Guide to the surveillance of healthcare-associated *Staphylococcus aureus* bacteraemia

May 2022

He aratohu whakamātau tauwhiro hauora mō te *Staphylococcus aureus* bacteraemia

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Document purpose | Take o te pukapuka

This document was developed to support standardised national surveillance and reporting of healthcare-associated *Staphylococcus aureus* bacteraemia (HA-SAB) by Aotearoa New Zealand acute health care facilities. HA-SAB rates are currently reported as an outcome measure for the Hand Hygiene New Zealand programme.

The guide is intended for health care professionals in Aotearoa New Zealand, specifically, infection prevention and control (IPC) teams, clinicians and quality and safety managers responsible for HA-SAB surveillance in their facility.

This guide does not replace or inform clinical assessment of suspected infections. A suspected HA-SAB whether it is healthcare associated or community associated, requires appropriate clinical assessment and patient management.

The guide supersedes the Commission's *Implementation guide for the surveillance of Staphylococcus aureus bacteraemia (SAB)*, August 2017. It includes a new section for HA-SAB source data collection and provides a list of SAB source categories.

Introduction | He kōrero whakataki

Background to *Staphylococcus aureus* bacteraemia surveillance

Staphylococcus aureus (*S. aureus*) is the most common cause of healthcare-associated bacteraemia in Aotearoa New Zealand and elsewhere.[1,2] In health care settings, *S. aureus* causes an infection when it enters the bloodstream by means of an existing infection or wound, or during a procedure involving penetration of the skin, such as surgery or the insertion of an intravascular or invasive medical device.

Individuals who develop healthcare-associated *S. aureus* bacteraemia (HA-SAB) are more likely to have medical complications, need complex treatment and stay longer in hospital. HA-SAB infections can also result in death.[3]

HA-SAB is potentially preventable through the use of infection prevention strategies such as compliance with the '5 moments for hand hygiene', aseptic technique, skin antisepsis before invasive procedures, improved insertion and management of indwelling devices, effective antimicrobial stewardship and regular infection surveillance.[4–6]

Continuous ongoing surveillance of healthcare-associated infections (HAIs), including HA-SAB, is an important quality improvement activity that helps to make care safer and guides strategies to improve clinical practice.[7] Surveillance of HA-SAB is considered a robust measure of the control of HAIs and the quality of IPC strategies, because the identification of *S. aureus* in a blood culture is rarely considered a contaminant.

In 2012 the Health Quality & Safety Commission endorsed using the rate of HA-SAB per 1,000 inpatient days as the outcome marker for Hand Hygiene New Zealand, its national quality improvement programme.

Case definition

Numerator definition

A patient episode of SAB is a positive blood culture for *S. aureus*.

For surveillance purposes, only the first isolate per patient is counted, unless at least 14 days has passed without a positive culture, after which a subsequent episode is recorded.

A SAB is healthcare associated (HA-SAB) if the following criteria are met:

1. The patient's first *S. aureus*-positive blood culture was collected:

   a. more than 48 hours after admission, with no documented evidence that infection was present
   (including incubating) on admission

   or

   b. less than 48 hours after discharge.

OR

2. It satisfies at least one of the following criteria:

   c. The SAB is a complication of the presence of an indwelling medical device (eg, vascular catheter, urinary catheter).

   d. The SAB occurs within 30 days of a surgical procedure where the SAB is related to the surgical site, or 90 days for deep incisional/organ space infections related to a surgically implanted device.

   e. The SAB was diagnosed within 48 hours of a related invasive instrumentation or incision.

   f. The SAB is associated with neutropenia* contributed to by cytotoxic therapy and is unrelated
   to the presence of an indwelling medical device.

A SAB is **community associated** if neither 1 or 2 are met

A SAB arising in neonates less than 48 hours after birth is considered **maternally acquired** during delivery unless strong evidence suggests otherwise

* Neutropenia is defined as at least two separate calendar days with values of absolute neutrophil count or total white blood cell count < 500 cells/mm3 (< 0.5 X 109/L) on or within a seven-day time period which includes the date the positive blood specimen was collected (day 1), the three calendar days before and the three calendar days after.

Denominator definition

Monthly inpatient admission and discharge data from the National Minimum Dataset is used to calculate the number of inpatient bed-days in the quarter.

