

FACT SHEET

Medicines in focus

This fact sheet addresses recommendations regarding *Antimicrobial Stewardship in Australian Hospitals*¹ from the Australian Commission on Safety and Quality in Healthcare (ACSQHC) and included in the *National Safety and Quality Health Service Standards*,² and reflected in *Equip 5*^{3,4} from the Australian Council on Healthcare Standards (ACHS). The emphasis is on how pharmacists can assist with antimicrobial stewardship, the prevention of resistance to antibiotics, and the prevention of healthcare associated infections to improve patient care.

Antimicrobial stewardship – prevent and reduce infections and antimicrobial resistance

Antimicrobial resistance is considered a major threat to public health and patient safety.^{5,6} It results in increased morbidity, mortality and cost of health care.⁷ Overuse and misuse of antimicrobials, and the spread of resistant organisms between individuals, communities, and countries contribute to the rise and spread of resistant microbes.⁸

Antibiotic use

Inappropriate antibiotic use presents a significant challenge to the healthcare system. It is estimated that there are about 200 000 hospital acquired infections (HAIs) in Australia each year.^{9,10} Around 30–40% of hospitalised patients are prescribed antimicrobials.¹¹ Australian and overseas studies have shown rates of inappropriate antibiotic use in hospitals of up to 50%.^{1,11}

In the community setting in Australia, antibiotics accounted for 19.3% of all prescriptions by GPs in 2007–8.¹² A recent NPS publication which summarises results from studies in Australia and overseas on antibiotic resistance notes that “Prescribing a routine course of antibiotics significantly increases the likelihood of an individual carrying a resistant bacterial strain.”¹³

CONTACT US

The Society of Hospital Pharmacists of Australia

PO Box 1774, Collingwood, Victoria, 3066, Australia

shpa@shpa.org.au

+61 3 9486 0177

+61 3 9486 0311

www.shpa.org.au

Antimicrobial stewardship

Antimicrobial stewardship (AMS) is an organised antimicrobial management program that can be undertaken to improve antimicrobial usage.^{1,5} It involves a systematic approach to optimising the organisation’s use of antimicrobials and clinical outcomes.^{5,7}

Successful programs:

- improve the appropriateness of antimicrobial use
- reduce antimicrobial resistance rates, morbidity and mortality
- reduce healthcare costs.^{5,7,14}

A major objective of the Australian Commission on Safety and Quality in Health Care (ACSQHC) is “improving patient safety by reducing inappropriate antimicrobial prescribing through AMS.”⁶ AMS provision is also assessed in health service accreditation^{3,4} and included in the ACSQHC’s *National Safety and Quality Health Service Standards*.

AMS programs are multidisciplinary

The core team ideally comprising an infectious diseases physician, clinical microbiologist or nominated clinician (lead doctor) and clinical pharmacist.^{1,7,15} The AMS team is responsible for implementing the organisation’s AMS program.

AMS should be part of an organisation’s clinical governance program, residing within the hospital’s quality improvement and patient safety governance structure. Hospital executive support and clinical leadership are essential to the success of AMS programs and teams.^{1,5,7,11}

Pharmacists can contribute to AMS both at an organisational system-wide level, and at the patient’s bedside.

Australian experience

Clinical audit conducted by an AMS team at a large hospital in Melbourne (2011) led to 236 recommendations being made for 158 patients where restricted antibiotics were prescribed either where approval had not been obtained or for an indication outside hospital policies. In most patients, agreement made with the treating clinician resulted in ceasing or reducing use of antimicrobials.³¹

An Antimicrobial Resistance Summit in Australia (2011) recommended antimicrobial resistance surveillance and antibiotic usage surveillance, education and AMS, infection prevention and control strategies, research with a focus on epidemiology and effective interventions for the public and health care sector, and regulation including resistance risk assessment.¹⁸

A recent MJA editorial notes that “ideal prescribing... requires availability of rapid diagnostic testing and local AMS programs that use periodic surveillance of microbial resistance within institutions to guide antimicrobial choice.”³³

A survey of Directors of Pharmacy in hospitals across Australia (2008) was conducted to identify barriers to AMS programs.

