Doncaster and Bassetlaw Teaching Hospitals
NHS Foundation Trust

In Hospital Management of Hypoglycaemia in Adults with Diabetes Mellitus

This procedural document supersedes any previous guidelines in relation to this subject: PAT/T 49 v.2 - In Hospital Management of Hypoglycaemia in Adults with Diabetes Mellitus

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Approved by:	Policy Approval and Compliance Group
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Target audience:	Trust wide

Amendment Form

Please record brief details of the changes made alongside the next version number. If the procedural document has been reviewed **without change**, this information will still need to be recorded although the version number will remain the same.

Version	Date Issued	Brief Summary of Changes	Author
Version 3	14 July 2017	• Changes made to definition of fast acting carbohydrate. • Please do not use Lucozade to treat hypoglycaemia	S Dewan/ S Robson
Version 2	November 2013	• Document reviewed and redesigned • Appendix 2 added	S Dewan
Version 1	November 2010	• This is a new procedural document, please read in full	S Dewan

Contents

1. INTRODUCTION

With the increasing prevalence of diabetes in the community, there has been an increase in diabetes in hospitalised patients. Most of these are treated with insulin or an oral agent that can cause hypoglycaemia. Approximately one in four people with diabetes suffer a hypoglycaemic episode during their hospital stay. Inpatient hypoglycaemia not only increases length of stay but is also associated with an increase in mortality.

Prevention of hypoglycaemia and its prompt and effective treatment is therefore essential. This guideline gives comprehensive advice on the management of hypoglycaemia in a variety of clinical situations from fully conscious, to the conscious but confused and through to the unconscious patient.

2. PURPOSE

Prevention of hypoglycaemia and improve inpatient management of diabetes thus improving care for patients.

3. DUTIES AND RESPONSIBILITIES

This guideline is designed to be Nurse-led. All nurses must work within the Nursing and Midwifery Council (NMC) professional code of conduct and work within their own competencies.

Diabetes In-patient team

- Implementation of this policy and all National recommendations made regarding diabetes and hypoglycaemia.
- Ensure education and training of all appropriate Trust staff.
- Responsibilities to ensure all patients with diabetes receive an equitable and high quality service.
- To be alerted to all patients with diabetes who are identified having episodes of hypoglycaemia (hypo audit form).

Escalate any incidents regarding diabetes management to the relevant clinical governance groups.

Consultant Diabetologist and Lead Nurse
Act as a clinical expert in diabetes management. Provide education and training to all staff. Also refer to 'Lead nurse in provision of care.

Head of Nursing for all speciality services
Support the Lead Nurse in provision of care for patients with diabetes experiencing episodes of hypoglycaemia.

Matrons and Ward Managers
To promote safe standards of diabetes care on all wards as appropriate.
Ward Managers to release staff when required in order to participate in education and training.

All staff directly involved in caring for patients who are experiencing episodes of hypoglycaemia
All staff to attend/undertake relevant training to provide safe effective care when dealing with patients having episodes of hypoglycaemia. To ensure all diabetic patients are referred to the Diabetes Specialist Nurse Team so that they can offer the patient and staff full support and guidance.

4. PROCEDURE

IN HOSPITAL MANAGEMENT OF HYPOGLYCAEMIA IN ADULTS WITH DIABETES

NHS
Doncaster and Bassetlaw Teaching Hospitals
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Hypoglycaemia is defined as a finger prick or laboratory glucose level of less than 4.0mmols/L

If patient is known diabetic and symptomatic of hypoglycaemia e.g. sweating, pallor, tremor, irritability or behavioural change
Perform Finger prick glucose & Laboratory glucose. **DO NOT DELAY TREATMENT WHILST WAITING FOR LABORATORY RESULT**

