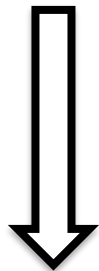


LANCASHIRE AND SOUTH CUMBRIA CRITICAL CARE INTRAVENOUS DRUG MONOGRAPHS

Drug preparation and administration guide

Full details on how to prepare and administer intravenous medication is available from the drug SPC at www.emc.medicines.org.uk or use the Injectable medicine guide available via intranet.



Medusa

Home Page | Inj Med Guide | Logout | NHS

Injectable Medicines Guide

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User: Ward Staff
Organisation: East Lancashire Hospitals NHS Trust

Please use the menu bar at the top right-hand corner of this page to select an activity. Each main function area has a drop-down menu, select the activity you want from the drop-down

[IntraVENOUS drugs](#) of the monographs, please send these to Gill Bullock at Gill.Bullock@imperial.nhs.uk.

[IntraMUSCULAR drugs](#)

[Ocular drugs](#)

[Paediatric IntraVENOUS drugs](#)

[Subcutaneous drugs](#)

[Documents and links](#)

To register additional users, download the [Instructions and Registration Form](#) (MS Word format).

What's New

18/01/2016 - Major incident on the Injectable Medicines Guide.

There has been a major incident on the Injectable Medicines Guide with the NHS versions of the website down since Saturday morning. The website is now back. Please accept my apologies for the disruption and we will be holding a major incident review as a result of this. Please let me know if there are any residual problems.

Introduction to using this Website

Hover over the **Inj Med Guide** on the menu bar at the top right hand corner of this page OR use the links on the left hand side of the home page to access the following: -

- IntraVENOUS drugs** - to access all IV medicines on the website
- IntraMUSCULAR drugs** - to access IM medicines (mainly used in mental health) on the website
- Ocular drugs** - to access ocular injections on the website (section under development)
- Paediatric IntraVENOUS drugs** - to access paediatric specific IV medicines on the website (section under development)

Click on down arrow and type first letter of the medicine, scroll down to required drug and click on relevant button to read or print monograph.

Printing from the website

When printing a monograph, click on the button 'print monograph' at the top of the monograph. Do not use the 'tool bar' print option because the right hand margin of the printed version may not be complete and information may be lost.

Links to BNF, SPCs, PIL's and other relevant information

Monographs contain links to the current BNF and latest SPCs (Summary of Product

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Alfentanil

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

Maintenance: 0.5-2.5mg per hour

Route

Intravenous infusion only

Preparation

5mg/10mL ampoules

Draw up 25mg Alfentanil into a 50mL syringe. The neat solution has a concentration of 1mg/2mL.

Administration

Comment on Trust's SMARTPUMPS

Storage / Stability

After reconstitution, use immediately

Flushing

Flush with sodium chloride 0.9% or glucose 5%

Other Information

Compatible infusions: Acetylcysteine, adrenaline, aminophylline, amiodarone (if both in glucose 5%), aprotinin, atracurium, bivalirudin, cisatracurium, clonidine, dexmetomidine, dobutamine, dopamine, dopexamine, esmolol, etomidate, fentanyl, furosemide, heparin sodium, insulin, labetalol, linezolid, midazolam, morphine sulfate, noradrenaline, propofol, remifentanyl

Compatible infusion fluids: sodium chloride 0.9%, glucose 5%, compound sodium lactate (Hartmann's), glucose 5% in sodium chloride 0.9%.

Incompatible: Amphotericin, glyceryl trinitrate, omeprazole, phenytoin, sodium bicarbonate, thiopental

Aminophylline – Treatment of wheeze in Asthma / COPD

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

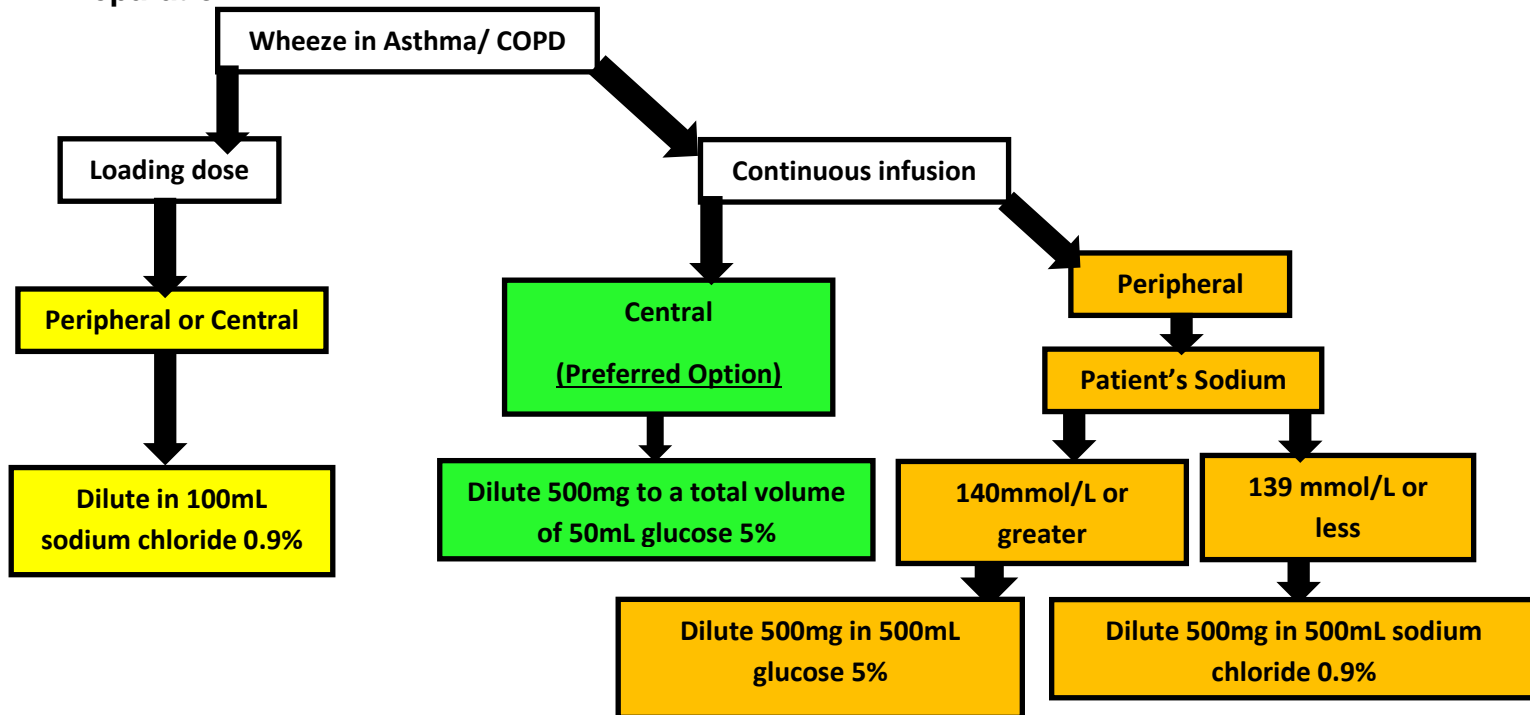
Dose

Dose on ideal body weight (IBW). If actual body weight is less than IBW then use the actual body weight

