Administration of Antimicrobials for Adults in Hospital in the Home and Outpatient Care Guideline

1. Purpose

This guideline provides guidance for administration of parenteral antimicrobials for patients managed in the outpatient setting via Hospital in the Home (HITH) and Home Nursing Discharge Services (HNDS) or are attending Emergency Departments or day infusion clinics for administration of long term antimicrobial therapy post discharge.

This guideline also provides guidance for the registered nurse/midwife preparation of elastomeric devices (infusors).

2. Guideline

2.1 Administration Considerations

The following points provide general guidance for the preparation and administration of antimicrobials in the HITH or outpatient care setting:

- Administration information applies to peripherally inserted central catheter (PICC) or central venous catheter (CVC), unless specifically stated otherwise.
- Care and maintenance of vascular devices is per the WACHS Peripheral Intravenous Cannula (PIVC) Guideline and the WACHS Central Venous Access Devices (CVAD) and Long Peripheral Venous Catheter (PVC) Management- Clinical Practice Standard.
- For selected antimicrobials administration can occur via a peripherally inserted venous catheter (PIVC). Nursing staff are to perform a daily PIVAS (peripheral intravenous assessment score) and the PIVC must be changed every 72 hours. This can be documented on the MR179 WACHS Peripheral Intravenous Cannula Insertion and Observation Record.
- All orders are to be charted on the WA Hospital Medication Chart (WA HMC) or other endorsed chart prior to administration of the antimicrobial.
- In the community setting when only one registered nurse/midwife is on site, intravenous preparation and administration of antimicrobials is exempt from requiring an independent second check. Refer to the WACHS Medication Prescribing and Administration Policy
- Refer to the Australian Injectable Drug Handbook (AIDH) and specific product information available via AusDI for preparation information.
- For treatment with a continuous intravenous infusion via an elastomeric device (infusor), connection of the initial infusor should occur as soon as possible after the last intermittent antimicrobial dose was administered.
- Daily elastomeric device changes should occur at the same time or within 2 hours of the previous connection.
- When therapeutic monitoring is required, blood samples must have the time of the last dose, and the dose administered documented. Time of dose administration is not required for continuous vancomycin infusions, instead ensure it is clear on the pathology request that the monitoring is required for a continuous infusion. If needed, annotate ‘Urgent’ on the blood collection request.

2.2 Patient Considerations

The following points provide patient considerations for the use of antimicrobials in the HITH or outpatient care setting:

- Antimicrobial choice and doses for patients will be influenced by the patient's medical condition, weight, renal function, and allergy status.
- Prescribers should be aware of known medication adverse effects and ensure that required monitoring is arranged for the patient and communicated to relevant medical and nursing staff.
- It is recommended that all patients have received a minimum of one dose of the prescribed antimicrobial in hospital or a clinically appropriate environment such as the Emergency Department and have had no adverse reaction prior to ongoing administration in the HITH or Outpatient Care setting.
- The patient should be educated on the signs of infection or extravasation. Provision of this information to the patient should be documented in the patient's healthcare record. There are multiple patient resources available, clinician to determine most suitable resource for their patient. Refer to Other Related Documents section for examples.
- The patient is required to check the administration site two to three times a day and if they have any concerns, they are to present to the nearest Emergency Department.
- All patients should have an order of intramuscular (IM) adrenaline charted as a when required order for urgent management of anaphylaxis. Anaphylaxis should be managed as per the WACHS endorsed ASCIA Guideline – Acute Management of Anaphylaxis.
- Patients receiving continuous infusions via an elastomeric device, such as a Baxter Infusor®, should be provided with a wearable cooler bag and the Baxter Infusor®- Home Infusion Systems Patient Guide.
- Patients are advised to follow the Baxter Infusor®- Home Infusion Systems Patient Guide for other standard conditions of use (e.g. sleeping/bathing).
- Patients and their carers should be educated about the management of the elastomeric device, how to recognise problems such as a reduced flow rate, and how to obtain assistance if required.

