Quick Pocket Guide to Emergency Medication

Dose, Reconstitution and /or Dilution, Stability and Infusion rate

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Definition of term

Incompatibility: an undesirable physical or chemical reaction that occurs between the drug and the solution, container or another drug.

Formulation strength: the presentation of medicine with an amount of measured scale either in %, mg, gm, mmol, meq etc.

Prescribed dose: the amount of dose that is expected to be prescribed.

Y-site: compatibility/incompatibility of the medicine and/or diluents in the administration set close to the cannula insertion site.

Syringe: compatibility/incompatibility of the medicine and/or diluents in the syringe.

Admixture: compatibility/incompatibility of the medicine and/or diluents when added/mixed to the bag that contained the medicine.

Solution: diluents, usually fluid, used for reconstitution or dilution.

Abbreviation

AAU_____ ADDIS ABABA UNIVERSITY

CHS_____ COLLEGE OF HEALTH SCIENCE

DNS_____ dextrose 5% in normal saline 0.9%

DW5%_____ dextrose water 5%

IOP_____ intraocular pressure

KCL_____ potassium chloride

MgSO4_____ magnesium sulphate

NA_____ not available

NaHCO3 _____ sodium bicarbonate

NNN _____ not necessarily needed

NS_____ normal saline 0.9%

RT_____ room temperature

SWFI_____ sterile water for injection

TASH_____ TIKURANBESSA SPECIALIZED HOSPITAL

Disclaimer

These drug dilution, reconstitution, compatibility, storage and infusion rate guidelines are offered as a general summary of information for physicians, Pharmacist, nurses, and other health care professionals.

Inappropriate administration of drugs to patients can results in severe injury and death. These guidelines cannot identify medical risks specific to an individual patient's or recommend patient's treatment. These guidelines are not to be used as a substitute for professional education.

These guidelines are not necessarily all inclusive. Use of these guidelines indicates acknowledgement that neither publishers nor the authors will be responsible for any loss or injury, including death, sustained in connection with, or as a result of the use of these guidelines.

Readers should consult the complete information available in the package insert for each agent indicated before administering the medications. Future medical advances or product information may affect or change the information provided. Health professionals using these guidelines are responsible for monitoring ongoing medical advances related to drug therapy.

Preface

The following guidelines which cover the common drugs used in emergency departments for adults only. This quick reference is produced to standardize the practice among health professionals in TIKUR ANBESSA SPICIALIZED HOSPITAL emergency department as well as for other health setting who use the same guideline.

Use of standard guidelines assists in preventing drug administration errors and aids in the handover of patients. They do not preclude the infusion of other drugs or use of other concentration, if these are required in individual patients.

Our aim is to provide comprehensive information regarding both injectable and oral medication that needs dilution with compatible diluents prior to administration.

It remains the responsibility of every professional to evaluate the appropriateness of a particular opinion or therapy in the context of actual clinical situation and with due consideration of any new developments in the fields. The use of this manual requires knowledge-based interpretation by health care professionals and is intended solely for use by nurses in the health care facilities.

All information contained in this manual has been provided with the sole intent that is readily accessible for nurses' information and as a guide for conducting dilution, and/reconstitution of drugs with compatible diluents, storage, and infusing with proper rate, for prescribed medication that needs infusion.

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Introduction

To promote and ensure the quality use of antimicrobials and other medications, many strategies have been implemented. Nevertheless, dilution of drugs with compatible diluents, keeping the stability by appropriate storage, and infusing with the proper infusion rate is an essential part to ensure that patient's receive the optimum therapy.

The overall presentation of the guideline is in table form, to make it easier to search for the required drug for the professionals. When we calculate the infusion rate for certain medications, it is pertinently required that we assume the patient's weight is an average adult weight of 60kg.when there is individual dose adjustment required, use of the formula that is displayed below the table is expected, as calculating the infusion rate by each individual patients makes the guideline complex and not easily accessible.

The compatibility is assumed that medicines and diluents meet in the administration set close to the cannula insertion site(Y-site) or on the syringe. The guideline is referenced well; inappropriateness in reviewing this guide is what is expected from every professional using these guidelines.

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Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Adrenaline (Epinephrine)	1MG/ML AMPOULE (1:1000)	IV injection	Given undiluted	**Recurrent Ventricular Fibrillation/Tachycardia:** 1mg every 3-5 min., If this fails higher dose up to 0.2mg/kg may be indicated.	NNN	24 hrs(light resistant container, RT)
		IV infusion	**Dilute 1 mg in 1,000 mL** titrate based on response to **1-5mg solute in 250ml solvent**	**CPR (Cardiac Arrest)** Infuse at a rate of 1mcg/minute, increased to 3-4mcg/minute as needed.	20 drops/min for 1mcg/min in 1mg/1000ml. For 1-5mg/250ml&different infusion rate*	
				Bradycardia: initially 1mcg/minute with response ranges from 2-10 mcg/minute.	20 drops/min for 1mcg/min in 1mg/1000ml. For 1-5mg/250ml&different infusion rate*	

* Calculate based on the formula displayed.

NB: Infusion rate (drop/min) = Dose (micrograms/minute) x 20(drop factor)
Concentration (micrograms/mL)

NB: Infuse via a central line to reduce the risk of extravasations and ensure good bioavailability.

- **IV incompatibilities**
  - **Solution :** NA
  - **Admixture :** aminophylline,Na-bicarbonate, halogens, nitrates, nitrites and salts of iron, copper and zinc
  - **Syringe :**Na-bicarbonate
  - **Y-site :**ampicillin,thiopental
  - **Not specified :**atropine,carbenicillin,diazepam,erythromycin,lidocaine
- **IV compatibilities**
  - **Solution :**NS,DW5% ,RL ,DNS
  - **Admixture::** amikacin,cimetidine,dobutamine,furosemide,verapamil
  - **Syringe** :heparin
  - **Y-site:** amiodarone,calciumgluconate,dopamine,dobutamine,fentanyl,heparin ,hydrocortisone,sodiumsuccinate,labetalol,morphinesulphate,nitroglycerin,norepenephrine ,vitamin-k.
  - **Not specified :**meperidine (active form of pethidine)

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Adenosine	3MG/ML IN 2 ML AMPOULE FOR INJECTION	IV injection	Given undiluted	**paroxysmal supraventricular tachycardia (PSVT):** **Initial does:** 3mg as a bolus **Second dose:** If the first dose does not result in elimination of PSVT within 1-2 min., 6mg given as a bolus. **Third dose:** if the second dose does not result in elimination of PSVT within 1-2 min., 12mg given as a bolus. Additional doses are not recommended.	Over 2 seconds.	Use immediately

- To ensure the drug reaching the systemic circulation, inject directly into a vein. If given through an IV line, inject as closely as possible to the patient's venous access, then follow each dose with a rapid flush of 20ml of 0.9% NS, RL, 5% DW. Must not be mixed with other medicinal products.

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Alteplase	10MG/10ML 20MG/20ML 50MG/50ML POWDER FOR INJECTION	IV injection	reconstitute 10mg with 10mL reconstitute 20mg with 20mL Reconstitute 50mg with 50mL.To a final conc. of 1MG/ML	NNN	NNN	Use immediately
		IV infusion	The reconstituted solution may be diluted further to a final concentration of not less than 0.2mg/1mL.which Means is that 1mg/ml reconstituted solution should further diluted with 5ml solvent.	**ACUTE ISCHAEMIC STROKE** Initially, administer 0.09mg/kg or 10% of the dose (0.9mg/kg) rapidly. Then 0.81 mg/kg or 90% 0f the dose (0.9mg/kg) (maximum dose 90 mg).	Initially Over 1 min followed by over 1 hr.	
				MYOCARDIAL INFARCTION 3-Hr Infusion (60 mg, 6-10 mg ,20 mg)	**3-Hr Infusion** 60mgDuring the first hr, 6-10mg over 1-2 min.,& 20mg the next 2 hrs. **Accelerated**	

				Accelerated Infusion: (15 mg, 50 mg , 35 mg)	**Infusion:** 15mg over 1-2 min., 50mg over the next 30 min.,&35mg next hr.	
				PULMONARY EMBOLISM: 100 mg	over 2 hrs	

- **Incompatibility**
  - **Solution :DW5%**
  - **Admixture:** dopamine HCL,dobutamine HCL, heparin sodium
  - **Y-site:** nitroglycerin, dopamine HCL,dobutamine HCL

- **Compatibility**
  - **Solution ::** NS 0.9%
  - **Admixture :**LidocaineHCl, Morphine Sulfate, Nitroglycerin
  - **Y-site :** propranololHCL,metoprololtartrate,lidocaine

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/reconstitution
Amikacin	100MG/2ML 500MG/2ML VIALS	IV injection	100mg in 2mL preparation can be given undiluted, or diluted with 10-20ml, to a final Min.conc.of 5mg/ml& max.conc.of 10mg/ml;this will also aid slow administration.Due to extreme osmolarity of the 500mg in 2mL preparation always dilute dose before administration with 10-20ml, to a final min. conc. Of 25mg/ml.& Max conc. of 50mg/ml.	**Serious infections (bone, respiratory tract, endocarditis, and septicemia)** 15-20 mg/kg once daily. In normal renal function. 5 mg/kg TID or 7.5 mg/kg BID. *	Over 2 to 3 min.,	24 hrs(RT) or 48 hrs refrigerated.
		IV infusion	Dilute the required dose in 100ml of solvent	**Meningitis (pseudomonas aeruginosa)** 5mg/kg/day with another bactericidal drug.**Hospital acquired pneumonia** 20mg/kg/day with carbapenem.	Over 30-60 min.,	

*there are a condition in which amikacin require dose adjustment in renal impairment patients.

NB: Amikacin solution may change from colorless to pale yellow but this does not indicate loss of potency.

