CUH
Ospidéal Ollscoil Chorcaí
Cork University Hospital

Critical Care IV Guidelines

Pharmacy Department,

Cork University Hospital

May 2022

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Ospidéal Ollscoil Chorcaí
Cork University Hospital

Contents

This information has been summarised to act as a guide for those administering IV medication. The monograph should be used in conjunction with the drug data sheet and BNF for information on dose, adverse effects, cautions and contra-indications. Further information is available from pharmacy on 22142 or 22546.

Owner Denise Leamy,Miriam Flynn Pharmacy Department CUH, Version 1 Updated May 2022.

Adrenaline

<table>
<tr><td colspan="3">CAUTION: High Administration Risk Rating</td></tr>
<tr><td>Form</td><td colspan="2">1:10,000 (1mg per 10mL) prefilled syringe.
1:1,000 (1mg per mL) ampoules as acid tartrate.</td></tr>
<tr><td>Dose</td><td colspan="2">Adrenaline is usually prescribed as a "mcg/minute" dose for adults.
The usual range is 1-30 mcg/min, titrated to desired effect, but can go higher (up to 80mcg/min).</td></tr>
<tr><td>Reconstitution</td><td colspan="2">Prefilled syringe: Already in solution
Ampoule: Already in solution. Dilute further before IV administration.</td></tr>
<tr><td>Compatibility & Stability</td><td>Glucose 5%
Sodium Chloride 0.9%</td><td>Diluted solutions are stable for 24 hours
Protect infusion from light</td></tr>
<tr><td>Administration</td><td colspan="2">IV Injection: For emergency use only Using 1:10,000 prefilled syringe give by rapid IV injection. IV injection administered via a peripheral vein should be followed by a 20mL flush of Sodium Chloride 0.9% to aid entry into the central circulation.

IV Infusion: Use 1:1000 ampoules and administer through a Central Line, using a syringe driver to control the rate of infusion.

Single Strength Adrenaline
Add 3mg Adrenaline (3mL) to 47mL Glucose 5% to give 50mL of a solution containing 60mcg/mL Adrenaline.
<table>
<tr><th>Infusion rate of 1mL/hr = 60mcg/hr = 1mcg/min</th></tr>
<tr><td>1mL/hr = 1mcg/min</td></tr>
<tr><td>2mL/hr = 2mcg/min</td></tr>
<tr><td>3mL/hr = 3mcg/min</td></tr>
</table>
Double Strength Adrenaline
Add 6mg Adrenaline (6ml) to 44mL Glucose 5% to give 50mL of a solution containing 120mcg/mL Adrenaline.
<table>
<tr><th>Infusion rate of 1mL/hr = 120mcg/hr = 2mcg/min</th></tr>
<tr><td>1mL/hr = 2mcg/min</td></tr>
<tr><td>2mL/hr = 4mcg/min</td></tr>
<tr><td>3mL/hr = 6mcg/min</td></tr>
</table>
Quadruple Strength Adrenaline
Add 12mg Adrenaline (12mL) to 38mL Glucose 5% to give 50mL of a solution containing 240mcg/mL Adrenaline.
<table>
<tr><th>Infusion rate of 1mL/hr = 240mcg/hr = 4mcg/min</th></tr>
<tr><td>1mL/hr = 4mcg/min</td></tr>
<tr><td>2mL/hr = 8mcg/min</td></tr>
<tr><td>3mL/hr = 12mcg/min</td></tr>
</table></td></tr>
</table>

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Monitoring	• Arterial line monitoring is strongly recommended.
Extravasation	• Tissue infiltration may lead to local ischemia. Tissue necrosis may occur due to low ph.
Additional Information	• Infuse through a central venous catheter, using a syringe driver to control the rate of infusion.

Information provided relates to Adrenaline manufactured by MercuryPharma and prefilled syringes manufactured by Aurum

Aminophylline

Aminophylline dosing is weight based; ensure accuracy of documented weight before administration	
CAUTION: High Administration Risk Rating	
Form	250mg per 10mL ampoule
Reconstitution	Already in solution **Further dilute before administration**
Compatibility & Stability	Sodium Chloride 0.9% Glucose 5%
Administration	**Intermittent IV infusion (Loading dose)** The loading dose should be diluted in 100mL and administered over at least 30 minutes. The rate of administration should not exceed 25mg per minute. **Continuous Infusion (Maintenance dose)** Dilute to a concentration of 1mg in 1mL (e.g. 500mg aminophylline in 500mL). Fluid restriction: Can be given by a central venous access device at higher concentrations i.e. required dose in 50mL (or undiluted 25mg/mL). The rate of administration should not exceed 25mg per minute.
Monitoring	• Monitor ECG, heart rate and blood pressure during administration. • Monitor serum potassium levels if therapy is on-going. • Serum theophylline levels should be monitored.
Extravasation	• Extravasation likely to cause tissue damage. Due to high pH preferably give via a central venous access device. If this is unavailable, administer via a large peripheral vein monitoring insertion site closely.
Additional Information	• A loading dose is not normally given to patients taking oral theophylline or aminophylline; if considered necessary, defer treatment until a serum theophylline level is available. • Calculate dose on the basis of ideal body weight in obese patients to avoid excessive dosing. Refer to Ideal Body Weight calculator on the microguide app. • Discard the ampoule if the contents are discoloured.

Information provided relates to Aminophylline manufactured by MercuryPharma.

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Amiodarone - ITU

CAUTION: High Administration Risk Rating	
Form	300mg per 10mL prefilled syringe (resuscitation trolley) 150mg per 3mL ampoule
Reconstitution	Already in solution, dilute ampoules further
Compatibility & Stability	**Glucose 5%** only Solutions are stable for 24 hours **Incompatible with PVC** A non-PVC infusion container and a non-PVC infusion set should be used.
Administration	**Slow IV injection: For emergency use only** Use 300mg per 10mL prefilled syringe. Does not require further dilution. Give over a minimum of 3 minutes. Flush with 10mL of glucose 5%. **IV infusion (central line) –intermittent** Preferably administer via a central venous access device to avoid potential venous irritation. If given peripherally, choose a large vein and monitor the injection site closely. 300mg diluted in a usual volume of 250mL Glucose 5% (100mL often used in ITU centrally), and given over one hour, via volumetric pump. **IV infusion (central line) – continuous** Following the initial intermittent infusion Day 1: 900mg Amiodarone in 500mL Glucose 5% given over 23 hours. Day 2: 900mg Amiodarone in 500mL Glucose 5% given over 24 hours Day 3: 600mg Amiodarone in 500mL Glucose 5% given over 24 hours. The maximum concentration for continuous infusion via **peripheral** veins is 2mg/mL.
Monitoring	• BP, ECG monitoring is required
Extravasation	• Extravasation is likely to cause tissue damage due to low pH
Additional Notes	• **Incompatible with PVC**. A non-PVC infusion container (Baxter Viaflo®, Braun Ecoflac®) and non-PVC infusion set should be used. • Amiodarone may reduce drop size of infusion solutions therefore use volumetric infusion pumps

Information provided relates to Cordarone® manufactured by Sanofi ,Aurum and Hameln Pharmaceuticals

