dobutamine (Dobutrex)

Policy Statement

- All care provided within the Liverpool Health Service will be in accordance with infection control guidelines, manual handling guidelines and minimisation and management of aggression guidelines.
- Medications are to be prescribed and signed by a medical officer unless required during an emergency.
- Medications are to be given at the time prescribed and are to be signed by the administering registered nurse.
- Parenteral medication prescriptions and the drug are to be checked with a second registered nurse prior to administration.
- Infection Control guidelines are to be followed.
- All drugs administered during an emergency (under the direction of a medical officer) are to be documented during the event, then prescribed and signed following the event. Exceptions to this Policy are found in ‘Emergency Drug Dose Guidelines’ – Policy 1.e.
- Adverse drug reactions are to be documented and reported to a medical officer.
- Medication errors are to be reported using the hospital Drug Incident Report form.
- Guidelines are for adult patients unless otherwise stated.

- Dobutamine infusions may be titrated or weaned by accredited RNs.
- Dobutamine infusions are not to be purged.
- Medical Officers must ensure that titration and/or weaning parameters are specified on the management plan, and have been discussed with the nurse assigned to that patient.
- Dobutamine may be administered via a peripheral cannula or central line.
- Dobutamine MUST ALWAYS be administered via a dedicated lumen, and never “piggybacked” with other drugs or fluids. Where multiple infusions are required, it may be acceptable to administer Dobutamine with other inotropes, via a three-way tap.
- Dobutamine infusions must be administered by syringe pump or infusion pump.
- Dobutamine infusions must not be administered via the drug infusion port on a haemodialysis circuit.

For the purposes of this Policy, an accredited RN is: a Registered Nurse (RN) who has completed the required self directed learning packages and has been accredited by an Educator/Clinical Nurse Consultant, to administer/titrate inotropic drugs when caring for an Intensive Care Unit (ICU) Patient. The Educator/Clinical Nurse Consultant may deem the nurse competent if the nurse has previous documented experience/qualifications.

Actions

Dobutamine is a synthetic catecholamine, a direct acting inotrope.

It stimulates the beta (β) receptors in the sympathetic nervous system.
- β-1 stimulation results in an increase in heart rate, myocardial contractility and excitability.
- β-2 stimulation is minimal – may have some peripheral vasodilatation and bronchodilation.

Indications

- Acute heart failure.
- Cardiogenic shock.
- To reduce preload and afterload in cardiogenic pulmonary oedema.
- To increase cardiac output, improve contractility and oxygen delivery in trauma, sepsis.

Contraindications

- Hypovolaemia.
- Idiopathic hypertrophic subaortic stenosis.
- Allergy to sulphites.
- Hypersensitivity
Precautions
• Dobutamine contains sodium metabisulfite, which may cause an allergic response in patients with asthma.
• Dosage should be titrated to avoid excessive increases in heart rate and systolic blood pressure.
• Positive inotropic therapy can be associated with increases in intrapulmonary shunting; arterial blood gases should be assessed frequently during therapy.
• Digoxin preparations should be administered prior to dobutamine when there is atrial fibrillation with a rapid ventricular response.

Significant Interactions
• Concomitant use of dobutamine and nitroprusside results in a higher cardiac output and, usually, a lower pulmonary wedge pressure than when either drug is used alone.
• Small studies indicate that patients with heart failure treated with dobutamine and glyceryl trinitrate will have:
  ⇒ Lower pulmonary wedge pressure than when just using dobutamine.
  ⇒ Higher cardiac output than when just using glyceryl trinitrate.

Adverse Effects
• Tachycardia.
• Dysrhythmias, Ventricular Ectopic Beats (VEBs)
• Hypertension.
• Angina.
• Hypotension.
• Myocardial ischaemia.

Presentation
Dobutamine 250mg vial.

Administration Guidelines

Dilute 250mg dobutamine in 50mL sterile 0.9% normal saline, to give a final concentration of 5mg/mL, or 5000micrograms/mL.

Desired dose range is 2 – 20 micrograms/kg/minute.
Commence at 5 micrograms/kg/min, and titrate the infusion using parameters which have been discussed and documented on the management plan with the Medical Officer; including:
⇒ Mean arterial blood pressure.
⇒ Cardiac index.
⇒ Pulmonary capillary wedge pressure (PCWP).
⇒ Systemic vascular resistance.

• If necessary, increase the infusion by 1 microgram/kg/min every 5 minutes, while closely monitoring the patient for the desired effect.
• Hypotension may follow the administration of dobutamine due to the β-2 mediated vasodilation. Colloid/volume expansion may be needed to maintain an adequate preload, preferably titrated against PCWP measurements.

Weaning
• Commenced when the patient has been stable for approximately 24 hours.
• Decrease the infusion by no more than 1microgram/kg/min, no more frequently than every 30 minutes, while observing the patient closely for signs of deterioration, especially recurrent pulmonary oedema.
• Weaning dobutamine may need to be coincided with commencing oral agents such as ACE inhibitors.
Clinical Considerations
Use of dobutamine may be associated with a lower serum potassium, observe electrolyte levels.

dobutamine 5000 microgram/mL Infusion

(all calculations are in microgram/kg/min, correct to 2 decimal places)

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References

Policy Author(s) See "Pharmacology Acknowledgements.doc"
Policy Reviewers: ICU Director, ICU – CNC.