Somerset Partnership NHS
NHS Foundation Trust

# HYPOGLYCAEMIA MANAGEMENT POLICY FOR ADULT PATIENTS

## To be read in conjunction with the Insulin Management Policy

| | |
|---|---|
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| Relevant Staff Groups: | All Clinical staff where this is a designated part of their role |

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## DOCUMENT CONTROL

| **Reference** SD/IMP | **Version** 4 | **Status** Final | **Author** Nurse Consultant for Diabetes |
|---|---|---|---|
| **Amendments** | • Update following the NPSA/2011/PSA003 on insulin safety and reference to the implementation of Insulin Passports/Safety Cards and Patient Information Booklet.<br>• Use of the new Somerset Partnership Insulin prescription Chart.<br>• Web links to latest lists of all available insulins and their actions.<br>• Addition of self medication decision tree.<br>• Changes to cover assistant practitioners | | |
| **Document objectives:** This document will ensure that Somerset Partnership NHS Foundation Trust staff complies with the standards set out in this document | | | |
| **Intended recipients:** All clinical staff where this is a designated part of their role | | | |
| **Committee/Group Consulted:** Medicines Management Group | | | |
| **Monitoring arrangements and indicators:** This policy will be overseen by the Medicines Management Group, Somerset Partnership NHS Foundation Trust | | | |
| **Training/resource implications:** please see section 12. | | | |
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## 1. INTRODUCTION

1.1 This policy is for the management of hypoglycaemia in adults with diabetes mellitus within the community and community hospital and mental health inpatient setting.

1.2 Hypoglycaemia in a person with diabetes is defined as a capillary or venous glucose of less than 4mmol/L with or without symptoms.

1.3 Hypoglycaemia (hypo) results from an imbalance between glucose supply, glucose utilisation and current insulin levels, resulting in more insulin than is needed at that time. This complication of the treatment of diabetes should be excluded in any acutely unwell, drowsy, aggressive, unconscious or fitting patient. If hypos are prolonged they can result in death.

1.4 Most insulin treated patients can expect to experience hypos at some time, with up to one in seven having a more severe episode each year, and 3% suffering recurrent episodes (Turner and Wass 2002).

1.5 Hypoglycaemia is the commonest side effect of insulin, sulphonyurea and metiglinide therapy in the treatment of all types of diabetes mellitus and presents a major barrier to satisfactory long term glycaemic control. Metformin, Pioglitazone, the DPP-4 inhibitors, SGLT-2 inhibitors and GLP analogues prescribed without insulin, sulphonyurea or metiglinide therapy are unlikely to result in hypoglycaemia.

1.6 Frail patients or those with renal impairment are at particular risk of hypoglycaemia.

1.7 Acute hypos provoke an intense haemodynamic response and may provoke a cardiac arrhythmia, myocardial ischaemia, myocardial infarction or stroke in patients with co-morbidities.

1.8 The brain is dependent on a continuous supply of glucose and its interruption leads to central nervous system dysfunction, impaired cognition and eventually coma (Frier and Fisher 1999).

## 2. PURPOSE & SCOPE

2.1 The purpose of this policy is to clearly define the procedure for the management of hypoglycaemia in adults with diabetes mellitus within the community, and the community hospital and mental health inpatient setting.

2.2 The aim of this policy is to minimise harm caused by hypoglycaemia.

2.3 The target audience for this procedural document is all Somerset Partnership NHS Foundation Trust clinical staff.

## 3 LEGAL REQUIREMENTS

### Consent and capacity

3.1 Patient's have a legal and ethical right to determine what happens to them. The main purpose of seeking consent is to protect and respect the patients'

autonomy and individual rights, whilst ensuring medical accountability, involving the patients and carers in all aspects of their care. Every reasonable adjustment will be made to enable this to happen.

3.2 The Somerset Partnership Consent and Capacity to Consent to treatment policy sets out standards and procedures that define 'consent' between patients and health professionals providing treatment.

3.3 Consent may be indicated non-verbally, orally or in writing. For consent to be valid the patient must:

- Have capacity to make a decision
- Have received sufficient information to enable him / her to make an informed choice, given in accessible format. This may include professional translation and interpreting.
- To be free from duress when making decisions.

