Management of Non-Diabetic Hypoglycaemia

Is the peripheral blood glucose < 4.0 mmol/l

Yes [Peripheral blood glucose < 2.8 mmol/l a venous sample must be obtained as per policy (SoP for use of blood glucose meter) (Do not wait for the result before treating)]

No [Hypoglycaemia management is not appropriate. BUT consider other reasons for symptoms and review soon as blood glucose may be dropping rapidly]

Reactive Hypoglycaemia?
Malnutrition/Bowel Surgery/Enzyme/hormone deficiency/Metastatic disease/Renal/Liver failure/Hepatic disorders/ Ethanol consumption

Yes

No

Is the patient conscious and able to swallow?

Yes [Medication Exposure / Insulinoma]

No

1. Inform medical staff
2. Give 15 - 20 grams of fast acting carbohydrate
   15-20g example is one of the following:
   - 150-200 mls pure fruit juice (not suitable for renal patients due to high potassium)
   - 45-60 mls Juice style (NOT milk based) supplement Drink (e.g. Fresubin Jucy Drink, Ensure Plus Juce or Fortijuce)
   - 4 - 5 Glucotabs
   - 3 - 4 heaped teaspoons of sugar dissolved in a non-milky drink
   - 170-220 mls of Lucozade Original
   3. If the patient is Nil By Mouth
      1½ - 2 tubes of Glucose oral gel squeezed into the side of the mouth (not swallowed). Rubbing the cheek can aid absorption.
   4. Repeat peripheral blood glucose in 10 minutes.

N.B. only follow this process for 3 cycles (30-45 minutes) then seek medical review for Intravenous glucose / IM Glucagon treatment (see IV Glucose / IM Glucagon treatment box)

IV Glucose / IM Glucagon Treatment
1. Inform medical staff: CHECK ABCD/AVPU. If reduced CGS escalate as medical emergency.
2. Administer a total of 150 mls of 10% glucose IV (must be prescribed) over 15 mins via one of the following methods:
   - 50 mls of 10% glucose bolus every 5 minutes (Check blood glucose between each dose)
   Or
   - 150 mls of 10% glucose infusion over 15 minutes via infusion pump if available
   Or
3. Glucagon 1mg s.c or i.m. (must be prescribed)
   * Glucagon may be ineffective in episodes of hypo precipitated by the ingestion of alcohol

Then

4. Repeat peripheral blood glucose in 10 minutes. If no improvement CGS is reduced escalate as a medical emergency.

Is the peripheral blood glucose< 4mmol/l (See Next Page)
Is the peripheral blood glucose < 4 mmol/l?

- Yes
  - Follow up with long acting carbohydrate i.e. 2 plain biscuits or 1 slice of toast or 200-300 mls of milk (Double the amount if Glucagon used)
  - Or
  - A meal with carbohydrate if the next meal is due.
- No
  - If the patient remains unconscious or is nil by mouth obtain medical review for dextrose infusion

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**Reactive Hypoglycaemia Guidance Notes**

Continue to monitor blood glucose trend at least x 4 day and follow guideline

**Anorexia / Bariatric Surgery / Malnutrition** refer to:
- Endocrine Team
- GI consultant
- Dietitian

**Malnutrition:**
Review of diet and consider dietary changes, high protein low carb with frequent but small feeds to avoid big fluctuations in insulin secretion. High fibre and fibre supplementation recommended
Refer to dietitian

**Renal and Liver Failure**
Refer to Endocrine team and Renal / Hepatology consultant

**Metastatic Disease**
Supportive consider surgical referral if appropriate

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**Medication Exposure / Insulinoma Guidance Notes**

Continue to monitor blood glucose trend at least x 4 day and follow guideline

**Medication Exposure**
Refer to Endocrine and Psychiatry team

**Insulinoma**
Refer to Endocrine team for consideration of Diazoxide, Octreotide

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For further advice refer to Endocrine Team via Maxims
1. **Aim/Purpose of this Guideline**

1.1. This guideline is for the management of Non-Diabetic Hypoglycaemia in Adults. It has been benchmarked against national guidance, to provide detailed guidance on the clinical management in line with best practice guidelines. This guideline applies to all healthcare professionals involved in the treatment of non-diabetic hypoglycaemia.

