

DIABETES MANAGEMENT & INSULIN ADMINISTRATION - CHW

PRACTICE GUIDELINE[®]

DOCUMENT SUMMARY/KEY POINTS

- This document is solely written for the Management of type 1 diabetes.
- Mandatory adherence to the NSW Health directives on Sharps Injury Protection and the *Infection Control Policy*.
- Mandatory adherence to correct sharps disposal as per Section 3 of the NSW Health Infection Control policy.
- Insulin can be kept at room temperature whilst in use, the date must be entered on the label and it must be used within 30 days of opening. Store in a cool place away from direct light.
- An Insulin cartridge in use must have a patient ID label attached. All other Insulin cartridges are to remain in the ward/unit refrigerator.
- Insulin kept in the refrigerator is best removed 30 minutes before administration as cold insulin will sting.
- Glargine (Lantus™) is a clear long acting insulin which cannot be mixed with any other insulin due to its acidity and therefore needs to be given in a separate syringe.
- Detemir (Levemir™) is also best administered separately.
- Insulin Pen Devices are to be used by patients, parents or relatives of patients under Nursing Supervision and/or under the direction of the Diabetes Team
- Insulin Pen Needles are available from Stores, in 4 mm length. All needles should enter the sub cutaneous tissue at a 90° angle.
- It is important to rotate insulin injection sites, using both the abdomen and or the buttocks

This document reflects what is currently regarded as safe practice. However, as in any clinical situation, there may be factors which cannot be covered by a single set of guidelines. This document does not replace the need for the application of clinical judgement to each individual presentation.

Approved by:	SCHN Policy Procedure & Guideline Committee	
Date Effective:	1 st November 2014	Review Period: 3 years
Team Leader:	Manager Diabetes Clinical Services	Area/Dept: Endocrinology

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This Guideline may be varied, withdrawn or replaced at any time.

CHANGE SUMMARY

- Document due for mandatory review.
- New Insulin delivery devices and glucose meters.

READ ACKNOWLEDGEMENT

- All medical and nursing staff caring for children with type 1 diabetes should read and acknowledge they understand the contents of this document.
- In-services are available for nursing education on skills required to use the new insulin delivery devices and glucose meters. Contact the Diabetes & Endocrinology Department (ext 53169)

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1 Blood Glucose Monitoring

Introduction

Blood glucose levels (BGL) using the finger prick method are measured using the Freestyle Optium H glucose meter (<http://www.diabetesnow.co.uk/products/optium.asp>) This meter can also be used to measure blood ketones.



Equipment

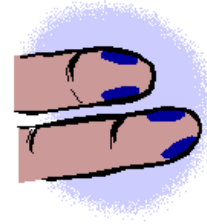
- Blood letting device – Haemolance Plus™ (available from stores) Neonatal size (Baby Pink) or Paediatric size (Baby Blue).
- Freestyle Optium H blood glucose meter
- Freestyle Optium H glucose strips
- Cotton balls
- Gloves

1.1 Procedure

1. Explain procedure to child.
2. Set up equipment.
3. Wash hands.
4. Have child wash hands in warm water and dry thoroughly.
5. Insert the blood glucose strip with the 3 black lines facing up and push the strip into the insertion slot. (This is shaded yellow on the meter and this turns the machine on). Check that the 5 digit LOT number on screen coincides with the number on the calibration bar.
6. Put on gloves. (An apron made from impervious material must be worn where there is a likelihood of splashes or contamination with blood or other body substance and goggles

must be worn while performing any procedure where there is a likelihood of splashing or splattering of blood or other body substances.)

7. Using a bloodletting device, pierce area along the side of the finger. Avoid the pad of the finger and the tip. Rotate finger usage – as area will harden with repeated use.
8. Squeeze the finger to obtain an adequate drop of blood. (The Freestyle Optium H strip (blue strip) will only require 0.6microlitre of capillary blood rather than 2.5microlitre.)
9. Touch the blood drop to the white target area at the tip of the strip.
10. The meter will then count down, note the BGL as it appears on display screen.
11. Remove blood glucose strip from the meter and discard into contaminated waste bin.
12. Discard the bloodletting device in sharps container.
13. Record on chart (MRN29A). Date, time and BGL.



1.2 Calibration Procedure

Calibration should be performed each time a new box of blood glucose strips is opened.

1. Remove the calibration bar from the box of strips.
2. Check that the 5 digit lot number matches on the following;
 - A. The calibration bar
 - B. Each glucose strip
3. Insert the calibration bar into the insertion slot.
4. The sensor turns on automatically and will show the 5 digit LOT number
5. Calibration is complete.
6. Turn off, remove calibration bar and keep it in the meter station on ward or unit. Only discard calibration bar when strip box is empty

1.3 Ward Meter Quality Control Report

Optium Quality Control Solutions

- The Freestyle Optium H blood glucose meter is kept in a meter station in the Wards and Unit areas and must be checked daily using the High and Low Optium Control solutions.
- Insert a blood glucose strip into the meter. Meter will switch on. Press middle button on the meter to indicate a control test is being done (control bottle icon will appear on meter screen).
- Apply one drop on the strip, same procedure as for testing BGLs.
- Once a control solution bottle has been opened, the date should be written on the bottle and the bottle discarded after 3 months of opening.

