Government of **Western Australia**
Department of **Health**

Antimicrobial Stewardship Guidance Document

NSQHSS Antimicrobial stewardship

Action 3.18

Action 3.19

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Contents

Introduction

Improving antimicrobial use is an important aspect of patient safety and reducing the antimicrobial resistance (AMR), which is deemed “an issue of great significance for health care in Australia and has been declared a significant threat to human health”[1]. The increase in antimicrobial prescribing and the inappropriate use of antimicrobials have contributed to AMR.

Antimicrobial stewardship (AMS) is a systematic approach to optimise the use of antimicrobials and is an important component of patient safety and a vital strategy to reduce AMR.[1] AMS can reduce inappropriate antimicrobial use, improve patient outcomes and reduce adverse consequences of antimicrobials (including AMR, secondary infections (e.g. *Clostridioides difficile*), toxicity and unnecessary costs).

The WA Statewide Medicine Formulary (SMF) promotes the safe, quality, effective and equitable use of medicines including antimicrobials in all WA public hospitals.

The WA SMF is an integral component of AMS and contains:

- A limited selection of available antimicrobials for use (within defined criteria) to minimise the development of resistant organisms and promote effective and economical prescribing.
- The restricted availability of certain antimicrobials, which require approval prior to prescribing for specific indications.

All antimicrobials available on the WA SMF are approved for indications as per current version of the *Therapeutic Guidelines*[2]. The *Therapeutic Guidelines* is recognised as the national best practice guide for antimicrobial prescribing. In addition, some antimicrobials may also be approved for other indications which are listed on the SMF. The current restriction level categories for antimicrobials in the SMF are shown below:

UNRESTRICTED	No restrictions apply to use, provided the indication is either TGA registered or considered an accepted indication (widely used in clinical practice with an extensive evidence base).
RESTRICTED	Can only be initiated as per criteria stated in the listing.
HIGHLY RESTRICTED	Initiation is limited to very specific criteria to tightly control use.
NON-FORMULARY	Only available via an Individual Patient Approval (IPA).

The neonatal and paediatric sub formularies restriction level categories are based on the adult SMF. Refer to the Neonatal Statewide Medicines Formulary and the Paediatric Statewide Medicines Formulary for further information on restrictions.

Health Service Providers and/or hospitals may further restrict the use of certain antimicrobials than currently outlined in the WA SMF. If further restriction of antimicrobials is considered at local site/hospital level, restriction of antimicrobials should take the following into consideration: spectrum, safety, prevalence of resistance, resistance-inducing and amplification potential, frequency of indication, potential patient hypersensitivity and cost. These restrictions should be governed by the AMS Committee and endorsed by the Drug and Therapeutics Committees (DTCs)/Medicines and Therapeutics Committees (MTCs) or equivalent authorities. An avenue of informing WAMEP/WACA of further local hospital/site restrictions of antimicrobials should be included, as an avenue for WAMEP to consider state implications and whether further restriction of antimicrobials is required for the WA SMF.

Antimicrobial Stewardship Program

AMS requires a system-based approach that operates with support of the health service organisation executive, within the governance framework of the organisation, using the expertise and resources of a multidisciplinary team to coordinate activities.

It is recommended that hospitals and health services have an AMS Program in place in accordance with the Preventing and Controlling Healthcare -Associated Infection Standard criteria 3.18 and 3.19 and associated Advisory notes of the National Safety and Quality Health Service Standards.[3]

Governance arrangements for an antimicrobial stewardship program should include;

- Establishment of an AMS Committee lead by a multidisciplinary team with the authority and resources to enable implementation of the program, membership at a minimum including:
    - an appropriate clinician (ideally a clinical microbiologist or infectious diseases physician if available)
    - a clinical pharmacist (with infectious diseases training if possible), and
    - an infection prevention and control professional.

Note: For smaller facilities the functions of the AMS Committee may be managed at an Area Health Service level or form part of a combined committee, such as the DTC/MTC or equivalent authorities (for example, Clinical Risk and Infection Prevention Committee).

- Clearly defined operational and reporting lines to health service executives and the director of clinical governance and links with committees responsible for drug and therapeutics, infection prevention and management, patient safety and quality or clinical governance.
- Incorporates core elements and recommendations and principles from the current Antimicrobial Stewardship Clinical Care Standard[4] and in accordance with the WA SMF.
- Assignment of responsibility to the tasks of risk assessment, management, and monitoring of antimicrobials.
- Development of local antimicrobial prescribing policies in consultation with the local AMS Committee or DTC/MTC or equivalent authorities.

Roles and Responsibilities

The overall accountability for AMS lies with the highest level of governance in a health service. The Antimicrobial Stewardship Committee is responsible for implementing the program and effectively and efficiently managing available resources for AMS.