EMERGENCY TREATMENT

Chosen according to condition of patient and their prior treatment

Pt. is conscious, orientated and able to swallow **Follow Step A**	Pt. is conscious but confused, uncooperative or disoriented and unable to tolerate oral treatment **Follow Step B or C**	Pt. is unconscious/fitting/unable to swallow **Follow Step B and C**
STEP A Give any of the following: A quick acting carbohydrate drink, for example 60ml of fortijuice. **OR** 150-200ml pure fruit juice e.g. orange **OR** 3 dextrosol tablets (patient's own) **OR** 1 Tube of glucose gel **OR** 60mls Fortijuice (for enteral feeding)	**STEP B** **GLUCAGON** 1 mg reconstituted with diluents and given IM **Cautions, Contraindications and Side effects as per B.N.F guidelines**	**STEP C** Check ABC. Stop any IV insulin 10% Glucose infusion 200mls given over 10 mins. Alternatively, give 20% glucose infusion 100mls stat.
Points of consideration Treatment may need repeating after 10-15 mins if no improvement. If blood glucose remains <4.0mmol/L after 45 mins or 3 attempts of quick acting carbohydrate, consider glucagon or IV glucose	**Points of consideration** If patient is disoriented, uncooperative give Glucagon as above. Patients usually respond within 10 minutes. May be less in patients prescribed sulphonylureas, or under the influence of alcohol. Approx. 20% patients experience nausea and vomiting post dose. If blood glucose remains <4.0mmols/L after 45 mins use IV glucose regime	**Points of consideration** Response usually within 4-6 mins **ALWAYS CHECK FINGER PRICK GLUCOSE LEVELS 10-15 MINS AFTER INITIAL TREATMENT AND AT 1 HOUR**

ON RECOVERY

Give longer acting carbohydrate or next meal if due e.g. Sandwich, 2 digestive biscuits, 1 slice of bread/toast, non-sugary cereals or 200-300mls glass of milk

COMPLETE HYPOGLYCAEMIA AUDIT FORM

We Care

March 2017 Review date by: March 2020

Designed by Graphics, DBTH, 01302 644246

IF NO IMPROVEMENT, ALERT MEDICAL STAFF AND CONSIDER ALTERNATIVE DIAGNOSIS FOR REDUCED CONSCIOUSNESS.

PRACTICAL CONSIDERATIONS

FOR TABLET CONTROLLED PATIENTS WITH A BLOOD GLUCOSE LESS THAN 4.0MMOL/L

Give 15-20g quick acting carbohydrate of the patient's choice where possible. Once blood glucose is above 4.0mmol/L and the patient has recovered, give a long acting carbohydrate.

If blood glucose level remains less than 4.0mmol/L after 45 minutes (or 3 cycles of treatment) **Contact a doctor**. Consider IV 10% glucose infusion at 100ml/hr. Volume should be determined by clinical circumstances.

Ensure regular capillary blood glucose monitoring is continued for 24 to 48 hours. Give hypoglycaemia education or refer to diabetes inpatient specialist nurse (DISN)

Refer to flow chart and follow step A

FOR INSULIN CONTROLLED PATIENTS WITH A BLOOD GLUCOSE LESS THAN 4.0 MMOL/L

DO NOT omit insulin injection if due (However, dose review may be required). Give half the usual dose.

Give 15-20g quick acting carbohydrate of the patient's choice where possible. Once blood glucose is above 4.0mmol/L and the patient has recovered, give a long acting carbohydrate.

If blood glucose level remains less than 4.0mmol/L after 45 minutes (or 3 cycles of treatment) **Contact a doctor**. Consider IV 10% glucose infusion at 100ml/hr. Volume should be determined by clinical circumstances.

Ensure regular capillary blood glucose monitoring is continued for 24 to 48 hours. Give hypoglycaemia education or refer to Diabetes Specialist Nurse (DISN)

Refer to flow chart and follow step A

IF A PATENT IS ON IV INSULIN WITH A BLOOD GLUCOSE LESS THAN 4.0 MMOL/L

If the patient has an insulin infusion in situ, **stop immediately.**

Give 15-20g quick acting carbohydrate of the patient's choice where possible. Once blood glucose is above 4.0mmol/L and the patient has recovered, give a long acting carbohydrate.

If the patient was on IV insulin, only restart after a review of dose regimen, continue to check blood glucose every hour.

