

Indicator Specification
**Antimicrobial Stewardship
Clinical Care Standard**

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Disclaimer

The Australian Commission on Safety and Quality in Health Care has produced this Clinical Care Standard to support the delivery of appropriate care for a defined condition and is based on the best evidence available at the time of development. Health care professionals are advised to use clinical discretion and consideration of the circumstances of the individual patient, in consultation with the patient and/or their carer or guardian when applying information contained within the Clinical Care Standard. Consumers should use the information in the Clinical Care Standard as a guide to inform discussions with their health care professional about the applicability of the Clinical Care Standard to their individual condition.

Contents

Antimicrobial Stewardship Clinical Care Standard	2	Quality statement 8 – Review of treatment	13
Introduction	3	Indicator 7a: Review of patients prescribed broad-spectrum antibiotics	13
Quality statement 1 – Life-threatening conditions	5	Quality statement 9 – Surgical prophylaxis	14
Indicator 1a: Median time to first dose of antibiotics for life threatening conditions	5	Indicator 9a: Surgical antibiotic prophylaxis in accordance with guidelines	14
Quality statement 2 – Microbiological testing	6	Indicator 9b: Timely administration of prophylactic antibiotics prior to surgery	16
Quality statement 3 – Information on treatment options	7	Indicator 9c: Cessation of prophylactic antibiotics after surgery	18
Quality statement 4 – Use of guidelines and clinical condition	8	Indicators of effectiveness	19
Indicator 4a: Antibiotic prescribing in accordance with guidelines	8	Indicators of appropriateness	20
Indicator 4b: Antibiotic-allergy mismatch in prescribing	9	Prescribing audits	20
Quality statement 5 – Taking antibiotics as prescribed	10	Antimicrobial utilisation	21
Quality statement 6 – Documentation	11		
Indicator 6a: Documentation of reason for prescribing antibiotics	11		
Quality statement 7 – Use of broad-spectrum antibiotics	12		
Indicator 7a: Review of patients prescribed broad-spectrum antibiotics	12		

Antimicrobial Stewardship Clinical Care Standard

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1 A patient with a life-threatening condition due to a suspected bacterial infection receives prompt antibiotic treatment without waiting for the results of investigations.
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2 A patient with a suspected bacterial infection has samples taken for microbiology testing as clinically indicated, preferably before starting antibiotic treatment.
- 

3 A patient with a suspected infection, and/or their carer, receives information on their health condition and treatment options in a format and language that they can understand.
- 

4 When a patient is prescribed antibiotics, whether empirical or directed, this is done in accordance with the current version of the *Therapeutic Guidelines*^a (or local antibiotic formulary). This is also guided by the patient's clinical condition and/or the results of microbiology testing.
- 

5 When a patient is prescribed antibiotics, information about when, how and for how long to take them, as well as potential side effects and a review plan, is discussed with the patient and/or their carer.
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6 When a patient is prescribed antibiotics, the reason, drug name, dose, route of administration, intended duration and review plan is documented in the patient's health record.
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7 A patient who is treated with broad-spectrum antibiotics has the treatment reviewed and, if indicated, switched to treatment with a narrow-spectrum antibiotic. This is guided by the patient's clinical condition and the results of microbiology tests.
- 

8 If investigations are conducted for a suspected bacterial infection, the responsible clinician reviews these results in a timely manner (within 24 hours of results being available) and antibiotic therapy is adjusted taking into account the patient's clinical condition and investigation results.
- 

9 If a patient having surgery requires prophylactic antibiotics, the prescription is made in accordance with the current *Therapeutic Guidelines*^a (or local antibiotic formulary), and takes into consideration the patient's clinical condition.

^a Antibiotic Expert Groups. Therapeutic guidelines: antibiotic. Version 15. Melbourne: Therapeutic Guidelines Limited; 2014.

Introduction

Antibiotic resistance poses a significant threat to public health because antibiotics underpin routine clinical practice in a variety of healthcare settings. Bacteria can develop resistance to specific antibiotics, meaning that the antibiotic is no longer effective against those bacteria. Although antibiotic resistance is a natural feature of bacterial evolution, inappropriate use of antibiotics has increased the development of antibiotic-resistant bacteria, not only in hospitals and healthcare facilities but also in the community.^{a,b}

To help prevent the development of current and future bacterial resistance, it is important to prescribe antibiotics according to the principles of antimicrobial stewardship, such as prescribing antibiotics only when needed (and not for mild infections such as colds, earache or sore throats).

The Antimicrobial Stewardship Clinical Care Standard aims to ensure that a patient with a bacterial infection receives optimal treatment with antibiotics. 'Optimal treatment' means treating patients with the right antibiotic to treat their condition, the right dose, by the right route, at the right time and for the right duration based on accurate assessment and timely review.

