Critical Care - Metoprolol

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Functional Sub-Group: Clinical

Summary: This guideline has been developed to ensure standardized preparation and administration of metoprolol throughout the SWSLHD.

Approved by: Clinical Quality Council

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1. **Introduction:**

The risk addressed by this policy:

| Patient Safety |

2. **The Aims / Expected Outcome of this policy:**

| Metoprolol will be administered safely and without adverse side effects. |

**Related Standards or Legislation**

- NSQHS Standard 1 Governance
- National Standard 4 Medication Safety

**Related Policies**

PD2013_043 Medication Handling in NSW Public Hospitals

3. **Principles**

- All care provided within SWSLHD 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 and documentation.
- 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.
- **This guideline is for administration of drugs in critical care areas only.**

**Actions**

- Metoprolol is a beta-adrenergic blocking agent - blocks the beta receptors in the sympathetic nervous system.
- It is relatively selective for beta-1 receptors (heart), although does also block beta-2 receptors (bronchi and elsewhere). However, beta-1 effects are greater than beta-2 effects.
- Beta 1 blockade results in decreased heart rate, contractility and excitability.
Beta 2- blockade causes a degree of bronchoconstriction and peripheral vasoconstriction.
When administered IV, the beta-blocking effect lasts approximately 6 hours, dose dependent.

Indications
- Supraventricular tachyarrhythmias including Atrial Fibrillation
- Hypertension.
- Dissection of thoracic aorta (use metoprolol prior to GTN or Sodium Nitroprusside)
- Acute myocardial infarction with haemodynamic stability
- Conscious ventricular tachycardia (VT) in right ventricle outflow

Contraindications
- Pulse rate < 50, evidence of 2nd or 3rd degree heart block.
- Hypotension, SBP < 100mmHg.
- Severe left ventricular failure
- Asthma or CAL, or allergic disorders that might suggest a predisposition to bronchospasm
- Right ventricular failure secondary to pulmonary hypertension.
- Patients with phaeochromocytoma

Precautions
- Concomitant use with calcium channel blockers as these may cause negative inotropic and chronotropic effects. Verapamil should not be given IV to patients receiving beta-blockers as there is a risk of cardiac arrest.
- Avoid concurrent use of beta-blockers and clonidine. This is because the rebound hypertension associated with clonidine withdrawal can be exacerbated by the presence of a beta blocker.
- Use with caution in patients on other antiarrhythmic drugs.
- Dose adjustment may be necessary in patients with renal failure.
- In patients with cardiomyopathy or chronic myocardial insufficiency, metoprolol can precipitate cardiac failure by depressing myocardial contractility.

Significant Interactions
- Verapamil should not be given IV to patients receiving beta-blockers.
- Metoprolol can enhance the effects of other antihypertensives especially prazosin
- It can increase the anticoagulant effect of Warfarin
- If used with digitalis It may increase the atrioventricular conduction time and may induce bradycardia.

Adverse Effects
- Bradycardia.
- Hypotension
- Bronchospasm

Presentation
- 5mg/5mL ampoule

Administration Guidelines
Metoprolol 5 mg in 5mL = concentration of 1mg/mL. No Dilution needed
Give 1-2mg Metoprolol as a slow IV bolus per minute, titrated to the desired effects
Repeat as needed to a total dose of 10-15mg.
Clinical Considerations

- Patients being treated with Warfarin may have increased anticoagulation when receiving concomitant metoprolol.
- Cardiac monitoring required during administration – monitor heart rate and blood pressure. Blood pressure should be monitored at least 5minutely if continuous monitoring with arterial line is not in place.

4. References and links

1. MIMS Online, CIAP: NSW Health Department, Copyright MIMS Australia Pty Ltd. February 2012. [http://www.use.hcn.com.au]

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