Determining a case | Te whakatau kēhi

Case detection

All health care providers should have an active surveillance process in place for all *S. aureus*-positive blood culture notifications to determine the organisation's HA-SAB cases.

As part of this process, IPC teams should review cases in collaboration with clinicians responsible for the patients' clinical care to determine if cases fit the 'healthcare-associated' definition.

Further consultation with a clinical microbiologist or infectious diseases physician may be needed if it is hard to attribute the case.

Location of attribution

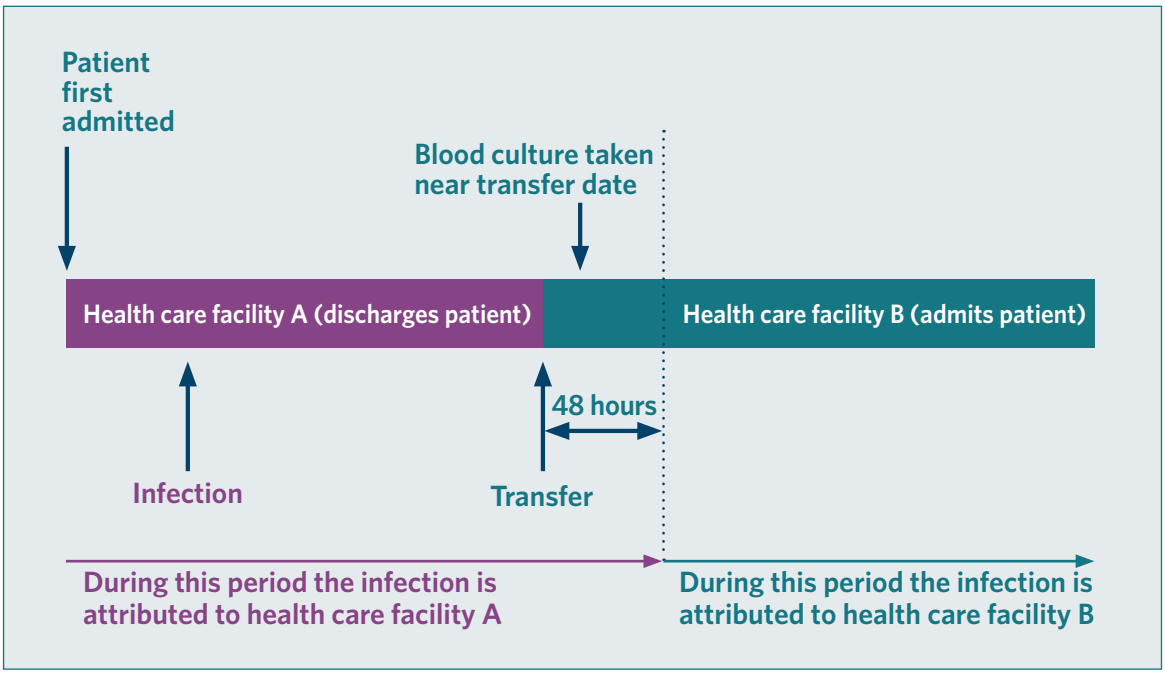
The HA-SAB should be attributed to the location where the patient was assigned on the date of the positive blood culture, unless the Transfer Rule* applies (see Figure 1).

The Transfer Rule applies if the HA-SAB occurred within 48 hours of transfer from another health care facility (Figure 2). If the Transfer Rule applies, the HA-SAB should be attributed to the facility from which the patient was transferred. The principles of the Transfer Rule can also be applied at clinical unit or ward level.

If the patient was admitted to multiple health care facilities within the Transfer Rule timeframe, the HA-SAB should be attributed to the first facility to which the patient was admitted the day before the HA-SAB occurred. Receiving facilities should share information with the transferring facilities so that all HA-SABs can be reported.

Attribution has to be accurate because it informs targeted review and improvement activities.

Figure 1: The Transfer Rule



* The Transfer Rule allows for exceptions to the location of attribution. If the date of event is on the date of transfer or discharge, or the next day, the infection is attributed to the transferring/discharging location. This is called the 'Transfer Rule'.