Asthma / COPD – Loading dose of 5mg/kg

- Followed by a continuous infusion of 0.5mg/kg/hour (0.3mg/kg/hour in the elderly)

Preparation



Administration

Comment on Trust's SMARTPUMPS

Storage / Stability

Expiry time to be written on 'medicine added' label of Continuous infusion: 24 hours

Flushing

Flush with sodium chloride 0.9% or glucose 5%

Other Information

See Injectable Medicines Guide online for full compatibilities and incompatibilities

Amiodarone

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

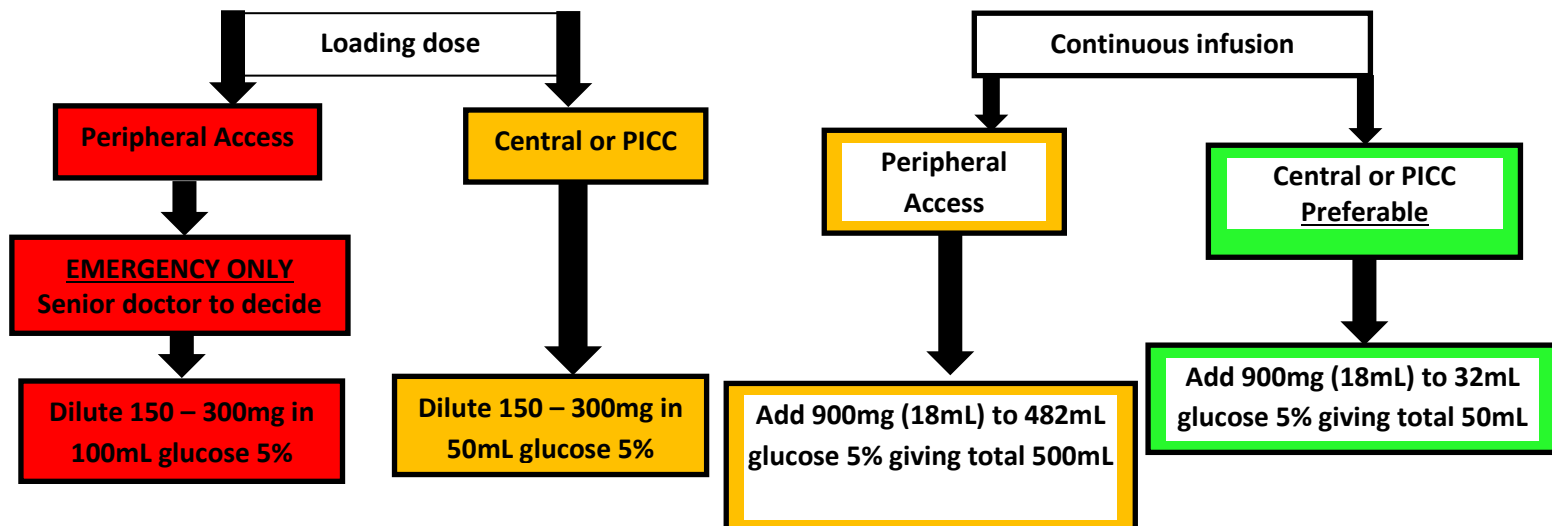
Loading dose: 150 – 300mg over 20 minutes to 1 hour

Continuous infusion: 900mg over 24 hours

Route

Central venous or PICC Line only (Peripheral access may be used in Emergencies ONLY)

Preparation



Blackpool Cardiac Intensive Care ONLY:

600mg continuous infusion via peripheral and central in 500mL or 50mL glucose 5% respectively.

Administration

Comment on Trust's SMARTPUMPS

Storage / Stability

Expiry time to be written on 'medicine added' label of continuous infusion: 24 hours

Flushing

IV infusion via a central venous access device: Do not flush the central venous access device. After the infusion is discontinued, disconnect the administration set, aspirate the cannula contents and then flush with sodium chloride 0.9%.

Other Information

Do NOT give amiodarone with any drug diluted in sodium chloride 0.9%.

See MEDUSA for full list of compatible and incompatible drugs due to extensive list

Atracurium

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

Dose on ideal body weight. If actual body weight is less than IBW then use the actual body weight

Ideal body weight* (Kg)		50	60	70	80	90	100	110	120
Minimum rate (mL/h)	0.3 mg/kg/h	1.5	1.8	2.1	2.4	2.7	3	3.3	3.6
Starting rate (mL/h)	0.5 mg/kg/h	2.5	3	3.5	4	4.5	5	5.5	6
Maximum rate (mL/h)	1.5 mg/kg/h	7.5	9	10.5	12	13.5	15	15	15

Prior to starting the infusion, a **bolus** dose of 0.5 mg/kg may be administered over 30 seconds.

Discontinuation should occur as early as feasible.

Tapering the dose is not necessary; the infusion may be stopped. Following an infusion of 24h, time to recovery of neuro-muscular function may be prolonged for a few hours; therefore, adequate analgesia and sedation must be maintained immediately after stopping the infusion.

Preparation

Draw up 500mg Atracurium into a 50mL syringe. The neat solution has a concentration of 10mg/mL.

Route

Central (preferred) and peripheral (may cause venous irritation)

Administration

Comment on Trust's SMARTPUMPS

Storage / Stability

Store ampoules at 2-8°C. May be stored at 25°C for 28 days.
Discard the infusion after 24 hours.

Flushing

Flush with sodium chloride 0.9% or glucose 5%.

Compatibility

Atracurium is **compatible** with Amiodarone (in glucose 5%), Alfentanil, Clonidine, Dexdor (dexmedetomidine), Glyceyl Trinitrate, Hydrocortisone Succinate, Isoprenaline, Labetalol, Lorazepam, Midazolam, Morphine, Noradrenaline, Plasmalyte 148, Potassium chloride, Hartmann's, Sodium chloride 0.9%, Soluble Insulin and Glucose 5%, Vancomycin.

Atracurium is **incompatible** with Aminophylline, Diazepam, Furosemide, Omeprazole, Propofol, Thiopental.

Clarithromycin

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose:

500mg twice a day

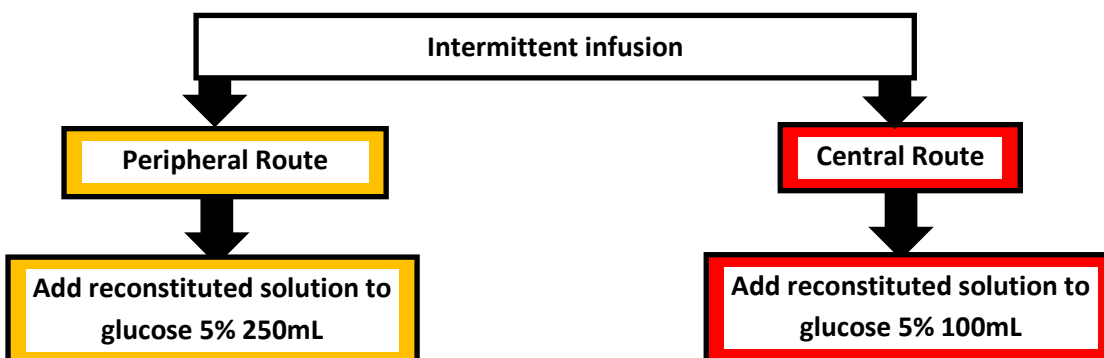
Route:

IV infusion

Preparation:

Reconstitute with 10mL water for injections and shake the vial to dissolve the contents.
N.B. Do **NOT** initially reconstitute with sodium chloride 0.9%.

