



**JOHORE
ANTIBIOTICS DILUTION
QUICK REFERENCE
2011**

1st Edition

Introduction

To promote and ensure the quality use of antibiotics, many strategies have been implemented such as good infection control practices, conduct of multidisciplinary antibiotic rounds, establishment of national antimicrobial guideline, surveillance programmes, audits, continuous training and education amongst health personnel.

Nevertheless, dilution of antibiotics is an essential part to ensure that patients receive the optimum therapy. It is important that the concentration of antibiotics' dilution is correct to minimize the side effects. Besides, stability of the antibiotics is essential to ensure safety, quality and efficacy of the drugs.

This Johore Antibiotics Dilution Quick Reference 2011 is produced to standardize the practice among all pharmacists in Johore state. Our aim is to provide comprehensive information regarding antibiotics dilution. It remains the responsibility of every pharmacists 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 pharmacists in healthcare facilities. All information contained in this manual has been provided with the sole intent that it be readily accessible for pharmacist's information and as a guide for conducting dilution of drugs that may be prescribed.

Advisor

Pn. Rosidah bt. Md.Din - *Deputy Director of Health (Pharmacy) Johore
Johore Pharmaceutical Services Division*

Contributors :

Steril/Non-Steril Preparation Working Committee Members, Johore Pharmaceutical Services Division.

Pn. Hamidah bt. Aرسال - *Chief Pharmacist, Kluang Hospital*

Pn. Eyatul Mazuin Ayla bt. Mamdooh Waffa - *Pharmacist U48, Hospital Sultanah Aminah, Johor Bahru*

Cik Ng Chau Tee - *Pharmacist U44, Hospital Batu Pahat*

Pn. Nurulhieda bt. Ab. Jamal - *Pharmacist U44, Hospital Kluang*

Cik So Yeong Zu - *Pharmacist U41, Hospital Sultan Ismail, Johor Bahru*

Pn. Azalilah bt Shaari - *Assistant Director of Pharmacy (Practice & Development),
Johore Pharmaceutical Services Division.*

CONTENT

No.	Antibiotics	Page
1.	Acyclovir 250 mg	1
2.	Amikacin 250 mg/2mL, 500 mg/2MI	1
3.	Amoxicillin 1 g + Clavulanate 200 mg	1
4.	Ampicillin 500 mg	2
5.	Ampicillin 1 g + Sulbactam Sodium 500 mg	2
6.	Amphotericin B 50 mg	3
7.	Azithromycin 500 mg	3
8.	Benzathine Benzylpenicillin 2.4 MIU/5 ml	3
9.	Benzylpenicillin 1 MIU, 5 MIU	4
10.	Caspofungin Acetate 50 mg/70 mg	4
11.	Cefepime 1 g	4
12.	Cefoperazone 1g	5
13.	Cefoperazone 500 mg + Sulbactam 500 mg	5
14.	Cefotaxime 1g	6
15.	Ceftazidime 1 g	6
16.	Ceftriaxone 1 g	7
17.	Cefuroxime 750 mg	7
18.	Ciprofloxacin 200 mg/100 ml	8
19.	Clindamycin Phosphate 150 mg/ml	8

No.	Antibiotics	Page
20.	Cloxacillin Sodium 500 mg	8
21.	Doripenem Monohydrate 500 mg	9
22.	Erythromycin Lactobionate 500 mg	9
23.	Fluconazole 100 mg/50ML	10
24.	Fusidic Acid 500 mg	10
25.	Gentamicin 80 mg/2 ml	10
26.	Imipenem 500 mg + Cilastatin 500 mg	11
27.	Linezolid 600 mg/300 ml	11
28.	Meropenem 500 mg, 1g	11
29.	Metronidazole 500 mg/100 mL	12
30.	Moxifloxacin 400 mg/250 ml	12
31.	Piperacillin 4 g + Tazobactam 500 mg	12
32.	Polymycin B 500,000 IU	12
33.	Streptomycin Sulphate 1g	13
34.	Sulfamethoxazole 400 mg+ Trimethoprim 80 mg	13
35.	Teicoplanin 200 mg	13
36.	Tigecycline 50 mg	14
37.	Vancomycin 500 mg	14
	Abbreviations & References	15