Ensure regular capillary blood glucose monitoring is continued for 24 to 48 hours. Give hypoglycaemia education or refer to Diabetes Specialist Nurse (DISN).

Refer to flow chart and follow step A

PATIENTS WHO SELF MANAGE THEIR INSULIN PUMPS WITH A BLOOD GLUCOSE LESS THAN 4.0 MMOL/L

Give 15-20g quick acting carbohydrate of the patient's choice where possible.
Patients who self-manage their insulin pumps may not need a long acting carbohydrate

Ensure regular capillary blood glucose monitoring is continued for 24 to 48 hours. Give hypoglycaemia education or refer to Diabetes Specialist Nurse *(DISN)*

Refer to flow chart and follow step A

PATIENTS WHO ARE 'NIL BY MOUTH' WITH A BLOOD GLUCOSE OF LESS THAN 4.0 MMOL/L

If the patient has a variable rate intravenous insulin infusion, adjust as per prescribed regimen, and seek medical advice. Once blood glucose is greater than 4.0mmol/L and the patient has recovered consider 10% glucose at a rate of 100ml/hr until patient is no longer 'Nil by Mouth' or has been reviewed by a doctor.

Ensure regular capillary blood glucose monitoring is continued for 24 to 48 hours. Give hypoglycaemia education or refer to diabetes inpatient specialist nurse (DISN)

Refer to flow chart and follow step B and C

PATIENTS REQUIRING ENTERAL FEEDING WITH A BLOOD GLUCOSE LESS THAN 4.0MMOL/L

Patients requiring total parenteral/enteral nutrition (TPN or feeds) should be referred to a dietitian /nutrition team and diabetes team for individual assessment.

Do not administer these treatments via a TPN line.
1) Give 15-20g quick acting carbohydrate of the patient's choice where possible. Some examples are:
25ml original undiluted Ribena®
45-60ml Fortijuce®
3-4 heaped teaspoons of sugar dissolved in water

All treatments should be followed by a water flush of the feeding tube to prevent tube blockage. Once blood glucose is above 4.0mmol/L and the patient has recovered, restart feed. If bolus feeding, give additional bolus feed (read nutritional information and calculate amount required to give 20g of carbohydrate). Alternatively, give 10% IV glucose at 100ml/hr. Volume should be determined by clinical circumstances.

Ensure regular capillary blood glucose monitoring is continued for 24 to 48 hours. Give hypoglycaemia education or refer to Diabetes Specialist Nurse (DISN)

Refer to flow chart follow step Band C

WHEN HYPOGLYCAEMIA HAS BEEN TREATED SUCCESSFULLY

Identify the risk factor or cause resulting in hypoglycaemia. Take measures to avoid hypoglycaemia in the future. The DISN or diabetes team can be contacted to discuss this.

Please **DO NOT** omit next insulin injection or start variable rate intravenous insulin infusion to 'stabilise' blood glucose.

Please **DO NOT** treat isolated spikes of hyperglycaemia with 'stat' doses of short/rapid acting insulin. Instead, maintain regular capillary blood glucose monitoring and adjust normal Insulin regimen if a particular pattern emerges.

COMPLETE HYPOGLYCAEMIA AUDIT FORM (See Appendix 2)

Any hypo caused by 'care issues' must complete a DATIX

ADMISSION TO HOSPITAL IS LIKELY TO BE REQUIRED IN:-

- The elderly
- The socially isolated
- Patients on long acting Sulphonylureas i.e. Glibenclamide, Chlorpropramide, Gliclazide Sustained Release.
- Patients with prolonged hypoglycaemia where recovery is incomplete.
- Patients who have taken a deliberate insulin or oral hypoglycaemic overdose.
- Patients with co-existing medical conditions needing further investigation.

ALL PATIENTS ADMITTED WITH HYPOGLYCAEMIA WILL NEED REFERRAL TO THE DIABETES IN-PATIENT TEAM.