S. aureus as a contaminant

S. aureus is a rare contaminant in a blood culture. A positive culture of *S. aureus* will only be considered a contaminant, and therefore not reported in the surveillance data, if:

- the clinical picture is unsupportive of infection and a repeat blood culture is negative

and/or

- the clinical picture is unsupportive of infection and no targeted *S. aureus* antimicrobial treatment has been given.

If blood culture results are inconsistent, the episode should be investigated to confirm whether it is a true bloodstream infection.

Note: Best practice recommends the collection of two sets of blood cultures from separate sites on the patient to identify SAB.

Classification of HA-SAB by antimicrobial susceptibility

When classifying HA-SAB by antimicrobial susceptibility, classification should be based on cefoxitin susceptibility results and/or the presence of the mecA gene. HA-SAB should be classified as either:

1. methicillin-susceptible *S. aureus* (MSSA)

or

2. methicillin-resistant *S. aureus* (MRSA), which includes MRSA defined as multi-resistant.

Applying the HA-SAB definition | Te whakamahi tikanga HA-SAB

(See also **Appendix 2** for some scenarios on applying the HA-SAB definition.)

1. HA-SAB detected > 48 hours of admission to hospital or < 48 hours after discharge

An episode of HA-SAB occurs when the first positive *S. aureus* blood culture occurs more than 48 hours after admission, with no documented evidence that infection was present (including incubating) on admission or less than 48 hours after discharge.

2. HA-SAB detected within 48 hours of admission to hospital

There are four criteria used to identify episodes of HA-SAB that are detected within 48 hours of admission to hospital. Where SAB episodes occur in hospital after this period, you will almost always classify them as healthcare associated (unless you decide the infection was incubating on admission).

Some episodes of SAB may meet more than one of the four criteria for HA-SAB. As long as an episode meets at least one criterion, you should include it in the surveillance for HA-SAB if the patient has been in hospital less than 48 hours.

Criterion 2A. HA-SAB as a complication of indwelling medical device – an intravascular device or other medical device

Identify an episode of SAB as a complication of an **intravascular device** (and so count/report it as healthcare associated) if:

- an intravascular catheter was present up to 48 hours before the SAB episode

and

- you cannot identify any other focus of infection due to *S. aureus*.

Note: This does not mean that the intravascular catheter had to be in place for at least 48 hours.

An introducer used in intravascular procedures (eg, in angiograms) is an intravascular catheter according to National Healthcare Safety Network (NHSN) definitions.[8] So you would count an episode of SAB occurring within 48 hours of a procedure using an intravascular introducer as healthcare associated unless you can identify a focus of infection (likely due to *S. aureus*) at another site.

For patients with haemodialysis access devices in place, attribute an HA-SAB episode to such a device if:

- there is clinical evidence of infection at the vascular access site

or

- no other source of infection due to *S. aureus* can be identified.

Identify an episode of SAB as a complication of a **non-intravascular indwelling medical device** (and so count/report it as a HA-SAB) if:

- the device was in place within 48 hours of the SAB

and

- there is clinical or microbiological evidence of *S. aureus* associated with the site of device insertion or an organ connected to the device.

Such devices include (but are not limited to): urinary catheters, percutaneous endoscopic gastrostomy (PEG) tubes, chest tubes, cerebrospinal fluid (CSF) shunts, peritoneal dialysis catheters, temporary pacing wires, nephrostomy tubes or other percutaneously placed tubes, pacing wires, endoscopic retrograde cholangiopancreatography (ERCP) and cardiac catheterisation.

Criterion 2B. HA-SAB as a complication of a surgical procedure

To count as an episode of HA-SAB, the infection must meet the surveillance criteria of a superficial, deep or organ space surgical site infection (SSI) that is proven or likely to be due to *S. aureus*.

If a patient has a surgically implanted device, extend the 30-day time limit to 90 days after surgery if you detect a deep incisional/organ space infection related to the device. This recognises the possibility of a delay in presentation of infection in this context. Items classified as surgically implanted devices include (but are not limited to): permanent pacemakers, joint prostheses, brain and spinal cord nerve stimulators, breast implants and surgical mesh.

Attribute the episode of HA-SAB to the hospital/DHB that undertook the relevant surgery/surgical manipulation previously.

If a patient has repeated surgical procedures, even if these involve recurrent infection, attribute the HA-SAB episode that meets the case definition to the hospital/DHB that undertook the most recent surgical procedure.