No	Medication	Diluent	Administration	Reconstitution/Dilution	Final Concentration	Stability
1.	Acyclovir 250 mg	D ₅ W NS Lactate Ringer's Hartmann's Gluc-NaCl	Intermittent IV infusion: Over a minimum of 1 hr NOT for IM or subQ administration	Reconstitute 250 mg with 10 ml WFI: 25 mg/ml Intermittent IV infusion: Withdraw required dose and further dilute concentration ≤ 5 mg/ml with diluents (usually NS) dose ≤ 500 mg to 100 ml dose > 500 mg to 250 ml	Intermittent IV infusion: ≤ 5 mg/ml	Reconstituted solution 25 mg/ml: 12 hrs (RT) Prepared infusion ≤ 5 mg/ml : 24 hrs (RT) Do not refrigerate, may precipitate
2.	Amikacin 250 mg/2mL 500 mg/2mL	D ₅ W NS Hartmann's Lactate Ringer's	IM (preferred route): Deep IM into upper outer quadrant of buttocks. IV injection: Over 2-3 min Intermittent IV infusion: Adult: over 30 – 60 min Infant: 1-2 hrs	IM & IV injection: Withdraw required dose without further dilution. Intermittent IV infusion: Withdraw required dose and further dilute to 0.25 – 5mg/ml with diluents. (usually 100 ml NS)	0.25 – 5mg/ml	Prepared infusion 0.25 – 5 mg/ml: 24 hrs (RT) 2 days (2-8°C) Unused portion in vial should be discarded Protect from light and do not freeze
3.	Amoxicillin 1 g + Clavulanate 200 mg	NS Incompatible with D₅W	IV injection: Over 3-4 min Intermittent IV infusion: Over 30-40 min	Reconstitute 1.2 g with 20 ml WFI: 60 mg/ml IV injection: Withdraw required dose without further dilution. Intermittent IV infusion: Withdraw required dose and further dilutes to with diluents. Dose 1.2 g in 100 ml NS	IV injection: 60 mg/ml Intermittent IV infusion: 12 mg/ml	Reconstituted vials & prepared infusion: Used immediately. Use within 3 hrs in 25°C after preparation

No	Medication	Diluent	Administration	Reconstitution/Dilution	Final Concentration	Stability
4.	Ampicillin 500 mg	NS Incompatible with D₅W & Hartmann's	IM IV injection: Over 3-5 min Intermittent IV infusion: Over 30-60 min	IM administration: Reconstitute 500 mg with 1.8 ml WFI: 250 mg/ml. Withdraw required dose without further dilution IV administration: Reconstitute 500 mg with 5 ml WFI: 100 mg/ml IV injection: Withdraw required dose without further dilution Intermittent IV infusion: Withdraw required dose and add to suitable volume of diluents. Dose ≤ 1g to 50 ml Dose >1g to 100 ml	IM: 250 mg/ml IV injection: 100 mg/ml Intermittent IV infusion: ≤ 30 mg/ml	Reconstituted vials: Used immediately IM & IV injection: Use within 1 hr after preparation. Prepared infusion in NS: 8 hrs (RT) 12 hrs (2-8°C)
5.	Ampicillin 1 g + Sulbactam Sodium 500 mg	NS D ₅ W 0.5% or 2% lidocaine hydrochloride for IM administration only	IM IV injection: Over 10-15 min Intermittent IV infusion: Over 15 - 30 min	Reconstitute 1.5 g with 3.2 ml WFI: 375 mg/ml IM & IV injection: Withdraw required dose without further dilution. Intermittent IV infusion: Withdraw required dose and further dilute with 50 – 100 ml diluent.	IM & IV injection: 375 mg/ml 375 mg = 250 mg ampicillin + 125 mg sulbactam Intermittent IV infusion: 3 – 45 mg/ml 3 mg/ml = 2 mg ampicillin + 1 mg sulbactam 45 mg = 30 mg ampicillin + 15 mg sulbactam	Prepared IM/ IV injection: Use within 1 hr after preparation Prepared infusion in NS: 8 hrs (RT) 72 hrs (2-8°C) Prepared infusion in D ₅ W: 2 hrs (RT) 4 hrs (2-8°C)

