## Drug Therapy Protocols: Insulin (Actrapid®)

<table>
<thead>
<tr>
<th>Policy code</th>
<th>DTP_INS_0119</th>
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</thead>
<tbody>
<tr>
<td>Date</td>
<td>January, 2019</td>
</tr>
<tr>
<td>Purpose</td>
<td>To ensure a consistent procedural approach to insulin (Actrapid®) administration.</td>
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<tr>
<td>Scope</td>
<td>Applies to all Queensland Ambulance Service (QAS) clinical staff.</td>
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<tr>
<td>Health care setting</td>
<td>Pre-hospital assessment and treatment.</td>
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<tr>
<td>Population</td>
<td>Applies to all ages unless specifically mentioned.</td>
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<tr>
<td>Source of funding</td>
<td>Internal – 100%</td>
</tr>
<tr>
<td>Author</td>
<td>Clinical Quality &amp; Patient Safety Unit, QAS</td>
</tr>
<tr>
<td>Review date</td>
<td>January, 2022</td>
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**Insulin (Actrapid®)**

**Drug class**
Glucose regulatory hormone

**Pharmacology**
Insulin is a regulatory anabolic protein hormone that lowers blood glucose levels by binding to insulin receptors to increase glucose uptake, inhibit hepatic glucose output and promote glycogen production.[1,2]

**Metabolism**
The majority of circulating insulin is metabolised by the kidneys.[1]

**Indications**
- Diabetic ketoacidosis (DKA)
- Hyperosmolar hyperglycaemic syndrome (HHS)
- Critical care patients during interfacility transport

**Contraindications**
- Hypoglycaemia

**Precautions**
- Rapid correction of hyperglycaemia may contribute to cerebral oedema and electrolyte imbalances
- Hypoglycaemia may occur if the insulin dose is too high in relation to the insulin requirement

**Side effects**
- Irritation and redness at IV cannulation site

**Presentation**
- Vial, 10 mL (1,000 units) insulin (short acting) Actrapid®

**Onset (IV INF)**
- ≈ 30 minutes

**Duration (INF IV)**
- Hours

**Half-life**
- 5–7 hours
**Queensland Ambulance Service**

**Special notes**

- Ambulance officers must only administer medications for the listed indications and dosing range. Any consideration for treatment outside the listed scope of practice requires mandatory approval via the QAS Clinical Consult and Advice Line.

- All insulin infusions are to be initiated using hospital supplies. Insulin will not be carried by QAS.

- Minimum half-hourly BGL monitoring is required for all patients on Actrapid® infusions.

- All parenteral medications must be prepared in an aseptic manner. The rubber stopper of all vials must be disinfected with a 2% Chlorhexidine/70% Isopropyl Alcohol swab and allowed to dry prior to piercing.

**Routes of administration**

Intravenous infusion (IV INF)

**Schedule**

- S4 (Restricted drugs).

**Adult dosages**

- **Diabetic ketoacidosis (DKA)**
- **Hyperosmolar Hyperglycaemic Syndrome (HHS)**
- **Critical care patients during Interfacility transport**

**Actrapid® infusions** are to be administered via a syringe driver using the following sliding scale.

<table>
<thead>
<tr>
<th>Blood glucose level (mmol/L)</th>
<th>Infusion dose (50 units in 50 mL)</th>
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</thead>
<tbody>
<tr>
<td>≤ 5</td>
<td>0 units/hour (mL/hour)</td>
</tr>
<tr>
<td>5.1 - ≤ 10</td>
<td>1 units/hour (mL/hour)</td>
</tr>
<tr>
<td>10.1 - ≤ 15</td>
<td>2 units/hour (mL/hour)</td>
</tr>
<tr>
<td>15.1 - ≤ 20</td>
<td>3 units/hour (mL/hour)</td>
</tr>
<tr>
<td>20.1 - ≤ 25</td>
<td>4 units/hour (mL/hour)</td>
</tr>
<tr>
<td>&gt; 25</td>
<td>5 units/hour (mL/hour)</td>
</tr>
</tbody>
</table>

**Syringe preparation:** Mix 50 units (0.5 mL) of Actrapid® with 49.5 mL of sodium chloride 0.9% in a 50 mL syringe to achieve a final concentration of 1 unit/mL. Ensure all syringes are appropriately labelled. Administer via syringe driver.

**Paediatric dosages**

**Note:** QAS officers are **NOT** authorised to administer Actrapid® to paediatric patients.