Queensland Health

Healthcare associated infection surveillance – INTERIM

Queensland Health Guideline version 1.5 January 2025

QH-GDL-321-7-1

Key messages

- Healthcare-associated infections (HAI) represent a significant disease burden in Australia. Surveillance is a critical strategy for reducing HAIs, with evidence indicating a well-implemented **surveillance** program can decrease infection rates by 35–55%. (1–4)
- Summary instruction: All HHSs should have a HAI surveillance strategy. This is outlined in Action 3.05 of the National Safety and Quality Health Service Standards.
- Healthcare-associated infections (HAI) are those infections that are acquired by patients/consumers as a direct or indirect result of healthcare. HAI result in increased morbidity and mortality, prolonged hospital stays, and higher healthcare costs.
- Without effective and continuous surveillance, healthcare-associated infections may go undetected.
- Timely detection of HAI events, including outbreaks, provides the opportunity to implement risk mitigation strategies thereby reducing the likelihood of harm to patients.

Purpose

The Healthcare-associated infection surveillance – interim clinical practice guideline (the Guideline) provides evidence-based recommendations for the surveillance of healthcare-associated infection within Queensland Health facilities. The guideline outlines a standardised approach to defining and measuring HAI to improve patient outcomes and enable consistent and uniform data collection. Surveillance data informs infection prevention and control strategies and evaluates the impact of these interventions.

Scope

The Guideline applies to all Queensland Health healthcare workers (HCW) (permanent, temporary, and casual), and all organisations and individuals acting as its agents (including Visiting Medical Officers and other partners, contractors, consultants, and volunteers).

The Guideline applies to all patients, specifically those who meet the inclusion criteria for surgical site infections, significant organism, and bloodstream infection surveillance.

Compliance with this guideline is not mandatory, but sound reasoning must exist for departing from the recommended principles within the Guideline.

Guideline recommendations

The document includes recommendations for the collection of a minimum data set for each surveillance indicator; surgical site infections (SSI), significant organisms (SO) and bloodstream infections (BSI). The indicators are summarised below and detailed in the Queensland Health *Healthcare-Associated Infection (HAI) Surveillance Definitions*, (2024, pending online publication). (5,6)

Please note: HAI surveillance should be undertaken by infection prevention and control staff, or other staff appropriately trained in HAI surveillance data collection techniques, using Multiprac Surveillance™ system.

1. Surgical site surveillance (SSS) minimum data set inclusions

The SSS definition includes a set of criteria that are used to determine if an infection can be attributed to a prescribed set of surgical procedures. SSS data can be used to evaluate the prevalence of SSI by procedure type. Data sets from multiple time periods can be collated to identify trends. Appendix 1: Procedures for inclusion in SSS and Appendix 2: Operative procedures and ICD-10-AM codes provide comprehensive details on requirements for the minimum SSS data set.

1.1 The procedures included in the minimum SSS data set are:

- Hip arthroplasty,
- Knee arthroplasty,
- Coronary artery bypass graft (CABG)
- Elective and emergency lower uterine segment caesarean section (LUSCS) (as optional procedures).

1.1.1. The inclusion of other surgical procedures should be determined based on a risk assessment. The risk assessment should consider:

- The population of patient/s undergoing the procedures and their risk factors for susceptibility to infection,
- The infection risks associated with the specific surgical procedures.

2. Significant organisms (SO) minimum data set inclusions

Significant organisms are microorganisms that are resistant to multiple classes of antimicrobial agents typically used to treat infections they cause. These multidrug-resistant organisms (MROs) are a critical concern in healthcare settings and require continuous surveillance to monitor transmission and prevent outbreaks. While many of these organisms are bacteria, multidrug resistance can also occur in fungi and viruses.