Antimicrobial Stewardship Committee / Drug and Therapeutics Committee

- Define restriction status and approval process for antimicrobial agents prescribed within the hospital and health service. At a minimum, the approval process should include a discussion with an infectious disease physician / clinical microbiologist that is documented in the patient's medical record and is therefore auditable.

- Must review and recommend any alterations to restrictions, audit antimicrobial use and oversee related education.
- Ensure medication safety is a key consideration in all formulary decisions and antimicrobials considered to be high-risk are included in the high-risk medication list when added to the formulary.
- Develop and endorse local policies, protocols and guidelines relating to antimicrobial use, antimicrobial resistance or in response to any local Multi Resistant Organism (MRO) outbreaks. MP 0177/23 Screening and Management of Multi-resistant Organisms in Healthcare Facilities may provide further information.
- Monitor antimicrobial prescribing and use.
- Use surveillance data on antimicrobial resistance reported by the pathology service or other state reports such as Healthcare Infections Surveillance Western Australia (HISWA) reports and policy compliance rates and formulate corrective action, if indicated.
- Report to clinicians and the governing body regarding:
    - Compliance with the local site antimicrobial stewardship policy
    - Antimicrobial use and resistance and areas of action for antimicrobial resistance
    - Appropriateness of prescribing and compliance with the SMF, current evidence based Australian *Therapeutic Guidelines* or local endorsed guidelines on antimicrobial prescribing
    - Areas of action to improve appropriateness of prescribing and compliance with the Statewide Medicines Formulary and current evidence-based Australian *Therapeutic Guidelines* or local endorsed guidelines
    - The health service organisation's performance over time for use and appropriateness of use of antimicrobials and provide recommendations to assist with improving overall AMS outcomes.

Pharmacy Department

- Provision of clinical pharmacy expertise to advise and educate prescribers and implement relevant policy: contribute to AMS Committee activities including program implementation and audit; participate in the application of antimicrobial formulary and prescribing guidelines.

Clinical Microbiology Service

- Provide best practice diagnostic testing for infection for optimal specimen collection, targets reporting of clinically meaningful pathogens and their susceptibilities, uses selective antibiotic susceptibility reporting, clinical microbiology advice, and regular analyses of antimicrobial resistance (antibiograms).

Clinical staff involved in medication management must comply with policy and standards of antimicrobial medicines.

- **Prescribers** e.g. medical, nurse practitioners, other prescribers are responsible for:
    - prescribing according to the SMF, *Therapeutic Guidelines* or local endorsed guidelines (if applicable),
    - directing therapy based on microscopy, culture and other susceptibility test results,
    - following the principles of good antimicrobial prescribing in this guidance document,
    - documenting the indication and expected duration for prescription of all antimicrobials in the medical record, and
    - complying with the local approval process for restricted antimicrobials, as well as manage any therapeutic drug monitoring if required.

- **Pharmacists** are responsible for:
    - reviewing antimicrobial orders for adherence to the SMF, *Therapeutic Guidelines* or local endorsed guidelines (if applicable),
    - checking and adjusting doses to suit patient size and renal function,
    - monitoring drug-drug interactions,
    - adjusting dosing intervals and
    - providing timely feedback, where applicable, to the prescriber.

When therapeutic drug monitoring is necessary, the pharmacist advises on sampling time, and assists in interpretation of results and adjustment of dosing regimen.

- **Prescribers and pharmacists** will follow the principles of use of antimicrobials as per the current version of *Therapeutic Guidelines*, the WA SMF, local endorsed guidelines (if applicable) as well as local procedures for each antimicrobial agent. They will review and document symptoms of infection, duration of treatment, support the switch from intravenous (IV) to oral therapy when appropriate for the patient and escalate to formal expert clinical review when appropriate.

- **Nurses** are responsible for:
    - ensuring antimicrobials are administered in accordance to the prescription,
    - ensuring the seven-rights of medication administration (right patient; right medicine; right dose; right route; right time; right documentation; right indication) are met each time, as specified in local Nursing Practice Policy.
    - In addition, if therapeutic drug monitoring is needed, ensure blood is sampled at an appropriate time, and the result is reviewed prior to administering the next dose or as specified by the doctor or pharmacist.