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Atracurium

Atracurium dosing is weight based; ensure accuracy of documented weight before administration		
CAUTION: High Administration Risk Rating		
Form & Storage	10mg/ml 2.5mL ampoule (25mg) 10mg/ml 5mL ampoule (50mg)	Store between 2-8°C. Do not freeze. Keep in outer carton.
Dose	Usual dose 650-780microgram/kg/hr. Range 270-1770microgram/kg/hr.	
Reconstitution	Already in solution. Can be diluted if required.	
Compatibility & Stability	Sodium chloride 0.9% Glucose 5%	
Administration	**IV injection** Bolus given over one minute. **IV infusion (continuous)** Use 500mg (50mL of 10mg/mL solution) Administer via syringe pump to control rate of administration.	
Extravasation	• Extravasation is likely to cause tissue damage. The undiluted solution has a pH below 4 and is hypotonic. Preferably administer via a central venous access device to avoid potential venous irritation. If given peripherally, choose a large vein and monitor the injection site closely.	
Additional Information	• To avoid excessive dosage in obese patients, dose should be calculated on the basis of ideal body weight. Refer to Ideal Body Weight calculator on the microguide app. • Atracurium should only be administered with adequate general anaesthesia, and only under the close supervision of an experienced anesthetist with adequate facilities for endotracheal intubation and artificial ventilation.	

Information relates to Atracurium manufactured by AS Kalceks

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Calcium Gluconate

CAUTION: High Administration Risk Rating	
Form	Ampoules containing calcium gluconate 10% (2.2mmol of calcium in 10mL) This is equivalent to 0.22mmol of calcium in 1mL.
Reconstitution	Already in solution Only use the ampoule if the solution is clear.
Compatibility & Stability	Sodium Chloride 0.9% Glucose 5%
Administration	**IV Injection: Emergency use only** In an emergency can be given undiluted by a slow IV injection. Administer each 10mL ampoule over a minimum of 3 - 5 minutes. **IV Infusion** Preferably administer via a central venous access device to avoid potential venous irritation. If given peripherally, choose a large vein and monitor the injection site closely. Add required dose to 50mL compatible fluid. Infuse over 10-20 minutes. If a 50ml infusion volume is used the residual volume in the infusion line **must be flushed through at the same rate** to avoid significant underdosing. Rates of administration may vary with indication
Monitoring	Monitor ECG, blood pressure and plasma-calcium levels during administration.
Extravasation	Calcium salts are highly irritant. Extravasation is likely to cause tissue damage. The infusion site must be monitored regularly to ensure extravasation injury has not occurred.
Additional Information	• Because of the risk of aluminium exposure, calcium gluconate injection packed in small-volume glass containers should not be used for repeated or prolonged treatment in children < 18 years or in patients with renal impairment • This medication is unlicensed in Ireland.

Information relates to Calcium Gluconate 10% manufactured by Braun.

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Dexmedetomidine

Dexmedetomidine dosing is weight based; ensure accuracy of documented weight before administration	
CAUTION: High Administration Risk Rating	
Form & Storage	100 micrograms/ml concentrate for solution for infusion Each 4mL vial contains 400 micrograms of dexmedetomidine.
Dose	0.7 microgram/kg/hour, adjusted according to response; usual dose 0.2–1.4 micrograms/kg/hour
Reconstitution	Already in solution
Compatibility & Stability	Sodium chloride 0.9% Glucose 5%[1]
Administration	**Continuous IV Infusion** **4mcg/mL:** 4mL dexmedetomidine in 96mL compatible fluid. **8mcg/mL:** 8mL dexmedetomidine in 92mL compatible fluid. Initial infusion rate of 0.7micrograms/kg/hour, then adjusted stepwise at hourly intervals within the dose range 0.2 to 1.4micrograms/kg/hour in order to achieve the desired level of sedation. A lower starting infusion rate may be considered for frail patients.
Monitoring	Monitor cardiac function. Monitor respiratory function in non-intubated patients.
Extravasation	• Unlikely to cause major tissue injury
Additional Information	• As dexmedetomidine may be adsorbed to some types of natural rubber it is advisable to use components with synthetic or coated natural rubber gaskets. • The maximum dose of 1.4 micrograms/kg/hour should not be exceeded. Patients failing to achieve an adequate level of sedation with the maximum dose of dexmedetomidine should be switched to an alternative sedative agent.

Information relates to Dexdor manufactured by Orion Pharma

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Dobutamine

Dobutamine dosing is weight based; ensure accuracy of documented weight before administration	
CAUTION: High Administration Risk Rating	
Form	250mg/20ml Dobutamine
Dose	Dobutamine is usually prescribed as a "mcg/kg/minute" dose. The usual range is 0- 20 mcg/kg/minute, although this can vary between patients. The usual maximum rate is 40mcg/kg/min.
Reconstitution	Already in solution. Further dilution is required before administration.
Compatibility & Stability	Glucose 5% Sodium chloride 0.9% Diluted solutions are stable for 24 hours
Administration	**IV infusion only** The patient's weight is used in calculating the amount of drug to be added to the infusion solution. The formula used is: **Patient's Weight(kg) multiplied by 3 =** Amount of Dobutamine (mg) to be added to Glucose 5% to make up to 50mL. **E.g.** Weight of patient = 70kg Using the above formula; 70 x 3 = 210mg Take 210mg Dobutamine (16.8mL) and add it to 33.2mL Glucose 5%. This gives a final volume of 50mL, containing 210mg Dobutamine with a concentration of 4.2mg/mL (4200mcg/mL). An infusion rate of 1mL/hr = 4200mcg/hr = 70mcg/min = 1mcg/kg/min **1mL/hr = 1mcg/kg/min** **2mL/hr = 2mcg/kg/min** **3mL/hr = 3mcg/kg/min**
Monitoring	• Continuous ECG and arterial line monitoring is strongly recommended • Monitor heart rate and rhythm, blood glucose, urine output, serum potassium and infusion rate
Extravasation	• Extravasation may cause tissue damage. Infuse through a central venous catheter or a large vein, using a syringe driver to control the rate of infusion.
Additional Information	• Solution may turn pink due to oxidation of the drug. There is no significant loss of potency during recommended storage and administration periods.

Information relates to Dobutamine manufactured by Mercury

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Dopamine

Dopamine dosing is weight based; ensure accuracy of documented weight before administration	
CAUTION: High Administration Risk Rating	
Form	Ampoules containing 200mg/5mL Dopamine.
Dose	Dopamine is usually prescribed as a "mcg/kg/minute" dose. The usual range is 0 - 20 mcg/kg/minute, although this can vary between patients. Up to 50mcg/kg/min may be required.
Reconstitution	Already in solution. Further dilution is required before administration.
Compatibility & Stability	Glucose 5% Sodium chloride 0.9% Diluted solutions are stable for 24 hours Protect from light
Administration	**IV infusion only** The patient's weight is used in calculating the amount of drug to be added to the infusion solution. The formula used is: **Patient's Weight(kg) multiplied by 3 =** Amount of Dopamine (mg) to be added to Glucose 5% to make up to 50mL. **E.g.** Weight of patient = 70kg Using the above formula; 70 x 3 = 210mg Take 210mg Dopamine (5.25mL) and add it to 44.75mL Glucose 5%. This gives a final volume of 50mL, containing 210mg Dopamine with a concentration of 4.2mg/ml (4200mcg/mL). An infusion rate of 1mL/hr = 4200mcg/hr = 70mcg/min = 1mcg/kg/min **1mL/hr = 1mcg/kg/min** **2mLhr = 2mcg/kg/min** **3mL/hr = 3mcg/kg/min**
Monitoring	• Monitor blood pressure, HR, ECG, urinary output and where possible cardiac output. Arterial line monitoring is strongly recommended
Extravasation	• Extravasation may cause tissue damage. Infuse through a central venous catheter or a large vein, using a syringe driver to control the rate of infusion.
Additional Information	• If treated with MAOI's, within 2-3 weeks of dopamine infusion, the starting dose is one- tenth of normal • Discontinue gradually