3.4 It is essential that all healthcare professionals clearly document assessments, patient's wishes and preferences and the decisions made.

3.5 If the patient is identified as lacking capacity, service providers have a duty to support them so that they can make their own decisions about the care they receive. People needing such support may include people with severe and enduring mental illness, dementia, people with learning disabilities and people at the end of a terminal condition (Mental Capacity Act 2005).

3.6 A person is assumed to have capacity unless it is proved otherwise.

3.7 If there is any doubt about an patient's capacity the Consent and Capacity to Consent policy / procedure must be followed.

## 4 DUTIES AND RESPONSIBLITIES

4.1 The **Trust Board** has a responsibility to ensure training is available to all relevant staff and that competency assessment is available via the clinical practice team as required. This responsibility is delegated to the Director of Nursing and patient safety.

4.2 The **Director of Nursing and Patient Safety** is the lead for patient safety for the Trust and is responsible for ensuring training, information and updates, regarding the treatment of hypoglycaemia is cascaded to all relevant staff.

4.3 **Each healthcare practitioner that works under this policy** is accountable for his/her own practice and will be aware of their legal and professional responsibilities relating to their competence in the recognition and management of hypoglycaemia within their scope of practice; and work within the Code of practice of their professional body (if applicable). All healthcare practitioners involved in the management of patients with diabetes at risk of hypoglycaemia:

- must acquaint themselves with this policy and other related policies

- will be aware of the action that should be taken if their practice or patient safety is compromised

- will be aware of the action of, frequency of administration, side effects, contra-indications and interactions of any medication that may cause hypoglycaemia

- will be aware of their limitations and seek advice or support from appropriate health professionals when in doubt.

## 5. EXPLANATIONS OF TERMS USED

5.1 Non registered practitioner refers to an Assistant Practitioner who has a minimum QCF level 5 diploma, higher diploma or foundation degree

5.2 Hypoglycaemia - Hypoglycaemia in a person with diabetes is defined as a capillary or venous glucose of less than 4mmol/L with or without symptoms.

5.3 Insulin – is a peptide hormone, produced by beta cells of the pancreas, and is central to regulating carbohydrate and fat metabolism in the body. It causes cells in the liver, skeletal muscles, and fat tissue to absorb glucose from the blood therefore lowering blood glucose levels.

5.4 Sulphonylurea – sulphonylurea derivatives are a class of oral hypoglycaemic agents that are used in the management of diabetes mellitus type 2. They act by increasing insulin release from the beta cells in the pancreas.

5.5 Meglitinide - Meglitinides are a class of drugs used treat diabetes type 2. They bind to an ATP-dependent $K^+$ ($K_{ATP}$) channel on the cell membrane of pancreatic beta cells in a similar manner to sulfonylureas but have a weaker binding affinity and faster dissociation.

5.6 DPP– 4 Inhibitor - Inhibitors of dipeptidyl peptidase 4, also DPP-4 inhibitors or gliptins, are a class of oral hypoglycemics that block DPP-4. They can be used to treat diabetes mellitus type 2. The first agent of the class - sitagliptin - was approved by the FDA in 2006.

5.7 SGLT2 is a member of the sodium glucose co-transporter family which are sodium-dependent glucose transport proteins. SGLT2 is the major co-transporter involved in glucose reabsorption in the kidney. The first agent in this class – Dapagliflozin – was approved by the FDA in 2012.

5.8 Glucagon-like peptide-1 agonists (GLP-1 agonists) are a class of drugs for the treatment of type 2 diabetes, known as the "incretin mimetics". One of their advantages over older insulin secretagogues, such as sulphonyureas or meglitinides, is that they have a lower risk of causing hypoglycaemia. The agents in the class are Exenatide twice daily or once weekly, Liraglutide and Lixisenatide.

5.9 Glucojuice – Is a 60 ml glucose drink providing 15g of rapidly absorbed carbohydrate.

5.10 Glucotabs – contain 4g of fast acting carbohydrate.

5.11 Glucogon - a peptide hormone secreted by the pancreas, raises blood glucose levels. Its effect is opposite that of insulin, which lowers blood glucose levels.

