# Guidelines for the Management of patients with DKA and HHS in the ED

## Diagnosis

<table>
<thead>
<tr>
<th>Diabetic Ketoacidosis (DKA)</th>
<th>Hyperosmolar Hyperglycaemic State (HHS)</th>
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</thead>
<tbody>
<tr>
<td>BGL &gt; 15mmol/L</td>
<td>BGL Often high &gt; 28)</td>
</tr>
<tr>
<td>pH &lt; 7.1</td>
<td>pH &gt;7.3</td>
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<td>HCO3 &lt; 15</td>
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### CRITERIA FOR ICU/HDU MANAGEMENT OF DKA / HHS

1. Haemodynamic Instability
2. Inability to protect airway
3. Obtundation
4. Presence of abdominal distension or succussion splash
5. Insulin infusion (varies in different institutions)

### TRENDS

- Vital signs
- Lab electrolytes/q2H
- Glucose - q4H
- Ketones - q4H
- Fluids: Ongoing

## Initial Evaluation

### FLUIDS

- Fluid overload in elderly / cardiac / renal patients – Consider CVP
- Intraosseous or central access initially

### VOLUME OF FLUIDS AND RATE, RESUSCITATION PHASE

<table>
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<tr>
<th>2L in 1st Hour (adult)</th>
<th>THEN 500-1000mls/h over next 2-4h</th>
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### INJECTIONS

**Injection rates**

1. Give fluids, resuscitate
2. Delay in pts with severe K+ (<3.3)
3. No Bolus
4. Check pump hourly
5. Consider use of Regular SC Rapid acting insulin regimens for mild to moderate DKA, DW your endocrine team

### INFUSION:

- 50 units ACRAPID in 50 mins 0.9% Saline via Syringe

**Duration**

- Match with urine output (U/O) + 100-200 ml/h

### ADD 5%-10% Dextrose when BGL <15

- Titrate to maintain BGL around 10-15 during insulin infusion
- Increased sugar requirements in late pregnancy (2 times)

### CONTINUE DEXTROSE/INSULIN UNTIL KETONES* AG CLEARANCE & PT TOLERATING FLUIDS PO

### POTASSIUM

- K+ >5 Nil
- K+ 4 – 5 20 mmol/L in replacement fluid
- K+ 3 – 4 30-40 mmol/L in replacement fluid or via separate infusion pump
- K+ <3 40-50 mmol/L in replacement fluid or via separate infusion pump, central access if >10 mmol/H

### OTHER THERAPIES

- HCO3 replacement, generally NO
- Consider if pH < 6.9 (in setting of high K+ or arrhythmias or HCO3 ≤ 5), consult widely
- May be beneficial if resuscitated with NS and hyperchloremic acidosis
- Heparin for HHS cases
- Note that large vessel arterial thrombosis and embolisation are common events
- Low dose heparin provided no clinical evidence of thrombosis

### INSULIN

**SLOW MR INFUSION**

1. 0.04 U/min x (PT’s BGL – 100) if BGL <10

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### HYPOHYPERKALEMIA

- Stabilize circulation with Plasmalyte
- Then consult senior ED, endochrine, ICU (corrected Na+ = [(Glucose – 10) ÷ 3] + measured Na+)

### PHOSPHATE / MAGNESIUM REPLACEMENT

- PO4<0.32 - K2PO4 20mmol over 6 hours
- Mg<0.6 – MgSO4 2g over 4h

### EMPIRICAL/DIRECTED ANTIBIOTICS WITH SEPSIS

- See Sepsis guidelines (link)

### INTERVENTIONS

- Regular SC Rapid acting insulin regimens for mild to moderate DKA
- DW your endocrine team

### MAIN CAUSES OF DEATH

- New onset diabetes
- Acute stress (pancreatitis/Alcohol/Drugs)
- Silent MI / CVA (older pts)
- Steroids
- Trauma

### Additional Information

- Developed by the ECI based on “Management of Adult Patients with Diabetic Ketoacidosis (DKA) & Hyperosmolar Non-ketotic Coma (HONK)” by Saysana, K. ISLHD, December 2012

- Further References and Resources: Diabetic ketoacidosis - BMJ Best Practice

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**Updated June 2016**