Status Active PolicyStat ID 15017869

Origination	May 2022	Owner	Sylvia White: Clinical Pharmacist
Last Approved	May 2024	Area	S4-Medication Safety-Medicine Guidelines
Effective	May 2024	Applicability	St John of God Organisation
Last Revised	May 2024		
Next Review	May 2027		

SJGHC Medicine Guideline 49 Dobutamine

Our Vision - We are recognised for care that provides healing, hope and a greater sense of dignity, especially to those most in need.

Our Mission - To continue the healing mission of Jesus.

RELATED DOCUMENTS *(Site Specific)*

SJGHC Medicine Guideline 49SU Dobutamine (Stress Echocardiography) Subiaco

ASSOCIATED MEDICINE GUIDELINES

NA

ASSOCIATED POLICY DOCUMENTS

MS0001 Medication Safety - Allergy, Alert and Adverse Drug Reaction and Reporting Policy

MS0004 Medication Administration Policy

MS0006 Medication Administration Scope of Practice Policy

MS0011 High Risk Medication Management Policy

AD0002 Escalation of Care Policy

AD0004 Recognising and Responding to Anaphylaxis Policy

FOR FURTHER INFORMATION REFER TO:

MIMS Online
AUSTRALIAN INJECTABLE DRUGS HANDBOOK (where available)
AUSTRALIAN MEDICINES HANDBOOK (where available)

PURPOSE

To provide guidance for the safe and appropriate administration of dobutamine.

SCOPE

This medicine guideline applies at:

1. St John of God Health Care Hospitals
   Administration restricted to:
   1. Critical Care Areas in accordance with local area restrictions
   2. Acute Emergency Situations

Refer to MS0006 Medication Administration Scope of Practice and MS0004 Medication Administration Policy for administration and local area restrictions.

ACTIONS

Dobutamine is a positive inotropic and chronotropic agent, indicated for inotropic support and afterload reduction in low cardiac output states, such as acute heart failure, cardiogenic shock and cardiac surgery, which persist despite adequate fluid resuscitation.

Predominant and relatively selective β1-receptor stimulation increases the force of myocardial contraction and heart rate, augmenting cardiac output. Mild β2-receptor stimulation causes vasodilation, decreasing peripheral and pulmonary vascular resistance.

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

Onset of action: 1–2 minutes.

Duration of action: 10 minutes.

PRESENTATION

Dobutamine 250 mg/20 mL vial

Dobutrex® brand requires reconstitution with water for injection or glucose 5% prior to use. Other brands do not need reconstitution.

Solution may appear pink, with no significant loss of potency if stored within recommended parameters.

CAUTION

Contraindications

- Hypertrophic cardiomyopathy with outflow tract obstruction.
- Pheochromocytoma - may result in acute hypertension due to additive effect on catecholamines.
- Ventricular arrhythmias or rapid atrial fibrillation.

Precautions

Hypovolemia and electrolyte imbalances (particularly potassium) must be corrected prior to administration.

Hypotension can occur due to vasodilation, intravascular volume deficit or a paradoxical decrease in cardiac output due to ventricular outlet obstruction.

Increased myocardial oxygen demand may further precipitate angina/myocardial injury in the patient with ischemic heart disease.

Close monitoring is required in cases where the patient has atrial fibrillation as rapid ventricular response may occur.

Dobutamine vials may contain sodium metabisulfite which may cause allergic reactions, particularly in asthmatic patients.

Hypersensitivity reactions including rash, fever and bronchospasm have been reported.

DOSAGE

Inotropic Support

Dosage rate is usually 2.5 to 10 microg/kg/minute, maximum 40 microg/kg/minute, adjusted according to the patient's response.

Use patient's ideal body weight.

Response is determined by heart rate, presence of ectopic activity, blood pressure, urine output. The measurement of central venous or pulmonary wedge pressure and cardiac output to be used where available.

To minimise the risk of myocardial ischaemia the lowest possible dose to achieve desired effect should be used. Any increase in contractile force and/or heart rate may increase the size of an infarction by intensifying ischaemia.

ADMINISTRATION

Inotropic Support

Dobutamine is administered as a continuous intravenous infusion.

Administration via a CVAD is preferred, but patients may be commenced on an infusion using a peripheral line whilst central access is being arranged. Consider diluting dose to 250 - 500mL and administering into a large and stable vein using a large bore PIVC if giving peripherally. Areas of flexion ie cubital fossa veins should be avoided to prevent extravasation.

Dobutamine must be administered through a dedicated line and should not be mixed with other medications.

Dobutamine is incompatible with sodium bicarbonate solution. If sodium bicarbonate is simultaneously indicated to treat acidosis, it should be given through a separate infusion line from a separate container.

Do not flush the giving set after the infusion has stopped as a bolus dose of dobutamine will be administered.

Dobutamine infusion should not be ceased abruptly. Gradual dose reduction is recommended.

