusion pumps. **(1.29b)**



# Developing the patient's comprehensive care plan

**to support best practice in preventing and managing hypoglycaemia**

> Clinicians should partner 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 hypoglycaemia**

Clinicians identify risk factors for hypoglycaemia which include:

- Illness that impacts on glycaemic activity and metabolism
- Comorbidities or treatment plans that impact on oral intake:
  - pre-procedure / investigation fasting
  - emetigenic medications
  - emetigenic treatments (such as radiation)
- Polypharmacy with interactions and incompatibilities.

**Clinical assessment**

Clinicians comprehensively assess:

- Conditions
- Risk factors
- Medication use, history and allergies
- Cognition in the older patient.

Clinicians document risks in clinical record.

| **Informing patients with a high risk** | Clinicians provide information about signs of hypoglycaemia and escalation processes to high-risk patients and their carers. |
|---|---|
| **Collaborating and working as a team** | Medical, nursing, pharmacy and allied health staff work collaboratively to perform clinical assessment. |
| **Documenting and communicating the care plan** | Clinicians document in the clinical record and communicate:<br>• The findings of the clinical assessment process<br>• The planned frequency of blood glucose management. |

# Delivering comprehensive care

## to prevent and manage medicine-related hypoglycaemia

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

| **Collaborating and working as a team** | Medical, nursing, pharmacy and allied health staff work collaboratively to deliver blood glucose management. |
|---|---|
| **Delivering blood glucose management in partnership with patients and carers** | Clinicians work in partnership with patients and carers to use the comprehensive care plan to deliver optimal blood glucose management. |
| **Delivering management in partnership** | Clinicians work in partnership with patients and carers to ensure patients who experience hypoglycaemia are managed according to best-practice guidelines. |
| **Monitoring and improving care** | Clinicians should:<br>• Monitor the effectiveness of strategies to maintain optimal blood glucose control<br>• Review and update the diabetes management plan if it is not effective or is causing adverse effects<br>• Engage in reviewing clinical outcomes, identifying gaps and opportunities for improvement<br>• Ensure the patient is referred for appropriate support services. |
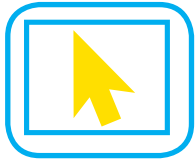
# Additional resources

## Medication Complications

Australian Commission on Safety and Quality in Health Care. Medication safety and quality education and training. ☐

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ISMP Canada. Enhancing Safety with Unfractionated Heparin: A National and International Area of Focus. ☑ ISMP Canada Safety Bulletin. 2008 July 25; 8(5).

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Purdue University PharmaTAP. Anticoagulant Toolkit: Reducing Adverse Drug Events & Potential Adverse Drug Events with Unfractionated Heparin, Low Molecular Weight Heparins and Warfarin. ☑ Indianapolis, IN: Purdue University; 2008.

Scottish Intercollegiate Guidelines Network. Prevention and management of venous thromboembolism: A national clinical guideline. ☑ Edinburgh: Healthcare Improvement Scotland; 2010.

### Hypoglycaemia

Canadian Patient Safety Institute. Altered Blood Glucose. ☑

ISMP Canada. Insulin Errors. ☑ ISMP Canada Safety Bulletin. 2003; 3(4).

Stanisstreet D, Walden E, Jones C, Graveling A. The Hospital Management of Hypoglycaemia in Adults with Diabetes Mellitus. ☑ London: NHS; 2010.

## 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.

# References

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# 11 Delirium

**Selected best practices and suggestions for improvement for clinicians and health system managers**

Hospital-Acquired Complication **11**

# DELIRIUM

| | HOSPITAL-ACQUIRED COMPLICATION | RATE[a] |
|---|---|---|
| 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[b] |
| 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

Delirium refers to a hospital-acquired confusional state that may be fluctuating or acute.[*]

# Why focus on delirium?

Each year, patients in Australian public hospitals experience more than 22,700 recognised episodes of delirium.[1] Delirium is an acute change in mental status that is common among older patients in hospital.[2] Delirium is a serious condition that is associated with increased mortality[3-5] and significant morbidity that may precipitate long-term cognitive decline[6,7] and premature entry to residential care.[8] However, delirium is poorly recognised, both in Australian hospitals[3-5,9] and internationally.[10,11]

Symptoms of delirium are distressing for patients and their carers. They include confusion, hallucinations, anxiety, fear or paranoia, irritability or frustration, rapid and unpredictable mood changes, sleeplessness and restlessness and agitation, or sleepiness, sluggishness and apathy. Symptoms fluctuate in the course of the day and may worsen in the evening or into the night.

The rate of hospital-acquired delirium in Australian hospitals was 51 per 10,000 hospitalisations in 2015–16.[1] Hospital-acquired delirium prolongs the length of hospitalisation, which impacts on patients and their families. Hospital-acquired delirium also 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.[12] While there is an increased financial cost, the most significant cost is the pain and discomfort experienced by the patient.

Prevention is the most effective strategy, but outcomes for patients with delirium can also be improved by early recognition and intervention. Significant reductions in delirium rates are being achieved in some hospitals through preventive initiatives.[4] The rate for delirium at Principal Referral Hospitals[†] was 61 per 10,000 hospitalisations in 2015–16. If all Principal Referral Hospitals above this rate reduced their rate to 61 per 10,000 hospitalisations, then 3,870 episodes of delirium during hospitalisation in these hospitals would have been prevented, and more when other types of facilities are considered.

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[*]   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 ⧉.

[†]   Hospitals were classified in the Principal Referral Hospitals peer group for these purposes according to the Australian Institute of Health and Welfare's former definition of major city hospitals with more than 20,000 acute weighted separations and regional hospitals with more than 16,000 acute weighted separations.

# What is considered best practice for preventing delirium?

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 delirium:

- Has systems for delirium risk identification, prevention and management that are consistent with best-practice guidelines
- Ensures that equipment and devices, such as low-rise beds, call bells and clocks, are available to decrease the risk and effectively manage delirium.

**Clinicians** caring for patients at risk of delirium:

- Conduct cognitive and delirium risk screening in accordance with best practice time frames and frequency
- Provide delirium prevention 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[13], 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.

# Top tips for prevention and management of delirium

The following provides key points for clinicians to consider to avoid this hospital-acquired complication

## Conduct risk assessment

- Conduct a comprehensive risk assessment.
- Identify key risk factors such as:
  - Pre-existing cognitive impairment and/or dementia
  - Aged ≥ 65 years (≥45 years for Aboriginal and Torres Strait Islander peoples)
  - Severe medical illness
  - Hip fracture.

▼

**For a patient at risk, develop a prevention plan as part of a comprehensive care plan**

▼

## Develop prevention plan

Clinicians, patients and carers develop an individualised, comprehensive prevention plan to prevent delirium that identifies:

- Goals of treatment consistent with the patient's values
- Any specific nursing requirements , including equipment needs
- Any allied health interventions required, including equipment needs
- Observations or physical signs to monitor and determine frequency of monitoring
- Laboratory results to monitor and determine frequency of monitoring
- If specialist assistance is required.

▼

## Deliver prevention plan

Where clinically indicated, deliver delirium prevention strategies, such as:

- Regular monitoring for changes in behaviour, cognition and physical condition
- Medication review, including review of antipsychotics, as there is evidence that using antipsychotics can worsen delirium
- Activities for stimulating cognition
- Non-drug measures to help promote sleep
- Assistance for patients who usually wear hearing and visual aids
- Correction of dehydration, malnutrition and constipation
- Mobility activities
- Oxygen therapy where appropriate
- Pain assessment and management
- Regular reorientation and reassurance.

▼

## Monitor

- Monitor the effectiveness of the delirium prevention strategies, and reassess the patient if delirium 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
- Follow up patients regarding resolution of delirium, the emergence of ongoing cognitive impairment and other comorbidities.

# Clinical governance structures and quality-improvement processes

**to support best practice in delirium prevention and management**

> Health service organisations need to ensure systems are in place to identify patients at risk, prevent delirium and appropriately care for patients who develop delirium 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.

| | |
|---|---|
| **Policies, procedures and/or protocols** | Health service organisations:<br>• Ensure policies, procedures and/or protocols are consistent with national evidence-based guidelines for the risk assessment, prevention and management of delirium. **(5.1a)** |
| **Best-practice screening, assessment and management** | Health service organisations:<br>• Agree on the process and criteria for cognitive screening and delirium assessment using validated tools **(5.7)**<br>• Inform the clinical workforce of screening and assessment requirements **(5.1c)**<br>• Identify a format for prevention plans for high-risk patients **(5.29)**<br>• Identify a management plan format for patients with delirium. **(5.13)** |
| **Identification of key individuals/ governance groups** | Health service organisations identify an individual or a governance group that is responsible for:<br>• Monitoring compliance with the organisation's delirium policies, procedures and protocols **(1.7c)**<br>• Presenting data on the performance of delirium prevention and management systems to the governing body. **(1.25, 1.6)** |
| **Training requirements** | Health service organisations:<br>• Identify workforce training requirements **(1.20a, 5.1c)**<br>• Train relevant workers in the use of screening and delirium assessment tools, prevention plans and delirium management plans **(1.20b, 1.20c, 5.1c)**<br>• Ensure workforce proficiency is maintained. **(1.20, 1.22, 1.28b, 5.2)** |

| Monitoring the delivery of prophylaxis and care | Health service organisations ensure mechanisms are in place to: |
|---|---|
| | • Report delirium **(1.9, 5.2c)** |
| | • Manage risks associated with delirium **(5.1b, 5.30)** |
| | • Identify performance measures and the format and frequency of reporting **(1.8a)** |
| | • Set performance measure goals **(1.8a)** |
| | • Collect data on compliance with policies **(1.7b)** |
| | • Collect data about risk identification, cognitive screening and delirium assessment, including whether those activities are leading to appropriate action **(5.1b, 5.2)** |
| | • Identify gaps in systems for delirium prevention and management (**5.2**) |
| | • Collect data on incidence of delirium **(1.11, 5.2)** |
| | • Provide timely feedback and outcomes data to staff. **(1.9)** |

| Quality-improvement activities | Health service organisations: |
|---|---|
| | • Implement and evaluate quality-improvement strategies for the early identification of at-risk patients and patients with delirium and to reduce the frequency and duration of delirium **(1.8, 5.2a, 5.2b)** |
| | • Use audits of patient clinical records and other data to: |
| |   – identify opportunities for improving delirium prevention plans **(5.2)** |
| |   – identify gaps and opportunities to improve the use of delirium prevention plans **(5.2)** |
| |   – monitor the overall effectiveness of your systems for prevention and management of delirium **(1.11g, 1.13c, 1.14g)** |
| | • Use audits of patient clinical records, transfer and discharge documentation and other data to: |
| |   – identify opportunities for improving delirium management plans **(5.2)** |
| |   – assess compliance with delirium management plan requirements **(5.2)** |
| |   – identify strategies to improve the use and effectiveness of delirium management plans. **(5.2)** |

| Environment | Health service organisations facilitate access to an appropriate environment for the prevention and management of delirium. **(1.29b)** |
|---|---|