Barriers

Main barriers identified included:

- lack of education and training related to antimicrobial usage
- a prescribing culture in hospitals resistant to change, lack of resources
- lack of feedback on institutional antimicrobial use.³⁴

A point prevalence survey was conducted at 3 RACFs (2010) screening for the presence of vancomycin resistant enterococci, *Clostridium difficile* and

Pharmacists are essential to the success of AMS programs.^{1,5} As members of the system-wide AMS team pharmacists can:

- participate in policy development and enforcement, and the application and maintenance of antimicrobial formulary and prescribing guidelines consistent with the *Therapeutic Guidelines: Antibiotic 1* (along with local resistance patterns)
- provide review and feedback at patient and unit level particularly in wards with high antimicrobial usage¹⁶⁻¹⁸
- champion and coordinate the activities of the AMS program and assist in implementing activities that promote safe, effective and appropriate use of antimicrobials, and antimicrobial usage audits
- participate in research associated with AMS and antimicrobial use¹
- optimise antimicrobial use by interventions appropriate to local needs, resources and infrastructure⁵
- provide expert advice and education to hospital staff¹
- participate in consultations and on other organisational committees such as the drug and therapeutics committee, and the infection prevention and control committee
- liaise with other departments to enhance, promote and deliver best practice/
- appropriate use of antibiotics
- support other members of the AMS team.¹

In addition, pharmacists providing clinical services to individual patients as part of the healthcare team can assist with and support AMS, the prevention of antimicrobial resistance and help prevent hospital-acquired infections by:

- reviewing antimicrobial orders for adherence to local guidelines and providing timely feedback to the prescriber
- promoting prescribing of antimicrobials aligned with microbial culture and sensitivity results and streamlining therapy to narrow-spectrum agents, where appropriate
- undertaking therapeutic monitoring of antibiotics such as aminoglycosides and vancomycin
- assisting in the selection of best mode of administration taking

into account the patient's clinical status and prescribing guidelines, for instance, converting from intravenous to oral therapy if appropriate

- promoting the use of antimicrobial guidelines, hospital antibiotic formularies and supporting appropriate prescribing
- optimising appropriate antimicrobial use and promoting cost effective and quality use of antimicrobials for individual patients
- providing patient, family and carer education and information on safe, appropriate and effective use of antimicrobials.

Monitoring antimicrobial usage

Monitoring antimicrobial usage and surveillance of the appropriateness of antimicrobial prescribing are essential components of AMS programs.^{1,16} For instance, the National Antimicrobial Utilisation Surveillance Program (NAUSP) is available for organisations to potentially contribute and benchmark their data.^{16,18-20}

The utilisation of information technology for prescribing, clinical decision support and online approval systems may prompt and support desired antibiotic prescribing practice and AMS.^{1,21}

Experience with AMS and knowledge of best practice in antimicrobial use can be transferred to and shared with community-based health professionals and organisations to optimise patient care. Stewardship should be extended beyond healthcare institutions to community care, residential aged-care facilities (RACFs) and non-medical antibiotic use.^{18,22,23} The AMS pharmacist can liaise between Medicare Locals and Local Hospital Networks to promote AMS.

The ACHS National Report on Health Services Accreditation Performance 2009-2010²⁴ notes for criterion 1.5.1 *Medications are managed to ensure safe and effective practice*, that "the antibiotic stewardship program at Peter MacCallum Cancer Centre, Victoria is excellent." Under criterion 1.5.2 *Infection control system supports safe practice and ensures safe environment for consumers/patients and health care workers* (a mandatory criteria with Equip4): "The Guidance Decision Support is an electronic antimicrobial approvals system, initiated by Peter MacCallum

extended spectrum b-lactamase (ESBL) producing organisms.