- **IV incompatibilities**
  - **Solution :** NA
  - **Admixture :** aminophylline in dextrose-containing diluents,ceftazidime,heparin,phenytoin,thiopental,vitaminB complex &vitamin C
  - **Syringe :** heparin
  - **Y-site :**azithromycin,propofol
- **IV compatibilities**
  - **Solution :**compatible for most of common solvents(NS,DNS,DW5% &RL)
  - **Admixture :**aminophylline with RL,NS,ceftiaxone,ciprofloxacillin,clindamycin,fluconazol,furosemide,metronidazol,vancomycin, KCL,NaHCO3,promethazine,verapamil,hydrocortisone sodium succinate,and phosphate,norepinephrine,epinephrine,vitamin-K.
  - **Syringe** :clindamycin
  - **Y-site :**amiodarone,fluconazol,furosemide,MgSO4,morphine,ondansetrone,pethidine

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/reconstitution
Aminophylline	250MG/10 ML AMPOULE	IV injection	Dilute the dose to 100ml.To a final conc. Of 2.5mg/ml.	IV infusion is preferable	NNN	24 hrs(RT)
		IV infusion	Dilute the dose to a final conc. of 1mg/ml. Meaning 250mg/10ml dose with 250ml solvent.	**Asthma (bronchodilator)** 10 mg/kg (up to 300 mg) daily in divided doses (usually 8 hrs), with titration up to a usual maximum dosage of 800 mg daily in divided doses (every 6-8 hrs).	Over 20-30min with maximum rate of infusion 0.36mg/kg/ minute	

NB: IM administration is not recommended

- **IV incompatibilities**
  - **Solution :** NA
  - **Admixture:** clindamycin,dobutamine,epinephrine,erythromycin,meperidine,morphine,norephinephrine,vancomycin,vitamin B complex with C,ceftriaxone,cefepimeHCL,ciprofloxacin,hydralazin.
  - **Y-site:** amiodarone,dobutamine,ciprofloxacin,hydralazine.
  - **Not specified :** tetyracyclline,carbencillin
- **IV compatibilities**
  - **Solution :** NS,DW5%
  - **Admixture**:Calciumgluconate,dopamine,esmolol,heparin,hydrocortisone,lidocaine,nitroglycerin, KCL,$NaCO_3$,verapamil,cimetidine,flumazenil,meropenem,hydrocortisone sodium succinate.
  - **Syringe** :heparin, pentobarbital
  - **Y-site :** ampicillin,cefazolin,esmolol,heparin,KCL,vitamin B complex with C,meropenem,fluconazol,cimetidine,ceftazidime.
  - **Not specified:** diazepam

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Amiodarone hydrochloride	50MG IN 1ML(150MG IN 3ML) 30MG IN 1ML (300MG IN 10ML) AMPOULE.	IV injection	Use the 300mg in 10mL preparation (pre-filled syringe or ampoule) without further diluting. If these are not available; the 150mg in 3mL preparation can be used, Preferably by diluting the dose to 10mL with glucose 5%.However, 300mg in 6mL can be used without further dilution if necessary.	NNN **NB:** Preferably best if it could be administer as an infusion for the below case scenario.	Over a minimum of 3 min., preferably 10 to 20 min.,	24 hrs(RT)
		IV infusion	**Central administration**: ***Loading dose:*** Dilute 300mg amiodarone to 50mL. **Continuation infusion**; Dilute each 300mg amiodarone to 50mL. For doses greater than 300mg multiples of these syringes may be used. E.g. for a 900mg dose use 3 x (300mg in 50mL). **Peripheral administration: loading dose**: Dilute 300mg amiodarone to 250mL. **Continuation infusion**; Add the required dose to 500mL E.g. 900mg in 500mL.	**Ventricular Arrhythmias Load:** initial 150 mg Followed by 360 mg **Maintenance** 540 mg **Acute Atrial Fibrillation** 125 mg/hr (max 3 g for a total of max.24hrs).	**Loading dose:** over 10min.,& Over 6 hrs. **Maintenance dose:** over 18-24 hrs.	

- **IV incompatibilities**
  - **Solution :** NA
  - **Admixture :** floxacillin,quinidine
  - **Syringe :** heparin
  - **Y-site :** aminophylline,cefazolin.ceftazidime,heparin,digoxin,furosemide,NaHCO3
- **IV compatibilities**
  - **Solution:** DW5%„NS 0.9%
  - **Admixture :** dobutamine,furosemide,lidocaine,KCL,verapamil
  - **Y-site:** atropine,ciprofloxacillin,clarithromycin,dobutamine,dopamine,epinephrine , erythromycin, esmolol, fentanyl, fluconazol, gentamcin, lidocaine, MgSO4, morphine , nitroglycerin, norephinephrine, KCL, vancomycin.

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/reconstitution
Artesunate	60MG POWDER FOR RECONSTITUTION WITH ONE AMPOULE (1ML) OF 5% SODIUM BICARBONATE SOLUTION.	IV injection	**Reconstitute** the contents of 60mg vial with 1ml sodium bicarbonate 5% solution, provided. Shake for 2-3 min.,Then, **Dilute** with 5ml, to make a maximum final conc. of 10mg/ml. With SWFI. Gently swirl for 5 to 6 min., to mix.	2.4 mg/kg/dose initially, Followed by 2.4 mg/kg/dose **at 12 hrs,24 hrs,** and **48 hrs** after the initial dose for a total of 4 doses over a period of 3 days	3-4mL (30-40mg artesunate) per minute.	Use immediately

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Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Calcium gluconate	CALCIUM GLUCONATE 10% (1GM/10ML)(2.2 MMOL OR 4.4 MEQOF CALCIUM IN 10ML) AMPOULE	IV injection	Given undiluted.	**Acute,symptomatic hypocalcaemia:** Initially4.65-9.3 mEq(10-20 mL)	over 10 min.,	24 hrs(RT)
		IV infusion	Dilute each 10mL of calcium gluconate 10% to 100mL.To make a final conc. of 10mg/ml.	followed by 27-36 mEq(58-77 mL)	50ml/hr	

- **IV incompatibilities**
  - **Admixture: d**obutamine ,methylprednisolone sodium succinate
  - **Y-site :**ampicillin,NaHCO3,fluconazol,lansoprazol
  - **Not specified:** clindamycin,tetracyclin
- **IVcompatabilities**
  - **Admixture:** aminophylline,dopamine,heparin,hydrocortisone,lidocaine,norepinephrine,KCL ,vancomycin,verapamil
  - **Y-site:** cefazolin,dobutamine,epinephrine,heparin,KCL,ciprofloxacin,
  - **Not specified:** erythromycin
  - **Solution**: 5%DW,NS,DNS,RL
- **NB:** do not mix in the same bag or line with carbonate, phosphate, sulfate, and tartarate, because of precipitation.

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/reconstitution
Cefepime	500MG (AS SODIUM SALT) VIALS, 1G (AS SODIUM SALT) VIALS 2G (AS SODIUM SALT).	IM injection	Reconstitute vials containing 500mg with 2mL water for injections. Reconstitute vials containing 1g with 4mL water for injections. Reconstitute vials containing 2g with 10mL water for injections. To a final conc. Of 250mg/ml.	**Mild to Moderate Uncomplicated or Complicated UTIs:** 0.5-1 g IV/IM BID for 7-10 days **Empiric Therapy in Febrile Neutropenic Patients**: 2 g IV TID for 7 days or until neutropenia resolves.	NNN	24hrs (RT) 7days(2-8^{0}C)
		IV infusion	Withdraw the required dose and further dilute in 50-100mL.	**Moderate to Severe hospital acquired Pneumonia :**1-2 g IV BID for 10 days **Severe Uncomplicated or Complicated UTIs :**2 g IV BID for 10 days	Over 30 min.,	

NB: color of cefepime solution may darken on storage; however, product potency is not adversely affected.

- **IV incompatibilities**
  - **Admixture:** aminophylline,gentamicine,tobramycin
  - **Y-site:** chlordiazepoxide,chlorpromazine,cimetidine,ciprofloxacillin,diazepam,diphenhydramine,dobutamine,dopamine,haloperidol,MgSO4,mannitol,pethidine,metoclopromide,morphine , promethazine.
- **Iv compatabilities**
  - **Admixture :**amikacin,clindamycin,heparin,metronidazole,KCL,theophylline,vancomycin
  - **Y-site:** calcium gluconate, dexamethasone, fluconazole, metronidazole, propofol, sodium bicarbonate.hydrocortisone sodium succinate and hydrocortisone sodium phosphate.furosemide.
  - **Solution :**5%DW, NS,SWFI,DNS,lidocaine 1%

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Cefotaxime	500MG (AS SODIUM SALT) VIALS, 1G (AS SODIUM SALT) VIALS 2G (AS SODIUM SALT).	Iv injection & IM injection	Reconstitute vials containing 500mg with 2mL water for injections. Reconstitute vials containing 1g with 4mL water for injections. Reconstitute vials containing 2g with 10mL water for injections. To a final conc. of 250mg/ml.	**Uncomplicated Infections*** IV or IM: 1 g BID **Moderate to Severe Infections*** IV or IM: 1-2 g TID	Over 3-5 min.,	Use immediately
		Iv infusion	Withdraw the required dose and further dilute in 40-100mL.	**Severe or Life-threatening Infections*** IV: 2 g QID-TID For life threatening infections, 2 g every 4 hrs.	Over 20-60 min.,	

* Peritonitis, Meningitis, Pneumonia, Pyelonephritis, Septicemia, Sepsis, Urinary Tract Infection.

- **IV incompatibilities**
  - **Admixture:** aminoglycoside,aminophylline,$NaHCO_3$,
  - **Syringe:** doxapram
  - **Y-site:** fluconazol,gemcitabine,pentamidine,azithromycin
- **Iv compatabilities**
  - **Admixture :**Metronidazole infusion, acyclovir, heparin, morphine sulphate,midazolam,clindamycin
  - **Solution :**5%DW, NS,SWFI
  - **Y-site:** $MgSo_4$,morphine,pethidine propofol

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Ceftriaxone	500MG,IGM (AS SODIUM SALT) POWDER FOR RECONSTITUTION	IM injection	Reconstitute 500mg with 2ml, and 1gm with 4ml. To a final con. Of 250mg/ml.	The same indication, with same dosage range with that of IV Injection.	NNN	24hrs (RT with SWFI) 10days (2-8 °C) withlidocaine 1%)
		IV injection	Reconstitute 500mg with 5ml, and 1gm with 10ml.To a final con. Of 100mg/ml.	Pneumonia, Septicemia, Bacterial Infection, UTI, bronchitus, Intraabdominal Infection, Meningitis, Pelvic Inflammatory Disease, 1-2 g once daily or BID. Duration 4 to 14 days. For other indication going through reference is expected, however*	over 2 to 4 min.,	6hrs(RT) 24hrs(2-8 °C)
		IV infusion	Withdraw the required dose and further dilute with 50-100ml.	NNN prescribed for IV infusion administration.	over 30 min.,	6hrs(RT) 24hrs(2-8 °C)

* **General Adult Dosage: IV or IM** 1-2 g once daily or BID.

