

INTRAVENOUS DRUG *QUICK*GUIDE

GENERAL NOTES

IMPORTANT

THIS GUIDE IS AN AIDE MEMOIRE ONLY, AND SHOULD NOT REPLACE YOUR PROFESSIONAL REQUIREMENT TO USE MANUFACTURER'S LICENSED INFORMATION TO INFORM YOUR PREPARATION AND ADMINISTRATION OF MEDICATION. Look up the SPC at www.emc.medicines.org.uk
Remember you can always contact the hospital pharmacy for advice on any aspect of IV drugs.

NEVER GIVE A DRUG UNLESS YOU ARE CONFIDENT THAT YOU ARE COMPETENT TO DO SO, FAMILIAR WITH THE DRUG AND ITS SIDE-EFFECTS, ARE FOLLOWING ALL RELEVANT TRUST POLICIES AND HAVE THE CORRECT FACILITIES AND EQUIPMENT TO PREPARE AND ADMINISTER THE DOSE CORRECTLY, AND MONITOR THE PATIENT SAFELY. INCLUSION ON THIS LIST DOES NOT CONSTITUTE APPROVAL FOR USE IN COMMUNITY, IN FACT MAY BE USEFUL TO DETERMINE NON-SUITABILITY.

PREPARING A DOSE FROM A POWDER VIAL

If the dose to be given is the same as the vial dose, then unless otherwise indicated in the product leaflet, add the precise volume of correct diluent as stated, then draw up the entire vial contents once it is fully dissolved. Always dilute further if directed.

FRACTIONAL DOSES

If a fractional dose is to be taken from a powder vial, make up the solution by adding the precise volume of diluent as stated, then calculate the volume to draw out from the vial as follows:

$$\text{volume to draw from vial} = \frac{\text{dose required (mg)}}{\text{mg in vial}} \times \left(\text{volume of diluent added} + \text{displacement volume for vial} \right)$$

e.g. giving a 1000mg dose of benzylpenicillin from a 1.2g vial, $1000/1200 \times (8+0.8) = 7.3\text{ml}$. Therefore 8ml added to 1.2g vial and draw up 7.3ml, then dilute further to around 20ml (use at least $1000/1200 \times 20 = 17\text{ml}$) = 1000mg

COMPATIBILITY

Always administer each drug separately (but metronidazole bags are compatible with cefuroxime or cefotaxime). ALWAYS FLUSH BEFORE, AFTER AND BETWEEN DRUGS.

SINGLE-USE: Always use a freshly-prepared solution immediately, and use each vial ONCE ONLY, unless the vial specifically states that it is a multi-dose vial.

RISK FACTOR LEVEL: Risk score calculated on best case scenario, e.g. appropriate vial strengths, and bolus where possible. Risk may vary depending on circumstance, always complete risk score. Risk reduction strategies are required for HIGH (RED) (score 6+) products. Risk reduction strategies are recommended for MODERATE (AMBER) (score 3-5) risk products. Risk reduction strategies should be considered for LOW (GREEN) (score 1-2) risk products,