Criterion 2C. HA-SAB associated with invasive instrumentation or incision within 48 hours

If more than 48 hours pass between invasive instrumentation or incision and the HA-SAB episode, you must have compelling evidence that the infection was related to the invasive device or procedure before counting it as healthcare associated.

If a patient has had multiple incisions or instrumentation, attribute the infection to the most recent procedure, and the facility that performed it. Examples of invasive instrumentation include (but are not limited to): pacing wires, endoscopic retrograde cholangiopancreatography (ERCP) and cardiac catheterisation.

Criterion 2D. HA-SAB associated with neutropaenia caused by cytotoxic therapy

This criterion refers to drug-related neutropaenia associated with the administration of cytotoxic therapy. It does not include neutropaenia due to other causes, such as disease-related neutropaenia.

Where the HA-SAB and neutropaenia is related to the presence of an indwelling medical device (eg, a central venous catheter), apply criterion 2A, not criterion 2D.

3. SAB incubating on admission

Do not count an episode of SAB as healthcare associated if you get an *S. aureus*-positive blood culture from a patient more than 48 hours after admission and there were clinical signs of staphylococcal infection documented on admission. Provided you have no evidence that the infection is associated with an earlier admission or medical procedure received in hospital (consistent with the HA-SAB definition), it is not healthcare associated.

Make this decision in consultation with the patient's medical officer and/or an infectious diseases physician or clinical microbiologist. If there is significant uncertainty, then classify the episode as healthcare associated.

SAB source data collection | Te kohinga raraunga SAB

When you identify an episode of SAB as healthcare associated through surveillance, it is important to identify the source of the infection. This will enable a better understanding of the epidemiology of HA-SAB cases and the associated risk factors for healthcare-related acquisition. It also helps health providers develop focused quality improvement plans.

Clinical specialty

The clinical speciality is the type of clinical oversight and care the patient is receiving, ie, the department that is managing the care of the patient. For example, a dialysis patient seen in an emergency department would be listed as renal medicine. These departments or specialist care units are described differently in each hospital. For example, rehabilitation and care of the elderly are listed as separate specialities, although in some organisations they may be combined as one department.

When completing the HA-SAB source data collection tool, choose a department or speciality from the list that is the equivalent to the one in your facility.

Sources of HA-SAB

The Health Quality & Safety Commission's principal categories for the origin or source of the HA-SAB infection, and the sub-categories for each, are listed and described below in Table 1.

Device

For the purposes of HA-SAB surveillance, the category for '**Device**' is used for an invasive medical device that remains in situ and presents an ongoing break in the skin or opening that allows pathogens to enter and cause an infection. This group includes intravascular devices, urinary catheters, endotracheal tubes and a variety of other medical tubes and drains. Refer also **Criterion 2A. HA-SAB as a complication of indwelling medical device – an intravascular device or other medical device**.

Infections that arise from other tubes and drains placed in a body cavity are captured within the category, 'Other procedure or intervention'.

SSI

An HA-SAB infection that is a complication of a SSI must be further categorised into superficial, deep or organ space. Refer also **Criterion 2B. HA-SAB as a complication of a surgical procedure**. The type of surgical procedure is not required.

Organ source – not SSI

Choose this category for an HA-SAB infection where the source is **an infection at an organ site** other than a surgical wound, and is not associated with a device or another type of procedure or clinical intervention. This includes HA-SAB arising from pneumonia, burns, pressure injuries, urosepsis (not related to a device), manipulation of the hepatobiliary tract or a cardiac source other than cardiac surgery or procedure.

Neutropaenic sepsis

Refer to **Criterion 2D. HA-SAB associated with neutropaenia caused by cytotoxic therapy** for inclusion criteria for this category.

Unknown source

This category should only be used in rare circumstances when a detailed investigation does not provide a clear source for the HA-SAB infection.

Other procedure or intervention

HA-SAB may arise following a procedure or intervention that is not regarded as surgery. This includes endoscopy, percutaneous interventional radiology procedures, intra-cavity ultrasound and insertion of an internal stent or drain. In this case, apply the definition for HA-SAB as described in **Criterion 2C. HA-SAB associated with invasive instrumentation or incision within 48 hours**.

