**Diabetic Ketoacidosis Intravenous Insulin Chart**

**ONLY TO BE USED FOR THE MANAGEMENT OF DKA IN ADULTS**

‘INSULIN’ SHOULD ALSO BE DOCUMENTED ON THE MAIN CHART

---

**Hospital:**

**Consultant:**

**Ward:**

**Date:**

**Weight (kg):**

**Diabetes Type:**

---

**Title:** Diabetic Ketoacidosis Intravenous Insulin Chart

**Approved by:** Records Management Committee July 2010

**Review date:** (min 3 years) Nov 2013

---

<table>
<thead>
<tr>
<th>Day/Time</th>
<th>Date</th>
<th>Time</th>
<th>Insulin prescription – see 1a overleaf</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>DD/MM/YY</td>
<td>50</td>
<td>Units of ACTRAPID in 49.5ml of 0.9% Sodium Chloride</td>
<td>Prescribed</td>
<td>Given</td>
</tr>
<tr>
<td>DD/MM/YY</td>
<td>50</td>
<td>Units of ACTRAPID in 49.5ml of 0.9% Sodium Chloride</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**If the patient is on regular Detemir (Levemir) or Glargine (Lantus) insulin, please continue. Prescribe this on the regular insulin prescription chart**

---

1. Replacement of circulating volume and potassium:

- Prescribe concurrent intravenous fluids with potassium on appropriate fluid chart – see 1a. & 1b. overleaf

- Once glucose is less than 14mmol/L prescribe concurrent intravenous glucose on the appropriate fluid chart – see 1c. overleaf

---

2a. Intravenous Insulin Prescription:

- Start insulin infusion rate at: (0.1 Units/kg/hour)

- Units insulin/hour

- Continue as long as blood ketones falling by at least 0.5 mmol/L/hr & bicarbonate rising by at least 3mmol/L/hr

---

2b. Initial Fixed-rate Intravenous Insulin Infusions (IVII) Rate:

- If blood ketones not falling by at least 0.5 mmol/L/hr or bicarbonate not rising by at least 3mmol/L/hr

- Increase infusion rate by: 1 Units insulin/hr

- Otherwise maintain current infusion rate

- Continue fixed rate insulin infusion until ketones less than 0.3 mmol/L, venous pH over 7.3 and/or venous bicarbonate over 18 mmol/L.

---

2c. Adjusting intravenous Insulin Infusions (IVII) rate

- Monitoring blood glucose and insulin infusion rate: (Check blood glucose hourly till stable, then two-hourly)

---

---

---

---

---

---

---

---

---

---
Management of Diabetic Keto-Acidosis

Definition
- Diabetes: Blood glucose over 11 mmol/L or known diabetes mellitus
- Ketosis: Ketonaemia 3 mmol/L and over or significant ketonuria (2+ or more on standard urine sticks)
- Acidosis: Serum bicarbonate < 15 mmol/L and/or venous pH < 7.3.

Assessment of severity
The presence of one or more of the following may indicate severe DKA and admission to a Level 2/HDU environment, insertion of a central line and immediate senior review should be considered:

- Blood ketones over 6 mmol/L
- Bicarbonate level below 5 mmol/L
- Venous/arterial pH below 7.1
- Hypokalaemia on admission (under 3.5mmol/L)
- GCS less than 12 or abnormal AVPU scale
- Oxygen saturation below 92% on air (assuming normal baseline respiratory function)
- Systolic BP below 90 mmHg
- Pulse over 100 or below 60 bpm
- Anion gap above 16

Monitoring
- Capillary glucose and blood ketones should be measured hourly
- Venous blood gas for pH, bicarbonate and potassium at 60 mins and 2 hour and 2 hourly thereafter
- Accurate fluid balance chart, with minimum urine output 0.5ml/kg/hr. Catheterise if no urine output after 60 mins

1a. Intravenous fluids
On average these patients are at least 100ml/kg fluid-deplete i.e a 70kg man may be up to 7 litres in deficit
The initial fluid regimen should be 0.9% (Normal) saline and this should be infused quickly.

1b. Potassium replacement
Potassium level (mmol/L) Potassium replacement
Over 5.5 Nil
3.5 – 5.5 40 mmol/L
Below 3.5 Senior review as addition potassium needs to be given

1c. Glucose replacement
Once glucose falls to <14 mmol/L add a glucose infusion to run concurrently with the intravenous insulin. The rate of glucose infusion remains constant. Normal saline should continue as fluid replacement, if necessary. (Fluids MUST be prescribed & batch no. MUST be recorded on a fluid chart)

Standard regimen: 500ml 10% glucose at 125ml/hr via a pump.
Regimen if concerns about fluid overload: 500ml 20% glucose at 62.5ml/hr via a pump.

2a. Intravenous Insulin Prescription

2b. Intravenous Insulin Rate
Start at 0.1 Unit/kg/hr. If patient’s weight is unknown, then estimate weight, but weight at earliest opportunity
Increase insulin rate by 1Unit/hr if blood ketones not falling by at least 0.5 mmol/L/hr or bicarbonate not rising by at least 3mmol/L/hr

3. Stopping fixed rate intravenous insulin
DKA has resolved when blood ketones < 0.3mmol/L, venous pH >7.3 and/or venous bicarbonate > 18mmol/L
- The patient is eating and drinking give fast acting or mixed subcutaneous insulin at the next meal and take IV insulin down 1 hour later.
- The patient not eating and drinking switch to routine intravenous insulin chart, note that this will mean a decrease in the insulin and the glucose infusion rates

Title: Diabetic Ketoacidosis Intravenous Insulin Chart
Approved by: Records Management Committee July 2010
Review date: (min 3 years) Nov 2013

Health Records:
Charts & Special Sheets

Page 2 of 2