1.2. This version supersedes any previous versions of this document.

1.3. **Data Protection Act 2018 (General Data Protection Regulation – GDPR) Legislation**

The Trust has a duty under the DPA18 to ensure that there is a valid legal basis to process personal and sensitive data. The legal basis for processing must be identified and documented before the processing begins. In many cases we may need consent; this must be explicit, informed and documented. We can't rely on Opt out, it must be Opt in.

DPA18 is applicable to all staff; this includes those working as contractors and providers of services.

For more information about your obligations under the DPA18 please see the ‘information use framework policy’, or contact the Information Governance Team rch-tr.infogov@nhs.net

2. **The Guidance**

2.1. **Hypoglycaemia**

Hypoglycaemia is a clinical syndrome when the blood glucose concentration falls below the normal fasting glucose range (<4.0)

When glucose falls below this range glucose meters are not accurate and lab serum or plasma testing is useful to confirm. Whipple’s triad should be present in cases of true hypoglycaemia.

2.2. **Causes**

- Deliberate or accidental intake of sulphonyureas, a metiglinide, or insulin
- Other medications Aspirin, Quinolones, Quinine, Haloperidol, Disopyramide, Beta adrenergic blockers, Tramadol
- Growth Hormone deficiency, adrenal insufficiency
- Malnourished individuals including Anorexia nervosa (post prandial hypoglycaemia)
- Ethanol consumption with simple carbs only
- Rare disorders like insulinoms (0.4/100,000)
- Large tumours like sarcomas, fibromas, renal cell cancers, fibrosarcomas, large liver tumours
- Islet cell hypertrophy following bariatric surgery
- Bariatric surgery
2.3. Symptoms of Hypoglycaemia
May include one or more of the following
- Sweating
- Hunger
- Pallor
- Headache
- Odd behaviour, confusion, aggression
- Weakness
- Drowsiness

2.4. Symptoms when blood glucose falls below 3.3mmol/L
Include sweating, anxiety, nausea, tremor, hunger, generalised tingling and palpitations

2.4.1. **Glucagon** and epinephrine secretion are triggered by glucose levels below 3.6mmol/L

2.4.2. Growth Hormone and cortisol secretion increase when blood glucose falls below 3.3mmol/

2.5. Symptoms when the blood glucose falls below < 2.8
Neuroglycopenic symptoms result from insufficient glucose supply to the brain despite the sympathoadrenal attempts to raise blood sugar

2.5.1. Symptoms may include blurred vision, dizziness, confusion, dysarthria and somnolence

2.5.2. At the extreme end of the spectrum, convulsions, coma and even death may occur

2.6. There are 2 main classifications for non-diabetic hypoglycaemia

2.6.1 **Reactive Hypoglycaemia**: can result in low blood glucose levels after eating. Typically occurs 2-4 hours after a meal. Causes can be:

- Malnutrition
- Bowel Surgery
- Enzyme/hormone deficiency
- Metastatic disease
- Renal/Liver failure
- Hepatic disorders
- Ethanol consumption
2.6.2 Medication Exposure / Insulinoma (pancreatic beta cell tumor): Medication such as insulin or sulphonylurea’s (e.g. Glicalzide), or a beta cell tumor in the pancreas causes additional insulin to be present. This can result in low blood glucose levels at any time.

3. Monitoring compliance and effectiveness

<table>
<thead>
<tr>
<th>Element to be monitored</th>
<th>Compliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>Consultant Endocrinologist</td>
</tr>
<tr>
<td>Tool</td>
<td>Datix</td>
</tr>
<tr>
<td>Frequency</td>
<td>Adult In-patients who are reviewed by the Endocrine Team who have required management of Non diabetic Hypoglycaemia</td>
</tr>
<tr>
<td>Reporting arrangements</td>
<td>Non-compliance will be reported to the ward /area manager. Repeated non-compliance will be reported via Datix.</td>
</tr>
<tr>
<td>Acting on recommendations and Lead(s)</td>
<td>Ward / Area managers will undertake subsequent recommendations and action planning for any or all deficiencies and recommendations within reasonable timeframes for their areas. The Endocrine Team will undertake any trust wide recommendations and action planning for any or all deficiencies and recommendations within reasonable timeframes.</td>
</tr>
<tr>
<td>Change in practice and lessons to be shared</td>
<td>Lesson learned or changes to practice will be shared with all the relevant stakeholders.</td>
</tr>
</tbody>
</table>

4. Equality and Diversity

4.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement which can be found in the 'Equality, Inclusion & Human Rights Policy' or the Equality and Diversity website.