Table 1: HA-SAB source category and sub-category

HA-SAB source category	Source sub-category
Device (Includes vascular device, urinary catheter, extra-corporeal tubes, drains and catheters)	Peripheral intravenous catheter Arterial catheter Non-tunnelled central venous catheter (CVC) Tunnelled CVC Peripherally inserted central catheter Urethral catheter Suprapubic catheter Peritoneal dialysis catheter External ventricular drain Percutaneous endoscopic gastrostomy tube Endotracheal tube Other device
SSI	Organ space Deep Superficial Unknown
Organ source – not SSI	Pulmonary Hepatobiliary Skin/soft tissue Urinary tract Cardiac Other organ source
Neutropaenic sepsis	No sub-source category
Unknown source	None of the above, bloodstream infection of unknown origin

HA-SAB source category	Source sub-category
Other procedure or intervention	Temporary or permanent pacing wires Cardiac catheterisation Endoscopy Endoscopic retrograde cholangiopancreatography (ERCP) Cystoscopy Trans-vaginal ultrasound Trans-rectal ultrasound Placement of a body cavity drain, eg, nephrostomy tube, chest drain or biliary drain Other

Numerator and denominator data | Raraunga taurunga, tauraro

How to submit numerator data

SAB numerator data is collected monthly by the DHB hand hygiene coordinator then submitted to Hand Hygiene New Zealand every quarter on a cloud-based spreadsheet.

Coordinators have 30 days from the end of each quarter to submit numerator data for the quarter, to allow time to identify numerator cases. So, the required dates for submission are:

- 31 January (for the quarter to 31 December)
- 30 April (for the quarter to 31 March)
- 31 July (for the quarter to 30 June)
- 31 October (for the quarter to 30 September).

If any issues arise when entering the data into the spreadsheet, coordinators can email the national coordinator for help at: **HHNZ@hqsc.govt.nz**.

Denominator data

DHBs do not have to submit denominator data. The Health Quality & Safety Commission's health quality intelligence team calculates this data from the Ministry of Health's National Minimum Dataset (NMDS) using the monthly inpatient admission and discharge data to calculate the number of inpatient bed-days in the quarter.

Well babies, mental health patients and hospital boarders (eg, a caregiver staying with a child) are excluded because these groups have minimal risk of developing HA-SAB during their hospital stay.

Glossary | Te kuputaka

Term	Definition
Admission	The process whereby the hospital accepts responsibility for the patient's care and/or treatment. Admission follows a clinical decision based upon specified criteria that a patient requires same-day or overnight care or treatment. An admission may be formal or statistical. Formal admission: The administrative process by which a health care facility records the commencement of treatment and/or care and/or accommodation of a patient. Statistical admission: The administrative process by which a health care facility records the commencement of a new episode of care, with a new care type, for a patient within one stay.
Antimicrobial susceptibility	Antimicrobial susceptibility tests are used to determine which specific antibiotics a particular bacteria or fungus is sensitive to.
Aseptic technique	A set of practices aimed at minimising contamination, particularly used to protect the patient from infection during procedures.
Blood culture	For adults, a blood culture set comprises two specimen bottles (aerobic and anaerobic); the usual sample volume is 8–10 millilitres (mLs) per bottle; for paediatric patients one aerobic bottle is required per sampling; the usual sample volume is 1–3 mLs. For neonates, usual sampling is 0.5–1 mL. Best practice recommends that two sets of blood cultures be collected from separate sites on the patient for identification of the SAB. However, if the results are inconsistent, the episode should be investigated to confirm it is a true bacteraemia.
Healthcare-associated infection (HAI)	Infection acquired as a direct or indirect result of health care.
Hospital boarder	A person who is receiving food and/or accommodation but not medical care, including well babies ≥ 10 days of age.
MRSA	Methicillin resistant *Staphylococcus aureus* based on cefoxitin susceptibility results and/or the presence of the mecA gene.
MSSA	Methicillin susceptible *Staphylococcus aureus* based on cefoxitin susceptibility results and/or the absence of the mecA gene.
National Minimum Dataset (NMDS)	A national collection of public and private hospital discharge information, including clinical information, for inpatients and day patients. Unit record data is collected and stored. All records must have a valid NHI number.
Neutropenia (caused by cytotoxic therapy)	Defined as at least two separate calendar days with values of absolute neutrophil count (ANC) or total white blood cell count (WBC) < 500 cells/mm3 (< 0.5 × 109/L) on or within a 7-day time period which includes the date the positive blood specimen was collected (day 1), the 3 calendar days before and the three calendar days after.

