

## Document Control

Title			
<b>Hypoglycaemia in Adults with Diabetes Mellitus - Hospital Management Guideline</b>			
<b>Author</b>		<b>Author's job title</b> Lead Clinical Nurse Specialist Diabetes	
<b>Directorate</b> Medicine		<b>Department</b> Diabetes	
Version	Date Issued	Status	Comment / Changes / Approval
0.1	Nov 2009	Draft	
0.2	Jan 2010	Draft	Amends by Corporate Affairs Team to formatting and layout.
0.3	Mar 2010	Draft	Amendments to update majority of Guidelines. Approved by Drug & Therapeutic Group on 9 <sup>th</sup> September 2010 subject to amendments.
1.0	Oct 2010	Final	Amendments made as requested by Drug & Therapeutic Group. Minor amendments by Corporate Affairs to document control report, filename, formatting for document map navigation and hyperlinks to appendices. Minor adjustments to quantities and durations by Diabetes Team.
1.1	Jan 2011	Revision	Wording changed to replace 'trained staff' with 'Registered staff' in sections 6.2, 6.3 and 6.5
1.2	April 2013	Revision	Wording changed
2.0	April 2013	Draft	Harmonised policy as a result of the merging of Northern Devon Healthcare NHS Trust and NHS Devon Community Services. A summary of key issues and differences is on page 3
2.1	Nov 2013	Revision	Strength and amount of IV fluid used in the management of the 'unconscious' or 'enteral fed patient when tube is not patent' to replace '50mls of 20% glucose' with '150mls of 10% glucose' sections 6.3, 6.5 and hypoglycaemic treatment pathway appendix A.
2.2	April 2016	Revision	New oral hypoglycaemia medication added to section 2 and 3. Revised date changed
2.3	May 2020	Revision	Amendment to the amount of IV fluid used in the management of hypoglycaemic patients. To replace "100mls of 10% glucose" with "150mls of 10% glucose" sections 6.2, 6.3 and hypoglycaemic treatment pathway appendix A
3.0	March 2021	Final	Approved by Medicine Divisional Governance – Additional review completed by Consultant Physician Acute Medicine and Diabetes.

			Changes are as in 2.3 and contents of the hypo box have been updated
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<b>Superseded Documents</b>			
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## Summary of key differences and main changes in this harmonised policy compared to the Northern and Eastern policies

Staff are expected to review the complete policy's contents.

Key Differences / Changes
Add "refer to patient's GP if in community hospital"
Add details of who to phone if in community hospital
Add "refer to patient's GP if community hospital"
Add "Community hospitals to phone (9)999
Add "refer to patient's GP if community hospital"
Addition of appendix B Treatment of Hypoglycaemia-Adult Care Pathway-Community hospitals

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## 1. Purpose

This guideline sets out Northern Devon Healthcare NHS Trust's system for the hospital management of Hypoglycaemia in Adults (older than age 16) with Diabetes Mellitus. It provides a robust framework to ensure a consistent approach across the whole organisation, including community hospitals.

Hypoglycaemia is recognised as a blood glucose level less than 4.0mmols/L. Hypoglycaemia results from an imbalance between glucose supply, glucose utilisation and current insulin levels, resulting in more insulin than is needed at that time. Approximately 20% of inpatients may experience a hypoglycaemic episode during their admission. Hypoglycaemia should be excluded in any person with diabetes who is acutely unwell, drowsy, unconscious, unable to co-operate, presenting with aggressive behaviour or seizures.

Acute hypoglycaemia provokes an intense haemodynamic response and may provoke a cardiac arrhythmia, myocardial ischaemia or myocardial infarction in compromised patients. If hypoglycaemia is prolonged, it can result in brain damage and even death.

