

**SCOPE:** Western Australia, South Australia, New South Wales

## RATIONALE

- To promote client's independence with self administration of insulin and maintain client's usual insulin routine.
- To administer insulin to a client who cannot self administer as per medication authority.

## DEFINITIONS

**Diabetes Mellitus:** is a lifelong metabolic disorder, which is usually classified into Type 1 or Type 2 diabetes mellitus. It is characterised by a chronically elevated blood glucose level (hyperglycaemia) resulting from defects in insulin secretion, insulin action or both.

**Type 1 Diabetes:** previously known as insulin dependent or juvenile diabetes – is an autoimmune disease that occurs when the pancreas is no longer able to produce the insulin needed, because the cells that produce the insulin have been destroyed by the body's immune system. Type 1 diabetes is usually diagnosed in childhood, teen and young adult years, but can occur at any age.

**Type 2 Diabetes:** is a chronic condition that occurs when the pancreas does not produce enough insulin and / or the insulin does not work effectively to meet the body's needs. It represents 85 to 90% of all cases of diabetes and is more likely in people with a family history of type 2 diabetes or from particular ethnic backgrounds. It usually develops in adults over the age of 45 years but is increasingly occurring in younger age groups, but can be delayed or prevented in 58% of cases.

**MODY:** Mature onset diabetes in the young.

**Neonatal:** Onset of diabetes in infants 0-6 months old.

**Gestational:** Onset of diabetes mellitus during pregnancy.

## MEDICAL REQUIREMENTS

A written medication authority from a medical practitioner is required for this procedure.

## PROCEDURAL INFORMATION

To prevent needle stick injuries associated with the use of insulin pens and auto delivery devices, Silver Chain staff are advised to comply with the following:

- 1 If the **client is unable** to safely remove the needle from the insulin pen or auto delivery device independently then the nurse must only use an autoshield Duo™ pen needle device otherwise **DO NOT use the pen** - the insulin should be removed from the insulin reservoir/cartridge using a needle and syringe. The needle and syringe can then be disposed of immediately into a sharps container.
- 2 A new insulin needle and syringe or insulin autoshield Duo™ pen needle must be used for each injection if a Silver Chain care provider is giving or drawing up insulin. A needle must never be left on the pen.

- 3 Do not use a device you are not familiar with.
- 4 Client should have individual blood glucose level (BGL) parameters set by Medical Practitioner or Diabetes Educator or as per recommended guidelines.
- 5 Client must have Care Plan documenting their individual hypoglycaemic episode or as per recommended guidelines.

## EQUIPMENT

Prescribed insulin  
Insulin syringe and needle or insulin pen  
Autoshield Duo Pen Needle Device™  
Alcohol wipes  
Sharps container  
Disposable non sterile gloves

## PROCEDURE

- 1 Verify medical practitioner's orders for insulin using medication authority
- 2 Explain the procedure to client.
- 3 Attend hand hygiene and apply disposable non sterile gloves.
- 4 Provide for client's privacy.
- 5 Check client blood glucose level (BGL) prior to procedure.
- 6 Check insulin vial/cartridge for correct insulin type and strength, expiry date and product stability.
- 7 Gently roll and invert vial or pen to ensure mixture of insulin.
- 8 Slow gentle wave motion for the insulin cartridge to mix insulin and avoid presence of air bubbles.

### Drawing up Insulin from a Vial Using a Needle and Syringe

- 1 Pull back the plunger of the syringe to measure the amount of air equivalent to the amount of insulin that is required.
- 2 Wipe rubber stopper of the vial with an alcohol wipe and allow to dry.
- 3 With the insulin vial standing upright, insert the needle straight through the centre of the rubber cap of the insulin vial and push the syringe plunger completely in.
- 4 Turn the insulin vial upside down making certain that the point of the needle inside the vial is well beneath the surface level of the insulin. Pull back the syringe plunger until the correct dose of insulin has been drawn up.
- 5 Remove the needle from the insulin vial and expel any air bubbles.
- 6 Do not squirt any excess insulin back into the vial.
- 7 If a mixed dose is required ie two different types of insulin, draw up clear insulin first. Check compatibility with second insulin before mixing. Glargine insulin should never be mixed with any other insulin.
- 8 If more than the required dose of cloudy insulin is drawn up in syringe, discard and start again.
- 9 Insulin must be administered immediately after mixing.
- 10 Select appropriate injection site.
- 11 With your non-dominant hand, support injection site.
- 12 Insert needle at a 90° angle.

- 13 Place thumb on plunger and slowly inject medication into client's subcutaneous tissues. Wait 10 seconds before withdrawing.
- 14 Discard needle and syringe into sharps container.
- 15 Remove gloves and attend hand hygiene.
- 16 Document insulin administration.