4.2. Equality Impact Assessment
The Initial Equality Impact Assessment Screening Form is at Appendix 2.
## Appendix 1. Governance Information

<table>
<thead>
<tr>
<th>Document Title</th>
<th>Non-Diabetic Hypoglycaemia in Adults Clinical Guideline V1.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date Issued/Approved:</td>
<td>24&lt;sup&gt;th&lt;/sup&gt; December 2019</td>
</tr>
<tr>
<td>Date Valid From:</td>
<td>7&lt;sup&gt;th&lt;/sup&gt; May 2020</td>
</tr>
<tr>
<td>Date Valid To:</td>
<td>21&lt;sup&gt;st&lt;/sup&gt; April 2023</td>
</tr>
<tr>
<td>Directorate / Department responsible (author/owner):</td>
<td>Dr Tabinda Dugal, Consultant</td>
</tr>
<tr>
<td>Contact details:</td>
<td>01872 252697</td>
</tr>
<tr>
<td>Brief summary of contents</td>
<td>Treatment for Non-Diabetic hypoglycaemia in adults</td>
</tr>
<tr>
<td>Suggested Keywords:</td>
<td>Diabetes, hypoglycaemia, hypo</td>
</tr>
<tr>
<td>Target Audience</td>
<td>RCHT  CFT  KCCG</td>
</tr>
<tr>
<td>EXECUTIVE DIRECTOR RESPONSIBLE FOR POLICY:</td>
<td>Medical Director</td>
</tr>
<tr>
<td>Date revised:</td>
<td>28&lt;sup&gt;th&lt;/sup&gt; April 2020</td>
</tr>
<tr>
<td>This document replaces (exact title of previous version):</td>
<td>Non-Diabetic Hypoglycaemia in Adults Clinical Guideline V1</td>
</tr>
<tr>
<td>Approval route (names of committees)/consultation:</td>
<td>Endocrine Governance Committee</td>
</tr>
<tr>
<td>Care Group General Manager confirming approval processes</td>
<td>Sharon Matson</td>
</tr>
<tr>
<td>Name and Post Title of additional signatories</td>
<td>Not Required</td>
</tr>
<tr>
<td>Name and Signature of Care Group/Directorate Governance Lead confirming approval by specialty and care group management meetings</td>
<td>{Original Copy Signed}</td>
</tr>
<tr>
<td>Name: Becky Osborne</td>
<td></td>
</tr>
<tr>
<td>Signature of Executive Director giving approval</td>
<td>{Original Copy Signed}</td>
</tr>
<tr>
<td>Publication Location (refer to Policy on Policies – Approvals and Ratification):</td>
<td>Internet &amp; Intranet  ✓  Intranet Only</td>
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**Version Control Table**

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<th>Version No</th>
<th>Summary of Changes</th>
<th>Changes Made by (Name and Job Title)</th>
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<tr>
<td>24 December 2019</td>
<td>V1.0</td>
<td>Initial version.</td>
<td>Dr Tabinda Dugal, Consultant</td>
</tr>
<tr>
<td>28 April 2020</td>
<td>V1.1</td>
<td>Partial Update. Option for urgent medical review added to graph.</td>
<td>Amanda Veal, Clinical Nurse Specialist Diabetes</td>
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</tbody>
</table>

**All or part of this document can be released under the Freedom of Information Act 2000**

**This document is to be retained for 10 years from the date of expiry.**

**This document is only valid on the day of printing**

**Controlled Document**

This document has been created following the Royal Cornwall Hospitals NHS Trust Policy for the Development and Management of Knowledge, Procedural and Web Documents (The Policy on Policies). It should not be altered in any way without the express permission of the author or their Line Manager.
Appendix 2. Initial Equality Impact Assessment Form