A set of suggested indicators have been developed to assist with local implementation of this Clinical Care Standard. They can be used by health services to monitor the implementation of the quality statements, and support improvement as needed.

The process to develop these indicators comprised:

- an environmental scan of existing local and international indicators
- a prioritisation review and refinement of the indicators with a dedicated sub-committee of the Topic Working Group, and review by the Topic Working Group and Clinical Care Standards Advisory Committee.

Where no indicator was identified for a given quality statement, the sub-committee drafted new indicators based on their experience with audits in relevant sectors.

The specification of the indicators aims to support the consistent local collection of data related to the implementation of this Clinical Care Standard. It sets out the name for each indicator along with the rationale, computation, numerator, denominator, relevant inclusion and exclusion criteria, and associated references.

a World Health Organization. The evolving threat of antimicrobial resistance: options for action. Geneva: WHO, 2012.

b Duguid M, Cruickshand M, editors. Antimicrobial Stewardship in Australian hospitals. Sydney: Australian Commission on Safety and Quality in Health Care; 2011.

Role of the Commission in developing indicators

Responsibilities of the Australian Commission on Safety and Quality in Health Care (the Commission) are specified in the *National Health Reform Act 2011* and the *National Health Reform Agreement 2011*.

The National Health Reform Act requires the Commission to 'formulate, in writing, indicators relating to health care safety and quality matters' (9)(1)(g), and to 'promote, support and encourage the use of indicators formulated ...' (9)(1)(i).

The National Health Reform Agreement specifies the Commission's responsibility to 'recommend national data sets for safety and quality...' (clause B80d).

The Commission's work program is driven by the *Australian Safety and Quality Framework for Health Care* principles, which state that health care delivery should be consumer-centred, driven by information, and organised for safety.

Notes

The indicators in this specification are unlikely to be collected prospectively for all patients. Rather, a sampled audit approach is recommended in a number of randomly selected charts that are reviewed regularly to identify quality of care issues. Audits are discussed in the 'Indicators of appropriateness' section at the end of this document.

Where indicators refer to diagnosis of suspected bacterial meningitis or suspected sepsis, this refers to episodes where the International Classification of Diseases and Related Health Problems, 10th Revision, Australian Modification (8th edition) code (ICD-10-AM) has been identified as the principal diagnosis^a for the episode, or is sequenced as one of the first two additional diagnoses.^b

METeOR is the national metadata registry.^c Where a data element is part of the National Health Data Dictionary, the METeOR^a identifier is referenced.

The final section of the document describes existing indicators of effectiveness and appropriateness. It also summarises a range of activities being undertaken by the Commission or other agencies to support the reporting and surveillance of antibiotic usage, antimicrobial resistance and healthcare associated infections across Australia.

For more information about this Clinical Care Standard, visit www.safetyandquality.gov.au/ccs.

^a METeOR identifier: 514304. Definition: "The diagnosis established after study to be chiefly responsible for occasioning a patient's service or episode".

^b METeOR identifier: 514271. Definition: "A condition or complaint either coexisting with the principal diagnosis or arising during the episode of admitted patient care, episode of residential care or attendance at a health care establishment".

^c See <http://meteor.aihw.gov.au/content/index.phtml/itemId/181162>.

Quality statement 1 – Life-threatening conditions

A patient with a life-threatening condition due to a suspected bacterial infection receives prompt antibiotic treatment without waiting for the results of investigations.

Indicator 1a: Median time to first dose of antibiotics for life-threatening conditions

Definitional attributes

Name: Median time from first clinical contact to the first dose of antibiotics for patients with suspected bacterial meningitis (G00.0 to G00.9 or G01)^a, or for patients requiring admission to an intensive care unit (ICU) for suspected sepsis (any code or in combination: A40.0 to A40.9, A41.0 to A41.9, A42.7, A54.8, B00.7, B37.7, O75.3, O85, P36.0 to P36.9, P37.52, R65.0 to R65.3, T80.2, T81.42 and/or T88.0).^a

Rationale: A delay in starting antibiotic treatment for life-threatening infections is associated with increased morbidity and mortality.¹

Collection and usage attributes

Computation: Median = the middle value of a set of ordered data

The median value corresponds to the middle observation in that ordered list. In order to calculate the median, the data must first be ranked (sorted in ascending order). The position of the median is:

$\{(n + 1) \div 2\}$ th value, where n is the number of values in a set of data.^b

Inclusions

For patients requiring admission to ICU for suspected sepsis^a, include rural patients fitting the above criterion.

Exclusions

For patients requiring admission to ICU for suspected sepsis^a, exclude patients admitted to ICU from a ward (i.e. not from an emergency department).

Setting: Hospital.

Comments: First clinical contact can be a general practitioner (GP), ambulance service or emergency department (ED).