5.12 HbA1c - is a form of haemoglobin that is measured primarily to identify the average plasma glucose concentration over prolonged periods of time. It is formed in a non-enzymatic glycation pathway by haemoglobin's exposure to plasma glucose. Normal levels of glucose produce a normal amount of glycated haemoglobin. As the average amount of plasma glucose increases, the fraction of glycated haemoglobin increases in a predictable way. This serves as a marker for average blood glucose levels over the previous months prior to the measurement.

## 6. RISK FACTORS FOR HYPOGLYCAEMIA

6.1 The following are risk factors that can contribute or exacerbate hypoglycaemic events in patients with diabetes:

| Medical issues | Lifestyle issues |
|---|---|
| • strict glycaemic control<br>• previous history of severe hypoglycaemia<br>• long duration of type 1 diabetes<br>• duration of insulin therapy in type 2 diabetes<br>• lipohypertrophy at injection sites<br>• impaired awareness of hypoglycaemia<br>• severe hepatic dysfunction<br>• renal failure (on dialysis)<br>• acute kidney injury<br>• impaired renal function<br>• inadequate treatment of previous hypoglycaemia<br>• terminal illness<br>• bariatric surgery involving bowel resection<br>• food mal-absorption e.g. gastroenteritis, coeliac disease | • increased exercise (relative to usual)<br>• irregular lifestyle<br>• increasing age<br>• alcohol<br>• early pregnancy<br>• breast feeding<br>• no or inadequate blood glucose monitoring |

## 7 POTENTIAL CAUSES OF HYPOGLYCAEMIA

7.1 The following are potential causes of hypoglycaemia:

| Medical issues | Reduced carbohydrate intake |
|---|---|
| • inappropriate use of 'stat' or 'PRN' rapid/short acting insulin<br>• acute discontinuation of long term steroid therapy<br>• recovery from acute illness/stress<br>• mobilisation after illness<br>• major amputation of a limb<br>• incorrect type of insulin or oral hypoglycaemic therapy prescribed and administered<br>• inappropriately timed insulin or oral hypoglycaemic therapy in relation to meal or enteral feed<br>• change of insulin injection site<br>• IV insulin infusion with or without glucose infusion<br>• inadequate mixing of intermediate acting or mixed insulins<br>• regular insulin doses or oral hypoglycaemia therapy being given in hospital when these are not routinely taken at home<br>• discontinuation of enteral feed e.g. due to displaced tube | • missed or delayed meals<br>• less carbohydrate than normal<br>• change of the timing of the biggest meal of the day (i.e. main meal at midday rather than evening)<br>• lack of access to usual between meal or before bed snacks<br>• prolonged starvation time e.g. 'Nil by Mouth'<br>• vomiting<br>• reduced appetite |

## 8 SYMPTOMS OF HYPOGLYCAEMIA

8.1 The symptoms of hypoglycaemia warn a patient of its onset and vary considerably between individuals.

8.2 Autonomic symptoms are generated by the activation of the sympatho-adrenal system and neuroglycopenic symptoms are the result of cerebral glucose deprivation.

8.3 Below are the signs and symptoms experienced by patients or can be identified through assessment:

| **Autonomic Signs/Symptoms** | **Neuroglycopenic Signs/Symptoms** |
|---|---|
| • sweating<br>• palpitations<br>• shaking<br>• hunger<br>• tachycardia | • confusion<br>• drowsiness<br>• odd behaviour<br>• speech difficulty<br>• in coordination<br>• fits |

8.4 Some patients, particularly those with longstanding diabetes, may lose their hypo awareness, and therefore signs or symptoms may be less obvious. This is particularly relevant when assessing the elderly or patients treated with Beta-Blockers.

8.5 Patients treated with sulphonylureas are at risk of prolonged hypos. This could persist for 24 to 48 hours, especially with the added complication of renal impairment. Consider prolonged treatment with 10% glucose infusion or transfer to secondary care unit.

## 9 TREATMENT OF HYPOGLYCAEMIA

9.1 All staff please refer to Appendix A for treatment flowchart for hypoglycaemia. Enteral tube fed patients must be treated according to the moderate or severe pathway of this flowchart.