### Dialling up Insulin Using an Insulin Pen or Auto Delivery Device, eg Innolet Device

- 1 Swab the rubber seal on the end of the pen with an alcohol swab and allow to dry
- 2 Remove the cap from the autoshield pen needle and push, then twist the pen needle hub onto the pen in a clockwise direction until it meets resistance
- 3 Pull the cover off the Autoshield Duo™ (the needle is hidden under the white plastic shield). Do not touch the white shield prior to injecting as any pressure on the shield may cause the safety mechanism to lock, making the pen needle unusable.
- 4 Prime the pen needle as per manufacturers instruction prior to dialling up the prescribed dose of insulin
- 5 Dial up the prescribed dose.
- 6 Select appropriate injection site. With your non-dominant hand, support injection site.
- 7 Remove needle sheath and insert at a 90° angle.
- 8 Place thumb on plunger rod and slowly inject medication into client's tissues. Wait 10 seconds before withdrawing.
- 9 On removing the pen away from the skin, the shield will automatically lock in place. Metal tabs will appear confirming shield is locked in place. An audible click may also be heard.
- 10 Remove the Autoshield Duo™ pen needle from the pen by holding the hub and twisting the pen counter clockwise and discard into a sharps container.
- 11 Remove gloves and discard, attend hand hygiene.
- 12 Document insulin administration.
- 13 The insulin cartridge is to be changed as per manufacturer's recommendations.

### Drawing up Insulin from an Insulin Pen, Cartridge or Disposable Device

- 1 **For devices with a separate cartridge**, after wiping stopper with an alcohol wipe and allowing to dry, insulin is to be withdrawn from the cartridge by accessing through the rubber stopper using a needle and syringe. **Do not inject air into the cartridge.**
- 2 Once the cartridge is used in this manner, there is a risk that an inaccurate dosage of insulin may be delivered if the same cartridge were to be used in the pen.
- 3 **Cartridges accessed by a needle and syringe must be labelled with date and time of first access and used for this purpose only.**
- 4 If the pen is to be used with a cartridge, then a new cartridge is to be placed in the pen.
- 5 **For disposable devices**, the insulin is to be accessed through the rubber stopper in the insulin reservoir.
- 6 Due to the risk of inaccurate dosing following this process, the disposable devices should be labelled with the date and time the reservoir was accessed.
- 7 It should also be noted that the device is only to be used for access by a needle and syringe.
- 8 If the device is to be used with a needle attached at a later time, then a new device is to be used.

### RELATED CARE

Insulin syringes are available in the following sizes:

- 1.0ml insulin syringes graduated in 2 unit intervals and are ideal for insulin doses over 50 units.

- 0.3ml insulin syringes graduated in 1 unit intervals which are ideal for insulin doses under 30 units.
- 0.5ml insulin syringes graduated in 1 unit intervals which are ideal for insulin doses 30 to 50 units.

### **Types of Insulin**

- Soluble insulin is a clear, colourless insulin. It has a rapid onset and a relatively short duration of action.
- Insoluble insulin has a cloudy, milky appearance. It is soluble insulin mixed with a retarding agent to delay the onset and extend the duration. Onset and duration times are variable.
- Other insulin types include bi-phasic, intermediate acting and long acting insulin.

Each injection site has a different absorption pattern and in order to reliably predict the effect of a dose of insulin, site consistency should be maintained. Rotation within the same site is recommended to prevent pitting or lumpiness of the skin and poor insulin absorption.

Alcohol wipes need to be used routinely to clean the rubber stopper on the insulin vial prior to injection. It is also recommended alcohol wipes are used **only** if the client's injection site is visibly soiled.

### **Insulin Storage**

- Insulin vials/cartridges in use can be kept in a cool place away from direct sunlight in less than 25 degrees Celsius. Discard if exposed to higher temperatures or direct sunlight.
- Stock vials/cartridges should be kept in the fridge – **do not freeze**.

### **Discard Insulin if:**

- Expiry date has passed.
- Any particles appear in clear insulin.
- Any sediment present in cloudy insulin that does not dissolve when the vial/cartridge is rotated.
- After insulin has been opened for 28 days. (Write the date of opening a new vial of insulin on the side of the vial and document in client's notes.)

### **REFERENCES**

- 1 Australian Diabetes Council. Diabetes Connect, Summer 2012 1-52.  
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- 2 BD™ Insulin Delivery Devices – Getting Started. 2008 1-11.  
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- 3 Owens DR. 2011 Insulin preparations with prolonged effect. Diabetes Technology Theory. 2011 Jun; 13 Suppl 1:S5-14.

- 4 Meetoo, D; McAllister, G; West, A; Turnball, A. 'In pursuit of excellence of diabetes care: Trends in insulin delivery'. *British Journal of Nursing*. 2012 Volume 21, number 10, pg 588-595.
- 5 Livingstone, C; Wolpor, S and Rogers, T. 'Improving efficiency and safety for patients who are unable to self-administer insulin'. *British Journal of Community Nursing*. 2013 Volume 18, number 10, pg 476- 481.