

# Paediatric Diabetic Ketoacidosis

PATIENT NAME

DATE

British Society for Paediatric Endocrinology and Diabetes

**Diagnosis of DKA** = blood glucose >11mmol/L and pH<7.3 bicarb <15 mEq/L , capillary blood ketone > 3 mmol/L. Use guideline if >5% dehydrated, or vomiting, drowsy or clinically acidotic

**Degree of dehydration** determined by pH; >7.1 or above is MILD or MODERATE DKA = 5% <7.1 is SEVERE DKA =10% dehydration

**MAJOR RISK = CEREBRAL OEDEMA**  
Aim for slow metabolic correction over 48 hrs

**Emergency Management**

- 1) Airway: insert airway if coma. NGT if coma or vomiting
- 2) Breathing: give 100% oxygen by face mask
- 3) Circulation: Insert IV cannula, take blood samples
- 4) If shocked, 10ml/kg 0.9% saline bolus. Discuss with Paeds Consultant if further fluid boluses required
- 5) Confirm diagnosis of DKA
- 6) Investigations: blood glucose, plasma Na, Cl, Ur, Cr venous/capillary blood gases (pH, pCO2)

**MONITORNG:**

- 1) Strict fluid balance (input / output)
- 2) Hourly BP and vital signs
- 3) Hourly blood glucose
- 4) Blood ketones (1-2 hrly if available)
- 5) Acid base, plasma Na, K, Cl (4 hrly)
- 6) 12 hrly weight
- 7) HDU /PICU if coma, pH<7.1, <1 yr

## FLUID THERAPY

Weight	Fluid Maintenance
0 - 9 kg	2 ml/kg/hrs
10 - 39 kg	1 ml/kg/hrs
>40 kg	40 ml/hr (NOT per/kg)

\* neonates may require 3ml/kg/hr

Enter patient weight (kg)\*

Dehydration (%)

Total resus volume (ml)

Use 0.9% saline for 1st 24 hrs (0.45% saline = risk cerebral oedema)

Maintenance rate (ml/kg/day)	Total ML per DAY *
Maintenance volume over 48hrs (ml)	Total (ml/kg/day)
Rehydration volume over 48hrs (ml)	<b>TOTAL (ML/HOUR)</b> <input type="text"/>
Total fluid /48hrs (ml) minus resus fluid	Total (ml/kg/hr)

Note: Subtracts fluid boluses >20ml/kg from total allowance

**\*BSPED Position Statement 2017 on weight limits and the DKA Calculator - Disclaimer:** Clinicians need to be aware that they use this calculator at their own risk and that the DKA calculator does not have a weight limit. Adjustment to 50th centile weight for age or inserting a weight limit of 70 kg should be considered in obese type 1 children presenting with DKA.

## INSULIN (Only start infusion after 1st hr of starting fluid)

Use 0.05 to 0.1 units/kg/hour  
DO NOT REDUCE insulin rate until ketoacidosis improves  
If glucose falls (<14 mmol/L) add Glucose to IVI fluids

Add **50 units** insulin to **50ml** solution of 0.9% saline (concentration 1 unit/ml, 0.1u/kg/hr = 0.1ml/kg/hr)

Required insulin infusion rate (units/kg/hr)

## Corrected Na (failure to increase = risk cerebral oedema)

	Sample1	Sample2
Glucose (mmol/L)	<input type="text"/>	<input type="text"/>
Plasma Na (mmol/L)	<input type="text"/>	<input type="text"/>
Corrected Na	<input type="text"/>	

Corrected Na should rise with therapy (0.5-1mmol/hr)

If associated with falling GCS: consider osmotherapy

- 1) 5ml/kg of 2.7% saline or
- 2) 0.5-1 gram/kg mannitol
- 3) Consider CT head
- 4) 2.7% saline can be repeated (even if Na is high)

See www.strs.nhs.uk for information

Simplified Corrected Na formula = plasma Na 0.3x (Glu - 5.5)

## GLUCOSE CALCULATOR

Size Infusion bag(ml)  % Glucose at Start  % Glucose needed

Revised August 2015

<http://www.bsped.uk>



Reference: ESPE/LWPES consensus statement on diabetic ketoacidosis in children and adolescents. Arch Dis Child. 2004 Feb;89(2):188-94. National Institute for Health Care and Excellence (NICE) <https://www.nice.org.uk>