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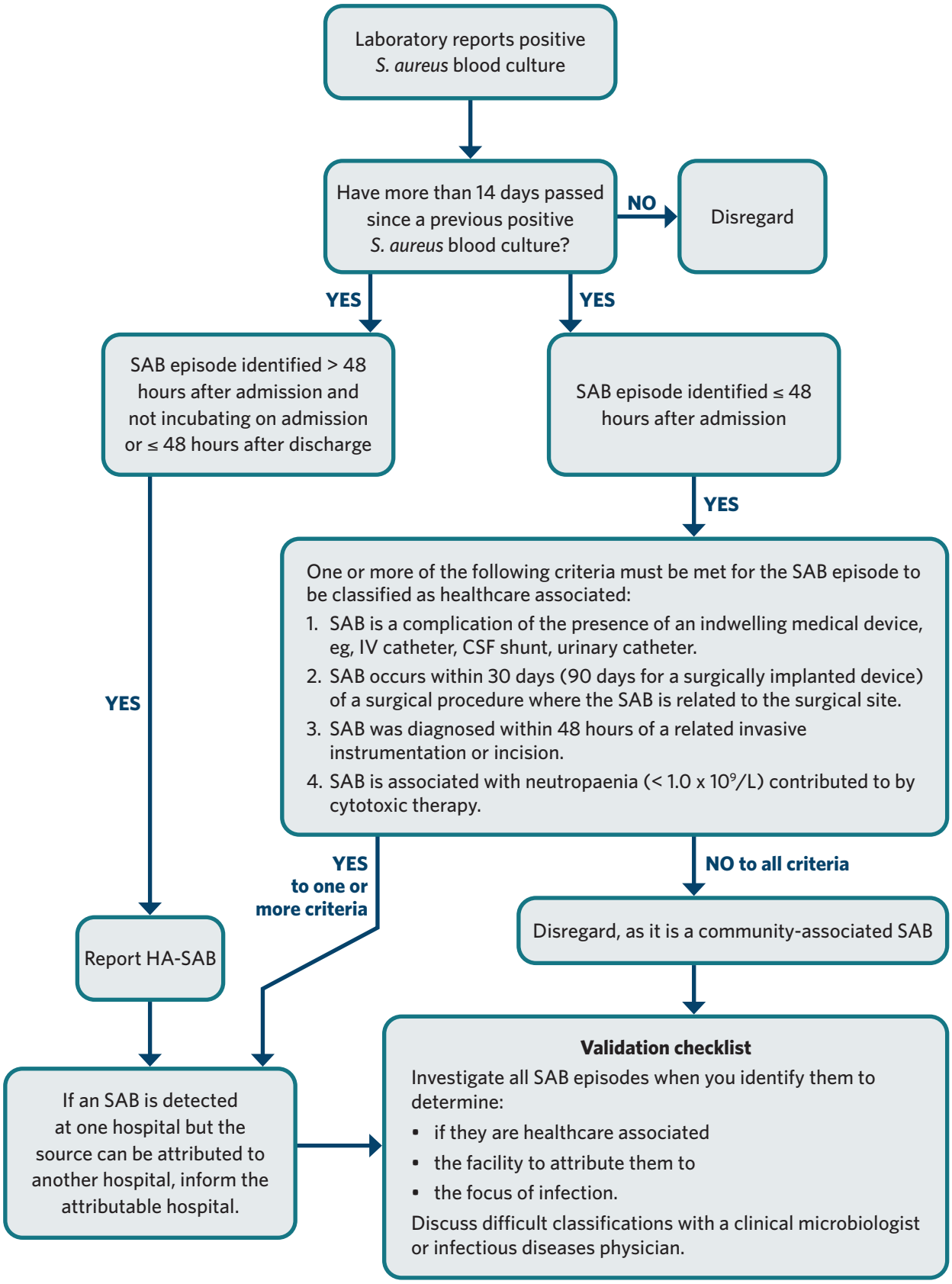
Appendix 1: Flowchart to determine HA-SAB | Āpitihanga 1: Mahere ripo hei whakatau HA-SAB