Information relates to Dopamine manufactured by Hospira

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Epoprostenol

Epoprostenol dosing is weight based; ensure accuracy of documented weight before administration	
CAUTION: High Administration Risk Rating	
Form	Powder vial = 500micrograms epoprostenol Solvent vial = 50mL of glycine buffer solution
Reconstitution	**Use only the sterile solvent solution for reconstitution.** Withdraw approximately 10mL of the sterile solvent solution into a sterile syringe. Inject into the vial containing the freeze-dried Flolan and shake gently until the powder has dissolved. Draw up the resulting Flolan solution into the syringe. **Re-inject it into the remaining volume of the sterile solvent solution and mix thoroughly.** This solution is referred to as the concentrated solution and contains 10,000nanograms/ml of Flolan (500,000 nanograms in 50mL) Only this concentrated solution is suitable for further dilution prior to use. **To further dilute draw up 50mL of concentrated solution into a larger syringe and then attach a sterile filter to the syringe.** Withdraw 50mls from a 250mL bag of sodium chloride 0.9%. Add the concentrated solution directly into 200mls sodium chloride 0.9% and mix well. The resulting diluted solution has a concentration of 2,000 nanograms/mL Flolan.
Compatibility & Stability	Sodium Chloride 0.9% Reconstituted solution = 12 hours (24hrs if refrigerated)
Administration	**Infusion** infusion either intravenously or into the external heparin line in the aquarius machines. Infusion rate(mL/hr) = $\frac{\text{Dosage (ng/kg/min) x bodyweight (kg)} \times 60}{\text{Concentration of infusion (ng/mL)}}$ Using a **diluted solution of 2,000ng/mL**

Dosage ng/kg/min	**Patient's weight (kg)**							
	30	**40**	**50**	**60**	**70**	**80**	**90**	**100**
1	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3
2	1.8	2.4	3	3.6	4.2	4.8	5.4	6
3	2.7	3.6	4.5	5.4	6.3	7.2	8.1	9
4	3.6	4.8	6	7.2	8.4	9.6	10.8	12
5	4.5	6	7.5	9	10.5	12	13.5	15
	Infusion rate in mL/hour							

Monitoring	• Blood pressure and heart rate should be monitored during administration of Flolan due to potential side effect of hypotension and may either increase or decrease heart rate.
Extravasation	• Due to high pH of final infusion solutions, care should be taken to avoid extravasation during administration as risk of tissue damage.

Information relates to Flolan manufactured by GSK

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Esmolol

Esmolol dosing is weight based; ensure accuracy of documented weight before administration	
CAUTION: High Administration Risk Rating	
Form	100mg/10ml ampoule esmolol hydrochloride
Dose	Usually prescribed in **'mcg/kg/min',** with varying doses based on indication, up to a usual maximum of 300mcg/kg/min when given by continuous infusion.
Reconstitution	Already in solution
Compatibility & Stability	N/A
Administration	**IV injection (loading dose)** IV injection over 15-30 seconds **IV infusion** Administer via infusion pump to control rate of infusion
Monitoring	• Monitor blood pressure, ECG and heart rate.
Extravasation	• Extravasation may cause tissue damage. If a central venous access device is unavailable, administer via a large peripheral vein monitoring insertion site closely. Resite cannula at first signs of inflammation.
Additional Information	• Infusions into small veins or through a butterfly catheter should be avoided (can cause thrombophlebitis) • Only a clear colourless or slightly coloured solution should be used.

Information relates to Brevibloc manufactured by Baxter

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Fentanyl - ITU

CAUTION: High Administration Risk Rating		
Form & Storage	500mcg in 10mL ampoule	Controlled Drug (CD): Must be stored in CD Press
Reconstitution	Already in solution (use neat)	
Compatibility & Stability	N/A	
Administration	**IV infusion** Use 10ml (50mcg/mL) ampoules and administer using a syringe pump to control the rate of infusion.	
Monitoring	• Monitor blood pressure, heart and respiratory rate.	
Additional Information	• For bolus administration guidelines, please see regular IV guidelines administration document. • This is a controlled drug. • Naloxone should be kept in all areas where opioids are administered	

Information relates to Fentanyl manufactured by Mercury

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Glyceryl Trinitrate

Form	50mg/10ml ampoule (Glyceryl Trinitrate - Hospira)
Reconstitution	Already in solution Glyceryl trinitrate 50mg in 10 mL **must be diluted further before administration**.
Compatibility & Stability	Sodium Chloride 0.9% Glucose 5%
Administration	**<u>Continuous IV infusion</u>** To prepare a **1mg/mL** solution: Dilute glyceryl trinitrate-Hospira 50mg/10mL by adding each 50mg/10mL ampoule to 40mL of compatible infusion fluid. Administer via a syringe driver using **non-PVC** giving set and syringe. If a central venous access device is unavailable, administer via a large peripheral vein monitoring insertion site closely. Usual max rate of 20mg/hr
Monitoring	• Monitor blood pressure and heart rate. Also consider pulmonary capillary wedge pressure, cardiac output
Extravasation	• Extravasation is likely to cause tissue damage due to low pH and presence of excipients propylene glycol and ethanol.
Additional Information	• The diluted solution should be used immediately. • The solution should be clear and colourless to slightly yellow. Do not use if solution is discoloured. • Oral nitrates should be withheld when administering IV. • Glyceryl trinitrate is contraindicated with PDE5 inhibitors such as sildenafil, tadalafil and vardenafil.

Information provided relates Glyceryl Trinitrate manufactured by Hospira and Merus Labs

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Isoprenaline Hydrochloride

Two isoprenaline preparations are available **- isoprenaline sulphate** and **isoprenaline hydrochloride.**
Check carefully when you are using this monograph to ensure that you are using it appropriately.
Isoprenaline sulfate 1.125mg = isoprenaline hydrochloride 1mg.
Information in this monograph is specific to **isoprenaline hydrochloride.**

CAUTION: High Administration Risk Rating

Form	0.2mg/mL ampoules
Reconstitution	Already in solution. **Further dilute prior to administration**
Compatibility & Stability	Glucose 5% (preferred) Sodium Chloride 0.9%
Administration	**Continuous IV Infusion** To make 4 micrograms per mL solution: Add 1mg (5 ampoules) to 245ml compatible fluid. Adjust rate according to response and indication.

