South Australian Neonatal Medication Guidelines

gentamicin

10mg/mL injection, 80mg/2mL injection

Note:

This guideline provides advice of a general nature. This statewide guideline has been prepared to promote and facilitate standardisation and consistency of practice, using a multidisciplinary approach. The guideline is based on a review of published evidence and expert opinion.

Information in this statewide guideline is current at the time of publication.

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Health practitioners in the South Australian public health sector are expected to review specific details of each patient and professionally assess the applicability of the relevant guideline to that clinical situation.

If for good clinical reasons, a decision is made to depart from the guideline, the responsible clinician must document in the patient's medical record, the decision made, by whom, and detailed reasons for the departure from the guideline.

This statewide guideline does not address all the elements of clinical practice and assumes that the individual clinicians are responsible for discussing care with consumers in an environment that is culturally appropriate and which enables respectful confidential discussion. This includes:

- The use of interpreter services where necessary,
- Advising consumers of their choice and ensuring informed consent is obtained,
- Providing care within scope of practice, meeting all legislative requirements and maintaining standards of professional conduct, and
- Documenting all care in accordance with mandatory and local requirements

This is a High Risk Medication ⚠

Please consider the right dose and the need for therapeutic drug monitoring before giving the next dose

Dose and Indications

Infection Due To Susceptible Gram Negative Organisms

Intravenous

Infectious Disease (ID) advice should be sought if therapy is required beyond 3 days

GESTATION (At birth) in weeks	Postnatal age (days)	
	0-14	>14
< 33	6mg/kg every **48 hours**	6 mg/kg every **24 hours**
≥ 33	5mg/kg every **24 hours**	6mg/kg every **24 hours**

For babies with corrected age (gestational age + postnatal age) ≥ 44 weeks, follow paediatric intravenous guidelines.

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Checklist (for IV administration)

Before administering a dose:

- Check if gentamicin serum level results need to be acted upon prior to the administration of the next dose
- Check if the dosing interval needs amendment as a result of the blood level results
- Check the date and time when the next blood level is required, and
- Document the ongoing plan in the Nursing Care Plan and/or Medication Chart.

Preparation and Administration

Intravenous

A dilution will be required **only if using gentamicin 80mg/2mL injection**.

Dilute 2mL of the 80mg/2mL gentamicin solution with 6mL of compatible fluid (to a total volume of 8mL). The resulting solution contains 10mg/mL of gentamicin.

The intravenous solution contains 10mg/mL gentamicin

Dose	4mg	8mg	12mg	16mg	20mg
Volume	0.4mL	0.8mL	1.2mL	1.6mL	2mL

Administer over at least 5 minutes

Compatible Fluids (Intravenous)

Glucose 5%, glucose 10% and sodium chloride 0.9%

Adverse Effects (Intravenous)

Common

Non-oliguric renal impairment (increase in plasma urea and creatinine), ototoxicity – vestibular and auditory.

Rare

Oliguria, anaphylaxis, respiratory depression.

Monitoring

- There is no need to monitor levels if the anticipated duration of gentamicin is ≤ 48 hours. Where gentamicin is to be continued beyond 48 hours monitoring should be done.
- There are two methods by which gentamicin levels can be monitored. Trough level monitoring is the method routinely in use at all sites in SA at this time.
- If AUC_{24} or peak monitoring is clinically required after microbiology results are available, please consult the WCH pharmacy and infectious diseases (ID) department for advice.

Monitoring Gentamicin by Trough Levels

Dosing frequency	Monitoring
48 hourly	Two hours before the second dose
24 hourly	Two hours before the third dose

- Levels should be measured prior to 2nd dose if there is uncertainty of adequate renal clearance, as in renal failure or to optimise blood levels in the context of culture proven sepsis.
- The patient should have adequate renal clearance. A rising urea and creatinine, urine output <2mL/kg/hour and extreme prematurity may be indicators of inadequate clearance.

Interpreting Gentamicin Trough Levels

Gentamicin level	Interpretation
≤ 1.2mg/L	Give next gentamicin dose
1.3mg/L - 2mg/L	Delay next gentamicin dose by 12 hours. No repeat level required before next dose.
> 2mg/L	Hold dose. Repeat gentamicin level in 12 hours

- The next gentamicin dose should be held until the results of the trough level are available

Practice Points

- Take care with use of any medication that can reduce renal function in particular vancomycin or ibuprofen/indometacin, with renal impairment or renal abnormalities. In these situations consider alternative options for antibiotic coverage where appropriate.
- Take care with concomitant furosemide (frusemide) therapy due to an increased risk of hearing impairment
- Gentamicin injection can be administered intramuscularly but this route is painful and difficult in neonates. AUC monitoring is also not reliable when using this route.
- Gentamicin is contraindicated if the parents of the infant have a known or suspected genetic predisposition to gentamicin ototoxicity
- IV penicillins and cephalosporins can inactivate IV aminoglycoside antibiotics (eg. gentamicin). Preferably separate doses by 1 hour. If it is not possible to separate doses, flush the line well with sodium chloride 0.9%, before and after giving each medication.

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