Appendix 2: Examples of how to apply HA-SAB case definition | Āpitihanga 2: Ngā tauira mō te pēhea e mahi tikanga kēhi HA-SAB

When you are collecting HA-SAB data, you may need more information on some scenarios. See the table below for common scenarios and how to apply the current definitions of:

- healthcare associated: SAB occurs more than 48 hours after admission or within 48 hours of discharge
- healthcare associated: SAB occurs 48 hours or less after admission and meets one of the key clinical criteria
- community associated: SAB occurs 48 hours or less after admission and meets none of the key clinical criteria.

The scenarios use the following coding:

- Hosp A = DHB Hospital A
- Hosp B = DHB Hospital B
- Community HCF = community-based health care facility, such as aged residential care

Scenario	Details	SAB criteria that apply	Attributable facility/ community	Rationale for classification
1	• SAB detected on admission to Hosp A • Patient discharged from Hosp A less than 48 hours previously • Patient has intravascular catheter in situ associated with a previous episode of care in Hosp A	Healthcare associated: SAB occurs 48 hours or less after admission and meets one of the key clinical criteria	Hosp A	Hosp A reports SAB as HA-SAB (complication of an indwelling medical device)
2	• Patient in Hosp A for more than 48 hours, no blood cultures collected • Patient with peripheral intravenous catheter in situ transferred to Hosp B, blood culture collected on admission – SAB detected	Healthcare associated: SAB occurs more than 48 hours after admission or within 48 hours of discharge	Hosp A	• Hosp B IPC service informs Hosp A IPC service of SAB • Hosp A reports SAB as HA-SAB (collected less than 48 hours after discharge)

Scenario	Details	SAB criteria that apply	Attributable facility/ community	Rationale for classification
3	• Patient in Hosp A for more than 48 hours, SAB detected day 5 (arteriovenous fistula in situ – endocarditis) • Patient transferred to Hosp B, blood cultures on admission negative • Subsequent blood culture (within 14 days of the SAB in Hosp A, identified on day 5) – SAB detected	Healthcare associated: SAB occurs more than 48 hours after admission or within 48 hours of discharge	Hosp A	• Hosp A reports initial SAB as HA-SAB • Hosp B not required to report because case was a known previous HA-SAB within last 14 days (there must be 14 full days for new HA-SAB to be recorded) • Note: This case highlights the importance of having accurate clinical notes in transfer summaries, and collaboration between Hosp A and Hosp B IPC services
4	• Patient presents to emergency department in Hosp A within 48 hours of an invasive radiological procedure at Hosp A – blood culture collected and SAB detected • Patient directly transferred to Hosp B for further management (not admitted to Hosp A), no further blood cultures collected	Healthcare associated: SAB occurs 48 hours or less after admission and meets one of the key clinical criteria	Hosp A	• Hosp A reports SAB as HA-SAB • Hosp B not required to report SAB
5	• SAB detected in emergency department and patient admitted to Hosp A • Patient had total hip joint replacement (implant) two months ago in Hosp A – SAB related to deep incisional/organ space infection	Healthcare associated: SAB occurs 48 hours or less after admission and meets one of the key clinical criteria	Hosp A	Although infection has occurred less than 48 hours after admission, SAB is related to deep wound infection within 90 days of implant surgery, therefore is HA-SAB

Scenario	Details	SAB criteria that apply	Attributable facility/ community	Rationale for classification
6	• Patient in Community HCF for more than 48 hours, blood culture collected and SAB detected • Patient transferred to Hosp A, no blood culture collected	Community associated	Community	SAB does not meet definition for HA-SAB. The Community HCF may investigate for its own quality improvement purposes
7	• Patient in Community HCF for more than 48 hours, blood culture collected and SAB detected • Patient transferred to Hosp A, blood culture collected on admission and SAB detected	Community associated: SAB occurs 48 hours or less after admission and meets none of the key clinical criteria	Community	• SAB does not meet definition of HA-SAB • Hosp A notes case as community associated SAB and is not required to report
8	• Patient in Hosp A more than 48 hours with peripherally inserted central catheter in situ • Transfer to Hosp B, failed vascath insertion on admission • Blood culture collected eight hours after vascath attempt – SAB detected	Healthcare associated: SAB occurs 48 hours or less after admission and meets one of the key clinical criteria	Hosp B	Hosp B reports SAB as HA-SAB following invasive instrumentation, the most recent of which was in Hosp B
9	• Patient in Hosp A admitted with infected chronic leg ulcers that have isolated *S. aureus* • Patient has clinical signs of sepsis on admission • Blood culture taken four days after admission and SAB detected • SAB antibiotic susceptibilities same as wound swab	Community associated: SAB occurs 48 hours or less after admission and meets none of the key clinical criteria	Community	• Hosp A not required to report SAB as HA-SAB as does not meet definition • *S. aureus*-positive blood culture from a patient more than 48 hours after admission, and there were clinical signs of staphylococcal infection documented on admission