# Developing the patient's comprehensive care plan

**to support best practice in delirium prevention and management**

> Clinicians should partner 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 key risk factors for delirium** | Clinicians identify key risk factors associated with delirium:[2,3,14-16]<br><br>• Pre-existing cognitive impairment and/or dementia<br>• Aged ≥ 65 years (≥45 years for Aboriginal and Torres Strait Islander people)<br>• Severe medical illness<br>• Hip fracture. |
| **Implement risk assessment screening** | Appropriately trained clinicians use validated screening and assessment processes at presentation to identify cognitive impairment and assess for delirium and requirements for prevention strategies.[14] This should be attended for all patients identified with the risk factors above. |
| **Clinical assessment** | Clinicians comprehensively assess:<br><br>• Conditions<br>• Medications<br>• Cognition<br>• Risks identified through screening process.<br><br>Clinicians document risks in the clinical record. |
| **Informing patients with a high risk or with delirium** | Clinicians provide information for patients with high risk and their carers about delirium prevention and management. |
| **Planning in partnership with patients and carers** | Clinicians inform patients, family and carers about the purpose and process of developing a delirium prevention and management plan and invite them to be involved in its development. |
| **Collaborating and working as a team** | Medical, nursing, pharmacy and allied health staff work collaboratively to perform delirium risk identification cognitive screening, delirium assessment and clinical assessment. |
| **Documenting and communicating the care plan** | Clinicians document in the clinical record and communicate:<br><br>• The findings of the screening and assessment process<br>• The findings of the clinical assessment process<br>• The delirium prevention and management plan. |

# Delivering comprehensive care

## to prevent and manage delirium

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

| | |
|---|---|
| **Collaborating and working as a team** | Medical, nursing, pharmacy and allied health staff work collaboratively to deliver delirium prevention and management. |

**Delivering delirium prevention strategies in partnership with patients and carers**

- Clinicians work in partnership with patients and carers to use the comprehensive care plan to deliver delirium prevention strategies where clinically indicated; for example, identifying and managing the underlying causes including:
  - regular monitoring for changes in behaviour, cognition and physical condition
  - medication review, including review of antipsychotics, as there is evidence that using antipsychotics can worsen delirium[17]
  - activities for stimulating cognition
  - non-drug measures to help promote sleep
  - assistance for patients who usually wear hearing and visual aids
  - correction of dehydration, malnutrition and constipation
  - mobility activities
  - oxygen therapy where appropriate
  - pain assessment and management
  - regular reorientation and reassurance.

  These strategies can also apply for people who have delirium.

- Clinicians undertake regular cognitive screening and, if required, delirium assessment for patients who are at risk (reassess, monitor and document).

**Delivering delirium management in partnership**

Clinicians work in partnership with patients and carers to ensure patients who develop delirium are managed according to best-practice guidelines/clinical care standards. This includes developing an individualised care plan in collaboration with the patient, carer and the patient's GP, that describes ongoing care required after the patient leaves hospital.

**Monitoring and improving care**

Clinicians:
- Monitor the effectiveness of these strategies in preventing and/or managing delirium
- 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
- Follow up patients regarding resolution of delirium, the emergence of ongoing cognitive impairment and other comorbidities.
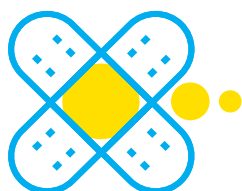
# Minimising specific patient harm

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

- Falls
- Dehydration
- Aggression and violence
- Restrictive practices, including restraint and seclusion.
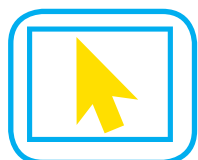
# Additional resources

Australian Commission on Safety and Quality in Health Care. Delirium Clinical Care Standard. ☑ Sydney: ACSQHC; 2016.

Australian Commission on Safety and Quality in Health Care. A better way to care: Safe and high-quality care for patients with cognitive impairment (dementia and delirium) in hospital – Actions for health service managers. ☑ Sydney: ACSHQC; 2014.

Australian Commission on Safety and Quality in Health Care. A better way to care: Safe and high-quality care for patients with cognitive impairment (dementia and delirium) in hospital – Actions for clinicians. ☑ Sydney: ACSHQC; 2014.

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National Institute for Health and Care Excellence. Delirium: prevention, diagnosis and management. ☑ London: NICE; 2010 [updated 2015]; [CG 103].

Australasian Delirium Association. ☑

The Center of Excellence for Delirium in Aging: Research T, and Educational Enhancement (CEDARTREE). Hospital Elder Life Program (HELP) for Prevention of Delirium. ☑

Health Research and Educational Trust. Preventing Iatrogenic – Delirium Change Package: 2017 Update. ☑ Chicago, IL, US2017.

# 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 Hospital Pricing Authority (IHPA) may differ due to the IHPA's methodology, which applies different inclusion/exclusion criteria.

# References

1. Independent Hospital Pricing Authority (AU). Activity Based Funding Admitted Patient Care 2015−16, acute admitted episodes, excluding same day.

2. Clinical Epidemiology and Health Service Evaluation Unit, Melbourne Health. Clinical Practice Guidelines for the Management of Delirium in Older People. Developed by the Clinical Epidemiology and Health Service Evaluation Unit, Melbourne Health in collaboration with the Delirium Clinical Guidelines Expert Working Group Commissioned on behalf of the Australian Health Ministers' Advisory Council (AHMAC), by the AHMAC Health Care of Older Australians Standing Committee (HCOASC). Melbourne: Victorian Government Department of Human Services on behalf of AHMAC; 2006. p. 121.

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7. Inouye SK, Westendorp RGJ, Saczynski JS. Delirium in elderly people. The Lancet.383(9920):911−22.

8. Fong TG, Jones RN, Marcantonio ER, et al. Adverse Outcomes After Hospitalization and Delirium in Persons With Alzheimer Disease Annals of Internal Medicine. 2012;156(12):848-W296

9. Iseli RK, Brand C, Telford M, LoGiudice D. Delirium in elderly general medical inpatients: a prospective study. Intern Med J. 2007;37(12):806−11.

10. Collins N, Blanchard MR, Tookman A, Sampson EL. Detection of delirium in the acute hospital. Age Ageing. 2010;39(1):131−5.

11. Travers C, Byrne G, Pachana N, Klein K, Gray L. Prospective observational study of dementia and delirium in the acute hospital setting. Intern Med J. 2013;43(3):262−9.

12. Independent Hospital Pricing Authority, Pricing and funding for safety and quality − Risk adjustment model for hospital acquired complications − version 3, March 2018, IHPA: Sydney.

13. Australian Commission on Safety and Quality in Health Care. National Safety and Quality Health Service Standards (second edition). Sydney 2017.

14. Ahmed S, Leurent B, Sampson EL. Risk factors for incident delirium among older people in acute hospital medical units: a systematic review and meta-analysis. Age Ageing. 2014;43(3):326−33.

15. Australian Commission on Safety and Quality in Health Care. Delirium Clinical Care Standard. Sydney: ACSQHC; 2016.

16. Australian Commission on Safety and Quality in Health Care. A better way to care: Safe and high-quality care for patients with cognitive impairment (dementia and delirium) in hospital − Actions for clinicians. Sydney: ACSHQC; 2014.

17. Agar MR, Lawlor PG, Quinn S, Draper B, Caplan GA, Rowett D, et al. Efficacy of Oral Risperidone, Haloperidol, or Placebo for Symptoms of Delirium Among Patients in Palliative Care: A Randomized Clinical Trial. JAMA Internal Medicine. 2017;177(1):34−42. Epub 2016/12/06.

# 12 Persistent incontinence

**Selected best practices and suggestions for improvement for clinicians and health system managers**

Hospital-Acquired Complication **12**

# PERSISTENT INCONTINENCE

| | HOSPITAL-ACQUIRED COMPLICATION | RATE[a] |
|---|---|---|
| 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[b] |
| 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

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Persistent incontinence is defined as urinary incontinence that arises during a hospital admission, and which is present on discharge or which persists for seven days or more.*

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# Why focus on persistent incontinence?

Each year, patients in Australia experience more than 3,690 episodes of persistent incontinence.[1]

Persistent urinary incontinence has a significant impact both on those who suffer from it, as well as on people caring for those with the condition.[2] Patients' experiences range from inconvenience to social and psychological stigmatisation, and include physical symptoms such as skin irritation and painful excoriation.

There are many causes of persistent urinary incontinence.[2] While the majority of the factors are associated with natural life circumstances (such as childbirth and menopause) and underlying systemic conditions (such as diabetes, obesity, cardiovascular, multiple sclerosis), there are additional factors which can create or worsen incontinence conditions.[3,4] Many of these factors may arise in the context of hospital-related care, such as postoperative complications following prostate surgery or hysterectomy, constipation, medications (such as antidepressants, oestrogens, diuretics, and sleep medications), infections such as a urinary tract infection, and poor mobility due to surgery for another condition (such as fractured neck of femur).[3,4]

The rate of hospital-acquired persistent incontinence in Australian hospitals was 8.3 per 10,000 hospitalisations in 2015−16.[1] Hospital-acquired persistent incontinence prolongs length of hospitalisation, which impacts on patients and their families. Hospital-acquired persistent incontinence also 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.[5] While there is an increased financial cost, the most significant cost is the pain and discomfort experienced by the patient.