- **IV incompatibilities**
  - **Admixture**: aminophyllin,clindamycin,theophylline,metronidazol,linezolid
  - **Y-site;** fluconazol,labetalol,vancomycin
  - **Solution:** RL
  - **Syringe:** lidocaine
  - **General:** calcium containing drugs
- **IV compatibilities :**
  - **solution**: DNS,NS,DW5%,SWFI,lidocaine 1%

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Ceftazidime	500MG,1GM (AS*PENTHAHYDRATE*) POWDER FOR RECONSTITUTION	IM injection	Reconstitute 500mg with 2ml, and 1gm with 4ml.To a final con. Of 250mg/ml.	**Less Severe Infections*:** 1 g TID-BID.	NNN	3 hrs (RT) 3 days(2-8°C)
		IV injection	Reconstitute 500mg with 5ml, and 1gm with 10ml.To a final con. Of 100mg/ml.	**Severe or Life-threatening Infections*** 2 g TID especially in immuno-compromised patients **Febrile Neutropenic Patients** 100 mg/kg/day in 3 divided doses or 2 g TID either alone or in conjunction with an aminoglycoside (amikacin, gentamicin, tobramycin has been used.	Over 3-5 min.,	12 hrs(RT) 3 days(2-8°C)
		IV infusion	Withdraw the required dose and further dilute with 50-100ml.	NNN prescribed for IV infusion administration.	over 20 to 30 min.,	12 hrs(RT) 1 days(2-8 oc)

*Pyelonephritis, Urinary Tract Infection. Intra-abdominal and Gynecologic Infections, Meningitis, Respiratory Tract Infections.

- **IV incompatibilities**
  - **Admixture**: amikacin,aminophyllin,ciproflaxacillin,gentamycin,rantidine
  - **Y-site;** amiodarone,azithromycine,clarithromycin,fluconazol
- **IV compatibilities :**
  - **solution:** DNS,NS,DW5%,RL,SWFI

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Cefuroxime Sodium	250MG, 750MG, 1.5G POWDER FOR RECONSTITUTION.	IV injection	Dilute 250mg in 2mL. 750mg in 6mL, 1.5g in 12mL. To a final conc. Of 125mg/ml.	**General Adult Dosage indications *** 750-1.5 g TID for 5-10 days.	over 3-5 min.,	Used immediately
		IV infusion	Dilute the required dose to 50mL.	**Life-threatening Infections or Those Caused by Less Susceptible Organisms *** 1.5 g QID.	over 30 min.,	

***** Meningitis, Respiratory Tract Infections, Urinary Tract Infections (UTIs)

- **IV incompatibilities**
  - **Admixture: a**minoglycoside,ciprofloxacillin,NaHCO3
  - **Syringe:** doxapram
  - **Y-site:** azithromycin,clarithromycin,fluconazol,midazolam,vancomycin
- **Iv compatabilities**
  - **Admixture :**clindamycin,floxacillin,furosemide,gentamicin,metronidazole
  - **Solution :**5%DW, NS,SWFI
  - **Y-site**: amiodarone,dilitiazem,morphine,ondasetrone,propofol

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Ciprofloxacin	BAGS CONTAINING CIPROFLOXACIN 2MG IN 1ML (AS LACTATE) SOLUTION FOR INFUSION	IV infusion	Given undiluted	**Mild to Moderate Infections *** 400 mg IV BID for ≥4-6 weeks. **Severe or Complicated Infections *** 400 mg IV TID for ≥4-6 weeks. **Mild to Moderate UTIs and Prostatitis**200 mg IV BID for 7-14 days. **Complicated UTIs and Prostatitis**400 mg IV BID for 7-14 days.	30 min.,	Immediate use

***** Meningitis and CNS Infections, Intra-abdominal Infections, Endocarditis, Infectious Diarrhea, Shigella Infections, Travelers' Diarrhea, Respiratory Tract Infections, Empiric Therapy in Febrile Neutropenic Patients(400 mg TID has been used in conjunction with IV piperacillin (50 mg/kg every 4 hrs, not to exceed 24 g/daily or 300 mg/kg daily) duration 7–14 days.)

NB: IV infusions should be given into a large vein to minimize discomfort and reduce the risk of venous irritation. If a Y-type administration set is used, the other IV solution flowing through the tubing should be discontinued while ciprofloxacin is being infused.

- **IV incompatibilities**
  - **Admixture:** aminophylline,amoxicillin-clavulanate,ceftazidime,cefuroxime,clindamycin,$NaHCO_3$,heparin,
  - **Y-site:** aminophylline,azithromycin,cefepime,dexamethasone,furosemide,heparin,hydrocortisone , $MgSO_4$, methylprednisolone, phenytoin, $NaHCO_3$.
- **Iv compatabilities**
  - **Admixture:** amikacin,dobutamine,dopamine,fluconazol,gentamicin,lidocaine,metronidazole,KCL
  - **Solution :**5%DW, NS,SWFI
  - **Y-site**: amiodarone , calciumgluconate, clarithromycin, digoxin, dobutamine, dopamine, promethazine

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Clindamycin	300MG IN 2ML, 600MG IN 4ML	Intermittent and continuous iv infusion.	Dilute 300mg and 600mg doses with 50mL, 900mg with 50-100mL and 1200mg with 100mL. To a final conc. of 6mg/ml, 12mg/ml, 9-18mg/ml respectively. **NB:** The concentration of Clindamycin once diluted should not exceed 18mg in 1Ml.	**General Adult Dosage** **>Serious Infections *** IV or IM: 600 mg to 1.2 g daily in 2-4 equally divided doses. **>More Severe Infections *** IV or IM: 1.2-2.7 g daily in 2-4 equally divided doses. For life-threatening infections, dosage may be increased up 4.8 g daily.	Over 10–60 min., and at a rate ≤30 mg/minute.	24 hrs (RT)

*Gynecologic Infections, Anthrax, Pneumocystis jiroveci (Pneumocystis carinii) Pneumonia,Bacterial Endocarditis.Treatment of Severe P. falciparum Malaria (10-mg/kg IV loading dose followed by 5 mg/kg IV every 8 hrs; when oral therapy is tolerated, switch to oral clindamycin 20 mg/kg daily in 3 divided doses and continue for a total duration of 7 days in conjunction with IV quinidine gluconate (followed by oral quinine sulfate) given for a total duration of 3–7 days).

NB: Clindamycin phosphate ADD-Vantage vials and the commercially available Clindamycin phosphate injection in 5% dextrose should be used only for IV infusion.

- **IV incompatibilities**
  - **Admixture:**aminophylline,ceftriaxone,ciprofloxacillin,gentamicin,cefazolin
  - **Y-site:** azithromycin,fluconazol
  - **Syringe:** tobramycin
- **Iv compatabilities**
  - **Admixture:** amikacin,cefazolin,cefepime,cefotaxime,cefoxitin,ceftazidim,cefuroxime,cimrtidine,fluconazol , gentamycin, heparin, hydrocortisone, methylpredinsolone, metronidazole, KCL, verapamil.
  - **Solution :**5%DW, NS,SWFI
  - **Y-site**: : amiodarone,esmolol,heparin,morphine,ondasetrone,propofol,
  - **Syringe:** amikacin,aztreonam,gentamicin,heparin

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Co-amoxiclav (Augmentin®)	600MG POWDER FOR RECONSTITUTION 1.2G POWDER FOR RECONSTITUTION	IV injection	Reconstitute 600mg (500/100mg) with 10mL water for injection; Reconstitute 1.2g (1000/200mg) with 20mL water for injections, to a final conc. Of 60mg/ml.	**Standard dose** 1000 mg/200 mg TID. **To stop infections during and after surgery** 1000 mg/200 mg before the Surgery when you are given your anesthetic. The dose varies on the type of operation performed.	over 3-4 min.,	Used immediately
		IV infusion	Add the 600mg (500/100mg) reconstituted solution to 50mL and 1.2g (1000/200mg) reconstituted solution to 100mL to a final conc. of 12mg/ml.	If recommended administer with the dilution and rate displayed in the respective column.	over 30-40 min.,	

- **IV incompatibilities**
  - **Admixture:** aminoglycoside, ciprofloxacin
  - **Solution::** 5%DW
  - **Y-site:** midazolam hydrochloride
- **Iv compatabilities**
  - **Solution :**, NS,SWFI,RL

D

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/reconstitution
Dobutamine	READY TO USE INFUSION VIAL: 250MG IN 50ML (5MG IN 1ML). & PREPARATIONS WHICH REQUIRE DILUTION BEFORE USE: AMPOULE 250MG IN 20ML (12.5MG IN 1ML).	Continuous IV infusion	Preferably use the 250mg in 50mL preparation which does not require further dilution. If this preparation is unavailable dilute the 250mg in 20mL preparation to 1 liter, 500ml, 250ml, &50mL. To a final conc. of 0.25mg/ml, 0.5mg/ml,1mg/ml and 5mg/ml respectively.	**Cardiac Decompensation and Shock, CPR, MI:** 2-20 mcg/kg per minute.	**Example** for2.5 mcg/kg/min is 1 drop/min., assumed for 60kg patients with a formulation of250mg/50 ml.	24 hrs (RT)

NB: Infusion rate (drop/min) = $\frac{\text{Dose (micrograms/kg/minute) x patient weight (kg) x 20(drop factor)}}{\text{Concentration (micrograms/ml)}}$

- **IV incompatibilities**
  - **Admixture:**aminophylline,calciumgluconate,digoxin,insulin,MgSo4,phenytoin,NaHCO3,alteplase, furosemide
  - **Solution:** NaHCO3 5%
  - **Y-site:** aminophylline,cefepime,heparin,furosemide,vitamin-K,thiopental
- **Iv compatabilities**
  - **Admixture:**amiodarone,atropine,ciprofloxacin,dopamine,epinephrine,flumazenil,hydralazine,lidocaine ,meperidine,morphinesulphate,verapamil,nitroglycerin
  - **Solution :**5%DW, NS,SWFI,RL,DNS
  - **Y-site**: : amiodarone,calcium gluconate,ciprofloxacillin,diazepam,dialtiazim,dopamine,epinephrine,fentanyl,lidocaine,MgSo4 , morphine sulphate,norephinephrine,KCL,propofol,verapamil.
  - **Syringe:** heparin

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Diazepam	AMPOULES CONTAINI N-G 10MG IN 2ML.	IV injection:	Given without dilution by slow IV injection at a maximum rate 1mL per minute (1mL = 5mg) into a large vein.	**Anxiety Disorders** Initially, 2-5 mg IV for moderate or 5-10 mg IV for severe acute anxiety; may repeat in 3-4 hrs. **Alcohol Withdrawal** initially 10 mg IV then 5-10 mg every hr if necessary, although an interval of 3-4 hrs. **Seizure Disorders** Initially, 5-10 mg IV/IM May repeat at 10- to 15-minute intervals, to a maximum total dose of 30 mg. **Sedation in Critical-Care Settings**: 0.03-0.1 mg/kg as an intermittent injection every 0.5-6 hrs.	Over 3- 5 min.,	6hrs(RT)
		Continuous infusion:	Dilute 10mg (2mL) preparation, in 200mL of infusion solution. To a final conc. of 0.05mg/ml.& dilute 40mg (8mL) preparation, in 500mL of infusion solution. To a final conc. Of 0.08mg/ml. **There is a risk of precipitation; care on dilution.**	IF recommended administer with the dilution and rate displayed. In the respective column.	1ml/min	

- NB: Some clinicians recommend IV administration of a dilute solution to avoid extravasation; however, manufacturers do not recommend this method of administration, since precipitation may occur.May be administered as deep IM injection; however, absorption may be slow and erratic IM route is rarely justified.