9.2 All inpatient units and MIUs should have a hypo box available to staff.

9.3 For patients in community settings, the following applies:

- for all patients with diabetes where a registered nurse or non - registered practitioner is attending for the purpose of insulin administration, a Glucagon prescription must be supplied by the GP and the Glucagon stored in the patients fridge

- this will be necessary only for the period of time that the patient requires nursing intervention. Not all patients require glucagon, i.e. if they live alone or there is no-one able to administer if needed

- all registered nurses and non - registered practitioners should carry a box of Glucotabs with them and administer 3-5 tablets if patient's blood glucose is less than 4mmol/L. Steps 1 and 2 of the treatment flowchart (Appendix A) must be followed

- enteral tube fed patients at risk of hypoglycaemia to be prescribed 2 x Glucojuice bottles

## 10. WHEN HYPOGLYCAEMIA HAS BEEN SUCCESSFULLY TREATED

10.1 After treatment is completed, replenish hypo box/community supplies with either Glucogel, Glucotabs or Glucojuice. These are available from Pharmacy. Check expiry dates of all products in box/supplies and reorder as necessary from Pharmacy.

10.2 For inpatients, complete hypo form (Appendix B). This can be found in the hypo box. A copy should be placed in medical notes and the second copy sent to The Diabetes Intermediate Care Service, Parkgate House, Taunton, TA1 3ES. For community patients, a record of the hypoglycaemia event and treatment given should be sent to The Diabetes Intermediate Care Service.

10.3 Please refer for medical review or Community Diabetes Intermediate Care Service review if hypo episode was severe, as defined on the treatment flowchart, or was a recurrent event.

10.4 Identify the cause if possible, e.g. omitted meal/snack and document in the patient's evaluation record/progress notes.

10.5 Take measures to avoid hypos in future. The Community Diabetes Intermediate Care Service can be contacted to discuss this:

- DO NOT OMIT the next insulin injection.
  If unsure of subsequent diabetes treatment discuss with the Community Diabetes Intermediate Care Service

- be aware that during the next 12-24 hours, the patient may experience higher blood glucose levels.
  DO NOT TREAT WITH STAT DOSES OF SHORT ACTING INSULIN

## 11. RECORD KEEPING

11.1 There is a statutory requirement to clearly document all events, time-lines and action taken in the patient's evaluation records/progress notes.

## 12. TRAINING REQUIREMENTS

12.1 The Trust will work towards all staff being appropriately trained in line with the organisation's Staff Mandatory Training Matrix (training needs analysis), including the Safe Use of Insulin e-learning module every 2 years.

12.2 All Somerset Partnership NHS Foundation Trust clinical staff have access to the Diabetes Intermediate Care service for advice and guidance.

## 13. EQUALITY IMPACT ASSESSMENT

All relevant persons are required to comply with this document and must demonstrate sensitivity and competence in relation to the nine protected characteristics as defined by the Equality Act 2010. In addition, the Trust has identified Learning Disabilities as an additional tenth protected characteristic If you, or any other groups, believe you are disadvantaged by anything contained in this document please contact the Equality and Diversity Lead who will then actively respond to the enquiry.

## 14. MONITORING COMPLIANCE AND EFFECTIVENESS

14.1 Overall monitoring will be by the Medicines Management Group by reviewing trends in incident reporting via DATIX.

14.2 Incidents will be reported to the Medicines Incident Group for consideration, identifying good practice, any shortfalls, action points and lessons learnt. This Group will be responsible for ensuring improvements, where necessary, are implemented.

14.3 Six monthly reporting to the Clinical Governance Group via the and Medicines Management Group. These reports will be accessible to all staff on the Trust Intranet and hyperlinked into Whatson@sompar newsletter to raise awareness.

## 15. COUNTER FRAUD

15.1 The Trust is committed to the NHS Protect Counter Fraud Policy – to reduce fraud in the NHS to a minimum, keep it at that level and put funds stolen by fraud back into patient care. Therefore, consideration has been given to the inclusion of guidance with regard to the potential for fraud and corruption to occur and what action should be taken in such circumstances during the development of this procedural document.

