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**DIABETIC KETOACIDOSIS MANAGEMENT GUIDELINES IN ADULTS
WITHIN THE UNIVERSITY HOSPITAL OF WALES AND UNIVERSITY
HOSPITAL LLANDOUGH**

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Documents to read alongside these Guidelines	Joint British Diabetes Society Inpatient Care Group : The Management of Diabetic Ketoacidosis in Adults (March 2010)
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Disclaimer

When using this document please ensure that the version you are using is the most up to date either by checking on the UHB database for any new versions. If the review date has passed please contact the author.

OUT OF DATE POLICY DOCUMENTS MUST NOT BE RELIED ON

REVIEWS AND UPDATES

Version Number	Date of Review Approved	Date Published	Summary of Amendments
1	01.12.11	13.02.12	Not applicable – the guideline does not supersede any documents of the predecessor organisations.

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1 INTRODUCTION

The Joint British Diabetes Societies Inpatient Care Group has developed a Guideline for the Management of Diabetic Ketoacidosis in Adults. The Guideline has been developed and adopted nationally by professional diabetes societies (Diabetes UK, NHS Diabetes, Association of British Clinical Diabetologists, Welsh Endocrine and Diabetes Society). The Cardiff and Vale University Local Health Board (UHB) has also adopted the Guideline within the University Hospital of Wales (UHW) and the University Hospital Llandough (UHL) for adults. Its implementation will improve the management of patients presenting with diabetic ketoacidosis (DKA) which will improve outcomes, reduce morbidity, reduce length of stay and improve the patient experience.

This guideline is not intended for Paediatric patients. The Paediatric/Diabetes On-call team should be contacted as soon as it is suspected that that a child is suffering from DKA.

Adults being cared for in the community or UHB hospital settings other than UHW and UHL who are, or are suspected of suffering from Diabetic Ketoacidosis should be referred as a medical emergency to UHW or UHL.

The purpose of this UHB document is to set the scene for implementation of the national guideline, identifying where local provisions are required to ensure its implementation, and specify the arrangements for internal audit and review.

2 AIM

The aim of this Guideline is to improve the clinical outcome of diabetic ketoacidosis in adult patients within UHW and UHL.

3 OBJECTIVES

The objectives of this Guideline are to:-

- 3.1 Improve clinical care;
- 3.2 Reduce morbidity such as electrolyte disturbance, recurrence of ketoacidosis and hypoglycaemia;
- 3.3 Reduce length of stay as a result of inappropriate management of ketoacidosis and hypoglycaemia; and
- 3.4 Improve the patient experience e.g. new guideline requires less invasive testing

4 JOINT BRITISH DIABETES SOCIETIES INPATIENT CARE GROUP – GUIDELINE FOR THE MANAGEMENT OF DIABETIC KETOACIDOSIS IN ADULTS

The national guideline, [Joint British Diabetes Society Inpatient Care Group : The Management of Diabetic Ketoacidosis in Adults \(March 2010\)](#) reflects

new practice in the UK for use by health care professionals who manage DKA in adults.

The UHB have developed a checklist, to support the use of the JBDS National guideline, for the medical management of DKA at both UHW and UHL – see page 8

5 RESPONSIBILITIES

The implementation of the Guideline will be undertaken by the clinicians managing adult patients with diabetic ketoacidosis within UHW and UHL. This will include medical staff, nursing staff and laboratory staff. The action points are contained in the body of the national guideline (see pages 1-24).

The Consultant in charge of the patient is responsible for ensuring the action points are followed if appropriate to the clinical situation or for deviations from the Guideline if that is appropriate. All deviations must be documented within the patients notes with a rationale given for that decision.

Consultants in Diabetes and Diabetes Specialist Nurses are responsible for training staff in the use of this guideline and records of this training will be kept by the Diabetes Team.

6 RESOURCES

The national Guideline requires blood ketone testing. This has been arranged by the Point of Care Team as part of the change in arrangements to the near patient blood glucose testing and is available in clinical areas managing patients with diabetic ketoacidosis.

7 TRAINING

The guideline represents a modification of current practice. Training in blood ketone testing will be arranged by the DSN and Point of Care Team. All training should be undertaken within 6 months of the approval of this Guideline.