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\*   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 ⬚.

The majority of persistent incontinence can be prevented. Significant reductions in persistent incontinence rates are being achieved in some hospitals by preventive initiatives. The rate of persistent incontinence at Principal Referral Hospitals* was 9.3 per 10,000 hospitalisations. If all Principal Referral Hospitals above this rate reduced their rate to 9.3 per 10,000 hospitalisations, then 838 episodes of persistent incontinence during hospitalisation in these hospitals would have been prevented, and more when other facilities are considered.

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

# What is considered best practice for preventing persistent incontinence?

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 persistent incontinence:

- Has systems for incontinence prevention and management that are consistent with best-practice guidelines
- Ensures that equipment and devices are available to decrease the risk and effectively manage incontinence.

**Clinicians** caring for patients at risk of persistent incontinence:

- Conduct comprehensive continence assessments in accordance with best-practice time frames and frequency
- Provide incontinence prevention 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[6], 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.

# Top tips for prevention and management of persistent incontinence

The following provides key points for clinicians to consider to avoid this hospital-acquired complication

## Conduct risk assessment

Conduct a comprehensive risk assessment

Identify risk factors such as:

- Medicines, such as antidepressants, oestrogens, diuretics and sleep medicines
- Underlying systemic conditions such as diabetes, obesity, cardiovascular, multiple sclerosis
- Infections, such as urinary tract infection
- Postoperative complications following prostate surgery or hysterectomy
- Constipation
- Poor mobility due to surgery, such as fractured neck of femur
- Childbirth
- Menopause

Review other factors such as delirium, polyuria including that from heart failure or hyperglycaemia, faecal impaction, urinary retention, bladder issues and/or toilet access or signage.

▼

**For a patient at risk, develop a prevention plan as part of a comprehensive care plan**

▼

## Develop prevention plan

Clinicians, patients and carers develop an individualised, comprehensive prevention plan to prevent incontinence that identifies:

- Goals of treatment consistent with the patient's values
- Any specific nursing requirements, including equipment needs
- Any allied health interventions required, including equipment needs
- Observations or physical signs to monitor and determine frequency of monitoring
- Laboratory results to monitor and determine frequency of monitoring
- If specialist assistance is required.

▼

## Deliver prevention plan

Where clinically indicated, deliver incontinence prevention strategies, such as:

- Identify and treat reversible causes of incontinence
- Consider carefully the need to insert an indwelling catheter, and aim for earliest safe removal.

▼

## Monitor

- Monitor the effectiveness of incontinence prevention strategies, and reassess the patient if persistent incontinence 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.

# Clinical governance structures and quality-improvement processes

**to support best practice in incontinence prevention and management**

> Health service organisations need to ensure systems are in place to prevent incontinence 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.

| | |
|---|---|
| **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 incontinence. **(1.27, 5.1a)** |
| **Best-practice screening and management** | Health service organisations:<br>• Agree on the process and criteria for incontinence risk screening **(5.7)**<br>• Inform the clinical workforce of screening requirements **(5.1c)**<br>• Identify a format for continence assessments **(5.4)**<br>• Identify a format for prevention plans for high-risk patients **(5.4)**<br><br>Identify a management plan format for patients with incontinence. **(5.12, 5.13)** |
| **Identification of key individuals/ governance groups** | Health service organisations identify an individual or a governance group that is responsible for:<br>• Monitoring compliance with the organisation's continence policies, procedures and protocols **(1.7b, 5.2a)**<br>• Presenting data on the performance of incontinence prevention and management systems to the governing body **(1.9, 5.2c)**<br><br>Overseeing the care of patients at risk of persistent incontinence. **(5.5b)** |
| **Training requirements** | Health service organisations:<br>• Identify workforce training requirements **(1.20a)**<br>• Train relevant staff on the use of risk screening, prevention plans and incontinence management plans **(1.20b, 1.20c)**<br>Ensure workforce proficiency is maintained. **(1.20d, 1.22, 1.28b)** |

| | |
|---|---|
| **Monitoring the delivery of prophylaxis and care** | Health service organisations ensure mechanisms are in place to:<br><br>• Report incontinence **(1.9, 5.2)**<br><br>• Manage risks associated with incontinence prophylaxis and management **(5.1b)**<br><br>• Identify performance measures and the format and frequency of reporting **(1.8a)**<br><br>• Set performance measurement goals **(1.8a)**<br><br>• Collect data on compliance with policies **(1.7b)**<br><br>• Collect data about incontinence risk screening activities, including whether risk assessment is leading to appropriate action **(1.8, 5.1b, 5.2)**<br><br>• Identify gaps in systems for screening patients for incontinence collect data on incidence, prevalence and severity of incontinence **(5.2)**<br><br>• Provide timely feedback and outcomes data to staff. **(1.9)** |
| **Quality-improvement activities** | Health service organisations:<br><br>• Implement and evaluate quality-improvement strategies to reduce the frequency and harm from incontinence **(5.2)**<br><br>• Use audits of patient clinical records and other data to:<br>  – identify opportunities for improving incontinence prevention plans **(5.2)**<br>  – identify gaps and opportunities to improve the use of incontinence prevention plans (such as increasing the number of at-risk patients who have incontinence prevention plans implemented) **(5.2)**<br>  – monitor the overall effectiveness of systems for prevention and management of incontinence. **(5.2)**<br><br>• Use audits of patient clinical records, transfer and discharge documentation and other data to:<br>  – identify opportunities for improving incontinence management plans **(5.2)**<br>  – assess compliance with incontinence management plan requirements **(5.2)**<br>  – identify strategies to improve the use and effectiveness of incontinence management plans. **(5.2)** |
| **Equipment and devices** | Health service organisations facilitate access to equipment and devices for the prevention and management of incontinence. **(1.29b)** |

# Developing the patient's comprehensive care plan

**to support best practice in persistent incontinence prevention and management**

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 incontinence** | Clinicians identify risk factors associated with persistent incontinence which include[3,4]:<br>• Medicines, such as antidepressants, oestrogens, diuretics and sleep medicines<br>• Underlying systemic conditions such as diabetes, obesity, cardiovascular, multiple sclerosis<br>• Infections, such as urinary tract infection<br>• Postoperative complications following prostate surgery or hysterectomy<br>• Constipation<br>• Poor mobility due to surgery, such as fractured neck of femur<br>• Childbirth<br>• Menopause. |
| **Implement risk assessment screening** | Clinicians use relevant screening processes at presentation to assess the risk of incontinence and requirements for prevention strategies. |
| **Clinical assessment** | Clinicians comprehensively assess:<br>• Conditions, including reversible causes:<br>  – delirium<br>  – dementia<br>  – urinary tract infection<br>  – atrophic urethritis and vaginitis<br>  – depression<br>  – polyuria such as from heart failure or hyperglycaemia<br>  – restricted mobility<br>  – faecal impaction.<br><br>Clinicians should also monitor for:<br>• Decreased fluid intake<br>• Urinary retention<br>• Lack of toilet access/poor signage<br>• Whether the patient is completely emptying their bladder, especially if they have a neurological condition<br>• Medicines<br>• Risks identified through screening process.<br><br>Clinicians undertake comprehensive clinical assessment and document in the clinical record. |

| Informing patients with a high risk | Clinicians provide information for patients with high risk and their carers about incontinence prevention and management. |
|---|---|
| Planning in partnership with patients and carers | Clinicians inform patients, family and carers about the purpose and process of developing an incontinence 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 incontinence risk assessment and clinical assessment. |
| Documenting and communicating the care plan | Clinicians document in the clinical record and communicate:<br>• The findings of the risk screening process<br>• The findings of the clinical assessment process<br>• The incontinence prevention plan<br>• If needed, a continence chart can be implemented. |

# Delivering comprehensive care

## to prevent and manage persistent incontinence

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, pharmacy staff and allied health workers collaborate to deliver incontinence prevention and management. |
|---|---|
| Delivering incontinence prevention strategies in partnership with patients and carers | Clinicians work in partnership with patients and carers to use the comprehensive care plan to deliver incontinence prevention strategies where clinically indicated, for example by:<br>• Identifying and treating reversible causes of incontinence<br>• Considering carefully the need to insert an indwelling catheter, and aiming for earliest safe removal<br>• Offering regular toileting opportunities and prompts. |
| Delivering incontinence management in partnership | Clinicians work in partnership with patients and carers to ensure patients who have incontinence are managed according to best-practice guidelines. |

| **Monitoring and improving care** | Clinicians: |
|---|---|

Clinicians:

- Monitor the effectiveness of these strategies in preventing incontinence and reassess the patient if incontinence 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.

# Minimising specific patient harm

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

**Nutrition and hydration**

Ensure the nutritional and fluid requirements of the patient are planned, delivered and adjusted as appropriate, and that the patient's intake and output are monitored.
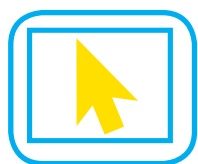
# Additional resources

Continence Foundation of Australia. Key statistics. Melboourne.

Agency for Healthcare Research and Quality. Toolkit for Reducing CAUTI in Hospitals. Rockville, MD (US) Agency for Healthcare Research and Quality; 2017 [updated March 2017].

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Joanna Briggs Institute. Educational interventions to raise men's awareness of bladder and bowel health. Nursing & Health Sciences. 2013;15(1):131–3

Qaseem A, Dallas P, Forciea M, et al. Nonsurgical management of urinary incontinence in women: A clinical practice guideline from the American College of Physicians. Annals of Internal Medicine. 2014; 161(6):[429–40 pp.].

# 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.

# References

1. Independent Hospital Pricing Authority (AU). Activity Based Funding Admitted Patient Care 2015–16, acute admitted episodes, excluding same day.

2. Australian Institute of Health and Welfare. Incontinence in Australia: prevalence, experience and cost 2009. Canberra: AIHW; 2012.

3. Continence Foundation of Australia. Who's at risk? Melbourne (AU) Available from: https://www.continence.org.au/pages/whos-at-risk.html.

4. Palmer MH, Baumgarten M, Langenberg P, Carson JL. Risk factors for hospital-acquired incontinence in elderly female hip fracture patients. The journals of Gerontology Series A, Biological sciences and medical sciences. September 2002 ed2002. p. 672–7.