## 16. RELEVANT CARE QUALITY COMMISSION (CQC) REGISTRATION STANDARDS

16.1 Under the **Health and Social Care Act 2008 (Regulated Activities) Regulations 2014 (Part 3), the fundamental standards** which inform this procedural document, are set out in the following regulations:

| | |
|---|---|
| Regulation 9: | Person-centred care |
| Regulation 10: | Dignity and respect |
| Regulation 11: | Need for consent |
| Regulation 12: | Safe care and treatment |
| Regulation 13: | Safeguarding service users from abuse and improper treatment |
| Regulation 14: | Meeting nutritional and hydration needs |
| Regulation 15: | Premises and equipment |
| Regulation 16: | Receiving and acting on complaints |
| Regulation 17: | Good governance |
| Regulation 18: | Staffing |
| Regulation 19: | Fit and proper persons employed |
| Regulation 20: | Duty of candour |
| Regulation 20A: | Requirement as to display of performance assessments. |

16.2 Under the **CQC (Registration) Regulations 2009 (Part 4)** the requirements which inform this procedural document are set out in the following regulations:

| | |
|---|---|
| Regulation 16: | Notification of death of service user |
| Regulation 17: | Notification of death or unauthorised absence of a service user who is detained or liable to be detained under the Mental Health Act 1983 |
| Regulation 18: | Notification of other incidents |

16.3 Detailed guidance on meeting the requirements can be found at http://www.cqc.org.uk/sites/default/files/20150311%20Guidance%20for%20providers%20on%20meeting%20the%20regulations%20FINAL%20FOR%20PUBLISHING.pdf

**Relevant National Requirements**

NICE Quality Standards for Adults with Diabetes.

Hospital management of Hypoglycaemia in Adults with Diabetes mellitus, NHS Diabetes 2010.

## 17. REFERENCES, ACKNOWLEDGEMENTS AND ASSOCIATED DOCUMENTS

The Endocrine Society (2009). Evaluation and Management of Adult Hypoglycaemic Disorders, Journal of Clinical Endocrinology and Metabolism, 94, (3), 709-728.

http://www.medicinescomplete.com/mc/bnf/current/PHP4223-treatment-of-hypoglycaemia.htm (accessed January 2014).

Fisher BM and Frier BM (1999). Hypoglycaemia in Clinical Diabetes, Wiley Chichester.

Medicine Ethics and Practice (2008) http://www.rpsgb.org (accessed June 2010).

Turner HE and Wass JAH (2002). Oxford Handbook of Endocrinology and Diabetes, University Press Oxford.

**Cross reference to other procedural documents**

Consent and Capacity to Consent to Examination and/or Treatment Policy
Development & Management of Organisation-wide Procedural Documents Policy and Guidance
Hand Hygiene Policy
Healthcare Clinical Waste Policy
Inpatient Diabetes Medication, Prescription and Administration Record
Insulin Management Policy
Learning Development and Mandatory Training Policy
Medical Devices Policy
Medicines in Acute Emergencies Policy
Needlestick and Contamination Injury Policy
Record Keeping and Records Management Policy
Risk Management Policy and Procedure
Staff Mandatory Training Matrix (Training Needs Analysis)
Training Prospectus
Untoward Event Reporting Policy and procedure

All current policies and procedures are accessible in the policy section of the public website (on the home page, click on 'Policies and Procedures'). Trust Guidance is accessible to staff on the Trust Intranet.

## 18. APPENDICES

18.1 For the avoidance of any doubt the appendices in this policy are to constitute part of the body of this policy and shall be treated as such. This should include any relevant Clinical Audit Standards.

