Insulin Injection Technique

This document provides a short guide on insulin injection technique.

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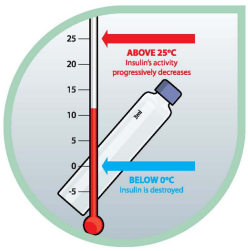
Insulin Storage



- Insulin and GLP-1 agonist not in use must be kept in the fridge – avoid freezing
- Store insulin and GLP-1 agonist in use at room temperature and discard 30 days after initial use or follow manufacturers instructions
- Avoid extremes of temperature e.g.
  - Direct sunlight
  - Leaving in a car
  - On top of a radiator
- Extremes of temperature will damage insulin and GLP-1 agonist making it less effective

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✓ **FIT Recommends**
Cold insulin may cause more discomfort than insulin kept at room temperature

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Insulin should be stored in fridge 2 - 8 º C

Insulin in use can remain at room temperature for 4 weeks (5 weeks for Levemir).

However avoid any exposure to direct sunlight or heat from radiator.

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Checking Insulin and GLP-1 Agonist

Check

- Name and type of insulin (mistakes may occur with basal bolus regimen)
- Expiry date
- Always check the pharmacist has dispensed prescribed insulin
- Clear insulin must be clear
  - i.e. no discolouration,
  - cloudyness,
  - particles seen
- Cloudy insulin must be cloudy
  - uniformally cloudy when resuspended

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Note: It may be useful to carry an ID card stating the name of the insulin or GLP-1 agonist as a reference or in case of an emergency

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Quick Acting (QA) insulins are clear in appearance.

Long Acting (LA) Analogues (Lantus and Levemir) are also clear solutions so it is important to check the name on your insulin.

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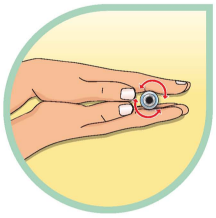
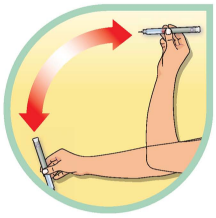
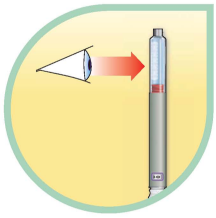
Cloudy Insulin Re-suspension



Roll 10 times



Tip 10 times



Visual check

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✓ **FIT Recommends**
Correct re-suspension technique should be regularly re-evaluated

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Isophane insulins (Humulin I - Insulatard) and Mixed insulins are cloudy. These insulins need to be re-suspended because the insulin is bound to a protamine that slows its action. It is therefore essential to mix the insulin so that it is cloudy in appearance throughout.

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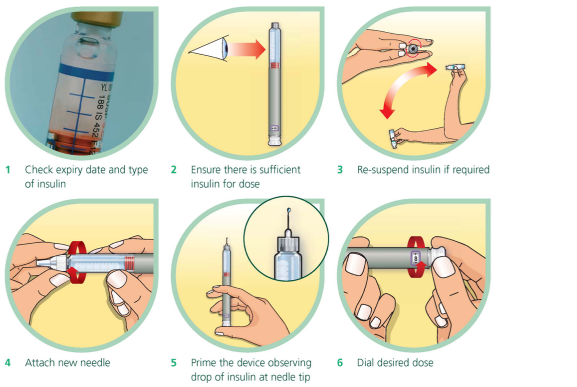
Pen Device Preparation



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Insulin comes in:

- 10 ml Vials
- Pen-fill Cartridges
- Pre filled Pen devices

Check name of insulin

Check expiry date

Apply needle- (may be 4 mm 5 mm 6 mm 8 mm)

Prime needle - 2 units initially & until drops observed at needle tip

No need to disinfect injection site.

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Self Injection Site Inspection

- Always inspect the site before giving injection
- Look for these signs before every injection:
  - Lipohypertrophy
  - Inflammation
  - Oedema
  - Infection
- Palpate for lipohypertrophy every 4-6 weeks

FIT Recommends
To avoid lipohypertrophy rotate injection sites with each injection and avoid needle re-use

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Insulin should be injected into subcutaneous tissue abdomen, thigh, and buttocks.

Abdomen has the quickest absorption rate.

Thighs have a medium absorption rate.

Buttocks have slowest absorption rate.

Injecting in the arm is no longer recommended as the risk of injecting into muscle is increased. If insulin is injected into muscle the insulin is absorbed too fast.

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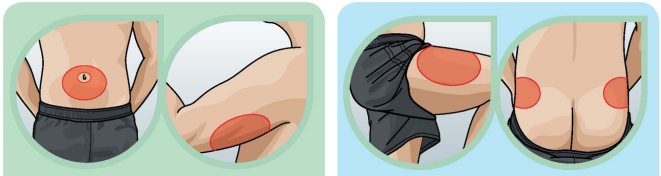
Human Insulin



Bolus Insulin
The abdomen is preferred for soluble bolus insulin since absorption* is fastest here

Basal Insulin
Thigh and buttocks are preferred sites for basal insulin since absorption is slowest here**

FIT Recommends
Avoid intramuscular injection of all human insulins – due to rapid absorption and risk of hypoglycaemia

*Frid A Linde B. Clinically important differences in insulin absorption from the abdomen in IDDM. Diabetes Res Clin Pr 1992;21:137-141.
** Henriksen JE, Vaag A, Hansen IR, Lauritzen M, Djurhuus MS, Beck-Nielsen H. Absorption of NPH (isophane) insulin in resting diabetic patients; evidence for subcutaneous injection in the thigh as preferred site. Diabetic Medicine 1991;8:453-457.