2.3 Intravenous Administration of Antimicrobials

The antimicrobials listed below are frequently used within the outpatient settings across WACHS. This is not an exhaustive list. For additional antimicrobial advice, contact your pharmacist.

Antimicrobial	Dose / Concentration	Compatible fluid	Volume	Method	Duration	Other information
Aciclovir	Up to 2.4 g (based on elastomeric device stability)	Sodium chloride 0.9%	**240 mL**	Continuous infusion over 24 hours via elastomeric device		**Do not** refrigerate aciclovir solutions. Crystals may form and they do not redissolve at room temperature.
Anidulafungin	100 mg (following initial 200 mg loading)	Sodium chloride 0.9% or glucose 5%	100 mL (total volume after reconstitution with 30 mL water for injection =130 mL)	Infusion	90 minutes (for 100 mg dose)	Information provided for the 100 mg dose. The initial loading will ideally be administered in hospital/health service.
Benzylpenicillin	Up to 14.4 g (based on elastomeric device stability)	Sodium chloride 0.9%	**240 mL**	Continuous infusion over 24 hours via elastomeric device		**Not** able to be prepared by nursing staff due to instability of solution when not prepared using buffered diluent. **Not** to be mistaken for benzathine benzylpenicillin

Antimicrobial	Dose / Concentration	Compatible fluid	Volume	Method	Duration	Other information
Caspofungin	50 mg or 70 mg	Sodium chloride 0.9%	250 mL	Infusion	60 minutes	**Not** stable in elastomeric device If necessary, a maximum concentration of 0.5 mg/mL can be used (e.g. 50 mg in 100mL of sodium chloride 0.9%)
Cefazolin	1 g or 2 g	Sodium chloride 0.9%	10 mL	Push	Over at least 5 minutes	For the treatment of cellulitis, where it is appropriate to use a **Once daily** dose of intravenous cefazolin 2 g for outpatient management, an oral dose of probenecid 1 g daily administered 30 minutes before cefazolin administration can be used to optimise cefazolin exposure.
	1 g or 2 g	Sodium chloride 0.9%	50 to 100 mL	Infusion	10 to 60 minutes	
	Up to 9.6 g (based on elastomeric device stability)	Sodium chloride 0.9%	**240 mL**	Continuous infusion over 24 hours via elastomeric device		

Antimicrobial	Dose / Concentration	Compatible fluid	Volume	Method	Duration	Other information
Ceftriaxone	1 g	Sodium chloride 0.9%	20 mL	Push	Over at least 5 minutes	Do not mix ceftriaxone with IV solutions containing calcium because a precipitate can form. See Table 2 for dosing advice for administration via the subcutaneous route
	2 g	Sodium chloride 0.9%	50 mL	Infusion	Over 30 minutes	
	4 g	Sodium chloride 0.9%	50 mL	Infusion	Over 30 minutes	
	Up to 4 g	Sodium chloride 0.9%	**240 mL**	Continuous infusion over 24 hours via elastomeric device		
Daptomycin	≤ 500 mg	Sodium chloride 0.9%	Based on dose, refer to AIDH.	Push	Over 2 minutes	Reconstitute with sodium chloride 0.9% (not water for injection) **Do not shake** during or after reconstitution. Allow to stand 10 minutes then gently rotate to dissolve. *Alternatively, higher doses may be divided to allow for bolus administration (e.g. 850 mg administered as a 500 mg bolus and a 350 mg bolus).
	> 500 mg*	Sodium chloride 0.9%	Based on dose, refer to AIDH.	Infusion	Over 30 minutes	
Ertapenem	1 g	Sodium chloride 0.9%	10 mL	Push	Over 5 minutes	Ertapenem is the preferred carbapenem in the HITH and

