





# Appendices & references

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## Appendices & References

### Appendix 1: List of HACs and related diagnoses

Complication	Diagnosis
Pressure injury	<ul style="list-style-type: none"><li>• Stage III ulcer</li><li>• Stage IV ulcer</li><li>• Unspecified decubitus ulcer and pressure area</li></ul>
Falls resulting in fracture or intracranial injury	<ul style="list-style-type: none"><li>• Intracranial injury</li><li>• Fractured neck of femur</li><li>• Other fractures</li></ul>
Healthcare-associated infection	<ul style="list-style-type: none"><li>• Urinary tract infection</li><li>• Surgical site infection</li><li>• Pneumonia</li><li>• Blood stream infection</li><li>• Central line and peripheral line associated bloodstream infection</li><li>• Multi-resistant organism</li><li>• Infection associated with prosthetics/implantable devices</li><li>• Gastrointestinal infections</li></ul>
Surgical complications requiring unplanned return to theatre	<ul style="list-style-type: none"><li>• Post-operative haemorrhage/haematoma requiring transfusion and/or return to theatre</li><li>• Surgical wound dehiscence</li><li>• Anastomotic leak</li><li>• Vascular graft failure</li><li>• Other surgical complications requiring unplanned return to theatre</li></ul>
Unplanned intensive care unit admission	<ul style="list-style-type: none"><li>• Unplanned admission to intensive care unit</li></ul>
Respiratory complications	<ul style="list-style-type: none"><li>• Respiratory failure including acute respiratory distress syndrome requiring ventilation</li><li>• Aspiration pneumonia</li></ul>
Venous thromboembolism	<ul style="list-style-type: none"><li>• Pulmonary embolism</li><li>• Deep vein thrombosis</li></ul>

Complication	Diagnosis
Renal failure	<ul style="list-style-type: none"> <li>• Renal failure requiring haemodialysis or continuous veno-venous haemodialysis</li> </ul>
Gastrointestinal bleeding	<ul style="list-style-type: none"> <li>• Gastrointestinal bleeding</li> </ul>
Medication complications	<ul style="list-style-type: none"> <li>• Drug related respiratory complications/depression</li> <li>• Haemorrhagic disorder due to circulating anticoagulants</li> <li>• Hypoglycaemia</li> </ul>
Delirium	<ul style="list-style-type: none"> <li>• Delirium</li> </ul>
Persistent incontinence	<ul style="list-style-type: none"> <li>• Urinary incontinence</li> </ul>
Malnutrition	<ul style="list-style-type: none"> <li>• Malnutrition</li> </ul>
Cardiac complications	<ul style="list-style-type: none"> <li>• Heart failure and pulmonary oedema</li> <li>• Arrhythmias</li> <li>• Cardiac arrest</li> <li>• Acute coronary syndrome including unstable angina, STEMI and NSTEMI</li> </ul>
Third and fourth degree perineal laceration during delivery	<ul style="list-style-type: none"> <li>• Third and fourth degree perineal laceration during delivery</li> </ul>
Neonatal birth trauma	<ul style="list-style-type: none"> <li>• Neonatal birth trauma</li> </ul>

### 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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