Trust Standard Operating Procedure

University Hospitals Plymouth NHS Trust

Setting up and maintaining an intravenous insulin infusion

Issue Date	Review Date	Version
September 2019	September 2024	3

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

1 **2** **3**	December 2012 August 2016 August 2019	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.

Section	Description	Page
1	Introduction	3
2	Definitions	3
3	Regulatory Background	3
4	Key Duties	3
5	Procedures to Follow	4
6	Document Ratification Process	6
7	Dissemination and Implementation	6
8	Monitoring and Assurance	6
9	Reference Material	7
10	Appendix 1 – Dissemination Plan and Review Checklist	8

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 and Review Checklist | Appendix 1

Dissemination Plan	
Document Title	Setting up and maintaining an intravenous insulin infusion
Date Finalised	03/09/2019
Previous Documents	
Action to retrieve old copies	Trust Document drive to be updated

Dissemination Plan

Recipient(s)	When	How	Responsibility
All Trust staff	Immediately	Vital Signs	Information Governance Team

Review Checklist		
Title	Is the title clear and unambiguous?	Yes
	Is it clear whether the document is a policy, procedure, protocol, framework, APN or SOP?	Yes
	Does the style & format comply?	Yes
Rationale	Are reasons for development of the document stated?	Yes
Development Process	Is the method described in brief?	Yes
	Are people involved in the development identified?	Yes
	Has a reasonable attempt has been made to ensure relevant expertise has been used?	Yes
	Is there evidence of consultation with stakeholders and users?	Yes
Content	Is the objective of the document clear?	Yes
	Is the target population clear and unambiguous?	Yes
	Are the intended outcomes described?	Yes
	Are the statements clear and unambiguous?	Yes
Evidence Base	Is the type of evidence to support the document identified explicitly?	Yes
	Are key references cited and in full?	Yes
	Are supporting documents referenced?	Yes
Approval	Does the document identify which committee/group will review it?	Yes
	If appropriate have the joint Human Resources/staff side committee (or equivalent) approved the document?	Yes
	Does the document identify which Executive Director will ratify it?	Yes
Dissemination & Implementation	Is there an outline/plan to identify how this will be done?	Yes
	Does the plan include the necessary training/support to ensure compliance?	Yes
Document Control	Does the document identify where it will be held?	Yes
	Have archiving arrangements for superseded documents been addressed?	Yes
Monitoring Compliance & Effectiveness	Are there measurable standards or KPIs to support the monitoring of compliance with and effectiveness of the document?	Yes
	Is there a plan to review or audit compliance with the document?	Yes
Review Date	Is the review date identified?	Yes
	Is the frequency of review identified? If so is it acceptable?	Yes
Overall Responsibility	Is it clear who will be responsible for co-ordinating the dissemination, implementation and review of the document?	Yes