❖ **IV incompatibilities**

- **Admixture :**dobutamin,furosemide
- **Solution:** RL
- **Y-site:** cefipime,fluconazol,heparin,hydrocortisone,meropenem,propofol,KCL
- **Not specified:** atropine,epinephrine,lidocaine,meperidine,morphine,norephinephrine,NaHCO3

❖ **Iv compatabilities**

- **Admixture :**verapamil
- **Solution :**5%DW, NS,SWFI,RL
- **Y-site**: fentanyl,morphine sulphate
- **Syringe: c**imetidine

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Digoxin	500MICROGRAMS(0.5MG) IN 2ML (AMPOULES)	IV injection	Given either Undiluted or Dilute 1 part Digoxin with at least 4 parts of suitable diluents **N.B. The use of less than a 4-fold dilution could lead to precipitation of Digoxin.**	**CHF, Loading Dose * initial** dose of 400-600 mcg (0.4-0.6 mg) IV additional doses of 100-300 mcg (0.1-0.3 mg) IV at 6- to 8-hr intervals.	over ≥5 min., **N.B. when administering as an emergency loading dose the BNF recommends an infusion duration of at least 120 min., (unlicensed)**	Use immediately
		IV infusion	Volume used for dilution in adults is usually 50-100mL (maximum 500mL).the required dose is further diluted with 100-500ml.	**Maintenance Dosage** 125-350 mcg (0.125-0.35 mg) once daily. In patients with Clcr of ≥50 ml/minute.	Over 1-2 hrs	

* Rapid digitalization

- **IV incompatibilities**
  - **Admixture:** dobutamine
  - **Y-site:** amiodarone,fluconazol,insulin,propofol
- **Iv compatabilities**
  - **Admixture :**cimetidine,floxacillin,furosemide,lidocaine,verapimil
  - **Solution :** 5%DW, NS,SWFI,RL
  - **Y-site**: ciprofloxacillin,heparin,hydrocortisone,meperidine,morphinesulphate,KCL

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Dopamine hydrochloride	200MG IN 5ML 800MG IN 5 ML AMPOULES.	IV infusion	Dilute 200mg to 500ml 200mg to 250ml 400mg to 500ml 400mg to 250ml 800mg to 500ml 800mg to 250ml To a final conc. Of 400 mcg/ml, 800 mcg/ml, 800 mcg/ml, 1600 mcg/ml, 1600 mcg/ml, 3200 mcg/ml respectively. The concentration used is individualized according to patient dosage and fluid requirements.	**Shock and CPR** initiate at a rate of 2-5 mcg/kg per minute; increase by 1-4 mcg/kg per minute at 10- to 30-minute intervals until the optimal response is attained Usual maintenance rate of 20 mcg/kg per minute or less. **CHF**0.5-3 mcg/kg per minute.	The infusion rate is individualized based on the formula given.	24 hrs

- **NB**: Rate and duration should be carefully adjusted according to patient response as indicated by heart rate, BP, urine flow, peripheral perfusion, presence of ectopic heartbeats, and, whenever possible, by measurement of central venous or pulmonary wedge pressure and cardiac output.

- Patients with occlusive vascular disease: Initiate at a rate of 1 mcg/kg per minute or less because of risk of local ischemia (e.g., gangrene).
- Maximum usually is 50 mcg/kg per minute; although administration rates >50 mcg/kg per minute have been safe in advanced circulatory decompensation states.

NB: Infusion rate (drop/min) = $\frac{\text{Dose (micrograms/kg/minute) x patient weight (kg) x 20(drop factor)}}{\text{Concentration (micrograms/mL)}}$

- **IV incompatibilities**
  - **Admixture:** ampicillin, metronidazol, $NaHCO_3$, pencillin
  - **Solution:** $NaHCO_3$
  - **Y-site:** cefepime, furosemide, heparin, thiopental
- **Iv compatabilities**
  - **Admixture :** aminophyllin, calcium gluconate, ciprofloxacillin, dobutamine, heparin, hydrocortisone, lidocaine, nitroglycerin, KCL, verapamil
  - **Solution :** 5%DW, NS, SWFI, RL, DNS
  - **Y-site:** amiodarone, dobutamine, epinephrine, fentanyl, heparin, hydrocortisone, lidocaine, morphine sulphate, nitroglycerin, ondasetrone, KCL, propofol
  - **Not specified:** tetracycline, iron salt, oxidizingagent, alkaline solution

E

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Esomeprazole	40MG (AS SODIUM SALT) POWDER FOR RECONSTITUTION VIAL	IV injection	Dilute 40mg vial with 5ml.To a final conc. of 8mg/ml.	**GERD with Erosive Esophagitis**20 or 40 mg once daily for up to 10 days.	Over 3 to 5 min.,	Use immediately
		IV infusion	Dilute the required dose to 100mL.	NNN, but if recommended administer with dilution and rate displayed in the respective column.	over 10 to 30 min., over	

NB: Do not administer with any other drugs or diluents because of potential incompatibilities.

- **IV compatibilities**
  - **Solution :**5%DW, NS,SWFI,RL

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Enoxaparin	40MG/0.4ML, 60MG/0.6ML, 80MG/0.8ML, 100MG/ML PREFILLED SYRINGE.	Subcutaneous (sub Q)	Given Undiluted	**Prevention of DVT and/or PE** 40 mg/day initiated 2 hrs prior to surgery. For 7–10 days. **Deep Vein Thrombosis With or Without Pulmonary Embolism** 1 mg/kg BID or 1.5 mg/kg once a day for a minimum of 7 days **Unstable Angina and Non-Q-Wave Myocardial Infarction** 1 mg/kg BID for a minimum of 2 days in conjunction with aspirin therapy (100–325 mg once daily).	NNN	Use immediately. **Do not freeze.**
		IV injection	Given Undiluted	**Acute ST-segment Elevation, Myocardial Infarction** Initial dose in patients <75 years of age 30 mg by direct IV injection. Follow with 1 mg/kg sub-Q every 12 hrs (maximum 100 mg per dose for each of the first 2 sub-Q doses, then 1 mg/kg per dose thereafter) **Acute Ischemic Complications of PCI** Patients who have	NNN	

				not received prior anticoagulant therapy: 0.5–0.75 mg/kg by direct (bolus) IV injection.		

***Patients in whom sub-Q Enoxaparin has been initiated prior to PCI ("upstream") and patients' ≥75 years of age see the full dosage recommendation of anticoagulant.**

- **IV compatabilities**
  - **Solution :** 5%DW, NS,SWFI,RL
  - **Y-site:** Temocillin sodium

NB: Do not mix or co-administer with other medications; may be administered with NS or D5W.

- To avoid mixing IV enoxaparin with other drugs, flush IV line with a sufficient amount of 0.9% sodium chloride injection or 5% dextrose injection prior to and following IV administration of enoxaparin.
- To avoid loss of drug when using the 30- or 40-mg prefilled syringes, do not expel air from syringe prior to injection
- ACCP recommends initiating warfarin on the first treatment day and overlapping therapy with warfarin and enoxaparin for ≥5 days and until the INR is at least 2 for ≥24 hrs.

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Ephedrine hydrochloride /sulfate	**AMPOULES** CONTAINING 30MG IN 10 ML SOLUTIONS FOR INJECTION.**PRE-FILLED SYRINGES** CONTAINING 30MG IN 10ML SOLUTION FOR INJECTION (UNDILUTED). **AMPOULES** CONTAINING 30MG IN 1ML SOLUTION FOR INJECTION (NEED DILUTION).	Slow IV injection.	For formulation that needs dilution, dilute 30mg/1mL to a final concentration of 3mg in 1mL. The same for both route of administration	**Bronchospasm:** 12.5–25 mg; give smallest effective dose. Further dosage should be determined by patient response. **Hypotension** and **Cardiac Arrhythmias and Heart Block** 5–25 mg; repeat in 5–10 min., if necessary	Over 3 to 5 min.,	Use immediately
		Sub Q injection		**Hypotension** and **Cardiac Arrhythmias and Heart Block** 25–50 mg (range: 10–50 mg).Further dosage should be determined by BP response	NNN	

		IM injection		**Hypotension** and **Cardiac Arrhythmias and Heart Block** 25–50 mg (range: 10–50 mg).Further dosage should be determined by BP response	NNN	

- Absorption and onset of action more rapid following IM administration (within 10–20 min.,) than following sub-Q administration.

- **Iv compatabilities**
  - **Solution :**5%DW, NS,SWFI,RL
  - **Admixture:** lidocaineHCL,penicillin G potassium
  - **Y-site :**propofol,ethomidate
- **Iv incompatibilities:**
  - **Admixture**: hydrocortisone sodium succinate,Phenobarbital sodium
  - **Y-site:** thiopental sodium

F

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Fentanyl	100MICROGRAMS IN 2ML AND 500MICROGRAMS IN 10ML.	IV injection or IM injection	Given Undiluted	**Severe pain:** 50-100 mcg/dose every 1-2 hrs as needed. **Patient-controlled analgesia (PCA):** **Usual Conc.:**50 mcg/mL **Demand dose:** Usual: 10 mcg; range: 10-50 mcg **Lockout interval:** 5-8 min.,	Over 3-5 min.,over<1 minute (e.g., for high-dose opiate anesthesia).	48 hrs(RT)
		IV infusion	**0 - 5000 mcg in 50-250ml.** 1250 mcg in 250 ml 2500 mcg in 250 ml 5000 mcg in 250 ml To a final conc. Of 5mcg/ml, 10mcg/ml, 20mg/ml respectively. May concentrate further 2500 mcg in 50 ml (to a final conc. Of 50 mcg/ml).	**Anesthesia:** Initial loading dose: Usually, 4–20 mcg/kg titrated to effect over several min., Maintenance dose: Usually, 2–10 mcg/kg per hr; additional supplemental IV doses of 25–100 mcg as needed	Individualized Based on formula given. **NB: IV infusion:** Infuse using an infusion pump.	

