Tasmanian Infection Prevention and Control Unit

Staphylococcus aureus Bacteraemia Surveillance Protocol

Version 3.0

(Approved 2/11/2011 by HAI Steering Committee)

Department of Health and Human Services

Tasmania
Explore the possibilities

Editors

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Foreward

Healthcare Associated Infections can have a significant impact on the functioning of a health service and more importantly, have an impact on patients and the quality of health care we provide for the population.

Within the health care system and related environment, we strive to prevent infections. The patient must be at the centre of what we do with the desired outcome of care being to minimise and reduce the risk of infection. The prevention and control of infection must be the responsibility of many disciplines, involve all members of the healthcare team, and not simply be the role of a professional trying to manage this solo.

The Department of Health and Human Services (DHHS) established the Tasmanian Infection Prevention and Control Unit (TIPCU) early in 2008 and since this time has taken proactive steps in the prevention and control of healthcare associated infections.

One of the functions of Unit is to co-ordinate and implement surveillance programs for health care associated infections in Tasmania. Surveillance of healthcare associated infections is crucial in understanding the current infection control issues in Tasmania and provides a means by which performance can be monitored. It also prepares Tasmania for any future changes in the epidemiology of healthcare associated infections.

In December 2008, the Australian Health Ministers Conference (AHMC) endorsed recommendations for implementation of a standardised national approach to the surveillance of *Staphylococcus aureus* bacteraemia (SAB). The TIPCU has adopted these nationally accepted definitions. To support the implementation of the definitions the SAB Surveillance Implementation Guide has been developed by the Australian Commission on Safety and Quality in Healthcare, Technical Advisory Group.

Surveillance is just one of many aspects needed for the successful prevention and control of infections and I welcome, support and fully endorse the surveillance program outlined in this document.

Dr Roscoe Taylor

Director of Public Health

Background

Staphylococcus aureus is a bacterium that is common on human skin and mucosa. *Staphylococcus aureus* can cause disease, particularly if there is an opportunity for the bacteria to enter the body. Illnesses such as skin and wound infections, urinary tract infections, pneumonia and **bacteraemia** (blood stream infection) may then develop. Some *Staphylococcus aureus* bacteria are resistant to the antibiotic methicillin, termed methicillin-resistant *Staphylococcus aureus* (MRSA).

Staphylococcus aureus bacteraemia (SAB) infections are common and are a serious cause of morbidity and mortality worldwide. Approximately one half of all SAB episodes have a hospital onset. SAB episodes are associated with a high mortality, yet many are potentially preventable.

SAB in Tasmania became a notifiable disease pursuant to the *Public Health Act 1997* on 17 December 2008. As such all SABs will be notified to the Communicable Disease & Prevention Unit (CDPU) and subsequently to TIPCU.

The surveillance program outlined in this document involves collecting information for each SAB episode. It is hoped that this scheme will provide hospitals with a more accurate picture, with respect to *Staphylococcus aureus* and MRSA bacteraemia rates, will contribute to building a better evidence base regarding risk factors for infection and provide a baseline from which future interventions can be measured.

This document is consistent with the SAB Surveillance definitions approved by the National Health Information Statistical Standards Committee (NHISSC) in December 2010, Australian Commission on Safety and Quality in Healthcare (ACSQHC) and with the SAB Implementation Guide which was worked on by all state and territory jurisdictional bodies.
www.health.gov.au/internet/safety/publishing.nsf/Content/PriorityProgram-03

Process of Surveillance

TIPCU will receive notification of a SAB from the Communicable Diseases Prevention Unit (CDPU). Participating hospitals will receive notification of a SAB from TIPCU and may also receive notifications directly from the laboratory. Additional information as outlined in this protocol will be sought via the hospital Infection Control Teams (IC Team) or the patient's General Practitioner (GP). TIPCU will send a SAB Surveillance Form via email to the relevant IC Team or GP.

