Diabetic ketoacidosis care pathway 2

4 hours to discharge

Time bundle started:_____ NAME: *Affix label*

Location: _____

Date: _____

Whenever possible, all patients should be notified to the diabetes team within 12 hours of admission

Aim: To improve management of diabetic ketoacidosis in adults aged 16 years and over more than 4 hours after presentation

Definition: Severe uncontrolled diabetes with: a) ketonaemia/ketonuria; b) metabolic acidosis: c) usually with hyperglycaemia

Subsequent Management	✔
Review Blood Glucose results and U&Es	
Prescribe usual long acting insulin SC if relevant along with IV insulin (Detemir, Glargine, Insulatard, Humulin I etc) at patient's usual times	
Continue Sodium chloride 0.9% + KCl at 250 mls/hr until BG <14 mmol/L	

When Blood Glucose falls <14 mmol/L (If not fallen in first 4 hours)	
• Commence Glucose 10% with 20 mmol KCl 100ml/hour • Reduce Sodium chloride 0.9% to 150mls/hour + KCL (according to K+ table below) • Reduce insulin to 3 units/hour • Maintain Blood Glucose >9 mmol/L and ≤14 mmol/L adjusting insulin rate as necessary	
Review U&Es	
Review K+ result and replace KCl in 500 ml Sodium Chloride 0.9% bag as: • None if anuric or > 5 mmol/L • 10 mmol if level 3.5-5 mmol/L • 20 mmol if level <3.5 mmol/L	
Measure and record Lab glucose, U&Es and HCO3 4 hourly for 24 hours (Measure lab BG 2 hourly if BG>20mmol/l)	
8 ☐ 12 ☐ 16 ☐ 20 ☐ 24 ☐	
Convert back at next convenient meal time to usual sc insulin regimen when: • HCO3 within normal reference range • Patient eating normally Stop iv fluids and iv insulin 30 mins after usual injection of pre-meal sc insulin	
Phone/refer for specialist diabetes review before discharge. If not available, ensure specialist team receives a copy of the discharge summary	
Do not discharge until HCO3 normal, established on usual sc regimen and eating normally	

If Blood Glucose rises >14 mmol/L after glucose commenced	✔
• Continue Glucose 10% with 20mmol KCL at 100ml/hour • Continue Sodium chloride 0.9% at 150mls/hour + KCL • Increase insulin to maintain Blood Glucose > 9 mmol/L and ≤14 mmol/L • When Blood Glucose ≤ 14mmol/L adjust insulin rate as necessary to maintain Blood Glucose > 9 and ≤ 14 mmol/L	

Good Clinical Practice
Record SEWS/MEWS/SIRS and GCS score. Finger prick Blood Glucose hourly
Review other investigations
If not improving at start of this bundle: • Check that equipment is working • Confirm venous access is secure • Check non-return valve on pump • Replace 50ml syringe with fresh saline & insulin • Call consultant/senior physician if all the above is working and patient still deteriorating

Supplementary Notes

1. Continuation of Insulin It is reasonable to use a point-of-care blood glucose meter to monitor blood glucose level if the previous laboratory blood glucose value is less than 20 mmol/L.

2. Consider Precipitating Factors

Common causes include:

- Omissions of insulin
- Infection
- Newly diagnosed
- Myocardial infarction
- Combination of the above.

Some or all of the following may have contributed to the DKA episode:

- Errors in insulin administration
- Faulty equipment
- Practical problems.

3. Refer for Specialist Diabetes review as soon as possible

For local diabetes Service:

- Insert No here_____

Ensure insulin is prescribed before patient leaves hospital.

Fluid (potassium) prescription sheet

	DATE	FLUID POTASSIUM	RATE Dose (mmol)	Signature	Serial No Batch No	Time begun	Given by
A		Sodium Chloride 0.9%	250ml / hour				
B		Sodium Chloride 0.9%	250ml / hour				
C		Sodium Chloride 0.9%	150ml / hour				
D		Sodium Chloride 0.9%	150ml / hour				
E		Sodium Chloride 0.9%	150ml / hour				
F		Sodium Chloride 0.9%	150ml / hour				
G							
H							

Once Blood Glucose <14mmol start Glucose 10% in addition to Sodium Chloride 0.9%

I		Glucose 10% KCL 20 mmol	100ml/hour				
J		Glucose 10% KCL 20 mmol	100ml/hour				
K							

Intravenous Insulin Prescription

DATE TIME	INSULIN RATE (units/hr)	TYPE OF INSULIN	SIGNATURE	GIVEN BY
	6units/hr			
	3units/hr			

Pathway for Management of DKA in Aberdeen Royal Infirmary Updated May 2022

Patients diagnosed with DKA – as per the guidance in the DKA pathways documents, should have treatment initiated immediately at their point of entry to the hospital ie ED or AMIA. Patients will then be transferred to another medical ward. All patients should have adequate IV access established prior to transfer.

The following gives guidance on which location patients should be admitted to. However at times of severe shortages of beds in Critical Care or ward 105 or ward closures patients may need to be transferred to other locations but **this should only happen after discussion with the consultants on-call for Critical Care and Diabetes** (24/7 see Rota watch).

- Patients with mild DKA should be admitted to ward 105
- Patients with severe DKA should be admitted to Critical Care as they require closer monitoring.
- Patients with mild DKA but with other acute illness or serious co-morbidities (eg Heart Failure, End Stage / Dialysis dependent renal failure) may require closer monitoring and should be discussed with Critical Care.

A Guide for the Assessment of Severity of DKA

The presence of one or more of the following may indicate severe DKA:

- Blood ketones over 6mmol/L
- Bicarbonate level below 5mmol/L
- Venous/arterial pH below 7.1
- Hypokalaemia on admission (under 3.5mmol/L)
- GCS less than 12
- Oxygen saturation below 92% on air (assuming normal baseline respiratory function)
- Systolic BP below 90mmHg
- Pulse over 100 or below 60bpm

However patients who are clinically very well i.e. normal BP, pulse, oxygen sats and GCS and not vomiting may be managed in ward 105 if pH between 7 and 7.1.

The guidance only applies to adults over the age of 16 years. Under the age of 16 years the paediatric protocol should be used (www.bsped.org.uk). Young people over the age of 16 but who are not fully developed (completed puberty) should be discussed with senior staff and using the paediatric protocol in HDU considered.

Assessment of improvement of DKA

Response to treatment in the first hour can be assessed by monitoring the rise in bicarbonate. A rise of less than 3 mmol/l or a fall in bicarbonate or a deterioration in clinical indicators may require a patient to be transferred to Critical Care for further monitoring once simple factors such as patency of lines etc has been assessed. This should be discussed with the on-call team for Critical Care and Diabetes.

Stepdown of patients to ward 105

Patients can be *considered* for step down to ward 105 after 4 hours if they no longer meet the criteria for severe DKA, are clinically improving and clinically appropriate. Patients with other acute co-morbidities may not be appropriate for ward 105.

PLEASE NOTE THAT THE ABOVE IS FOR GUIDANCE BUT ANY DEVIATION FROM THIS GUIDANCE MUST BE DISCUSSED WITH THE CRITICAL CARE AND DIABETES CONSULTANTS ON-CALL.