ABBREVIATIONS: NaCl = sodium chloride WFI = water for injections

TABLE FOR PREPARATION AND ADMINISTRATION OF IV MEDICATION

Medication generic name	Typical Adult dose and dose interval (assumes no renal/hepatic impairment)	Displacement volume (to be taken into account for fractional doses)	Suitable diluent for initial reconstitution of powder	Suitable volume for diluting powder/final volume for bolus administration	Speed of bolus injection (bolus often preferred if possible)	Suitable fluid and volume for infusion	Speed of infusion	Risk Factor Score (NPSA)
aciclovir	5-10mg/kg EVERY 8 HOURS	Negligible, also comes ready- mixed	NaCl 0.9%	10ml per 250mg then must dilute to at least 5mg/ml	NOT FOR BOLUS ADMINISTRATION	500mg/100ml NaCl 0.9%	60 minutes	5
amoxicillin	500mg-1g EVERY 6-8 HOURS	0.2ml/250mg Draw up entire vial contents for full dose	WFI	5ml per 250mg e.g. 20ml for 1g	3-4 minutes	NaCl 0.9% 50-100ml	30-60 minutes	2
aztreonam	1-2g EVERY 6, 8 OR 12 HOURS	Draw up entire vial contents for full dose	WFI	10ml	3-5 minutes	NaCl 0.9% 50-100ml per 1g	20-60 minutes	1
benzylpenicillin	600mg-3g (or can be higher) EVERY 4-6 HOURS	0.4ml/600mg Draw up entire vial contents for full dose	WFI or NaCl 0.9%	4ml per 600mg	DOSES >1.2g MUST BE GIVEN BY INFUSION At least 2 minutes per 600mg. Preferred 10ml per 600mg given over 5-10 minutes	Doses over 1.2g must be infused NaCl 0.9% 50-100ml	30-60 minutes	3
cefotaxime	1g EVERY 12 HOURS (though can be up to 12g daily in 3-4 doses)	0.5ml/1g vial Draw up entire vial contents for full dose	WFI solution is straw-coloured (okay to reconstitute with Minibag Plus)	1g vial– 4ml 2g vial– 10ml	3-5 minutes	Acceptable, but bolus preferred	See SPC	1

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ceftazidime (see leaflet for specific reconstitution guidance)	1g EVERY 8 HOURS or 2g EVERY 12 HOURS but can be up to 6g/day	0.55ml/500mg	WFI or NaCl 0.9%	5ml/500mg 10ml/1-2g 15ml/3g	3-5 minutes	NaCl 0.9% 50-100ml	20-60 minutes	2
ceftriaxone (1g bolus ONLY)	1g EVERY 24 HOURS	0.5ml/1g	WFI	10ml	2-4 minutes	n/a	n/a	1
ceftriaxone (2g infusion ONLY)	2g EVERY 24 HOURS	1.03ml/2g	NaCl 0.9%	40ml - ALWAYS READ LEAFLET AS MAY VARY BY BRAND	NOT FOR BOLUS ADMINISTRATION	40ml NaCl 0.9% added to vial and administer from vial via giving set	2g to be given over 30 minutes	2
cefuroxime	750mg-1.5g EVERY 8 HOURS (or can be inc to 6-hourly)	0.54ml/750mg	WFI	6ml/750mg 15ml/1.5g	3-5 minutes	NaCl 0.9% 50-100ml	30 minutes	2
clarithromycin	500mg EVERY 12 HOURS	reconstituted solution = 50mg/ml	WFI	10ml/500mg then must dilute	NOT FOR BOLUS ADMINISTRATION	NaCl 0.9% 250ml	60 minutes	3
clindamycin	Can be up to 3g divided into 2-4 doses daily	Ready-mixed	Ready-mixed	n/a	NOT FOR BOLUS ADMINISTRATION	NaCl 0.9% Must not be more than 18mg/ml, e.g. 600mg in 50ml	Minimum 10 minutes for every 300mg	2