5. Independent Hospital Pricing Authority, Pricing and funding for safety and quality – Risk adjustment model for hospital acquired complications – version 3, March 2018, IHPA: Sydney.

6. Australian Commission on Safety and Quality in Health Care. National Safety and Quality Health Service Standards (second edition). Sydney 2017.

# 13 Malnutrition

**Selected best practices and suggestions for improvement for clinicians and health system managers**

Hospital-Acquired Complication **13**

# MALNUTRITION

| | HOSPITAL-ACQUIRED COMPLICATION | RATE[a] |
|---|---|---|
| 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[b] |
| 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

Malnutrition is a deficiency of nutrients such as energy, protein, vitamins and minerals, and causes adverse effects on body composition, function or clinical outcome.[1]*

## Why focus on malnutrition?

Each year, patients in Australian hospitals experience over 5,400 episodes of hospital-acquired malnutrition.[2] Malnutrition is both a cause and an effect of ill health.

Malnutrition can develop through a deficiency in dietary intake, from complications associated with illnesses causing poor absorption, such as Crohn's disease and ulcerative colitis; nutrient losses; or as a consequence of increased nutritional requirements of a disease state.[3] The risk of malnutrition becomes more acute for patients as they age[4], and is associated with a range of adverse outcomes including depression of the immune system, impaired wound healing, muscle wasting, longer length of hospital stay, and higher treatment costs and increased mortality.

Malnutrition in the acute hospital setting may be estimated as high as approximately 40% of all admitted patients. Patients may be malnourished on admission or develop malnutrition while in hospital.[5] Nutrition screening is important to identify vulnerable patients who may be at risk of malnutrition, and to enable the commencement of a preventive management plan.

The rate of hospital-acquired malnutrition in Australian hospitals was 12 per 10,000 hospitalisations in 2015–16.[2] Hospital-acquired malnutrition prolongs the length of hospitalisation, which impacts on patients and their families. Hospital-acquired malnutrition also 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.[6] While there is an increased financial cost, the most significant cost is the pain and discomfort experienced by the patient.

*   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 ⬀.

Significant reductions in malnutrition rates are being achieved in some hospitals by suitable preventive initiatives.[5] The rate for malnutrition at Principal Referral Hospitals* was 14 per 10,000 hospitalisations in 2015–16. If all Principal Referral Hospitals above this rate reduced their rate to 14 per 10,000 hospitalisations, then 1,652 episodes of malnutrition during hospitalisation in these hospitals would have been prevented, and more when other facilities are considered.

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

# What is considered best practice for preventing malnutrition?

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 malnutrition:

- Has systems for prevention and management of malnutrition that are consistent with best-practice guidelines
- Ensures that equipment and devices are available to decrease the risk and effectively manage pressure injuries.

**Clinicians** caring for patients at risk of malnutrition:

- Screen for malnutrition and where indicated, conduct comprehensive nutritional status assessments in accordance with best practice time frames and frequency
- Provide malnutrition prevention 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[7], 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.

# Top tips for prevention and management of malnutrition

The following provides key points for clinicians to consider to avoid this hospital-acquired complication

## Conduct risk assessment

- Identify risk factors such as: increased age, frailty and impaired mobility, polypharmacy, oral dysphagia, impaired swallowing, constipation, malabsorption conditions and syndromes, Parkinson's disease, chronic disease, cognitive decline and delirium, dementia, eating dependencies and/or institutionalisation
- Identify patients who are nutritionally at risk, including those who have been admitted to hospital with poor appetites or inadequate food intakes, preceding unexplained or unintentional weight loss, physical difficulty eating and/or drinking, and/or communication difficulties
- Identify patients with high nutritional needs, including those with increased nutritional requirements, those with poor absorptive capacity, some who are malnourished and lactating women.

▼

**For a patient at risk, develop a prevention plan as part of a comprehensive care plan**

▼

## Develop prevention plan

Clinicians, patients and carers develop an individualised, comprehensive prevention plan to prevent malnutrition that identifies:

- Goals of treatment consistent with the patient's values
- Any specific nursing requirements
- Any allied health interventions required
- Observations or physical signs to monitor and determine frequency of monitoring
- Laboratory results to monitor and determine frequency of monitoring
- If specialist assistance is required.

▼

## Deliver prevention plan

Where clinically indicated, deliver malnutrition prevention strategies, such as:

- Social measures to ensure provision of meals
- Help with feeding
- Food and fluid intake records
- Modified menus
- Dietetic advice and oral nutrition supplements and/or artificial nutrition support
- Patient and family input where feasible.

▼

## Monitor

- Monitor the effectiveness of any malnutrition prevent strategies, and reassess the patient if malnutrition 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.

# Clinical governance structures and quality-improvement processes

## to support best practice in prevention and management of malnutrition

> Health service organisations need to ensure systems are in place to prevent malnutrition 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.

| | |
|---|---|
| **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 malnutrition. **(1.27, 1.7, 5.1a)** |
| **Best-practice screening and management** | Health service organisations:<br>• Agree on the process and criteria for malnutrition risk screening **(5.7)**<br>• Inform the clinical workforce of screening requirements **(5.1c)**<br>• Identify a format for nutritional assessments **(5.1a, 5.10)**<br>• Identify a format for prevention plans for high-risk patients **(5.7a)**<br>• Identify a management plan format for patients with malnutrition. **(5.13a, 5.27, 5.28)** |
| **Identification of key individuals/ governance groups** | Health service organisations identify an individual or a governance group that is responsible for:<br>• Monitoring compliance with the organisation's nutrition policies, procedures and protocols **(1.7b, 5.2a)**<br>• Presenting data on the performance of malnutrition prevention and management systems to the governing body **(1.9, 5.2c)**<br>• Overseeing the food services system. **(1.8, 5.5b)** |
| **Training requirements** | Health service organisations:<br>• Identify workforce training requirements **(1.20a)**<br>• Train relevant staff on the use of risk screening, prevention plans and malnutrition management plans **(1.20b, 1.20c)**<br>• Ensure workforce proficiency is maintained. **(1.20d, 1.22, 1.28b)** |

| | |
|---|---|
| **Monitoring the delivery of prophylaxis and care** | Health service organisations ensure mechanisms are in place to: |
| | • Report malnutrition **(1.9, 5.2)** |
| | • Manage risks associated with malnutrition prophylaxis and management **(5.1b)** |
| | • 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 malnutrition risk screening activities, including whether risk assessment is leading to appropriate action **(1.8, 1.11, 5.1b, 5.2)** |
| | • Identify gaps in systems for screening patients for malnutrition, collect data on incidence, prevalence and severity of malnutrition **(5.2)** |
| | • Provide timely feedback and outcomes data to staff. **(1.9)** |
| **Quality-improvement activities** | Health service organisations: |
| | • Implement and evaluate quality-improvement strategies to reduce the frequency and harm from malnutrition **(5.2)** |
| | • Use audits of patient clinical records and other data to: |
| | – identify opportunities for improving nutrition plans **(5.2)** |
| | – identify gaps and opportunities to improve the use of nutrition plans (such as increasing the number of at-risk patients who have nutrition plans implemented) **(5.2)** |
| | – monitor the overall effectiveness of systems for prevention and management of malnutrition. **(5.2)** |
| **Equipment and devices** | Health service organisations facilitate access to equipment and devices for the prevention and management of malnutrition. **(1.29b)** |

# Developing the patient's comprehensive care plan

**to support best practice in malnutrition prevention and management**

> 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 malnutrition

Clinicians should identify risk factors. The following are some key risk factors associated with malnutrition[8]:

- Increased age
- Frailty and impaired mobility
- Oral dysphagia
- Impaired swallowing
- Constipation
- Malabsorption conditions and syndromes
- Parkinson's disease
- Chronic disease
- Cognitive decline and delirium
- Dementia
- Depression
- Eating dependencies
- Institutionalisation.

Patients who are nutritionally at risk include those who have:

- Been admitted to hospital with poor appetites or inadequate food intakes
- Preceding unexplained or unintentional weight loss
- Physical difficulty eating and/or drinking, including poor dentition leading to eating fatigue and lack of interest in food
- Acute or chronic illness or medical treatments affecting appetite and food intake
- Cognitive and communication difficulties, creating difficulties with ordering appropriate food and fluids
- Eaten little or nothing for five days and/or are likely to eat little or nothing for five days or longer.

Patients with high nutritional needs, including:

- Those with increased nutritional requirements, such as due to cachexia, trauma, surgery and/or burns
- Those with poor absorptive capacity, such as short-gut syndrome
- Some who are malnourished
- Lactating women.

| | |
|---|---|
| **Implement risk assessment screening** | Clinicians should use basic screening processes at presentation to assess the risk of malnutrition and identify requirements for further assessment to identify appropriate prevention strategies. For example, screen patients: |
| | • On admission, and then either: |
| | – weekly during the patient's episode of care in an acute facility |
| | – at least monthly in slower stream facilities |
| | – or if the patient's clinical condition changes. |
| | If identified on basic screening as at risk of malnutrition, conduct a comprehensive malnutrition risk-assessment using a validated screening tool to identify patients requiring prevention and management strategies. |
| | Formal nutrition assessment should be undertaken by a Dietician using validated tools such as the: |
| | • Subjective Global Assessment (SGA) Tool |
| | • Mini Nutritional Assessment (MNA) |
| | • Patient Generated Subjective Global Assessment (PG-SGA). |
| **Clinical assessment** | Clinicians comprehensively assess: |
| | • Conditions |
| | • Medications |
| | • Risks identified through screening process. |
| | Clinicians routinely weigh* patients at risk of malnutrition and document weights in the clinical record. |
| **Informing patients with a high risk** | Clinicians provide information for patients with high risk and their carers about prevention and management of malnutrition. |
| **Planning in partnership with patients and carers** | Clinicians inform patients, family and carers about the purpose and process of developing a nutrition 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 malnutrition risk assessment and clinical assessment. |
| **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 patient weight |
| | • The nutrition plan. |

* Weight and height documented on admission and weight should continue to be recorded at least weekly.