There are a number of definitions of sepsis. This indicator recommends the definition from the *Therapeutic Guidelines: Antibiotic*:

*'Severe sepsis is the systematic response to an infection manifested by organ dysfunction, hypoperfusion or hypotension combined with one or more of the following: fever, tachypnoea, elevated white cell count.'*¹

References

1. Antibiotic Expert Groups. Therapeutic guidelines: antibiotic. Version 15. Melbourne: Therapeutic Guidelines Limited; 2014.

Supplementary sources:

2. Dellinger RP, Levy MM, Rhodes A, et al. Surviving sepsis campaign: international guidelines for management of sepsis and septic shock: 2012. *Critical Care Medicine*. 2013;41(2):580–637.
3. Agency for Clinical Innovation. Adult sepsis pathway. Sydney. ACI, 2011. Used in the NSW CEC Sepsis Kills program.^c

a ICD-10-AM (8th edition).

b Statistics Canada, Calculating the median. (Cited August 2014 at <http://www.statcan.gc.ca/edu/power-pouvoir/ch11/median-mediane/5214872-eng.htm>).

c See www.cec.health.nsw.gov.au/programs/sepsis.

Quality statement 2 – Microbiological testing

A patient with a suspected bacterial infection has samples taken for microbiology testing as clinically indicated, preferably before starting antibiotic treatment.

No appropriate indicators for this quality statement have been identified.

Superseded



Quality statement 3 – Information on treatment options

A patient with a suspected infection, and/or their carer, receives information on their health condition and treatment options in a format and language that they can understand.

No appropriate indicators have been identified for this quality statement. However, patient experience surveys in many cases address the issue of informed consent, and may be used as a measure towards this statement.

Superseded



Quality statement 4 – Use of guidelines and clinical condition

When a patient is prescribed antibiotics, whether empirical or directed, this is done in accordance with the current version of the *Therapeutic Guidelines*¹ (or local antibiotic formulary). This is also guided by the patient's clinical condition and/or the results of microbiology testing.

Indicator 4a: Antibiotic prescribing in accordance with guidelines

Definitional attributes

Name: Proportion of antibiotic prescriptions that are in accordance with guidelines.

Rationale: The decision to prescribe an antibiotic should always be clinically justified and guided by the latest version of *Therapeutic Guidelines*¹ or local antibiotic formulary. This ensures that the correct drug is prescribed, and the dose and duration of therapy are optimised.^{1,2}

Collection and usage attributes

Computation: $(\text{Numerator} \div \text{denominator}) \times 100$

Numerator: Total number of prescriptions for an antibiotic that are in accordance with the current version of *Therapeutic Guidelines: Antibiotic*¹ or local antibiotic formulary.

Numerator criteria: No additional criteria.

Denominator: Total number of prescriptions for antibiotics.

Denominator criteria: No additional criteria.

Setting: Community, hospital (including day procedure service), and residential aged-care facility.

Comments: There are a number of existing audit tools where samples of medication charts are assessed for appropriateness and compliance of antimicrobial prescribing, against the *Therapeutic Guidelines*.¹ These include:

- the National Antimicrobial Prescribing Survey – conducted by the Antimicrobial Stewardship Research Group at Melbourne Health Point Prevalence Survey
- audits of GP prescribing administered by NPS MedicineWise. These include, but are not confined to, antimicrobial prescribing.^a

References

1. Antibiotic Expert Groups. *Therapeutic guidelines: antibiotic*. Version 15. Melbourne: Therapeutic Guidelines Limited; 2014.
2. Duguid M, Cruickshank M, editors. *Antimicrobial Stewardship in Australian hospitals*. Sydney: Australian Commission on Safety and Quality in Health Care. 2011.

Supplementary sources:

3. National Prescribing Service. *Indicators of quality prescribing in Australian general practice*. Sydney: NPS, 2006.
4. National Health and Medical Research Council. *Antimicrobial prescribing survey*. Canberra: NHMRC.

^a See www.nps.org.au/health-professionals/professional-development/clinical-audits-for-gps.

Quality statement 4 – Use of guidelines and clinical condition

Indicator 4b: Antibiotic-allergy mismatch in prescribing

Definitional attributes

Name: Rate of antibiotic-allergy mismatch in prescribing.

Rationale: Preventing adverse outcomes from known allergies and adverse drug reactions to antibiotics can avoid significant harm to patients and reduce potentially avoidable hospitalisation.¹

Collection and usage attributes

Computation: $(\text{Numerator} \div \text{denominator}) \times 100$

Numerator: Total number of patients for whom the prescribed antibiotic belongs to a therapeutic class that has been documented in the medication chart or medical notes as causing 'hypersensitivity' (i.e. allergy mismatch).

Numerator criteria: No additional criteria.

Denominator: Total number of patients prescribed antibiotics.

Denominator criteria: No additional criteria.

Setting: Community, hospital (including day procedure service) and residential aged-care facility.

