Intravenous Administration of Antibiotics for Adults in the Hospital in the Home (HITH) and Outpatient Care Setting Guideline

1. Guiding Principles

The following dilutions and administration rates are recommended for IV antibiotic administration for patients managed via Hospital in the Home (HITH), Home Nursing Discharge Services (HNDS) and attending Emergency Departments for administration of long term antibiotics post discharge.

2. Guideline

Administration information is based on administration via a PICC / CVC line (unless specifically stated otherwise).
Care and maintenance of vascular devices as per the WACHS Peripheral Intravenous Cannulae (PIVC) Management Clinical Practice Standard and the WACHS Central Venous Access Device (CVAD) Management - Clinical Practice Standard

Powder vial injections should initially be reconstituted with Water for Injection only (unless specifically stated otherwise). Refer to Australian Injectable Drug Handbook for reconstitution information. Observe for any precipitates in the solution prior to administration.

When therapeutic drug monitoring is required all blood samples must be collected from a peripheral site. Document the time of the last dose, the dose administered and, if needed, write 'Urgent' on the blood collection request form.

All patients receiving continuous infusions via an elastomeric device, such as an Infusor®, should be provided with a wearable cooler bag and patient information leaflet. Patients should be educated about management of the device, how to recognise problems and when/how to obtain assistance.

Medication doses for individual patients will be influenced by the patient's medical condition, weight and renal function. Prescribers should be aware of known drug associated toxicities and ensure that required blood 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 medicine in hospital or a clinically appropriate environment such as the Emergency Department and have had no adverse reaction prior to administration in the HITH or Outpatient Care setting.

It is recommended that all patients have an order of IM adrenaline up to 500micrograms charted as a when required order (but not dispensed) for urgent management of anaphylaxis. Anaphylaxis should be managed as per the WACHS endorsed ASCIA Guideline – Acute Management of Anaphylaxis.

Timing of initial connection of an elastomeric device should not be delayed based on last dose administered on the ward. Daily connection should be changed within +/- 2 hours of the infusion completion.

For those selected antibiotics where administration can occur via a PIVC nursing staff are to perform a daily PVIAS check. The patient is to be educated and provided written information on signs of infection or extravasation and the requirement to check the area two to three times a day, if they have any concerns they are to present to the nearest Emergency Department. Provision of this information to the patient should be documented in the patient's medical record. PIVC are to be changed every 72 hours.

Drug	Dose / Concentration	Compatible fluid	Volume	Method	Duration	Other information
Amikacin	< 500mg	Sodium chloride 0.9%	20mL	Push	Over at least 5 minutes	Amikacin 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 drug. Record time of administration When therapy is to continue for more than 72 hours therapeutic drug monitoring should occur. Specialised Medication - Intravenous Aminoglycoside for Adult Non-pregnant Patients Guideline
	≥ 500mg 16-20mg/kg up to a maximum of 1500mg daily *Reduce in renal impairment	Sodium chloride 0.9%	50 to 100mL	Infusion	30 minutes	
Benzyl penicillin	Up to 14.4g	Sodium chloride 0.9%	**240mL**	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. Elastomeric devices for continuous infusion are ordered by Pharmacy.

Drug	Dose / Concentration	Compatible fluid	Volume	Method	Duration	Other information
Cefazolin	1g to 2g	Sodium chloride 0.9%	20mL	Push	Over at least 5 minutes	Cefazolin 1g to 2g daily can be administered by injection over at least 5 minutes via a peripheral intravenous cannula (PIVC) – following the WACHS PIVC Management CPS
	1g to 2g	Sodium chloride 0.9%	50 to 100mL	Infusion	10 to 60 minutes	
	Up to 9.6g (based on elastomeric device stability)	Sodium chloride 0.9%	**240mL**	Continuous infusion over 24 hours via elastomeric device		
Cefepime	1g to 2g	Sodium chloride 0.9%	20mL	Push	Over at least 5 minutes	Reconstitute with sodium chloride 0.9% or glucose 5% (not water for injection). One FRIDGE CHILLED cold pack should be placed inside the cooler bag, alongside the elastomeric device. Chilled cold packs should be changed every 8 hours to ensure solution remains below 25°C.
	1g to 2g	Sodium chloride 0.9%	50 to 100mL	Infusion	Over 30 minutes	
	Up to 6g	Sodium chloride 0.9%	**240mL**	Continuous infusion over 24 hours via elastomeric device		