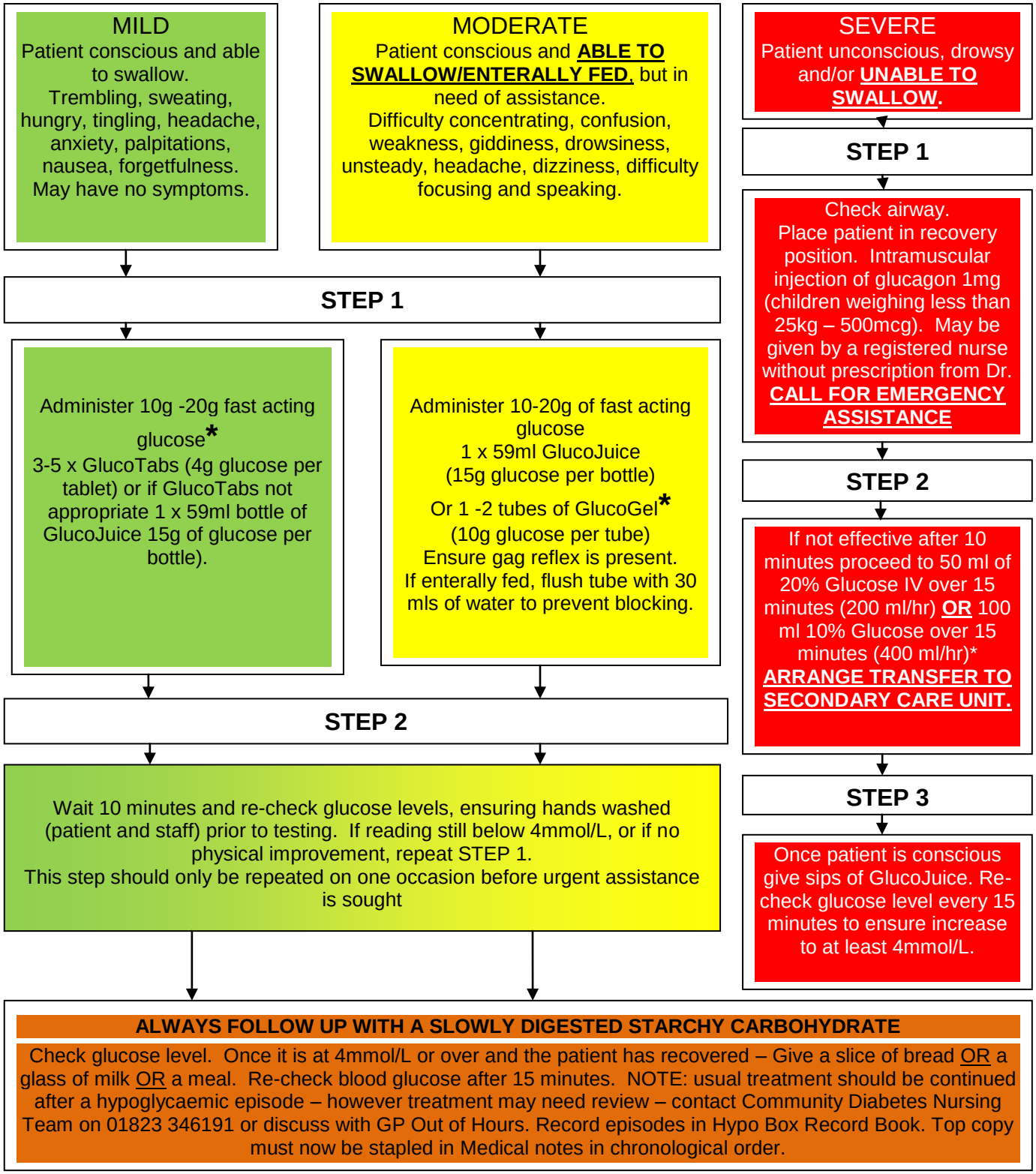
Appendix A - Treatment of Hypoglycaemia Flowchart

Appendix B - Hypo form

**APPENDIX A**

# TREATMENT OF HYPOGLYCAEMIA
# HYPO BOX: GUIDELINE FOR TREATMENT OF HYPOGLYCAEMIA IN DIABETES

Hypoglycaemia is blood glucose of less than 4mmol/L.
Check Blood Glucose prior to treatment




*http://www.medicinescomplete.com/mc/bnf/current/PHP4223-treatment-of-hypoglycaemia.htm (last accessed January 2014)

# Hypoglycaemia patient record

HYPO BOX

Please retain top copy in the patient's file, with bottom copy retained in book within Hypo Box

Patient's name _____ Patient's hospital number _____ Clinic/ward name/number _____

Name of person completing form _____ Incident date _____ Incident time _____

**Please refer to 'Treatment of Hypoglycaemia' protocol provided within the Hypo Box and record each step below.**

Blood glucose level at start of treatment _____ mmol/L

Symptoms _____

_____

STEP 1 Treatment provided _____

_____

Glucose level at step 2 _____ mmol/L after 15 minutes

STEP 2 Treatment provided _____

_____

Additional medical treatment provided _____

_____

Time of BGM over 4mmol/L _____ BGM at time of completion _____ mmol/L