# Trust Standard Operating Procedure

## Setting up and maintaining an intravenous insulin infusion

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<tr>
<th>Issue Date</th>
<th>Review Date</th>
<th>Version</th>
</tr>
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<tbody>
<tr>
<td>September 2019</td>
<td>September 2024</td>
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## Purpose

To instruct staff on how to correctly set up the appropriate intravenous (IV) insulin infusion to ensure the safe and effective management for those patients with known diabetes or those patients who require IV insulin during their hospital admission.

## Who should read this document?

Applies to all staff who prescribe or administer IV insulin infusions.

## Key Messages

Staff working for or on behalf of University Hospitals Plymouth NHS Trust who prepare and administer IV insulin infusions must do so in accordance with this SOP.

Staff must ensure they are using the current versions of protocols as found in the Trust Document Library.

## Core accountabilities

- **Owner**: Sally Read, Diabetes Inpatient Specialist Nurse
- **Review**: Diabetes MDT
- **Ratification**: Elizabeth Moore, Diabetes Service Line Director
- **Dissemination (Raising Awareness)**: Peter Gray, Pharmacist
- **Compliance**: Safe Use of Insulin Steering Group

## Links to other policies and procedures

- Diabetes/1031 – **VRIII Protocol 2018**
- Diabetes/1176 – [Diabetes and Endocrinology Adults with HHS](#)
- Diabetes/1351 – [Diabetes and Endocrinology FRIII DKA](#)
- Diabetes/1142 - [Management of blood glucose for pregnant women with unstable diabetes](#)
- Diabetes/1730 - [Management of blood sugars for women with diabetes in labour](#)
- Management of hyperglycaemia in acute coronary syndrome (ACS) – [Acute Coronary Syndrome](#)
- Emergency treatment of severe hyperkalaemia - [UHPT Clinical Guidelines/Renal/E-LINK - Hyperkalaemia](#)
- UHPT Trust Documents/Medicines Management Policy

## Version History
Changes:
- Update to current SOP template
- Change of Review, Approval, & Ratification from Medicines Utilisation and Assurance Committee to Safe Use of Insulin Steering Group
- Updates to other policies and procedures list including web links
- Removal of option to use Humulin S insulin

The Trust is committed to creating a fully inclusive and accessible service. Making equality and diversity an integral part of the business will enable us to enhance the services we deliver and better meet the needs of patients and staff. We will treat people with dignity and respect, promote equality and diversity and eliminate all forms of discrimination, regardless of (but not limited to) age, disability, gender reassignment, race, religion or belief, sex, sexual orientation, marriage/civil partnership and pregnancy/maternity.

An electronic version of this document is available on Trust Documents. Larger text, Braille and Audio versions can be made available upon request.

Standard Operating Procedures are designed to promote consistency in delivery, to the required quality standards, across the Trust. They should be regarded as a key element of the training provision for staff to help them to deliver their roles and responsibilities.

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Standard Operating Procedure (SOP)
Setting up and maintaining an intravenous insulin infusion

1 Introduction

This policy applies to all employees of University Hospitals Plymouth NHS Trust (UHPNT) including bank staff and agency staff working in the Trust; it also covers members of staff who are not directly employed by the Trust but who act in a professional capacity within the Trust through a service level agreement or honorary contract.

All NHS contractors registered with the Trust should also be compliant with this policy.

This policy is a supplement to the Trust Medicines Management Policy and is to be read in conjunction with that policy.

This document will refer to other UHPNT policies and protocols for specific areas and is intended to cover the additional practical issues relating to IV insulin infusions.

2 Definitions

IV – intravenous
VRIII – variable rate intravenous insulin infusion
HHS – hyperosmolar hyperglycaemic syndrome
FRIII – fixed rate intravenous insulin infusion
DKA – diabetic ketoacidosis
ACS – acute coronary syndrome
DSN – diabetes specialist nurse

3 Regulatory Background

Not applicable

4 Key Duties

The aim of this document is to ensure that:

- Staff are aware of the various protocols for use of intravenous insulin whilst on adult inpatient wards
- The correct equipment is used to set up Intravenous insulin infusions
- Appropriate monitoring is carried out in accordance with individual protocols
- Intravenous insulin infusions are commenced both correctly and safely
- Intravenous insulin infusions are stopped both correctly and safely
5 Procedures to follow

The following current UHPNT IV insulin prescription and monitoring forms should be used:

Diabetes/1031 – VRIII Protocol 2018
Diabetes/1176 – Diabetes and Endocrinology Adults with HHS
Diabetes/1351 – Diabetes and Endocrinology FRIII DKA
Diabetes/1142 - Management of blood glucose for pregnant women with unstable diabetes
Diabetes/1730 - Management of blood sugars for women with diabetes in labour

Management of hyperglycaemia in acute coronary syndrome (ACS) – Acute Coronary Syndrome

Emergency treatment of severe hyperkalaemia - UHPT Clinical Guidelines/Renal/E-LINK - Hyperkalaemia

UHPT Trust Documents/Medicines Management Policy

Please note that this list is not inclusive of every clinical situation in which an IV insulin infusion is used.

The indication for IV insulin infusion will be determined by the responsible clinician.

Also note that Cardiothoracic and General Intensive Care areas work on an individual patient basis under the guidance of the ICU Consultants regarding IV insulin infusions.

