# Paediatric Diabetic Ketoacidosis

DATE

British Society for Paediatric **Endocrinology and Diabetes** 

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

**Degree of dehydration** determined by pH;  $\geq$ 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 alucose
- 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**

Maintenance rate (ml/kg/day) Total ML per DAY \* Weight Fluid Maintenance Maintenance volume over 48hrs (ml) Total (ml/kg/day) Enter patient weight (kg)\* 0 - 9 kg2 ml/kg/hrs Rehydration volume over 48hrs (ml) **TOTAL (ML/HOUR)** 10 - 39 kg 1 ml/ka/hrs Dehydration (%) >40 kg40 ml/hr(NOT per/kg) Total fluid /48hrs (ml) minus resus fluid Total (ml/kg/hr) Total resus volume (ml) \* neonates may require 3ml/kg/hr

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

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

#### \*BSPED Position Statement 2017 on weight limits and the DKA Calculator - Disclaimer:

The DKA Calculator 2015 does not yet have official approval by the MHRA as a medical device. Pending formal MHRA approval, clinicians need to be aware that they use this calculator at their own risk and that they are aware that 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)
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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) Plasma Na (mmol/L) Corrected Na

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

If associated with falling GCS: consider osmotherapy

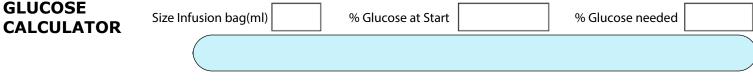
- 1) 5ml/kg of 2.7% saline or
- 2) 0.5-1 gram/kg mannitol
- 3) Consider CT head
- 4) 2.7% saline can be repeated (even if Na is high) See www.strs.nhs.uk for information

Simplified Corrected Na formula =

plasma Na 0.3x (Glu - 5.5)

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