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co-amoxiclav (contains a penicillin)	1.2g EVERY EIGHT HOURS (can be increased to every 6 hours)	0.5ml/600mg	WFI	10ml per 600mg	3-4 minutes	NaCl 0.9% 50ml per 600mg	30-40 minutes	2
daptomycin (Black triangle drug)	4 - 6mg/kg EVERY 24 HOURS	negligible	NaCl 0.9%	1ml per 50mg	2 minutes (but infusion preferred as clinically proven)	NaCl 0.9% 50ml	30 minutes	4
ertapenem	1g every 24 hours	negligible	WFI or sodium chloride 0.9%	10ml then must dilute to final volume of 50ml or more	NOT FOR BOLUS ADMINISTRATION	NaCl 0.9% 50ml	30 minutes	2
flucloxacillin	250mg-1g EVERY 6 HOURS (can be up to 2g every 6 hours)	0.2ml/250mg	WFI	5ml per 250mg	Bolus = 3-5 minutes (Doses of 2g must be given by infusion)	(Doses of 2g must be infused) NaCl 0.9% 50-100ml	20-60 minutes	Bolus=2
								Infuse=3
furosemide	20-250mg at a rate not exceeding 4mg/minute, repeated usually under consultant supervision	Ready-mixed	Ready-mixed	no need to dilute for bolus	not more than 4mg/min	NaCl 0.9% any volume, but 1mg/ml preferred, but not more than 10mg/ml	not more than 4mg/min	Bolus=3
								Infuse=5
gentamicin	3-4mg/kg daily in 8-hourly doses OR 5mg/kg EVERY 24 HOURS	Ready-mixed	Ready-mixed	no need to dilute for bolus	3-5 minutes	NaCl 0.9% Not more than 100ml	No longer than 20 minutes	Bolus=3
								WILL REQUIRE BLOOD LEVEL MONITORING THAT MAY NOT BE SUITABLE FOR COMMUNITY, SEEK PHARMACY ADVICE Infuse=4

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hydrocortisone sodium succinate	100-500mg up to four times daily	0.05ml/100mg	Ready-mixed	no need to dilute for bolus	3-5 minutes	NaCl 0.9% or glucose 5% 100ml	30-40 minutes	1
immunoglobulins	Varies with indication and weight, sometimes given every 3-4 weeks	Ready-mixed	Ready-mixed	n/a	NOT FOR BOLUS ADMINISTRATION	Ready-mixed	Variable rate - experience necessary , do not give without training	5
magnesium sulphate infusion	Varies with replacement requirements	Ready-mixed	Ready-mixed	n/a	NOT FOR BOLUS ADMINISTRATION	NaCl 0.9%	60 minutes	4
meropenem	500mg-1g EVERY 8 HOURS	0.4ml/500mg	WFI	10ml per 500mg	5 minutes	NaCl 0.9% 50-200ml	15-30 minutes	1
methyl- prednisolone	Short courses of high dose (1g daily for 3 days) used for MS	negligible	add all of diluent ampoule	Only doses up to 250mg suitable for bolus	up to 250mg 5 minutes	over 250mg NaCl 0.9% 100ml	30 minutes	4
metronidazole	500mg EVERY 8 HOURS	n/a	Ready-mixed	n/a	NOT FOR BOLUS ADMINISTRATION	Ready-mixed	20 minutes	1
Pabrinex®	One pair of ampoules every two weeks after haemodialysis – other uses may not be appropriate in community - high therapeutic risk	Draw up entire vial contents for full dose	Ready-mixed	The contents of ampoules 1 & 2 must be both drawn up and mixed in the syringe, or both added to the infusion bag	10 minutes (but infusion preferred)	Infusion preferred: NaCl 0.9% 100ml	30 minutes	3

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pamidronate infusion (ready-made solution only)	Variable depending on indication and clinical results	Ready-mixed	Ready-mixed	n/a	NOT FOR BOLUS ADMINISTRATION	NaCl 0.9% Minimum 125ml per 30mg	at least 1mg/minute e.g. 60mg over 1 hour Staff must be experienced with bisphosphonates	5
piperacillin/ tazobactam (contains a penicillin)	4.5g EVERY 8 HOURS	0.7ml/1g (3.15ml/4.5g)	WFI or NaCl 0.9%	20ml per 4.5g vial	NOT FOR BOLUS ADMINISTRATION	NaCl 0.9% 50-100ml	30 minutes	2
potassium- containing infusions	Variable according to clinical need – high therapeutic risk, CHECK calculations	USE Ready-mixed bags ONLY	Ready-mixed	n/a	NOT FOR BOLUS ADMINISTRATION	Ready-mixed	No more than 3mmol/kg over 24 hours – USE PUMP	3
teicoplanin	200-400mg EVERY 24 HOURS	Draw up 3ml from 200mg or 400mg vial	use all diluent supplied	do not shake - roll until dissolved and stand until foam reduces.	3-5 minutes	Acceptable, but bolus preferred	See SPC	1
tigecycline	Maintenance dose 50mg (see SPC for first dose)	Add 5.3ml of diluent to create a concentration of 10mg/ml	NaCl 0.9%	5.3ml per 50mg then draw up 5ml and add to bag	NOT FOR BOLUS ADMINISTRATION	NaCl 0.9% 100ml	30-60 minutes	3