No	Medication	Diluent	Administration	Reconstitution/Dilution	Final Concentration	Stability
6.	Amphotericin B 50 mg	D ₅ W Incompatible with NS and all electrolyte solutions	Intermittent IV infusion: Over 20-30 min (test dose) Over 4 to 6 hrs or longer if not tolerated. Flush line again with D ₅ W after infusion complete	Reconstitute 50 mg with 10 ml WFI: 5 mg/ml Withdraw required dose and further dilute to: 500 ml, ≤ 0.1 mg/ml 250 ml, ≤ 0.25 mg/ml	Peripheral infusion: ≤ 0.1 mg/ml Central infusion: ≤ 0.25 mg/ml	Reconstituted solution 5 mg/ml: 24 hrs (RT) 7 days (2-8°C) Prepared infusion: 24 hrs (RT) 2 days (2-8°C) Protect from light
7.	Azithromycin 500 mg	NS D ₅ W Lactated Ringer's	Intermittent IV infusion: Over 3 hrs (1 mg/ml) Over 1 hr (2 mg/ml) Minimum duration of 1 hr. NOT for IM or IV bolus administration	Reconstitute 500 mg with 4.8 ml WFI: 100 mg/ml Intermittent IV infusion: Reconstituted solution 100 mg/ml further dilute with diluents to: 500 ml, 1 mg/ml 250 ml, 2 mg/ml	1 – 2 mg/ml	Reconstituted solution: 24 hrs (< 30°C) Prepared infusion 1-2 mg/ml: 24 hrs (RT) 7 days (2-8°C)
8.	Benzathine Benzylpenicillin 2.4 MIU/5 ml	NA	IM: Deep IM into upper outer quadrant of buttock Children < 2 year old: IM into midlateral muscle of thigh NOT for IV, intra-arterially or subQ administration	NA	NA	2-8°C

No	Medication	Diluent	Administration	Reconstitution/Dilution	Final Concentration	Stability
9.	<p>Benzylpenicillin 1 MIU 5 MIU</p> <p>(Penicillin G 1 & 5 MIU)</p> <p>600 mg = 1 MIU</p>	<p>NS D₅W (less stable)</p>	<p>IM: Deep IM into upper outer quadrant of buttock.</p> <p>IV injection: Over 5 minutes. Max rate: 300 mg/min</p> <p>Intermittent IV infusion: Over 30-60 minutes</p>	<p>IM administration: Reconstitute 1 MIU with 1.6 ml WFI: 300 mg/ml Withdraw required dose without further dilution.</p> <p>IV administration: Reconstitute 1 MIU with 5.6 ml WFI/NS: 100 mg/ml</p> <p>IV injection: Withdraw a required dose without further dilution</p> <p>Intermittent IV infusion: Withdraw required dose and further dilute with diluents. Usually 100 ml NS</p>	<p>IM: 300 mg/ml</p> <p>IV injection: 100 mg/ml</p> <p>Intermittent IV infusion: 6 mg/ml</p>	<p>Reconstituted solution, 2-8°C: 7 days (K⁺ base) 3 days (Na⁺ base)</p>
10.	<p>Caspofungin Acetate 50 mg/70 mg</p>	<p>NaCl solution Hartmann's</p> <p>Incompatible with Glucose solution</p>	<p>Intermittent IV infusion: Over 1 hr</p>	<p>Reconstitute 50 mg / 70 mg with 10.5 ml WFI: 50 / 70 mg/ml</p> <p>Withdraw required dose and further dilute to ≤ 0.5 mg/ml with diluents. Usually 250 ml NS</p>	<p>≤ 0.5 mg/ml</p>	<p>Reconstituted solution: 1 hrs (RT)</p> <p>Prepared infusion: 24 hrs (RT) 2 days (2-8°C)</p>
11.	<p>Cefepime 1 g</p>	<p>D₅W NS</p>	<p>IM</p> <p>Intermittent IV infusion: Over 30 min</p>	<p>IM administration: Reconstitue 1 g with 2.4 ml WFI: 280 mg/ml. Withdraw required dose without further dilution</p> <p>IV administration: Reconstitute 1 g with 10 ml WFI: 100 mg/ml.</p>	<p>IM: 280 mg/ml</p> <p>Intermittent IV infusion: 1 – 40 mg/ml</p>	<p>Reconstituted & prepared infusion: 24 hrs (RT) 7 days (2-8°C)</p> <p>Color of cefepime solution may darken on storage. However, product potency is not adversely affected.</p>