Comments: There are a number of existing audit tools where samples of medication charts are assessed for appropriateness and compliance of prescribing antibiotics, as described in indicator 4a.

References

1. Antibiotic Expert Groups. Therapeutic guidelines: antibiotic. Version 15. Melbourne: Therapeutic Guidelines Limited; 2014.

Supplementary sources:

2. National Prescribing Service. Indicators of quality prescribing in Australian general practice. Sydney: NPS, 2006.
3. National Health and Medical Research Council. Antimicrobial prescribing survey. Canberra. NHMRC.



Quality statement 5 – Taking antibiotics as prescribed

When a patient is prescribed antibiotics, information about when, how and for how long to take them, as well as potential side effects and a review plan, is discussed with the patient and/or their carer.

No appropriate indicators have been identified for this quality statement. However, patient experience surveys in many cases include questions on whether patients felt that their care was adequately explained and discussed, and may be used as measures towards this statement.

Superseded



Quality statement 6 – Documentation

When a patient is prescribed antibiotics, the reason, drug name, dose, route of administration, intended duration and review plan is documented in the patient's health record.

Indicator 6a: Documentation of reason for prescribing antibiotics

Definitional attributes

- Name:** Rate of documentation of clinical reason (or indication) for prescribing antibiotics.
- Rationale:** Documentation aims to improve communication between health professionals who are caring for a patient. It also ensures that antibiotic treatment is optimised.^{1,2}

Collection and usage attributes

Computation: $(\text{Numerator} \div \text{denominator}) \times 100$

Numerator: Total number of prescriptions for which the reason for prescribing antibiotics is 'documented'.

'Documented' means the indication or reason for prescribing each antibiotic is written in the prescription or the medical record.

Numerator criteria: No additional criteria.

Denominator: Total number of antibiotic prescriptions.

Denominator criteria: No additional criteria.

Setting: Community, hospital (including day procedure service) and residential aged-care facility.

Comments: This indicator is based on a modification of *Indicator 21: Reason for prescribing recorded, as contained in Indicators of quality prescribing in Australian general practice*.³

There are a number of existing audit tools where samples of medication charts are assessed for appropriateness and compliance of prescribing antibiotics, as outlined in Indicator 4a.

References

1. Australian Commission on Safety and Quality in Health Care. Safety and Quality Improvement Guide, Standard 6: Clinical Handover. Sydney: ACSQHC, 2012.
2. Duguid M, Cruickshank M, editors. Antimicrobial Stewardship in Australian hospitals. Sydney: Australian Commission on Safety and Quality in Health Care. 2011.
3. National Prescribing Service. Indicators of quality prescribing in Australian general practice. Sydney: NPS, 2006.



Quality statement 7 – Use of broad-spectrum antibiotics

A patient who is treated with a broad-spectrum antibiotic has the treatment reviewed and, if indicated, switched to treatment with a narrow-spectrum antibiotic. This is guided by the patient's clinical condition and the results of microbiology tests.

Indicator 7a: Review of patients prescribed broad-spectrum antibiotics

Definitional attributes

Name: Proportion of patient prescriptions of broad-spectrum antibiotics for which a medical review is documented within 48 hours from first prescription.

Rationale: Unnecessary continuation of broad-spectrum antibiotics is associated with antimicrobial resistance. Culture results, including identification and antibiotic susceptibility test results, are usually available 24–48 hours after specimen collection. The results of these tests should be used to reassess the appropriateness of the initial therapy prescribed, along with the patient's clinical progress and other investigation results.¹

Collection and usage attributes

Computation: $(\text{Numerator} \div \text{denominator}) \times 100$

Numerator: Total number of patients where one or more of these broad-spectrum antibiotics were prescribed (meropenem, vancomycin, ciprofloxacin, ceftriaxone or piperacillin and tazobactam)

AND for whom:

the microbiology results were 'reviewed'.

'Reviewed' means that the clinician initials the microbiology result report.

AND

a treatment decision is documented within 48 hours from first prescription.

'Documented' means there is a note in the prescription or the medical record.

OR

makes a record in the medical notes.

Numerator criteria:

No additional criteria.

Denominator: Total number of patients where one or more of these broad-spectrum antibiotics were prescribed (meropenem, vancomycin, ciprofloxacin, ceftriaxone or piperacillin and tazobactam).

Denominator criteria:

No additional criteria.

Setting:

Hospital.

References

1. Australian Commission on Safety and Quality in Health Care. Action 4: Review and assess antibiotics at 48 hours – Fact sheet. Sydney: ACSQHC, 2014.

Supplementary sources:

2. The Royal Australian College of General Practitioners. Clinical indicators for Australian general practice. Melbourne: RACGP, 2012.
3. National Health and Medical Research Council. Antimicrobial prescribing survey. Canberra: NHMRC.