Dose (micrograms/min)	0.5	1	2	3	4	5	6	7	8	9	10
Rate (mL/h)	7.5	15	30	45	60	75	90	105	120	135	150

Monitoring	• Monitor ECG, arterial blood pressure, heart rate, urine flow, central venous pressure, blood pH, blood pCO_2 or bicarbonate, and cardiac output
Extravasation	• This medicine has a low pH and may cause venous irritation and tissue damage in cases of extravasation. If a central venous access device is unavailable, administer via a large peripheral vein monitoring insertion site closely. Infusion should preferably be given via central line.
Additional Information	• This product contains metabisulphite and may cause allergic reactions • Do not use if the injection is pinkish, darker than slightly yellow or contains a precipitate. • Unlicensed medication in Ireland.

Information provided relates to Isoprenaline Hydrochloride manufactured by SALF Pharmacological Lab, Bergamo, Italy.

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Isoprenaline Sulphate

Two isoprenaline preparations are available **- isoprenaline sulphate** and **isoprenaline hydrochloride.**
Check carefully when you are using this monograph to ensure that you are using it appropriately**.**
Isoprenaline sulfate 1.125mg = isoprenaline hydrochloride 1mg.
Information in this monograph is specific to **isoprenaline sulphate**

Most texts express doses in terms of isoprenaline hydrochloride. Therefore this guide advises how to dilute isoprenaline sulfate to equivalent strengths of isoprenaline hydrochloride.

CAUTION: High Administration Risk Rating

Form & Storage	Usual brand kept Aleudrina® (200mcg in 1mL=0.2mg/mL)**	Aleudrina® should be stored in the fridge, protect vials from light
	Other strengths possible	Other preparations may need to be stored at room temperature. Follow advice from pharmacy.
Reconstitution	Already in solution. **Further dilute prior to administration**	
Compatibility & Stability	Glucose 5% (preferred) Sodium Chloride 0.9%	
Administration	**Continuous IV Infusion** Isoprenaline sulfate 1.125mg is equivalent to isoprenaline hydrochloride 1mg. To get a solution **equivalent to 4 microgram per mL isoprenaline hydrochloride**:	

Isoprenaline sulphate preparation	Volume	Diluted to
2.25ml in 2mL	2mL	250mL
5mg in 5mL 2mg in 2mL	2.3mL	500mL
**200mcg in 1mL	5.63mL	250mL
100mcg in 1mL	4.51mL	100mL
100mcg in 2mL	4.5mL	50mL

Adjust rate according to response and indication.

Monitoring	• Monitor ECG, arterial blood pressure, heart rate, urine flow, central venous pressure, blood pH, blood pCO_2 or bicarbonate, and cardiac output
Extravasation	• Isoprenaline has a low pH and may cause venous irritation and tissue damage in cases of extravasation. Infusion should preferably be given via a central line. If a central venous access device is unavailable, administer via a large peripheral vein monitoring insertion site closely. Re-site cannula at first signs of inflammation.
Additional Information	• This product may contain metabisulphite and may cause allergic reactions • Do not use if the injection is pinkish, darker than slightly yellow or contains a precipitate. • Unlicensed medicine in Ireland

Information provided relates to Aleudrina® by Reig Jofre .

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Ketamine

Ketamine dosing is weight based; ensure accuracy of documented weight before administration		
CAUTION: High Administration Risk Rating		
Form & Storage	10mg/ml 20mL vial (200mg/vial) 50mg/ml 10mL vial (500mg/vial)	Controlled Drug (CD): Must be stored in CD Press
Reconstitution	Already in solution	
Dose	The dose is usually prescribed in **'mcg/kg/minute',** with a usual dose range for maintenance of 10-45mcg/kg/min, adjusting rate according to response.	
Compatibility & Stability	Sodium Chloride 0.9% Glucose 5% **Note: Ketamine 10mg/mL vials are not recommended for dilution.**	
Administration	**IV injection** IV injection over at least 1 minute **IV infusion (continuous)** IV infusion via volumetric infusion or syringe pump. Dilute to a concentration of 1mg/mL. In fluid restriction, a maximum concentration of 50mg/mL (undiluted) can be used via a syringe driver (unlicensed). If a central venous access device is unavailable, administer via a large peripheral vein monitoring insertion site closely. Resite cannula at first signs of inflammation. **IM injection**	
Monitoring	• Monitor heart rate, blood pressure, respiratory rate.	
Extravasation	• Extravasation may cause tissue damage	

Information provided relates to Ketalar manufactured by Pfizer

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Owner Denise Leamy,Miriam Flynn Pharmacy Department CUH, Version 1 Updated May 2022.

Labetalol

CAUTION: High Administration Risk Rating	
Form	100mg per 20mL ampoule (Trandate)
Reconstitution	Already in solution
Compatibility & Stability	Glucose 5% Sodium chloride 0.9% & Glucose 5%
Administration	**IV Injection** Emergency use only. Use undiluted at a maximum rate of 50mg/min. Can be repeated every 5 minutes. The total dose should not exceed 200mg **Continuous IV infusion** • **Dilute to a concentration of 1mg/mL** Refer to IV Guideline for dilution Infuse the prescribed dosage using a rate-controlled infusion pump • **Dilute to a concentration of 5mg/mL:** **(Fluid restriction, unlicensed. Central line only)** Draw up 300mg (60mL) of labetalol into a syringe neat to give a 5mg/mL infusion. Adjust rate according to response. Usual infusion rate of up to 2mg/min.
Monitoring	• Monitor Blood pressure, heart rate, ECG, respiratory function.
Extravasation	• Extravasation may cause tissue damage. If a central venous access device is unavailable, administer via a large peripheral vein monitoring insertion site closely. Resite cannula at first signs of inflammation.
Additional Information	• Avoid upright position during and for 3 hours after intravenous administration

Information provided relates to Trandate® manufactured by RPH Pharmaceuticals.

This information has been summarised to act as a guide for those administering IV medication. The monograph should be used in conjunction with the drug data sheet and BNF for information on dose, adverse effects, cautions and contra-indications. Further information is available from pharmacy on 22142 or 22546.

Owner Denise Leamy,Miriam Flynn Pharmacy Department CUH, Version 1 Updated May 2022.

Lidocaine

Potential SALAD
Check **strength**. Also available as Lidocaine 1%

CAUTION: High Administration Risk Rating

Form	Lidocaine 2% (100mg per 5 mL) ampoules
Reconstitution	Already in solution
Compatibility & Stability	Glucose 5% Sodium Chloride 0.9%
Administration	**IV Injection** Give 50 - 100mg over 2 minutes and flush immediately with 20mL sodium chloride 0.9%. **IV Infusion** Infusions of 2mg/mL generally used, but up to 8mg/mL if fluid restricted. Preferably administer via a central venous access device to avoid potential venous irritation. If given peripherally, choose a large vein and monitor the injection site closely.
Monitoring	ECG monitoring is required.
Extravasation	Extravasation is likely to cause tissue damage due to acidic pH (<5).
Additional Information	Lidocaine products containing adrenaline or preservatives **must not** be given by IV injection.

- **For 2mg/mL solution (1g in 500mL)**

Add 50mL of 2% Lidocaine to 450mL of compatible infusion fluid to give 500mL of a solution containing 2mg/mL Lidocaine.

Dose mg/min	Rate mL/hour
1	30
2	60
3	90
4	120

- **For 4mg/ml solution (2g in 500mL)**

Add 100mL of 2% Lidocaine to 400mL of compatible infusion fluid to give 500mL of a solution containing 4mg/mL Lidocaine.