No	Medication	Diluent	Administration	Reconstitution/Dilution	Final Concentration	Stability
	Cefepime 1g			Withdraw required dose and further dilute in 50 or 100 ml diluents. Usually 1 g in 50 ml diluents		
12.	Cefoperazone 1g	D ₅ W NS Lactate Ringers’ (not for reconstitution) 2% lidocaine for IM administration only	IM IV injection: Over minimum of 3 min Intermittent IV infusion: 15 – 60 min	IM administration: Reconstitute 1g with 3.4 ml WFI: 250 mg/ml Withdraw required dose without further dilution IV administration: Reconstitute 1 g with 10 ml diluents/WFI: 100 mg/ml IV injection: Withdraw required dose without further dilution Intermittent IV infusion: Withdraw required dose and further dilute with 20 – 100 ml diluents	IM: 250 mg/ml IV injection: 100 mg/ml Intermittent IV infusion: 10 -50 mg/ml	Reconstituted & prepared infusion: 24 hrs (RT) 5 days (2-8°C)
13.	Cefoperazone 500 mg + Sulbactam 500 mg	D ₅ W NS Lactate Ringers’ (not for reconstitution)	IM IV injection: Over a minimum of 3 min Intermittent IV infusion: Over 15 to 60 min	Reconstitute 1 g with 3.4 ml WFI: 250 mg/ml IM & IV injection: Withdraw required dose without further dilution. Intermittent IV infusion: Withdraw required dose and further dilute to ≤250 mg/ml with diluents (20 – 100 ml) Dose 1 g to 20 ml.	IM & IV injection: 250 mg/ml Intermittent IV infusion: ≤250 mg/ml 250 mg =125 mg cefoperazone +125 mg sulbactam	Reconstituted & Prepared infusion: 1 day (RT)

No	Medication	Diluent	Administration	Reconstitution/Dilution	Final Concentration	Stability
14.	Cefotaxime 1g	NS D ₅ W Gluc-NaCl Hartmann's 2% lidocaine for IM injection only	IM IV injection: Over 3-5 min Intermittent IV infusion: Over 15-60 min	Reconstitute 1g with 4 ml WFI:250 mg/ml IM & IV injection: Withdraw required dose without further dilution Intermittent IV infusion: Withdraw required dose and further dilute with 50-100 ml diluent	IM & IV injection: 250 mg/ml Intermittent IV infusion: 10-20 mg/ml	Reconstituted solution: 12 - 24 hrs (RT) 7 – 10 days (2-8°C) Prepared infusion: 24 hrs (RT) 5 days (2-8°C) Protect from light.
15.	Ceftazidime 1 g	NS D ₅ W Gluc-NaCl Hartmann's Lactate Ringer's	IM IV injection: Over 3-5 min Intermittent IV infusion: over 20-30 min	IM administration: Reconstitute 1 g with 3 ml WFI: 333 mg/ml. Withdraw required dose without further dilution. IV administration: Reconstitute 1 g with 10 ml WFI: 100 mg/ml IV injection: Withdraw required dose without further dilution. Intermittent IV infusion Withdraw required dose and further dilute to ≤ 100 mg/ml with diluents. (usually 100 ml NS) Minimum 50 ml for 2 g Minimum 100 ml for 3 g	IM: 333 mg/ml For Dose ≤ 1g IV injection: 100 mg/ml Intermittent IV infusion: ≤ 100 mg/ml	Prepared IM injection in WFI: 3 hrs (RT) 3 days (2-8°C) Prepared IV injection: 12 hrs (RT) 3 days (2-8°C) Prepared infusion: 12 hrs (RT) 1 day (2-8°C)