Further dilute as follows:



Administration

Comment on Trust's SMARTPUMPS

Storage / Stability

Discard drug following 24 hours. Store vials at room temperature and in original container to protect from light.

Flushing

Flush with glucose 5% or sodium chloride 0.9%.

Other Information

If patient experiences discomfort at the injection site, can reduce rate of administration to 125mL/hr.

Clonidine

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

Intermittent infusion

Doses of 50 to 400micrograms TDS or QDS have been used

Continuous Infusion

Doses in the range of 0.25 to 1 microgram/kg/hour are typically used. Doses up to 4 microgram/kg/hour have been used in exceptional circumstances. Use ideal body weight.

Doses should normally start at around 0.25 microgram/kg/hour for an hour as a loading dose; the rate is then titrated to sedative effect. Initial bolus dose of 10 micrograms may be used and repeated until desired effect is reached.

Route

IV injection or infusion

Preparation flow diagram

PERIPHERAL

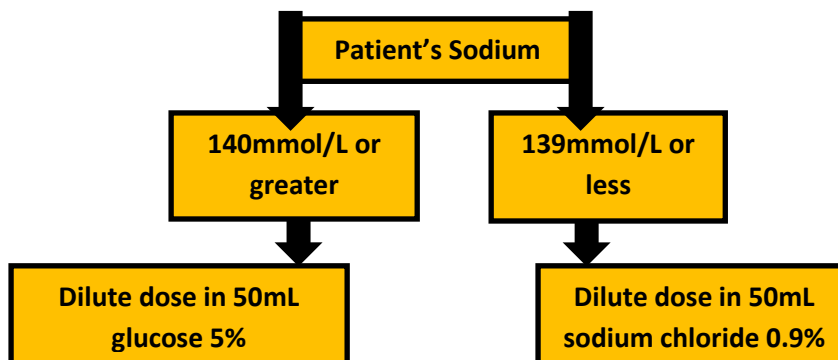
Use 5 x 150 microgram ampoules to produce a 750microgram/50mL syringe for administration

CENTRAL

Use 5 x 150 microgram ampoules to produce a 750microgram/50mL syringe for administration

Optional concentrated solution

Use 10 x 150 microgram ampoules to produce a 1500microgram/50mL syringe for administration



Administration

Comment on Trust's SMARTPUMPS

Continuous infusion should be reduced gradually by 0.25-0.5mL/hr. Withdrawal should be over several hours.

Other Information

Compatible infusion fluids: Alfentanil, aminophylline, atracurium, fentanyl, furosemide, heparin, insulin, labetalol, magnesium, midazolam, morphine and potassium chloride, remifentanyl. Amiodarone and dobutamine if clonidine made up with glucose 5%

Incompatible infusion fluids: Omeprazole

Dexmedetomidine

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

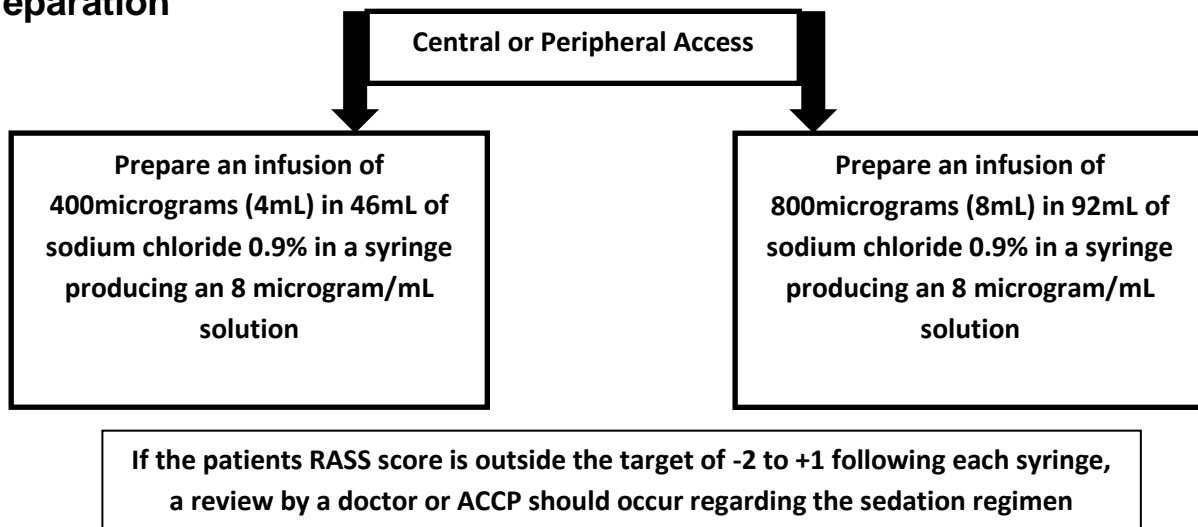
Initial infusion rate 0.7 micrograms/kg/hour

See clinical guidance

Route

Peripheral or Central continuous infusion

Preparation



Administration

Comment on Trust's SMARTPUMPS

Do not abruptly stop

Storage / Stability

24 hours after dilution

Protect undiluted ampoules from light

Flushing

Flush with sodium chloride 0.9% or glucose 5%

IV infusion via a central venous access device: Do not flush the central venous access device. After the infusion is discontinued, disconnect the administration set, aspirate the cannula contents and then flush with sodium chloride 0.9% or glucose 5%

Other Information

Compatible infusions: Atracurium besilate, ciprofloxacin (in sodium chloride 0.9%), dexamethasone, digoxin, dobutamine, dopamine hydrochloride, etomidate, fentanyl, fluconazole, levofloxacin, lidocaine hydrochloride, mannitol 20%, metoclopramide hydrochloride, midazolam, mivacurium, morphine sulfate, noradrenaline (norepinephrine), phenylephrine hydrochloride, procainamide hydrochloride, rocuronium bromide, thiopental sodium, tobramycin (in sodium chloride 0.9%), vecuronium bromide

Compatible infusion fluids: Glucose 5%, sodium chloride 0.9%, compound sodium lactate (Hartmann's solution)

Enoximone

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

Initial Dose: 90microgram/kg/minute over 30 – 60 minutes

Infusion rates using 100mg/40mL preparation

Weight (kg)	40	50	60	70	80	90	100
Infusion Rate (mL/hour)	86.4	108	129.6	151.2	172.8	194.4	216

Maintenance Dose: 5 - 20 micrograms/kg/min by continuous IV infusion. *Total dose over 24 hours should not usually exceed 24mg/kg*

Infusion rates using 100mg/40mL preparation

Weight (kg)	40	50	60	70	80	90	100
Minimum Infusion Rate (mL/hour)	4.8	6	7.2	8.4	9.6	10.8	12
Maximum Infusion Rate (mL/hour)	19.2	24	28.8	33.6	38.4	43.2	48

Route

Intravenous infusion only

Preparation

Add 100mg of enoximone to 40mL of Sodium chloride 0.9% in a syringe producing 2.5mg/mL solution

Administration

Comment on Trust's SMARTPUMPS

Storage / Stability

24 hours at room temperature

Flushing

To avoid adverse effects resulting from an unintentional 'bolus' dose flush with sodium chloride 0.9% at the same rate the medicine was administered.