GENERALISED POINTS FOR CONSIDERATION

- **Hypoglycaemia may last up to 72 hours**
- Referral to the Health Care Professional responsible for the patients diabetes care (i.e. General Practitioner or Secondary care diabetes team) may be useful for those with a poor understanding of their diabetes.
- Hypoglycaemia may be fatal in elderly patients taking Sulphonylureas.
- Hypoglycaemia may be precipitated by worsening renal function, hepatic failure or heart failure.

- **PATIENTS TAKING ACARBOSE NEED TREATMENT WITH INTRAVENOUS/ORAL GLUCOSE AND NOT SUCROSE.**

(A fast acting carbohydrate drink or glucose tablets can be given to patients taking Acarbose.)

- ***CONSIDER CAUSE OF HYPOGLYCAEMIA AND MAKE POSSIBLE CHANGES TO PREVENT A SIMILAR OCCURRENCE.***

    1. **Reinforce education of patient**
    2. **Blood glucose levels may remain high after initial treatment therefore; avoid making incremental adjustment to insulin dose in the ensuing 24 hours.**

HYPOGLYCAEMIA IN THE NON-DIABETIC PATIENT IN HOSPITAL

- Hypoglycaemia in these patients requires proper investigation, admission to hospital and referral to the physician with an interest in Diabetes/ Endocrinology.

5. TRAINING/ SUPPORT

Each member of staff is accountable for his/her practice and should act in such a way to promote safety and well- being. Each staff member will receive instructions and direction regarding hypo prevention and control information from a number of sauces.

- Trust policies and procedures available on the intranet
- Link Nurse to provide ward based education and keep a register of all training sessions.
- Group/individual educational sessions provided by the In-Patient Diabetes Specialist Nurses.
- Virtual college/E Learning/self- directed
- Educational displays/posters (hypo awareness week)

Training sessions for hypoglycaemia treatment and use of hypo box will be provided by the link nurse at ward level, by the nurse educators and in-patient Diabetes nurses.

6. MONITORING COMPLIANCE WITH THE PROCEDURAL DOCUMENT

Audit of this policy will be as per the National Guidelines- http://www.diabetologists-abcd.org.uk/JBDS/JBDS.htm. This would be done annually by the Ward Manager to look at the ease and effectiveness of the hypoglycaemia treatment guidelines, treatment regimens followed.

What is being Monitored	Who will carry out the Monitoring	How often	How Reviewed/ Where Reported to
Cause of hypoglycaemia identified & recorded. Training for hypo boxes at ward level to be delivered by link nurse, educators and DISNs	In-Patient Diabetes Nursing Team	3 Monthly	Hypoglycaemia audit forms to be reviewed by DISNs/diabetes team. If hypo forms not received, to DATIX as incident. The audits are to include information identified from UNIPOC.

Time to recovery	In- Patient Diabetes Nursing Team	3 Monthly	Hypoglycaemia audit forms to be reviewed by DISNs/diabetes team
Percentage of appropriate insulin/anti-hyperglycaemic medication dose adjustment	In-Patient Diabetes Nursing Team	3 Monthly	Hypoglycaemia audit forms / JAC to be reviewed by DISNs/diabetes team

7. DEFINITIONS

Hypoglycaemia is defined as a finger prick or laboratory glucose level of less than 4.0 mmols/L.

8. EQUALITY IMPACT ASSESSMENT

An Equality Impact Assessment (EIA) has been conducted on this procedural document in line with the principles of the Equality Analysis Policy (CORP/EMP 27) and the Fair Treatment For All Policy (CORP/EMP 4).

The purpose of the EIA is to minimise and if possible remove any disproportionate impact on employees on the grounds of race, sex, disability, age, sexual orientation or religious belief. No detriment was identified. (See Appendix 3).