No	Medication	Diluent	Administration	Reconstitution/Dilution	Final Concentration	Stability
16.	Ceftriaxone 1 g	D ₅ W NS Gluc-NaCl 1% lidocaine for IM injection only Must not be administered simultaneously with calcium containing solution.	IM IV injection: Over 2-4 min IV intermittent infusion: Over at least 30 min	IM administration: Reconstitute 1 g with WFI 2.1 ml, 350 mg/ml 3.6 ml, 250 mg/ml Withdraw required dose without further dilution. IV administration: Reconstitute 1 g with 9.6 mL WFI: 100 mg/ml IV injection: Withdraw required dose without further dilution Intermittent IV infusion: Withdraw required dose and further dilute with 50-100 ml diluents (usually NS)	IM: 250 or 350 mg/ml Dose < 1g IV injection: 100 mg/ml Intermittent IV infusion: 10-40 mg/ml	Prepared IM injection: 24 hrs (RT) 10 days (1% lidocaine, 2-8°C) Reconstitute & prepared solution: 6 hrs (RT) 24 hrs (2-8°C)
17.	Cefuroxime 750 mg	NS D ₅ W Gluc-NaCl Harmann's Lactate Ringer's	IM: Into large muscle such as gluteus or lateral aspect of thigh IV injection: Over 3-5 min Intermittent IV infusion: over 15-30 min	IM administration: Reconstitute 750 mg with 3 ml WFI: 250 mg/ml Withdraw required dose without further dilution. IV administration: Reconstitute 750 mg with WFI 6 ml, 125 mg/ml 10 ml, 75 mg/ml IV injection Withdraw required dose without further dilution.	IM: 250 mg/ml IV injection: 75 or 125 mg/ml Intermittent IV infusion: 15 -30 mg/ml	Reconstituted solution: 24 hrs (RT) 2 days (2-8°C) Prepared infusion: 24 hrs (RT) 7 days (2-8°C)

No	Medication	Diluent	Administration	Reconstitution/Dilution	Final Concentration	Stability
	Cefuroxime 750 mg			Intermittent IV infusion: Withdraw required dose and further dilute with 50-100 ml diluents. Dose 750 in 50 ml		
18.	Ciprofloxacin 200 mg/100 ml	NA	Intermittent IV infusion: 200 mg infuse over 30 min	NA	≤ 2 mg/ml	Use opened vials immediately. Discard any unused solution.
19.	Clindamycin Phosphate 150 mg/ml	D ₅ W NS Gluc-NaCl	IM Intermittent IV infusion: Over at least 10-60 minutes Not > 30 mg/min Not >1200 mg/hr Never administer as BOLUS	IM: Withdraw required dose without further dilution Intermittent IV infusion: Withdraw required dose and further dilute to ≤ 18 mg/ml with diluents.	IM: ≤ 600 mg in single injection Intermittent IV infusion: ≤ 18 mg/ml	Prepared infusion: 16 days (RT) 32 days (2-8°C) Unused portion in vial should be discarded
20.	Cloxacillin Sodium 500 mg	D ₅ W NS	IM IV injection: Over 3 - 4 min IV infusion	IM administration: Reconstitute 500 mg with WFI 2 ml, 250 mg/ml 4 ml, 125 mg/ml IV administration: Reconstitute 500 mg with WFI 5 ml, 100 mg/ml 10 ml, 50 mg/ml IV injection: Withdraw required dose	IM: 125 or 250 mg/ml IV injection: 50 or 100 mg/ml IV infusion: 1-2 mg/ml	Reconstituted solution: 24 hrs (RT) 48 hrs (2-8°C) Prepared infusion: 12 hrs (RT)