Drug	Dose / Concentration	Compatible fluid	Volume	Method	Duration	Other information
Ceftriaxone	1g	Sodium chloride 0.9%	20mL	Push	Over at least 5 minutes.	Do not mix ceftriaxone with IV solutions containing calcium because a precipitate can form. Ceftriaxone 1g to 2g daily can be administered by injection over at least 5 minutes via a peripheral intravenous cannula (PIVC) – following the WACHS PIVC Management CPS.
	2g	Sodium chloride 0.9%	40mL	Push	Over at least 5 minutes.	
	4g	Sodium chloride 0.9%	50mL	Infusion	Over 30 minutes	
	Up to 4g	Sodium chloride 0.9%	**240mL**	Continuous infusion over 24 hours via elastomeric device		
Daptomycin	≤ 500mg	Sodium chloride 0.9%	10mL	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 Dose reduction in renal impairment is required. Monitor creatinine kinase (CK) due to risk of drug induced rhabdomyolysis. * Alternatively, higher doses may be divided to allow for bolus administration (eg 850mg administered as a 500mg bolus and a 350mg bolus).
	> 500mg*	Sodium chloride 0.9%	50mL	Infusion	Over 30 minutes	

Drug	Dose / Concentration	Compatible fluid	Volume	Method	Duration	Other information
Ertapenem	1g	Sodium chloride 0.9%	50mL	Infusion	Over 30 minutes	Nil.
Flucloxacillin	Up to 12g	Sodium chloride 0.9%	**240mL**	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 FRIDGE CHILLED cold pack should be placed inside the cooler bag, alongside the elastomeric device. Chilled cold 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.

Drug	Dose / Concentration	Compatible fluid	Volume	Method	Duration	Other information
Gentamicin	Max 400mg daily *Reduce in renal impairment *Higher dose should only be prescribed on the recommendation of specialist ID advice and where appropriate monitoring is able to be guaranteed.	Sodium chloride 0.9%	**20mL**	Push	5 to 10 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 drug. Record time of administration When therapy is to continue for more than 72 hours therapeutic drug monitoring should occur. Specialised Medication - Intravenous Aminoglycoside for Adult Non-pregnant Patients Guideline
			50mL to 100mL	Infusion	30 minutes	

Drug	Dose / Concentration	Compatible fluid	Volume	Method	Duration	Other information
Meropenem	Up to 6g (based on via elastomeric device stability)	Sodium chloride 0.9%	**240mL**	Continuous infusion over 24 hours via elastomeric device		**NOT** able to be prepared by nursing staff due to stability. Elastomeric devices for continuous infusion are ordered by Pharmacy. Available devices have limited stability and therefore consider appropriateness and potential change to ertapenem – particularly over long weekend / public holiday periods. If used - One FRIDGE CHILLED cold pack should be placed inside the cooler bag, alongside the elastomeric device. Chilled cold packs should be changed every 8 hours to ensure solution remains below 25°C.
Piperacillin / Tazobactam	Up to 18g / 2.25g (based on via elastomeric device stability)	Sodium chloride 0.9%	**240mL**	Continuous infusion over 24 hours via elastomeric device		

Drug	Dose / Concentration	Compatible fluid	Volume	Method	Duration	Other information
Teicoplanin	400mg		3mL *(can be further diluted with sodium chloride 0.9% if needed for ease of administration)*	Push	Slowly over 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. Therapeutic drug 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.
	800mg	Sodium chloride 0.9%	50 to 100mL	Infusion	Over 30 minutes	

Drug	Dose / Concentration	Compatible fluid	Volume	Method	Duration	Other information
Tobramycin	Max 400mg daily *Reduce in renal impairment *Higher dose should only be prescribed on the recommendation of specialist ID advice and where appropriate monitoring is able to be guaranteed.	Sodium chloride 0.9%	20mL	Push	5 to 10 minutes	Tobramycin 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 drug. Record time of administration When therapy is to continue for more than 72 hours therapeutic drug monitoring should occur. Specialised Medication - Intravenous Aminoglycoside for Adult Non-pregnant Patients Guideline
			50mL to 100mL	Infusion	30 minutes	
Vancomycin	Up to 4.8g (based on stable infusor concentration)	Sodium chloride 0.9%	**240mL**	Continuous infusion over 24 hours via elastomeric device		**Extravasation may cause tissue necrosis.** Therapeutic drug monitoring should occur. Specialised Medication - Intravenous Vancomycin in Adults Guideline

3. Definitions

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.