- 1.1. The purpose of this guideline is to promote best practice and ensure adherence when managing the treatment of hypoglycaemic episodes for adult patients in the hospital setting.
- 1.2. The guideline applies to all Trust staff who look after adult patients with diabetes mellitus, and must be adhered to. Specifically it applies to the following staff groups who may be caring for patients with diabetes mellitus who treat their diabetes with any oral hypoglycaemic medication and/or insulin injections and/or incretin mimetics in combination with sulphonylureas:
  - Registered Nurses
  - Unregistered Clinical Staff
  - Midwives
  - Medical Staff
  - Operating Department Practitioners

Staff undertaking this responsibility must be able to demonstrate attendance at relevant in-house training and continued competence as per the Trust's policy for assessing and maintaining clinical competence. Non-compliance with this guideline may be for valid clinical reasons only. The reason for non-compliance must be documented clearly in the patient's notes.

- 1.3. Implementation of this guideline will ensure that:
  - Staff involved in the treatment of hypoglycaemic episodes have clear guidance.
  - A pathway for the treatment of hypoglycaemia for adults with diabetes in all hospital clinical settings is provided.
  - Evidence-based safe systems of work are identified to minimise the risks associated with hypoglycaemic events within the clinical setting.

- Increased knowledge and understanding of the treatments of hypoglycaemia will increase patient safety and satisfaction.
- There is equality of care for all adult patients with diabetes mellitus in hospital.

## 2. Definitions

- Hypo = Hypoglycaemia
- IV = Intravenous Infusion
- IM = Intramuscular
- DISN = Diabetes Inpatient Specialist Nurses.
- PGD = Patient Group Directives
- IAH = Impaired Awareness of Hypoglycaemia
- NSAIDS = Non-steroidal anti-Inflammatory Drugs
- SSRI = Selective Serotonin Re-uptake Inhibitors
- CSII = Subcutaneous Insulin Infusion
- NDDH = Northern Devon District Hospital

A practical definition of hypoglycaemia is a blood glucose level less than 4.0mmol/L although some patients may tolerate lower levels of blood glucose levels without apparent symptoms. It can be defined as “mild” if the episode is self-treated and “severe” if assistance by a third party is required (DCCT, 1993). Adults with diabetes treated with insulin and/or sulphonylureas during a hospital admission with any blood glucose levels less than 4.0mmol/L should be treated.

The hospital environment presents additional obstacles to the maintenance of good glycaemic control and the avoidance of hypoglycaemia. Hypoglycaemia occurs in 7.7% of admissions and results in increased length of stay and mortality rates (Turchin et al 2009).

Hypoglycaemia is the commonest side effect of insulin and sulphonylureas (e.g. Gliclazide, and particularly Glibenclamide) in the treatment of diabetes and presents a major barrier to satisfactory long term glycaemic control. Metformin, thiazolidinediones, DPP-4 inhibitors and GLP-1 analogues prescribed without insulin or sulphonylurea therapy are unlikely to result in hypoglycaemia.

The risk of hypoglycaemia with sulphonylurea therapy is often underestimated and as a consequence of the duration of action of tablets, is frequently prolonged. Elderly patients or those with renal impairment are at particular risk of hypoglycaemia.

## 3. Roles and Responsibilities

The guideline applies to all Trust staff looking after adult patients with diabetes and must be adhered to.

### 3.1. Role of Diabetes Specialist Team

- To provide expert advice and guidance to all staff in the management of hypoglycaemia.

### 3.2. Role of Doctors

- To assess glucose control and current doses of insulin and/or sulfonylureas.
- To support the nursing staff in the correct management of hypoglycaemia

### 3.3. Role of all Staff

- To ensure patients at risk of hypoglycaemia have their blood glucose levels monitored regularly during any hospital admission.
- To report any changes to blood glucose levels that may need a reduction in insulin or sulfonylurea doses
- To follow the hypoglycaemic pathway, ensuring regular blood glucose monitoring is adhered to.

## 4. Hypoglycaemia in Adults with Diabetes Mellitus

### 4.1. Clinical Features

The symptoms of hypoglycaemia warn an individual of its onset and vary considerably between individuals. Autonomic symptoms are generated by the activation of the sympathoadrenal system and neuroglycopenic symptoms are the result of cerebral glucose deprivation. Refer to Table 1.

The brain is dependent on a continuous supply of circulating glucose as the substrate to fuel cerebral metabolism and support cognitive performance. If blood glucose levels fall sufficiently, cognitive dysfunction is inevitable (Evans & Amiel, 2002).