No	Medication	Diluent	Administration	Reconstitution/Dilution	Final Concentration	Stability
	Cloxacillin Sodium 500 mg			without further dilution. IV infusion: Reconstitute 500 mg with 5 ml WFI: 100 mg/ml. Withdraw required dose and further dilute with diluents. Dose ≤ 500 mg to 250 ml Dose >500 mg to 500 ml		
21.	Doripenem Monohydrate 500 mg	D ₅ W NS <i>Less stable in D₅W</i>	Intermittent IV infusion: Over 1 hr May infuse over 4 hrs which allow the serum concentration to maintain above MIC	Reconstitute 500 mg with 10 ml WFI or NS: 50 mg/ml Withdraw required dose and further dilute with diluents Usually 100 ml NS,	5 mg/ml	Reconstituted solution: 1 hr Prepared infusion in NS: 8 hrs (RT) 24 hrs (2-8°C) Prepared infusion in D ₅ W: 4 hrs (RT) 24 hrs (2-8°C)
22.	Erythromycin Lactobionate 500 mg	NS <i>Do not use D₅W as a diluents unless 0.5 mL 8.4% NaHCO₃ added per each 100 ml D₅W</i>	Intermittent IV infusion: Over 20-60 min Continuous IV infusion Give more slowly in patients with risk factors or history of arrhythmias. Never administer as direct IV injection (Fatal ventricular arrhythmias)	Reconstitute 500 with 10 ml WFI: 50 mg/ml. Withdraw required dose and further dilute to 1 - 2 mg/ml with diluents. At least 100 ml NS of infusion solution. If phlebitis/pain occur with used dilution, consider further dilution	1-2 mg /ml Max: 5 mg/ml (↑ venous irritation)	Reconstituted solution: 8 hrs (RT) 14 days (2-8°C) Prepared infusion: 24 hrs Protect from light

No	Medication	Diluent	Administration	Reconstitution/Dilution	Final Concentration	Stability
23.	Fluconazole 100 mg/50ML	NS D ₅ W Hartmann's Ringer's	Intermittent IV infusion: Over 1-2 hrs Max rate: 200 mg/hr (100 ml/hr)	NA	NA	Infusions are single use only. Discard any unused portion
24.	Fusidic Acid 500 mg	D ₅ W NS Hartmann's	Intermittent IV infusion: Over ≥ 2 hrs NOT for IM or subQ administration	Reconstitute 500 mg with 10 ml of supplied diluents: 50 mg/ml. Withdraw required dose and further dilute to 1 - 2 mg/ml with diluents (usually 500 ml NS) For patient < 50 kg, required dose should be diluted to at least 10 FOLD in compatible diluents.	1-2 mg/ml	Prepared infusion: 24 hrs
25.	Gentamicin 80 mg/2 ml	NS D ₅ W Gluc-NaCl	IM: Volume > 4 ml, distributed btw ≥ 2 injection site IV injection: Over 3-5 min (↑ risk of neuromuscular blockage) Intermittent IV infusion: Over 30-60 min	IM & IV injection: Withdraw required dose without further dilution. Intermittent IV infusion: Withdraw required dose and further dilute with diluents.	Intermittent IV infusion: 1 mg/ml	Prepared IV infusion: 24 hrs