NB: infusion rate (Ml/Hrs) = $\frac{\text{dose (nanogram/kg/min)} \times \text{patient weight (kg)} \times 60\text{min}}{1000 \times \text{concentration (mcg/ml)}}$

- **IV incompatibilities**
  - **Admixture:** flurouracil,lidocaine.thiopental
  - **Y-site:** azithromycin,phenytoin,thiopental,Phenobarbital
  - **Syringe:** pentobarbital,thiopental
- **Iv compatabilities**
  - **Admixture :**clonidine
  - **Solution :** 5%DW, NS,SWFI
  - **Y-site**: amiodarone,atropine,diazepam,deltiazim,diphenhaydraminedobutamin,dopamine,epinephrine,heparin,hydrocortisone,morphine,norephinephrine,KCL,propofol
  - **Syringe:**atropine,chlorpromazine,heparin,diphenhydramine,meperidine,morphine,promethazine, ondansetrone

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Fluconazole	200MG IN 100 ML SOLUTIONS FOR INFUSION. 50MG IN 25 ML SOLUTIONS FOR INFUSION. 400MG IN 200 ML SOLUTIONS FOR INFUSION. 100MG IN 50ML SOLUTION FOR INFUSION	IV infusion	Further dilution is unnecessary Given undiluted	**Febrile Neutropenic Patients** Initial dose of 400 mg IV, then 5 mg/kg daily (up to 400 mg daily IV) has been used until neutropenia resolved, **Cryptococcal Meningitis:** 400 mg IV given as a single dose on first day, then 200-400 mg IV once daily.**Cryptococcosis** **Non meningeal** 400-800 mg IV daily. **Candida Urinary Tract Infections,** cystitis 200 mg IV daily for 2 weeks. Pyelonephritis 200-400 mg IV daily for 2 weeks. Urinary fungus balls 200-400 mg IV daily until symptoms have resolved and urine cultures are negative for *Candida*.	5-10ml/min (i.e.10-20mg/min).	Use immediately

- **IV incompatibilities**
  - **Admixture :**trimetoprime-sulphamethozaxole (co-trimoxazole)
  - **Y-site: ampicillin**,calcium gluconate,ceftazidim,ceuroxim,clindamycin,digoxin,diazepam,haloperidol
- **Iv compatabilities**
  - **Admixture:**
    :amikacin,cefazolin,ceftazidime,ciprofloxacillin,clindamycin,gentamicin,heparin,metronidazol,morphine,KCL,ondasetrone,theophylline
  - **Solution :**5%DW, SWFI,RL
  - **Y-site**: amikacin,aminophyllin,amiodarone,cefazolin,cefepime,cholopromethazine,cimetidine,dobutamine,gentamicin,heparin,metronidazole,propofol,promethazine,vancomycin,merophenem

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Flumazenil	500mcgm in 5mL or 1mg in 10mL	IV injection	Given Undiluted.	**Benzodiazepine Over dosage** Initially, 0.2 mg given. If the desired consciousness level is not achieved after waiting 30 seconds, additional 0.3-mg doses may be administered, If an adequate response still is not achieved, further additional 0.5-mg doses may be administered over 30 seconds at 1-minute intervals up to a cumulative dose of 3 mg. **Reversal of Conscious Sedation** Initially, 0.2 mg given IV over 15 seconds. If the desired consciousness level is not achieved after waiting 45 seconds, additional 0.2-mg doses may be administered at 1-minute intervals until an adequate response is achieved or a maximum of 4 additional doses is administered	over 15-30 seconds Further doses May be given at 60 second intervals if required.	24 hrs(RT)
		IV infusion	Dilute with sodium chloride 0.9% or glucose 5%.To a final conc. Of 2 to 10micrograms per ml. For example the 500mcgm/5ml preparation may diluted to 250ml.		100 to 400Mcgm per hr	

Incompatibility: Do not infuse with any other medicines due to the extreme pH of this preparation. To avoid possible venous irritation, it may be advisable to administer via a central venous access device. If this is not possible, use a freely running established IV infusion line into a large peripheral vein.

H

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Heparin sodium	1000UNITS IN 1ML: 1ML AMP, 5ML AMP, AND 5ML VIAL, 10ML AMP, 20ML AMP. 5000UNITS IN 1ML: 1ML AMP, 5ML AMP, 5ML VIAL. 25000UNITS IN 1ML: 1ML AMP, 5ML VIAL	IV Injection	Given Undiluted	**Venous Thrombosis and Pulmonary Embolism** Full-dose intermittent therapy: 5000 units IV injection then 10,000-20,000 units sub-Q initially, followed by 8000-10,000 units sub-Q TID or 15,000-20,000 units sub-Q BID, Adjusted-dose therapy: 5000 units IV initially as a loading dose followed by 17,500 units sub-Q BID.	Over 3-5 min.,	24 hrs(RT)
		Subcutaneous injection (sub-Q)	Given Undiluted			
		continuous IV infusion	Dilute to produce a final concentration of 1,000units in 1mL.Invert At least six times to prevent pooling.	**Treatment of DVT and PE** **Full-dose continuous therapy** 5000 units' initial loading dose by IV injection, then 20,000–40,000 units in 1 L of compatible IV solution infused over 24 hrs. **Full-dose intermittent therapy** 10,000 units initial loading dose (either undiluted or diluted in 50 or 100 mL),	3 ml/hr	

				then 5000–10,000 units every 4–6 hrs. **Acute Ischemic Complications of Unstable Angina and Non-ST-Segment Elevation MI** 60 units/kg [maximum 4000 units] loading dose followed by continuous infusion of 12 units/kg per hr [maximum 1000 units/hr]) **STEMI (ST-Segment Elevation MI)** Initially, 60 units/kg (maximum 4000 units): loading dose. Maintenance dosage: 12 units/kg per hr (maximum 1000 units/hr), adjusted to maintain a therapeutic aPTT (1.5–2 times control value or approximately 50–70 seconds) for 48 hrs.		

NB: NHS Lothian WARNING: For heparin infusions, always use the ampoules containing a ready to use solution of heparin sodium 1000units/ml as per NHS Lothian Heparin Infusion Chart. This solution does not need to be further diluted before administration.

- Do not administer IM because of frequency of hematoma at injection site.

- **IV incompatibilities**
  - **Admixture:** dobutamine,gentamicin,haloperidol,hydrocortisone,meperidine,morphine,vancomycin,ciprofloxacin
  - **Y-site:** amiodarone,diazepam,dobutamine,gentamicin,haloperidol,vancomycin
  - **Syringe:**amiodarone,diazepam,gentamicin,haloperidol,vancomycin,meperidine
  - **Not specified:** hydroxyzine,tetracycline
- **Iv compatibilities**
  - **Admixture:** aminophylline,ampicillin,calciumgluconate,clindamycin,dopamine,esmolol,furosemide,lidocaine,norepinephrine,KCL,NaHCO3,verapamil,meropenem
  - **Solution :**5%DW, NS,SWFI
  - **Syringe:a**minophylline,ampicillin,atropine,cimetidine,clindamycin,dobutamine,dopamine,epinephrine,lidocaine,norephinephrine NaHCO3
  - **Y-site**:aminophylline,ampicillin,atropine,calciumgluconate,cimetidine,clindamycine,dopamine,epinephrine,furosemide,hydrocortisone,lidocaine,norephineprine,meperidine,morphine,KCL,NaHCO3.

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Hydralazine hydrochloride	20MG/ML POWDER FOR RECONSTITUTION OR (SOLUTION IN AMPOULE)	IM injection	Preparation with Clear solution for injection is given undiluted, but preparation with Powder for reconstitution is diluted in 2-5ml to produce final max.conc. Of 4mg/ml.	**Hypertensive Emergencies:** 10-40 mg doses are repeated as necessary and may be increased within this range according to the BP response.	NNN	Use Immediately
		IV injection	Dissolve the contents of each ampoule in 1mL water for injections, and then with 9mL to produce 20mg in 10mL. (final conc. Of 2mg/ml)	**Hypertensive Emergencies:** 10-20 mg doses are repeated as necessary and may be increased within this range according to the BP response. **Pregnancy-associated Hypertensive Emergencies** initially5 mg followed by 5–10 mg every 20–40 min., as necessary to achieve an adequate BP reduction. Maximum total dose of 20 or 25 mg has been recommended.	Over at least 5 min., repeated injection can be given after an interval of 20-30 min.,	

NB: infusion rate (ML/hr) = $\frac{\text{dose (mcgm/min)} \times 60\text{min}}{\text{Concentration (mcgm/ml)}}$

- **IV incompatibilities**
  - **Admixture** aminophylline,ampicillin,dobutamine,hydrocortisone,Phenobarbital,verapamil
  - **Y-site:** aminophylline,ampicillin,furosemide
  - **Solution:** DW5%
- **Iv compatabilities**
  - **Solution :**RL, NS,SWFI
  - **Admixture:** dobutamin
  - **Y-site**: heparin,hydrocortisone,KCL,verapamil

I

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Insulin (soluble) human, Human Actrapid[R].	VIALS (10ML) CONTAINING INSULIN (SOLUBLE), HUMAN 100UNITS PER ML	IV injection **(hyperkalaemia)**	Dilute 5 to 10units insulin to 50mL	Refer full Dosage recommendation and give with the displayed dilution and rate in the respective column.	over 5-15 Min.,	24 hrs(RT)
		Continuous infusion	Dilute 50units insulin to 50mL		NNN	

- **IV incompatibilities**
  - **Admixture:** Aminophylline, dopamine and digoxin.
  - **Y-site:** ranitidine HCL
- **Iv compatabilities**
  - **Admixture :**Amiodarone, heparin, lidocaine, magnesium sulphate, Morphine, potassium chloride, propofol, vancomycin, verapamil.
  - **Solution :**5%DW, NS
  - **Y-site:** dobutamin,doxapram,propofol,$NaHCO_3$

L

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Labetalol hydrochloride	100MG IN 20ML (AS HYDROCHLORIDE) SOLUTION FOR INJECTION	Iv injection	Given Undiluted	**Severe Hypertension and Hypertensive Crisis** Initially, 20-80 mg additional 40-80 mg at 10-minute intervals until the desired supine BP is achieved or dose max.300 mg. **Preeclampsia** Initially, 20 mg followed by 40 mg IV 10 min., later and then 80-mg doses at 10-minute intervals for 2 additional doses.	over 2-10min 50mg/min.,	Use immediately
		Iv infusion	Dilute the required dose to a final concentration of 1mg/ 1ml.	**Severe Hypertension and Hypertensive Crisis** 0.5-2 mg/minute. Max.dose50-200 mg; up to 300 mg may be required. Rate adjusted based on BP response.	**2mg/min** but need to refer further because rate varies for different indication.	