Quality statement 8 – Review of treatment

If investigations are conducted for a suspected bacterial infection, the responsible clinician reviews these results in a timely manner (within 24 hours of results being available) and antibiotic therapy is adjusted taking into account the patient's clinical condition and investigation results.

Indicator 7a is applicable to measure this quality statement.

Superseded



Quality statement 9 – Surgical prophylaxis

If a patient having surgery requires prophylactic antibiotics, the prescription is made in accordance with the current *Therapeutic Guidelines*¹ (or local antibiotic formulary), and takes into consideration the patient's clinical condition.

Indicator 9a: Surgical antibiotic prophylaxis in accordance with guidelines

Definitional attributes

- Name:** Proportion of patients for whom surgical prophylactic antibiotics were prescribed in accordance with guidelines.
- Rationale:** Health services should regularly audit surgical prophylaxis practices to ensure that:
- surgical patients should receive timely prophylaxis when indicated
 - correct antibiotics, route of administration and dosage are used
 - the duration of prophylaxis is appropriate.

Collection and usage attributes

Computation: $(\text{Numerator} \div \text{denominator}) \times 100$

Numerator: Total number of patients undergoing surgery who received prophylactic antibiotics in accordance with *Therapeutic Guidelines*¹ or local antibiotic formulary.

Numerator criteria:

Inclusions

Patients undergoing surgery for which there are documented guidelines for the administration of prophylactic antibiotics (i.e. *Therapeutic Guidelines*¹ or local antibiotic formulary).

Exclusions

Patients undergoing surgery for which there are no documented guidelines for the administration of prophylactic antibiotics (i.e. *Therapeutic Guidelines*¹ or local antibiotic formulary)

OR

prophylaxis is not indicated due to the patient's current antibiotic therapy.

Denominator: Total number of patients undergoing surgery for which there are documented guidelines for the administration of prophylactic antibiotics (i.e. *Therapeutic Guidelines*¹ or local antibiotic formulary).

Denominator criteria:

Inclusions

Patients undergoing surgery for which there are documented guidelines for the administration of prophylactic antibiotics (i.e. *Therapeutic Guidelines*¹ or local antibiotic formulary.

Surgical procedures for which guidelines are available are listed in the *Therapeutic Guidelines*.¹

Exclusions

Patients undergoing surgery for which there are no documented guidelines for the administration of prophylactic antibiotics (i.e. *Therapeutic Guidelines*¹ or local antibiotic formulary)

OR

prophylaxis is not indicated due to the patient's current antibiotic therapy.

Quality statement 9 – Surgical prophylaxis

Setting: Hospital, (including day procedure service) and dental practice.

Comments: The *Therapeutic Guidelines*¹ provides guidelines for administration of prophylactic antibiotics for the following types of surgery:

- abdominal surgery, including:
 - colorectal surgery, appendicectomy, and upper gastrointestinal tract or biliary surgery (including laparoscopic approaches)
 - endoscopic procedures
 - hernia repair
- burns, extensive skin loss
- cardiac surgery
- head, neck and thoracic surgery
- lower limb amputation
- neurosurgery
- obstetric and gynaecological surgery, including:
 - hysterectomy and termination of pregnancy
 - caesarean section
- orthopaedic surgery
- urological surgery, including:
 - prostatectomy
 - transrectal prostatic biopsy
- vascular surgery.

Services may select specific procedures to focus on as part of the audit process, based on their own casemix and priorities.

This indicator is based on surgical antibiotic prophylaxis indicators developed by the Victorian Hospital Acquired Infection Surveillance System Coordinating Centre (VICNISS)² and the Western Australian Safety and Quality Investment for Reform (SQiRe) Program.³

References

1. Antibiotic Expert Groups. Therapeutic guidelines: antibiotic. Version 15. Melbourne: Therapeutic Guidelines Limited; 2014.
2. Department of Human Services. Type 2 surveillance manual version 10. Melbourne: Victorian Hospital Acquired Infection Surveillance System Coordinating Centre, DHS, 2007.^a
3. Department of Health WA. SQiRe 2 CPI guide: Surgical site infection prevention. Perth: DHWA, 2009.^b

Supplementary source:

4. NSW Therapeutic Advisory Group. Indicators for quality use of medicines in Australian hospitals. Sydney: NSW TAG, 2007.

a See www.vicniss.org.au/HCW/Type2/Manual.aspx.

b See www.safetyandquality.health.wa.gov.au/docs/squire/HP11557_SURGICAL_SITES_WEB.pdf.

Quality statement 9 – Surgical prophylaxis

Indicator 9b: Timely administration of prophylactic antibiotics prior to surgery

Definitional attributes

Name: Proportion of patients who are administered indicated prophylactic antibiotics within 2 hours before a surgical procedure.