- Record the results of the High and Low readings in the QA book available in the meter station, making sure Freestyle Optium H readings are within the ideal ranges which is available in the product leaflet inside each strip box.
- In the event that the High and Low results are out of the recommended ranges then recalibrate with the calibration bar and then re-test again.
- If the testing results remain out of the recommended ranges then open a new batch of strips and test. Following that, if the meter results are still out of range then send the meter to Biomedical engineering for review.

Ward Meter Quality Control

- Biochemistry, in conjunction with all Wards and Units that use meters, perform monthly quality control assessments determining the accuracy of all blood glucose meters distributed in the hospital.

2 Blood Ketone Monitoring

Introduction

The Freestyle Optium H blood glucose meter has a feature to test for Beta Hydroxybutrate (ketone test) from capillary blood. The clinical purpose for this method is detect and monitor suspected or actual Diabetic Ketoacidosis (DKA) in the setting of a child with diabetes being unwell or hyperglycaemic.

This method of testing is the gold standard for the clinical assessment of ketosis and is a much more reliable tool than ketone urine testing.

Equipment

- Blood letting device – Haemolance Plus™ (available from stores) neonatal or paediatric size
- Freestyle Optium H blood glucose meter
- Ketone Strips
- Cotton balls
- Gloves

2.1 Procedure

1. Explain procedure to child.
2. Set up equipment.
3. Wash hands.
4. Have child wash hands in warm water and dry thoroughly.
5. Insert the calibration bar into the meter. Check that the LOT number on screen coincides with number on calibration bar. When checked, remove.
6. Insert Ketone strip into the meter.

7. Put on gloves.
8. Using a bloodletting device, pierce area along the side of the finger (as per picture page 5). Avoid the pad of the finger and the tip. Rotate finger usage as areas likely to harden with repeated use.
9. Squeeze the finger to obtain an adequate drop of blood.
10. Touch the blood drop to the white target area at the tip of the test strip. The blood is drawn into the strip. The sensor display will give you a blood ketone reading in 10 seconds.
11. Remove strip from meter and discard into contaminated waste bin.
12. Discard bloodletting device in sharps container.
13. Record on patient's BGL chart, the date, time and ketone level. Contact Endocrine Registrar if ketones are > 0.6 mmol/L.

2.2 Interpretation of Results

The ketone results will show:

- **0.0 mmol/L (Negative Ketones)**
- **0.1 – 0.6 mmol/L SMALL**
- **0.7 – 1.5 mmol/L MODERATE**
- **Greater than & equal to 1.5 mmol/L LARGE**

2.3 Calibration

Calibration should be performed each time a new box of ketone strips is opened.

- Remove the calibrator strip from the box of strips.
- Check that the 5 digit Calibration code number matches on the following;
 - A. The calibration bar.
 - B. Each ketone strip is foil packed

Calibration Procedure:

1. Insert the calibration strip into the yellow shaded insertion slot.
2. The Sensor turns on and the CODE number will appear which should correspond to the strip CODE number printed on each individual strip.
3. Calibration is complete.
4. Remove the calibration bar and keep it in the meter station

NB: Only discard calibration bar when the ketone strip strips are all used.

3 Insulin Administration

Introduction

Insulin:

- is to be administered via subcutaneous injection.
- can be administered via an insulin syringe, an insulin pen device or insulin pump.
- is a schedule 4 medication (S4).
- should be kept in a locked fridge until opened for individual patient use.
- cartridge in use must have an ID patient label attached. All other insulin cartridges are to remain in the Ward/Unit refrigerator. (See: [Appendix 1.](#))
- kept in the fridge is best removed 30 minutes before administration as cold insulin 'stings'.

3.1 Using a Syringe when drawing up one insulin

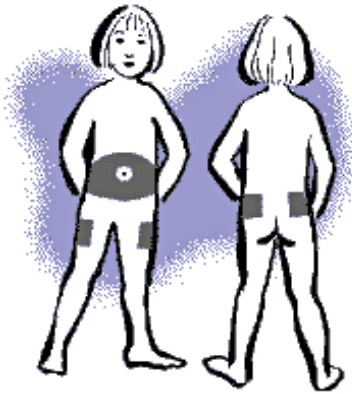
Equipment

- 30IU, 50IU or 100IU Insulin Syringes are available.
- Insulin 3mL cartridge /penfill
- Alcohol Swab
- Green portable tray
- Patient ID label
- Medication Chart

Procedure

1. Check medication sheet for required dose and insulin type.
2. Wash Hands
3. Wipe rubber stopper on insulin cartridge/penfill with an alcohol swab.
4. If administering cloudy insulin the cartridge/penfill should be inverted gently 10-20 times to re-suspend solution.
5. Insulin cartridge/penfills are not a closed circuit container therefore insert the syringe needle into the cartridge and withdraw the required dose.
6. Flick the syringe needle to allow any air bubbles float to the top and discard bubbles. .
7. Check that the insulin dose is correct; another nurse should also check that the dose drawn up is accurate. Check that the correct insulin is used and the insulin is within its expiry date.
8. Once at the bedside check the patients' ID band against the medication chart.
9. Explain the procedure to the child as appropriate.