Hypoglycaemia can cause irritability, confusion, disorientation, coma, hemiparesis and seizures. If the hypoglycaemia is prolonged the neurological deficits may become permanent. Acute hypoglycaemia impairs many aspects of cognitive function.

Impaired awareness of hypoglycaemia (IAH) is an acquired syndrome usually in people with long standing insulin diabetes who are prone to recurrent or chronic hypoglycaemia. IAH results in the warning symptoms of hypoglycaemia becoming diminished in intensity, altered in nature or lost altogether. This increases the vulnerability of affected individuals of progression to severe hypoglycaemia. The prevalence of IAH increases with duration of diabetes and is more common in Type 1 than in Type 2 diabetes (Graveling & Frier, 2009).

Autonomic	Neuroglycopenic	General Malaise
Sweating	Confusion	Headache
Palpitations	Drowsiness	Nausea
Shaking	Odd behaviour	

Hunger	Speech difficulty	
	Lack of co-ordination	

**Table 1: Edinburgh Hypoglycaemia Scale (Deary et al 1993)**

#### 4.2. Risk Factors for Hypoglycaemia

Hypoglycaemia can be precipitated by concurrent use of drugs with hypoglycaemic agents e.g. warfarin, quinine, salicylates, fibrates, sulphonamides (including cotrimoxazole), monoamine oxidase inhibitors, NSAIDs, probenecid, somatostatin analogues, SSRIs. Medication should not be stopped or withheld without discussion with the medical team or pharmacist.

The loss of anti-insulin hormone function (Addison's disease, growth hormone deficiency, hypothyroidism, hypopituitarism) can also be a risk factor for hypoglycaemia. For further risks, refer to Table 2.

Medical Issues	Lifestyle issues
Tight glycaemic control	Increased exercise (relative to usual)
Previous history of severe hypoglycaemia	Irregular lifestyle
Undetected nocturnal hypoglycaemia	Increasing age
Long duration of diabetes	Alcohol
Poor injection technique	Early pregnancy
Impaired awareness of hypoglycaemia	Breast feeding
Preceding hypoglycaemia (less than 3.5mmol/L)	Injection into areas of lipohypertrophy (lumpy areas)
Severe hepatic	Inadequate blood glucose

Medical Issues	Lifestyle issues
dysfunction	monitoring
Renal dialysis therapy	
Impaired renal function	Reduced carbohydrate intake
Inadequate treatment of previous hypoglycaemia	Food malabsorption e.g. gastroenteritis, coeliac disease
Terminal illness	

**Table 2: Risk Factors for Hypoglycaemia**

#### 4.3. Potential causes of Inpatient Hypoglycaemia

Common causes of inpatient hypoglycaemia are listed in Table 3. One of the most serious and common causes of inpatient hypoglycaemia is insulin prescription error including:

- Misreading poorly written prescriptions – when ‘U’ is used for units (4U becoming 40units)
- Confusing the insulin name with the dose (e.g. Humalog Mix25 becoming Humalog 25 units)
- Transcription error (e.g. where patient on animal insulin is inadvertently prescribed human insulin)

Medical Issues	Reduced carbohydrate intake
Inappropriate use of ‘stat’ or ‘PRN’ quick acting insulin	Missed or delayed meals
Acute discontinuation of long term steroid therapy or growth hormone	Change of timing of the biggest meal of the day i.e. main meal at midday rather than evening
IV insulin infusion with or without glucose infusion	Lack of access to usual between meal or before bedtime snacks
Mobilisation after illness	Prolonged starvation time e.g. ‘Nil by Mouth’
Major amputation of a limb	Vomiting
Incorrect insulin prescribed and administered	Reduced appetite

Medical Issues	Reduced carbohydrate intake
Recovery from acute illness/stress	
Inadequate mixing of intermediate acting or mixed insulins	
Regular insulin doses being given in hospital when these are not always taken at home	

**Table 3: Potential causes of Inpatient Hypoglycaemia**

## 5. Contact numbers

- 5.1. The Diabetes Inpatient Specialist Nurses (DISN) team can be contacted on 01271 322726 / 349105 internal extension: 2726 / 3105 or bleep 044

## 6. Management of Hypoglycaemia

- 6.1. Hypo boxes are designed to allow for more rapid and consistent in-hospital treatment of unexpected hypoglycaemic episodes. Each hypo box will contain all the equipment required to treat a patient experiencing a hypoglycaemic episode. The hypo box will be situated in a prominent place in each clinical area. Clinical areas that routinely take admissions of people with diabetes will keep more than one hypo box on site.