Rationale: One-third to one-half of antibiotic use in hospitals is for surgical antibiotic prophylaxis. Surgical antibiotic prophylaxis is used inappropriately 30–90 per cent of the time, especially with respect to timing and duration.¹

Collection and usage attributes

Computation: $(\text{Numerator} \div \text{denominator}) \times 100$

Numerator: Total number of patients who received prophylactic antibiotics within 2 hours before a surgical procedure.

Numerator criteria:

Inclusions
Patients undergoing surgery for which there are documented guidelines for the administration of prophylactic antibiotics prior to surgery (i.e. *Therapeutic Guidelines*¹ or local antibiotic formulary).

Exclusions
Patients undergoing surgery for which there are no documented guidelines for the administration of prophylactic antibiotics prior to surgery (i.e. *Therapeutic Guidelines*¹ or local antibiotic formulary)

OR

for whom guidelines recommend otherwise.

Denominator: Total number of patients undergoing surgery for which there are documented guidelines for the administration of prophylactic antibiotics prior to surgery (i.e. *Therapeutic Guidelines*¹ or local antibiotic formulary).

Denominator criteria:

Inclusions
Patients undergoing surgery for which there are documented guidelines for the administration of prophylactic antibiotics prior to surgery (i.e. *Therapeutic Guidelines*¹ or local antibiotic formulary).

See list of surgical procedures for which guidelines are available in the *Therapeutic Guidelines: Antibiotic*¹ under 'Comments' below.

Exclusions
Patients undergoing surgery for which there are no documented guidelines for the administration of prophylactic antibiotics prior to surgery (i.e. *Therapeutic Guidelines*¹ or local antibiotic formulary)

OR

for whom guidelines recommend otherwise.

Setting: Hospital, (including day procedure service) and dental practice.

Comments: The current version of the *Therapeutic Guidelines: Antibiotic*¹ recommend that prophylactic antibiotics be provided as soon as the patient is stabilised after induction of anaesthesia for most surgery, except for cardiac surgery, where there may be benefit from 24 hours of antibiotic prophylaxis. Some local guidelines can recommend the administration of surgical prophylaxis of up to 2 hours before surgery.

Quality statement 9 – Surgical prophylaxis

The *Therapeutic Guidelines: Antibiotic*¹ provides guidelines for administration of prophylactic antibiotics for the following types of surgery:

- abdominal surgery, including:
 - colorectal surgery, appendectomy, and upper gastrointestinal tract or biliary surgery (including laparoscopic approaches)
 - endoscopic procedures
 - hernia repair
- burns, extensive skin loss
- cardiac surgery
- head, neck and thoracic surgery
- lower limb amputation
- neurosurgery
- obstetric and gynaecological surgery, including:
 - hysterectomy and termination of pregnancy
 - caesarean section
- orthopaedic surgery
- urological surgery, including:
 - prostatectomy
 - transrectal prostatic biopsy
- vascular surgery.

Services may select specific procedures to focus on as part of the audit process, based on their own casemix and priorities.

This indicator is based on surgical antibiotic prophylaxis indicators developed by the Victorian Hospital Acquired Infection Surveillance System Coordinating Centre (VICNISS)¹ and the Western Australian Safety and Quality Investment for Reform (SQIRe) Program.²

References

1. Antibiotic Expert Groups. *Therapeutic guidelines: antibiotic*. Version 15. Melbourne: Therapeutic Guidelines Limited; 2014.
2. Department of Health WA. *SQIRe 2 CPI guide: Surgical site infection prevention*. Perth: DHWA, 2009.^a

Supplementary sources:

3. NSW Therapeutic Advisory Group. *Indicators for quality use of medicines in Australian hospitals*. Sydney: NSW TAG, 2007.
4. Department of Human Services. *Type 2 surveillance manual version 10*. Melbourne: Victorian Hospital Acquired Infection Surveillance System Coordinating Centre, DHS, 2007.^b

a See www.safetyandquality.health.wa.gov.au/docs/squire/HP11557_SURGICAL_SITES_WEB.pdf.

b See www.vicniss.org.au/HCW/Type2/Manual.aspx.

Quality statement 9 – Surgical prophylaxis

Indicator 9c: Cessation of prophylactic antibiotics after surgery

Definitional attributes

- Name:** Proportion of patients whose prophylactic antibiotics were discontinued within 24 hours after surgery, or 48 hours for vascular surgery.
- Rationale:** One-third to one-half of antibiotic use in hospitals is for surgical antibiotic prophylaxis. Surgical antibiotic prophylaxis is used inappropriately 30–90 per cent of the time, especially with respect to timing and duration.¹

Collection and usage attributes

Computation: $(\text{Numerator} \div \text{denominator}) \times 100$

Numerator: Total number of patients who received prophylactic antibiotics before surgery whose antibiotics were discontinued within 24 hours after surgery (or within 48 hours for vascular surgery).