Other Information

Do not infuse with any other medicines

Erythromycin

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

Prokinetic dose: 250mg twice daily
Consult Trust Antimicrobial Formulary for other indications.

Route

Intravenous infusion only

Preparation

Reconstitute Erythromycin 1g vial with 20mL Water for Injection. Shake well to dissolve (this takes some time).

Take 5mL (obtain check) and transfer to a 50mL bag of Sodium chloride 0.9%.

Administration

Comment on Trust's SMARTPUMPS

Storage/ Stability

Use immediately following reconstitution.

Flushing

Flush with sodium chloride 0.9%

Other Information

Erythromycin infusion is compatible with the following infusions (it is assumed that medicines meet close to the vascular access device): Aciclovir, aminophylline, amiodarone (in glucose 5%), bivalirudin, doxapram, esmolol, levofloxacin, magnesium sulfate, midazolam, morphine sulfate, noradrenaline, zidovudine.

Compatible infusion fluids:

Compound sodium lactate (Hartmann's solution), buffered glucose 5%, sodium chloride 0.9%, buffered sodium chloride 0.18% with glucose 4%.

Incompatible: Acetylcysteine, amikacin, ceftazidime, colistin, flucloxacillin, fluconazole, furosemide, gentamicin, heparin, linezolid, metaraminol, rocuronium bromide

Esmolol

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Treatment of hypertension and tachycardia in patients who are nil by mouth – Labetalol should be used as first line treatment

Dose

Administer at a rate of 3 -12 mg/ kg/ hour, adjust every 15 minutes according to desired heart rate and blood pressure.

Route

Can only be given peripherally in a large vein or via a central line

Preparation

- Take a 250mL sodium chloride 0.9% bag, withdraw 50mL
- Reconstitute 1 x 2500mg vial using the 50mL sodium chloride 0.9% withdrawn from the bag
- Withdraw the reconstituted contents of the vial and place back into the Sodium chloride 0.9% bag
- Resulting concentration – 2500mg in 250mL sodium chloride (10mg/mL)

Storage / Stability

24 hours

Flushing

Do not flush the central venous access device. After the infusion is discontinued, disconnect the administration set, aspirate the cannula contents and then flush with sodium chloride 0.9% or glucose 5%.

If giving via a large peripheral vein, flush at the same speed as the rate of infusion to avoid adverse haemodynamic effects.

Other Information

Compatible infusion fluids: Potassium chloride 40mmol/L and glucose 5%, Sodium chloride 0.45%, Sodium chloride 0.45% and glucose 5%, Sodium chloride 0.9% and glucose 5%, Compound sodium lactate (Hartmanns)

Compatible (it is assumed that medicines meet close to the vascular access device): Amikacin, amiodarone, benzylpenicillin, ceftazidime, clindamycin, dopamine, erythromycin, gentamicin, hydrocortisone, metronidazole, morphine, phenytoin, potassium chloride, ranitidine and vancomycin (all tested in glucose 5%)

Incompatible: Amphotericin, diazepam, furosemide, thiopental sodium, Sodium bicarbonate

Furosemide

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

Individual dose: Give initial dose of 1.5-2mg/kg, if diuresis achieved, repeated doses can be given 8 hourly.

Continuous infusion: 1 – 10 mg per hour. Discuss with consultant if higher rate required.

Route

Intravenous infusion only

Preparation

Individual dose: Doses up to 50mg can be given undiluted as a bolus over 3 minutes.

Doses above 50mg to be diluted in 50mL sodium chloride 0.9% in a syringe and given over 60 minutes.

Concentrated Continuous infusion – Add neat 500mg Furosemide to a total of 50mL in a syringe

Alternative Continuous infusion – Add 50mg Furosemide and dilute to a total of 50mL of sodium chloride 0.9% in a syringe

Administration

Comment on Trust's SMARTPUMPS

Storage / Stability

Discard after 24 hours

Flushing

Flush with sodium chloride 0.9% or glucose 5%

Other Information

Compatible (it is assumed that medicines meet close to the vascular access device):

Ceftazidime, fentanyl, heparin, meropenem, metoprolol, potassium chloride, tirofiban.

Incompatible (exclusion from this list does not imply compatibility)

Adrenaline, amikacin, amiodarone, argipressin, azithromycin, caffeine citrate, caspofungin, ciprofloxacin, cisatracurium, clarithromycin, clonidine,⁽¹⁴⁾ diazepam, diltiazem, dobutamine, dopamine, doxapram, droperidol, eptifibatide, erythromycin, esmolol, filgrastim, fluconazole, gentamicin, glucose, hydralazine, isoprenaline, isosorbide dinitrate, ketamine, labetalol, levofloxacin, lidocaine, metoclopramide, midazolam, milrinone, morphine, nicardipine, noradrenaline, omeprazole, ondansetron, pantoprazole, pethidine, phenylephrine, promethazine, quinidine, rocuronium, tobramycin, vasopressin, vecuronium bromide, verapamil

Ketamine

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

See unit guidance

Route

Intravenous infusion only

Preparation

Final concentration of any dilution should be **10mg/mL**.

WARNING: Preparation is dependent on the concentration available; 10mg/mL, 50mg/mL and 100mg/mL are available.

If **10mg/mL** vials available draw up undiluted into a 50mL syringe.

If **50mg/mL** vials available, take 10mL and add to 40mL sodium chloride 0.9% a bag or syringe.

If **100mg/mL** vials available, take 5mL and add to 45mL sodium chloride 0.9% in a bag or syringe.

Administration

Comment on Trust's SMARTPUMPS

Do not abruptly stop

Storage / Stability

Discard after 24 hours

Flushing

Flush with sodium chloride 0.9%

Other Information

Compatible (it is assumed that medicines meet close to the vascular access device): Morphine, propofol.

Incompatible: Barbiturates, diazepam doxapram (when mixed together in the same infusion fluid or syringe). Diazepam should be given separately and not mixed in the same container.