# Delivering comprehensive care

**to prevent and manage malnutrition**

> 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, pharmacy staff and allied health workers collaborate to deliver malnutrition prophylaxis and management. |
| **Delivering malnutrition prevention strategies in partnership with patients and carers** | Clinicians work in partnership with patients and carers to use the comprehensive care plan to deliver malnutrition prevention strategies[9] where clinically indicated, for example by considering and documenting: <br>• Clearly identified goals of treatment <br>• Social measures to ensure provision of meals <br>• Help with feeding <br>• Food and fluid intake and output records <br>• Modified menus <br>• Dietetic advice and oral nutrition supplements and/or artificial nutrition support <br>• Patient and family input where feasible. |
| **Delivering malnutrition management in partnership** | Clinicians work in partnership with patients and carers to ensure patients who have malnutrition are managed according to best-practice guidelines. |
| **Monitoring and improving care** | Clinicians should: <br>• Monitor the effectiveness of these strategies in preventing malnutrition and reassess the patient if malnutrition occurs <br>• Review and update the care plan if it is not effective or is causing side effects <br>• Engage in reviewing clinical outcomes, identifying gaps and opportunities for improvement. |
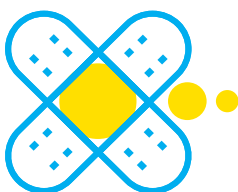
# Minimising specific patient harm

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

| | |
|---|---|
| **Nutrition and hydration** | Clinicians should work together to ensure the nutritional and fluid requirements of the patient are: <br>• Planned <br>• Delivered and adjusted as appropriate <br>• The patient's intake and output are monitored. |
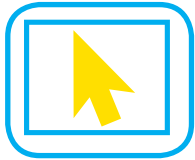
## Additional Resources

### Nutritional standards

Western Australian Government. Nutrition Standards for adult inpatients in WA hospitals. ⬀ (AU) 2012.

Queensland Health. Queensland Health Nutrition Standards for Meals and Menus. ⬀ (AU) 2015.

NSW Agency for Clinical Innovation. Nutrition Standards for Adult Inpatients in NSW Hospitals. ⬀ (AU) 2011.

NSW Agency for Clinical Innovation. Nutrition Standards for consumers of inpatient mental health services in NSW. ⬀ (AU) 2013 [updated 2013].

Department of Human Services Victoria. Nutrition Standards for Menu Items in Victorian Hospitals and Residential Aged Care Facilities. ⬀ (AU) 2009.

### Nutritional tools

Nutrition Education Materials Online. Subjective Global Assessment. ⬀ (AU) 2009.

Nutrition Education Materials Online. Food diary – inpatient or outpatient. ⬀ (AU) 2015.

Nutrition Education Materials Online. Nutrition and Dietetics Discharge Report. ⬀ (AU) 2015.

Nutrition Education Materials Online. Food and Fluids Consumption Chart. ⬀ (AU) 2017.

Nestle. Mini Nutritional Assessment. ⬀ Vevy, Switzerland 2009.

Queensland Government. Malnutrition: Is your patient at risk? ⬀ (AU) 2015.

Queensland Government Lady Cilento Children's Hospital. Paediatric Nutrition Screening Tool. ⬀ (AU).

BAPEN Malnutrition Advisory Group. Malnutrition Universal Screening Tool. ⬀ (UK) 2011.

### Other resources

National Institute for Health and Care Excellence. Nutrition support in adults. ⬀ [qs24] (UK) 2012.

Department of Health & Human Services Victoria. Identifying nutrition and hydration issues. ⬀ Melbourne (AU).

McClave SA, DiBaise JK, Mullin GE, Martindale RG. ACG clinical guideline: nutrition therapy in the adult hospitalized patient. The American Journal of Gastroenterology. 2016;111(3):315

NSW Ministry of Health. Nutrition Care. ⬀ (PD2017_041). Sydney (AU) 2017.

NSW Agency for Clinical Innovation. The patient nutrition care journey: a guide to support implementation of the NSW Health Nutrition Care Policy. ⬀ (v1) Sydney (AU) 2012.

## 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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1. National Institute for Health and Care Excellence. Nutrition support for adults: oral nutrition support, enteral tube feeding and parenteral nutrition [cg 32]. (UK) 2006; Available from: https://www.nice.org.uk/guidance/cg32/resources/nutrition-support-for-adults-oral-nutrition-support-enteral-tube-feeding-and-parenteral-nutrition-pdf-975383198917.

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3. Naber TH, Schermer T, de Bree A, Nusteling K, Eggink L, Kruimel JW, et al. Prevalence of malnutrition in nonsurgical hospitalized patients and its association with disease complications. The American Journal of Clinical Nutrition. 1997;66(5):1232−9. Epub 1997/11/14.

4. Walton K. Treating malnutrition in hospitals: Dietitians in the driving seat? Nutrition & Dietetics. 2009;66(4):202−5.

5. Barker LA, Gout BS, Crowe TC. Hospital malnutrition: prevalence, identification and impact on patients and the healthcare system. International journal of environmental research and public health. 2011;8(2):514−27. Epub 2011/05/11.

6. Independent Hospital Pricing Authority, Pricing and funding for safety and quality − Risk adjustment model for hospital acquired complications − version 3, March 2018, IHPA: Sydney.

7. Australian Commission on Safety and Quality in Health Care. National Safety and Quality Health Service Standards (second edition). Sydney 2017.

8. Fávaro-Moreira NC, Krausch-Hofmann S, Matthys C, Vereecken C, Vanhauwaert E, Declercq A, et al. Risk Factors for Malnutrition in Older Adults: A Systematic Review of the Literature Based on Longitudinal Data. Advances in Nutrition: An International Review Journal. 2016;7(3):507−22.

9. NSW Ministry of Health. Nutrition Care (PD2017_041). Sydney (AU) 2017; Available from: http://www1.health.nsw.gov.au/pds/ActivePDSDocuments/PD2017_041.pdf.

**AUSTRALIAN COMMISSION**
**ON SAFETY AND QUALITY IN HEALTH CARE**

# 14 Cardiac complications

**Selected best practices and suggestions for improvement for clinicians and health system managers**

Hospital-Acquired Complication **14**

# CARDIAC COMPLICATIONS

| | HOSPITAL-ACQUIRED COMPLICATION | RATE[a] |
|---|---|---|
| 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[b] |
| 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

Hospital-acquired cardiac complications include the diagnoses of:

- Heart failure and pulmonary oedema
- Arrhythmias
- Cardiac arrest
- Acute coronary syndrome including unstable angina and myocardial infarction – both STEMI (ST-segment elevation myocardial infarction) and Non-STEMI/NSTEMI (Non-ST segment elevation myocardial infarction).*

## Why focus on cardiac complications?

Each year, patients in Australia experience almost 31,000 cardiac complications while in hospital.[1] These complications range from unstable angina, through to acute myocardial infarction, arrhythmias, pulmonary oedema and even cardiac arrest. Patients may experience symptoms including shortness of breath, peripheral oedema, paroxysmal nocturnal dyspnoea, palpitations, dizziness, collapse or sudden death.

About 30,000 Australians are diagnosed with heart failure every year, with older people more likely to develop heart failure.[2,3] In hospital, contributory causes may include excessive intravenous fluids, medicines not charted or onset of another cardiac event. An exacerbation of heart failure requires careful titration of medicines and monitoring of fluid and electrolyte status.

Cardiac arrhythmias can occur as a complication of treatment or worsening of pre-existing conditions. Patients experiencing arrhythmias are at risk of harm including the many consequences of haemodynamic compromise. In some cases the management of arrhythmia will be short lived and have no long-term impact; in others the consequences can be life-changing, shorten life expectancy or lead to sudden cardiac death.

It is important to identify early those at risk of significant clinical deterioration that could result in cardiac arrest and death.[4] A rapid, skilled response to cardiac arrest is vital for survival and limiting the degree of debilitation.[5]

*  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.

Acute coronary syndromes account for more than 25,000 deaths per year in Australia and contribute to a large burden of acute in-hospital clinical care and morbidity.[6] Patients with unstable angina or myocardial infarction require close monitoring by specialist clinical teams and careful management of medicines to maximise health outcomes and prevent complications.[7]

Prevention of cardiac complications therefore presents an important challenge in acute care hospitals. A number of best practices have been shown to be effective in reducing the occurrence of cardiac complications, but these practices are not used systematically in all hospitals.

The rate of hospital-acquired cardiac complications in Australian hospitals was 69 per 10,000 hospitalisations in 2015–16.[1] Hospital-acquired cardiac complications prolong the length of hospitalisation, which impacts on patients and their families. These complications increase 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.[8] While there is an increased financial cost, the most significant cost is the pain and discomfort experienced by the patient.

Significant reductions in cardiac complication rates are being achieved in some hospitals by suitable preventive initiatives. The rate for cardiac complications at Principal Referral Hospitals* is 84 per 10,000 hospitalisations. If all Principal Referral Hospitals above this rate reduced their rate to 84 per 10,000 hospitalisations, then 5,053 cardiac complications during hospitalisation in these hospitals would have been prevented, and more when other facilities are considered.

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

# What is considered best practice for preventing cardiac complications?

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 cardiac complications:

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

**Clinicians** caring for patients at risk of cardiac complications:

- Conduct appropriate risk assessments
- 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[9], 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.