Numerator criteria: Exclusions
Patients for whom longer antibiotic prophylaxis is indicated by *Therapeutic Guidelines*¹ or local antibiotic formulary
OR
for the treatment of specific conditions (e.g. a patient undergoing a complex operation, where antibiotic treatment is required for a pre-existing infection, or a patient who is immunocompromised).

Denominator: Total number of patients receiving prophylactic antibiotics prior to surgery.

Denominator criteria:

Exclusions

Patients for whom longer antibiotic prophylaxis is indicated by *Therapeutic Guidelines*¹ or local antibiotic formulary

OR

for the treatment of specific conditions.

Setting: Hospital, (including day procedure service) and dental practice.

Comments: Prophylaxis is the use of antibiotics to prevent surgical site infection and, in some circumstances, bacteraemia.¹

Deliberate continuation of antibiotics after 24–48 hours for the treatment of an infection does not constitute surgical prophylaxis.

Services may select specific procedures to focus on as part of the audit process, based on their own casemix and priorities.

This indicator is based on surgical antibiotic prophylaxis indicators developed by the Victorian Hospital Acquired Infection Surveillance System Coordinating Centre (VICNISS)² and the Western Australian Safety and Quality Investment for Reform (SQulRe) Program.³

References

1. Antibiotic Expert Groups. *Therapeutic guidelines: antibiotic*. Version 15. Melbourne: Therapeutic Guidelines Limited; 2014.
2. Department of Human Services. *Type 2 surveillance manual version 10*. Melbourne: Victorian Hospital Acquired Infection Surveillance System Coordinating Centre, DHS, 2007.^a
3. Department of Health WA. *SQulRe 2 CPI Guide: Surgical site infection prevention*. Perth: DHWA, 2009.^b

Supplementary source:

4. NSW Therapeutic Advisory Group. *Indicators for quality use of medicines in Australian hospitals*. Sydney: NSW TAG, 2007.

^a See www.vicniss.org.au/HCW/Type2/Manual.aspx.

^b See www.safetyandquality.health.wa.gov.au/docs/squire/HP11557_SURGICAL_SITES_WEB.pdf.

Indicators of effectiveness

Indicators of effectiveness, also known as outcome indicators, provide markers of how close care is to recommended care, allow healthcare services to monitor outcomes, and provide signals to patients and clinicians on quality of care. This section describes concurrent activities pertaining to the specification of data sets used to support monitoring and measurement of healthcare associated infection and antibiotic resistance.

In 2008, Australian health ministers endorsed jurisdictional surveillance of the following healthcare associated infections:

- *Staphylococcus aureus* bacteraemia (SAB)
- Clostridium difficile infection (CDI).

In 2009, ministers endorsed the Commission's recommendation for routine monitoring, at hospital level, of SAB and CDI.

These indicators were subsequently included in the national health *Performance and Accountability Framework* (PAF).^a The PAF specifies indicators that are intended to be publicly reported by the National Health Performance Authority at hospital and Local Hospital Network level. The specification for these indicators is published on the Commission web site, along with a set of *Implementation Guides*.^b

Further, the Commission is involved in the development of a coordinated national approach for the reporting and surveillance of antibiotic usage, antimicrobial resistance and healthcare associated infections across Australia.

This work includes:

- standardising data collection and reporting processes for SAB, CDI and central-line associated bloodstream infections
- developing definitions and data set specifications for catheter-associated infections, urinary infections and surgical site infections
- standardising of laboratory reporting of multi-resistant gram-negative organisms
- developing specifications for a hospital-level cumulative antibiogram which can be used to optimise prescribing and antimicrobial stewardship activities
- coordinating and managing the National Hand Hygiene Initiative, including data standardisation and the hand hygiene database.

a Available at www.nhpa.gov.au/internet/nhpa/publishing.nsf/Content/PAF/.

b See www.safetyandquality.gov.au/our-work/healthcare-associated-infection/national-hai-surveillance-initiative/.

Indicators of appropriateness

Two approaches^a support monitoring of antimicrobial prescribing:

- *Audits of antimicrobial prescribing* use sampled chart review to assess prescriber compliance with guidelines.
- *Monitoring of antimicrobial usage*, at either a population or hospital level, provides very useful data on prescribing trends, even in the absence of patient-level and indication information.

Prescribing audits

There is a number of existing audit tools where samples of GP prescriptions and hospital medication charts are assessed for appropriateness of antimicrobial prescribing. These include:

- the *National Antimicrobial Prescribing Survey* – conducted by the Antimicrobial Stewardship Research Group at Melbourne Health, in which a large sample of Australian hospitals voluntarily participate in audits.
- audits of GP prescribing administered by NPS MedicineWise. These 'Clinical e-Audits for GPs' include an e-Audit for Respiratory Tract Infections.^b Table 1 (on the following page) shows the NPS MedicineWise clinical indicators used in the audits of GP prescribing.