Labetalol

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

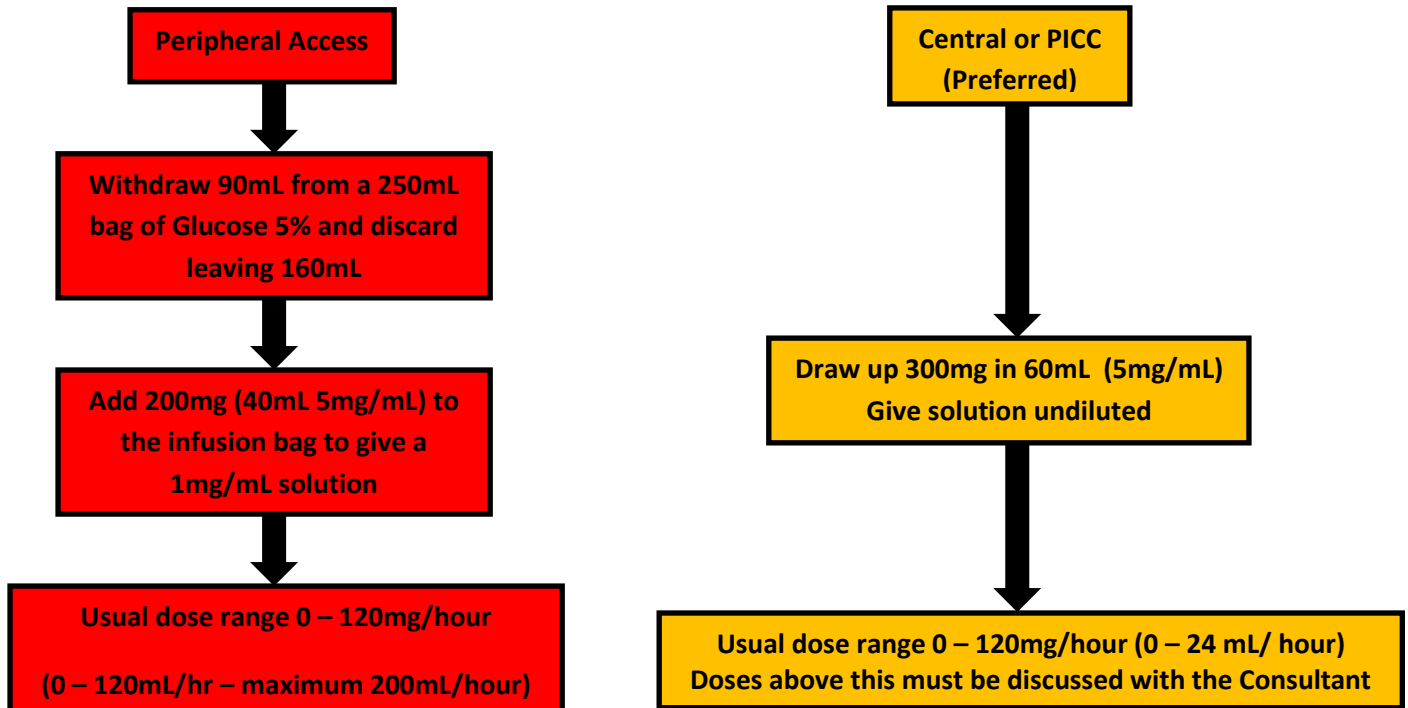
Dose

Continuous infusion – usual dose range 0 – 120mg/hour – maximum 200mg/hour

Route

Peripheral or Central continuous infusion

Preparation



Administration

Comment on Trust's SMARTPUMPS

Storage / Stability

24 hours after preparation

Flushing

IV injection: Flush with sodium chloride 0.9% or glucose 5%

IV infusion via a central venous access device: Do not flush the central venous access catheter. After the infusion is stopped, disconnect the administration set, aspirate the cannula contents and then flush with sodium chloride 0.9%.

IV infusion via peripheral cannula: Flush the peripheral cannula with sodium chloride 0.9% at the same rate the medicine was infused to avoid adverse haemodynamic effects.

Other Information

Compatible infusions: Acetylcysteine, alfentanil, aminophylline, amiodarone (in glucose 5%), atracurium, calcium gluconate, co-trimoxazole, dobutamine, dopamine, dopexamine, fentanyl, gentamicin, glyceryl trinitrate, isosorbide dinitrate, magnesium sulfate, midazolam, milrinone, noradrenaline, potassium chloride, propofol, remifentanyl, sodium nitroprusside (in glucose 5%), vancomycin and vecuronium, adrenaline, esmolol, clonidine and morphine sulfate

Compatible infusion fluids: Sodium chloride 0.9% and glucose 5%

Incompatible: Ceftriaxone, furosemide, heparin, insulin, pantoprazole, thiopental, omeprazole

Levetiracetam

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

Status epilepticus: Consult *Lancashire and South Cumbria: Managing convulsive (tonic-clonic) status epilepticus (adults)* guideline

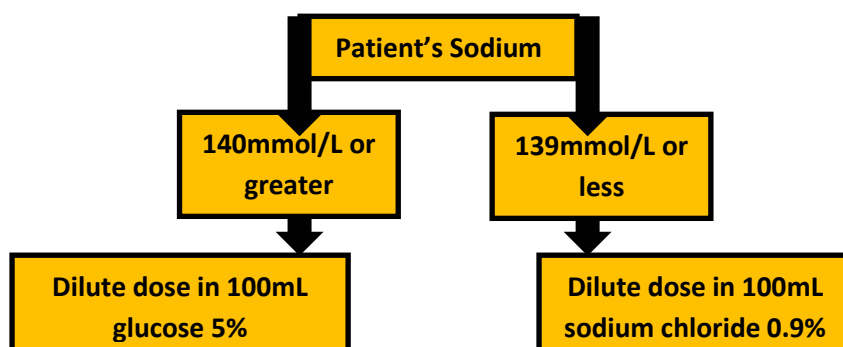
Maintenance dose: 250mg – 1.5 grams twice daily (higher doses may be used under specialist neurology advice)

Route

Intravenous infusion or enteral (same dose applies)
Enteral route is preferred if absorbing.

Preparation

All doses require dilution before administration



Administration

Comment on Trust's SMARTPUMPS

Flushing

Flush with sodium chloride 0.9% or glucose 5%

Other Information

Compatible infusions (it is assumed that medicines meet close to the vascular access device):
Diazepam, lorazepam, sodium valproate.

Compatible infusion fluids: glucose 5%, sodium lactate compound (Hartmann's) and sodium chloride 0.9%

Metaraminol

Full details are available from the SPC <http://www.medicines.org.uk/emc> or use the Injectable medicines guide available via Medusa on the intranet

Dose

Titrate to target MAP

Route

Intravenous infusion only

Preparation

Pre-filled syringes are available on the unit

Solution for injection. May be given diluted or undiluted to aid administration.
For example dilute 10mg/1mL ampoule to 10mg/20mL (500 microgram/mL concentration).

Solution for infusion. Dilute to a 500microgram in 1mL concentration with sodium chloride 0.9%. For example, 20mg in 40mL or 25mg in 50mL.