# Clinical governance structures and quality-improvement processes

## to support best practice in the prevention and management of cardiac complications

Health service organisations need to ensure systems are in place to prevent cardiac 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.

| | |
|---|---|
| **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 cardiac complications. **(1.27, 5.1a)** |
| **Best-practice risk assessment and management** | Health service organisations:<br>• Agree on the process and criteria for cardiac complications risk assessment **(5.7)**<br>• Inform the clinical workforce of risk assessment requirements **(5.1c)**<br>• Identify a format for cardiac care plan for high-risk patients **(5.4)**<br>• Identify a management plan format for patients with cardiac complications. **(5.12, 5.13)** |
| **Identification of key individuals/ governance groups** | Health service organisations identify an individual or a governance group that is responsible for:<br>• Monitoring compliance with the organisation's cardiac complications policies, procedures and protocols **(1.7b, 5.2a)**<br>• Presenting data on the performance of cardiac complications prevention and management systems to the governing body **(1.9, 5.2c)**<br>• Overseeing the clinical care of patients at risk of or experiencing cardiac complications. **(5.5b)** |

| **Training requirements** | Health service organisations: |
|---|---|
| | • Identify workforce training requirements **(1.20a)** |
| | • Train relevant staff on the use of risk assessment, prevention plans and cardiac complications management plans **(1.20b, 1.20c)** |
| | • Ensure workforce proficiency is maintained. **(1.20d, 1.22, 1.28b)** |
| **Monitoring the delivery of prevention and care** | Health service organisations ensure mechanisms are in place to: |
| | • Report cardiac complications **(1.9, 5.2)** |
| | • Manage risks associated with cardiac complications prophylaxis and management **(5.1b)** |
| | • 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 cardiac complications risk screening activities, including whether risk assessment is leading to appropriate action **(5.1b, 5.2)** |
| | • Identify gaps in systems for screening patients for cardiac complications **(1.8, 5.2)** |
| | • Collect data on incidence, prevalence and severity of cardiac complications **(5.2)** |
| | • Provide timely feedback and outcomes data to staff. **(1.9)** |
| **Quality-improvement activities** | Health service organisations: |
| | • Implement and evaluate quality-improvement strategies to reduce the frequency and harm from cardiac complications **(5.2)** |
| | • Use audits of patient clinical records and other data to: |
| | • identify opportunities for improving cardiac complications prevention plans **(5.2)** |
| | • identify gaps and opportunities to improve the use of cardiac complications prevention plans **(5.2)** |
| | • monitor the overall effectiveness of systems for prevention and management of cardiac complications **(5.2)** |
| | • Use audits of patient clinical records, transfer and discharge documentation and other data to identify opportunities for improving cardiac complications management plans. **(5.2)** |
| **Equipment and devices** | Health service organisations facilitate access to equipment and devices for the prevention, detection and management of cardiac complications, such as electrocardiography (ECG) machines and Holter monitors. **(1.29b)** |

# Developing the patient's comprehensive care plan

**to support best practice in the prevention and management of cardiac 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.

**Identify patient risk factors associated with cardiac complications**

Clinicians use relevant screening processes at or prior to presentation to assess the risk of cardiac failure, arrhythmia, ischaemia and/or clinical deterioration. Specific risk factors include[10]:

- Age
- Male gender
- High blood pressure and left ventricular hypertrophy (LVH)
- Abnormal blood lipids: high total cholesterol, LDL-cholesterol and triglyceride levels, and low levels of HDL cholesterol
- Diet high in saturated fat
- Diabetes mellitus
- Excess homocysteine in blood
- Inflammatory markers such as elevated C-reactive protein
- Abnormal blood coagulation such as elevated fibrinogen
- Heredity or family history
- Tobacco and alcohol use, physical inactivity and obesity
- Low socioeconomic status.

**Risk assessment**

Clinicians comprehensively assess the conditions, medicines and risks identified.

**Use strategies to prevent and manage cardiac complications**

Clinicians assess patients for cardiac complication risks as indicated, particularly when their hospital episode is associated with:

- Recent emergency surgery
- Sudden onset palpitation and haemodynamic stability
- Loss of consciousness
- Ventricular arrhythmias
- Changes in medicines
- Fluid overload.

| **Document the comprehensive care plan** | Clinicians conduct a comprehensive clinical assessment of patients at-risk or with cardiac complications and document the following in the clinical notes: |
|---|---|

- Clinical history and assessment

- If heart failure and/or pulmonary oedema was present, or suspected of being present, at the time of admission, confirm that the complication previously existed or was part of the patient's presenting problem, a comorbidity or chronic disease (such as a frail nursing home resident with history of poorly controlled heart failure, present to the emergency department with shortness of breath and worsening of peripheral oedema)

- Describe clearly all relevant clinical findings (such as recent emergency surgery, sudden onset, palpitation and haemodynamic stability)

- Document any additional (secondary) diagnosis if the complication arose during the current episode of care or as the principal diagnosis if consequent to a previous episode of care, that is a readmission, and describe clearly all relevant clinical findings (such as patient reason for admission, sudden onset, loss of consciousness, ventricular arrhythmias)

- Document contributing factors, predispositions or comorbidities which are relevant for the incident (such as recent surgery, changes in medicines, fluid overload)

- Document any associated investigations (such as chest X-ray, cardiac echocardiograms).

| **Institute appropriate monitoring** | Clinicians implement testing or monitoring of clinical and laboratory indicators including: |
|---|---|

- Jugular venous pressure

- Peripheral oedema

- Chest auscultation

- Electrolytes, urea and creatinine, troponin.

| **Audit documentation** | Clinicians monitor completion of observation charts. |
|---|---|

# Delivering comprehensive care

**to prevent and manage cardiac complications**

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

| | |
|---|---|
| **Working in partnership to deliver the care plan** | Clinicians work in partnership with patients and carers to implement prevention and management strategies as clinically appropriate, including: <br><br> • Clinical management according to best-practice guidelines <br><br> • Systems to recognise and respond to deterioration in defined early warning criteria <br><br> • Specific strategies where clinically indicated, for example[11,12,13]: <br>   – physical examination (including measurement of blood pressure and heart rate) resting 12-lead ECG, stress test <br>   – pathology, such as blood tests (troponin, creatinine, glucose, haemoglobin etc) <br>   – echocardiogram <br>   – antiplatelet therapy/anticoagulant therapy <br>   – oxygen and pain relief <br>   – afterload reduction agents such as nitro-glycerine <br>   – anti-thrombin therapy <br>   – coronary angiography <br>   – percutaneous coronary interventions <br>   – coronary artery bypass grafting <br>   – development of a symptom management and treatment escalation plan <br>   – rehabilitation and discharge planning. |
| **Partnering with patients** | Inform patients and carers of the risks, prevention strategies and management of cardiac complications. |
| **Documentation** | Document the treatment plan, goals and outcome. |
| **Monitor impact of plan** | Monitor the effectiveness of these strategies in preventing cardiac complications and reassess the patient if cardiac complications occur. |
| **Update care plan** | Review and update the care plan if it is not effective or is causing side effects. |

# Minimising specific patient harm

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

**Fluid overload**

Ensure the fluid requirements of the patient are:

- Planned
- Delivered
- Intake is monitored
- Adjusted as appropriate to ensure fluid overload is avoided.
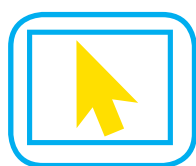
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## Note on data

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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1.  Independent Hospital Pricing Authority (AU). Activity Based Funding Admitted Patient Care 2015–16, acute admitted episodes, excluding same day.

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# 15

# Third and fourth degree perineal laceration during delivery

**Selected best practices and suggestions for improvement for clinicians and health system managers**

Hospital-Acquired Complication **15**

# THIRD AND FOURTH DEGREE PERINEAL LACERATION DURING DELIVERY

| | HOSPITAL-ACQUIRED COMPLICATION | RATE[a] |
|---|---|---|
| 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[b] |
| 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 third and fourth degree perineal lacerations with and without instrumentation.*

## Why focus on third and fourth degree perineal laceration?

Each year, women giving birth in Australian hospitals collectively experience a large number of third or fourth degree perineal lacerations. In 2015–16, 5,639 such lacerations were recorded in Australian public hospitals.[1] This was equivalent to a rate of 358 perineal lacerations for vaginal birth per 10,000 hospitalisations in 2015–16.[1]

Third and fourth degree perineal lacerations cause persistent and distressing physical and psychological symptoms, including perineal pain, sexual and urinary problems, faecal urgency and incontinence of both flatus and stool. If these injuries are not recognised and repaired promptly, they can have serious long-term consequences for women's lives.[2] Third and fourth degree perineal lacerations also prolong length of stay in hospital.

Reductions in perineal laceration rates are being achieved in some hospitals through preventive initiatives.[3] The rate for third and fourth degree perineal lacerations at Principal Referral Hospitals[†] was 358 per 10,000 hospitalisations for vaginal birth in 2015–16.[‡2] If all Principal Referral Hospitals above this rate reduced their rate to 358 per 10,000 hospitalisations for vaginal birth, then 447 third and fourth degree perineal lacerations in Principal Referral Hospitals would have been prevented, and more when other types of facilities are considered.[1]

* 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 ↗.

† Hospitals were classified in the Principal Referral Hospitals peer group for these purposes according to the Australian Institute of Health and Welfare's former definition of major city hospitals with more than 20,000 acute weighted separations and regional hospitals with more than 16,000 acute weighted separations.

‡ This rate differs from the rate described in the Second Australian Atlas of Healthcare Variation. The rate in the Atlas is a three-year average and includes data from all private and public hospitals.

# What is considered best practice for preventing perineal lacerations?

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

The **health service organisation** providing birthing services to women

- Has clear clinical guidelines for the prevention, recognition and management, including follow-up, of third and fourth degree perineal lacerations.

**Clinicians** caring for patients at risk of perineal laceration

- Provide care during labour and delivery in accordance with best practice guidelines.

The National Safety and Quality Health Service (NSQHS) Standards (second edition), in particular the Comprehensive Care Standard[4], 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.

