Clinical Practice Guidelines:
Toxicology and toxinology/Beta blocker

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<th>Date</th>
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<tr>
<td>Purpose</td>
<td>To ensure to consistent approach to the management of Beta blocker poisoning.</td>
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<td>Scope</td>
<td>Applies to all QAS clinical staff.</td>
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Beta blockers act as antagonists at the beta adrenergic receptors and are prescribed widely for the management of cardiac dysrhythmias, hypertension and following myocardial infarction.\cite{1} Unfortunately, toxicity from accidental or intentional overdose is not uncommon and the subsequent bradycardia is associated with significant mortality.\cite{1}

Beta receptors work by influencing myocardial calcium channels and therefore their blockade is similar to calcium channel blocker toxicity. In significant overdoses, both atropine and transcutaneous pacing may have little effect on blood pressure due to the lack of intracellular calcium necessary for effective contractions.\cite{2}

Examples include:
- Propranolol
- Sotalol
- Atenolol
- Bisoprolol
- Carvedilol

### Clinical features

#### Cardiovascular effects
- bradycardia
- heart block
- hypotension
- cardiogenic shock

#### Systemic effects
- hypoglycaemia/hyperglycaemia
- hyperkalaemia
- bronchospasm
- seizures
- coma

### Risk assessment

Beta blocker toxicity is potentially life-threatening.

High risk populations:
- underlying cardiorespiratory disease
- elderly
- co-ingestion with calcium channel blockers or digoxin.
Additional information

- Clinical features typically manifest ≤ 4 hours following ingestion but may occur > 6–12 hours if slow release preparation.
- Propranolol behaves like a TCA in overdose and should be managed in accordance with *CPG: Tricyclic antidepressants*.¹
- Sotalol blocks K+ channels leading to QT prolongation and Torsades de Pointes.³
- Glucagon was previously regarded as a specific antidote to β blocker poisoning but it offers no advantages over standard inotropes and chronotropes.⁴

Consider:

- Sodium bicarbonate 8.4% (QRS > 0.12)
- Magnesium sulphate (Torsades de Pointes)

Manage as per:

- *CPG: Sedation – Acute behavioural disturbance*

Consider:

- Oxygen
- IV access
- 12-Lead ECG
- Midazolam

Consider:

- Verbal de-escalation
- QPS assistance
- Physical restraint
- EEA

Consider:

- IV fluid
- Atropine
- Transcutaneous pacing
- Adrenaline (epinephrine)

Transport to hospital

Pre-notify as appropriate