Antimicrobial	Dose / Concentration	Compatible fluid	Volume	Method	Duration	Other information
	1 g	Sodium chloride 0.9%	50 mL	Infusion	Over 30 minutes	outpatient setting due to instability of meropenem in an elastomeric device. NOTE: ertapenem has no activity against *Pseudomonas aeruginosa* or in Melioidosis. See Table 2 for dosing advice for administration via the subcutaneous route
Flucloxacillin	Up to 12 g	Sodium chloride 0.9%	**240 mL**	Continuous infusion over 24 hours via elastomeric device		If prepared by nursing staff must be stored below 30°C for the entire 24 hour infusion. Provide wearable cooler bag and two small cold packs to the patient. One **chilled** ice pack should be placed inside the cooler bag, alongside the elastomeric device. Ice packs should be changed every 8 hours to ensure solution remains below 30°C. **NB:** These precautions are not required with commercial manufacturer supplied flucloxacillin devices.

Antimicrobial	Dose / Concentration	Compatible fluid	Volume	Method	Duration	Other information
Gentamicin	Variable dosing according to recommendation of specialist ID advice.	Sodium chloride 0.9%	20 mL	Push	Over at least 5 minutes	Gentamicin is inactivated by penicillin and cephalosporin antibiotics. Do not mix in the same injection or infusion solution. Flush lines well before and after giving each medication. When therapy is to continue for more than 72 hours therapeutic monitoring must occur. To ensure accurate therapeutic monitoring, the administration time must be recorded.
			50 mL to 100 mL	Infusion	30 minutes	
Piperacillin / Tazobactam	Up to 16 g / 2 g (18 g combined) (based on via elastomeric device stability)	Sodium chloride 0.9%	**240 mL**	Continuous infusion over 24 hours via elastomeric device		
Teicoplanin	400 mg	Sodium chloride 0.9%	Reconstitution is brand dependent. Refer to the AIDH.	Push	Over at least 5 minutes	Add diluent slowly down the side wall of the vial and roll gently to dissolve. **Do Not shake**. If solution foams, allow to stand for 15 minutes to settle.

Antimicrobial	Dose / Concentration	Compatible fluid	Volume	Method	Duration	Other information
	800 mg		50 to 100 mL	Infusion	Over 30 minutes	Therapeutic monitoring should occur. Trough concentrations should be monitored (take blood immediately prior to administering dose). Recommended to monitor weekly. **Bloods need to be sent to QEII PathWest Nedlands for processing**. QEII Pathwest can process samples for teicoplanin levels Monday to Friday, will not be run on weekends. See Table 2 for dosing advice for administration via the subcutaneous route
Vancomycin	Up to 4.8 g (based on stable infusor concentration)	Sodium chloride 0.9%	**240 mL**	Continuous infusion over 24 hours via elastomeric device		**Extravasation may cause tissue necrosis.** Therapeutic monitoring must occur. Specialised Medication - Intravenous Vancomycin in Adults Guideline

Table 1: Intravenous administration of antimicrobials

2.4 Preparation of Antimicrobials in Elastomeric Devices

There is often a two-to-four-day turnaround for supply of the elastomeric device (Infusor®) from the manufacturer once the order is placed. To facilitate patient discharge on the day of referral, registered nurses/midwives can prepare an elastomeric device before the commercially prepared device is available. This also allows timely administration to patients referred to HITH or outpatient services after hours or over the weekend, or patients whose medication or dose may change during the course of treatment.

Information in this guideline pertains to Infusors® provided by Baxter. See Appendix A for the Baxter Infusor® Filling and Preparation Guide.

Registered nurses/midwifes are able to prepare antimicrobials in elastomeric devices:

- as soon as possible prior to use
- in a suitable clinical area
- using non-touch aseptic technique
- with antimicrobials that have proven stability in solution for 24 hrs in an elastomeric device.