- **IV incompatibilities**
  - **Y-site:** ceftriaxone, furosemide, thiopental, lansoprazol.
- **Iv compatabilities**
  - **Y-site:**amikacin,aminophylline,amiodarone,ceftazidim,clindamycin,cimetidine,dobutamin,dopamine , epinephrin,pethidine,MgSO4,vancomycin,norepinephrin,propofol.
  - **Solution**:DW5%,NS 0.9% ,RL

M

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/reconstitution
Magnesium sulphate	**10% IN 20ML (2GM IN 20ML)** **50% IN 20ML (10GM IN 20ML)** 1G IN 2ML (4MMOL MAGNESIUM OR 8MEQ IN 2ML) - 2.5G IN 5ML (10MMOL OR 20MEQ MAGNESIUM IN 5ML) - 5G IN 10ML (20MMOL OR 40MEQ MAGNESIUM IN 10ML) - 10G IN 20ML (40MMOL OR 80MEQ MAGNESIUM IN 20ML) - 25G IN 50ML (100MMOL IN 50ML).	IV injection	(Give magnesium sulphate 10% solution by slow IV injection) without dilution.	**Hypomagnesemia Treatment:** IM injection **Mild deficiency:** Usually, 1 g (8.12 mEq or 2 mL of the 50% solution) every 6 hrs for 4 doses. **Severe deficiency:** If necessary, may administer up to 250 mg (about 2 mEq or 0.5 mL of the 50% solution) per kg of body weight within a 4-hr period.	1.5mL (0.6mmol) per minute.	24 hrs(RT)
		IV Infusion:	**To prepare magnesium sulphate 10% (i.e. 20mmol magnesium in 50mL)** Dilute 10mL of magnesium sulphate 50% to a final conc. Of 50mL with sodium chloride 0.9% or glucose 5%. **To prepare magnesium sulphate 5% (i.e. 20mmol magnesium in 100mL) :** Dilute 10mL of magnesium sulphate 50% injection to a	**Severe preeclampsia or eclampsia:** Initially, IV infusion of 4–5 g (32.4–40.5 mEq) diluted in 250 mL, in combination with IM injection of up to 10 g (10 mL of undiluted 50% solution administered into each buttock). Continue therapy until paroxysms cease. **For eclampsia,** ACOG currently recommends 4–6 g in 100 mL of IV fluid over 15–20 min., followed by 2 g per hr continuous IV infusion; use antihypertensive agents for women	1.5mL/minute using a 10% solution or3mL/minute using a 5% solution.	

			final conc. Of 100mL.	with DBP ≥105–110 mm Hg. **Hypomagnesemia Prevention** Additive in total parenteral nutrition: Usually, 5–8 mEq daily. **Hypomagnesemia severe deficiency:** 5 g (approximately 40 mEq) added to 1 L over 3 hrs. Acute Asthma: Usually, 1.2–2 g over 20 min., **Barium Poisoning:** Usually, 1–2 g to counteract the intense muscle stimulating effects of barium.		

NB: Preferably administer concentrations of 5% and above via a central venous access device to avoid Potential venous irritation as the preparation has a high osmolarity.If infusion via a peripheral Cannula is required it is recommended to dilute to a concentration of less than 5%.

- **IV incompatibilities**
  - **Admixture:**dobutamine,$NaHCO_3$
  - **Y-site:** amiodarone,cefepime,ciprofloxacin
- **Iv compatabilities**
  - **Admixture:** erythromycin, esmolol, gentamicin, heparin, insulin (soluble), labetalol, metronidazole, morphine sulphate, potassium chloride infusion, Propofol, vancomycin
  - **Solution :**5%DW, NS,SWFI

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution& / reconstitution
methylprednisolone (as sodium succinate)	40MG, 125MG, 500MG, 1G, 2G POWDER FOR RECONSTITUTION	IM injection	Use readymade depot methylprednisolone acetate and sodium succinate without reconstitution	**Adrenogenital Syndrome** 40 mg every 2 weeks. **Dermatologic Diseases** Usually, 40–120 mg once weekly for 1–4 weeks.	NNN	24hrs RT
		IV injection	**Reconstitute** 40mg with 1 ml 125mg with 2ml 500mg with 10ml 1gm with 20ml 2 gm with 30ml.To a final conc. of 40mg/ml, 62.5mg/ml,50mg/ml,50mg/ml,67mg/ml respectively	**Shock:** 100–250 mg by direct IV injection (over 3–15 min.,) initially and repeated at 2- to 6-hr intervals as required Continue high-dose therapy only until the patient's condition has stabilized and usually not beyond 48–72 hrs. **Lupus Nephritis:** 1 g IV (over a 1-hr period) daily for 3 consecutive days. **Optic Neuritis:** 1 g daily for 3 days followed by oral prednisone 1 mg/kg daily for 11 days has been used.	**General** Over 5 min., Depend based on indication	
		IV Infusion	Then reconstituted solution further diluted to 50-250 ml.	**Acute Spinal Cord Injury** Initially, 30 mg/kg by rapid IV injection over 15 min., followed in 45 min., by IV infusion of 5.4 mg/kg per hr for 23 hrs.	**General** Over 30 min., depend Based on indication	

- **IV incompatibilities**
  - **Admixture:** calcium gluconate
  - **Y-site:** propofol,ciprofloxacin
- **Iv compatabilities**
  - **Admixture:** cimetidine, clindamycinphosphate, dopamineHCL, heparin, norepinephrine, verapamil.
  - **Y-site:** amiodarone, dopamineHCL, heparin, pethidine, metronidazole, morphine , sodium bicarbonate.
  - **Solution :**5%DW,NS 0.9%,RL

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Mannitol	20% 20GM/100 ML IN 500ML BAGS meaning 100GM IN 500ML.	IV infusion	NNN	**Test Dose***0.2* g/kg or 12.5 g (75 mL). **Oliguric Acute Renal Failure:** ***For Prevention*** *IV:* 50-100 g ***For Treatment*** *IV:* 100 g **Reduction of Intracranial Pressure**1.5-2 g/kg **Edema andAscites**: ***IV*** 100 g	**ForTest Dose:** over 3 to 5 min., **Treatment of oliguria**: over 90 min., several hrs. **Reduction of intracranial or IOP:** over 30-60 min., **Treatment of Edema and ascites:** over 2-6 hrs.	use immediately

- **IV incompatibilities**
  - **Admixture:** meropenem,etoposide,imipenem
  - **Y-site:** cefepime,doxorubicin
- **Iv compatabilities**
  - **Admixture** :cimetidine,furosemide,metoclopromide,ondasetrone
  - **Y-site:** propofol,allopurinol
  - **Solution** :5%DW

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Meropenem	500MG, 1G POWDER FOR RECONSTITUTION (AS TRIHYDRATE).	IV injection:	Reconstitute 500mg of Meropenem with 10mL 1gm with 20ml to a final conc. of 50mg/ml.	**Intra-abdominal Infections**1 g TID. **Meningitis**40 mg/kg TID. (Up to 6 g daily in conjunction with ceftriaxone or Cefotaxime. ***Nosocomial Pneumonia***1 g TID. **NB:** IV infusion is preferred.	Over 5 min.,	use immediately
		IV infusion (preferred):	Then reconstituted solution may be further diluted with 50-200mL.	If recommended administer as per indicated dilution protocol and rate.	Infuse over approximately 15 to 30 min.,	

- **IV incompatibilities**
  - **Admixture:** metronidazole,multivitamin.,
  - **Y-site:** diazepam,metronidazole
- **Iv compatabilities**
  - **Admixture :**aminophylline, dexamethasone,

    Digoxin, fluconazole, furosemide, gentamicin, heparin, insulin human soluble, metoclopramide, morphine, potassium chloride

  - **Solution :**5%DW, NS,SWFI

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Metronidazole	500MG METRONIDAZOLE IN 100 ML SOLUTIONS FOR INFUSION.	IV infusion	NNN	**Anaerobic Bacterial Infections** **Serious Infections:** Loading dose of 15 mg/kg followed by IV maintenance doses of 7.5 mg/kg QID After clinical improvement occurs, switch to oral (7.5 mg/kg QID). **Tetanus:** 500 mg QID given for 7–10 days. **Amebiasis:** 500 mg QID given for 10 days.	At a rate of 5mL/minute(25 mg/minute) which is 500mg in 100ml over a minimum of 20 min.,	Use immediately

- Do not administer by rapid IV injection because of the low pH of the reconstituted product.

❖ **IV incompatibilities**

- **Admixture:** cefepime,ciprofloxacin,dopamine,meropenem
- **Y-site:** meropenem,warfarin

- **Iv compatabilities**
  - **Admixture :**Adrenaline, aminophylline, amiodarone, amikacin, ampicillin, cefotaxime, ceftazidime, ceftriaxone cefuroxime,chloramphenicol,ciprofloxacin,clarithromycin,clindamycin,dopamine,fluconazole,gentamicin,hydrocortisone sodium succinate,midazolam, Morphine sulfate
  - **Solution :**5%DW, NS,SWFI

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Morphine sulphate	**READY TO USE PREPARATIONS (FOR INJECTION):** AMPOULES CONTAINING MORPHINE 10MG IN 1ML. AMPOULES CONTAINING MORPHINE 15MG IN 1ML. **READY TO USE PREPARATIONS (FOR INFUSION):** VIALS CONTAINING MORPHINE 50MG IN 50ML FOR INTRAVENOUS INFUSION. VIALS CONTAINING MORPHINE 100MG IN 50ML FOR INTRAVENOUS INFUSION. **PREPARATIONS REQUIRING FURTHER DILUTION**: AMPOULES CONTAINING MORPHINE 30MG IN 1ML, 60MG IN 2ML. THESE PRODUCTS ARE INTENDED FOR PREPARATION OF INTRAVENOUS INFUSIONS ONLY AND **MUST BE** DILUTED BEFORE USE.	IV injection:	Preparation used for IV injection may have a low pH. It is preferable to dilute with 3 to 5mL. Before injecting, this will also aid slow administration. Use low strength morphine ampoules only, e.g. morphine 10mg/mL, to reduce the risk of Overdose.	**Pain(Other Routes)**2.5-20 mg every 2-6 hrs as needed or via continuous infusion at a rate of 0.8-10 mg per hr **Pain (MI)**1-4 mg up to every 5 min.,**Unstable Angina (Unresponsive to 3 Sublingual Doses of Nitroglycerin)**2-5 mg (repeated every 5-30 min., as needed	2mg/minute	7 days (RT or refrigerated)
		IV infusion	Use ready to use preparations for infusion. if unavailable, Use 30mg/mL preparation to prepare the infusion. Dilute the required amount from this preparation to a final conc. Of 0.1–1 mg/mL.	**Pain(Other routes)** 2.5-20 mg at a rate of 0.8-10 mg per hr. **Cancer Pain** an IV loading dose of ≥15 mg, Maintenance doses have ranged from 0.8-80 mg/hr.	1-2mg/hr	

