AMIKACIN SULPHATE

<table>
<tr><td>Trade Name</td><td>DBL® Amikacin Injection (Pfizer) 500 mg / 2 mL</td></tr>
<tr><td>Class</td><td>Semi-synthetic aminoglycoside antibiotic</td></tr>
<tr><td>Mechanism of Action</td><td>Inhibits translation of bacterial DNA by interfering with bacterial mRNA at ribosomal level</td></tr>
<tr><td>Indications</td><td>Empiric treatment for late onset sepsis
Treatment of suspected or proven gram-negative bacterial sepsis
Most commonly used in combination with β-lactam antibiotics, eg flucloxacillin, amoxycillin</td></tr>
<tr><td>Contraindications</td><td>Hypersensitivity to amikacin or its components.
Myaesthenia Gravis
Amikacin injection contains sodium metabisulphite, monitor for signs of anaphylaxis.
Clostridium difficile infection has been associated with amikacin dosing monitor for signs of diarrhoea.
Caution in renal impairment, and in combination with other nephrotoxic, ototoxic drugs (indometacin, furosemide, vancomycin, amphotericin).</td></tr>
<tr><td>Supplied As</td><td>500mg in 2mL vial clear solution</td></tr>
<tr><td>Dilution</td><td>IV:
Add 1 mL (250 mg) of amikacin to 49 mL of sodium chloride 0.9% to make a 250 mg / 50mL (= 5 mg /mL) solution.

<table>
<tr><th>Amikacin</th><th>Sodium Chloride 0.9% Added</th><th>Final Volume</th><th>Final Concentration</th></tr>
<tr><td>250mg
(1 mL)</td><td>49 mL</td><td>50 mL</td><td>250 mg / 50 mL
= 5 mg / mL</td></tr>
</table>
</td></tr>
<tr><td>Dosage[6]</td><td>12mg/kg/dose</td></tr>
<tr><td>Interval</td><td>Levels taken following the first dose will help to inform subsequent dosing and interval
Aiming for interval to be 24 – 48 hourly</td></tr>
<tr><td>Administration</td><td>IV infusion over 30 minutes
(IM route can be used if IV is not available but IM is not routinely recommended – refer to www.anmfonline.org for dilution instructions)</td></tr>
</table>

Monitoring **Red gel free tube**	**Levels analysed in the Biochemistry lab** **Blood sampling:** Take **two** blood samples after the first dose. 1. 30 mins after the end of the flush given following the dose 2. 8 -14 hours post dose **Target levels:** Peak 24- 35 mg/L, Trough <5 mg/L Pharmacy will review the results and provide further dosing and monitoring advice. Monitor routine biochemistry and renal function, serum creatinine and electrolytes, ensure adequate hydration
Compatible With	**In solution:** dextrose 5 %, dextrose 10%, sodium chloride 0.9%, sodium chloride 0.45%, lactated ringers **Terminal injection Y-site**: acyclovir, adrenaline, aminophylline, amiodarone, atropine, benzylpenicillin, calcium chloride, calcium gluconate, cefazolin, cefepime,cefotaxime, ceftazidime, ceftriaxone, cefuroxime, chloramphenicol, clindamycin, dexamethasone, dexmedetomidine, digoxin, dobutamine, dopamine, ephedrine, epoetin alfa, famotidine, fluconazole,folic acid, furosemide, glyceryl trinitrate, hydrocortisone, insulin, lidocaine, magnesium sulfate, meropenem, methylprednisolone, metronidazole, midazolam, milrinone, morphine, naloxone, noradrenaline, octreotide, ondansetron, pancuronium, piperacillin tazobactam, phenobarbital, potassium chloride, pyridoxine, ranitidine, rocuronium, sodium acetate, sodium bicarbonate, vancomycin,vasopressin, zidovudine, TPN.
Incompatible With	Amphotericin B, amoxicillin,azithromycin,diazoxide, folic acid, ganciclovir, heparin (variable), ibuprofen, indometacin,insulin, penicillins, phenytoin propofol sulphamethoxazole/trimethoprim. Flush the line between these meds. Compatibility of amikacin with SMOF lipid has not been tested therefore recommend to avoid this combination.
Interactions	**Physical contact of amikacin with penicillins (eg.amoxicillin, flucoxacillin) in lines may impair antibiotic activity, flush lines well between administration of each drug.** Furosemide – increased risk of nephro and or ototoxicity Indometacin – increased amikacin levels and risk of toxicity Pancuronium – potential increased risk of neuromuscular blockade especially in the presence of hypocalcaemia. (Note amikacin is reported to cause less neuromuscular blockade than gentamicin) Amikacin can interfere with other lab tests causing falsely high bilirubin and low sodium, potassium and platelet results.
Stability	Single use only, administer immediately after drawing up the dopse and any unused portion of the vial.
Storage	Store below 25^{o}C. Protect from light.

Adverse Reactions	Nephrotoxic, ototoxic – related to total dose, treatment duration and high area under the curve (AUC). Ototoxicity is not usually seen with single doses**.** Neuromuscular blockade and respiratory paralysis has occurred in adults with iv boluses so infuse over 30 minutes
Metabolism	Excreted unchanged in urine by glomerular filtration; Elimination half life: 7 -14 hours in neonates <30 weeks, 4 - 7 hours in neonates 40+ weeks
Comments	When the 30 min infusion finishes, this is “completion of the dose”. To ensure the entire dose reaches the baby (and none is left in the line) follow the amikacin infusion with a 30 min flush. Amikacin acts synergistically with penicillins for treatment of gentamicin resistant organisms. Green tubes used in NICU are not appropriate for amikacin assays because they contain a gel plug that absorbs the medication and prevents accurate measurement
References	1. Cristea S, Smits A, Kulo A, Knibbe CAJ, van Weissenbruch M, Krekels EHJ, Allegaert K. Amikacin Pharmacokinetics To Optimize Dosing in Neonates with Perinatal Asphyxia Treated with Hypothermia. Antimicrob Agents Chemother. 2017;61 2. Smits A, Kulo A, van den Anker J, Allegaert K. The amikacin research program: a stepwise approach to validate dosing regimens in neonates. Expert Opin Drug Metab Toxicol. 2017;13:157-66. 3. Smits A, De Cock RF, Allegaert K, Vanhaesebrouck S, Danhof M, Knibbe CA. Prospective Evaluation of a Model-Based Dosing Regimen for Amikacin in Preterm and Term Neonates in Clinical Practice. Antimicrob Agents Chemother. 2015;59:6344-51 4. Neofax in www.micromedexsolutions.com 5. Trissel LA, IV Compatibility in www.micromedex.com 6. www.anmfonline.org 7. Amikacin for neonates in www.starship.org.nz/guidelines
Updated By	N Austin, M Wallenstein, B Robertshawe. September 2021 A Lynn, B Robertshawe June 2025
Consensus	