Table 1: NPS clinical indicators on general practitioner prescribing

Area of care	Indicator
Patient education	<ul style="list-style-type: none"> • Discussed beliefs and expectations regarding treatment • Provided advice on symptomatic management
Antibiotic use	<ul style="list-style-type: none"> • Use of a recommended antibiotic, dose, frequency and duration when antibiotic therapy is recommended • Use of an antibiotic when there is no recommendation for antibiotic therapy
Common cold /acute viral rhinitis (non-specific URTI)	<ul style="list-style-type: none"> • Use of an antibiotic (not recommended)
Acute bronchitis	<ul style="list-style-type: none"> • Use of an antibiotic (not recommended)
Acute bacterial rhinosinusitis	<ul style="list-style-type: none"> • Use of a recommended antibiotic where an antibiotic is recommended • Use of recommended duration of therapy where recommended antibiotic is prescribed • Use of a recommended dose and frequency where recommended antibiotic is prescribed • Use of an antibiotic where there is no recommendation for antibiotic use
Acute sore throat/ pharyngitis/tonsillitis	<ul style="list-style-type: none"> • Use of a recommended antibiotic where an antibiotic is recommended • Use of a recommended dose and frequency where recommended antibiotic is prescribed • Use of recommended duration of therapy where recommended antibiotic is prescribed • Use of an antibiotic where there is no recommendation for antibiotic use
Acute otitis media (AOM)	<ul style="list-style-type: none"> • Use of a recommended antibiotic where an antibiotic is recommended • Use of a recommended dose and frequency where recommended antibiotic is prescribed • Use of recommended duration of therapy where recommended antibiotic is prescribed • Use of an antibiotic where there is no recommendation for antibiotic use
Imaging in acute bacterial rhinosinusitis	<ul style="list-style-type: none"> • Recommendation for a sinus CT scan when CT scan is ordered

^a At time of the release of this document, there were two current approaches to support monitoring of antimicrobial prescribing.

^b See www.nps.org.au/health-professionals/professional-development/clinical-audits-for-gps.

In addition, a major revision of the NSW TAG Quality Use of Medicines (QUM) indicators for hospitals has taken place and will be available in 2014. This involved a review of the TAG QUM indicators published in 2007, and pilot testing of the proposed set. A subset of the QUM indicators (Section 2) addresses antimicrobial prescribing, and are shown in Table 2.

Table 2: Quality use of medicines indicators on antimicrobial prescribing^a

Indicator	Description
Antibiotic therapy	
2.1	Percentage of patients undergoing specified surgical procedures that receive an appropriate prophylactic antibiotic regimen
2.2	Percentage of prescriptions for restricted antibiotics that are concordant with Drug and Therapeutics Committee approved criteria
2.3	Percentage of patients in whom doses of empirical aminoglycoside therapy are continued beyond 48 hours
2.4	Percentage of adult patients with community acquired pneumonia that are assessed using an appropriate validated objective measure of pneumonia severity
2.5	Percentage of patients presenting with community acquired pneumonia that are prescribed guideline concordant antibiotic therapy
Medication ordering	
3.2	Percentage of patients whose known adverse drug reactions are documented on the current medication chart

Antimicrobial utilisation

Monitoring of antimicrobial utilisation provides aggregated data sets to map trends and help understand the appropriateness of prescribing in different parts of Australia:

- The National Antimicrobial Utilisation Surveillance Program (NAUSP)^b provides information on usage in 37 hospitals across Australia. It describes quantities of antimicrobials dispensed by hospital pharmacies, by class. Volumes are standardised using the WHO Derived Daily Dose.^c
- Queensland Health uses a program called MedTrx to monitor antimicrobial utilisation in their public hospitals.
- The Drug Utilisation Sub-Committee of the Pharmaceutical Benefits Advisory Committee provides prescription data from community pharmacies and outpatient hospital services. Like NAUSP, however, the database does not include any information on the condition for which a drug has been prescribed.

The Bettering the Evaluation and Care of Health (BEACH)^d project sits between these two approaches. BEACH collects data on clinical activities in general practice. BEACH is a paper based data collection system in which an ever-changing random sample of about 1,000 GPs per year each records details of 100 consecutive GP-patient encounters, on structured paper encounter forms. One output of the BEACH project, for example, is the rate of antimicrobial prescriptions for upper respiratory tract infections.

a Australian Commission on Safety and Quality in Health Care and NSW TAG Inc., National quality use of medicine indicators for Australian hospitals. Sydney: ACSQHC, 2014.

b See <http://www.sahealth.sa.gov.au/wps/wcm/connect/public+content/sa+health+internet/clinical+resources/clinical+programs/antimicrobial+stewardship/national+antimicrobial+utilisation+surveillance+program+nausp>.

c See www.whocc.no/ddd/definition_and_general_considera.

d See www.sydney.edu.au/medicine/fmrc/beach.



Superseded

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