- **IV incompatibilities**
  - **Admixture:**
    aminophylline,chlorothiazide,heparin,meperidine,phenytoin,thiopental,NaHCO3
  - **Y-site:** cefepime,furosemide,phenytoin,propofol,thiopental
  - **Syringe:** haloperidol,meperidine,promethazine,thiopental
- **Iv compatabilities**
  - **Admixture:**dobutamine,fluconazol,furosemide,ondasetrone,metochlopromide,verapamil
  - **Solution :**5%DW, NS,SWFI
  - **Y-site**:
    amikacin,amiodarone,ampicillin,atenolol,atropine,clindamycin,dopamine,dobutamine,fentanyl,heparin,haloperidol,vancomycin,proponalol,KCL
  - **Syringe:**atropine,cimetidine,clonidine,fentanyl,ketamine,ondansetrone

N

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Noradrenaline *(Norepinephrine)*	2MG IN 2ML AMPOULES. 4MG IN 4ML AMPOULES. 20MG IN 20ML AMPOULES.	IV infusion	dilute 4mL (4mg noradrenaline base) to 1000 mL To give a final concentration of 4 micrograms noradrenaline base in 1mL. A more dilute or concentrated solution may be prepared depending on the fluid volume requirements of the patient. For example 4 mg, 8mg, 16,32mg to 50ml.	**Shock loading**8-12 mcg/minute **maintenance**2-4 mcg/minute **Sepsis and septic shock** 0.01- 3 mcg/kg/minute	Individualized based on the formula displayed below. **NB:** If the rate includes a 0.05 figure, the rate should be rounded UP to the next decimal place When setting the infusion pump.	24 hr at (RT)

NB: Infusion rate (drop/min) = $\frac{\text{Dose (micrograms/minute)}}{\text{Concentration (micrograms/mL)}}$ x 20(drop factor)

- **IV incompatibilities**
  - **Admixture:** aminophylline,pentobarbital,thiopental,phenytoin
  - **Not specified :** atropine,cefazolin,diazepam,carbenicillin
- **Iv compatabilities**
  - **Admixture:** calcium gluconate, cimetidine, dobutamine, heparin, KCL, verapamil, meropenem, ciprofloxacin, MgSo4.
  - **Solution :**5%DW, NS,SWFI,DNS
  - **Y-site**: amiodarone,epinephrine,esmolol,fentanyl,furosemide,heparin,hydrocortisone,KCL,meropenem
  - **Syringe:** heparin
  - **Notspecified:** tetracyclin

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Nimodipine	10MG/10ML SOLUTION VIAL.	IV infusion	Given Undiluted	**Aneurysmal subarachnoid hemorrhage:** for the first 2 hrs 1mg (5ml/hr) should be infused if it is well tolerated the dose should be increased after 2 hrs to 2mg (10ml/hrs), providing no severe decrease in blood pressure is observed. Patients with body weight less than 70kg or with unstable blood pressure should be started with 0.5mg (2.5ml/hrs). **Duration:** in 5 days; max 14 days.		NA BUT, the authors recommend 24 hrs in clean and safe environment.

- **Nimodipine solution must not be added to an infusion bag or bottle and must not be mixed with other drugs.**

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Naloxone HCL	400MCG/ML IN 1ML AMPOULE. 400MCG/ML IN 1ML, 2ML, 5 ML PRE-FILLED SYRINGES. 40MCG/ML IN 2 ML AMPOULES.	IV injection	May be diluted to convenient volume with SWFI or given undiluted.	**Opiate Over dosage:** **Diagnosis** 0.4–2 mg IV, administered at 2- to 3-minute intervals if necessary; if no response is observed after a total of 10 mg of the drug has been administered, the depressive condition may be caused by a drug or disease process not responsive to naloxone. **Treatment** **Opiate-dependent individuals**: Use initial dose of 0.04–0.4 mg to minimize adverse cardiovascular effects and withdrawal symptoms; if initial response is inadequate, repeat dose or titrate up to 2 mg.	Slowly	24 hr at (RT)
		IV infusion	Dilute 10mg(25 ampoule of 400mcg) with 50ml ,to a final concentration of 200mcg/ml.	starting dose is 60% of initial IV bolus dose required for resuscitation	Over 1 hr, then adjusted according to respiratory rate and level of consciousness	

- **IV incompatibilities**
  - **Y-site:** lansoprazol, Amphotericin B cholesteryl, Amphotericin B lipid complex, Dantrolene sodium,Diazepam, Lansoprazole,Leucovorincalcium,Pantoprazole sodium, Phenytoin sodium
  - **Syringe:** Cyclosporine, Diazepam, Indomethacin sodium trihydrate, Lorazepam, Nitroglycerin, Pantoprazole sodium, Phenytoin sodium, Thiopental sodium
- **Iv compatabilities**
  - **Admixture :**morphine sulphate,verapamil
  - **Solution :** NS 0.9%,DW5%
  - **Y-site**: propofol,linezolide.

P

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Pethidine hydrochloride	**100MG IN 2ML, AND** **50MG IN 1ML.** **100MG IN 10ML AND** **50MG IN 5ML**	IM injection	NNN	**Pain management**50-150 mg every 3-4hrs as needed.	NNN	24 hr RT
		IV injection	Dilute to a final concentration of 10mg per 1ml.	**Pain management** LOADING 12.5-25 mg every 10 min., 50-125 mg total MAINTENANCE 5-10 mg every 6-12 min.,	Over 2-5 min.,	
		IV infusion	Dilute to a final conc. Of 1mg/1ml.	15-35 mg/hr until pain relief.	15-35mg/hr	

- **IV incompatibilities**
  - **Admixture:** aminophylline, furosemide, heparin, morphine, phenytoin, $NaHCO_3$
  - **Y-site:** cefepime, furosemide, imipenem
  - **Syringe:** heparin, morphine, pentobarbital
  - **Not specified:** diazepam
- **Iv compatabilities**
  - **Admixture :** dobutamine, metoclopromide, ondasetron, verapamil, cefazolin
  - **Solution :** NS 0.9%, DW5%
  - **Syringe:** atropine, chlorpromazine, cimetidine, ketamine, ondasetrone, promethazine, fentanyl
  - **Y-site:** amikacin, amipicillin-sulbactum, atenolol, cefazolin, cefotaxime, ceftazidim, ceftriaxone, dobutamine, dopamine, insulin, heparin, Oxytocin, propofol, propranololthiopental, diphenhaydramine, dexamethasone.
  - **Not specified:** epinephrine

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Phenytoin sodium	250MG IN 5ML POWDER FOR INJECTION VIALS. 50MG/100MG ENTERIC COATED TABLET	Nasogastric tube via oral	Dilute each tablet with at least 10ml, then combined with flushing the tube with at least 20ml of diluents after administration.	**Seizure Disorders**1gm loading, 100mg TID.	NNN	Use immediately.
		Slow IV injection	Administer slowly undiluted.	**Status Epileptics** LOAD 10-15 mg/kg MAINTENANCE 100 mg TID.	50mg per minute.	
		IV infusion	dilute to 50-100mL to a final concentration of 10mg per 1ml.	**NB: Because of the low solubility of Phenytoin and the possibility of precipitation occurring, When diluted, administration by intravenous infusion following dilution is not usually recommended. But if required give with the displayed dilution and rate. In the respective column.**	50mg per minute.	

- **IV incompatibilities**
  - **Admixture:** amikacin, dobuatmine, insulin (regular), lidocaine, pethidine, morphine sulphate, streptomycin
  - **Y-site:** ciprofloxacin, claritromycin, diltiazem, fentanyl, heparin, hydrocortisone, Morphinesulphate, theophyllin, propofol
  - **Syringe:** hydromorphone, sufentanil
  - **Solution: DW5%, RL, DNS**
- **Iv compatabilities**
  - **Admixture :** verapamil
  - **Solution :** NS0.9%
  - **Y-site**: esmolol, famotidine, fluconazol

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Phytonadione Vitamin K1)	**10MG IN 1ML**	IV infusion	Dilute in 50mL, to a final conc. of 0.2mg/ml. **NB:** Do not dilute with other injectable. Protect infusion and giving set from light.	**NNN,** but if prescribed, give with the recommended dilution and infusion rate.	over 20-30 min.,	Use immediately
		IV injection	Can be given undiluted. However, to facilitate IV injection when volumes are very small, a larger volume can be prepared by taking the required dose from the ampoule and diluting it with 10-20ml.	**Anticoagulant induced Hypoprothrombinemia**2.5-10 mg every 6-8 hrs. **Hypoprothrombinemia from Other Causes** 2.5-25 mg	over at least 30 seconds (usually over 3-5 min.,)	

❖ **IV incompatibilities**

- **Admixture:** Dobutamine, , sodium bicarbonate infusions, phosphate preparations, blood components, plasma substitutes

❖ **Iv compatabilities**

- **Admixture:** Ampicillin, epinephrine, heparin sodium, hydrocortisone sodium succinate, potassium chloride
- **Solution :**5%DW, NS,SWFI

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Potassium chloride	1.5 GM IN 10 ML AMPOULE (20MEQ)	IV infusion	10 meq in 100 ml or 20 meq in 250 ml or 40 meq in 500 ml.	**Glucose-Insulin-Potassium (GIK) Therapy** in AMI IV:40- 80mEq/L.	10 meq/hr	24 hr(RT)

NB: Concentrations greater than 40mmol per liter must always be given via a central venous access device, using a suitable infusion pump; readymade solutions should be used wherever possible

- **IV incompatibilities**
  - **Admixture:** :amphoterecin B
  - **Y-site:** diazepam
- **Iv compatabilities**
  - **Admixture:** aminophylline,amiodarone,calcium gluconate,cimetidine,clindamycin,dobutamine,dopamine,furosemide,heparin,lidocaine, Norepinephrine, NaHCO3, vancomycin
  - **Solution :**5%DW, NS
  - **Y-site**: amiodarone,aminophylline,ampicillin,atropine,dobutamine,,dopamine,ephinephrine,esmolol, furosemide,heparin,lidocaine,morphine,norepinephrine.
  - **Not specified:** cefazolin,tetracyclline

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Propofol	DIPRIVAN® 1%: AMPOULES CONTAINING PROPOFOL 200MG IN 20ML. PRE-FILLED SYRINGES CONTAINING PROPOFOL 500MG IN 50ML. DIPRIVAN® 2%: PRE-FILLED SYRINGES CONTAINING PROPOFOL 1000MG IN 50ML. PROPOVEN® 1% AMPOULES CONTAINING PROPOFOL 200MG IN 20ML. VIALS CONTAINING PROPOFOL 500MG IN 50ML. VIALS CONTAINING PROPOFOL 1000MG IN 100ML. PROPOVEN® 2%: VIALS CONTAINING PROPOFOL 1000MG IN 50ML	IV injection	Only Propofol 1%.	Prescribing dose depends on the indication and patient response. Going through reference is required.	Depending on indication and patient response.	**Diluted** solutions: 6 hrs.(RT) **Undiluted** solutions: 12 hrs.(RT)
		IV infusion	Administer propofol 2% undiluted. Propofol 1% diluted* or undiluted.		Depending on indication and patient response.	

