

Document Control

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Getting insulin right Standard Operating Procedure			
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1. Background

Insulin is a high risk medication, with multiple possibilities to cause error. Between 2003 and 2009 the National Reporting and Learning System received 16600 patient safety incidents involving insulin, including 6 deaths. The National Diabetes Inpatient Audit in 2017 showed 40% of type 1 diabetes patients suffered some sort of insulin error as an inpatient. Insulin errors carry high risks for the patient as well as organisational risks in terms of bed days and delayed discharges. Because of this, a great deal of work has been put into minimising risks of errors with insulin as a result.

In addition to this, there have been several patient safety alerts relating to insulin and associated never events. These include the 2016 patient safety alert [Risk of severe harm and death due to withdrawing insulin from pen devices](#), the inclusion of withdrawing insulin from insulin pens as a never event and the 2020 publication of the MHRA advice for healthcare professionals [Insulins \(all types\): risk of cutaneous amyloidosis at injection site](#).

2. Purpose

2.1. The Standard Operating Procedure (SOP) has been written to:

- Describe the procedure for the prescribing and delivery of insulin therapy to inpatients
- Improve patient care and reduce the risks associated with insulin errors

3. Scope

3.1. This Standard Operating Procedure (SOP) relates to the following staff groups who may be involved in the assessment and delivery of insulin on the wards:

- Registered practitioners
- Year three student nurses and student midwives, according to current competencies
- Trainee nursing associates in final six months of training, according to current competencies

4. Location

4.1. This Standard Operating Procedure getting insulin right can be implemented in all inpatient areas

4.2. Staff undertaking this procedure must be able to demonstrate continued competence as per the organisations policy on assessing and maintaining competence.

5. Equipment

- Insulin syringes (for the administration of insulin from insulin vials)
- Insulin pens and cartridges, according to individual patient requirements for insulin administration

6. Procedure

6.1. Medicines reconciliation

- Follow [Medicines Reconciliation Standard Operating Procedure](#)
- Confirm dose of insulin prior to admission with patient/carer, diabetes nurse records, recent discharges, insulin passport as per medicines reconciliation standard operating procedure
- Prescriber to review and decide if this dose is still appropriate, document in patient record any changes to be made and rationale

6.2. Prescribing

- Insulin should be prescribed in the specific insulin section of the drug chart, and a notation placed in the regular medication section to highlight this.

- Only insulin should be prescribed in the insulin section, all other antidiabetic medication, including other injectables, must be prescribed in the main chart
- Many insulin preparations have similar names. Ensure that prescriptions are clear and precise
- Always prescribe insulin by Brand and write the full name of the insulin
- Insulin now comes in multiple strengths and dose **must** be prescribed in UNITS
- Never abbreviate Units, always write the word in full to avoid unintentional overdoses
- Review insulin doses on a regular basis according to clinical need
- When changing a patient's insulin requirement, generally alter one prescription at a time by approximately 10% of the dose. Seek advice if unsure

THE PATIENT
123 456 7899
Affix patient label

**SUBCUTANEOUS INSULIN PRESCRIPTION CHART
+ BLOOD GLUCOSE MONITORING**
Adult inpatient Prescription chart for sub-cutaneous insulin

Ward: M44 Consultant: T. BOSS

Remember to prescribe "insulin" on the main prescription chart. Give before meals.

Insulin (approved name)				S/C	Date	Tick if self administering
Admission dose	1st change	2nd change	3rd change	Date		
H U M U L I N						
Date	Units	Date	Units	Date	Units	
20	18					Breakfast
14	14					Lunch
						Even meal
						Bed
Sig & GMC	Sig & GMC	Sig & GMC	Sig & GMC			Pharmacy
A 0.1/100	B 0.2/100					
U/L/100	M/L 12.5/100					
Insulin (approved name)				S/C	Date	
Admission	1st change	2nd change	3rd change	Date		

- Be aware of the effect on blood sugars of other medicines and conditions e.g. steroids and follow relevant available guidelines
- Care should be taken when rewriting drug charts that insulin is transcribed correctly
- All patients prescribed insulin should be referred to the diabetes specialist nurse team. This is the responsibility of the registered nurse looking after the patient
- For patients with insulin pumps please refer to [Insulin Pumps \(Continuous Subcutaneous Insulin Infusion \[CSII\]\); Guideline for supporting adults with diabetes to self-manage during hospital admission on BOB](#)

6.3. Supply

- Does the patient have their own insulin that can be used for administration?
- Each ward has a specific stock of insulin vials, approved by the diabetes specialist nurse team and pharmacy
- Insulin administered by the ward staff can be given from stock vials – please see the risk assessment; Risk of contamination from use of multidose vials of insulin, RR ID4868.
- Within pharmacy opening hours, insulin can be ordered on a named patient basis for self-injecting patients by the medicines management team and will be prioritized as a high risk medicine
- Vials will only be issued for named patients for discharge and/or where infection control measures require this
- Orders must state the **form** of insulin required; vial, cartridge or disposable pen device
- Outside of pharmacy opening hours if non-stock insulin is required it can be obtained from another ward.
- Where the required insulin is not available conversion to an available alternative should be used, see appendix 1. Insulin must **never** be omitted unless explicitly requested/documentated by the Diabetes Nurse Specialist, Consultant or Senior Doctor
- If a suitable conversion cannot be made or the patient is on a concentrated formulation/insulin pump contact the oncall pharmacist out of hours via bleep 500

