Safer Care Victoria

Dobutamine

APPLICABLE AREAS

THIS SECTION WILL BE LEFT BLANK FOR EACH HOSPITAL TO COMPLETE IN ACCORDANCE WITH LOCAL PRACTICE. EXAMPLES: ICU, ED, OR, WARD 2B

MECHANISM OF ACTION/PHARMACOLOGY

Dobutamine is a positive inotropic and chronotropic agent.

Predominant and relatively selective β_1-receptor stimulation increases the force of myocardial contraction and heart rate, augmenting cardiac output. Mild β_2-receptor stimulation causes vasodilation, decreasing peripheral and pulmonary vascular resistance.[1]

A small rise in systolic blood pressure can occur secondary to an increase in cardiac output, or hypotension can occur secondary to vasodilation.[2,3]

Onset of action: 1–2 minutes.[2,4]

Duration of action: 10 minutes.[4]

Half-life: 2 minutes.[4]

INDICATIONS

Inotropic support and afterload reduction in low cardiac output states, which persist despite adequate fluid resuscitation, such as acute heart failure and cardiogenic shock.

PRECAUTIONS

- Hypersensitivity to dobutamine or sulfites (may contain sodium metabisulfite)[4]
- Hypotension due to uncorrected hypovolaemia[4,5]
- Rapid atrial fibrillation (AF) – may increase ventricular response rate[4,5]
- Ventricular arrhythmias and ectopics – may be exacerbated[4]
- Hypertrophic obstructive cardiomyopathy (HOCM) and/or severe aortic stenosis and/or risk of systolic anterior motion of the mitral valve and/or dynamic left ventricular outflow tract obstruction
- Phaeochromocytoma.[3,5]

MEDICATION PRESENTATION

250 mg dry powder vial (Dobutrex®).

Dobutrex®: Reconstitute vial with 20mL of water for injections or glucose 5%.[2]

250 mg/20 mL vial (Claris®, DBL®, Sandoz®).

Other brands: Reconstitution not required.

MEDICATION STORAGE

Store vials below 25°C. Protect from light.[6]

Reconstituted solution (Dobutrex® only): stable for 6 hours at 25°C or 24 hours at 2 to 8°C.[6]

Infusion solution: stable for 24 hours at 25°C.[6]

Solutions may be pink and the colour will increase with time. There is no significant loss of potency during the time periods stated above.[6]

PREPARATION

	Infusion pump		Syringe driver
Prescribe	250 mg in 42 mL	500 mg in 83 mL	250 mg in 42 mL
Make up infusion in	50 mL bag of glucose 5%*	100 mL bag of glucose 5%*	Glucose 5%*
Volume to be removed from IV bag	28 mL	57 mL	Not applicable Draw up 22 mL in the syringe
Drug dose to be added	250 mg (20 mL)	500 mg (40 mL)	250 mg (20 mL)
Final volume	42 mL	83 mL	42 mL
Final concentration	6 mg/ mL	6 mg/mL	6 mg/mL
1 mL/hr =	100 microg/min	100 microg/min	100 microg/min

*Glucose 5% is preferred for diluting all inotropes and vasopressors. However, dobutamine is also compatible with glucose in sodium chloride solutions, Hartmann's and sodium chloride 0.9%.[6,7]

ADMINISTRATION – THIS GUIDELINE IS INTENDED FOR CENTRAL ACCESS ONLY

Administer continuous intravenous infusion through a central access line.

Infusions should be administered via a syringe driver or infusion pump, preferably with medication error reduction software enabled.

Avoid administration in lines where other drugs or fluids may be bolused or flushed.

DOSING

Starting dose: 100 to 400 microg/min.[3–5]

Titrate in accordance with prescribed parameters – for example, by increments of 50 to 100 microg/min. Effects on end-organ perfusion may not occur immediately.

Usual dose range: 100 to 1500 microg/min (2.5 to 10 microg/kg/min)[3,4]

Doses above 10microg/kg/min may be required but are associated with increased adverse effects. Maximum dose 20microg/kg/min.[5,8]

Dobutamine infusions should not be ceased abruptly.[6]

Many references recommend infusion rates in microg/kg/min; however, microg/min is commonly used in practice.

If weight-based dosing methods are employed, use ideal body weight.[9]

MONITORING

- Continuous blood pressure and cardiac monitoring for the duration of the infusion[2]
- Daily 12-lead ECG
- Monitor fluid balance and electrolytes at least daily, especially magnesium and potassium.

SIDE EFFECTS

- Angina, tachycardia, arrythmias and palpitations[1]
- Tissue ischaemia or necrosis due to vasoconstriction[3]
- Hyperglycaemia[3]
- Lactic acidaemia
- Hyper or hypotension.

COMPATIBILITIES

Consult the following references, which are available online through the Clinicians Health Channel:

- Australian injectable drugs handbook
- Trissel's™ in IV compatibility (Micromedex) – from the site homepage, select the 'IV Compatibility' tab.

IMPORTANT DRUG INTERACTIONS

Entacapone is a catechol-O-methyltransferase (COMT) inhibitor, which may inhibit the metabolism of dobutamine, increasing the risk of side effects. Dose dobutamine conservatively.[10]

β-antagonists: concurrent administration will reduce the efficacy of dobutamine.[2]

REFERENCES

1. Jentzer JC, Coons JC, Link CB, et al. Pharmacotherapy update on the use of vasopressors and inotropes in the intensive care unit. Journal of Cardiovascular Pharmacology and Therapeutics 2015; 20(3): 249–260
2. MIMS [online] (accessed 29 December 2017)
3. UpToDate [online] (accessed 2 January 2018)
4. Micromedex [online] (accessed 29 December 2017)
5. Australian medicines handbook (AMH) [online] (accessed 2 January 2018)
6. Australian injectable drugs handbook (AIDH) [online] (accessed 2 April 2016)
7. Trissel's Clinical Pharmaceutics Database (Parenteral Compatibility) via Micromedex [online] (accessed 29 December 2017)
8. Lexicomp [online] (accessed 29 January 2018)

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