*To a final concentration of not less than 2mg in 1mL.

- **IV incompatibilities**
  - **Y-site:**
    amikacin,ceftazidim,ciprofloxacin,diazepam,digoxin,gentamicin,methylpredinsolone,metoclopromide,morphinesulphate,phentoin,verapamil
  - **Do not mix with other drug prior to administration**
- **Iv compatabilities**
  - **Syringe:** ondasetrone,thiopental
  - **Solution :**5%DW, NS,RL
  - **Y-site**:
    dopamine,dobutamine,epinephrine,fentanyl,furosemide,ketamin,lidocaine,meperidine,MgSO4, ,KCl.

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Phenylephrine hydrochloride	PREPARATIONS ALWAYS NEED DILUTION 10MG IN 1ML (1%) PREPARATION DOES NOT NEED DILUTION 100MICROGRAMS IN 1ML.	IV injection	Dilute to a final conc. Of 1mg/mL (10mg in 10mL).	**Hypotension during Anesthesia** Initial dose is 50 or 100 mcg, ranging from 40–250 mcg, additional doses may be administered every 1–2 min., as needed (not to exceed total of 200 mcg); however, if BP response not adequate, initiation of a continuous IV infusion recommended. **Paroxysmal Supraventricular Tachycardia**initially0.5 mg increase subsequent doses in increments of 0.1-0.2 mg, depending on the BP response of the patient max.Single dose 1mg.	Over 3-5 min.,	24hrs (RT)
		IV infusion using infusion pump	dilute to a final conc. of 20micrograms in 1mL (10mg in 500mL)	**Septic Shock** Initially, 0.5–6 mcg/kg per minute; titrate to BP goal. **Hypotension during Anesthesia** Infusion rate10–35 mcg/minute or 0.5–1.4 mcg/kg per minute; generally initiate at a low rate and titrate to effect.	180mcgms/ minute. Adjust rate according to response.	

- **IV incompatibilities**
  - **Y-site**: lansoprazole,thiopental
- **Iv compatabilities**
  - **Admixture:** DobutamineHCL,lidocaineHCL,potassiumchloride,sodiumbicarbonate
  - **Y-site:** amiodaroneHCL,levofloxacin, haloperidol.
  - **Solution :**5%DW, NS,SWFI.RL

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Protamine sulphate	10MG IN 1ML. AVAILABLE AS 5ML AND 10ML AMPOULES.	IV injection	Given Undiluted	**Heparin Over dosage**: Severe bleeding occurring a few min., after IV injection of heparin: 1 mg for every 100 units of heparin sodium administered. Severe bleeding occurring 30 min., after IV injection of heparin: 0.5 mg for every 100 units of heparin sodium administered. Severe bleeding occurring ≥2 hrs after IV injection of heparin: 0.25-0.375 mg for every 100 units of heparin sodium administered. Severe bleeding occurring after sub-Q injection of heparin: Some clinicians recommend 1-1.5 mg for every 100 units of heparin sodium; **Low Molecular Weight Heparin Over dosage:** Severe bleeding within 8 hrs of administration of an LMW heparin: 1 mg for every 100 anti-factor X_a units (1mg) of LMW heparin IV injection .Severe bleeding >8 hrs	over 10 min.,	Immediate use

				after administration of an LMW heparin: 0.5 mg for every 100 anti-factor X_a units (1mg) of LMW heparin administered.		
		IV infusion	Usually undiluted but if required; Dilute 50 mg vials with 5 ml-SWFI (10mg/ml). then add to 25-50ml NS or D5W	NNN if recommended administer based on indicated dilution and rate	5mg/min over 10-20 min.,	

- **IV incompatibilities**
  - Ceftriaxone,ceftazidime,penicillins
- **Iv compatabilities**
  - **Solution :**5%DW, NS
  - **Admixture:** cimetidine,verapamil,ranitidine.

Q

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Quinine dihydrochloride	300MG IN 1ML. 600MG IN 2ML. 300MG IN 10ML	IV infusion **NB:** Preferably administer via a central venous access device to avoid possible venous irritation as the prepa-ration has a low pH.	Dilute the required dose to 250mL or 500ml. In fluid restriction can be diluted to a final concentration not exceeding 30mg in 1mL **NB:** The required dose, **diluted preferably in 5% DW** to counteract hypoglycaemia.	Initial dose of 20 mg/kg is infused over 4 hrs followed by 10 mg/kg every 8 hrs. However, the initial dose should be halved if the patient has received quinine, quinidine or mefloquine during the previous 12-24 hrs. The maintenance doses should be reduced threefold in patients with impaired renal function.	Loading and maintenanc e dose over 4 hrs	Use immediately

- **IV incompatibilities**
  - Do not infuse with any other medicines or infusion fluids.
- **Iv compatabilities**
  - **Solution :**5%DW, NS

S

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Sodium bi-carbonate (NaHCO3)	7.5% 1500MG IN 20 ML AMPOULES. (44.6MEQ HCO3 ION.)	IV injection	Given Undiluted	**Hyperkalemia:** One ampoule (44.6Meq HCO_3^-).	Slowly Over 5 min., repeat at 10-15 min., intervals if ECG changes persist.	24hrs(RT)
				Asystole: 1Meq/kg initially, may repeat with 0.5Meq/kg 10min., later one time or as indicated by the patient's acid base status.	Slowly	
		IV infusion	Dilute required dose with 1000ml.	**Metabolic Acidosis: moderate:** 50Meq-150mEq **Sever:** 90-180Meq	1-1.5L/hrs	
				If acid-base status is not available: 2-5Meq/kg.	Over 4-8 hrs	
				Diabetic Ketoacidosis: 50Meq, but if required to use as treatment.	1-1.5L/hrs	

- **IV incompatibilities**
  - **Admixture:** ampicillin, ciprofloxacin,dopamine, dobutamine, epinephrine, labetolol, MgSO4, meropenem, morphine, norepinephrine
  - **Y-site:** amiodarone, HCl, verapamile
- **Iv compatabilities**
  - **Solution :**5%DW, NS
  - **Admixture:**
    amikacin,aminophylline,atropine,cimetidine,ceftazedim,clindamycin,frusemide,heparin sodium,mannitol,thiopental.
  - **Y-site:**cefepime,ceftriaxone,dexamethasonesodiumphosphate,heparin,propofol,thiopental,vancomycin
    ,vitamin B complex.

T

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Tranexamic acid	500MG IN 5ML AMPOULE	**Slow IV injection**	Given Undiluted.	**Trauma-associated hemorrhage (off-label use):** Loading dose: 1000 mg over 10 min.,	1mL/min	24 hrs(RT)
		IV infusion (unlicensed)	**Dilute 1-2 grams in 50 - 250 mL.** 1000 mg in 50-100ml over 10 to 30 min., or as directed. 2000 mg in 50-250 mL over 20 min., or longer.	Followed by 1000 mg over the next 8 hrs.	Max 100 mg/min	

- **IV incompatibilities**
  - **Admixture:** blood,penicillin
- **Iv compatabilities**
  - **Admixture:** heparin
  - **Solution :**5%DW, NS0.9%

V

Medication	formulation strength	Route of administration	Dilution protocol	Prescribed dose	Infusion rate	Stability after dilution&/ reconstitution
Vancomycin	500MG POWDER FOR INJ. 1GRAM POWDER FOR INJ.	IV infusion **NB:** Preferably administer via a central venous access device to avoid potential venous irritation as the preparation has a low pH.	Reconstitute 500mg in 10mL. 1g in20ml.This Gives a final conc.Of 50mg in 1mL solution. Then the reconstituted solution further Dilute each 500mg with at least 100mL to give a final Concentration of not more than 5mg in 1mL.**Intermittent IV infusion:** Suggested dilutions:- - 500mg - 1g in 250mL. - 1.25g - 1.5g in 500mL. **Continuous IV infusion:** Suggested dilutions:- - 125mg- 500mg in 100mL. - 625mg -1.25g in 250mL. - 1.5g -2g in 500mL. **Fluid restricted patients: 10mg/ml can be used (e.g. 1g in 100ml).**	**Treatment of Life-threatening Systemic Infections**500 mg QID or 1 g BID. **Meningitis, Septicemia, Respiratory Tract Infections:** 500 mg every 6 hrs or 1 g every 12 hrs For other indication going through reference is expected.	max: 10mg/min	24 hrs(RT)

- **IV incompatibilities**
  - **Admixture:** aminophylline, dexamethasone, heparin, Phenobarbital, $NaHCO_3$ (?)
  - **Y-site:** heparin,cefotaxime,ceftazidime,ceftriaxone,omeprazole,
  - **Syringe:** heparin
- **Iv compatabilities**
  - **Admixture:** amikacin,calcium gluconate,cefepime,cimetidine,hydrocortisone,meropenem,KCL,verapamil
  - **Solution :**5%DW, NS,DNS,RL
  - **Y-site**: amiodarone,ampicillin,ampicillin-sulbactum,clarithromycin,esmolol,diltiazem,fluconazol,insulin,$MgSO_4$,morphine,ondasetrone, $NaHCO_3$.
  - **Syringe:** caffeine

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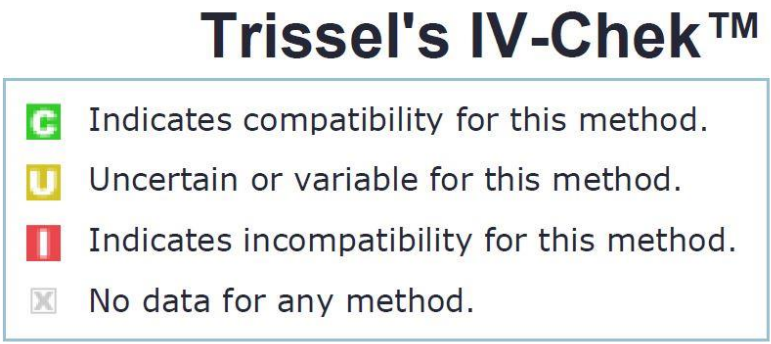
Key for the listed drugs and their compatibility chart profile



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