SESLHD GUIDELINE COVER SHEET

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SUMMARY	Guide for clinicians regarding appropriate intravenous to oral antimicrobial step down.

SESLHD GUIDELINE
COVER SHEET

Health
South Eastern Sydney
Local Health District

Intravenous to Oral Antimicrobial Switch

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Section 1 – Background

Intravenous administration of antimicrobials are used when treating severe infection (e.g. sepsis, meningitis and endocarditis) to ensure high tissue and systemic drug concentrations are achieved. However, inappropriately prolonged intravenous (IV) antimicrobials can lead to:

- Increased risk of thrombophlebitis
- Prolonged hospital admissions
- Increased healthcare associated costs and environmental impact
- Increased staff workload
- Risk of line infection
- Pain associated with IV cannula

Research has indicated that transitioning to oral antimicrobial medications when medically suitable offers several benefits. These advantages encompass a decreased duration of hospitalization, resulting in a decline in illness and death rates, reduced workloads on healthcare personnel, and diminished expenses related to antimicrobial treatments.

Section 2 – Principles

Daily review of ongoing intravenous antimicrobials is essential to reduce the risks associated with prolonged intravenous antimicrobial use.

Teams should consider switching to oral antimicrobials when:

- There is clinical improvement
  - Fever is resolved or is resolving (fever alone need not prevent switch)
  - Immune response is stable- WCC >3.5 <11 x 109 cells/L or is trending towards normal
  - Patient is hemodynamically stable i.e.. blood pressure, heart rate, and respiratory rate between the flags
- The patient is tolerating oral intake
  - Patient is not nil by mouth
  - Patient is tolerating oral food or enteral feeding
  - Oral absorption is not compromised e.g. diarrhea, vomiting, swallowing disorder, unconscious, malabsorption disorder present.
- A suitable oral antimicrobial is available with the same or appropriate spectrum of cover (refer to tables 1 and 2 below)

Prolonged parenteral therapy IS required initially for the following indications:
Infectious Diseases consultation is recommended for antimicrobial management advice including switching to oral therapy

- Sepsis/septic shock
- Deep-seated infection e.g. abscess/empyema
- Meningitis or encephalitis
- Necrotising soft tissue infection
- Infected implant or prosthesis
- Staphylococcus aureus bacteraemia
- Osteomyelitis
- Septic Arthritis
- Endocarditis

Advice in this guideline excludes the following patient groups:

- Patients <16 years
- Patients who are unable to absorb oral antimicrobials e.g. unable to tolerate oral medications due to vomiting, diarrhea, mucositis, etc.
- Where practical issues influence adherence to oral therapy
- Patient is haemodynamically unstable (note: fever alone should not prevent switch)

Section 3 – Definitions

Definition:

AMS- Antimicrobial Stewardship

AMS CAAG – Clinical Applications Advisory Group for Antimicrobial Stewardship

IV to PO - Intravenous to Oral

eMR- Electronic Medical Record

Hemodynamically stable- blood pressure, heart rate and respiratory rate are stable and between the flags.

WCC- White Cell Count
ID- Infectious Diseases

The following National Safety and Quality Health Service (NSQHS) Standards are addressed in this guideline:

Standard 3 - Preventing and Controlling Healthcare Associated Infections

3.01 - Integrating Clinical Governance by implementing policies and procedures for AMS and identifying and managing AMS risks

3.03 - Applying quality improvement systems by implementing strategies to improve AMS outcomes, monitoring the effectiveness of the AMS program and reporting to the governance body, workforce, patients and other relevant groups AMS outcomes

Standard 4 - Medication Safety.

4.02 - Applying quality improvement systems by reviewing, measuring and assessing the effectiveness and performance of medication management strategies

4.10 - Medication review by performing medications reviews for patients in line with evidence and minimising risk of medication related problems

4.13 - Information and decision support tools for medicines are available to clinicians

Section 4 – Responsibilities

AMS CAAG are responsible for:

- Monitoring of the AMS IV to PO Triage tool use and clinical outcome
- Governance reporting (Drug Therapeutic Committee and Digital Health Steering Committee) and submissions related to AMS CAAG activity.
- Maintenance and technical support of the Triage tool

AMS Teams are responsible for:

- Co-ordinating the implementation of the AMS IV to PO Triage tool including providing education, training, and communication to all stakeholders regarding Antimicrobial IV to PO Switch
- Supervising and supporting the daily activity relating to Antimicrobial IV to PO Switch
- Acting as the AMS escalation pathway for Pharmacists and Medical Officers

Medical Officers are responsible for:

- Assessing the ongoing need for intravenous antibiotics on a daily basis
- Converting eligible patients to appropriate oral therapy where possible based on this guideline and available susceptibility data
- Checking intravenous cannula date and integrity

Pharmacists are responsible for:

- Conducting medication review of antimicrobials and alerting the treating team when patient meets criteria to convert from intravenous to oral antimicrobials.

