Dobutamine - Standard Concentration

Newborn use only

2026

Alert	In conditions with low systemic vascular resistance (SVR) (e.g., septic shock) dobutamine is not the appropriate first drug of choice
Indication	Inotrope to increase cardiac output in neonates with myocardial dysfunction and unchanged or increased systemic vascular resistance.
Action	Catecholamine with beta-1 and beta-2 receptor actions which increases myocardial contractility, heart rate and conduction velocity and decreases SVR [1]. Dose dependent effects: • Low dose, 2.5 microgram/kg/min – no significant hemodynamic effects in neonates with cardiovascular compromise • Moderate dose, 5–7.5 microgram/kg/min – increases cardiac output • Higher dose, 5–20 microgram/kg/min – increases cardiac output and blood pressure in hypotensive preterm infants An additional effect of dobutamine on increasing cardiac output has been demonstrated in hypotensive preterm infants receiving dopamine.
Drug type	Inotropic agent
Trade name	Abbott Dobutamine Hydrochloride, Dobutamine Sandoz, Dobutamine Hydrochloride DBL, Dobutrex Baxter premade 20mL or 50mL syringes containing 1000, 2000 or 5000 microgram/mL in glucose 5%.
Presentation	250 mg/20 mL solution for injection; 250mg powder for reconstitution (Dobutrex) Baxter premade 20mL or 50mL syringes containing 1000, 2000 or 5000 microgram/mL in glucose 5%.
Dose	5−20 microgram/kg/minute. Titrate dose as per response. Clinical response is expected within a few minutes after entry of the drug into circulation. * If response is suboptimal, dose can be increased every 10-30 minutes until desired response is obtained or maximum dose is reached. ***NOTE:** The time from the initiation of infusion to the entry of the drug into circulation may influence the time it takes to see the clinical effect. This lag time can be reduced by starting temporarily at a higher infusion rate.
Dose adjustment	
Maximum dose	Use of up to 20 microgram/kg/min reported in neonates
Total cumulative dose	
Route	Continuous IV infusion
Preparation	**Note: Refer to Appendix for tables to assist with concentration selection.** **Note:** Use the smallest volume syringe available/suitable for drawing up the drug for the preparation. (e.g. for <1 mL draw up – use 1 mL syringe). For 10 mL syringe - Recommend using syringe that has markings at 0.2mL increments The standard concentrations outlined in this monograph were developed taking into consideration a minimum patient weight of **0.4 kg** and a minimum infusion rate of **0.1 mL/hour**. For patients weighing less than 0.4 kg, further dilution may be required. Prime the line as close to the entry point as possible to reduce the dead space – however, care should be taken not to deliver excess volume. Weight suggestions for infusion concentrations below are a guide only. Clinicians may choose infusion concentration different to the suggested based on expected dose and the corresponding 24-hour fluid volumes

Dobutamine concentration	**1000 microgram/mL**	**2000 microgram/mL**	**5000 microgram/mL**
Infant weight (Guide Only)	<1 kg	1 to 3 kg	>3 kg
10 microgram/kg/minute is equal to	0.6 mL/kg/hour	0.3 mL/kg/hour	0.12 mL/kg/hour

Premade syringe

Baxter premade 20mL and 50mL syringes containing 1000, 2000 or 5000 microgram/mL in glucose 5% are available. No dilution is required.

Bedside preparation

20mL Syringe

Draw up dobutamine and add compatible fluid* to make a diluted solution as per table below:.

Final dobutamine concentration	1000 microgram/mL	2000 microgram/mL	5000 microgram/mL
Volume of dobutamine (12.5 mg/mL)	1.6 mL (20 mg)	3.2 mL (40 mg)	8 mL (100 mg)
Volume of compatible fluid*	18.4 mL	16.8 mL	12 mL
Total volume	20 mL	20 mL	20 mL

*Compatible fluid: glucose 5%, glucose 10%, sodium chloride 0.9%

50mL Syringe

Draw up dobutamine and add compatible fluid* to make a diluted solution as per table below:

Final dobutamine concentration	1000 microgram/mL#	2000 microgram/mL	5000 microgram/mL
Volume of dobutamine (12.5 mg/mL)	4 mL (50 mg)	8 mL (100 mg)	20 mL (250 mg)
Volume of compatible fluid*	46 mL	42 mL	30 mL
Total volume	50 mL	50 mL	50 mL