All SAB which were **collected** before the end of the month should have completed surveillance information submitted to TIPCU by the tenth of the following month.

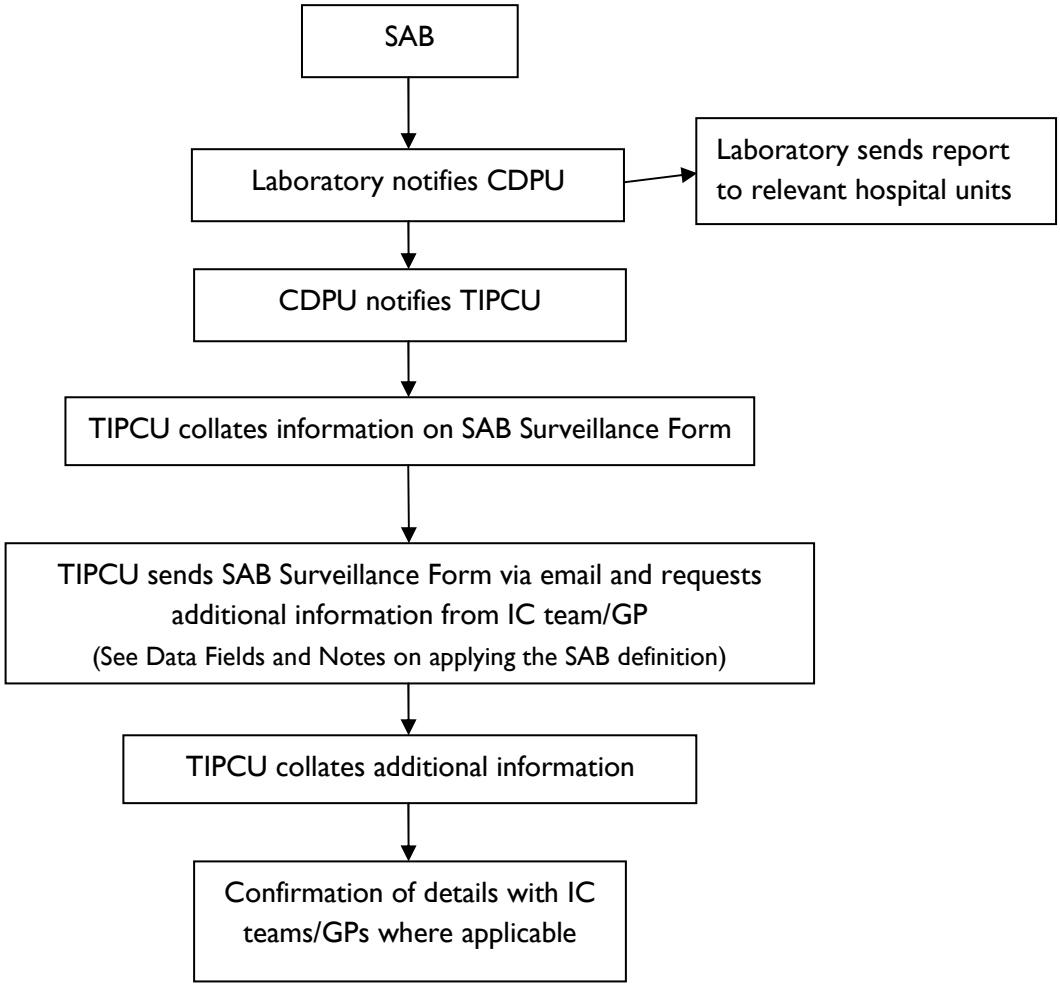
Information on each SAB case for the month can be submitted together or individually as reviewed by IC Teams or GPs.

(For example, SABs collected during March should have additional information submitted by 10 April).

This process is required to ensure:

- information is collected in a timely and accurate manner
- validation of total number of cases by TIPCU can occur and be fed back to the infection control teams.