Administration

Comment on Trust's SMARTPUMPS

Do not abruptly stop

Storage / Stability

Discard syringe after 24 hours

Flushing

IV infusion via a central venous access device: Do not flush the venous access device. After the infusion is discontinued, disconnect the administration set, aspirate the cannula contents and then flush with sodium chloride 0.9% or glucose 5%.

Other Information

Compatible infusion fluids: glucose 5%, sodium chloride 0.9%, Plasma-Lyte 148

Incompatible infusion fluids: Amphotericin B, benzylpenicillin, dexamethasone, erythromycin, hydrocortisone, thiopental

Methylthioninium Chloride (Methylene Blue)

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

Use adjusted body weight in obese patients

Loading Dose: 2 mg/kg over 20 minutes administered once.

Continuous Infusion: 0.25 -2 mg/kg/hour

Route

Intravenous infusion

Preparation

50mg/10mL ampoule (0.5%)

Loading Dose: Dilute desired dose in 50mL glucose 5%.

Continuous infusion: Remove 40mL of glucose 5% from a 250mL infusion bag and add 200mg (40mL) of methylene blue to produce 200mg Methylthioninium Chloride in 250mL glucose 5%

Administration

Comment on Trust's SMARTPUMPS

Storage / Stability

24 hours

Flushing

Flush with glucose 5%

Other Information

Compatibility: Administer via a dedicated line. Methylthioninium chloride is incompatible with sodium chloride 0.9% so do not use this to flush line post infusion.

Used with caution in patients with moderate to severe renal disease (eGFR is <60mL/min) since there is limited data available and methylthioninium chloride is predominantly renally eliminated. Lower doses (<1 mg/kg) may be required.

Metoclopramide

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

Prokinetic dose: 10mg three times a day

Consider dose reduction in patients less than 50kg – consult pharmacist

Route

Intravenous infusion only

Preparation

Can be given undiluted as a bolus over 3 – 5 minutes

or

Dilute in 20mL Glucose 5% and infuse over 15 minutes

Administration

Storage / Stability

Discard after 24 hours

Flushing

Flush with sodium chloride 0.9% or glucose 5%

Other Information

Compatible infusions (it is assumed that medicines meet close to the vascular access device):

Aciclovir sodium, ciprofloxacin, cisatracurium besylate, clarithromycin, dexmedetomidine hydrochloride, doxapram hydrochloride, fentanyl citrate, filgrastim, fluconazole, granisetron hydrochloride, heparin sodium, levofloxacin, linezolid, meropenem, morphine sulfate, ondansetron hydrochloride, piperacillin sodium-tazobactam sodium, remifentanyl hydrochloride.

Compatible infusion fluids: Sodium lactate, compound (Hartmann's), glucose 5% in sodium chloride 0.45%, sodium chloride 0.18% plus glucose 4%.

Incompatible: Allopurinol, amsacrine, doxorubicin hydrochloride liposomal injection, furosemide, propofol. The following are usually incompatible, infuse separately if possible. Parenteral nutrition solutions, sodium bicarbonate infusions, phosphate preparations, blood components, plasma substitutes

Midazolam for sedation

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

As per target RASS score or ICP as prescribed

Route

Intravenous infusion only

Preparation

100mg/50mL vials

10mg/2mL vials are no longer stocked on Critical Care as per NPSA alert 'Reducing risk of overdose with midazolam injection in adults'

Administration

Comment on Trust's SMARTPUMPS

Do not abruptly stop

Storage / Stability

Discard drug following 24 hours

Flushing

Do NOT flush without initially aspirating the line

Other Information

Compatible infusion fluids: glucose 5%, sodium chloride 0.9%, glucose 4% with sodium chloride 0.18%. Adrenaline, amikacin, amiodarone (in glucose 5%), atracurium, calcium gluconate, caspofungin (in sodium chloride 0.9%), cefotaxime, cisatracurium, clindamycin, digoxin, dopamine, erythromycin, esmolol, fentanyl, fluconazole, gentamicin, glyceryl trinitrate, haloperidol, heparin sodium, insulin soluble, labetalol, methylprednisolone, metronidazole, milrinone, morphine sulfate, noradrenaline (in glucose 5%), potassium chloride, propofol, ranitidine, remifentanyl, sodium nitroprusside (in glucose 5%), tobramycin, vancomycin, vecuronium clonidine, ketamine, morphine.

Incompatible: Albumin, amoxicillin, amphotericin, ampicillin, ceftazidime, cefuroxime, co-amoxiclav, co-trimoxazole, dexamethasone, fosphenytoin, furosemide, hydrocortisone, imipenem, omeprazole, pantoprazole, sodium bicarbonate, thiopental, aciclovir, alteplase, diazepam, flecainide, phenobarbital, phenytoin.

Milrinone

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

If actual body weight is less than IBW, then use actual body weight)

Loading – Suggested dose 25 micrograms/kg over 20 minutes (Loading is not essential). Note this is 50% of usual loading dose to minimise risk of hypotension.

Suggested loading dose of 25 micrograms/ kg			
Weight	Dose	VTBI	Rate mL /hour
50kg	1.25mg	6.2 mL	18.6
55kg	1.37mg	6.8 mL	20.4
60kg	1.5 mg	7.5 mL	22.5
65kg	1.63 mg	8.1 mL	24.3
70kg	1.75 mg	8.7mL	26.1
75 kg	1.87mg	9.4 mL	28.2

Suggested loading dose of 25 micrograms/ kg			
Weight	Dose	VTBI	Rate mL /hour
80 kg	2mg	10 mL	30
85 kg	2.12mg	10.6 mL	31.8
90 kg	2.25 mg	11.2 mL	33.6
95 kg	2.37 mg	11.8 mL	35.4
100 kg	2.5 mg	12.5 mL	37.5

Continuous infusion – Suggested dose 12 micrograms/kg/hour initially (Titrated to 45micrograms/kg/hour Max)

Route

Intravenous infusion only

Preparation

Add one 10mg ampoule of milrinone to 40 mL glucose 5% to give a final concentration of 200 micrograms/mL

Administration

Follow administration steps carefully

Comment on Trust's SMARTPUMPS

Other Information

Risk of severe hypotension due to vasodilation.

Do NOT leave the patient unattended until stabilised and be prepared to increase noradrenaline rate.

Compatible infusions (it is assumed that medicines meet close to the vascular access device):⁽⁴⁾ Adrenaline, amiodarone, dobutamine, dopamine, heparin, insulin soluble, lorazepam, midazolam, morphine sulfate, noradrenaline, potassium chloride, propofol, vancomycin

Compatible infusion fluids: Sodium chloride 0.9%,⁽¹⁾ glucose 5%,⁽¹⁾ sodium chloride 0.45%,⁽¹⁾⁽³⁾ sodium chloride with glucose,^(6a) Ringer's lactate⁽⁴⁾

Incompatible: Furosemide, bumetanide, sodium bicarbonate

Neostigmine

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

Administration of IV neostigmine infusion for constipation

Route

Intravenous infusion only

Preparation

Add Neostigmine 5mg in 2mL to give a total of 5mg in a 50mL syringe of 0.9% sodium chloride or glucose 5%

Administration

The infusion should be delivered at 2mL/hour for the first 8 hours, if tolerated the infusion rate can be increased to 4mL/hour. The total infusion time should not exceed 48 hours.