10. Administer the Insulin in either the abdomen or upper buttocks.
11. Pinch skin between two fingers and insert needle completely at a 90 degrees angle. Keep the skin pinched and inject insulin - let skin go –keep needle in for 5 -10 seconds and then withdraw needle.
12. Do not re-sheath needle. Dispose the used syringe in a sharps container.



Recommended sites for insulin injections



Pinching the skin to give an insulin injection. A small pinch with the finger and thumb is enough.

3.2 Mixing Insulin doses

Mixing of insulin is no longer applicable at the Children's Hospital at Westmead without consultation with diabetes team

Note:

Glargine (Lantus™) is a clear long acting insulin which cannot be mixed with any other insulin due to its acidity and therefore needs to be given in a separate syringe.

Detemir (Levemir™) is also best administered separately.

3.3 Insulin Administration with a Pen Device

- The administration of insulin via this method must be by a qualified person who has been trained by the Diabetes team.
- All in-patients with type 1 diabetes or their carers that have been educated about correct technique using an insulin pen device.
- Whilst an in-patient, this method of insulin administration must be under nursing supervision.

Equipment

- Insulin Pen device
- Pen needle (4mm)
- Cartridge/Penfill of insulin if required

Procedure

1. Wash hands
2. Check medication sheet for required dose and insulin type
3. Choose correct insulin pen, and check that there is enough insulin in the pen for the dose.
4. If administering "cloudy" intermediate insulin the pen should be inverted 10-20 times to re-suspend solution.
5. Screw appropriate pen needle onto pen.
6. Dial up 2 units and perform an air shot to prime needle and ensure that you see insulin come out of the needle. This step can be repeated until insulin is observed.
7. Dial up prescribed dose.
8. Explain procedure to child.
9. The cartridge/penfill in use can remain in the pen and should be discarded 30 days post opening
10. Pinch skin between two fingers and insert pen needle completely at a 90 degrees angle.
11. Keep the skin pinched and inject insulin by pushing pen button down slowly until it can not be pushed further. Let skin go – keep needle inserted for 5 -10 seconds and then withdraw needle.
12. Sign off on the medication chart.

4 Telephone prescribing

Note: A medical officer must prescribe insulin therapy.

The following telephone procedure must be followed if No Insulin Order Exists.

1. A medical officer employed by the hospital must order the insulin.
2. Two registered nurses (RN) must be present to take the telephone order.
3. The prescribing medical officer must repeat the patient's name, the insulin type and dose to the second registered nurse for confirmation. This is for a single dose of insulin.
4. The registered nurse must record the prescription on the child's medication chart in ink (MR46B), once only, together with the time, date, name of prescriber, the words "per phone" and the signatures of the two registered nurses. This must be completed at the time of the telephone call to the prescriber.
5. The registered nurses receiving the telephone prescription must document, administer and sign for the verbally prescribed insulin on the medication chart in ink.
6. The prescriber must confirm the telephone prescription by checking and signing the entry on the medication chart within twenty-four hours. This telephone procedure must be followed if a doctor wishes to change the insulin therapy prescribed, or the prescribed dose.

References and Associated documents

1. NSW Health Policy Directive (PD2007_052) – Sharps Injuries Prevention in NSW Health System: http://www0.health.nsw.gov.au/policies/pd/2007/pdf/PD2007_052.pdf (accessed November 2014)
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4. APEG Clinical Guidelines 2011: <http://www.apeg.org.au/portals/0/guidelines1.pdf> (accessed November 2014)
5. Product Information Lantus Insulin Glargine, Sanofi Group, March 2014: on-line: http://products.sanofi.com.au/aus_pi_lantus_20140408.pdf (accessed November 2014)
6. Product Information Levemir Penfill and FlexPen: online: <http://www.novonordisk.com.au/media/Pis/Levpi5a.pdf> (accessed November 2014)

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Appendix 1

LABELLING OF INSULIN PENFILLS and VIALS and PENS

- From 29th July 2013 ALL insulin penfills and vials will have a small plastic bag provided by pharmacy (photo below).



- This will be supplied with the penfills/vials and placed in the fridge.
- This will assist to more clearly:
 - ✓ **identify** which patient the penfill/vial is for (insulin penfills/vial cannot be shared between patients, as per NSW Health policy)
 - ✓ document the **date** the penfill/vial was opened (insulin has a 28 day expiry once opened)
- When a penfill/vial is required for a patient then the person taking it from the original container needs to :
 - ✓ complete the date opened and discard sticker
 - ✓ place the Patient Identification Label on the bag
 - ✓ store the penfill/vial in the zip lock bag

LABELLING OF INSULIN PENS

Similarly Insulin Pens will be labelled by the Department of Pharmacy with labels as below.

- When an insulin pen is required for a patient then the person taking it from the original container needs to :
 - ✓ complete the date opened and discard sticker
 - ✓ place the Patient Identification Label on the bag

(Photo below- same pen, different sides of flag label)