Process of Surveillance – Flowchart



Determination of SAB Rates

The following primary information will be used to define the monthly rates of SAB for each Tasmanian healthcare facility with acute inpatient beds:

Numerator

Patient-episodes of SAB (noting the following factors related to each episode):

- Determination of whether the SAB is a healthcare associated infection
- Designation of which healthcare facility the patient was admitted to at the time of the patient-episode of SAB

Denominator

Total patient days (noting the following inclusion)

- Same-day patients

The rate will be calculated for each healthcare facility and State/Territory per month as follows:

Numerator: **Patient episodes of Healthcare associated SAB x 10,000**

Denominator: **Number of patient days**

Further stratification of healthcare associated SAB cases may be undertaken for example:

- HCA MRSA bacteraemia
  - Multi-resistant (resistant to 3 or more antibiotic classes other than betalactams) and
  - Non-multi-resistant (resistant to < 3 antibiotic classes other than betalactam)
- HCA MSSA bacteraemia
- Age

Community-associated (CA) SAB occurrence will be calculated according to the availability of numerator and denominator data. For example, incidence in a specific population group.

Definitions

Healthcare Associated SAB

A SAB will be considered to be healthcare-associated if:

EITHER

CRITERION A: The patient's first SAB blood culture was collected more than 48 hours after hospital admission or less than 48 hours after hospital discharge

OR

CRITERION B: The patient's first SAB blood culture was collected less than or equal to 48 hours after hospital admission and **one or more** of the following key clinical criteria was met for the patient-episode of SAB:

Key clinical criteria*:

B1. SAB is a complication of the presence of an indwelling medical device (e.g. Intravascular line, haemodialysis vascular access, CSF shunt, urinary catheter)

B2. SAB occurs within 30 days of a surgical procedure where the SAB is related to the surgical site

B3. SAB was diagnosed within 48 hours of a related invasive instrumentation or incision

B4. SAB is associated with neutropenia (Neutrophils: $<1 \times 10^9$/L) contributed to by cytotoxic therapy

Community Associated SAB

SAB cases identified < 48 hours after admission and none of the key clinical criteria are met

Inclusion Criteria

For the purposes of the surveillance program, any one or more blood cultures positive for *S.aureus* is considered to be significant and to be included in the surveillance.

Exclusion Criteria

Only the first isolate per patient is counted, unless at least 14 days has passed without a positive blood culture, after which an additional episode is recorded.

* Key clinical criteria must be identified, where possible, for any SAB fulfilling Criterion A or Criterion B by the IC team at the relevant hospital.

Patient Days

The total number of days for all patients who were admitted for an episode of care and who separated during a specified reference period.

Patient days are calculated by counting the total patient days of those patients *separated* during the specified period, including those admitted before the specified period. Patient days of those patients admitted during the specified period who did not separate until the following reference period are not counted.