*Compatible fluid: glucose 5%, glucose 10%, sodium chloride 0.9%

Administration	Continuous IV infusion via a central or peripheral line, preferably through a dedicated line to prevent accidental bolus. Do not flush line or suddenly stop infusion. If Dobutrex brand is used reconstitute each vial with 20 mL WFI to make a concentration of 250 mg/20 mL.
Monitoring	Continuous heart rate, ECG and blood pressure monitoring preferable. Assess urine output and peripheral perfusion frequently.
Contraindications	Contraindicated in patients with idiopathic hypertrophic sub aortic stenosis and previous hypersensitivity to dobutamine.
Precautions	May cause hypotension therefore ensure adequate circulating blood volume prior to commencement.
Drug interactions	No evidence of drug interactions demonstrated in clinical studies. Exert caution when co-administering with drugs which can cause hypertension or tachycardia.
Adverse reactions	The positive inotropic and chronotropic effects of dobutamine may cause hypertension, tachyarrhythmias, myocardial ischaemia and ventricular fibrillation. Hypotension may result from vasodilation. May cause hypokalaemia. Phlebitis has been reported.
Compatibility	Fluids: Glucose 5%, glucose 10%, glucose in sodium chloride solutions, glucose 5% in Hartmann's, Hartmann's, sodium chloride 0.9%, sodium chloride 0.45% Y site:[10] Amino acid solutions, adrenaline hydrochloride, alfentanil, alprostadil, amikacin, amiodarone (for amiodarone strength≤15 mg/mL)[10], atenolol, atracurium besylate, atropine sulfate, azithromycin, aztreonam, caffeine citrate, calcium chloride, calcium gluconate, capreomycin, caspofungin, ceftizoxime, ciprofloxacin, cisatracurium, cisplatin, clarithromycin, clindamycin phosphate, clonidine, dexmedetomidine, digoxin, diltiazem, dopamine, doxycycline, enalaprilat, ephedrine, epinephrine HCL, epoetin alfa, erythromycin lactobionate, esmolol, fentanyl, fluconazole, gentamicin, glycopyrrolate, ketamine, labetolol, leucovorin, levofloxacin, lidocaine, linezolid, lorazepam, magnesium sulfate, methylprednisolone sodium succinate, metronidazole, milrinone, morphine sulfate, multiple vitamin injections, naloxone, netilmicin, nitroglycerin, norepinephrine, octreotide, ondansetron, pamidronate, pancuronium, papaverine, pentoxifylline, potassium acetate and chloride (refer to special comments), procainamide, propranolol, protamine, pyridoxine, ranitidine, remifentanil, rocuronium, sodium acetate,