2.1 The following significant organisms should form the minimum data set for SO surveillance. The data set may vary according to emerging organisms of concern or as determined by a facility or Hospital and Health Service (HHS) and may include:

- *Candida auris*,
- *Clostridioides difficile*,
- Vancomycin-resistant *Enterococcus faecalis* or *Enterococcus faecium*,
- Carbapenem-resistant *Acinetobacter species*,
- Carbapenemase-producing Enterobacterales,
- ESBL producing *Klebsiella pneumoniae*.

2.1.1. Every new SO isolate should be categorised by the place of probable acquisition as defined in Appendix 3: Significant Organism Acquisition:

- Healthcare-associated – Inpatient,
- Healthcare-associated – Non-inpatient,
- Community-associated,
- Indeterminant.

3. Bloodstream Infections

Continuous surveillance of healthcare-associated bloodstream infections (BSIs) contributes to safer care and provides valuable insight into preventability strategies used to improve clinical practice and patient outcomes.

3.1 Comprehensive and robust BSI surveillance data is collected using the following recommended minimum data sets:

3.1.1. Bloodstream infection criteria; criterion 1, criterion 2, and criterion 3 (Appendix 4),

3.1.2. Attribution criterion; whether the BSI was healthcare-associated (inpatient or non-inpatient) or community-associated (Appendix 5),

3.1.3. Acquisition criterion; specific circumstances that contributed to the BSI (Appendix 6),

3.1.4. Source/Focus refers to the site in or on the patient where the BSI is most likely to have originated.

Legislation

- Public Health Act 2005
- *Public Sector Act 2022*
- *Public Records Act 2002*
- *Right to Information Act 2009*
- *Human Rights Act 2019*

Standards, procedures, and guidelines

- Guideline Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019) (safetyandquality.gov.au)
- 2021 Preventing and Controlling Infections Standard, Action 3.05 | Australian Commission on Safety and Quality in Health Care
- ACSQHC Approaches to Surgical Site Infection Surveillance
- ACSQHC Implementation Guide for the Surveillance of Staphylococcus aureus bloodstream infection
- Queensland Health's updated Healthcare-Associated Infection (HAI) Surveillance Definitions, 2024
- Risk Management | Safety and Quality | Metro North HHS (health.qld.gov.au)

Editorial Independence Statement

This document has been developed by Queensland Health employees, who are bound by the National Code of Conduct for Health Care Workers (Queensland). The technical writers comply with Departmental conflicts of interest processes. Beyond the documented consultation process and Delphi study, there have been no external parties involved in the development of this document, and no external funding has been received.

Acknowledgement of country

Queensland Health acknowledges the Traditional and Cultural Custodians of the lands, waters, and seas across Queensland, pays our respects to Elders past and present, and recognises the role of current and emerging leaders in shaping a better health system.

Queensland Health acknowledges the First Nations peoples in Queensland are both Aboriginal peoples and Torres Strait Islander peoples, and supports the cultural knowledge, determination, and commitment of Aboriginal and Torres Strait Islander communities in caring for health and wellbeing for millennia.

Aboriginal and Torres Strait Islander considerations

Healthcare associated infection surveillance should prioritise improving health outcomes for Aboriginal and Torres Strait Islander people and communities by preventing infections, while promoting the social and cultural determinants of health.

Risk Impact Statement

The NSQHS Preventing and Controlling Infections Standard requires health service organisations to use evidence-based systems to reduce the risk of infection using the hierarchy of controls in conjunction with infection prevention and control (IPC) systems.

Healthcare associated infection surveillance is an administrative control that aims to establish baseline data and identify trends and changes in epidemiology and infection risks to consumers of healthcare within facilities. Surveillance data should also be used to measure the short- and long-term effectiveness of infection prevention and control strategies, primarily standard and transmission-based precautions. ACSQHC Hierarchy of controls in infection_prevention_and_-_fact_sheet.pdf (safetyandquality.gov.au)

Effective surveillance systems help to identify infections early, enabling prompt interventions that prevent the spread of infections, reduce patient harm, and improve overall clinical outcomes. By focusing on proactive surveillance, healthcare facilities may downgrade the risk rating according to local preventability interventions. The follow table provides a general advice on risk rating with and without and surveillance program.