No	Medication	Diluent	Administration	Reconstitution/Dilution	Final Concentration	Stability
26.	Imipenem 500 mg + Cilastatin 500 mg	NS D ₅ W Incompatible with lactate containing solution.	Intermittent IV infusion: Dose ≤ 500 mg imipenem over 20-30 min Dose ≥ 750 mg imipenem over 40-60 min Never administer as IV BOLUS	Reconstitute 500 mg imipenem with 10 ml NS: 50 mg/ml Withdraw required dose and further dilute to ≤ 5mg/ml with diluents. (usually 100-250 ml NS)	≤ 5mg/ml imipenem	Prepared infusion: 4 hrs (RT) 24 hrs (2-8°C)
27.	Linezolid 600 mg/300 ml	NS D ₅ W Gluc-NaCl Hartmann's Lactate Ringer's	Intermittent IV infusion: Over 30-120 min Flush line with D5%W, NS or Lactate Ringers' before and after infusing linezolid	Withdraw required dose without further dilution.	NA	Once opened, use immediately Discard any unused solution.
28.	Meropenem 500 mg 1 g	NS D ₅ W	IV injection: Over 3-5 min Intermittent IV infusion: over 15-30 min	Reconstitute to concentration of 50 mg/ml 500 mg with 10 ml WFI/NS 1 g with 20 ml WFI/NS IV injection: Withdraw required dose without further dilution. Intermittent IV infusion: Withdraw required dose and further dilute to 1-20 mg/ml with diluents Usually 50 – 200 ml NS	IV injection: 50 mg/ml Intermittent IV infusion: 1-20 mg/ml	Reconstituted solution in WFI: 2 hrs (RT) 12 hrs (2-8°C) Reconstituted solution in NS: 2 hrs (RT) 18 hrs (2-8°C) Prepared infusion: In NS: 4 hrs (RT) 24 hrs (2-8°C) Prepared infusion In D ₅ W : 1 hr (RT) 4 hrs (2-8°C)

No	Medication	Diluent	Administration	Reconstitution/Dilution	Final Concentration	Stability
29.	Metronidazole 500 mg/100 mL	NS D ₅ W Gluc-NaCl <i>Incompatible with D10%W & Hartmann's</i>	Intermittent IV infusion: At rate 5 ml/min over 30-60 min	Withdraw required dose without further dilution.	NA	Once opened, use immediately Discard any unused solution Do not refrigerate
30.	Moxifloxacin 400 mg/250 ml	NA	Intermittent IV infusion: Over 60 minutes Never administer as BOLUS	NA	NA	Once opened, use immediately Discard any unused solution
31.	Piperacillin 4 g + Tazobactam 500 mg	NS D ₅ W <i>Incompatible with Hartmann's</i>	IV injection: At least over 3-5 min Intermittent IV infusion: over 20-30 min	Reconstitute 4.5 g with 20 ml WFI/NS. IV injection: Withdraw required dose without further dilution. Intermittent IV infusion: Withdraw required dose and further dilute with diluents. Usually 50-100 ml NS	NA	Reconstituted solution: 24 hrs (RT) 2 days (2-8°C) Prepared infusion: 24 hrs (RT) 7 days (2-8°C)
32.	Polymycin B 500,000 IU	NS Procaine solution <i>D₅W for IV infusion only</i>	IM Continuous IV infusion IT	IM: Reconstitute 500,000 IU with 2 ml WFI/diluents IV infusion: Reconstitute and further dilute 500,000 with 300-500 ml D ₅ W IT: Reconstitute 500,000 IU with 10 ml NS	NA	Reconstituted solution: 3 days (2-8°C)