	streptokinase, succinylcholine, tacrolimus, theophylline, thiamine HCL, tobramycin, tolazoline, urokinase, valproate, vancomycin, vasopressin, vecuronium, verapamil, voriconazole, zidovudine, zoledronic acid.
Incompatibility	Fluids: Sodium bicarbonate, alkaline solutions, diluents that contain sodium bisulfite and ethanol. Y site:[10] Aciclovir, alteplase, aminophylline, amphotericin B cholesteryl sulfate complex, amphotericin B conventional colloidal, amphotericin B lipid complex, amphotericin B liposome, ampicillin, azathioprine, benzylpenicillin, cefazolin, cefepime, cefiderocol, cefotaxime, cefoxitin, ceftazidime, ceftriaxone, cefuroxime, chloramphenicol sodium succinate, cloxacillin, dexamethasone, diazepam, diazoxide, fluorouracil, folic acid (sodium salt), furosemide, ganciclovir, heparin, hydralazine, hydrocortisone sodium succinate, ibuprofen lysine, indometacin, insulin, meropenem, meropenem/vaborbactam, micafungin, oxacillin, pantoprazole, penicillin G potassium, penicillin G sodium, pentobarbital, phenobarbital, phenytoin, piperacillin, piperacillin-tazobactam, propofol, sodium bicarbonate, sulfamethoxazole-trimethoprim, ticarcillin, ticarcillin-clavulanate, warfarin
Stability	Reconstituted solution – Dobutrex brand only: Stable for 6 hours at 25°C and 24 hours at 2 to 8°C. Diluted solution – other brands: Stable for 24 hours at 25°C. Solutions may turn pink and colour will increase with time but with no significant loss of potency. Discard solutions that are hazy or contain particles.
Storage	Vial: Store below 25°C. Protect from light. Discard remaining solution after use.
Excipients	
Special comments	A 1983 report by Kirschenbaum HL[11] observed change in colour when dobutamine was mixed with potassium chloride 20 meq/10 mL. However, Trissel's clinical pharmaceutical database on parenteral compatibility reports compatibility with potassium acetate and chloride.[10]
Evidence	**Efficacy** Treatment of hypotension in preterm infants: Dobutamine is less effective than dopamine at increasing blood pressure in hypotensive infants but this may not change the clinical outcome. A single study[2] reported left ventricular output increased with dobutamine compared to a decrease with dopamine (LOE I, GOR C) [3]. Treatment of low systemic blood flow: Dobutamine increased superior vena cava (SVC) flow with little change in blood pressure, whereas dopamine increased blood pressure with little change in SVC flow. There was no difference in clinical outcome (LOE II, GOR C) [4-6]. **Summary:** Dobutamine is recommended to increase cardiac output in neonates with myocardial dysfunction and unchanged or increased systemic vascular resistance (SVR). In conditions with low SVR (e.g., septic shock) dobutamine is not the appropriate first drug of choice[1]. **Safety** No evidence of an effect on the incidence of adverse neuroradiological sequelae (severe periventricular haemorrhage and/or periventricular leucomalacia), or on the incidence of tachycardia. Insufficient data confirming long term benefit and safety of dobutamine [3]. Common side effects reported were ventricular arrhythmias, tachycardia, hypotension and chest pain (children) (LOE III-2, GOR B) [7]. **Pharmacokinetics** Dobutamine concentrations positively correlated with infusion dosages. Range of values vary widely between patients despite similar doses [7]. Short half-life around 2 minutes [8].
Practice points	
References	1. Noori, S. and I. Seri, Neonatal blood pressure support: the use of inotropes, lusitropes, and other vasopressor agents. Clin Perinatol, 2012. 39(1): p. 221–38. 2. Roze, J.C., et al., Response to dobutamine and dopamine in the hypotensive very preterm infant. Arch Dis Child, 1993. 69(1 Spec No): p. 59–63. 3. Subhedar, N.V. and N.J. Shaw, Dopamine versus dobutamine for hypotensive preterm infants. Cochrane Database Syst Rev, 2003(3): p. CD001242. 4. Osborn, D., N. Evans, and M. Kluckow, Randomized trial of dobutamine versus dopamine in preterm infants with low systemic blood flow. J Pediatr, 2002. 140(2): p. 183–91. 5. Osborn, D.A., N. Evans, and M. Kluckow, Left ventricular contractility in extremely premature infants in the first day and response to inotropes. Pediatr Res, 2007. 61(3): p. 335–40. 6. Osborn, D.A., et al., Low superior vena cava flow and effect of inotropes on neurodevelopment to 3 years in preterm infants. Pediatrics, 2007. 120(2): p. 372–80. 7. Mahoney, L., et al., A Literature Review of the Pharmacokinetics and Pharmacodynamics of Dobutamine in Neonates. Pediatr Cardiol, 2015 Sep 7. [Epub ahead of print].

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Appendix

Infusion tables to assist with concentration selection

Table 1: Infusion rates when using dobutamine concentration **1000 microgram/mL**

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 microgram/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	<1	1	1	2	2	3	3	4	4	5
4	<1	1	1	2	2	3	3	3	4	4
4.5	<1	1	1	1	2	2	3	3	3	4
5	<1	1	1	1	2	2	2	3	3	3

Table 2: Infusion rates when using dobutamine concentration **2000 microgram/mL**

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 microgram/kg/minute**									
0.5	7	13	20	27	33	40	47	53	60	67
1	3	7	10	13	17	20	23	27	30	33
1.5	2	4	7	9	11	13	16	18	20	22
2	2	3	5	7	8	10	12	13	15	17
2.5	1	3	4	5	7	8	9	11	12	13
3	1	2	3	4	6	7	8	9	10	11
3.5	1	2	3	4	5	6	7	8	9	10
4	1	2	3	3	4	5	6	7	8	8
4.5	1	1	2	3	4	4	5	6	7	7
5	1	1	2	3	3	4	5	5	6	7

Table 3: Infusion rates when using dobutamine concentration **5000 microgram/mL**

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 microgram/kg/minute**									
0.5	17	33	50	67	83	100	117	133	150	167
1	8	17	25	33	42	50	58	67	75	83
1.5	6	11	17	22	28	33	39	44	50	56
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

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

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

VERSION/NUMBER	DATE
Original 1.0	26/05/2025
Version 1.0 (minor errata)	4/09/2025
Version 1.1	18/06/2026
Version 1.2	2/07/2026
Current 1.3	08/10/2026
REVIEW	08/10/2031

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