A high prevalence of multiresistant ESBL-producing *E.coli* was found. Clonal relatedness of isolates suggests possible transmission within the RACF. AMS was amongst suggestions for limiting spread of these organisms.²²

A study to explore patterns of common infections and use of antimicrobials was conducted in four Australian RACFs. Close to 40% of antimicrobial prescribing was for episodes that did not fulfil criteria for clinical infection. Of all episodes treated with antimicrobials, 36% had documentation that a clinical specimen was obtained. The authors suggest developing policies to prevent infection among RACF residents, to explore epidemiology of antimicrobial resistance in clinical infections, and AMS initiatives for RACF.²³

Overseas experience

A paper describing implementation of an AMS program at a health system in the US (2008) noted this helped decrease inappropriate use of antibiotics, improve patient care and outcomes, further clinical research and increased training opportunities for clinical ID pharmacists.³⁵

and now rolled out in other hospitals. The excellent antibiotic stewardship program, which is an extension of this, continues to develop and now includes antibiotic stewardship rounds and provides extra support to clinicians making prescribing decisions. New guidelines for surgeons have been part of recent improvements.²⁴

Pharmacists

Pharmacists have a role in maintaining the patients' continuum of care by monitoring, reviewing and ensuring that prescribed medications (including antibiotics) are used safely, appropriately and effectively.²⁵⁻²⁸

Table 1 Selected health service standards, antimicrobial stewardship recommendations, and how pharmacists can help

Standards and recommendations	How pharmacists can help	Meeting standards and recommendations related to use of antimicrobials: what to consider
<p>ACSQHC National Safety and Quality Health Service (NSQHS) Standards Preventing and controlling healthcare associated infections, Standard 3 Antimicrobial stewardship², safe and appropriate antimicrobial prescribing is a strategic goal of the clinical governance system. Achieved by: 3.14 Developing, implementing and regularly reviewing the effectiveness of antimicrobial stewardship system Actions required: 3.14.1 An antimicrobial stewardship program is in place 3.14.2 The clinical workforce prescribing antimicrobials have access to current endorsed therapeutic guidelines on antibiotic usage 3.14.3 Monitoring of antimicrobial usage and resistance is undertaken 3.14.4 Action is taken to improve the effectiveness of antimicrobial stewardship</p> <p>ACSQHC Antimicrobial stewardship in Australian Hospitals¹ recommendations regarding the role of the pharmacy service include: 9.2.1 The antimicrobial stewardship team includes a pharmacist with experience or trained in AMS who is allocated time and resources for antimicrobial stewardship activities 9.2.2 Pharmacists review antimicrobial orders for adherence to local guidelines and provide timely feedback (where applicable) to the prescriber 9.2.3 Pharmacists are supported by the hospital in enforcing antimicrobial prescribing policies, including formulary restrictions and encouraging adherence to local prescribing guidelines 9.2.4 Hospitals support training for pharmacists to equip them with the knowledge and skills required to effectively participate in antimicrobial stewardship activities 9.4.5 Mechanisms are in place to allow pharmacists to seek expert advice from, and refer to, a clinical microbiologist or infectious diseases physician.</p> <p>EQuIP 5 (Evaluation and quality improvement program) standards and criteria from the Australian Council on Healthcare Standards³ include a number of mandatory criteria for organisations seeking accreditation.</p>	<p>Pharmacists play an active role in AMS as members of AMS teams and at the patient's bedside.¹</p> <p>In summary Pharmacists:</p> <ul style="list-style-type: none"> » optimise appropriate antimicrobial use within the hospital and for individual patients » take part in policy development and the application and maintenance of antimicrobial formulary and prescribing guidelines¹ » participate on hospital committees which oversee or have input in the AMS program » champion and coordinate AMS programs activities » promote adherence to antibiotic guidelines and policies » monitor antimicrobial use » conduct research » conduct antibiotic usage audits » provide review and feedback » promote safe, effective and appropriate use of medicines » provide guidance to clinicians regarding antibiotic selection, availability and use » undertake therapeutic drug monitoring » participate in ward rounds and consultations » provide advice and education » undertake point of care interventions » review local microbiology and antimicrobial susceptibility patterns » counsel/educate patients <p>Safe and effective use of medicines is the core business of pharmacists</p>	<p>Hospital executive</p> <ul style="list-style-type: none"> » Does your organisation support programs to reduce healthcare associated infections and the development of antibiotic resistance? » Does your organisation have an AMS program? » Does your organisation provide dedicated resources for AMS activities, education, and measuring and monitoring antimicrobial use? » Are pharmacists included in the AMS team? » Does your organisation have an antimicrobial approval system? » How is antibiotic use and prescribing monitored? » Are safety and quality indicators related to antimicrobial use collected in your organisation? » Does your organisation meet the ACSQHC-NSQHS AMS standard²? » How does your organisation support the ACSQHC's proposed Australian Safety and Quality Goals for Healthcare?^{2,32} » Does your organisation act on the APACs Guiding Principles to Achieve Continuity in Medication Management²⁵ » Does your organisation have clinical pharmacists working at the patient's bedside? » Does your organisation utilise information technology to facilitate clinical decision support to assist antibiotic prescribing practice or online antimicrobial approval systems?^{1,21} » Does your organisation contribute antimicrobial usage data to NAUSP?^{16,19,20} <p>Directors of medicine, nursing and pharmacy</p> <ul style="list-style-type: none"> » Are antimicrobials prescribed in accordance with AMS guidance? » Is funding available for an AMS pharmacist in your current business model? » Is funding for an AMS pharmacist part of your future funding submission? » Are your colleagues engaged with/supportive of AMS?