The infusion should be stopped as soon as a bowel movement has occurred.

Comment on Trust's SMARTPUMPS

Storage / Stability

Discard syringe after 24 hours

Flushing

Do NOT flush without initially aspirating the line

Other Information

Compatible infusions (it is assumed that medicines meet close to the vascular access device):
glycopyrronium

Noradrenaline

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

Initial target MAP of 65 mmHg or greater

Route

Intravenous infusion only

Preparation

4mg in 50mL: Add ONE vial of 4mg in 4mL Noradrenaline to 46mL glucose 5% in a 50mL syringe

8mg in 50mL: Add TWO vials of 4mg in 4mL Noradrenaline to 42mL glucose 5% in a 50mL syringe

16mg in 50mL: Add FOUR vials of 4mg in 4mL Noradrenaline to 34mL glucose 5% in a 50mL syringe

Administration

Comment on Trust's SMARTPUMPS

Storage / Stability

Discard syringe after 24 hours

Flushing

Do NOT flush without initially aspirating the line

Other Information

The concomitant administration of noradrenaline and other medicines via a Y-site should be avoided if possible to prevent inadvertent bolus administration of noradrenaline.

Compatible infusions (it is assumed that medicines meet close to the vascular access device):

Adrenaline, amiodarone, cisatracurium in glucose 5%, clonidine in sodium chloride 0.9%, dobutamine in glucose 5%, dopamine in glucose 5%, fentanyl, glyceryl trinitrate, heparin sodium, hydrocortisone, midazolam in glucose 5%, milrinone in glucose 5%, morphine in glucose 5%, potassium chloride, propofol, remifentanyl in sodium chloride 0.9%, vasopressin in sodium chloride 0.9%, vecuronium.

Compatible infusion fluids: Sodium chloride 0.9% glucose 5% and sodium chloride 0.9%, Hartmann's. Sodium chloride 0.9% not usually recommended as a diluent because of lack of protection from oxidation.⁽⁴⁾

Incompatible:- Alkaline solutions, Insulin, aminophylline, thiopental.

Omeprazole

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

40 – 80mg once or twice daily

Continuous infusion of 8mg/hour used in bleeding ulcers

Route

Intravenous infusion only

Preparation

Intravenous Infusion: Dilute 40mg or 80mg in 100mL Glucose 5% over 30 minutes

Continuous infusion: Dilute 80mg in 100mL Sodium Chloride 0.9%

Administration

Comment on Trust's SMARTPUMPS

Change continuous infusion bags every 10 hours for 72 hours total

Storage / Stability

Solution stable for 12 hours when diluted with Sodium Chloride 0.9%

Flushing

Flush with sodium chloride 0.9% or glucose 5%

Other Information

Do not infuse with any other medicines

Pantoprazole

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

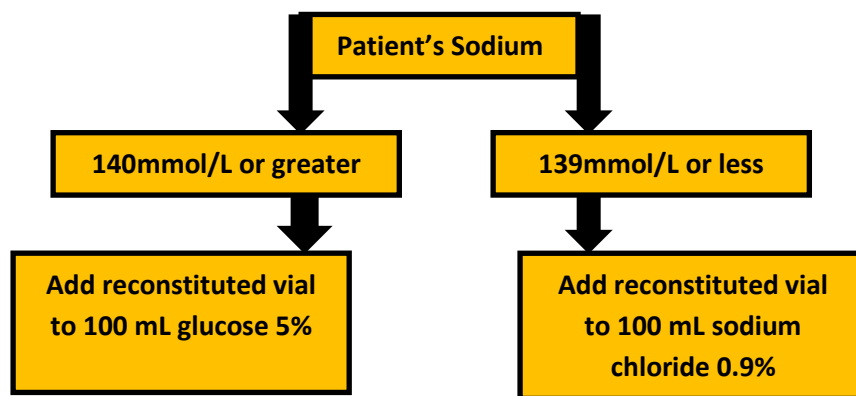
Stress Ulcer Prophylaxis: 40mg once daily in the morning

Route

Intravenous bolus or infusion

Preparation

Reconstitute each vial with 10mL sodium chloride 0.9%.
If giving by IV infusion, dilute further before administration.



Administration

Comment on Trust's SMARTPUMPS

Storage / Stability

Discard after 4 hours if not infused

Flushing

Flush with sodium chloride 0.9% or glucose 5%

Other Information

Compatible infusions (it is assumed that medicines meet close to the vascular access device):

Ceftriaxone, dopamine, furosemide, glyceryl trinitrate, insulin (soluble), morphine sulfate, argipressin, (all in glucose 5%).

Compatible infusion fluids: Sodium chloride 0.9%, glucose 5%, Plasma-Lyte 148 (pH 7.4).

Incompatible (do not assume that a drug not listed here is compatible): cisatracurium besilate, dobutamine, esmolol, mannitol, midazolam, noradrenaline (norepinephrine) (all in glucose 5%), vancomycin

Remifentanyl (Guardrails® enabled)

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

0.1 - 0.75 microgram/kg/min

See full unit guideline for how to alter dose

Route

Intravenous infusion only

Preparation

Reconstitute a 5mg vial of remifentanyl with 5ml sodium chloride 0.9% to produce a 1mg/ ml solution.

Further dilute to a total volume of 50ml with Sodium chloride 0.9% to produce a 100 micrograms/ ml solution

Administration

Comment on Trust's SMARTPUMPS

Storage / Stability

Change syringe every 24 hours

Flushing

Aspirating the line prior to flushing with sodium chloride 0.9% or glucose 5%

Other Information

Compatible infusions (it is assumed that medicines meet close to the vascular access device):

Adrenaline, aminophylline, co-trimoxazole, dobutamine, dopamine, esmolol, fentanyl, glyceryl trinitrate, heparin (in sodium chloride 0.9%), midazolam, morphine, noradrenaline, potassium chloride, thiopental sodium (in sodium chloride 0.9%), vancomycin, Propofol, sodium lactate, compound (Hartmann's).

Compatible with the following infusion fluids (can also be used as infusion diluent): Sodium chloride 0.9%, glucose 5%, sodium chloride 0.45%

Incompatible: Amphotericin

Rocuronium

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

300–600 micrograms/kg/hour for first hour then adjust dose according to response (Use ideal body weight to avoid excessive dosage in obese patients. If actual body weight is less than IBW, then use actual body weight)

Dosing table using 5mg/mL solution

Ideal body weight* (kg)	42-54	55-62	63-72	73-79	80-87	88-96	97-104	105-112	113-121
Usual rate (mL/h)	3	3.5	4	4.5	5	5.5	6	6.5	7
Max rate (mL/h) <i>Normal renal and liver function</i>	6	7	8	9	10	11	12	13	14
Max rate (mL/h) <i>Renal or liver failure present</i>	4	4.5	5	5.5	6	6.5	7	7.5	8

Route

Intravenous infusion

Preparation

Draw 250mg Rocuronium (five 50mg/5mL ampoules) into a 50mL syringe and then dilute with 25mL sodium chloride 0.9% or glucose 5%. The resulting solution has a concentration of 5mg/mL.