Dose mg/min	Rate mL/hour
1	15
2	30
3	45
4	60

- **For 8mg/ml solution (400mg in 50mL)**

Add 20mL of 2% Lidocaine to 30mL of compatible infusion fluid to give 50mL of a solution containing 8mg/mL Lidocaine. This may be used with a syringe pump in fluid restricted patients.

Dose mg/min	Rate mL/hour
1	7.5
2	15
3	22.5
4	30

This information has been summarised to act as a guide for those administering IV medication. The monograph should be used in conjunction with the drug data sheet and BNF for information on dose, adverse effects, cautions and contra-indications. Further information is available from pharmacy on 22142 or 22546.

Owner Denise Leamy,Miriam Flynn Pharmacy Department CUH, Version 1 Updated May 2022.

Magnesium Sulphate – ITU

Magnesium sulphate dosing may be weight based; ensure accuracy of documented weight before administration	
CAUTION: High Administration Risk Rating	
Form	1g (4mmol) per 2mL ampoule (50% w/v) equivalent to 2mmol Magnesium per 1mL
Reconstitution	Already in solution **MUST be further diluted before administration.**
Compatibility & Stability	Sodium Chloride 0.9% Glucose 5%
Administration	**IV Infusion (central)** Dilute 20mmol (10ml) in 100ml maintenance fluid, and administer over one hour.
Monitoring	• Monitor BP, respiratory rate and urinary output. • Use lowest possible rate to avoid bradycardia, flushing and hypotension. Rapid infusion may precipitate hypotension. Monitor for signs of overdose- loss of patellar reflexes, weakness, nausea, sensation of warmth, flushing, drowsiness, double vision, and slurred speech.
Extravasation	Extravasation is likely to cause tissue damage due to high osmolarity.
Additional Information	**For obstetric patients refer to CUMH guidelines or the Pharmacy Department** • 1 mmol = 2 mEq = 24 mg of elemental magnesium = 240 mg magnesium sulfate

Information provided relates to Magnesium Sulphate manufactured by Aurum Pharmaceuticals and Ethypharm.

This information has been summarised to act as a guide for those administering IV medication. The monograph should be used in conjunction with the drug data sheet and BNF for information on dose, adverse effects, cautions and contra-indications. Further information is available from pharmacy on 22142 or 22546.

Owner Denise Leamy,Miriam Flynn Pharmacy Department CUH, Version 1 Updated May 2022.

Midazolam - ITU

<table>
<tr><td colspan="2">Potential SALAD
Ensure selection of the correct strength of midazolam ampoule</td></tr>
<tr><td colspan="2">CAUTION: High Administration Risk Rating</td></tr>
<tr><td>Form</td><td>10mg in 5mL ampoule
10mg in 2mL ampoule
15mg in 3mL ampoule</td></tr>
<tr><td>Dose</td><td>Midazolam is usually prescribed as 'mg/hour' for adults when given by continuous infusion.
Usual initial dose 1-5mg, followed by maintenance usually up to 14mg/hr and above, titrated according to response.</td></tr>
<tr><td>Reconstitution</td><td>Already in solution</td></tr>
<tr><td>Compatibility & Stability</td><td>Sodium chloride 0.9%
Glucose 5%</td></tr>
<tr><td>Administration</td><td>IV Infusion
Administer using a syringe driver to control the rate of infusion.
Titrate dose to desired effect.

To prepare a 2mg/mL solution containing 120mg/60mL
<table>
<tr><th>Form</th><th>Preparation</th></tr>
<tr><td>10mg/5mL</td><td>Use neat ampoules</td></tr>
<tr><td>10mg/2mL
15ml/3mL</td><td>Draw up 120mg (24mL) and add 36mL infusion fluid.</td></tr>
</table></td></tr>
<tr><td>Antidote</td><td>• Flumazenil is a specific benzodiazepine antagonist and must be available to rapidly reverse respiratory depression when administering midazolam.</td></tr>
<tr><td>Extravasation</td><td>• Midazolam has a low pH and may cause venous irritation and tissue damage in cases of extravasation. If a central venous access device is unavailable, administer via a large peripheral vein monitoring insertion site closely. Re-site cannula at first signs of inflammation.</td></tr>
<tr><td>Additional Information</td><td>• Flumazenil is a specific benzodiazepine antagonist and must be available to rapidly reverse respiratory depression when administering midazolam.</td></tr>
</table>

Information provided relates to Hypnovel® manufactured by Cheplapharm

This information has been summarised to act as a guide for those administering IV medication. The monograph should be used in conjunction with the drug data sheet and BNF for information on dose, adverse effects, cautions and contra-indications. Further information is available from pharmacy on 22142 or 22546.

Owner Denise Leamy,Miriam Flynn Pharmacy Department CUH, Version 1 Updated May 2022.

Milrinone

Milrinone dosing is weight based; ensure accuracy of documented weight before administration

CAUTION: High Administration Risk Rating

Form

10 mg milrinone per 10 mL vial (1mg/mL)

Dose

Loading dose:
Recommended Loading Dose: 50 microgram/kg over 10minutes by slow intravenous injection, either undiluted or diluted.

Maintenance infusion:
Recommended Maintenance Dose: 0.375-0.75microgram/kg/min
Maximum total daily dose:1.13mg/kg/day.
See table below

Reconstitution

Already in solution

Compatibility & Stability

Sodium Chloride 0.9%
Glucose 5%
For single use, discard any unused solution.

Administration

IV Injection (Loading dose)
Loading dose of 50mcg/kg given over 10 minutes.
Usually followed by infusion. Dilute to 10mL with compatible fluid and give by slow injection over 10 minutes.

IV Infusion (Maintenance Dose)
Dilute milrinone 10mg (10mL) in 40ml of compatible fluid to give a final concentration of 0.2mg/ml (200mcg/mL), administer using a syringe pump.

Dose (mcg/kg/min)	**Patient's weight (kg)**							
	50	**60**	**70**	**80**	**90**	**100**	**110**	**120**
	Infusion rate in mL/hr							
0.375	5.6	6.8	7.9	9.0	10.1	11.3	12.4	13.5
0.400	6.0	7.2	8.4	9.6	10.8	12.0	13.2	14.4
0.500	7.5	9.0	10.5	12.0	13.5	15.0	16.5	18.0
0.600	9.0	10.8	12.6	14.4	16.2	18.0	19.8	21.6
0.700	10.5	12.6	14.7	16.8	18.9	21.0	23.1	25.2
0.750	11.3	13.5	15.8	18.0	20.3	22.5	24.8	27.0

Monitoring

- Monitor BP, ECG, heart rate.

Extravasation

- Extravasation is likely to cause tissue damage as the pH is less than 5. If a central venous access device is unavailable, administer via a large peripheral vein monitoring insertion site closely. Re-site cannula at first signs of inflammation.

Information relates to Milrinone manufactured by Wockhardt

This information has been summarised to act as a guide for those administering IV medication. The monograph should be used in conjunction with the drug data sheet and BNF for information on dose, adverse effects, cautions and contra-indications. Further information is available from pharmacy on 22142 or 22546.