# Clinical governance structures and quality-improvement processes

**to support best practice in perineal laceration prevention and management**

Health service organisations need to ensure systems are in place to prevent third and fourth degree perineal laceration 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.

| | |
|---|---|
| **Policies, procedures and protocols** | Health service organisations ensure policies, procedures and/or protocols are consistent with national evidence-based guidelines for the risk assessment, prevention, management and follow-up of perineal lacerations. **(1.27, 5.1a)** |
| **Best-practice screening and management** | Health service organisations:<br>• Agree on the process and criteria for third and fourth degree perineal laceration risk assessment **(5.4, 5.7)**<br>• Inform the clinical workforce of risk assessment requirements **(5.1c)**<br>• Identify a format for prevention plans for high-risk patients **(5.4)**<br>• Identify a management plan format for patients with a third or fourth degree perineal laceration **(5.7, 5.10)**<br>• Implement a system of follow-up. **(5.13e)** |
| **Identification of key individuals/ governance groups** | Health service organisations identify an individual or a governance group that is:<br>• Responsible for monitoring compliance with the organisation's labour and delivery policies, procedures and protocols **(1.7b, 5.2a)**<br>• Responsible for presenting data on the performance of third and fourth degree perineal laceration prevention, management and follow-up systems to the governing body. **(1.9, 5.2c)** |
| **Training requirements** | Health service organisations:<br>• Identify workforce training requirements **(1.20a)**<br>• Train relevant staff on the use of risk assessment, prevention and third and fourth degree perineal laceration management and follow-up plans **(1.20b, 1.20c)**<br>• Ensure workforce proficiency is maintained. **(1.20d, 1.22, 1.28b)** |

| | |
|---|---|
| **Monitoring the delivery of care** | Health service organisations ensure mechanisms are in place to:<br><br>• Report perineal lacerations **(1.9, 5.2)**<br><br>• Identify performance measures and the format and frequency of reporting **(1.8a)**<br><br>• Set performance measurement goals **(1.8a)**<br><br>• Collect data on compliance with policies **(1.7b)**<br><br>• Collect data about perineal laceration risk-screening activities including whether risk assessment is leading to appropriate action **(1.8, 5.1b, 5.2)**<br><br>• Identify gaps in systems for risk assessment for third and fourth degree perineal laceration **(5.2)**<br><br>• Collect data on incidence of third and fourth degree perineal laceration **(1.28b, 1.9, 5.2)**<br><br>• Provide timely feedback and outcomes data to staff. **(1.9)** |
| **Quality-improvement activities** | Health service organisations:<br><br>• Implement and evaluate quality improvement strategies to reduce the frequency and harm from third and fourth degree perineal laceration **(5.2)**<br><br>• Use audits of patient clinical records and other data to:<br>  – identify opportunities for improving perineal laceration prevention plans **(5.2)**<br>  – identify gaps and opportunities to improve the use of perineal laceration prevention plans (such as increasing the number of at risk patients who have perineal laceration prevention plans implemented) **(5.2)**<br>  – monitor the overall effectiveness of systems for prevention and management of third and fourth degree perineal lacerations **(5.2)**<br><br>• Use audits of patient clinical records, transfer and discharge documentation and other data to:<br>  – identify opportunities for improving third and fourth degree perineal laceration management plans **(5.2)**<br>  – assess compliance with third and fourth degree perineal laceration management and follow-up plan requirements **(5.2)**<br>  – identify strategies to improve the use and effectiveness of third and fourth degree perineal laceration management plans. **(5.2)** |
| **Equipment and devices** | Health service organisations facilitate access to relevant equipment for the prevention and management of perineal lacerations. **(1.29b)** |

# Developing the patient's comprehensive care plan

**to support best practice in perineal laceration prevention and management**

Clinicians should partner with patients and carers 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 perineal lacerations** | Clinicians assess for risk factors associated with obstetric lacerations which include[2,3,5]:<br>• Birth weight over 4kg<br>• Persistent occipito-posterior position<br>• Nulliparity<br>• Induction of labour<br>• Operative vaginal delivery, including forceps delivery<br>• Maternal age 25–34 years<br>• Epidural analgesia (ensure that patients are not overly anesthetised)<br>• Second stage longer than one hour<br>• Shoulder dystocia<br>• Midline episiotomy<br>• Mothers of Asian ethnicity<br>• Large head circumference of baby<br>• Previous severe perineal laceration<br>• Use of oxytocin<br>• Delivery with stirrups. |
| **Implement risk assessment screening** | Clinicians use relevant screening processes at presentation to assess the risk of third and fourth degree perineal laceration and requirements for prevention strategies. |
| **Clinical assessment** | Clinicians comprehensively assess:<br>• Conditions<br>• Medications<br>• Obstetric history<br>• Risks identified through screening process.<br><br>Clinicians document risks in the clinical record. |
| **Informing patients with a high risk** | Clinicians provide information for women with high risk and their carers about third and fourth degree perineal laceration prevention, management and follow-up. |

| **Planning in partnership with patients and carers** | Clinicians inform women and their partners and carers about the purpose and process of developing a third and fourth degree perineal laceration management plan and invite them to be involved in its development. |
|---|---|
| **Collaborating and working as a team** | Obstetric staff and midwives work collaboratively to perform third and fourth degree perineal laceration risk assessment and clinical assessment. |
| **Documenting and communicating the care plan** | Clinicians document in the clinical record and communicate the:<br>• Findings of the screening process<br>• Findings of the clinical assessment process<br>• Birth plan. |



# Delivering comprehensive care

## to prevent and manage third and fourth degree perineal laceration

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

| **Collaborating and working as a team** | Obstetricians and midwives work collaboratively to deliver third and fourth degree perineal laceration prevention and management. |
|---|---|
| **Delivering perineal laceration prevention strategies in partnership with patients and carers** | Clinicians work in partnership with women and carers to use the comprehensive care plan to deliver third and fourth degree perineal laceration prevention strategies where clinically indicated using evidence-based care bundles. |
| **Delivering third and fourth degree perineal laceration management in partnership** | Clinicians work in partnership with patients and carers to ensure women who have third and fourth degree perineal laceration are managed according to best-practice guidelines. |
| **Monitoring and improving care** | Clinicians should:<br>• Monitor the effectiveness of these strategies in preventing third and fourth degree perineal laceration and reassess the patient if third or fourth degree perineal laceration occurs<br>• Review and update the care plan if it is not effective or is causing side effects<br>• Engage in reviewing clinical outcomes, identifying gaps and opportunities for improvement. |
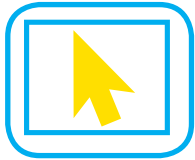
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# Note on data

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 Hospital Pricing Authority (IHPA) may differ due to the IHPA's methodology, which applies different inclusion/exclusion criteria.

# References

1. Independent Hospital Pricing Authority (AU). Activity Based Funding Admitted Patient Care 2015–16, acute admitted episodes, excluding same day.

2. Australian Commission on Safety and Quality in Health Care. Second Australian Atlas of Healthcare Variation. Sydney: ACSQHC; 2017. Available from: https://www.safetyandquality.gov.au/atlas/atlas-2017/.

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AUSTRALIAN COMMISSION
ON SAFETY AND QUALITY IN HEALTH CARE

# 16 Neonatal birth trauma

**Selected best practices and suggestions for improvement for clinicians and health system managers**

Hospital-Acquired Complication **16**

# NEONATAL BIRTH TRAUMA

| | HOSPITAL-ACQUIRED COMPLICATION | RATE[a] |
|---|---|---|
| 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[b] |
| 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

The neonatal birth trauma hospital-acquired complication includes a number of diagnosis codes which fit into the following categories:*

- Subdural and cerebral haemorrhage
- Epicranial subaponeurotic haemorrhage
- Other injuries to skeleton
- Injury to spine and spinal cord
- Facial nerve injury
- Other cranial and peripheral nerve injuries
- Other specified birth trauma.

This does not include: preterm infants younger than 37 completed weeks and with a birth weight less than 2,499g; osteogenesis imperfecta; and brachial plexus injury.

## Avoiding neonatal birth trauma

The health of the mother and baby are central to the clinical decision making during childbirth. Whilst all attempts should be made to avoid neonatal trauma, it must be recognised that sometimes, in order to preserve life, episodes of neonatal trauma may occur. However, rates of neonatal trauma vary significantly across the country and services should monitor their performance. Where neonatal trauma rates are elevated, services should work to reduce them.

To avoid trauma to the neonate, the risks and benefits of any delivery approach need to be weighed up in every case, and clinical practices should be in accordance with best-practice guidelines.[1-3]

In labour, when there are concerns regarding the wellbeing of the fetus, mother, or both, three options are available:

- to allow the labour to proceed aiming for vaginal birth
- to proceed to instrumental vaginal birth, or
- to perform a caesarean section.[1]

The circumstances, benefits and risks for each case will determine the delivery approach, and it is important to note that there are risks to the neonate in both vaginal and caesarean birth.

*   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 ⬀.

# Why focus on neonatal birth trauma?

Each year, neonates born in Australian hospitals experience a large number of traumatic birth injuries. There were 1,108 injuries meeting the above definition in Australian public hospitals in 2015–16.[4] The rate of hospital-acquired neonatal birth trauma in Australian public hospitals was 49 per 10,000 births in 2015–16.[4]

The consequences of neonatal birth trauma may be significant and have life-long consequences. Prevention of neonatal birth trauma therefore presents an important challenge.

Significant reductions in neonatal birth trauma rates are being achieved in some hospitals. While the aggregate rate for hospital-acquired birth trauma at Principal Referral Hospitals* was 54 per 10,000 newborns in 2015–16, the highest rate was 141.3 per 10,000 newborns.[4] If all Principal Referral Hospitals above the aggregate rate reduced their rate of birth trauma to 54 per 10,000 newborns, then potentially 134 neonatal birth traumas in these hospitals could have been prevented, and more when other facilities are considered.

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

# What is considered best practice for preventing neonatal birth trauma?

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 birthing services:

- Has systems of care for labour and delivery that are consistent with best-practice guidelines
- Ensures that equipment and devices are available to effectively manage complicated deliveries.

**Clinicians** caring for labouring patients:

- Conduct comprehensive antenatal and perinatal risk assessments in accordance with best-practice guidelines
- Provide care during delivery (whether via vaginal delivery or caesarean section) in accordance with best-practice guidelines.

The National Safety and Quality Health Service (NSQHS) Standards (second edition), in particular the Comprehensive Care Standard[5], 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.

# Clinical governance structures and quality-improvement processes

## to support best practice in prevention and management of neonatal birth trauma

Health service organisations need to ensure that effective clinical governance and quality improvement systems are in place to support best practice.