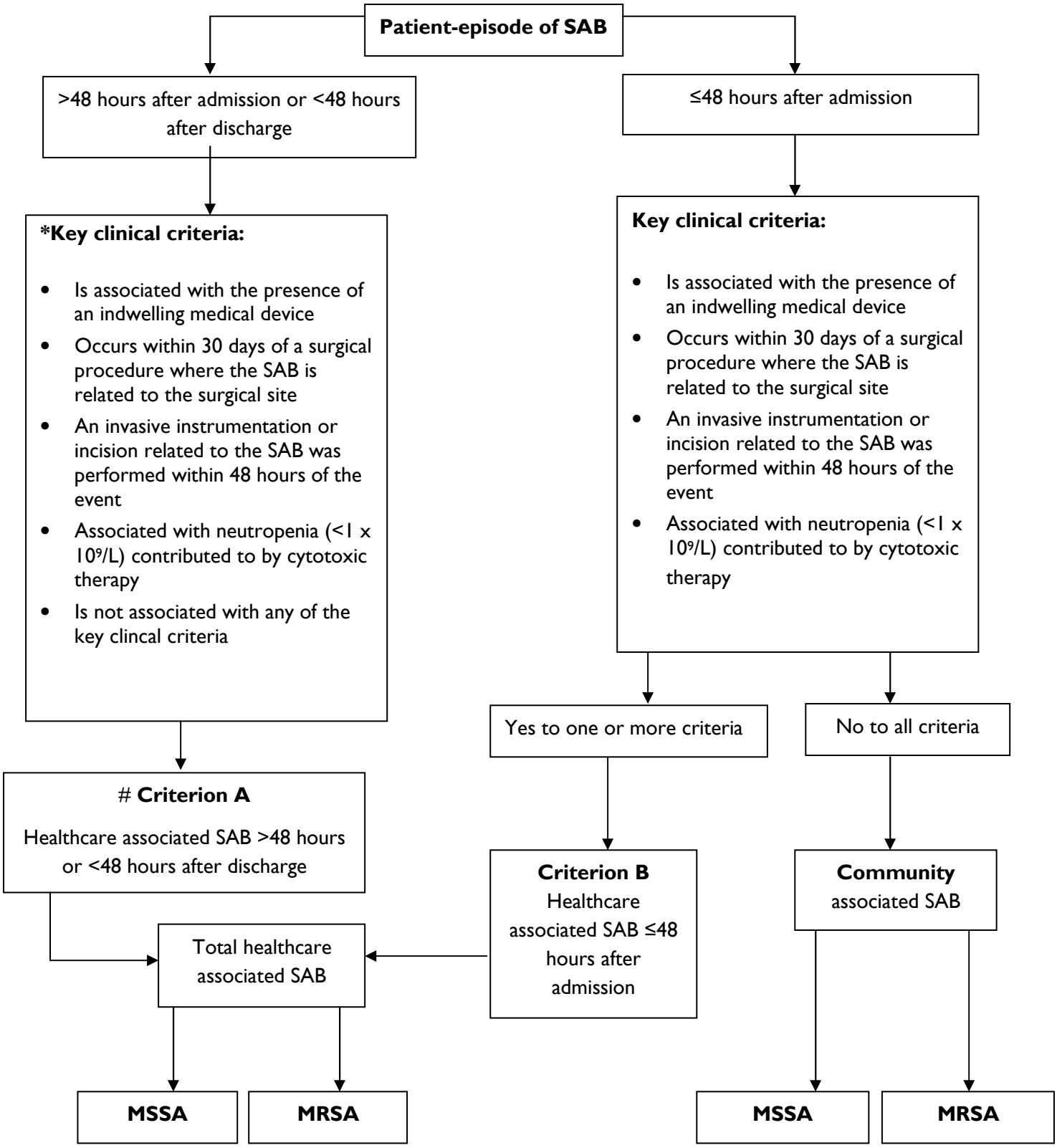
SAB Case Review

Some 'Community-onset patient-episodes of SAB' may in fact be related to a recent episode of healthcare (ie healthcare-associated). To identify whether SABs are truly community-associated or are in fact healthcare-associated, all SABs should undergo a case review by a healthcare worker with expertise in infection control. It is expected that each case review will take 15–20 minutes to complete.

Susceptibility Data

Susceptibility testing will be undertaken on each reported MRSA and MSSA SAB isolate. See required data set for which antibiotics are to be tested and reported as outlined in the Data Fields section in this document.

SAB Summary – Flowchart



* The "key clinical criteria is to be collected for both Criterion A and Criterion B.

SAB cases >48hours after admission or less that 48 hours after discharge are classified as healthcare associated regardless of key clinical criteria being identified.

Data Fields

Table 1 outlines the SAB patient episode data fields that will be collected. These data fields have been established from the ACSQHC Data set specifications and TIPCU requirements.