Owner Denise Leamy,Miriam Flynn Pharmacy Department CUH, Version 1 Updated May 2022.

Morphine – ITU

Potential SALAD Use separate storage locations within the controlled drug cupboard such as different shelves for low strength products used for bolus administration and high strength products used to prepare infusions		
CAUTION: High Administration Risk Rating		
Form & Storage	60mg per 1mL ampoule as Morphine Sulphate	Controlled Drug (CD): Must be stored in CD Press
Reconstitution	Already in solution	
Compatibility & Stability	Sodium chloride 0.9% Glucose 5% Diluted solutions are stable for 24 hours.	
Administration	**IV Infusion** **Single strength (CITU)** Dilute 60mg (one ampoule) to 60mL with compatible fluid to form a 1mg/mL solution. **Double strength (GITU)** Dilute 120mg (two ampoules) to 60mL with compatible fluid to form a 2mg/mL solution. Administer using a syringe driver to control the rate of infusion. Titrate dose to desired effect.	
Monitoring	• Blood pressure and pulse, LFTs, pain score, renal function: U, Cr, CrCl (or eGFR, respiratory rate.	
Antidote	• Naloxone should be kept in all areas where opioids are administered.	
Additional Notes	• Patients taking opiates chronically may become tolerant and may require higher doses. • Elderly or frail patients may require lower doses, as may patients with renal impairment, as morphine will accumulate in renal dysfunction. • For bolus administration guidelines, please see regular IV guidelines administration document	

Information provided relates to Morphine Sulphate manufactured by Mercury Pharmaceuticals.

This information has been summarised to act as a guide for those administering IV medication. The monograph should be used in conjunction with the drug data sheet and BNF for information on dose, adverse effects, cautions and contra-indications. Further information is available from pharmacy on 22142 or 22546.

Owner Denise Leamy,Miriam Flynn Pharmacy Department CUH, Version 1 Updated May 2022.

Nimodipine

<table>
<tr><td colspan="3">Nimodipine dosing may be weight based; ensure accuracy of documented weight before administration</td></tr>
<tr><td colspan="3">CAUTION: High Administration Risk Rating</td></tr>
<tr><td>Form</td><td colspan="2">10mg/50mL Infusion bottle</td></tr>
<tr><td>Reconstitution</td><td colspan="2">Already in solution</td></tr>
<tr><td>Compatibility & Stability</td><td>Sodium Chloride 0.9%
Glucose 5%

• Incompatible with PVC
Use polyethylene or polypropylene syringes</td><td>Protect Infusion from light</td></tr>
<tr><td>Administration</td><td colspan="2"><u>IV Continuous Infusion</u>
Administer as a continuous IV infusion via a central catheter using an infusion pump.
Connect to a three-way stopcock using the infusion line provided.
The three-way stopcock should be used to connect the Nimodipine polyethylene tube with the co-infusion line and the central catheter. (The stopcock must allow for concomitant flow of the Nimodipine solution and a co-infusion solution.)

<table><tr><th colspan="2">Rate to run co-infusion fluid at</th></tr><tr><th>Nimodipine Rate</th><th>Rate of administration of co-infusion fluid</th></tr><tr><td>1mg/hour (5mL/hour)</td><td>20mL/hour</td></tr><tr><td>2mg/hour (10mL/hour)</td><td>40mL/hour</td></tr></table>
i.e. For every 5mL per hour of nimodipine infused 20mL per hour of a compatible fluid must be infused simultaneously to prevent formation of crystals.</td></tr>
<tr><td>Extravasation</td><td colspan="2">Extravasation is likely to cause tissue damage due to the presence of alcohol as an excipient and high osmolarity.</td></tr>
<tr><td>Monitoring</td><td colspan="2">Monitor BP and heart rate. Monitor renal function (including fluid balance) in patients with renal disease and/or receiving nephrotoxic drugs.
A transient rise in liver enzymes may occur during intravenous administration; this usually reverts to normal on completion of treatment.</td></tr>
<tr><td>Additional Information</td><td colspan="2">• IV infusions should not be used concurrently with Nimodipine oral tablets.
• Use only the infusion container and the infusion line provided by the manufacturer.
• Each 50 ml vial also contains 10 g of ethanol (0.2 g/ml)
• Prepare a fresh infusion if required once 10 hours has elapsed.</td></tr>
</table>

Information provided relates to Nimotop manufactured by Bayer

This information has been summarised to act as a guide for those administering IV medication. The monograph should be used in conjunction with the drug data sheet and BNF for information on dose, adverse effects, cautions and contra-indications. Further information is available from pharmacy on 22142 or 22546.

Owner Denise Leamy,Miriam Flynn Pharmacy Department CUH, Version 1 Updated May 2022.

Noradrenaline

<table>
<tr><td colspan="2">CAUTION: High Administration Risk Rating</td></tr>
<tr><td>Form</td><td>Ampoules containing 1mg /mL (1:1000) Noradrenaline as Noradrenaline tartrate.</td></tr>
<tr><td>Dose</td><td>Noradrenaline is usually prescribed as a “mcg/minute” dose for adults. The usual range is 0-30 mcg/minute titrated to desired effect. Doses outside this range (up to 80mcg/min) may be required in some patients.</td></tr>
<tr><td>Reconstitution</td><td>Already in solution. Further dilution is required before administration.</td></tr>
<tr><td>Compatibility & Stability</td><td>Glucose 5%
Diluted solutions are stable for 24 hours
Protect infusion from light</td></tr>
<tr><td>Administration</td><td>IV infusion through a central line
Use a syringe driver to control the rate of infusion.

Single Strength Noradrenaline
Add 3mg Noradrenaline (3mL) to 47ml Glucose 5% to give 50mL of a solution containing 60mcg/ml Noradrenaline.<table><tr><td>Infusion rate of 1mL/hr = 60mcg/hr = 1mcg/min</td></tr><tr><td>1mL/hr = 1mcg/min</td></tr><tr><td>2mL/hr = 2mcg/min</td></tr><tr><td>3mL/hr = 3mcg/min</td></tr></table>
Double Strength Noradrenaline
Add 6mg Noradrenaline (6mL) to 44mL Glucose 5% to give 50mL of a solution containing 120mcg/mL Noradrenaline.<table><tr><td>Infusion rate of 1mL/hr = 120mcg/hr = 2mcg/min</td></tr><tr><td>1mL/hr = 2mcg/min</td></tr><tr><td>2mL/hr = 4mcg/min</td></tr><tr><td>3mL/hr = 6mcg/min</td></tr></table>
Quadruple Strength Noradrenaline
Add 12mg Noradrenaline (12mL) to 38ml Glucose 5% to give 50mL of a solution containing 240mcg/mL Noradrenaline.<table><tr><td>Infusion rate of 1mL/hr = 240mcg/hr = 4mcg/min</td></tr><tr><td>1mL/hr = 4mcg/min</td></tr><tr><td>2mL/hr = 8mcg/min</td></tr><tr><td>3mL/hr = 12mcg/min</td></tr></table></td></tr>
<tr><td>Monitoring</td><td>• Arterial line monitoring is strongly recommended</td></tr>
<tr><td>Extravasation</td><td>• Avoid extravasation which can lead to necrosis of tissue.</td></tr>
<tr><td>Notes</td><td>• Infuse through a central venous catheter using a syringe driver to control the rate of infusion.
• Do not use if brown colour or precipitate is visible in solution.</td></tr>
</table>

Information provided relates to Noradrenaline manufactured by Hospira

This information has been summarised to act as a guide for those administering IV medication. The monograph should be used in conjunction with the drug data sheet and BNF for information on dose, adverse effects, cautions and contra-indications. Further information is available from pharmacy on 22142 or 22546.