4. Roles and Responsibilities

All WACHS clinicians are accountable for their own practice and are to provide care:

- within their registration status
- in accordance with the codes and guidelines approved by their relevant National Board supported by AHPRA
- within their scope of practice and competence
- within their prescribed responsibilities and duties as defined in their Job Description Form (JDF) and
- within the context of practice that they are operating.

All Staff are required to work within policies and guidelines to make sure that WACHS is a safe, equitable and positive place to be.

5. Compliance

Failure to comply with this policy document may constitute a breach of the WA Health Code of Conduct (Code). The Code is part of the Integrity Policy Framework issued pursuant to section 26 of the *Health Services Act 2016* (WA) and is binding on all WACHS staff which for this purpose includes trainees, students, volunteers, researchers, contractors for service (including all visiting health professionals and agency staff) and persons delivering training or education within WACHS.

WACHS staff are reminded that compliance with all policies is mandatory.

6. Records Management

All WACHS clinical records must be managed in accordance with Health Record Management Policy.

7. Evaluation

Monitoring of compliance with this document is to be carried out by senior medical and nursing staff via reporting and review of clinical incidents relating to adult patient receiving antibiotics in the HITH and Outpatient care setting.

8. Standards

National Safety and Quality Health Service Standards - 4.1a; 4.1b; 4.13; 4.15b.

9. Legislation

Medicines and Poisons Act 2014 *(WA)*
Medicines and Poisons Regulations 2016 *(WA)*

10. References

Sir Charles Gairdner Hospital – Home Link. Home Link Intravenous (PICC/CVC) Antibiotic Standing Orders. Last reviewed 04/2019 https://healthpoint.hdwa.health.wa.gov.au/policies/Policies/NMAHS/SCGH/SCGH.MMG.Homelink_IV_antibiotic_infusion_rates.pdf (accessed online 2020).

Trissel L. Handbook on Injectable Drugs. 17th ed. Bethesda: American Society of Health-System Pharmacists; 2013.

Burridge, N. Australian Injectable Drugs Handbook 7th edition. Collingwood: The Society of Hospital Pharmacists of Australia; 2018. https://aidh-hcn-com-au.wachslibresources.health.wa.gov.au/browse/about_aidh (accessed 2020).

MIMS Online [Internet]. St Leonards: MIMS Australia; 2020 [cited Jan 2020]. Available from: https://www-mimsonline-com-au.wachslibresources.health.wa.gov.au/Search/Search.aspx

AHFS Drug Information 2019 [Internet]. Bethesda: American Society of Hospital-System Pharmacists; 2017. Accessed 2020 http://online.statref.com.wachslibresources.health.wa.gov.au/Document.aspx?SessionId=2931274PUONRJTJT&docAddress=pDsr3ldZEAdtFTdz9Db3Dw!!&npo=p7&anon=yes&noteId=55455

Baxter Professional Website. Accessed online via https://www.baxterprofessional.com.au

Electronic Medicines Compendium (emc) Website. Accessed online via https://www.medicines.org.uk/emc/product/1362/smpc
Insertion and Management of Peripheral Intravenous Cannulae in Western Australian Healthcare FacilitiesPolicy

11. 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

12. Related Policy Documents

WACHS Medication Administration Policy
WACHS High Risk Medications Procedure
WACHS Specialised Medication – Intravenous Aminoglycoside for Adult Non-pregnant Patients Guideline
WACHS Nurse Compounding of Antibiotics in Elastomeric Devices
WACHS PIVC Management CPS
WACHS Peripheral Intravenous Cannulae (PIVC) Management CPS
WACHS Central Venous Access Device (CVAD) Management CPS

13. Related WA Health System Policies

MP 0131/20 - High Risk Medication Policy

14. Policy Framework

Clinical Governance, Safety and Quality

This document can be made available in alternative formats on request for a person with a disability

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