<table>
<thead>
<tr>
<th>Name of the strategy / policy / proposal / service function to be assessed</th>
<th>Non-Diabetic Hypoglycaemia in Adults Clinical Guideline V1.1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Directorate and service area:</strong></td>
<td><strong>New or existing document:</strong></td>
</tr>
<tr>
<td>Medicine and ED: Endocrine</td>
<td>Existing</td>
</tr>
<tr>
<td><strong>Name of individual completing assessment:</strong></td>
<td><strong>Telephone:</strong></td>
</tr>
<tr>
<td>Amanda Veall</td>
<td>01872 253104</td>
</tr>
</tbody>
</table>

1. **Policy Aim**

*Who is the strategy / policy / proposal / service function aimed at?*

To provide detailed guidance on the clinical management of Non-Diabetic hypoglycaemia in line with best practice guidelines for all healthcare professionals working with RCH.

2. **Policy Objectives**

*To provide a consistent approach to the management of Non-Diabetic hypoglycaemia at RCH sites.*

*To maintain patient safety and improve outcomes for patients experiencing non diabetic hypoglycaemia whilst inpatients at RCH sites.*

3. **Policy – intended Outcomes**

*Consistent management of non-diabetic hypoglycaemia at RCH sites.*

*Prompt and safe management of non-diabetic hypoglycaemic episodes and follow up care.*

4. **How will you measure the outcome?**

Audit
Datix Reporting
Review of nursing/medical documentation as required

5. **Who is intended to benefit from the policy?**

All adults with diabetes who experience non diabetic hypoglycaemia in hospital at RCH sites.

6a **Who did you consult with**

<table>
<thead>
<tr>
<th>Workforce</th>
<th>Patients</th>
<th>Local groups</th>
<th>External organisations</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b. **Please identify the groups who have been consulted about this procedure.**

Endocrine Governance Committee:
Consultant Endocrinologists
Diabetes Inpatient Specialist Nurses
Diabetes Specialist Renal Nurse
Endocrine Ward Manager
Endocrine Matron

What was the outcome of the consultation? Proposed discussed and agreed

7. **The Impact**

Please complete the following table. If you are unsure/don’t know if there is a negative impact you need to repeat the consultation step.

<table>
<thead>
<tr>
<th>Equality Strands</th>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
<th>Rationale for Assessment / Existing Evidence</th>
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<tbody>
<tr>
<td>Age</td>
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<td></td>
<td>Clinical treatment is the same</td>
</tr>
<tr>
<td>Category</td>
<td>Yes</td>
<td>Clinical treatment is the same</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>-----</td>
<td>--------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex (male, female, trans-gender / gender reassignment)</td>
<td>✓</td>
<td>Clinical treatment is the same</td>
<td></td>
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</tr>
<tr>
<td>Race / Ethnic communities /groups</td>
<td>✓</td>
<td>Clinical treatment is the same</td>
<td></td>
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<tr>
<td>Disability - Learning disability, physical impairment, sensory impairment, mental health conditions and some long term health conditions.</td>
<td>✓</td>
<td>Clinical treatment is the same</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religion / other beliefs</td>
<td>✓</td>
<td>Clinical treatment is the same</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marriage and Civil partnership</td>
<td>✓</td>
<td>Clinical treatment is the same</td>
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<tr>
<td>Pregnancy and maternity</td>
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<td>Clinical treatment is the same</td>
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<td></td>
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<tr>
<td>Sexual Orientation, Bisexual, Gay, heterosexual, Lesbian</td>
<td>✓</td>
<td>Clinical treatment is the same</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

You will need to continue to a full Equality Impact Assessment if the following have been highlighted:

- You have ticked “Yes” in any column above and
- No consultation or evidence of there being consultation- this excludes any policies which have been identified as not requiring consultation. or
- Major this relates to service redesign or development

8. Please indicate if a full equality analysis is recommended.  Yes | No | ✓
9. If you are not recommending a Full Impact assessment please explain why.

Not indicated

<table>
<thead>
<tr>
<th>Date of completion and submission</th>
<th>28/04/2020</th>
<th>Members approving screening assessment</th>
<th>Policy Review Group (PRG)</th>
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<tr>
<td></td>
<td></td>
<td></td>
<td>APPROVED</td>
</tr>
</tbody>
</table>

This EIA will not be uploaded to the Trust website without the approval of the Policy Review Group.

A summary of the results will be published on the Trust’s web site.