



Wednesday 30 October 2019

12:40 - 13:30

TREND-UK & Injection Technique Matters Theatre

Injection Technique Matters with Lipohypertrophy 'Live' Demonstration

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Declarations

Co Chair of TREND-UK (Training, Research & Education for Nurses in Diabetes).

Chair of Injection Technique Matters

Editorial Board Member of The Diabetes Times

I have received funding from the following companies for providing educational sessions and documents, and for attending advisory boards:

B Braun, BD, Boehringer Ingelheim, BMS/Astra Zeneca, Eli Lilly, GlucoRx, Janssen, MSD, Mylan, Napp, Novo Nordisk, Owen Mumford, Sanofi and Takeda.



Learning Objectives for Session

This presentation will explore research that has confirmed that people who use injectable therapies for diabetes can be adversely affected if the correct injected technique is not used at each injection. It will give information on the correct injection technique to be teaching those who need injectable therapies to achieve optimum benefit from their therapy. We will look at some of the adverse effects caused by poor injection technique focusing on Lipohypertrophy. There will then be a 'Live' demonstration on correct palpation of Injection Sites after which the audience will have chance to perform the same technique on a person with diabetes.

Learning points:

- Demonstrate the correct injection technique for administering diabetes injectable therapies
- Be aware of the importance of site selection and site rotation
- Be aware of the importance for advising on appropriate needle size
- List the impacts of poor injection technique
- Examine injection sites for detection of lipohypertrophy





First UK Injection Technique Recommendations published in 2010 – evidence based (last updated October 2016) - 47 page document.

A distinct lack of non-promotional educational material for HCPs and people with diabetes to support best practice injection technique.

During 2018 *Injection Technique Matters* was founded by the former board members of FIT.

DEBBIE HICKS
Chair Nurse Consultant – Diabetes,
Barnet, Enfield and Haringey MHT,
Co-Chair TREND-UK

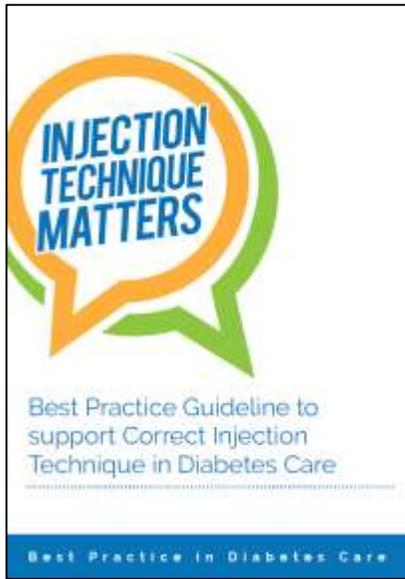
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All you need to know about Lipohypertrophy (Lipo)

What is a lipohypertrophy?
Lipohypertrophy is a condition where excess fat builds up under the skin at the injection site.

What causes a lipohypertrophy?
Lipohypertrophy is caused by repeated injections into the same site without allowing the skin to heal properly.

Should I worry about lipohypertrophy?
Lipohypertrophy can affect the accuracy of your insulin injections, leading to poor blood sugar control.

How can I prevent lipohypertrophy?
Rotate injection sites and avoid injecting into the same site repeatedly.

What if I suspect I have lipohypertrophy?
Ask your healthcare professional for advice on how to manage it.

Avoidance of Lipohypertrophy
It is important to rotate injection sites for your insulin injections. It is important not to inject into the same site repeatedly as this can cause problems with your blood sugar control.

Injection Needles
Use the correct needle length and gauge for your injection. Shorter needles are preferred for subcutaneous injections.

Storage
Store insulin pens and needles in a cool, dry place. Do not store insulin pens in a hot or cold environment.

Safe Disposal
Dispose of used needles and pens in a sharps container. Do not reuse needles or pens.

Things you need to know about injections

Injection sites

- You can use any of the sites shown in the picture above for injecting insulin in 0.5 to 2.0 units per dose.
- Sites of the upper arm are preferred for injecting insulin in 0.5 to 2.0 units per dose.
- Sites of the abdomen are preferred for injecting insulin in 0.5 to 2.0 units per dose.
- Sites of the thigh are preferred for injecting insulin in 0.5 to 2.0 units per dose.
- Sites of the buttock are preferred for injecting insulin in 0.5 to 2.0 units per dose.

