Drug Guideline Title: Salbutamol

Summary: Salbutamol is a bronchodilator, Beta (β)₂ adrenoreceptor stimulant, with some β₁ effects at high dosage levels.

Approved by: ICU Director
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Next Review Date: June 2017
Replaces Existing Drug Guideline: Salbutamol
Previous Review Dates: 2002, 2004

1. Introduction:
The risk addressed by this policy:

Patient Safety

The Aims / Expected Outcome of this policy:

Salbutamol will be administered safely and appropriately without any adverse side effects.

Related Standards or Legislation

- NSQHS Standard 1 Governance
- National Standard 4 Medication Safety

Related Policies
- LH_PD2013_C03.01 Drug Administration
- LH_PD2010_C03.00 Drug Prescribing
- LH_PD2008_C03.12 Administration of IV Medication

2. Policy Statement:

- All care provided within Liverpool Hospital will be in accordance with infection control, manual handling and minimisation and management of aggression guidelines.
- Medications are to be prescribed and signed by a medical officer/authorised nurse practitioner (NP) unless required during an emergency.
- All drugs administered during an emergency (under the direction of a medical officer/authorised nurse practitioner) are to be documented during the event, then prescribed and signed following the event.
• Medications are to be given at the time prescribed (as close to the time as is possible when multiple drugs require ‘same time’ administration and, when the nurse is caring for more than one patient, recognition is given to a possible short delay to administration – antibiotics and other lifesaving drugs are to be prioritised) and are to be signed by the administering nurse.
• Parenteral medication prescriptions and the drug are to be checked with a second registered or endorsed enrolled nurse prior to administration. The “rights of drug administration” must be followed: right: patient, drug, dose, route, administration, time, reason for the drug, documentation, education and evaluation/outcome.
• Adverse drug reactions are to be documented and reported to a medical officer.
• Medication errors are to be reported using the hospital electronic reporting system: IIMS.
• Guidelines are for adult patients unless otherwise stated

3. Principles / Guidelines

Actions\textsuperscript{1,2,3}
- Salbutamol is a bronchodilator, Beta (\(\beta\)) -2 adrenoreceptor stimulant, with some \(\beta\) -1 effects at high dosage levels.
- \(\beta\) - 1 stimulation causes an increase in heart rate, contractility and excitability.
- \(\beta\) - 2 stimulation causes bronchodilatation and vasodilatation.
- It causes uterine smooth muscle relaxation and is used to help prevent premature labor.

Indications\textsuperscript{1,2,3}
- Relief of severe bronchospasm
- Relief of bronchospasm in asthma.
- Any other cause of bronchospasm, such as:
  - Anaphylaxis
  - Smoke inhalation
  - Pulmonary oedema
  - Pneumonia
  - Bronchitis
- Shortness of breath with expiratory wheeze
- Inhibition of threatened preterm labor between 24-30 weeks. It is used as a tocolytic agent. The aim of tocolysis is to delay preterm birth to allow time for maternal administration of corticosteroids and in-utero transfer to a tertiary perinatal centre, thereby reducing neonatal morbidity and mortality. \textit{Note that there is little evidence to support the use of IV Salbutamol in adults and generally continuously nebulised Salbutamol is more effective}

Contraindications\textsuperscript{1,2,3}
- Hypersensitivity.
- Severe pre-eclampsia
- Uterine bleeding
- Premature membrane rupture with chorioamnionitis

Precautions\textsuperscript{1,2,3}
- During intravenous infusion of Salbutamol Injection for premature labour, careful monitoring of maternal pulse rate and blood pressure is recommended in addition to careful observation of foetal heart rate and status of the infant.
- It can induce metabolic changes such as hypokalaemia and increased blood glucose levels. Monitor and replace potassium, patient may require an insulin infusion.
- Monitor for tachycardia, cardiac dysrrhythmias, flushing and headache.
Significant Interactions

- When corticosteroids are used concurrently it may exacerbate hyperglycemia.
- Should be given only with extreme caution to patients who have already received large doses of sympathomimetics.