Following use to treat a patient, each clinical area will be responsible for replacing the items in the hypo box according to the contents list situated in the box (see Appendix C)

## 7. Treatment Pathway

The treatment pathway for hypoglycaemia follows a flowchart (see Appendix A and B) depending on presentation of symptoms and severity. The general principles of the hospital management of hypoglycaemia in adults with diabetes mellitus experiencing hypoglycaemic symptoms with a blood glucose level less than 4.0mmol/L is detailed below

### 7.1. Adults who are conscious, orientated and able to swallow:

Give 15 - 20g quick acting carbohydrate, e.g.:

- Pure orange juice 200ml carton, or
- 150ml can of Coca cola, or
- 3 - 4 heaped teaspoons sugar dissolved in water.

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Repeat capillary blood glucose measurement 10 - 15 minutes later. If blood glucose less than 4.0mmol/L, repeat step 1 up to 3 times.

If blood glucose remains less than 4.0mmol/L after 45 minutes or 3 cycles of treatment contact a doctor even if patient remains conscious and orientated and continue treatment according to pathway.

Once blood glucose is above 4.0mmol/L, give one of the following long acting carbohydrates\*;

- Two plain biscuits
- One slice of bread/toast
- 200 - 300ml glass of milk (not soya)
- Normal meal if due (must contain carbohydrate)

DO NOT omit next insulin injection.

Check blood glucose level 1 hour after last treatment. Ensure regular capillary blood glucose level monitoring is continued for 24 to 48 hours whether at home or in hospital.

Review events leading to hypoglycaemia to determine cause and instigate appropriate action to avoid recurrence. Refer to Diabetes Inpatient Specialist Team or patient's GP in community hospital if patient has experienced more than one hypoglycaemic episode or if cause is undetermined.

\*N.B. Patients who self-manage their insulin pumps will usually not need a long-acting carbohydrate. (NHS Diabetes, 2011)

## **7.2. Adults who are conscious, able to swallow but are also confused, disorientated, and require the support of another person to treat the hypoglycaemia.**

All Registered Staff who have undertaken the appropriate training can give the following treatment:

- Administration of IM Glucagon injection
- Administration of IV 10% glucose infusion

If patient is not capable of self-management but is able to swallow give either:

1.5 - 2 tubes of Glucoboost squeezed inside the mouth and swallowed or squeezed inside the cheek, gently massaging the cheek to aid absorption.

Repeat capillary blood glucose levels after 10 - 15minutes. If still less than 4.0mmol/L;

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Repeat Glucoboost up to 3 times, if blood glucose remains less than 4.0mmol/L after 45 minutes or 3 cycles contact a doctor and give 150ml of 10% IV glucose infusion over 15 minutes (delivered at an infusion rate of 600ml/hr). Once 150ml infusion complete check blood glucose level, if still below 4.0mmol/L repeat infusion as above (this may need to be repeated up to 3 times in total).

If in community hospital seek appropriate medical advice (on-site doctor if available, phone out of hour's on-call doctors or phone 999)

OR

1mg Glucagon IM injection. Glucagon, which may take up to 15 minutes to take effect, mobilises glycogen from the liver and will be less effective in patients prescribed sulfonylurea therapy, those who are chronically malnourished (e.g. those with history of alcohol abuse), in patients who have had a prolonged period of starvation and have depleted glycogen stores or in those with severe liver disease. In this situation or if prolonged treatment is required, IV glucose is preferred.

If glucagon IM injection has been given and blood glucose level is still less than 4.0mmol/L contact a doctor and give IV 10% glucose infusion as above.