No	Medication	Diluent	Administration	Reconstitution/Dilution	Final Concentration	Stability
33.	Streptomycin Sulphate 1g	NA	IM: upper outer quadrant of the buttock or the mid- lateral thigh (in children use mid-lateral thigh) NOT recommended for IV administration	Reconstitute 1 g with WFI 4.2 ml, 200 mg/ml 3.2 ml, 250 mg/ml 1.8 ml, 400 mg/ml Withdraw required dose without further dilution	NA	Injection should be freshly prepared and discard unused portion Protect from light
34.	Sulfamethoxazole 400 mg+ Trimethoprim 80 mg	D ₅ W NS Gluc-NaCl Limited stability in NS	Intermittent IV infusion: over 60-90 hrs IV infusion duration NOT > 1.5 hrs NOT for IM administration	Solution must be diluted prior to administration Withdraw required dose and further dilute with diluents. Dilute 1 mL Bactrim to 25-30 mL diluents. Usually 15 ml dilute to 500 ml diluents Fluid restriction: Add each 5 ml to 75 ml D ₅ W & infuse ≤ 60 min	NA	Prepared infusion: 24 hrs, except: 6 hrs: 5 ml/125 ml 4 hrs: 5 ml/100 ml 2 hrs: 5 ml/75 ml Do not refrigerate Protect from light Crystallization or turbidity may develop at any time. Discard if occur.
35.	Teicoplanin 200 mg	NS D ₅ W Gluc-NaCl Hartmann's	IM IV injection: Over 3-5 minutes Intermittent IV infusion: Over 30 minutes	Reconstitute 200 mg with entire content of solvent provided: 200 mg/3 ml IM & IV injection: Withdraw required dose without further dilution Intermittent IV infusion: Withdraw required dose and further dilute with diluents. Usually 100 ml NS/ D ₅ W	NA	Reconstituted solution: 24 hrs (2-8°C) Prepared infusion: 24 hrs

No	Medication	Diluent	Administration	Reconstitution/Dilution	Final Concentration	Stability
36.	Tigecycline 50 mg	D ₅ W NS	Intermittent IV infusion: Over 30-60 minutes	Reconstitute 50 mg with 5.3 ml diluents: 10 mg/ml Withdraw required dose and further dilute to ≤1 mg/ml. Usually 100 ml diluents	≤ 1 mg/ml	Reconstituted solution: 24 hrs (RT) Prepared infusion: 45 hrs (2-8°C)
37.	Vancomycin 500 mg	D ₅ W NS Hartmann's	Intermittent IV infusion: Over at least 1 hr Over 2 hrs for 1g dose. Max rate 10 mg/min If red man syndrome appear: Infuse over 1.5 hrs - 2 hrs and increase the dilution volume Continuous IV infusion: Over 24 hrs (only if intermittent technique is not feasible) IT Oral: Injection form may give orally if necessary Rotate infusion site frequently to avoid extravasation NOT for IM administration	Solution must be diluted prior to administration Reconstitute 500 mg with 10 mL WFI: 50 mg/ml Intermittent IV infusion: Withdraw required dose and further dilute to 2.5 – 5 mg/ml with diluents 500 mg dilutes with at least 100 ml diluents Continuous IV infusion: Withdraw required dose and add with sufficiently large volume of diluents. IT: Withdraw required dose and further dilute to 1-5 mg/ml with preservative free NS Oral: Reconstitute 500 mg with 10 ml WFI: 50 mg.ml Withdraw required dose and dilute with 30 ml WFI. Given via NG tube or drink.	Intermittent IV infusion: ≤ 5 mg/ml Fluid restriction: Max 10 mg/ml, but ↑ risk of infusion related effect IT: 1-5 mg/ml	Prepared infusion: 7 days (RT) 14 days (2-8°C)

Abbreviations:

D ₅ W	:	5% Dextrose in Water
Gluc-NaCl	:	Glucose / Sodium Chloride Solution
IM	:	Intramuscular
IT	:	Intrathecal
IV	:	Intravenous
K ⁺	:	Potassium Powder
LT	:	Lactated Ringers
Na ⁺	:	Sodium Powder
NaCl	:	Sodium Chloride Solution
NS	:	Sodium Chloride 0.9%
RT	:	Room Temperature
SubQ	:	Subcutaneous
WFI	:	Water for Injection

References:

1. Charles F.Lacy, Lora L.Armstrong, Morton P. Goldman, *Drug Information Handbook 19th Edition*, Lexi-Comp, 2010-2011.
2. Drug Insert.
3. Micromedex, Thomson Reuters.
4. Ministry of Health Virtual Library, *Injectable Drug Guideline*, Complete Medicines Online Subscription Services, July 2011 , cited from *www.medicinescomplete.com*.