6.4. Storage

- Insulin for named patients will be issued as single items and can be kept at room temperature in the patients locker
- Insulin for named patients will have a specific expiry date on the box. Discard according to this direction
- Stock insulin will be kept in the fridge or as per manufacturers specifications

6.5. Administration

- Blood sugars must be checked before administering any diabetes medication and prescriptions must be clear and unambiguous – any concerns must be immediately escalated to the medical team
- Where appropriate it is always preferable for the patient to self-administer insulin, please refer to the [Self-Administration of Medication, Standard Operating Procedure](#), via BOB intranet policy section
- Where patients cannot self-administer insulin type and dose should be checked with them if possible
- Practitioners should follow the injectable medicines policy and associated SOPs referenced below
- If the practitioner is unfamiliar with the device it should not be used
- All insulin doses should be measured and administered with an insulin syringe or pen device only
- Never extract insulin from an insulin cartridge or a prefilled pen device
- When staff are using a pen device a Trust safety needle must be used, not the patients' own needle. If using a vial, draw up required dose using an insulin needle
- If using a device, prime as necessary and dial up dose as per device instructions
- The main injection sites are the stomach, sides of thighs and buttocks
- Ensure area is clean and dry before injection
- When delivering insulin using an insulin syringe the injection must be inserted into a lifted skin fold Insert the needle at a 90 degree angle and depress plunger/activate device
- Count to 10 slowly before removing needle
- Dispose of needle in sharps bin as normal
- Injection sites should be rotated following a recommended rotation scheme and recorded to reduce risk of cutaneous amyloidosis and other skin reactions (MHRA safety update 2020)
- Always seek support from the Diabetes team if you are unsure about any aspect of diabetes care

6.6. Monitoring

- Capillary blood glucose (CBG) monitoring should always be related to the individual patient condition, but as a guide:

Regime	Frequency of blood sugars
Basal only with oral glucose lowering therapy	Twice daily, at fasting and one at different time
Biphasic insulin	Twice daily at different times
Basal bolus	Four times a day

- Monitor more frequently if CBG persistently >11 mmol/L and aiming for ideal glycaemic target
- Monitor more frequently if patients are experiencing recurrent hypoglycaemia
- Frequency of monitoring for patients with relaxed glycaemic target can be reduced if directed and documented by the diabetes specialist nurse team or under the advice of an endocrinology consultant

6.7. Discharge

- If prescribing on Trakcare, ensure correct preparation is selected
- Ensure insulin dose is prescribed in units and this has been selected on Trakcare
- Changes made to diabetes care are communicated to the patient, GP and where applicable, care home, via the discharge summary to ensure continuity
- Ensure patients receive detailed discharge counselling especially on altered doses to ensure no errors are introduced on discharge
- If the patient and/or carer are not able to self-manage insulin injections, the ward registered nurse is responsible for this referral to the community nursing team
- If community nursing care is required the discharging prescriber is responsible for completing community authority to administer (PMAR) chart to accompany the patient
- Where possible the community authority to administer should also be checked by the ward pharmacist
- The diabetes team must be informed of all discharges of patients on insulin
- Follow the insulin treated patients discharge check list in appendix 2

6.8. Complications

- [Hypoglycaemia in Adults with Diabetes Mellitus - Hospital Management Guidelines](#)
- [Diabetic ketoacidosis in MAU, ICU or ED](#)
- [Hyperosmolar Hyperglycaemic State \(HHS\) in MAU, ICU or ED](#)
- [Hyperglycaemia and Steroid \(Glucocorticoid\) Therapy in Adults](#)
- [Hyperglycaemia in Acute \(Adult\) Inpatients Requiring Enteral Feeding Guidelines](#)
- [Hyperglycaemia in acute \(adult\) inpatients requiring Parenteral Nutrition \(PN\) Guidelines](#)
- Variable rate intravenous insulin infusions (VRIII) in medical patients
- [Peri-operative Guidelines for the Management of Patients with Diabetes](#)
- [Diabetes foot care pathway for North Devon](#)
- [Diabetes in End of life care](#)

7. References

- Insulins (all types): risk of cutaneous amyloidosis at injection site MHRA 23 September 2020 <https://www.gov.uk/drug-safety-update/insulins-all-types-risk-of-cutaneous-amyloidosis-at-injection-site>
- Insulin safety presentation. TREND diabetes. June 2020
- A good inpatient diabetes service, JBDS, July 2019
- Risk of severe harm and death due to withdrawing insulin from pen devices, November 2016, NHS improvement
- NDDH insulin safety poster

