

# Management of Diabetic Ketoacidosis in first 24 hours in adults

## Establish diagnosis using following three criteria:

1. Blood ketones  $\geq 3$  mmol / L or urine ketones  $\geq 2+$  on standard urine sticks.
2. BM  $> 11$  mmol/L / known Type 1 Diabetes (T1DM)  
Be aware of DKA risk in patients on SGLT2 inhibitors (e.g. dapagliflozin, canagliflozin, empagliflozin) for Type 2 Diabetes and/or Heart failure
3. Venous bicarbonate  $\leq 15$  mmol and / or pH  $< 7.3$

## Perform following tests:

FBC, renal, LFTs, venous bicarbonate, plasma glucose, blood cultures only if septic and febrile, ECG, CXR, and Urinalysis (for infection screen and for ketones). HbA1c in a known diabetic patient if it has not been done during last 3 months.

Quick ABC assessment, 2 cannulas

## Give IV fluid NaCl 0.9%

These patients usually have 100ml/kg fluid deficit and would aim to replace this in first 24 hours using 0.9% NaCl. Eg, a 60kg patient might require 6L in 24 hours. Infusion rate should take account co-morbidities, particularly cardiac status. If appropriate, use saline as below.

- NaCl 0.9% 1L - 1 hour
- NaCl 0.9% + KCl 1L - next 2 hrs
- NaCl 0.9% + KCl 1L - next 2-4 hrs
- NaCl 0.9% + KCl 1L - next 4 hrs
- NaCl 0.9% + KCl 1L - next 4-6 hrs (If still dehydrated)
- NaCl 0.9% + KCl 1L - next 6 hrs (If still dehydrated)

## Monitoring advice (first 6 hrs)

- Hourly BM and ketones
- 2 hourly K<sup>+</sup> and HCO<sub>3</sub>.

## Consider increasing insulin infusion by 1.0unit/hr increments hourly (during first 6 hours) if:

- Blood ketones not reducing by 0.5mmol/L/hr AND/OR
- Venous bicarbonate not increasing by 3mmol/L/hr. AND/OR
- Blood glucose not falling by 3mmol/L/hr. (ensure cannulas are working)

## Give IV Fixed Rate Insulin

50 units of Actrapid made up to 50 mL with NaCl 0.9%. Infuse at **fixed rate** of 0.1unit/kg/hr. For example give 6units/hr in 60 kg patient. **If patient is usually on basal insulin e.g. Levemir, Lantus, Semglee, Abasaglar, Toujeo, Tresiba, please continue this at usual dose and times.**

## Give IV KCL

Add Potassium Chloride to N/Saline as follows:

Serum K <sup>+</sup> (mmol/L)	Add KCl (mmol/L)
>5.5	Nil
3.5-5.5	40
<3.5	Senior review

## If BM $\leq 14$ mmol/l, through a separate line, start 10% dextrose @ 125ml/hr.

Continue NaCl 0.9% if still dehydrated. Continue fixed rate insulin until criteria below is met. If blood glucose falls below 14mmol/L, consider reducing insulin infusion to 0.05units/kg/hour.

## Further Management:

Prescribe DVT prophylaxis if not contraindicated. It is not uncommon to see high WBC count in DKA. This usually settles down without antibiotics. Ensure mandatory hand-over to on-call team. Inform ITU if pH  $< 7.0$  and / or venous bicarbonate is  $< 10$  mmol/L.

## Stop IV Fixed Rate Insulin when the following criterion is met:

Blood ketones  $< 0.6$  (or urine free of ketones) and venous pH  $> 7.3$ . Venous bicarbonate level is unreliable. There is no need for ABGs if patient is improving.

## If patient is not yet eating and drinking:

Switch to **variable rate** (sliding scale) insulin. See separate VRIII trust guideline. Check capillary glucose hourly.

## If patient is eating and drinking:

Re-commence usual quick acting insulin at meal time. Stop IV insulin 30-60 mins after giving quick acting insulin. Ensure that basal insulin had been given within last 24 hours. If this is first presentation of T1DM, please refer to separate insulin initiation guide in new T1DM. Refer all patients to the DSN. If usually on mixed insulin, seek advice from Diabetes team on how to switch back to usual regime.