If in community hospital seek appropriate medical advice (on-site doctor if available, phone out of hour's on-call doctors or phone 999)

Once blood glucose is above 4.0mmol/L give one of the following long acting carbohydrates\*

- Two plain biscuits
- One slice of bread/toast
- 200 - 300ml glass of milk (not soya)
- Normal meal if due (must contain carbohydrate)

N.B. Patients given Glucagon require a larger portion of long-acting carbohydrate to replenish glycogen stores (double the suggested amount above).

DO NOT omit next insulin injection.

Check blood glucose level 1 hour after last treatment. Ensure regular capillary blood glucose level monitoring is continued for 24 to 48 hours whether at home or in hospital.

Review events leading to hypoglycaemia to determine cause and instigate appropriate action to avoid recurrence. Refer to DISN team or patient's GP if in community hospital if patient has experienced more than one hypoglycaemic episode or if cause is undetermined.

\*N.B. Patients who self-manage their insulin pumps will usually not need a long-acting carbohydrate. (NHS Diabetes, 2011)

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### 7.3. **Adults who are unconscious and/or having seizures and/or are very aggressive:**

Check:

- Airway
- Breathing
- Circulation
- Disability (including GCS and blood glucose)
- Exposure (including temperature)

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

- NDDH Fast bleep a doctor 2333
- Community Hospitals dial (9)999

All Registered Staff who have undertaken the appropriate training can give the following treatment:

- Administration of IM Glucagon injection
- Administration of IV 10% glucose infusion

The following two options are appropriate.

1. 1mg Glucagon IM injection. Glucagon, which may take up to 15 minutes to take effect mobilises glycogen from the liver and will be less effective in patients prescribed sulphonylurea therapy, those who are chronically malnourished (e.g. alcoholics) or in patients who have had a prolonged period of starvation and have depleted glycogen stores or in those with severe liver disease. In this situation or if prolonged treatment is required, IV glucose is better.
2. If IV access available, give 150ml of 10% glucose infusion (over 15 minutes). Repeat capillary blood glucose measurement 10 minutes later. If blood glucose remains less than 4.0mmol/L, repeat cycle. Continue to test capillary blood glucose levels at 10 minute intervals.

Once capillary blood glucose is above 4.0mmol/L, and patient is conscious, orientated and able to swallow give one of the following long acting carbohydrates;\*

- Two plain biscuits
- One slice of bread/toast
- 200 - 300ml glass of milk (not soya)
- Normal meal if due (must contain carbohydrate)

N.B. Patients given Glucagon require a larger portion of long-acting carbohydrate to replenish glycogen stores (double the suggested amount above).

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DO NOT omit next insulin injection.

If patient was on IV insulin, continue to check blood glucose every 15 minutes until above 4.0mmol/L, and then re-start IV insulin after review of dose regimen.

Check blood glucose level 1 hour after last treatment. Ensure regular capillary blood glucose level monitoring is continued for 24 - 48 hours whether at home or in hospital.

Review events leading to hypoglycaemia to determine cause and instigate appropriate action to avoid recurrence. Refer to DISN team or patient's GP if in community hospital if patient has experienced more than one hypoglycaemic episode or if cause is undetermined.

\*N.B. Patients who self-manage their insulin pumps will usually not need a long-acting carbohydrate (NHS Diabetes, 2011)

#### 7.4. Adults who are "Nil by mouth":

If the patient has a variable rate intravenous insulin infusion, adjust as per prescribed regimen and seek medical advice.

The following is an appropriate treatment option.

If IV access available, give 150ml of 10% glucose infusion (over 15 minutes). Repeat capillary blood glucose measurement 10 minutes later. If blood glucose remains less than 4.0mmol/L, repeat cycle. Continue to test capillary blood glucose levels at 10 minute intervals.

Once blood glucose greater than 4.0mmol/L and the patient has recovered consider IV 10% glucose at a rate of 100 ml/hr until patient is no longer "Nil by Mouth" or has been reviewed by a doctor.

Ensure regular continued capillary blood glucose level monitoring for 24 - 48 hours.