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

| | |
|---|---|
| **Policies, procedures and protocols** | Health service organisations ensure policies, procedures and protocols are consistent with national evidence-based guidelines. **(1.27, 5.1a)** |
| **Best-practice screening and management** | Health service organisations:<br>• Identify a format for a birth care plan **(5.4)**<br>• Identify a management plan format for neonatal patients with a neonatal birth trauma. **(5.12, 5.13)** |
| **Identification of key individuals/ governance groups** | Health service organisations identify an individual or a governance group that is responsible for:<br>• Monitoring compliance with the organisation's birth-related policies, procedures and protocols **(1.7b, 5.2a)**<br>• Presenting data on birth outcomes including neonatal trauma to the governing body **(1.9, 5.2c)**<br>• Overseeing the labour and birth system of care. **(5.5b)** |
| **Training requirements** | Health service organisations:<br>• Identify workforce training requirements **(1.20a)**<br>• Train relevant staff in the development and use of birth-related care plans **(1.20b, 1.20c)**<br>• Ensure workforce proficiency is maintained. **(1.20d, 1.22, 1.28b)** |

| | |
|---|---|
| **Monitoring the delivery of care** | Health service organisations ensure mechanisms are in place to:<br><br>• Report neonatal birth trauma **(1.9, 5.2)**<br>• Identify performance measures and the format and frequency of reporting **(1.8a)**<br>• Ensure all women are appropriately risk assessed during their pregnancies **(1.8, 5.1b, 5.2)**<br>• Identify gaps in systems for risk assessment during pregnancy **(5.2)**<br>• Collect data on incidence, prevalence and severity of neonatal birth trauma **(1.11)**<br>• Provide timely feedback and outcomes data to staff. **(1.9)** |
| **Quality-improvement activities** | Health service organisations:<br><br>• Implement and evaluate quality-improvement strategies to reduce the frequency and harm from neonatal birth traumas **(5.2)**<br>• Use audits of patient clinical records and other data to:<br>  – identify opportunities for improving birth care plans **(5.2)**<br>  – monitor the overall effectiveness of systems for prevention and management of neonatal birth trauma. **(5.2)** |
| **Equipment and devices** | Health service organisations facilitate access to equipment and devices for appropriate birth interventions. **(1.29b)** |



# Developing the woman's comprehensive care plan to support best practice in pregnancy and birth care

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

| | |
|---|---|
| **Implement risk assessment** | Develop and implement a robust risk assessment method in accordance with the National Midwifery Guidelines for Consultation and Referral.[6] |
| **Clinical assessment** | Clinicians comprehensively assess risks identified through screening process.<br><br>Clinicians undertake routine comprehensive assessments and document outcomes in the clinical notes. |
| **Informing mothers with significant identified risk** | Clinicians provide information for mothers with significant identified risk. |

| Planning in partnership with women and carers | Clinicians inform women, family and carers about the purpose and process of developing a pregnancy and birth care plan and invite them to be involved in its development. |
|---|---|
| Collaboration and working as a team | Medical staff and midwives work collaboratively to perform both risk assessment and clinical assessment. |
| Documenting and communicating the care plan | Clinicians document in the clinical record and communicate the findings of the:<br>• Risk assessment process<br>• Clinical assessment process. |



# Delivering comprehensive care

### during labour and birth

Safe care is delivered when the individualised care plan, which has been developed in partnership with women and their partners, is followed.

| Collaboration and working as a team | Doctors and midwives collaborate to deliver safe and quality care during labour and birth. |
|---|---|
| Delivering risk management strategies in partnership with women and carers | Clinicians work in partnership with patients and carers to use the labour and birth care plan to deliver the baby, where risk is identified, for example by:<br>• Ensuring systems are in place to recognise and respond to maternal, fetal, and neonatal requirements and neonatal birth injury<br>• Referring on to relevant services according to the National Midwifery Guidelines for Consultation and Referral as clinically indicated[6]<br>• Consulting with paediatricians/neonatal specialists prior to birth where indicated<br>• Considering suitability for labour and birth related interventions<br>• Increased monitoring and clinical oversight of women with identified risk<br>• Resuscitation and management of neonates affected by birth injury as indicated.[3] |
| Delivering neonatal care in partnership | Clinicians work in partnership with women and their partners to ensure babies who have been affected by neonatal birth trauma are managed according to best-practice guidelines specific to the injury sustained. |
| Monitoring and improving care | Clinicians should:<br>• Engage in reviewing clinical outcomes, identifying gaps and opportunities for improvement. |
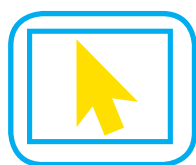
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# Note on data

The data used in this sheet are for hospital-acquired complications recorded during episodes of care in Australian public hospitals in 2015–16. Figures reported by Independent Hospitals Pricing Authority (IHPA) may differ due to the IHPA's methodology, which applies different inclusion/exclusion criteria.

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# Appendices & references

## Appendices & References

# Appendix 1: List of HACs and related diagnoses

| Complication | Diagnosis |
|---|---|
| Pressure injury | • Stage III ulcer<br>• Stage IV ulcer<br>• Unspecified decubitus ulcer and pressure area |
| Falls resulting in fracture or intracranial injury | • Intracranial injury<br>• Fractured neck of femur<br>• Other fractures |
| Healthcare-associated infection | • Urinary tract infection<br>• Surgical site infection<br>• Pneumonia<br>• Blood stream infection<br>• Central line and peripheral line associated bloodstream infection<br>• Multi-resistant organism<br>• Infection associated with prosthetics/implantable devices<br>• Gastrointestinal infections |
| Surgical complications requiring unplanned return to theatre | • Post-operative haemorrhage/haematoma requiring transfusion and/or return to theatre<br>• Surgical wound dehiscence<br>• Anastomotic leak<br>• Vascular graft failure<br>• Other surgical complications requiring unplanned return to theatre |
| Unplanned intensive care unit admission | • Unplanned admission to intensive care unit |
| Respiratory complications | • Respiratory failure including acute respiratory distress syndrome requiring ventilation<br>• Aspiration pneumonia |
| Venous thromboembolism | • Pulmonary embolism<br>• Deep vein thrombosis |

| Complication | Diagnosis |
|---|---|
| Renal failure | • Renal failure requiring haemodialysis or continuous veno-venous haemodialysis |
| Gastrointestinal bleeding | • Gastrointestinal bleeding |
| Medication complications | • Drug related respiratory complications/depression<br>• Haemorrhagic disorder due to circulating anticoagulants<br>• Hypoglycaemia |
| Delirium | • Delirium |
| Persistent incontinence | • Urinary incontinence |
| Malnutrition | • Malnutrition |
| Cardiac complications | • Heart failure and pulmonary oedema<br>• Arrhythmias<br>• Cardiac arrest<br>• Acute coronary syndrome including unstable angina, STEMI and NSTEMI |
| Third and fourth degree perineal laceration during delivery | • Third and fourth degree perineal laceration during delivery |
| Neonatal birth trauma | • Neonatal birth trauma |

# Appendix 2: Development of the HACs list

Measurement is foundational to advancing safety and quality improvement. To understand the major safety issues across the care continuum, meaningful metrics are required to identify, measure, and proactively mitigate patient safety risks.

The development of the HACs list followed a comprehensive process to ensure the agreed list focused on conditions that are significantly preventable, and are able to be identified from simple administrative data that are already being collected. This was an important development for Australia, given the volume of healthcare data and quality indicators that exist. The HACs provide a priority list of complications that can be identified through a routinely collected data source. Further, the HACs focus on priority complications that clinicians can respond to, and put in place strategies to reduce their occurrence.

In 2012 the Commission and IHPA established a Joint Working Party (JWP) to consider potential approaches to pricing for safety and quality in public hospital services in Australia. The JWP also considered how existing data that is routinely generated from the patient medical record (patient clinical data) could be used to drive improvements in healthcare safety and quality.

## Literature review

A literature review of existing Australian and international approaches to pricing for safety and quality was undertaken in 2013. The literature review found that:

- Linking quality and safety with hospital funding is being considered and implemented by many countries, using a variety of approaches
- The evidence for the material impact of such schemes on patient outcomes remains equivocal
- Evidence demonstrates that the provision of relevant and timely clinical information to clinicians and managers is an effective driver of safety and quality improvement.

## Environmental scan

An environmental scan reviewing the use of patient clinical data to drive safety and quality improvement was then undertaken. The environmental scan concluded that:

- Patient clinical data can be used as a screening tool to indicate areas of concern, or in need of attention, with regards to safety improvement
- The use of patient clinical data should be regarded as a useful first step in identifying potential safety issues but should not be the only method used.

## Development of the draft list of high-priority HACs

A clinician driven process was undertaken to develop a national list of high-priority HACs. Initial development of the list involved:

- Building on developments in patient safety monitoring – including the introduction of the condition onset flag, as a means of differentiating between conditions that arise before or during an admitted episode of patient care, and the development of the classification of hospital-acquired diagnoses (CHADx)
- A review of the safety literature and hospital incident reports to identify complications that were cited as having a material impact or being preventable
- Iterative identification of the highest priority complications by a clinical expert reference group – comprising clinicians, key hospital safety experts, clinical administrators and consumer representatives – based on preventability, patient impact (severity), health service impact and clinical priority.

The report for this work recommended that the HACs list be supported as a national set of complications for local monitoring and review, subject to broader consultation and testing.

## Proof-of-concept study

A proof-of-concept study to explore the validity of using the HACs for quality and safety improvements was undertaken over 2014 and 2015 in seven public and eight private hospitals. The study assessed the accuracy and completeness of patient clinical data for over 5,000 hospital records (accuracy testing). The study also assessed the feasibility and utility of using the HACs list for monitoring and reporting patient complications using an interactive reporting tool (utility testing). The study made the following key conclusions:

- The general concept of using patient clinical data to derive clinical measures for safety and quality purposes is useful and acceptable to clinicians
- The specific concept of using patient clinical data to detect and report HACs is useful and acceptable to clinicians
- Patient clinical data is sufficiently accurate to support implementation of measurement and monitoring of HACs for safety and quality monitoring, notwithstanding that there are areas for improvement in data quality
- Key areas for coding improvement are the accuracy of the condition onset flag and selected HACs – falls with fracture, iatrogenic pneumothorax, medication complications and persistent incontinence
- Monitoring and reporting on HACs at the hospital level can be used by clinicians to detect patient safety problems and develop clinical risk mitigation strategies to reduce (but not necessarily eliminate) the risk of the complication occurring
- Clinicians will make use of reported data if they have confidence in the measures of safety and quality and have access to analytical reporting tools and data expertise.

The HACs list was then refined based on the findings from the proof-of-concept study, a clinical reference group coding review and investigation of complications from clinical domains that required specialist advice.

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