Table 1 Selected health service standards, antimicrobial stewardship recommendations, and how pharmacists can help (cont.)

Standards and recommendations	How pharmacists can help	Meeting standards and recommendations related to use of antimicrobials: what to consider
<p>Within Standard 1.5, the criteria note that the ACSQHC includes AMS in approach to preventing antimicrobial resistance and decrease preventable healthcare associated infections. Criteria (which are mandatory) applicable to AMS are:</p> <p>1.5.1 Medications are managed to ensure safe and effective patient outcomes</p> <p>1.5.2 The infection control system supports safe practice and ensures a safe environment for patients and healthcare workers. Principles of AMS are considered in the evaluation against this criterion.</p> <p>NSW Therapeutic advisory group (TAG) representing Drug and Therapeutics Committees (DTCs) in NSW hospitals has developed Indicators for Quality Use of Medicines in Australian Hospitals.²⁹</p> <p>Indicators related to antibiotic therapy are:</p> <p>2.1 Percentage of patients undergoing specified surgical procedures that receive an appropriate prophylactic antibiotic regimen</p> <p>2.2 Percentage of prescriptions for restricted antibiotics that are concordant with Drug and Therapeutics Committee approved criteria</p> <p>2.3 Percentage of patients with a toxic or sub-therapeutic aminoglycoside concentration whose dosage has been adjusted or reviewed prior to the next aminoglycoside dose</p> <p>2.4 Percentage of adult patients with community acquired pneumonia that are assessed using an appropriate validated objective measure of pneumonia severity</p> <p>2.5 Percentage of patients presenting with community acquired pneumonia that are prescribed guideline concordant antibiotic therapy.</p>	<p>Principles of AMS align with the objectives of Equip 5^{3,4}</p> <p>These include:</p> <ul style="list-style-type: none"> » promotion of and a system to support safe and appropriate use of antimicrobials and evaluation and improvement if required » surveillance » actions to limit the use of broad-spectrum antimicrobials. Pharmacists undertake all these activities in their everyday practice. <p>Pharmacists conduct and have experience in drug use evaluation which includes audit and feedback^{17,30,31} and take part in research related to antimicrobial use and AMS.³⁰⁻¹ They are well placed to review antimicrobial orders prospectively and retrospectively and undertake quality improvement activities.</p>	<p>Local Hospital Networks, Medicare Locals</p> <ul style="list-style-type: none"> » Does your organisation meet the ACSQHC-NSQHS AMS standard? » Does your organisation support the ACSQHC's proposed Australian Safety and Quality Goals for Healthcare? » Does your organisation promote safe and appropriate prescribing of antimicrobials across the continuum of care? » Does your organisation promote education and awareness of local prescribing guidelines for antibiotics? » Does your AMS team have multidisciplinary involvement? » Does your organisation support programs to reduce healthcare-associated infections and the development of antimicrobial resistance?

An electronic version and complete list of references is available at <http://www.shpa.org.au> (Updated May 2012)

The Society of Hospital Pharmacists of Australia (SHPA) is the professional body which represents over 4,000 pharmacists, pharmacy students, pharmacy technicians and associates practising in all parts of the Australian health system.

SHPA vision

Excellence in medicines management through leading edge pharmacy practice and research

SHPA purpose

Deliver value through people, systems and processes and processes for the best patient outcomes