#### 7.5. Hypoglycaemia in Enterally Fed Patients:

##### **Hypoglycaemia Procedure to follow if enteral tube is patent**

(See Enteral Feeding Policy link:

<http://ndht.ndevon.swest.nhs.uk/policies/?p=1510> )

- Mix 4 level teaspoons sugar in 50ml water and administer via the enteral tube using an enteral syringe
- Do not use fizzy drinks with enteral tubes as they can damage the tube
- Flush with water
- Re-check blood glucose in 10 minutes and repeat sugar water if blood glucose is under 4.0mmol/L.
- If blood glucose remains less than 4.0mmol/L after 45 minutes or 3 cycles of treatment **contact a doctor**

- 
- Once blood glucose is above 4.0mmol/l, give 100ml of a milk based supplement e.g. (Ensure Plus milkshake style or Fresubin energy drink) using a 50ml enteral syringe and flush with 50ml water
  - Restart normal feeding regimen

DO NOT omit next insulin injection.

All Registered Staff who have undertaken the appropriate training can give the following treatment:

- Administration of IM Glucagon injection
- Administration of IV 10% glucose infusion
- 

**Hypoglycaemia Procedure to follow if enteral tube is not patent or there is no enteral tube**

- Contact a doctor
- Do not use Glucoboost due to risk of aspiration

Administer **1mg glucagon IM** if the patient has been receiving feed **or give 150ml of 10% IV glucose infusion over 15 minutes (delivered at an infusion rate of 600ml/hr).**

**Once 150ml infusion complete check blood glucose level, if still below 4.0mmol/L repeat infusion as above (this may need to be repeated up to 3 times in total).**

Once blood glucose is above 4.0mmol/L and the patient has recovered:

- Restart feed
- If bolus feeding, give additional bolus feed (20g of carbohydrate)
- 10% IV glucose at 100ml/hr. Volume should be determined by clinical circumstances.
- When hypoglycaemia has been successfully treated:
- Document episode in the patient's notes including treatments and doses administered, time of administration and capillary blood glucose measurements.
- It is the responsibility of the member of staff who uses any contents to replenish them after use.
- Identify the cause (e.g. omitted meal or snack(s), inaccurate dosage of diabetes medication, inappropriate use of 'stat' or 'PRN' doses of rapid acting insulin) and take measures to avoid recurrence. Consult DISN or diabetes medical team if advice needed.
- DO NOT OMIT next insulin dose. If unsure of subsequent diabetes treatment, discuss with the diabetes team/DISN.
- Contact DISN if hypo episode was severe or a recurrent event, or if patient needs education about their hypoglycaemic management.

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## 8. Monitoring Compliance with and the Effectiveness of the Guideline

- 8.1. All Clinical Staff are accountable for maintaining their education and training and competency to practice. The Diabetes Nursing Team will provide a formal training programme for staff to attend to learn how to implement the hypoglycaemia guideline.

The training programme will be managed by the Learning and Development Team. Informal training in clinical areas will be provided by the DISN team on request or as a follow up to learning opportunities identified through the audit outcomes tool.

Periodic audits will be carried out by the diabetes team to ensure compliance with this policy.

## 9. References

- Deary U, Hepburn DA, MacLeod KM, Frier BM, (1993) Partitioning the symptoms of hypoglycaemia using multi-sample confirmatory factors analysis, *Diabetologia* 36: 771-777
- Evans M, Amiel S., Hypoglycaemia; in Wass J, Shalet S, Gale E., & Amiel S., Eds (2002). *Oxford Textbook of Endocrinology and Diabetes*. Oxford University Press
- Graveling AJ, Frier BM (2009), Hypoglycaemia: an overview: *Primary Care Diabetes* 3: 131-9
- Joint British Diabetes Societies (2020) *The Hospital Management of Hypoglycaemia in Adults with Diabetes Mellitus*
- Medicine Ethics & Practice (2008) [www.rpsgb.org/pdfs/MEP32si-2a.pdf](http://www.rpsgb.org/pdfs/MEP32si-2a.pdf) (accessed April 2009)
- NHS Diabetes (2011) *Recognition, treatment and prevention of hypoglycaemia in the community*.
- The Diabetes Control and Complications Trial Research Group (1993). The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus, *N Eng J Med* 329: 977-986
- Turchin A, Matheny ME, Shubina M, Scanlon JV, Greenwood B, Pendergrass ML (2009). Hypoglycaemia and clinical outcomes in patients with diabetes hospitalised in the general ward. *Diabetes Care* 32: 1153-1157