NEW SOUTH WALES SITES

	Infusion pump (Peripheral or CVAD)	Syringe driver (CVAD only)
Prescribe	250 mg in 100 mL	250 mg in 50 mL
Make up infusion in	100 mL bag of glucose 5%	Glucose 5%
Volume to be removed from IV bag	20 mL	Not applicable Draw up 30 mL in the syringe
Drug dose to be added	250 mg (20 mL)	250 mg (20 mL)
Final volume	100 mL	50 mL
Final concentration	2.5 mg/mL	5 mg/mL

VICTORIAN SITES

	Infusion pump (CVAD only)		Syringe driver (CVAD only)
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

WESTERN AUSTRALIAN SITES

	Infusion pump (Peripheral or CVAD)		**Syringe driver (CVAD only)**
Prescribe	250 mg in 250 mL *(Subiaco preferred dilution)*	250 mg in 500 mL *(Midland & Murdoch preferred dilution)*	250 mg in 50 mL
Make up infusion in	250 mL bag of glucose 5%	500 mL bag of glucose 5%	Glucose 5%
Volume to be removed from IV bag	20 mL	20 mL	Not applicable Draw up 30 mL in the syringe
Drug dose to be added	250 mg (20 mL)	250 mg (20 mL)	250 mg (20 mL)
Final volume	250 mL	500 mL	50 mL
Final concentration	1 mg/ mL	0.5 mg/mL	5 mg/mL

Rate Calculation

The table below may be used as a guide to calculate the rate (mL/hour) of administration. Consider dose and concentration prescribed, and patient's ideal body weight.

If concentration prescribed is not listed below, data can be manipulated as required.

- For a 2.5 mg/mL solution - double the rate calculated for a 5 mg/mL solution.
- For a 0.5 mg/mL solution - double the rate calculated for a 1 mg/mL solution.

Dose		2.5 microg/kg/minute			5 microg/kg/minute			10 microg/kg/minute			
Concentration		1 mg/ mL	5 mg/ mL	6 mg/ mL	1 mg/ mL	5 mg/ mL	6 mg/ mL	1 mg/ mL	5 mg/ mL	6 mg/ mL	
Patient weight	60kg	9mL/hr	1.8mL/ hr	1.5mL/ hr	18mL/ hr	3.6mL/ hr	3mL/ hr	36mL/ hr	7.2mL/ hr	6mL/ hr	Rate in
	70kg	10.5mL/ hr	2.1mL/ hr	1.75mL/ hr	21mL/ hr	4.2mL/ hr	3.5mL/ hr	42mL/ hr	8.4mL/ hr	7mL/ hr	

	80kg	12mL/hr	2.4mL/hr	2mL/hr	24mL/hr	4.8mL/hr	4mL/hr	48mL/hr	9.6mL/hr	8mL/hr	mL/hour
	90kg	13.5mL/hr	2.7mL/hr	2.25mL/hr	27mL/hr	5.4mL/hr	4.5mL/hr	54mL/hr	10.8mL/hr	9mL/hr	
	100kg	15mL/hr	3mL/hr	2.5mL/hr	30mL/hr	6mL/hr	5mL/hr	60mL/hr	12mL/hr	10mL/hr	

OBSERVATIONS

- Continuous cardiac monitoring.
- Continuous or 5 minutely haemodynamic monitoring until clinically stable, then hourly.
- Fluid balance and electrolytes at least daily, especially magnesium and potassium.
- If giving peripherally, injection site must be monitored at least hourly for signs of extravasation.

COMPATIBILITIES

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%.

IMPORTANT DRUG INTERACTIONS

Beta blockers: concurrent administration will reduce the efficacy of dobutamine, and may result in peripheral vasoconstriction and hypertension by interfering with the adrenergic responses.

IMPORTANT ADVERSE EFFECTS

Cardiac

- Increased heart rate, blood pressure, and ventricular ectopic activity.
- Increased risk of an exaggerated pressor response with pre-existing hypertension.
- Occasionally, a reduction in blood pressure.
- Risk of rapid ventricular response in patients with atrial fibrillation.
- Reducing the rate of administration or temporarily stopping the dobutamine infusion until the patient stabilises is usually adequate management.

Other

- Nausea, headache, palpitations, shortness of breath, angina or non-specific chest pain
- Mild reduction in serum potassium concentration, rarely to hypokalaemic levels.
- Phlebitis has occasionally been reported. Avoid extravasation.

AUTHORITY

Standardised inotrope and vasopressor guidelines. Dobutamine. *Safer Care Victoria*. Retrieved 29 March 2023 from https://www.safercare.vic.gov.au/

Australian Medicines Handbook. (2023). Dobutamine. In *Australian Medicines Handbook* (online). Retrieved 16 March 2023 from https://amhonline.amh.net.au

The Society of Hospital Pharmacists of Australia. (2023). Dobutamine. In *Australian Injectable Drugs Handbook.* Retrieved 29 March 2023, from https://aidh.hcn.com.au

Arruda-Olson A. (2023) Overview of stress echocardiography. *UpToDate*. Retrieved 29 March 2023 from www.uptodate.com

(2023) Dobutamine: drug information. *UpToDate*. Retrieved 29 March 2023 from www.uptodate.com

MIMS Australia. (2022). Dobutamine. In *MIMS Online*. Retrieved 29 March 2023, from https://www.mimsonline.com.au/

Approval Signatures

Step Description	Approver	Date
Policy Governance Approver	Joanna Gurak: Coordinator Clinical Policy & Documentation	May 2024
Clinical Governance Approver	Luis Prado: Chief Medical Officer	Apr 2024
Medicine Guideline Owners	Sylvia White: Clinical Pharmacist	Jan 2024

Applicability

Accord, Ballarat Hospital, Bendigo Hospital, Berwick Hospital, Bunbury Hospital, Frankston Hospital, Geelong Hospital, Geraldton Hospital, Group Services, Hauora Trust, Hawkesbury District Health Service, Healthcare at Home, Langmore Centre, Marillac, Midland Public and Private Hospitals, Mt Lawley Hospital, Murdoch Hospital, SJG Foundation, SJG NSW Mental Health, Social Outreach (Australia and Timor-Leste), St John of God Administration, Subiaco Hospital, Warrnambool Hospital