Table 1: Risk rating

Risk rating **without** surveillance and associated infection prevention strategies			
Likelihood	**Almost certain** – frequency once very week or month.	**Consequence**	**Very High (23)** – Intolerable risk level. Additional risk treatment action to be identified, prioritised, and implemented to reduce the consequences.
Risk rating **with** surveillance and associated infection prevention strategies			
Likelihood	**Almost certain** – frequency once very week or month.	**Consequence**	**High (17)** – Tolerable risk level with no additional treatments required. Monitored through standard measures.

Risk Management | Safety and Quality | Metro North HHS (health.qld.gov.au)

Methodology

The Guideline was developed using a modified approach to the QIPCU CPG Development, Review and Evaluation Framework (pending publication). A modified, 2-round Delphi study was conducted in Queensland with field experts to develop a 13-item minimum dataset to support state-wide HAI surveillance and reporting. Use of this standardised approach can support data aggregation and targeted prevention activities. Further detail on this process can be requested by emailing qipcu@health.qld.gov.au. (5)

The draft CPG manuscript was reviewed by an expert working group (EWG) with academic and clinical expertise in evidence appraisal, IPC, and HAI surveillance.

Implementation

HHSs are supported by QIPCU in their implementation of the surveillance definitions through Implementation Guides for:

- Bloodstream infection Surveillance
- Surgical Site Surveillance
- Significant Organism Surveillance

The Implementation Guides can be requested by emailing qipcu@health.qld.gov.au pending publication on QHEPS.

Environmental sustainability

Healthcare facilities should employ strategies to reduce the environmental impacts of healthcare where there is appropriate evidence to support the retention of healthcare standards, particularly the prevention of healthcare associated infections. In accordance with the National Health and Climate Strategy, clinicians should prioritise high value care, which is impactful and patient-focused.

Consumer engagement

IPC CPGs have a variety of key stakeholders, including, IPCPs, other healthcare workers, and patients/consumers/residents and their families. The relevant Key Recommendations of this CPG have been reviewed by a nominated healthcare consumer for acceptability and appropriateness.

System consultation

The draft CPG and associated Implementation Toolkit and Evidence Check documents have been reviewed an Expert Working Group comprised of diverse clinicians and policy experts. Further, targeted consultation with Queensland Health Clinical Networks has been undertaken.

Conflicts of interest

The QIPCU technical writer and reviewers of the Guideline are Department of Health employees and declare no conflicts of interest relating to the Guideline or subject matter. The Delphi study participants have no conflicts of interest to declare. (5)

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Approval

Guideline Custodian	Position Contact Details	Approval Date	Approver
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Version Control

Version	Date	Author	Comments
1.0	21 June 2012	Chief Infection Control Nurse, Communicable Diseases Branch	2012 Version
1.5	14 January 2025	Trish Hurst, CNC, Queensland Infection Prevention and Control Unit	NEW Interim Guideline

Review plan

This interim guideline has been expediently developed to support the implementation of the QH revised surveillance definitions, which were operationalised 01 January 2025. It is anticipated that the final version of this document will incorporate user acceptability and other epidemiological data, with a view of finalisation by 01 February 2026, or sooner if practice change trigger applied.