Directions for antimicrobials to be added to 180 mL Baxter (LV10) Infusor®:

- reconstitute the antimicrobial according to the instructions in the Australian Injectable Drug Handbook or product information (accessible through AusDI)
- check the expiry of all equipment and supplies required to make up the infusor (pre-filled infusor (Baxter LV10), antimicrobial and reconstitution solution)
- dilute the reconstituted antibiotic solution with 0.9% sodium chloride to a final volume of 60 mL
- add diluted antibiotic solution to the 180 mL infusor
- invert the infusor device multiple times to ensure adequate mixing
- the final volume of the infusor device will be 240 mL
- attach an IV additive label and expiry to the infusor
- all infusors prepared by registered nurses/midwives have a 24-hour expiry only and must be connected as soon as possible
- all registered nurse/midwife prepared infusions must be double checked by two registered nurses/midwives or a registered nurse/midwife and a medication competent enrolled nurse prior to administration to the patient.

2.5 Use of Cold Packs for Temperature Controlled Antimicrobials

Patients who have been commenced on a temperature-controlled antimicrobial must be supplied with a wearable cooler bag and two small ice packs. One **chilled** ice pack should be placed inside the cooler bag, between the patient and the Infusor®. Wearable cooler bags are supplied by the manufacturer and are available from your regional pharmacy department.

To ensure the solution remains below 30˚C for the entire 24-hour infusion, the ice packs should be used alternatively (i.e. one chilling in the freezer while one is in use) and changed at least every eight hours.

2.6 Subcutaneous Administration of Antimicrobials

There is a small, but emerging body of evidence demonstrating the safety and efficacy of subcutaneous administration of antibiotics. Subcutaneous administration can be considered when venous access is poor or where the establishment and maintenance of an intravenous line presents a problem (e.g. delirious/distressed patient where cannulation is problematic) or as a vein preservation strategy.

Ensure the proposed subcutaneous administration site, usually the lateral abdominal wall, is free of existing dermatological conditions that may affect skin integrity at the administration site. The following antimicrobials are appropriate for subcutaneous administration.

Antimicrobial	Form	Preparation	Administration	Comments
Ceftriaxone	1 g vial	Dissolve a maximum of 1 g in 10 mL water for injection or sodium chloride 0.9%. Shake well to dissolve, and then dilute with 50 mL sodium chloride 0.9%.	Administer subcutaneously using a butterfly needle by a 30-minute gravity infusion	Infusion solution is stable for a maximum of 6 hours below 25°C.
Ertapenem	1g vial	Dissolve a maximum of 1 g in 10 mL water for injection or sodium chloride 0.9%. Shake well to dissolve, and then dilute with 50 mL sodium chloride 0.9%.	Administer subcutaneously using a butterfly needle by a 30-minute gravity infusion	Infusion solution is stable for a maximum of 6 hours below 25°C.
Teicoplanin	Sandoz® 400mg Targocid® 460mg	Reconstitution is brand dependent. Refer to the AIDH for reconstitution information	Administer subcutaneously using a butterfly needle by a 30-minute gravity infusion	Use the reconstituted infusion immediately or stable for 24 hours at 2 to 8°C.

Table 2: Subcutaneous administration of antimicrobials

3. Roles and Responsibilities

Prescribers are responsible for prescribing antimicrobials to be used in the HITH and outpatient care setting clearly and to provide support to nursing/midwifery for the ongoing management of the patient.

Registered nurses and midwives are responsible for the daily administration and monitoring of the prescribed antimicrobial/s to patients in the HITH and outpatient care setting.

Pharmacy departments are responsible for the supply of antimicrobials (e.g. Baxter Infusors®) for use in the HITH and outpatient care setting, unless supply will continue to be managed by a referring site (e.g. tertiary hospital).

Pharmacists are available to support medical and nursing in the ongoing care for the patients and to assist with clinical review of appropriateness of therapy.

All staff are required to comply with the directions in WACHS policies and procedures as per their roles and responsibilities. Guidelines are the recommended course of action for WACHS and staff are expected to use this information to guide practice. If staff are unsure which policies procedures and guidelines apply to their role or scope of practice, and/or are unsure of the application of directions they should consult their manager in the first instance.