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## 10. Associated Documentation

- Assessment and Maintenance of Clinical Competence in Nurses, Midwives and Support Workers Policy

<b>Appendix</b>		
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Appendix A: Treatment of Hypoglycaemia – Adult Care Pathway

i)

Hypoglycaemia is blood glucose of less than 4.0mmol/l

Patient is

Step 1

**Mild**

Patient conscious, orientated and  
**ABLE TO SWALLOW**

**Moderate**

Patient disorientated confused,  
conscious but  
**ABLE TO SWALLOW**  
(needs assistance from another  
person)

**Severe**

Patient drowsy,  
unconscious/seizures  
**UNABLE TO SWALLOW**

Step 2

**Give**

15-20g fast acting  
carbohydrate-  
Pure Orange juice 200ml  
carton  
OR  
150ml can of Coca cola  
OR  
3-4 heaped teaspoons of sugar  
dissolved in water.

**Give**

i) 1.5-2 tubes of glucoboost  
squeezed  
inside the mouth and swallowed  
or squeezed inside the cheek  
OR  
ii) 1mg Glucagon\* intramuscular  
injection

**Check – Airway**

If insulin infusion insitu  
**STOP IMMEDIATELY**  
**FAST BLEEP doctor 2333**  
**GIVE EITHER**  
i) 1mg Glucagon \*intramuscular  
injection (may take 10-  
20minutes to be effective)  
OR  
ii) intravenous 150mls of 10%  
glucose (over 15minutes)  
**Only give Glucagon once**  
Check capillary blood glucose  
level after 10minutes, if less  
than 4.0mmol/L, **give**

Step 3

After 10 minutes, recheck  
capillary  
blood glucose level.  
If it is still below 4.0mmol/L  
repeat Step 2 up to 3 times. If  
blood glucose level remains  
less than 4.0mmol/L after 45  
minutes **contact a doctor**

Recheck capillary blood glucose  
level after 10 minutes. If less than  
4.0mmol/L  
i) Repeat **Glucoboost** up to 3  
times  
ii) Only give **Glucagon** once  
If blood glucose level remains less  
than 4.0mmol/L. **contact a doctor**

