**Guidelines for Management of DKA (continued)**

**Box 5 Fluid therapy and clinical monitoring**

- Fluid therapy: After completing administration of the first 2 litres of fluid (see Box 1), commence 0.9% sodium chloride with potassium chloride 40 mmol/L at a rate of 500 mL/hr for the next 4 hours.
- Clinical monitoring: Monitor vital signs using EWS. Alert a senior decision maker if patient triggers a red. Be especially vigilant of consciousness—call HDU/ICU if any impairment of consciousness.
- Glucose monitoring: Perform capillary blood glucose measurements every hour (if >10 mmol/L, send laboratory sample for accurate result)
- Biochemical monitoring: Perform venous blood gas for pH, bicarbonate and potassium at the end of hours 1, 2 and 4.
- Other considerations: Exercise caution in elderly, pregnant, or adolescent patients. In those with cardiac or renal impairment or other serious co-morbidities. Catheterise if oliguric (urine output <0.5 mL/kg/hr).

**Box 6 Adjustment of insulin infusion rate**

- If BG is not falling by ≥3 mmol/hr: increase infusion rate by 1 unit/hr (check insulin infusion pump is working and connected).
- When BG is ≤14 mmol/L:
  - Add 10% glucose infusion at 100 mL/hr (continuing 0.9% sodium chloride infusion)
  - Reduce insulin infusion rate to 3 units/hr or to a rate that maintains BG in the range 9–14 mmol/L—do not stop insulin
- Otherwise continue insulin at 6 units/hr

**Subsequent management (beyond 5 hours)**

**Box 7 Fluid and insulin therapy**

- Glucose management: Maintain BG in the range 9–14 mmol/L by adjusting the insulin infusion rate as described in Box 6. Continue 10% glucose infusion at 100 mL/hr (do not alter the rate of glucose infusion).
- Fluid therapy: Continue 0.9% sodium chloride with potassium 40 mmol/L, adjusting the rate of administration as appropriate to maintain euvolaemia and to keep the serum potassium concentration within the reference range.
- Oral intake: Allow oral intake if bowel sounds are present.
- Conversion to subcutaneous (SC) insulin: Convert to SC insulin when the patient is eating and drinking and the serum bicarbonate concentration is >15 mmol/L.
- Stop IV fluids and IV insulin 1 hour after the first dose of SC insulin

**Discharge planning**

**Box 8 Assessing suitability for discharge and arranging follow-up**

- Refer to Specialist Diabetes Team before discharge: To determine cause of DKA, and for diabetes education, review of knowledge and understanding of the condition.
- Patient should not be discharged until:
  - Biochemically normal
  - Normal diet and established on usual SC insulin
  - Patient/carer able to administer SC insulin
- Arrange appropriate contact with Diabetes Specialist Nurse (DSN) within 1 week of discharge.
- Ensure patient has a diabetes clinic appointment.
- Ensure that a copy of the discharge letter is sent to the patient’s diabetes care team.

**Guide to converting to subcutaneous (SC) insulin therapy**

**Insulin-Naïve Patients**

- Total Daily Dose (TDD) can be calculated by multiplying the patient’s weight (kg) by 0.3 units. If obese (BMI > 30) use 0.5 units/kg (as patient is on fixed dose of insulin infusion DO NOT calculate the total amount of insulin used).

**BD regimen**

- Using pre-mixed insulin: NOVOMIX® 30
  - Give 70% of total daily dose pre-breakfast and 30% pre-evening meal
-Administer 1st dose of SC insulin preferably prior to breakfast or evening meal if monitoring overnight can be guaranteed. Do not give at bedtime. Discontinue IV insulin 1 hour after the 1st SC dose.

**Basal-bolus regimen**

- Using long-acting and short-acting insulin
  - Give 50% of total dose using long-acting insulin (LANTUS®) at 30min and divide the remaining dose using short-acting (NOVOpod®) equally between 
  - Breakfast, pre-breakfast, pre-lunch and pre-evening meal.
- The first dose of insulin should be the long-acting insulin. Discontinue IV insulin 1 hour after the long-acting insulin has been administered.

**Restarting Pre-admission Insulin Therapy**

- Check HbA1c prior to conversion: SC if <7.5% restart usual insulin regime as above for BD or basal/bolus regime.
- SC if >7.5% discuss appropriate regime with the diabetes team.
### INFUSION PRESCRIPTIONS

<table>
<thead>
<tr>
<th>Prescription</th>
<th>Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>Fluid* Vol Additive and dose† Duration Prescriber initials</td>
</tr>
</tbody>
</table>

*Once blood glucose <14 mmol/L, start 10% glucose in conjunction with 0.9% sodium chloride fluid replacement

†Using pre-prepared infusion bags replace potassium as indicated

**SERUM K⁺**

- Serum K⁺ >5.5 mmol/L: no supplementary potassium, recheck in 2 hr
- Serum K⁺ 3.5–5.5 mmol/L: potassium 40 mmol/L
- Serum K⁺ <3.5 mmol/L: potassium 40 mmol/L and call HDU

### INSULIN PRESCRIPTION

**Long-acting insulin**

If patient usually takes GLARGINE (LANTUS®) or DETEMIR (LEVEMIR®), continue to prescribe their usual dose

<table>
<thead>
<tr>
<th>Data due</th>
<th>Time due</th>
<th>Insulin (GLARGINE or LANTUS)</th>
<th>Dose (units)</th>
<th>Prescriber initials</th>
<th>Admin time</th>
<th>Nurse initials</th>
</tr>
</thead>
</table>

**Intravenous insulin**

Start at 6 units/hr—If the blood glucose (BG) does not decrease by 3 mmol/L per hour, increase infusion by 1 unit/hr (check infusion pump is working and connected). Once BG is <14 mmol/L, decrease insulin infusion to 3 units/hr (ensure 10% glucose is prescribed)

<table>
<thead>
<tr>
<th>Date/Time</th>
<th>Prescription (to be administered using 50 ml syringe driver)</th>
<th>Infusion rate (units/hr)</th>
<th>Prescriber’s initials</th>
<th>Batch no / exp. date</th>
<th>Start time</th>
<th>Nurse sig(s)</th>
<th>Finish time</th>
<th>Nurse initials</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50 units soluble insulin (ACTRAPID®) diluted in 0.9% sodium chloride to a total volume of 50 ml</td>
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### ADMINISTRATION AND MONITORING

**SYRINGE DRIVER CONTROLLED INSULIN INFUSION**

Record hourly

<table>
<thead>
<tr>
<th>Date &amp; time</th>
<th>Capillary glucose (mmol/L)</th>
<th>Rate (unit/hr)</th>
<th>Volume left in syringe (mL)</th>
<th>Volume infused in one hour (mL)</th>
<th>Total volume infused (mL)</th>
<th>Signature</th>
</tr>
</thead>
</table>

**RESULTS (with reference ranges)**

Check electrolyte, venous bicarbonate and ketones at 2 hours, then 2-4 hourly until bicarbonate >15 mmol/L

<table>
<thead>
<tr>
<th>Sodium 135–145 mmol/L</th>
<th>Potassium 4–5 mmol/L</th>
<th>Lab glucose 9–14 mmol/L</th>
<th>Bicarbonate &gt;18 mmol/L</th>
<th>Ketones &gt;2+</th>
</tr>
</thead>
</table>

Reassess patient, perform venous blood gas analysis for glucose, bicarbonate and potassium concentrations

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Reassess patient, perform venous blood gas analysis for glucose, bicarbonate and potassium concentrations

### RESULTS

**Cut away**