Section 5 – Appropriate Intravenous to Oral step down options

Table 1: Appropriate IV to PO antibiotic switch options based on pathogen spectrum

Current INTRAVENOUS (IV) →	ORAL Option (PO)
Azithromycin 500 mg IV daily	Azithromycin 500mg PO daily
Ampicillin 1 g – 2 g IV 8 hrly	Amoxicillin 500mg-1 g PO 8 hrly
Benzylpenicillin 1.2 g – 1.8 g IV 6 hrly	Amoxicillin 500mg-1 g PO 8 hrly
Cefazolin 1 g – 2 g IV 8 hrly	Cefalexin 500 mg – 1 g PO 6 hrly
Ceftriaxone 1 – 2 g IV daily	**Note: optimal oral antibiotic conversion depends on the indication (refer to eTG or table 2 for guidance)** Amoxicillin-clavulanic acid 875mg/125mg PO 12 hrly
Ciprofloxacin 400 mg IV 12 hrly	Ciprofloxacin 500 mg PO 12 hrly
Clindamycin 600 mg IV 8 hrly	Clindamycin 450 mg PO 8 hrly
Flucloxacillin 1g – 2 g IV 6 hrly	Flucloxacillin 500 mg – 1 g PO 6hrly
Metronidazole 500 mg IV 12 hrly	Metronidazole 400 mg PO 12 hrly
Moxifloxacin 400 mg IV daily	Moxifloxacin 400 mg PO daily
Piperacillin-tazobactam 4.5 g IV 8 hrly	Amoxicillin-clavulanic acid 875mg/125mg PO 12 hrly
Piperacillin-tazobactam 4.5 g IV 6 hrly	SEEK ADVICE FROM ID or AMS
Vancomycin, Meropenem, Cefepime	SEEK ADVICE FROM ID or AMS

Examples of antimicrobials with good oral bioavailability:

The following antimicrobials have good oral bioavailability. They can often be given orally rather than intravenously, provided the drug is appropriate for the indication, has adequate tissue penetration for the infection being treated, and the patient can tolerate oral administration.

Antimicrobials with good oral bioavailability include:

- Azithromycin (see notes on page **)
- Ciprofloxacin
- Clindamycin
- Doxycycline
- Fluconazole
- Itraconazole
- Linezolid
- Metronidazole
- Moxifloxacin
- Posaconazole
- Rifampicin
- Trimethoprim + sulfamethoxazole
- Voriconazole

**oral azithromycin is extensively distributed and achieves high intracellular concentrations despite lower bioavailability

Table 2: Appropriate IV to PO switch options based on indication

Current INTRAVENOUS (IV) →	ORAL Option (PO)
GASTROINTESTINAL - Acute calculous cholecystitis	
Ampicillin IV 6 hrly PLUS Gentamicin	Amoxicillin-clavulanic acid 875mg/125mg PO 12 hrly
GASTROINTESTINAL– Acute acalculous cholecystitis / Diverticulitis:	
Ampicillin 2 g IV 6 hrly PLUS Gentamicin PLUS Metronidazole 500 mg IV 12 hrly	Amoxicillin-clavulanic acid 875mg/125mg PO 12 hrly
Ceftriaxone 2 g daily PLUS Metronidazole 500 mg IV 12 hrly	Amoxicillin-clavulanic acid 875mg/125mg PO 12 hrly
RESPIRATORY - Severe community acquired pneumonia:	
Ceftriaxone 2 g IV daily PLUS Azithromycin 500mg IV daily	Amoxicillin 1 g PO 8 hrly PLUS Azithromycin 500 mg PO daily
If immediate non-severe penicillin allergy present	Cefuroxime 500mg BD PLUS Azithromycin 500mg PO daily
RESPIRATORY - Moderate community acquired pneumonia:	
Benzylpenicillin 1.2g 6 hrly IV daily PLUS Doxycycline 100mg 12 hrly PO	Amoxicillin 1 g PO 8 hrly PLUS Doxycycline 100mg 12 hrly PO
URINARY- Acute cystitis or pyelonephritis	
Ampicillin IV 6 hrly PLUS Gentamicin	Step down based on susceptibilities If susceptibilities unknown use Cefalexin 500mg 12 hrly

Notes regarding table 1 and 2:

- Doses mentioned in tables 1 and 2 are based on normal renal function- refer to the *Therapeutic Guidelines: Antibiotic* for dosing in renal impairment
- Check the patient's allergies before prescribing any new antimicrobial.
- The Therapeutic Guidelines: Antibiotic provides further indication specific oral step down options and information about antimicrobial choice in patients with allergies.

Section 6 - Clinical decision support tool to guide IV to PO Switch

A clinical decision support tool has been developed in eMR to prompt clinicians to consider switching to oral antimicrobials in appropriate patients. An alert will flag on prescription of an intravenous antimicrobial to potentially step down to oral if the patient meets the following criteria:

- The patient is >16 years of age
- The patient has been admitted for >24 hours on included wards (ICU, HITH and ED are excluded)
- The patient does not have a nil by mouth diet order
- The patient's recorded temperatures in eMR (axillary, oral, rectal, or tympanic) within the last 24 hours are 35.5^0C – 38^0C
- The patient's recorded systolic blood pressure readings in eMR are >95mmHg within the last 24 hours
- The patient's last white cell count (WCC) is between 3.5 – 11 x 10^9/L OR there are three consecutive WCC results trending towards 11 x 10^9/L, with a look back period of 7 days.
- Note- only select indications and antimicrobials are included in this alert. Contact your local Antimicrobial Stewardship Pharmacist for further information.

Patients who meet the above criteria will be flagged to pharmacists for post prescription review. Pharmacists can initiate discussion with the team to step down to oral antimicrobials.

Section 7 – Useful Contacts

Refer to the SESLHD AMS intranet page for useful links and information

Section 8

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Version and approval history

Date	Version	Version and approval notes
31 January 2024	1.0	New guideline. Approved by SESLHD Drug and Therapeutics Committee and SESLHD Clinical and Quality Council.
14 February 2024	1.1	Footer information on contents page edited.