4. Monitoring and Evaluation

Adverse events and clinical incidents involving patients receiving antimicrobials in the HITH and outpatient care setting must be notified through the WACHS-endorsed Clinical Incident Management System (CIMS) and managed in accordance with the WACHS Medication Prescribing and Administration Policy and MP 0122/19 Clinical Incident Management Policy. The WACHS Medication Safety Committee and regional Medicines and Therapeutics Committees are responsible for reviewing clinical incident data related to high-risk medications. This procedure will be evaluated periodically, and at least every five years, to ensure its effectiveness, relevance, and currency, with a mandatory review by the WACHS Medication Safety Committee.

5. References

Sir Charles Gairdner Hospital – Home Link. Home Link Intravenous (PICC/CVC) Antibiotic Standing Orders. Last reviewed 01/2025 https://healthpoint.hdwa.health.wa.gov.au/policies/Policies/NMAHS/SCGH/SCGH.MMG.Homelink_IV_antibiotic_infusion_rates.pdf (accessed online 2025).

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The Australian Therapeutic Guidelines- Antibiotic [Internet]. Abbotsford: Therapeutic Guidelines Limited; 2023. https://app-tg-org-au.wachslibresources.health.wa.gov.au/viewTopic/?guidelinePage=Antibiotic&etgAccess=true# (accessed 2025).

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Fiona Stanley Fremantle Hospitals Group – Subcutaneous Administration of Antibiotics. Last reviewed 01/2025 https://healthpoint.hdwa.health.wa.gov.au/policies/FSH%20Policies/Subcutaneous%20Administration%20of%20Antibiotics.pdf (accessed online 2025).

6. Definitions

Term	Definition
Elastomeric device	Non-electronic medication pump designed to provide ambulatory infusion therapy. Medication is delivered to the patient as the **elastomeric** "balloon" consistently deflates and gently pushes solution through the IV tubing and into the catheter/port. These are most often referred to as Baxter (LV10) Infusors® in practice.
Therapeutic Monitoring	Monitoring plasma concentrations to maximise efficacy and minimise the risk of dose-related toxicity of medications with a narrow therapeutic index (e.g. aminoglycosides, glycopeptides, antifungals). Monitoring may also be used to optimise dosage regimens in other circumstances (e.g. in patients with septic shock or who require intensive care support).

7. Document Summary

Coverage	WACHS-wide
Audience	Medical, nursing, midwifery, pharmacy, local Medicines and Therapeutics Committees (MTCs)
Records Management	Clinical: Health Record Management Policy
Related Legislation	*Medicines and Poisons Act 2014* (WA) Medicines and Poisons Regulations 2016 (WA)
Related Mandatory Policies / Frameworks	• MP 0131/20 High Risk Medication Policy • MP 0038/16 Insertion and Management of Peripheral Intravenous Cannulae in Healthcare Facilities Policy • Clinical Governance, Safety and Quality Framework • Public Health Framework
Related WACHS Policy Documents	• Central Venous Access Device (CVAD) and Long Peripheral Venous Catheter (PVC) Management - Clinical Practice Standard • High Risk Medications Procedure • Medication Prescribing and Administration Policy • Peripheral Intravenous Cannula (PIVC) Guideline • Specialised Medication – Intravenous Vancomycin in Adults Guideline
Other Related Documents	• ASCIA Guideline – Acute Management of Anaphylaxis • ACSQHC Patient Information- How to look after your cannula • Baxter Infusor®- Home Infusion Systems Patient Guide • FSFHG Subcutaneous Administration of Antibiotics Guideline • WACHS Consumer Information - Caring for an intravenous cannula
Related Forms	• MR179B WACHS Central Venous Access Device (CVAD) Insertion Site Assessment Continuation Sheet • MR179A WACHS Central Venous Access Device (CVAD) Insertion and Assessment Record • MR179 WACHS Peripheral Intravenous Cannula Insertion and Observation Record
Related Training	Available from MyLearning: • High Risk Medications: Introduction (HRMINT EL2)
Aboriginal Health Impact Statement Declaration (ISD)	ISD Record ID: 3720
National Safety and Quality Health Service (NSQHS) Standards	3.18; 3.19; 4.1; 4.13; 4.15
Aged Care Quality Standards	Nil

Chief Psychiatrist's Standards for Clinical Care	Nil
Other Standards	Nil

8. Document Control

Version	Published date	Current from	Summary of changes
2.00	17 October 2025	17 October 2025	• change of title • information from the Nurse Compounding of Antibiotics in Elastomeric Devices Guideline has now been amalgamated into this guideline and rescinded • inclusion of dosing advice for subcutaneous administration.