(Cross reference with SAB Enhanced Surveillance Form)

Table 1- SAB data fields

Object class	Data element	To be completed by
Patient episode of admitted patient care	Admission date	TIPCU
	Separation date	TIPCU
Establishment	Date and time specimen collected	TIPCU
	Establishment (See Hospital Codes below)	TIPCU
	Ward / Clinical area	Healthcare professional
Jurisdiction	Case identifier designation (Patient ID)	TIPCU
Laboratory	Laboratory code (See codes below)	TIPCU
	Laboratory Specimen Number	TIPCU
Person	Family name (TIPCU Database only)	TIPCU
	Given name (TIPCU Database only)	TIPCU
	Indigenous status (See codes below)	TIPCU
	Date of birth	TIPCU
	Date of death (up to one year post SAB)	TIPCU
	Sex	TIPCU
	Postcode	TIPCU
	Australian state/territory identifier (See codes below)	TIPCU
	Person identifier (Patient ID)	TIPCU
Patient episode of SAB	Healthcare associated SAB (See Notes on applying the definition below)	Healthcare professional
	Device if applicable (See codes below)	Healthcare professional
	SAB Methicillin susceptibility (See testing requirements below)	TIPCU
MRSA Isolate	Antibiotic susceptibility (MRSA isolate)	TIPCU/Healthcare professional

Data Field Codes (Cross reference with SAB Enhanced Surveillance Form)

Hospital codes

RHH	Royal Hobart Hospital
LGH	Launceston General Hospital
NWH	North West Regional Hospital
CHLV	Calvary Health Care -Lenah Valley
CHSJ	Calvary Health Care - St John's
CHSL	Calvary Health Care - St Luke's
CHSV	Calvary Health Care - St Vincent's
HPH	Hobart Private Hospital
NWP	North West Private Hospital
MER	Mersey Hospital
TR1	Rural hospital in Tasmania
TR2	Hospital Outside of Tasmania
TR3	Any other not listed
TR4	GP surgery or clinic
TR5	Long Term Care Facility

Indigenous Status

1	Aboriginal but not Torres Straight Islander origin
2	Torres Straight Islander but not Aboriginal origin
3	Both Aboriginal and Torres Straight Islander origin
4	Neither Aboriginal or Torres Straight Islander origin
9	Not stated / inadequately described

Australian State/Territory Identifier

1	New South Wales
2	Victoria
3	Queensland
4	South Australia
5	Western Australia
6	Tasmania
7	Northern Territory
8	Australian Capital Territory
9	Other territories (Cocos (Keeling) Islands, Christmas Island and Jervis Bay Territory)

Laboratory codes

RHH	Royal Hobart Hospital
LGH	Launceston General Hospital
NWP	North West Pathology
DSPLH	Hobart Pathology
DSPLL	Launceston Pathology
HS	Healthscope

Device codes

General Group	Code	Examples of devices
IV Device – Central venous lines	A	CVC, Tunnelled CVC (eg. Hickman's), PICC, Swan Ganz, Vascath, (dialysis), implanted ports (eg. Infusaport)
IV Device – Other IV lines	B	Arterial, peripheral (eg. Jelco, Insyte), umbilical.
Non IV indwelling medical device	C	Urinary catheters, percutaneous endoscopic gastrostomy (PEG) tubes, chest tubes, cerebro-spinal fluid (CSF) shunts, peritoneal dialysis catheters

Antibiotic Susceptibility Testing Requirements

Oxacillin or Cefoxitin (ie Flucloxacillin)	S / R
Penicillin	S / R
Ciprofloxacin	S / R
Erythromycin	S / R
Fusidic acid	S / R
Gentamicin	S / R
Rifampicin	S / R
Tetracycline or Doxycycline	S / R
Trimethoprim	S / R
Trimethoprim/Sulphamethoxazole	S / R

} And/or

Notes on applying the SAB definition

ICPs/GPs responsible for completion of the SAB Enhanced Surveillance Form should use the information from the ACSQHC Implementation Guide which can be found at:
www.health.gov.au/internet/safety/publishing.nsf/Content/PriorityProgram-03

Validation

The TIPCU will obtain a monthly summary report detailing all SABs. This data will be used by TIPCU to validate that all forms received by the IC Teams and GPs correspond with the number of SABs provided by the laboratories.