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vancomycin	500mg EVERY 6 HOURS or 1g EVERY 12 HOURS	Draw up entire vial contents for full dose	WFI	20ml per 1g then dilute further	NOT FOR BOLUS ADMINISTRATION	NaCl 0.9% not more than 5mg/ml e.g. give 1g in 250ml	Give over not less than 60 minutes and at least 10mg per minute, e.g. give 1g over 2hours	4
zoledronic acid (only applicable for prevention of skeletal events. For hypercalcaemia, seek expert advice)	4mg (Zometa®) 5mg (Aclasta®)	Ready-mixed	Ready-mixed	n/a	NOT FOR BOLUS ADMINISTRATION	Ready-mixed as 100ml infusion	Not less than 15 minutes, and staff must have experience in the use of bisphosphonates	2

ADMINISTERING AN INJECTABLE DRUG

These steps represent a reminder of the major components for administering an injectable treatment. Each practitioner should be aware of full Trust guidance on all aspects of drug administration.

Ensure you have all materials required against the valid administration authorisation, i.e. a green sheet or a drug chart. Ensure you are giving the correct treatment at the correct time to the right patient. Make sure you are happy with the dose, and that the patient is not allergic to the treatment.

Explain to the patient what you are doing, and make sure they are aware of the reason for treatment and understand any possible side-effects, according to their ability.

Check patient identity carefully against the administration sheet. Make sure they consent to the treatment, following the Consent Policy.

Assess the patient for suitability to receive the treatment at that time. Observe the site, and if applicable, the cannula/butterfly, to ensure the treatment can be given safely.

Prepare an appropriate level surface to work on using hard surface wipes. Wash your hands and/or apply alcohol handgel.

Put on non-sterile gloves and, if in a patient's home, lay out your sterile field. Swab your plastic tray with a hard-surface wipe.

Lay out your drug, diluents and syringes by your plastic tray and ensure everything is ready.

Swab ampoule necks and bungs each with a fresh 100% alcohol swab, and using a new wipe and put them in the tray, allow them to dry for 30 seconds.

Prepare the drug as required, in accordance with the product guidelines, using aseptic technique, in the tray. Make any calculations carefully and written down.

Discard waste and sharps appropriately as you work using safe practice. Wipe up any spillage carefully.

Draw up the sodium chloride 0.9% for each flush required (5ml for IV, less for butterfly) – one before treatment, one after treatment, and one between treatments if more than one drug is being given.

Use safe practice to minimise the risk of air embolism – syringes should have no air bubbles. Check each item to make sure there are no particles, haziness, or odd colouring.

Make sure the patient is comfortable. Swab the access device port with a wipe - 0.2% chlorhexidine in alcohol. Use careful aseptic technique to connect syringes or giving sets to the cannula/butterfly. Flush the access device with sodium chloride 0.9% and be satisfied about the patency as far as possible.

Administer the drug treatment by the correct route and, if appropriate, technique. Give at the correct rate, observing the patient throughout. Flush the access device with sodium chloride 0.9% after each drug treatment. Make sure the cannula/butterfly is left in a safe condition.

Dispose of all waste and clear away all equipment carefully. Decontaminate hands. Complete all paperwork thoroughly and legibly.

During treatment, deal with any problems or complications according to procedure, seeking help or advice where required. Document any incidents carefully.