Owner Denise Leamy,Miriam Flynn Pharmacy Department CUH, Version 1 Updated May 2022.

Phenylephrine

CAUTION: High Administration Risk Rating	
Form	10mg per 1mL ampoule
Reconstitution	Already in solution **Further dilute before administration**
Compatibility & Stability	Glucose 5% Sodium chloride 0.9%
Administration	Dilute 10mg (1mL of a 10mg/mL solution) to **100mL** compatible infusion fluid to give a 100 microgram/mL solution. **IV Injection** Usual IV bolus = 0.1mg-0.5mg**.** Withdraw the required amount from the prepared solution. Administer prescribed solution over 3-5 minutes. Injections should be repeated no more than every 15 minutes **Continuous IV Infusion** Peripheral or central IV route Initial maximum rate 180 microgram/minute, adjusted to 30-60 microgram /minute according to response, via rate controlled infusion pump or syringe pump.
Extravasation	• Extravasation may cause tissue necrosis. If a central venous access device is unavailable, administer via a large peripheral vein monitoring insertion site closely. Re-site cannula at first signs of inflammation.
Additional Information	• This concentration is also found in theatres.

Information provided relates to Phenylephrine manufactured by Beacon Pharmaceuticals.

This information has been summarised to act as a guide for those administering IV medication. The monograph should be used in conjunction with the drug data sheet and BNF for information on dose, adverse effects, cautions and contra-indications. Further information is available from pharmacy on 22142 or 22546.

Owner Denise Leamy,Miriam Flynn Pharmacy Department CUH, Version 1 Updated May 2022.

Potassium Chloride – ITU

CAUTION: High Administration Risk Rating		
Form & Storage	Potassium Chloride strong ampoules containing 2mmol potassium and 2mmol chloride per ml (20mmol potassium and 20mmol chloride per 10mL ampoule)	Concentrated potassium ampoules must be stored in the Controlled Drug press.
Reconstitution	Ampoules: Already in solution. **MUST be further diluted before administration.** Bolus injection can be **fatal**.	
Compatibility & Stability	Sodium Chloride 0.9% Glucose 5% (may cause a decrease in the plasma-potassium concentration)	
Administration	**Central IV Infusion ONLY** Dilute 20-40mmol (**10-20mL**) in 100mL maintenance fluid, and administer over 1-2 hours, with ECG monitoring. All potassium infusions must be thoroughly mixed before administration. If adding concentrated potassium to an infusion bag, it is essential to ensure careful and thorough mixing by inverting repeatedly as the potassium chloride solution is 'heavier' than the infusion fluid. ○ Rate control is essential. Administer using a rate-controlled infusion pump. ○ DO NOT EXCEED a rate of 20mmol per hour due to risk of asystole.	
Monitoring	• ECG monitoring required	
Extravasation	Because of risk of thrombophlebitis, solutions containing >30mmol/L should be given via the largest vein available.	
Additional Information	If magnesium levels are low, it may not be possible to correct potassium levels without first correcting magnesium.	

This information has been summarised to act as a guide for those administering IV medication. The monograph should be used in conjunction with the drug data sheet and BNF for information on dose, adverse effects, cautions and contra-indications. Further information is available from pharmacy on 22142 or 22546.

Owner Denise Leamy,Miriam Flynn Pharmacy Department CUH, Version 1 Updated May 2022.

Potassium Phosphate – ITU

CAUTION: High Administration Risk Rating		
Form & Storage	20mL ampoule containing 1mmol potassium(K^+) and 0.6mmol phosphate per mL (each ampoule contains 20mmol potassium, 12mmol phosphate)	Concentrated potassium ampoules must be stored in the Controlled Drug press.
Reconstitution	Already in solution **Further dilution is essential before administration**	
Compatibility & Stability	Sodium Chloride 0.9% Glucose 5%	
Administration	**<u>Central IV Infusion only</u>** Dilute 20-40mmol K^+ (**20-40mL**) in 100ml fluid, and administer over two hours.	
Monitoring	Monitor ECG, plasma potassium, phosphate and calcium concentrations closely when rate of intravenous potassium exceeds 20mmol per hour.	
Extravasation	• Venous irritation or phlebitis may occur at injection site where solutions contain more than 30mmol of potassium per litre. • Particular care should be taken to ensure that infusion is intravenous, since paravenous administration can lead to indurations and chalky deposits in the subcutaneous tissue.	
Additional Information	• If magnesium levels are low, it may not be possible to correct potassium levels without first correcting magnesium. • Ensure calcium level is within range first; if low, suggest supplementing prior to commencing phosphate. Otherwise, infuse at a slower rate (e.g. over 12 hours), and possibly a lower dose. See Potassium Phosphate in CUH IV Administration guidelines.	

Information provided relates to Potassium Phosphate manufactured by B Braun.

This information has been summarised to act as a guide for those administering IV medication. The monograph should be used in conjunction with the drug data sheet and BNF for information on dose, adverse effects, cautions and contra-indications. Further information is available from pharmacy on 22142 or 22546.

Owner Denise Leamy,Miriam Flynn Pharmacy Department CUH, Version 1 Updated May 2022.

CUH
Ospidéal Ollscoil Chorcaí
Cork University Hospital

Sodium Nitroprusside

Sodium Nitroprusside dosing is weight based; ensure accuracy of documented weight before administration

CAUTION: High Administration Risk Rating

Form

50mg/5mL powder and solvent for solution for injection

Reconstitution

Dissolve the contents of the vial with the solvent provided.
Dilute further before IV administration.
Protect from light using the tinfoil/opaque covering. .

Compatibility & Stability

Glucose 5%

Administration

Continuous intravenous infusion via a syringe pump.
Withdraw 50 mg (5 mL) from reconstituted vial and make up to 50 mL in a syringe pump with Glucose 5% to give a **1000micrograms/mL (1mg/mL) solution**.
The solution should be clear and may vary in colour from light brown, brownish-pink, light orange or straw.
Wrap the prepared syringe and infusion set immediately in foil/light-occlusive material.
Monitor the colour of the infusion periodically during administration and discard if discoloration has occurred.