Evaluation

- Health services are responsible for carrying out regular audits and evaluating compliance with antimicrobial prescribing and restrictions to promote continuous quality improvement.
- Setting measurable goals can be a useful tool to enhance uptake of implementation of AMS programs and track performance and compliance.
- Assessing compliance against the Antimicrobial Stewardship Clinical Care Standards[4] is recommended.
- Relevant data (i.e. audits, education sessions, completion of online learning modules, and quality use of medication indicators) should be regularly monitored to identify local risks, inform the focus of local programs and evaluate the effectiveness of the local antimicrobial stewardship program activities.
- Antimicrobial usage data is to be regularly analysed by the AMS committee to provide antimicrobial usage data (ideally normalised to usage density rates) and usage reports of antimicrobial agents determined by the hospital or health service. Participation in the National Antimicrobial Utilisation Surveillance Program (NAUSP) and the National Antimicrobial Prescribing Survey (NAPS) is strongly encouraged.
- Pathology data provided by the clinical microbiology service in the form of a standard antibiograms should be reviewed on a regular basis.
- Audit results are to be carefully analysed and distributed appropriately to prescribers, pharmacists, microbiologists and nursing staff. The feedback will highlight compliance with guidelines, and areas of non-concordance requiring immediate attention and action by the prescribers. This will be supported by education from the AMS team.

Principles of Judicious Antimicrobial Prescribing

The appropriate use of antimicrobials is critical to the effective delivery of care for patients and is a key factor in the management of antimicrobial resistance. The key first step is deciding whether antimicrobial therapy is indicated.

Antimicrobial stewardship is defined as processes to assist and support clinicians with decisions regarding the optimal selection, dose and duration of an antimicrobial. The objective of AMS is to ensure the best clinical outcome for the treatment or prevention of infection, with minimal toxicity to the patient and minimal impact on subsequent resistance development.

Key principles for judicious antimicrobial use

- Decide whether antimicrobial therapy is indicated.
- Consider the following factors prior to prescribing any antimicrobial agent[2]:

  M microbiology guides therapy (where possible)

  I indications should be evidence based

  N narrowest spectrum required

  D dosage individualised to the patient and appropriate to the site and type of infection

M minimise duration of therapy

E ensure oral therapy is used, were clinically appropriate

- Prescribe antimicrobials in accordance with the WA SMF.
- Incorporate core elements, recommendations and principles from the current AMS CCS[4] which aims to ensure that a patient with a bacterial infection receives optimal treatment with antimicrobials. 'Optimal treatment' means treating patients with the right antimicrobial for the condition, at the right dose, by the right route, at the right time and for the right duration based on accurate assessment and timely review. The AMS CCS contains 8 quality statements that describe the key aspects of care that a patient should be offered when antimicrobials are being considered for treatment of a bacterial infection or for prophylaxis. The 8 quality statements are:

    1) A patient with a life-threatening condition due to a suspected bacterial infection receives an appropriate antimicrobial immediately, without waiting for the results of investigations.

    2) When a patient is prescribed an antimicrobial, this is done in accordance with the current *Therapeutic Guidelines* or evidence based locally endorsed guidelines and the antimicrobial formulary.

    3) When an adverse reaction (including an allergy) to an antimicrobial is reported by a patient or recorded in their healthcare record, the active ingredient(s), date, nature and severity of the reaction are assessed and documented. This enables the most appropriate antimicrobial to be used when required. Refer to MP0053/17 Patient Alert Policy for further information.

    4) A patient with a suspected infection has appropriate samples taken for microbiology testing as clinically indicated, preferably before starting antimicrobial therapy.

    5) A patient with an infection, or at risk of an infection, is provided with information about their condition and treatment options in a way that they can understand. If antimicrobials are prescribed, information on how to use them, when to stop, potential side effects and a review plan is discussed with the patient.

    6) When a patient is prescribed an antimicrobial, the indication, active ingredient, dose, frequency and route of administration, and the intended treatment duration or review plan are documented in the patient's healthcare record.

    7) A patient prescribed an antimicrobial has regular clinical review of their therapy, the frequency of review dependent on patient acuity and risk factors. The need for ongoing antimicrobial spectrum of activity, dose, frequency and route of administration are assessed and adjusted accordingly. Investigation results are reviewed promptly when they are reported.

    8) A patient having surgery or procedure is prescribed antimicrobial prophylaxis in accordance with the current *Therapeutic Guidelines* or evidence-based, locally endorsed guidelines. This includes recommendations about the need for prophylaxis, choice of antimicrobial, dose, route and timing of administration, and duration.

- Antibiograms, or cumulative antibiotic susceptibility results that reflect local resistance epidemiology, may be used to guide empiric antibiotic decision making.

- A switch from IV antimicrobial to a suitable oral alternative is to be made as soon as it is safe to do so and IV to oral switch is to be promoted by pharmacists, clinicians, and local AMS committees and programs. There will be some circumstances where IV to oral switch may not apply such as the management of infections that require high tissue concentrations or prolonged IV therapy e.g. meningitis, endocarditis.

Criteria for IV to oral switching[2]:

- When the patient is tolerating oral fluids/food and there is no reason to believe poor oral absorption from the gastrointestinal tract.
- Fever has resolved or improving.
- Signs and symptoms of the infection are improved or resolved.
- No unexplained haemodynamic instability
- An appropriate oral alternative is available with same or similar spectrum, or an oral formulation of the same drug is available. For children, a suitable paediatric formulation is available.

