Waikato District Health Board	Type: **Drug Guideline**	Document reference: **2923**	Manual Classification: **Waikato DHB Drug Guidelines**
Title: **Gentamicin for Neonates**			Effective date: **9 September 2020**
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BRIEF ADMINISTRATION GUIDE

For detailed information refer to The Australasian Neonatal Medicines Formulary **gentamicin** guideline

Critical Note: there are minor variations between the ANMF and Waikato DHB best practice within this drug guideline – see yellow shaded text

Indications

- Treatment of suspected or proven gram negative infection
- Early sepsis (≤2 days) empiric therapy (in combination with amoxicillin), unless asphyxiated (then use cefotaxime)

Route:

Intravenous, preferably via peripheral line (avoid umbilical lines), or **intramuscular**

Note: IM injection is often difficult and painful in neonates. Serum level monitoring is also unreliable when using this route. Use only if IV route is unavailable.

- Supplied as gentamicin 80 mg/2 mL (40 mg/ml) ampoule
- pH 3 to 5.5

Dose:

Gestational Age (weeks)	Postnatal Age (days)	Dose (mg/kg/dose)	Interval (hours)
≤ 29 (or significant asphyxia)	0 to 7	5	48
	8 to 30	5	36
	≥31	5	24
30 to 34	0 to 7	5	36
	≥8	4	24
≥ 35	any	4	24
• Perinatal asphyxia on therapeutic hypothermia • Indomethacin / ibuprofen treatment			Increase above intervals by 12h

Dosage should be based on actual weight/birthweight (unless the patient has hydrops fetalis when an adjusted weight should be used)

Charting

- Chart dose and frequency on the medication chart i.e. normal prescribing
- Indicate (in administration section of the medication chart) the date and time of next trough level to be taken, to check dosing interval is appropriate (see "serum levels" below e.g. before second dose for 36 and 48 hour dosing, and before the third dose for 24 hour dosing)

Serum levels:

- Routine therapeutic drug monitoring for <36 hours duration of therapy is not necessary unless renal function is impaired
- **Obtain trough levels 1 hour prior to next dose** if drug being continued (following 36 hour period) and withhold the dose while result is awaited i.e. if interval is 36 or 48 hours then obtain level before 2nd dose, if 24 hour interval level before 3rd dose.

Trough Level (mcg/mL)	Suggested action
≤ 1.1	no change
1.2 to 2.4	Repeat trough level in 12 hrs
2.5 to 3.3	Repeat trough level in 24 hrs
≥ 3.4	Repeat trough level in 24 hrs

- Aim for **trough of 0.5 – 1** microgram/mL and adjust dosing interval accordingly:
- Repeat trough levels prior to the next dose if gentamicin interval is changed. If

stable; check level every 3 to 4 days, unless changing fluid or renal status (then check more frequently)

Note: Peak levels are only indicated if the organism has a high minimum inhibitory concentration – speak with a Microbiologist if using for non-standard indications.

Preparation and administration

Intravenous Infusion

- Gentamicin must be diluted with compatible fluid (sodium chloride 0.9%, glucose 5%, glucose 10%) prior to administration
- **For babies ≥ 1 kg**: Draw up 2 mL (= 80 mg) from amp and dilute with 6mL of compatible fluid, making a solution of **10 mg/mL** (which is the maximum recommended concentration).
  For babies < 1 kg*:* A concentration of **2 mg/mL** is recommended. Take 1 mL (40 mg) gentamicin and dilute with 19 mL of compatible fluid
- Draw up the prescribed dose and make up to a suitable volume for administration if required
- Administer by intravenous infusion **over 30 minutes** via a syringe driver with Guardrails settings
- Follow injection with a flush administered at the same rate as the gentamicin to ensure the full dose is delivered.
- Note: Gentamicin is inactivated by IV cephalosporins, penicillins and teicoplanin. Preferably separate doses by 1 hour. If it is not possible to separate doses by 1 hour, administer gentamicin first and flush the line well with a compatible fluid before and after giving each medicine. Also, gentamicin is incompatible with lipid emulsions.

Intramuscular administration

- Draw up prescribed dose and administer (undiluted) intramuscularly as per Lippincott procedure

Monitoring

- Maintain adequate hydration throughout therapy
- Monitor renal function and urinary output at baseline and daily during treatment
- Monitor serum gentamicin concentrations (if treatment is for >48 hours)
- Monitor IV site regularly and rotate injection site to reduce risk of local irritation and pain
- Gentamicin administration is a risk factor for ototoxicity. The frequency and timing of audiology testing is a clinical decision due to lack of standard guidelines. Identify babies that have had more than one ototoxic medication and very high troughs or long course and ensure they have adequate or additional testing.

Storage and Stability

- Discard any unused ampoule contents
- Diluted solutions are stable for up to 24 hours at room temperature or in the refrigerator

Competency for administration

This procedure is carried out by, or under, the direct supervision of a registered nurse/registered midwife who holds current Waikato DHB Generic Medicine Management and IV certification. For CVAD administration Neonatal specific competency NCV/NAC is also required.

Guardrails

Gentamicin is Guardrail profiled on the CC pump for NICU. Following are the guardrail limits:

Guardrails Drug Name	**Gentamicin***	
Pump	CC	
	0.4-1kg	**1-5kg**
Concentration (mg/ml)		
Minimum	1	2
Maximum	10	10
Default	2	10
Administration Rate (mg/kg/hr)		
Soft minimum	7.8	7.8
Default	8	8
Soft maximum	10	10
Hard maximum	12	12

References:

- Royal Prince Alfred Hospital NeoMed Consensus Group. Gentamicin Drug Information Sheet. June 2016. Available from: https://www.slhd.nsw.gov.au/rpa/neonatal/NeoMedPaperCopy.html
- New Zealand Formulary for Children (NZFC). 2020. Gentamicin. Accessed 12th February 2020. Available from: https://www.nzfchildren.org.nz/nzf_3133
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- Auckland DHB Newborn Services. Gentamicin Sulphate Drug Protocol. April 2012. Available from: http://www.adhb.govt.nz/newborn/DrugProtocols
- Notes on Injectable Drugs, 7th Edition, Gentamicin. New Zealand Hospital Pharmacists Association. Published 2015, Wellington NZ.
- Waikato DHB Guardrails Database 2018.

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