References

1. *World Health Organization. OECD-WHO Briefing Paper on Infection Prevention and Control: Addressing The Burden Of Infections And Antimicrobial Resistance Associated With Health Care [Internet]. 2022 Oct. Available from: https://www.oecd.org/content/dam/oecd/en/topics/policy-sub-issues/antimicrobial-resistance-and-pandemics/addressing-burden-of-infections-and-amr-associated-with-health-care.pdf*

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3. *Storr J, Twyman A, Zingg W, Damani N, Kilpatrick C, Reilly J, et al. Core components for effective infection prevention and control programmes: new WHO evidence-based recommendations. Antimicrob Resist Infect Control. 2017;6:6.*

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5. *Schults J, Havers S, Henderson B, Healy S, Runnegar N, Hurst T, et al. Expert consensus and recommendations for Healthcare-associated Infection surveillance in Queensland: A modified Delphi study. Brisbane; 2024.*

6. *NHMRC. Australian Guidelines for the Prevention and Control of Infection in Healthcare (2019) [Internet]. National Health and Medical Research Council; 2019. Available from: https://files.magicapp.org/guideline/7015ba58-c9e0-47fa-8619-7da7b15d32f8/published_guideline_7066-11_18.pdf*

Appendix 1: Procedures for inclusion in Surgical Site Surveillance

1. Minimum procedures to follow	

Hip and knee arthroplasty	▪ Deep or organ/space SSI detected within 90 days of the procedure.
	▪ **OR**
	▪ Superficial incisional SSI detected within 30 days of the procedure.
	▪ **Follow all** procedures as listed in Appendix 1
	  ○ Both elective and emergency procedures
	  ○ Bilateral hip or knee procedures performed during the same trip to the operating room and counted as two separate procedures.

Coronary artery bypass graft	▪ Deep or organ/space SSI detected up to 30 days after the procedure. ▪ **OR** ▪ Superficial incisional SSI detected within 30 days of the procedure, such as graft site or sternal wound. ▪ **Follow all** procedures as listed in Appendix 2
2. Optional procedures	
Caesarean section	▪ Deep or organ/space SSI detected up to 30 days after the procedure following both elective and emergency lower uterine segment caesarean section (LUSCS). ▪ **OR** ▪ Superficial incisional SSI detected within 30 days of the procedure. ▪ **Follow all** LUSCS performed in each period (NOT classical) ○ Include both emergency and elective procedures listed in Appendix 1

Appendix 2: Operative procedures and ICD-10-AM codes

Procedure	Procedure term ID	Procedure code
Total arthroplasty of hip, bilateral	ICD10AM	49319-00
Total arthroplasty of hip, unilateral	ICD10AM	49318-00
Total arthroplasty of knee with bone graft to tibia, unilateral	ICD10AM	49521-02
Total arthroplasty of knee, bilateral	ICD10AM	49519-00
Total arthroplasty of knee, unilateral	ICD10AM	49518-00
Coronary artery bypass, using 1 LIMA graft	ICD10AM	38500-00
Coronary artery bypass, using 1 RIMA graft	ICD10AM	38500-01
Coronary artery bypass, using 1 other arterial graft	ICD10AM	38500-04
Coronary artery bypass, using 1 other venous graft	ICD10AM	38497-04
Coronary artery bypass, using 1 radial artery graft	ICD10AM	38500-02
Coronary artery bypass, using 1 saphenous vein graft	ICD10AM	38497-00
Coronary artery bypass, using 2 LIMA grafts	ICD10AM	38503-00
Coronary artery bypass, using 2 epigastric artery grafts	ICD10AM	38503-03
Coronary artery bypass, using 2 other venous grafts	ICD10AM	38497-05
Coronary artery bypass, using 2 radial artery grafts	ICD10AM	38503-02
Coronary artery bypass, using 2 saphenous vein grafts	ICD10AM	38497-01
Coronary artery bypass, using 3 other venous grafts	ICD10AM	38497-06
Coronary artery bypass, using 3 saphenous vein grafts	ICD10AM	38497-02
Coronary artery bypass, using 2 other arterial grafts	ICD10AM	38503-04
Coronary artery bypass, using 4 other venous grafts	ICD10AM	38497-07
Coronary artery bypass, using 4 saphenous vein grafts	ICD10AM	38497-03
Elective lower segment caesarean section	ICD10AM	16520-02
Emergency lower segment caesarean section	ICD10AM	16520-03