Surgical prophylaxis

As per the CCS, surgical prophylaxis should only be prescribed in accordance with the current Therapeutic Guideline, locally endorsed guidelines and WA SMF.

Antimicrobial prophylaxis cannot be relied upon to overcome poor surgical technique e.g. inadequate haemostasis, excessive damage to tissues, inadequate debridement.

The first dose(s) of surgical prophylaxis should be given at a time that ensures adequate plasma and tissue drug levels are achieved at the start of the procedure i.e. administration of prophylaxis should be administered no more than 60 minutes before surgical incision.

For the vast majority of clean and clean contaminated procedures, prophylactic antimicrobials are not required after surgical incision is closed.

Repeat intra-operative doses are only recommended for prolonged procedures of more than three hours or if there is excessive blood loss. For these procedures, post operative doses can be considered but prophylaxis should not continue beyond 24 hours.

Evidence does not support continuing prophylactic antimicrobial until surgical drains or intravascular or urinary catheters are removed.

Postoperative antimicrobials increase the risk of subsequent infections with resistant pathogens and *Clostridioides difficile*.

Recommendations for Auditing and Monitoring of Antimicrobial Usage.

Antimicrobial Stewardship Clinical Care Standard Indicators[5] (2020) support health service organisations to monitor how well they are implementing the care recommended in this clinical care standard and are intended to support local quality improvement activities. The list of indicators are as follows:

Quality statement 2 – Use of Guidelines

2a The proportion of antimicrobial prescriptions that are in accordance with the current Therapeutic Guidelines or evidence-based, locally endorsed guidelines

2b The proportion of prescriptions for restricted antimicrobials that are in accordance with the locally endorsed approval policy.

Quality statement 3 – Adverse reaction to antimicrobials

3a The proportion of patients with an adverse reaction to an antimicrobial with comprehensive documentation of the reaction in their healthcare record

Quality statement 6 – Documentation

6a The proportion of prescriptions for which the indication for prescribing the antimicrobial is documented

6b The proportion of prescriptions for which the duration, stop date or review date for the antimicrobial is documented.

Quality statement 7 – Review of therapy

7a The proportion of prescriptions for which an antimicrobial review and updated treatment decision is documented within 48 hours from the first prescription.

Quality statement 8 – Surgical and procedural prophylaxis

8a The proportion of patients for whom the perioperative prophylactic antimicrobial is prescribed in accordance with the current Therapeutic Guidelines or evidence-based, locally endorsed guidelines

8b The proportion of patients for whom the perioperative prophylactic antimicrobial dose is prescribed in accordance with the current Therapeutic Guidelines or evidence-based, locally endorsed guidelines

8c The proportion of patients who are administered prophylactic antimicrobials within the recommended time perioperatively

8d The proportion of patients who were prescribed prolonged antimicrobials following a surgery or procedure that is discordant with the current Therapeutic Guidelines or evidence-based, locally endorsed guidelines.

Other Key Performance Indicators

- Median time from first clinical contact to first dose of antibiotics for patients with suspected bacterial meningitis/sepsis
- Proportion of antibiotic prescriptions that are in accordance with guidelines
- Rate of antibiotic/allergy mismatch in prescribing
- Rate of documentation of the indication for antimicrobial use.
- Proportion of patient prescription of broad spectrum antibiotics for which a medical review is documented within 48 hours from first prescription
- Percentage of patients with surgical prophylaxis prescribed according to guidelines
- Percentage of patients who are administered indicated prophylaxis within 2 hours before surgical procedure

- Percentage of patients whose prophylaxis was discontinued within 24 hours after surgery or 48 hours for vascular surgery
- Compliance with Therapeutic Guidelines: Antibiotic for empiric treatment of common infective conditions (e.g. community acquired pneumonia, urinary tract infection, sepsis)
- Compliance with gentamicin dosage and monitoring standards
- Compliance with IV-oral switch programs
- Participation in the annual National Antimicrobial Prescribing Survey (NAPS).

References

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2. eTherapeutic Guidelines Antibiotic - https://tgldcdp.tg.org.au/topicTeaser?guidelinePage=Antibiotic&etgAccess=true

3. Australian Commission on Safety and Quality in Health Care. National Safety and Quality Health Service Standards. Preventing and Controlling Infections Standard. Antimicrobial Stewardship (3.18 and 3.19) 2021

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5. Indicators for the Antimicrobial Stewardship Clinical Care Standard. https://www.safetyandquality.gov.au/our-work/clinical-care-standards/antimicrobial-stewardship-clinical-care-standard/indicators#antimicrobial-stewardship-clinical-care-standard-2020

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