Waikato District Health Board	Type: Drug Guideline	Document reference: 2909	Manual Classification: Waikato DHB Drug Guidelines
Title: **Dobutamine for neonates**			Effective date: **26 January 2022**
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BRIEF ADMINISTRATION GUIDE

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

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

Indications: To increase cardiac output by providing blood pressure support in infants with shock and hypotension. Increases contractility with little effect on rate.

Route:

- Intravenous (continuous IV infusion) via CVAD (but not via UAC)
  - Supplied as dobutamine hydrochloride, equivalent to dobutamine 250 mg/20 mL (12.5 mg/mL) ampoule
  - pH of dobutamine is 2.5 to 5.5

Dose:

- Initially 5 micrograms/kg/minute

Adjust according to response. Usual range is 2 - 25 microgram/kg/minute
Dose titrate upwards or downwards by (2-) 5 micrograms/kg/minute to achieve the target blood pressure. If the blood pressure is grossly out of range, a larger dose change will be needed. Always consider that there may be a dose delivery or preparation error if a previously stable neonate becomes suddenly unstable in the absence of any other clear cause for the change, e.g. line disconnect or obstruction, tissued line, air in line or wrong concentration of dobutamine at the time of a syringe change.

Preparation and administration

Compatible fluids: glucose 5%, glucose 10%, sodium chloride 0.9%, sodium chloride 0.45%, glucose in sodium chloride solutions

Continuous IV Infusion

- Select the concentration of dobutamine required based on the weight of the infant and in the context of any fluid restrictions (refer to appendix for assistance) and dilute the appropriate volume of dobutamine injection using compatible fluid in accordance with the table below:

Final Dobutamine Concentration	**1 mg/mL** 1000 microgram/mL	**3 mg/mL** 3000 microgram/mL	**5 mg/mL** 5000 microgram/mL
Volume of dobutamine (12.5 mg/mL)	4 mL	12 mL	12 mL
Volume of compatible fluid	46 mL	38 mL	18 mL
Total volume for infusion	50 mL	50 mL	30 mL

- Administer by continuous infusion (using Guardrails profile) preferably via a central line but may be used peripherally in an emergency when central access is not available.
- Do NOT flush line or suddenly stop infusion.

$$\text{Rate (mL/hr)} = \frac{60 \times \text{Dose (microgram/kg/min)} \times \text{Weight (kg)}}{\text{Concentration (microgram/mL)}}$$

Monitoring

- Continuous heart rate, blood pressure, ECG monitoring and where possible cardiac output and ventricular filling pressures. Document hourly and as required

- If administering peripherally observe for injection site reactions or signs of extravasation
- Monitor urine output and fluid balance
- Observe for hypersensitivity reactions or severe adverse reactions

Storage and Stability

- Prepare a fresh solution at least every 24 hours.
- Discard ampoule once opened
- Once diluted, the solution may exhibit a pink colour which may intensify over time, but there is no significant loss of potency during the period of infusion. Discard any solutions that are hazy or contain particulate matter.

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 as well as Neonatal specific competency NCV/NAC and NIC2.

Guardrails Information

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

Guardrails Drug Name	**Dobutamine**
Concentration (mg/mL)	
Minimum	0.6
Maximum	5
Dose rate (microgram/kg/min)	
Default	5
Soft minimum	2
Soft maximum	20
Hard max	25

References

- Australasian Neonatal Medicines Formulary (ANMF). Dobutamine 2021. Available from: https://www.seslhd.health.nsw.gov.au/sites/default/files/groups/Royal_Hospital_for_Women/Neonatal/Neomed/neomeddobutamine2021.pdf
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- Canterbury DHB Neonatal Services. Dobutamine Drug Information Sheet. March 2016. Available from: http://www.cdhb.health.nz/Hospitals-Services/Health-Professionals/Neonatal-Clinical-Resources/Neonatal-Drug-Information-Sheets.
- Australian Injectable Drugs Handbook 8th ed 2020. The Society of Hospital Pharmacists of Australia.

Appendix

Infusion tables to assist concentration selection

Table 1: Infusion rates when using dobutamine concentration **1 mg/mL**
(most useful for neonates < 1 kg)

Rate (mL/hr)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
Weight (kg)	**Approximate micrograms/kg/minute**									
0.5	3	7	10	13	17	20	23	27	30	33
1	2	3	5	7	8	10	12	13	15	17
1.5	1	2	3	4	6	7	8	9	10	11
2	1	2	3	3	4	5	6	7	8	8
2.5	1	1	2	3	3	4	5	5	6	7
3	1	1	2	2	3	3	4	4	5	6
3.5	0	1	1	2	2	3	3	4	4	5

Table 2: Infusion rates when using dobutamine concentration **3 mg/mL**
(likely useful for neonates 1 – 3 kg)

Rate (mL/hr)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
Weight (kg)	**Approximate micrograms/kg/minute**									
1	5	10	15	20	25	30	35	40	45	50
1.5	3	7	10	13	17	20	23	27	30	33
2	3	5	8	10	13	15	18	20	23	25
2.5	2	4	6	8	10	12	14	16	18	20
3	2	3	5	7	8	10	12	13	15	17
3.5	1	3	4	6	7	9	10	11	13	14
4	1	3	4	5	6	8	9	10	11	13

Table 3: Infusion rates when using dobutamine concentration **5 mg/mL**
(most useful for neonates > 3 kg)

Rate (mL/hr)	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
Weight (kg)	**Approximate micrograms/kg/minute**									
2	4	8	13	17	21	25	29	33	38	42
2.5	3	7	10	13	17	20	23	27	30	33
3	3	6	8	11	14	17	19	22	25	28
3.5	2	5	7	10	12	14	17	19	21	24
4	2	4	6	8	10	13	15	17	19	21
4.5	2	4	6	7	9	11	13	15	17	19
5	2	3	5	7	8	10	12	13	15	17