Main step 1 - Essential requirements before you start

- Patient to be cannulated with a clave connector attached to the cannula
- Documentation of cannula as per hospital policy
- Insulin chart signed by Prescriber
- IV fluids prescribed as per protocol or based on clinical needs
- Appropriate protocol has been selected and prescribed
Main step 2 - Equipment you will need

• Volumetric pump (Baxter Colleague is most widely available in the Trust)
• 50ml Syringe pump (Alaris GH is most widely available in the Trust)
• ALARIS giving set ~ with anti-syphon, anti-reflux, and ‘Y’ connection
• BAXTER IV fluid giving set
• IV fluids as specified in relevant protocol
• 50ml Luer Lok syringe with 49.5ml Normal Saline added
• 50 units short-acting insulin (ACTRAPID) drawn up using an insulin safety syringe.
• Additive label

Main step 3 - Documentation

• Check medication with another registered healthcare professional
• Complete and sign additive label, prescription chart and IV insulin chart

Main step 4 - Setting up the IV insulin infusion

• Prime all lines and date as per hospital policy
• Attach equipment to the pumps
• Attach IV fluid line to the ‘Y’ connector
• Attach the line to the patient’s cannula
• Commence infusions at the prescribed rates

Main step 5 - Management of the IV insulin infusion

Advice is printed on the insulin charts regarding:

• Continuation of basal insulin
• Stopping all rapid acting and mixed insulins, as well as non-insulin diabetes medication
• Change of IV fluids according to blood glucose result
• Frequency of blood glucose testing and ketone testing
• Requirement for regular urea, electrolyte, and pH values as per protocols
• Stopping IV insulin infusion and converting back to usual medication
NB: If appropriate glycaemic control is not achieved with the initial prescription then the responsible Prescriber should amend the rate in the space provided on the IV insulin prescription chart or seek the advice of the diabetes specialist team.

**IMPORTANT MANAGEMENT CONSIDERATIONS:**

- IV insulin without appropriate IV fluids will increase the risk of hypoglycaemia
- IV fluid without appropriate IV insulin will increase the risk of hyperglycaemia
- In patients with Type 1 diabetes there will be a high risk of DKA if basal insulin is omitted as well as IV insulin

### 6 Document Ratification Process

The design and process of review and revision of this procedural document will comply with The Development and Management of Formal Documents.

The review period for this document is set as default of five years from the date it was last ratified, or earlier if developments within or external to the Trust indicate the need for a significant revision to the procedures described.

This document will be reviewed by the Diabetes MDT and Safe Use of Insulin Steering Group and ratified by the Service Line Director.

Non-significant amendments to this document may be made, under delegated authority from the Service Line Director, by the nominated author. These must be ratified by the Lead DSN and should be reported, retrospectively, to the Diabetes MDT and Safe Use of Insulin Steering Group.

Significant reviews and revisions to this document will include a consultation with named groups, or grades across the Trust. For non-significant amendments, informal consultation will be restricted to named groups, or grades who are directly affected by the proposed changes.

### 7 Dissemination and Implementation

Following approval and ratification, this procedural document will be published in the Trust’s formal documents library and all staff will be notified through the Trust’s normal notification process, currently the ‘Vital Signs’ electronic newsletter.

Document control arrangements will be in accordance with The Development and Management of Formal Documents.

The document author(s) will be responsible for agreeing the training requirements associated with the newly ratified document with the Service Line Director and for working with the Trust’s training function, if required, to arrange for the required training to be delivered.

### 8 Monitoring and Assurance

Overall monitoring will be by the Safe Use of Insulin Steering Group and by reviewing trends in incident reporting via DATIX reports.

Incidents involving iv insulin will be reported to the Safe Use of Insulin Steering Group for consideration, identifying any shortfalls, action points and lessons learnt.
This Group will be responsible for ensuring improvements, where necessary, are implemented.

Monthly reporting to the Matrons, Ward Managers, and Quality Manager. These reports will be fed back to staff in the relevant areas via Safety Brief.

Quarterly reporting of incident themes are also made to the Safe Use of Insulin Steering Group identifying areas of concern and areas that need additional training &/or support.

9 | Reference Material

Diabetes UK

Joint British Diabetes Society
### Dissemination Plan

<table>
<thead>
<tr>
<th>Document Title</th>
<th>Setting up and maintaining an intravenous insulin infusion</th>
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<td>Date Finalised</td>
<td>03/09/2019</td>
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**Previous Documents**

| Action to retrieve old copies | Trust Document drive to be updated |

### Dissemination Plan

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<th>How</th>
<th>Responsibility</th>
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<td>All Trust staff</td>
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<td>Information Governance Team</td>
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### Review Checklist

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<td>Is it clear whether the document is a policy, procedure, protocol, framework, APN or SOP?</td>
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<td>Rationale</td>
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<td>Are supporting documents referenced?</td>
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<td>If appropriate have the joint Human Resources/staff side committee (or equivalent) approved the document?</td>
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<td>Does the document identify which Executive Director will ratify it?</td>
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<td>Dissemination &amp; Implementation</td>
<td>Is there an outline/plan to identify how this will be done?</td>
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<td>Does the plan include the necessary training/support to ensure compliance?</td>
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<td>Does the document identify where it will be held?</td>
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<td>Are there measurable standards or KPIs to support the monitoring of compliance with and effectiveness of the document?</td>
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