9. Approval

Policy Owner	Executive Director Clinical Excellence
Co-approver	Executive Director Nursing and Midwifery Services Chief Operating Officer
Contact	WACHS Chief Pharmacist
Business Unit	Pharmacy
EDRMS #	ED-CO-20-53050

This document can be made available in alternative formats on request.

Appendix A: Filling and Preparation Guide

FILLING AND PREPARATION GUIDE

Single-Rate Slow-Flow Infusor Device™ or Intermate™

These step-by-step instructions will guide you through the process of filling the **Single-Rate Slow-Flow Infusor** device.

A video guide to the filling procedure can be found on **baxterprofessional.com** or **baxterprofessional.co.nz**

The **Infusor** is filled by injecting the medication through the Fill Port using a syringe or filling system with a Luer-lock tip.

Sterile Fluid Path. Use aseptic techniques for preparation and administration. Do not use needle when filling the **Infusor** device.

1.

Remove paper tape from the tubing and uncoil the tube set. Remove the Sterility Protector Cap. Retain for later use.

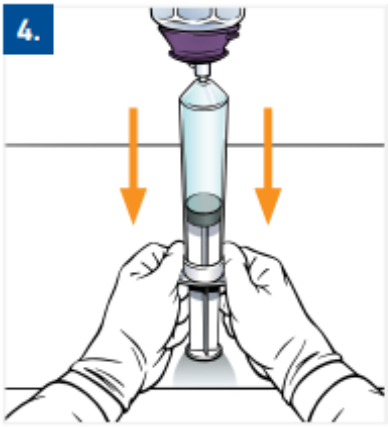
2.

Draw up the required drug solution in a syringe.[1,2] Prime to remove all air. Do not attach a needle to the syringe to avoid damaging the Fill Port.

3.

Insert the tip of the syringe or primed filling device into the Fill Port and turn clockwise to lock.[1,3,4]

4.



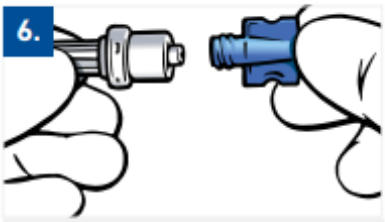
Place the head of the filled syringe plunger on a work surface. Keeping the unit vertical, grasp the syringe barrel or flanges and push slowly downward on the syringe to gradually fill the Elastomeric Reservoir. Do not hold the Infusor device during filling.

Repeat steps 2-4 to fill between the minimum and maximum fill volumes.[5,6,8]

5.

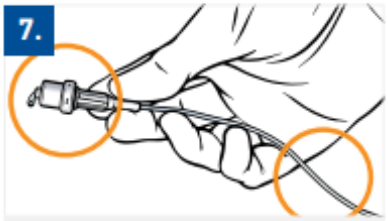
Disconnect the syringe or filling device from the Fill Port.[4,7] Replace Sterility Protector Cap.

6.



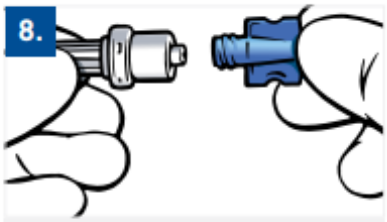
Remove the Winged Luer Cap to start system priming.

7.



Visually confirm fluid flow and that the tubing is clear of air before use. If not flowing, force prime as shown on next page.

8.



Reattach the Winged Luer Cap. Label the Infusor device in accordance with facility protocol.

Baxter Professional Website. Accessed online via https://www.baxterprofessional.com.au (accessed 2025)