8. Associated Documentation

- Trust [Medicines Policy](#) and Associated Standard Operating Procedures
- Injectable Medicines Policy (Prescribing, Preparing and Administering Injectable Medicines Policy)
- Administering Injectable Medicines Standard Operating Procedure
- [Insulin Pumps \(Continuous Subcutaneous Insulin Infusion \[CSII\]\); Guideline for supporting adults with diabetes to self-manage during hospital admission](#)

APPENDIX 1 – ALTERNATIVE INSULIN AND STOCK LOCATIONS

The majority of patients with diabetes are treated using a small number of insulin preparations

- Patients admitted as emergencies to in-patient sites, may not have their prescribed insulin with them
- To facilitate safe insulin use, the following advice is provided**
- Patients bringing their own supply, and who are able to administer their own insulin, should do so
 - **Patients who do not bring their own insulin, or who cannot administer their own insulin, should have insulin from the ward stock, you do not need to order a named vial of insulin**
 - Do not delay insulin administration

Duration	Patient's usual insulin	Alternative ward stock insulin	Device	Ward stock location
Rapid Acting (with meals)	Novorapid Humalog Apidra	Novorapid	Vial	MAU Lundy Tarka Resp Victoria Staples
Short acting (with meals)	Actrapid Humulin S Insuman Rapid	Actrapid	Vial	All wards
Mixtures (Biphasic) (with meals)	Novomix 30 Humalog Mix 25 Humalog Mix 50 Humulin M3 Insuman Comb 25 Insuman Comb 50	Humulin M3	Vial	MAU Lundy Tarka Resp Victoria Staples
Intermediate	Insulatard Humulin I Insuman Basal	Humulin I	Vial	MAU Lundy Tarka Resp Victoria Staples
Long Acting	Detemir (Levemir) Lantus (Glargine) Abasaglar	Lantus (Glargine)	Vial	MAU Lundy Tarka Resp Victoria Staples

The appropriate ward stock insulin can be prescribed and substituted on a unit-for-unit basis with the patient's usual insulin, until this can be supplied by pharmacy or the patient can self-administer their own insulin.

When giving Lantus (Glargine) and Novorapid as alternative insulin's, monitor blood glucose levels closely. This must be at least before each meal, before bed and two hours after each insulin dose is administered. Adjust insulin doses according to blood glucose levels. Increase frequency of blood glucose monitoring if there is evidence of hypoglycaemia. Obtain the patient's regular insulin in the correct administration device as soon as possible, and alter the prescription accordingly.

For patients who are on non-human insulin preparations, it is acceptable to receive human insulin as a suitable alternative on a unit-for-unit basis with close monitoring of capillary blood glucose.

APPENDIX 2 INSULIN TREATED PATIENTS DISCHARGE CHECKLIST

All patients should have the following	
	Appropriate formulation of insulin supplied in line with patient's needs and discharge plan must be provided
	Provision of a 14 day supply of insulin syringes/pen devices/cartridges/vials
	Blood glucose meter and/or ketone meter, strips and lancets as needed
	Sharps bin
	Insulin passport/insulin safety card

	Patient information leaflets
	Contact number of DSN involved in patient's care during the inpatient stay

Community nursing input required	
	Referral to Community Nursing team with clearly defined and specified level of support required documented
	Copy of discharge summary to community team
	Early referral to the diabetes specialist team to resolve any equipment issues
	Community authority to administer (PMAR) chart completed and signed by prescriber

APPENDIX 3 – EXPLANATION OF TERMS

Medicines reconciliation	The process of identifying an accurate list of a person's current medicines and comparing them with the current list in use, recognising any discrepancies, and documenting any changes, thereby resulting in a complete list of medicines, accurately communicated.
Basal	The role of basal insulin, also known as background insulin, is to keep blood glucose levels at consistent levels during periods of

	fasting. When fasting, the body steadily releases glucose into the blood to our cells supplied with energy.
Basal bolus	A basal-bolus routine involves taking a longer acting form of insulin to keep blood glucose levels stable through periods of fasting and separate injections of shorter acting insulin to prevent rises in blood glucose levels resulting from meals.
Biphasic insulin	Biphasic insulins are a mixture of a short- or rapid-acting insulin with an intermediate-acting insulin. These preparations can be used to cover mealtime and basal insulin requirements, and are often used twice a day
Human insulin	Human insulin is synthesised in a lab and mimics the insulin in humans. It comes as three forms – short acting (regular) and Intermediate acting (NPH) and Premixed insulin (a fixed mixture of the other two types)
Analogue	Analog insulin is synthetic human insulin which has been genetically modified to allow more rapid uptake or more uniform uptake by the body. It comes as rapid acting, long acting and premixed insulin
Animal	Animal insulin is derived from pigs (Porcine) or cows (Bovine) and has largely been replaced by human insulin, although it is still used in some patients. It comes in four types - short, intermediate and long acting and premixed insulin
Hypoglycaemia	Low blood glucose
Capillary blood glucose (CBG)	The level of circulating blood glucose as measured by glucometer analysis of a finger prick sample