Appendix 3: Significant Organism Acquisition

Healthcare-associated – Inpatient
The pathology was taken more than 48 hours after hospital admission commenced and there is no evidence the SO was present on admission
OR
The pathology was taken within 48 hours of discharge
Healthcare-associated – non-inpatient
The SO does not meet the criteria for healthcare-associated - inpatient
AND
is associated with healthcare received during a non-inpatient episode of care. E.g. haemodialysis, peritoneal dialysis, chemotherapy day wards, day surgery, emergency department.
Community-Associated
A SO is considered community-associated when it does not meet any of the criteria for healthcare-associated.
Indeterminant
A SO that has evidence that it might be either healthcare-associated or community-associated. This should be used as a last resort and all efforts to determine the true acquisition/attribution of the SO made.

Appendix 4: Bloodstream infection criteria

Case definition - Criterion 1 Bloodstream infection
A person of any age with one or more laboratory-confirmed positive blood culture(s) with a recognised pathogen.
Case definition - Criterion 2 Bloodstream infection
A person >1 year of age with a laboratory-confirmed positive blood culture with an organism that is on the National Healthcare Safety Network (NHSN) common commensal list
AND
At least one of the following symptoms: Fever greater than 38ºC, chills or hypotension
AND
Two separate blood culture collections on the same or two consecutive calendar days, with the same organisms cultured.
Case definition - Criterion 3 bloodstream infection
A person ≤1 year of age with a laboratory-confirmed positive blood culture with an organism that is on the National Healthcare Safety Network (NHSN) common commensal list
AND
At least one of the following symptoms: Fever greater than 38ºC or hypothermia (<36ºC core) or apnoea or bradycardia
AND
Two separate blood culture collections on the same or two consecutive calendar days, with the same organisms cultured.

Appendix 5: Bloodstream infection attribution

Healthcare-associated inpatient **If a criterion 1, 2 or 3 BSI is assessed, it is healthcare-associated if:**
An inpatient admission occurred when the blood culture was taken (i.e., stayed overnight in your hospital; the admission and discharge dates are on different days)
AND
was not incubating at the time of admission and occurred more than 48 hours after hospital admission.
OR
occurred less than 48 hours after discharge.
Healthcare-associated non–inpatient **If a criterion 1, 2 or 3 BSI is assessed, it is healthcare-associated non-inpatient if:**
the BSI does not meet inpatient criteria and is associated with health care that was received as a non-inpatient (NOT an overnight admission)
AND
occurred less than 48 hours after discharge.
Community-associated
Does not meet the inpatient or non-inpatient healthcare-associated definition.

Appendix 6: Bloodstream infection acquisition

Criterion	BSI identified >48 hrs after admission start
Acquired during hospitalisation and not present or incubating on admission	Should be selected for all HA-BSIs that occur and are identified at >48hrs after the admission commenced.
	BSI identified ≤48 hrs after admission start
Is a complication of an indwelling medical device (e.g., IV catheter, urinary catheter)	Should be selected for HA-BSIs that are identified ≤48hrs after the admission commenced that have evidence of being attributed to an indwelling medical device.
Occurs within 30 days of a surgical procedure, where the BSI is related to the surgical site infection	Should be selected for HA-BSIs that are identified ≤48hrs after the admission commenced where the BSI is related to a surgical site infection.
Occurs within 48 hours of an invasive instrumentation or incision related to the bloodstream infection	Should be selected for HA-BSIs that are identified ≤48hrs after the admission commenced where an invasive instrumentation or incision is believed to have caused the BSI. See *Contributing procedures* and *Definitions* for more information.
Associated with neutropenia ($<1x10^9/L$) contributed to by cytotoxic therapy.	Should be selected for HA-BSIs that are identified ≤48hrs after the admission commenced where the patient was neutropenic during the admission where the positive blood culture was collected, and the neutropenia is the cause of the BSI. Please note this is different to neutropenic sepsis (see Mucosal Barrier Injury below).