9. ASSOCIATED TRUST DOCUMENTS

- Trust policies and procedures available on intranet
- Guidance for Medicines Management policy -
- Guidance for the administration of medicines to patients who have swallowing difficulties or who are using enteral feeding tubes.
- Guidelines for use of patient observations.
- Hypo guidelines for non-diabetes patients.
- Guidance for the administration of medication for patients who have swallowing difficulties or are using enteral feeding tubes.
- Guide lines for intravenous fluids/medication

10. REFERENCES

Joint British Diabetes Society (revised September 2013) The Hospital Management of Hypoglycaemia in Adults with Diabetes Mellitus [online] accessed on 03/01/2014 at http://www.diabetologists-abcd.org.uk/JBDS/JBDS.htm

APPENDIX 1 - GLUCAGON

GLUCAGON

Contraindication: Insulinoma, Glucaganoma, ineffective in chronic hypoglycaemia, starvation and adrenal insufficiency.

Glucagon not to be given in case of Reactive Hypoglycaemia, in patients without diabetes.

APPENDIX 2 – HYPOGLYCAEMIA AUDIT FORM

Patient Details/Sticker: Healthcare Professional Details:

Hosp No: ..... DoB: .....
Surname: .....
Forename(s): .....
Male Female NHS No .....
Name: .....
Grade/Band: .....

Ward: ---------- Consultant: ----------

Date of Event: ____ / ____ / ____ Time of Event: _____: _____ hrs (24 hr clock)

Hypoglycaemic episode type please insert letter from key below:
Key:
A. Patient was conscious, orientated and able to swallow
B. Patient was conscious but confused, disorientated, aggressive or had an unsteady gait but was able to swallow
C. Patient was unconscious and/or having seizures and/or was very aggressive
D. Patients was conscious, orientated but 'Nil by Mouth'
E. Patients requiring enteral feeding

Blood Glucose (BG) at time of event:

Treatment administered

BG - 10 minutes after treatment:

BG - 15 minutes after treatment:

Treatment (if required):

Was Hypoglycaemia Treatment Guideline followed? Yes ☐ No*☐ *(Please tick appropriate box)*
***If No, please give details:**

Did the patient self-manage? Yes☐ No☐ * *(Please tick appropriate box)*

Patient recovered? Yes☐ No☐* *(Please tick appropriate box)*
***If No, please give details:**

What steps were taken to identify the reason for the hypoglycaemia?
Please give details:

What steps were taken to prevent a recurrence?
Please give details:

Please comment on the ease and effectiveness of the Treatment Guideline and make any suggestions on how it could be improved.

Thank you Please return the form to In-Patient Diabetes Specialist Nurses

APPENDIX 3 – EQUALITY IMPACT ASSESSMENT - PART 1 INITIAL SCREENING

Service/Function/Policy/Project/ Strategy	Care Group/Executive Directorate and Department	Assessor (s)	New or Existing Service or Policy?	Date of Assessment
In Hospital Management of Hypoglycaemia in Adults with Diabetes Mellitus	Department of Diabetes and Endocrinology. Speciality services care group	Shivani Dewan	Existing Policy	March 2017

1) Who is responsible for this policy? Name of Care Group/Directorate: Speciality care group.

2) Describe the purpose of the service / function / policy / project/ strategy? Who is it intended to benefit? What are the intended outcomes? Patients- appropriate treatment of in-hospital hypoglycaemia

3) Are there any associated objectives? Legislation, targets national expectation, standards

4) What factors contribute or detract from achieving intended outcomes? Education of nursing staff

5) Does the policy have an impact in terms of age, race, disability, gender, gender reassignment, sexual orientation, marriage/civil partnership, maternity/pregnancy and religion/belief? No

- **If yes, please describe current or planned activities to address the impact** [e.g. Monitoring, consultation]

6) Is there any scope for new measures which would promote equality? [any actions to be taken

7) Are any of the following groups adversely affected by the policy? No

Protected Characteristics	Affected?	Impact
a) Age	No	
b) Disability	No	
c) Gender	No	
d) Gender Reassignment	No	
e) Marriage/Civil Partnership	No	
f) Maternity/Pregnancy	No	
g) Race	No	
h) Religion/Belief	No	
i) Sexual Orientation	No	

8) Provide the Equality Rating of the service / function /policy / project / strategy – tick (✓) outcome box

Outcome 1 ✓	Outcome 2	Outcome 3	Outcome 4

Date for next review: March 2020

Checked by: Shivani Dewan **Date: March 2017**