8 IMPLEMENTATION

Implementation is required across UHW and UHL as soon as possible to improve care. It is envisaged that this implementation will take 6 months from the date of approval.

9 FURTHER INFORMATION

- The following national bodies have adopted this guideline:
- Association of British Clinical Diabetologists
- British Society for Endocrinology and Diabetes and Association of Children's Diabetes Clinicians
- Diabetes Inpatient Specialist Nurse Group

- Diabetes UK
- NHS Diabetes (England)
- Northern Irish Diabetologists
- Society of Acute Medicine
- Welsh Endocrine and Diabetes Society

10 EQUALITY IMPACT ASSESSMENT

The UHB is committed to ensuring that, as far as is reasonably practicable, the way it provides services to the public and the way it treat its staff reflects their individual needs and does not discriminate against individuals or groups. The UHB has undertaken an Equality Impact Assessment and received feedback on these guidelines and the way they operate. The UHB wanted to know of any possible or actual impact that this policy may have on any groups in respect of gender (including maternity and pregnancy as well as marriage or civil partnership issues), race, disability, sexual orientation, Welsh language, religion or belief, transgender, age or other protected characteristics. The assessment found that there was **no impact** to the equality groups mentioned. Where appropriate the UHB will make plans for the necessary actions required to minimise any stated impact to ensure that it meets its responsibilities under the equalities and human rights legislation.

11 AUDIT

There will be internal and external quality control via WEQAS who will undertake this in line with their usual process for near patient blood glucose testing.

Audits of the implementation of this Guideline will be undertaken at UHW and UHL by the Consultant Diabetologist, UHW and the Consultant Diabetologist, UHL on an annual basis.

The findings of the audits will be reported to the Medicine Division Quality and Safety Group.

12 DISTRIBUTION

The Guideline will be made available on the UHB Clinical Portal, intranet and internet sites and any future editions of the Good Prescribing Guide.

13 REVIEW

Review of this guideline will be prompted by the review of the National Guideline. Where, however, this does not take place within a three year period a review will be undertaken within the UHB to ensure that it remains current. Any changes within the UHB may also prompt a review within this timescale.

DKA Guideline Checklist

(please consult [full guideline](#) and adapt guidance to clinical situation)

Diagnosis

Capillary blood glucose > 11mmol/l

Capillary ketones > 3 mmol/l or urinary ketones ++ or more

Venous pH < 7.3 or venous bicarbonate < 15mmol/l

Initial Investigations

FBC, U+E, glucose, venous gases, blood culture, MSU, CXR, ECG

Insulin

0.1 units/kg/hour fixed rate insulin infusion of actrapid in 50mls 0.9% saline

Continue usual lantus or levemir insulin

Fluids

- 1 litre 0.9% saline over first 1 hour
- 1 litre 0.9% saline over next 2 hours, then
- 1 litre 0.9% saline over 2 hours
- 1 litre 0.9% saline over 4 hours
- 1 litre 0.9% saline over 4 hours
- 1 litre 0.9% saline over 6 hours

When glucose < 14mol/l ADD 10% dextrose 1 litre 8 hourly to above regime (through a separate cannula)

Potassium per 1 litre fluid

Potassium (mmol/l)	Potassium to be added per litre fluid
>5.5	nil
3.5 – 5.5	40mmol/l
<3.5	Senior advice for additional

Monitoring

Continuous cardiac monitoring

Blood ketones should fall 0.5mmol/l per hour; or

Bicarbonate should rise by 3mmol/l per hour and blood glucose fall by 3mmol/l per hr.

If not, increase insulin by 1 unit per hour.

Time	Cap glucose	ketones	potassium	bicarbonate	pH
1 hr ()					
2 hr ()					
3 hr ()			////////////////////	////////////////////	////////////////////
4 hr ()					
5 hr ()			////////////////////	////////////////////	////////////////////
6 hr ()					
7 hr ()			////////////////////	////////////////////	////////////////////
8 hr ()					
9 hr ()			////////////////////	////////////////////	////////////////////
10 hr ()					
11 hr ()			////////////////////	////////////////////	////////////////////
12 hr ()					