Infusion rate in ml per hour **(mL/hr)** is:

Dose microgram/ kg/min	**Weight (Kg)**											
	45	**50**	**55**	**60**	**65**	**70**	**75**	**80**	**85**	**90**	**95**	**100**
0.5	1.4	1.5	1.7	1.8	2.0	2.1	2.25	2.4	2.6	2.7	2.9	3
1	2.7	3	3.3	3.6	3.9	4.2	4.5	4.8	5.1	5.4	5.7	6
1.5	4.1	4.5	5	5.4	5.9	6.3	6.8	7.2	7.7	8.2	8.6	9
2	5.4	6	6.6	7.2	7.8	8.4	9	9.6	10.2	10.8	11.4	12
2.5	6.8	7.5	8.3	9	9.8	10.5	11.3	12	12.8	13.5	14.3	15
3	8.1	9	10	10.8	11.7	12.6	13.5	14.4	15.3	16.2	17.1	18
3.5	9.5	10.5	11.6	12.6	13.7	14.7	15.8	16.8	17.9	18.9	20	21
4	10.8	12	13.2	14.4	15.6	16.8	18	19.2	20.4	21.6	22.8	24
4.5	12.2	13.5	14.9	16.2	17.6	18.9	20.3	21.6	23	24.3	25.7	27
5	13.5	15	16.5	18	19.5	21	22.5	24	25.5	27	28.5	20

Monitoring

- Monitor blood pressure continuously.
- Check the heart rate, acid-base equilibrium and blood concentration of cyanides. In the presence of renal and/or hepatic insufficiency, or when the treatment has lasted longer than 3 days or doses exceed 4 micrograms/kg/minute, the blood levels of cyanides and/or thiocyanates should be monitored. Monitor daily blood pH (cyanide toxicity includes acidosis)

Side-effects

- Nervousness, agitation, disorientation,headache, GI upset, Hypotension, ECG changes, palpitations, precordial pain, bradycardia.

Additional Information

- Protect from light, even during administration.
- Avoid abrupt discontinuation; withdraw gradually over 15-30 minutes.
- Contains sodium – care if patient on low-sodium diet.
- Nitroprussiat Fides® is entirely incompatible with other medicinal products

Information provided relates to Nitroprussiat Fides® manufactured by Meda Pharma SL

This information has been summarised to act as a guide for those administering IV medication. The monograph should be used in conjunction with the drug data sheet and BNF for information on dose, adverse effects, cautions and contra-indications. Further information is available from pharmacy on 22142 or 22546.

Owner Denise Leamy,Miriam Flynn Pharmacy Department CUH, Version 1 Updated May 2022.

Sodium Phosphate – ITU

Sodium phosphate dosing is weight based; ensure accuracy of documented weight before administration	
CAUTION: High Administration Risk Rating	
Form	20mL ampoule containing 1mmol sodium and 0.6mmol phosphate per mL (each ampoule contains 20mmol sodium, 12mmol phosphate)
Reconstitution	Already in solution **Dilute further before administration.**
Compatibility & Stability	Sodium Chloride 0.9% Glucose 5%
Administration	**IV Infusion (central)** Dilute 20ml ampoule in 100ml maintenance fluid, and administer over two hours
Monitoring	Serum phosphate, calcium and sodium should be regularly monitored.
Extravasation	Particular care should be taken to ensure that infusion is intravenous, since paravenous administration can lead to indurations and chalky deposits in the subcutaneous tissue.
Additional Information	• Unlicensed medication in Ireland. • Ensure calcium level is within range first; if low, suggest supplementing prior to commencing phosphate. Otherwise, infuse at a slower rate (e.g. over 12 hours), and possibly a lower dose.

Information provided relates to Natrium Phosphat® manufactured by B Braun.

This information has been summarised to act as a guide for those administering IV medication. The monograph should be used in conjunction with the drug data sheet and BNF for information on dose, adverse effects, cautions and contra-indications. Further information is available from pharmacy on 22142 or 22546.

Owner Denise Leamy,Miriam Flynn Pharmacy Department CUH, Version 1 Updated May 2022.

Thiopentone

CAUTION: High Administration Risk Rating	
Form	500mg as dry powder
Reconstitution	Add 20mL Water for Injection to reconstitute each 500mg vial.
Compatibility & Stability	Sodium chloride 0.9% Store reconstituted solution between 2ºC to 8ºC in an upright position and use within 7 hours.
Administration	**IV bolus** Administer bolus over 10-15 seconds via a central line. The dose may be further diluted with sodium chloride 0.9% before administration if desired. **Continuous IV infusion** Use three reconstituted 500mg vials (1500mg/60mL) and infuse via a syringe driver using a central line (local policy).
Extravasation	• Extravasation likely to cause local tissue necrosis. If a central venous access device is unavailable, administer via a large peripheral vein monitoring insertion site closely. Re-site cannula at first signs of inflammation

Information relates to Thiopental manufactured by Kyowa Kirin

This information has been summarised to act as a guide for those administering IV medication. The monograph should be used in conjunction with the drug data sheet and BNF for information on dose, adverse effects, cautions and contra-indications. Further information is available from pharmacy on 22142 or 22546.

Owner Denise Leamy,Miriam Flynn Pharmacy Department CUH, Version 1 Updated May 2022.

Vasopressin(Argipressin)

Embesin®

CAUTION: High Administration Risk Rating	
Form & Storage	Argipressin (synthetic vasopressin) 40 Units per 2mL ampoules — Stored in the fridge
Dose	Usually used at a low fixed dose of 0.01-0.04 units per minute for vasodilatory shock
Reconstitution	Already in solution
Compatibility & Stability	Sodium chloride 0.9% Glucose 5%
Administration	**Continuous IV Infusion** (treatment of vasodilatory shock) Add 2ml ampoule (40 Units) to 38mL compatible fluid to give a concentration of 1unit/mL, and administer through a **central line**, using a syringe pump to control the rate of infusion. **1unit/hr = 1mL/hr** 0.04units/min = 2.4units/hr = 2.4mL/hr
Monitoring	• Monitor blood pressure and heart rate.
Additional Information	• Administration through a central line is recommended for vasodilatory shock. • Please note this information is for treatment of vasodilatory shock only –other indications may require different doses and routes of administration.

Information relates to Embesin manufactured by Orpha-Devel

This information has been summarised to act as a guide for those administering IV medication. The monograph should be used in conjunction with the drug data sheet and BNF for information on dose, adverse effects, cautions and contra-indications. Further information is available from pharmacy on 22142 or 22546.

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Vecuronium

Vecuronium dosing is weight based; ensure accuracy of documented weight before administration		
CAUTION: High Administration Risk Rating		
Form & Storage	10mg powder for solution for injection	Store between 2-8°C. Do not freeze. Keep in outer carton.
Dose	80–100 micrograms/kg; (by intravenous injection) maintenance 20–30 micrograms/kg, adjusted according to response Usual range 0.8- 1.4mcg/kg/min	
Reconstitution	Reconstitute each vial with 5 mL Water for Injections to give 2 mg/mL solution	
Compatibility & Stability	Sodium chloride 0.9% Glucose 5%	
Administration	**IV injection** Bolus given over one minute **IV infusion (continuous)** Administered via syringe pump to control rate of administration. Dilute 50mg (25mL) with an equal volume of sodium chloride 0.9% or glucose 5% to give 50mg in 50mL (1mg in 1mL)	
Monitoring	Monitor blood pressure and heart rate	
Extravasation	• Extravasation is likely to cause tissue damage. The undiluted solution has a low pH. Preferably administer via a central venous access device to avoid potential venous irritation. If given peripherally, choose a large vein and monitor the injection site closely.	
Additional Information	• To avoid excessive dosage in obese patients, dose should be calculated on the basis of ideal body weight. Refer to Ideal Body Weight calculator on the microguide app. • Vecuronium should only be administered under the close supervision of an experienced anesthetist[1] with adequate facilities for endotracheal intubation and artificial ventilation.	

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