Adverse Effects

- Increase in heart rate. This response is dose dependent, but is rarely a major problem.
- Hypotension may occur.
- By affecting pulmonary mismatch, can actually cause increased hypoxia ("paradoxical hypoxia"). Hence pulse oximetry and supplemental oxygen should be used.
- Fine tremor: Due to a direct action on skeletal muscle. Occurs in 20% of patients.
- Hand tremors, nervousness and restlessness. Less common reactions such as nausea, vomiting and dizziness have been reported.
- Slight stinging / pain or a sensation of warmth may occur after injection
- Hypokalaemia

Presentation

- Nebulised Solution: Salbutamol Nebules 5mg in 2.5ml
- Intravenous Solution
  - 500 mcg / 1 ml ampoule
  - 5 mg / 5 ml ampoule (obstetric)

Administration Guidelines

Nebuliser Administration Guidelines:
- Give 5mg (2.5ml) salbutamol via a nebuliser.
- This dose may be repeated whenever necessary.
- If the patient is in extremis, give nebulised salbutamol continuously.

Continuous nebulised salbutamol.

NB: intravenous salbutamol preparation is not to be used for nebulisation. Nebulised solution must be clearly labeled and administered via a syringe driver connected to the nebuliser

Preparation and Administration: For 5mg/hr, draw up nebulised salbutamol solution 5mg in 2.5ml in a 50ml syringe (2.5ml x 20 nebuliser ampoules = 50ml in total; 100mg in 50ml = 2mg/ml)
Infuse @ a rate of 2.5ml/hr (5mg/hr) via syringe driver that is connected to the nebuliser bowl. For continuous infusion use the continuous nebuliser kit (Neb. Plus RF1 nebuliser valve kit).

Intravenous Administration Guidelines

Intravenous Dose for Respiratory: Bronchospasm / Asthma

Bolus Loading Dose:
- Give 500 micrograms Salbutamol as a slow IV bolus over 2 to 10 minutes.
- May be repeated if necessary, then commence infusion.

Infusion:
- Dilute 5mg/5mL Salbutamol (obstetric) with 45ml sterile 0.9% sodium chloride, to give a final concentration of 5mg/50ml = 100 micrograms/mL.
- Commence at 3mL/hr (5 micrograms/min) and titrate up to 12mL/hr (20 micrograms/min), depending on the patient response.
Nebulised Salbutamol is administered concurrently (if inhaled therapy is not feasible or if there is no response to nebulised therapy, intravenous salbutamol can be considered in a highly monitored situation; however, there is no evidence that it is better than inhaled salbutamol)

Weaning the Salbutamol infusion should not be contemplated until the patient has been stable for at least 24 hours, and is extubated.

If adrenaline is also being administered, this should be weaned first.

Decrease the Salbutamol infusion slowly whilst observing the patient closely for recurrent bronchospasm.

Nebulised Salbutamol is administered concurrently.

**Threatened Preterm Labor – Inhibition between 24 and 33 weeks**:7

- Dilute 5mg/5mL Salbutamol (obstetric) to 45mL sterile 0.9% normal saline, to give a final concentration of 100 micrograms/mL.
- Administer 6-30mL/hour and adjust to obtain desired response.
- Starting dose is at 6mL/hr and increase the rate by 3mL/hr every 10 minutes until there is a suitable response, either cessation of contractions or a reduction in the frequency and strength of contractions.
- Do not exceed 30mL/hr. The maximum dose is determined by the individual’s response and may be much less than this in some cases.

**Clinical Considerations**2,3,4,5

- Nebulised Salbutamol is administered concurrently with intravenous salbutamol infusion.
- When using continuous salbutamol infusion via syringe driver – ensure that it is connected to the nebuliser bowl and that it is clearly labeled.
- Salbutamol can cause hypokalaemia – serum potassium concentration should be closely monitored.
- Monitor potassium levels, especially in patients with acute, severe asthma, and when they are receiving drug therapies such as steroids and diuretics.
- Steroids may be administered concurrently, 2nd hourly monitoring of blood glucose levels should be attended.
- Monitor patient for tachycardia and cardiac dysrhythmias.
- Liaise with obstetrics and maternity staff, when salbutamol is used for prevention of premature labor.
- Monitor maternal and foetal heart rate.

4. **Performance Measures**

All incidents are documented using the hospital electronic reporting system: IIMs and managed appropriately by the NUM and staff as directed.

5. **References / Links**