Data handling

All information held by the TIPCU will be done in accordance with the information privacy principles as set out in the *Privacy Act (Cth) 1988.*

Information shared by laboratories (public and private) pursuant to the *Public Health Act 1997* will be held in accordance with the Commonwealth information privacy principles as set out in the *Privacy Act (Cth) 1988.*

Table 1 contains details regarding the information to be held by TIPCU.

Surveillance reports developed by TIPCU will be reviewed by the HAI Steering Committee.

Information will be supplied to the Commonwealth as per relevant agreements.

Reports

Key principles of reports/data presentation:

- Reports will be sent to the relevant healthcare facility and infection control teams.
- Reports will be available on the TIPCU internet site.
- Reports will be developed in a manner as directed by the DHHS.
- Data will be provided to the Commonwealth as per relevant COAG agreement and published accordingly.

Quality Improvement

For issues of governance and quality improvement, where a participating organisation's results cause concern, the Chief Executive Officer of that area will be informed in line with the TIPCU operational policy. Issues raised from surveillance are to be used within the participating organisation's own quality improvement frameworks and participation in the program assumes this will occur.

The Tasmanian HAI Steering Committee will also review and discuss results and reports pertaining to any work undertaken by the TIPCU in respect to the DHHS.

References

Australian Commission on Safety and Quality in Health Care (2008) *Reducing harm to patients from health care associated infections; the role of surveillance*. Commonwealth of Australia

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National definition and calculation of Healthcare Associated *Staphylococcus aureus* bacteraemia (2010) Retrieved 29th June 2011 www.safetyandquality.gov.au/internet/safety/publishing.nsf/Content/PriorityProgram-03

Mitchell, B., Gardner, A., Collignon, P., Steward, L., Cruickshank, M. (2010). A literature review supporting the proposed national Australian definition for *Staphylococcus aureus* bacteraemia. *Healthcare Infection*, 15 (4), 105-113.

Privacy Act (Commonwealth) 1998. Retrieved 29th June 2011 www.privacy.gov.au/act/privacyact/index.html

Tasmanian *Public Health Act 1997* Retrieved 29th June 2011 www.austlii.edu.au/au/legis/tas/consol_act/pha1997126/

Appendix A: Laboratory Information Required

The following provides a summary of the information needed from laboratories in respect to this piece of surveillance.

INCLUSION CRITERIA

For the purposes of the surveillance program, any one or more blood cultures positive for *S.aureus* is considered to be significant and to be included in the surveillance.

DATA FIELDS

Data fields include:

- patient name
- date of birth
- UR number
- date specimen taken
- laboratory specimen number
- hospital
- MRSA or MSSA
- antibiotic susceptibility for MRSA and MSSA

(Required for all isolates)

Oxacillin or Cefoxitin (ie Flucloxacillin)	S / R
Penicillin	
Ciprofloxacin	S / R
Erythromycin	S / R
Fusidic acid	S / R
Gentamicin	S / R
Rifampicin	S / R
Tetracycline or Doxycycline	S / R
Trimethoprim	S / R
Trimethoprim/Sulphamethoxazole	S / R

} And/or

Additional notes in relation to antibiotic susceptibility

- Intermediate level resistance is reported as 'R'.
- Report one of trimethoprim or tri/sulpha dependent on which antibiotic was tested.

DUPLICATES

Will be determined by TIPCU and Infection Control teams.

VALIDATION REPORTS

Monthly, by the tenth day of each month.

FORMAT

Excel via email to TIPCU – tipcu@dhhs.tas.gov.au

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