Scenario	Details	SAB criteria that apply	Attributable facility/ community	Rationale for classification
9A	• Patient in Hosp A admitted with a leg ulcer colonised with *S. aureus* • Patient has no clinical signs of sepsis on admission • Blood cultures taken four days after admission and SAB detected • SAB antibiotic susceptibilities same as wound swab	Healthcare associated: SAB occurs more than 48 hours after admission or within 48 hours of discharge	Hosp A	• Hosp A required to report SAB as HA-SAB • SAB detected more than 48 hours after admission
10	• Patient had aortic valve replacement and coronary artery bypass graft in Hosp A • Admitted to Hosp B six weeks later with deep sternal wound infection growing *S. aureus* and SAB detected on admission • SAB antibiotic susceptibilities same as wound swab • Aortic valve normal on echocardiography	Healthcare associated: SAB occurs 48 hours or less after admission and meets one of the key clinical criteria	Hosp A	• Hosp A required to report SAB as HA-SAB • Hosp B not required to report • Although deep wound infection occurred more than 30 days after surgery and is not related to implant, clinician involved in management of the patient judges that the SAB is HA-SAB • Hosp B should notify Hosp A for its information and records
11	• Patient admitted to Hosp A for drainage of ascites via peritoneal catheter. Catheter removed and patient discharged one day later • Patient readmitted to Hosp A three days later with septic shock, SAB on admission • Ascites grows *S. aureus* • Insertion site not clinically infected • SAB antibiotic susceptibilities same as ascites specimen	Healthcare associated: SAB occurs 48 hours or less after admission and meets one of the key clinical criteria	Hosp A	Hosp A required to report SAB as HA-SAB – invasive instrumentation with compelling evidence that the infection was related to the invasive procedure (*S. aureus* in ascites fluid)

Scenario	Details	SAB criteria that apply	Attributable facility/ community	Rationale for classification
12A	• Patient had for total hip joint replacement in Hosp A • Patient admitted to Hosp B for deep incisional/organ space wound infection 10 weeks later. SAB on admission • Transfer to Hosp A for revision of total hip joint replacement	Healthcare associated: SAB occurs 48 hours or less after admission and meets one of the key clinical criteria	Hosp A	• Hosp A required to report SAB as HA-SAB • Deep wound infection occurs within 90 days of implant surgery • Hosp B should make Hosp A aware of the event
12B	Two months after revision surgery, patient admitted to Hosp A with deep total hip joint replacement infection and SAB detected on admission	Healthcare associated: SAB occurs 48 hours or less after admission and meets one of the key clinical criteria	Hosp A	• Hosp A required to report SAB as HA-SAB • Deep wound infection occurs within 90 days of implant surgery • Report according to last invasive procedure
13	• Patient undergoing chemotherapy as an outpatient at Hosp A via peripheral IV catheter • Admitted to Hosp B with febrile neutropaenia and SAB 10 days after last chemotherapy	Healthcare associated: SAB occurs 48 hours or less after admission and meets one of the key clinical criteria	Hosp A	• Hosp A required to report SAB as HA-SAB. • Hosp B should make Hosp A aware of the event
14	• Patient undergoing haemodialysis via arteriovenous fistula at Hosp A • Three days after last haemodialysis admission, patient presents with fever and SAB	Community associated: SAB meets none of the key clinical criteria	Hosp A	An arteriovenous fistula is not considered an intravascular device for purposes of HA-SAB surveillance.

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