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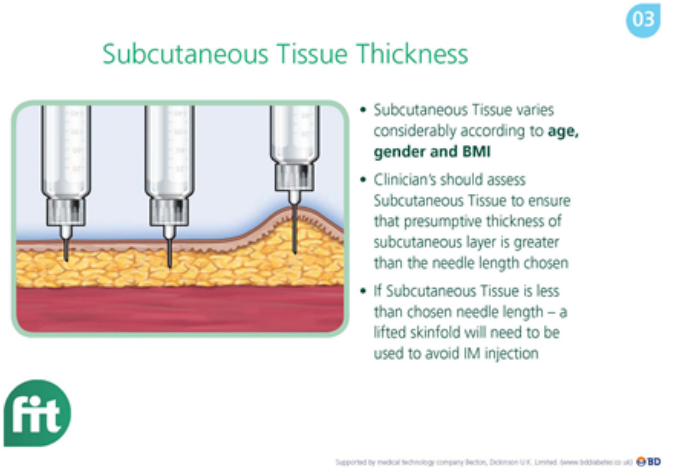
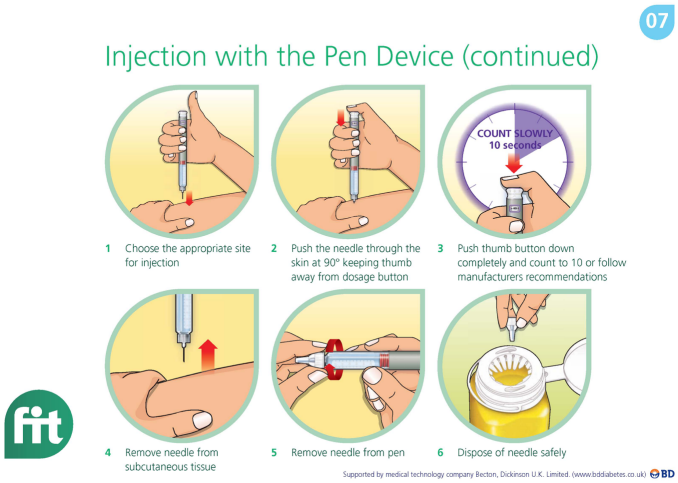


Insert the needle at a 90 degree angle and press the plunger of the syringe or pen all the way down.

If using an insulin pen hold the needle in place and count to 10 seconds before removing to ensure the full dose of insulin is received.

With the correct needle length no pinch up of the skin is required. However if you are very slim it may be advisable to use a shorter needle length.



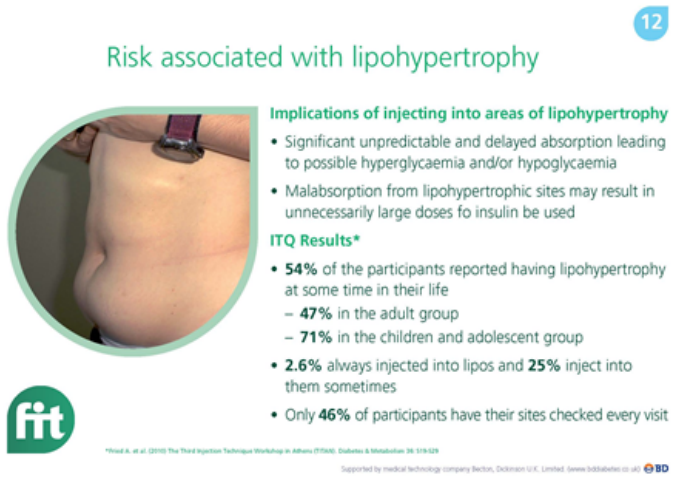
Heat increases insulin absorption, so be aware of hot baths/sauna/exercise.

Overuse of injection sites should be avoided.

Rotate injection sites.

In overused, fatty lumps can develop in injection sites known as lipohypertrophy (lipos).

If insulin is injected into areas of lipohypertrophy, the action of insulin can be very unpredictable.



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Prevention

- Practice good site rotation
- Avoid needle reuse
- Use good quality purified insulin

52 year old man injected in his thigh for 25 years, began to rotate. His daily insulin requirement fell from 66 units to 30

FIT Recommends
Malabsorption from lipohypertrophic sites may result in unnecessarily large doses of insulin be used

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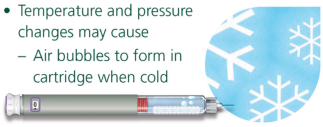
Risks of Leaving Needle Attached

- Leaking pre-mixed insulin can derange mixture ratio
  - This can lead to incorrect mixture and dosing
- Temperature and pressure changes may cause
  - Air bubbles to form in cartridge when cold



  - Insulin to leak out of cartridge when hot

FIT Recommends
Always remove the needle from the pen device after injection

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Always use a new insulin needle for each injection and follow local guidance for sharps disposal.

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