Administration

Comment on Trust's SMARTPUMPS

Storage

Vials are stored in the fridge

Stability

Discard drug following 24 hours

Flushing

Sodium chloride 0.9% or glucose 5%

Other Information

Compatible infusion fluids: sodium chloride 0.9%, glucose 5% and compound sodium lactate (Hartmann's). Acetylcysteine, adrenaline (epinephrine), alfentanil, aminophylline, atracurium, clonidine, dexmedetomidine, dobutamine, dopamine, dopexamine, esmolol, fentanyl, heparin sodium, insulin (soluble), isosorbide dinitrate, labetalol, midazolam, milrinone, noradrenaline (norepinephrine), remifentanil, vecuronium.

Salbutamol

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

Start at 300 micrograms/hour
180 – 1200 micrograms/hour

Route

Central and Peripheral intravenous infusion

Preparation

Add 5mg salbutamol to 45mL glucose 5% to create a 50mL solution of 100 micrograms/mL

Administration

Comment on Trust's SMARTPUMPS

Storage / Stability

Discard drug after 24 hours

Flushing

Aspirating line prior to flushing with sodium chloride 0.9% or glucose 5%

Other Information

Compatible with following infusion fluids: Sodium chloride 0.9%, glucose 5% and sodium chloride 0.18% and glucose 4%. In practice, often given with potassium in sodium chloride infusion (but not glucose).

Incompatible: Aminophylline and pantoprazole.

Sodium Valproate

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

Consult *Lancashire and South Cumbria: Managing convulsive (tonic-clonic) status epilepticus (adults)* guideline

Usual dose range 1-2g daily in two divided doses (maximum 3g/day)

Route

Peripheral or Central intermittent infusion

Preparation

Dilute dose in 50mL glucose 5% and infuse over 60 minutes

Administration

Comment on Trust's SMARTPUMPS

Storage / Stability

Discard after 24 hours

Flushing

Flush with sodium chloride 0.9% or glucose 5%

Other Information

Compatible infusion fluids: sodium chloride 0.9%, glucose 5%

Compatible infusions: Do not infuse with any other medicines or infusions

Vancomycin

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Dose

Consult *Lancashire and South Cumbria Critical Care - Vancomycin* guideline.

Route

Intravenous infusion only

Preparation

See *Lancashire and South Cumbria Critical Care - Vancomycin* guideline.

Continuous infusion:

If administered via a central venous catheter → use a 1g/120mL vancomycin solution

If administered via a peripheral venous cannula → use a 500mg/110mL vancomycin solution

Ready to use infusion bags are available on request from Pharmacy Aseptic Unit. Discuss with your Critical Care pharmacist if ready to use infusion bags are needed.

Administration

Comment on Trust's SMARTPUMPS

Storage / Stability

Discard following 24 hours

Flushing

Flush with sodium chloride 0.9% or glucose 5%

Other Information

Compatible infusions (it is assumed that medicines meet close to the vascular access device): Aciclovir, amiodarone (in glucose 5%), clarithromycin, fluconazole, insulin, magnesium sulfate, meropenem, midazolam, morphine sulfate, tigecycline

Compatible infusion fluids: Sodium chloride 0.9%, glucose 5%, glucose 5% in sodium chloride 0.9%, sodium lactate, compound (Hartmann's solution).

Incompatible: Ampicillin, cefotaxime, ceftazidime, ceftriaxone, cefuroxime, foscarnet, heparin, omeprazole, piperacillin/tazobactam, ticarcillin/clavulanate. Dexamethasone sodium phosphate, phenobarbital, sodium bicarbonate.

Vecuronium bromide for paralysis (Guardrails® enabled)

Full details are available from the SPC www.emc.medicines.org.uk or use the Injectable medicine guide available via Medusa on the intranet

Indication

Muscle relaxant

Dose

Use ideal body weight to prevent excessive dosing in obese patients.

Loading dose: 80-100 microgram/kg

Maintenance dose for infusion: 0.8-1.4microgram/kg/min

Dosing table for maintenance infusion using 2mg/mL strength solution

Patient weight (kg)	Dose (microgram/kg/minute)				Infusion
	0.8	1	1.2	1.4	
50-59	1.3	1.7	2	2.3	mL/hr
60-69	1.6	2	2.3	2.7	
70-79	1.8	2.3	2.7	3.2	
80-89	2	2.6	3.1	3.6	
90-99	2.3	2.9	3.4	4	
100-109	2.5	3.2	3.8	4.4	
110-119	2.8	3.5	4.1	4.8	

Route

Loading dose: intravenous injection

Maintenance dose: intravenous infusion

Preparation

Reconstitute each 10mg vecuronium bromide vial with 5mL water for injection.

Draw up the contents of FOUR reconstituted vials into a 30 mL syringe to create a 40mg in 20mL solution.

Ready to use syringes are available on request from Pharmacy Aseptic Unit. Discuss with your Critical Care pharmacist if ready to use syringes are needed.

Administration

Intravenous injection – Give rapidly

Intravenous infusion:

Comment on Trust's SMARTPUMPS

Storage / Stability

Discard drug following 24 hours

Flushing

Sodium chloride 0.9% or glucose 5%

Other Information

Compatible infusions (it is assumed that medicines meet close to the vascular access device):

Adrenaline, aminophylline, amiodarone (in glucose 5%), ciprofloxacin, clarithromycin, co-trimoxazole, dobutamine, dopamine, esmolol, fentanyl, fluconazole, gentamicin, glyceryl trinitrate, heparin sodium, hydrocortisone sodium succinate, isoprenaline, labetalol, linezolid, lorazepam, midazolam, morphine sulphate, noradrenaline, propofol, ranitidine, sodium nitroprusside, vancomycin.

Compatible infusion fluids: Sodium chloride 0.9%, glucose 5%, glucose 5% in sodium chloride 0.9%, compound sodium lactate (Hartmann's or Ringer-lactate) solution. **Incompatible:** Diazepam, etomidate, furosemide, micafungin, pantoprazole, thiopental and other alkaline medicines/solutions.

Lancashire and South Cumbria Consultation		
	Committee/Group	Date
Consultation	Lancashire and South Cumbria Critical Care Pharmacists Lancashire and South Cumbria Network Practice Educators Critical Care Consultants Lancashire and South Cumbria Network Lead Nurse Lancashire and South Cumbria ICS Aseptics Services Working Party	February 2025
Approval Committee	Lancashire and South Cumbria Critical Care CEG (Clinical Effectiveness Group)	June 2025
NEXT REVIEW DATE:	June 2028	
Host	Monographs hosted centrally by Lancashire Medicines Management Group	
AMENDMENTS:	Addition of vecuronium and remifentanyl Change of LSC CCMT Network logo	