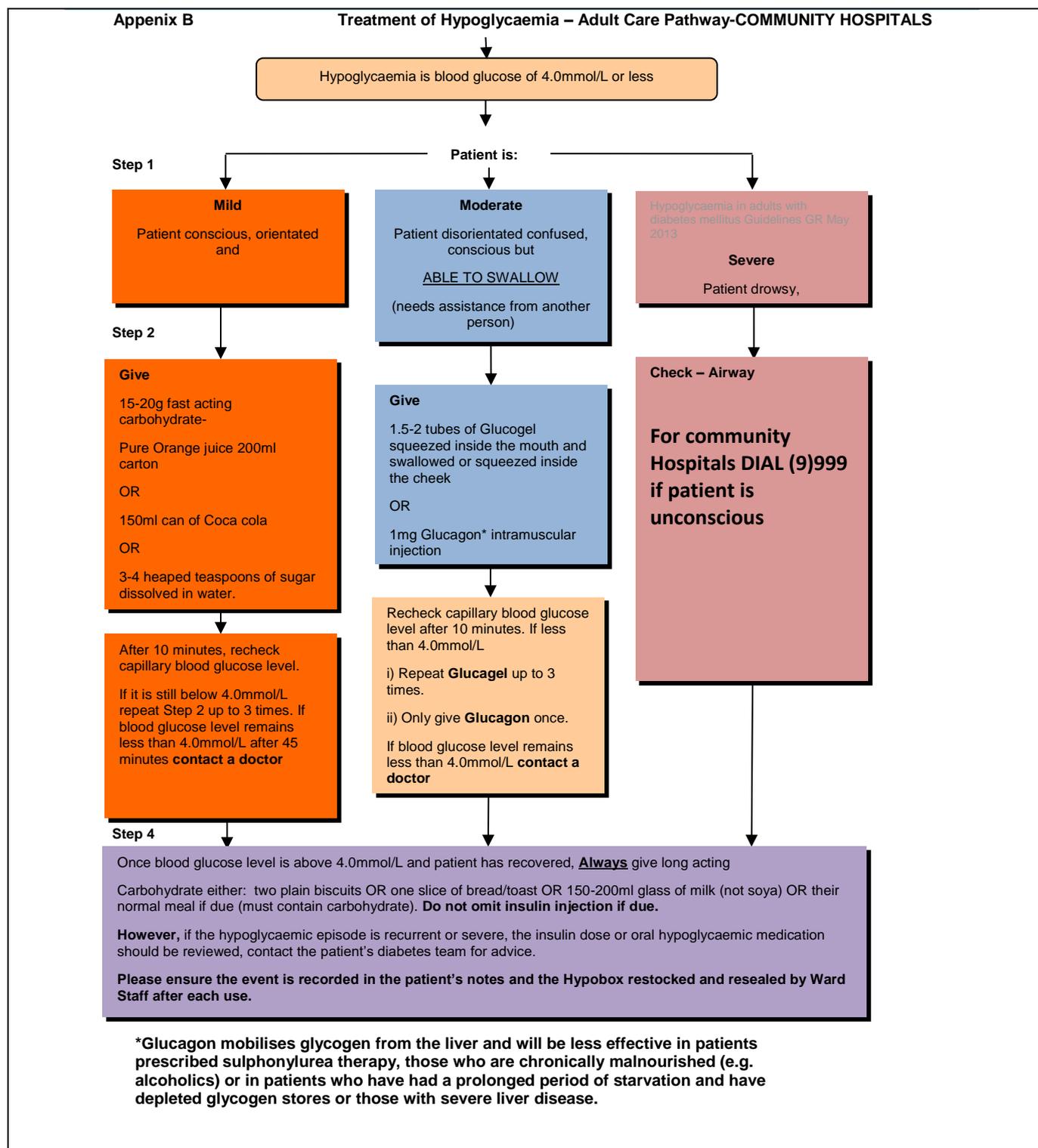
Step 4

IV 10% glucose infusion at 150mls over 15 minutes. **Retest the blood glucose level**, if still below 4.0mmol/L  
repeat.  
The IV 10% glucose infusion can be given up to four times (600mls)

Step 5

Once blood glucose level is above 4.0mmol/L and patient has recovered, **Always** give long acting  
carbohydrate either:  
Two plain biscuits OR one slice of bread/toast OR 150-200ml glass of milk (not soya) OR their normal meal if  
due (must contain carbohydrate). **Do not omit insulin injection if due. However**, if the hypoglycaemic  
episode is recurrent or severe, the insulin dose or oral hypoglycaemic medication should be reviewed, contact  
the Diabetes Team for advice.

\*Glucagon mobilises glycogen from the liver and will be less effective in patients prescribed sulphonylurea therapy, those who are chronically malnourished (e.g. alcoholics) or in patients who have had a prolonged period of starvation and have depleted glycogen stores



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## Appendix C: Example of contents of hypo box

### Hypo Box Contents List

- 1 x 150ml can of Coca Cola
- 1x 200ml pure orange juice
- 1 x box Glucoboost (3 X 10g tubes)
- 1 x Glucagon injection Date first taken out of fridge to be noted on outer case. Discard after 18 months.
- 3 x 2% chlorhexidine gluconate in 70% alcohol wipes
- 2 x green IV cannula 18 G
- 1 x grey IV cannula 16G
- 1 x IV cannula dressing
- 2 x 5ml prefilled saline syringes or saline ampoules and syringes
- 1 x IV solution administration set
- 1 x 10% IV glucose infusion 500ml bag
- 1 x closed system extension set
- 1 x pack of (2) plain biscuits

**It is the responsibility of the member of staff to re-stock the box following use. The box must be sealed recording the earliest expiry date of the contents.**