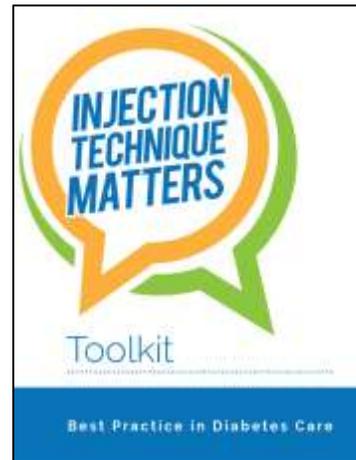
Where to inject

How deep to inject:

It is important to inject insulin into the subcutaneous layer of the skin. The needle should be inserted at an angle of 90 degrees.

10 Steps to giving an injection using a pen device:

1. Check the pen device is working correctly.
2. Wash your hands with soap and water.
3. Roll and remove the cap from the needle.
4. Hold the pen device in your hand.
5. Select the dose on the pen device.
6. Hold the pen device at an angle of 90 degrees.
7. Insert the needle into the skin.
8. Push the plunger button to inject the insulin.
9. Hold the pen device in your hand for 10 seconds.
10. Safely dispose of the needle in a sharps container.



Available to download at www.trend-uk.org

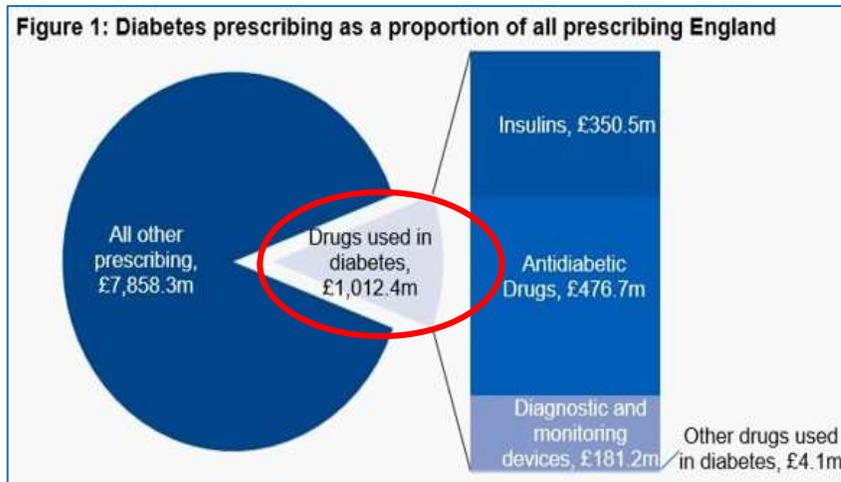


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Some facts & figures

- **4.2 million people** in the UK are diagnosed with diabetes¹
- **20 - 30%** of all people with diabetes in the UK are **insulin treated**²



- Over £1 billion is spent on drugs for diabetes
- **£350 million on insulin**
- + GLP-1 RA costs within (Antidiabetic Drugs = £476 million)

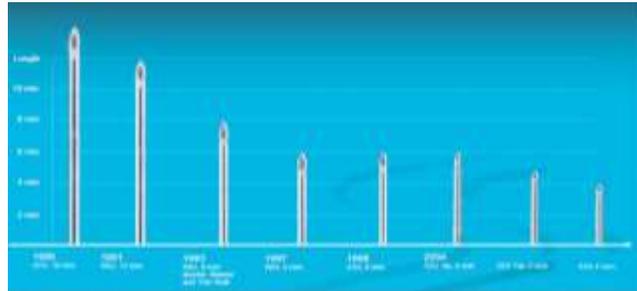


1. www.diabetes.org.uk/About_us/What-we-say/Statistics/State-of-the-nation-challenges-for-2016-and-beyond/

2. Holden SE et al. How many people inject insulin? UK estimates from 1991 to 2010. *Diabetes Obes Metab* 2014, 16(6): 553-9



....more “person-friendly” devices and shorter, finer needles.



“Insulin is rarely, if ever, given at the right time, in the right way or in the right amount. It is therefore amazing that anyone with diabetes has any semblance of good blood glucose control.”

*Professor Edwin Gale,
Medical School Unit, Southmead Hospital, Bristol*



How you inject is as important as
what you inject



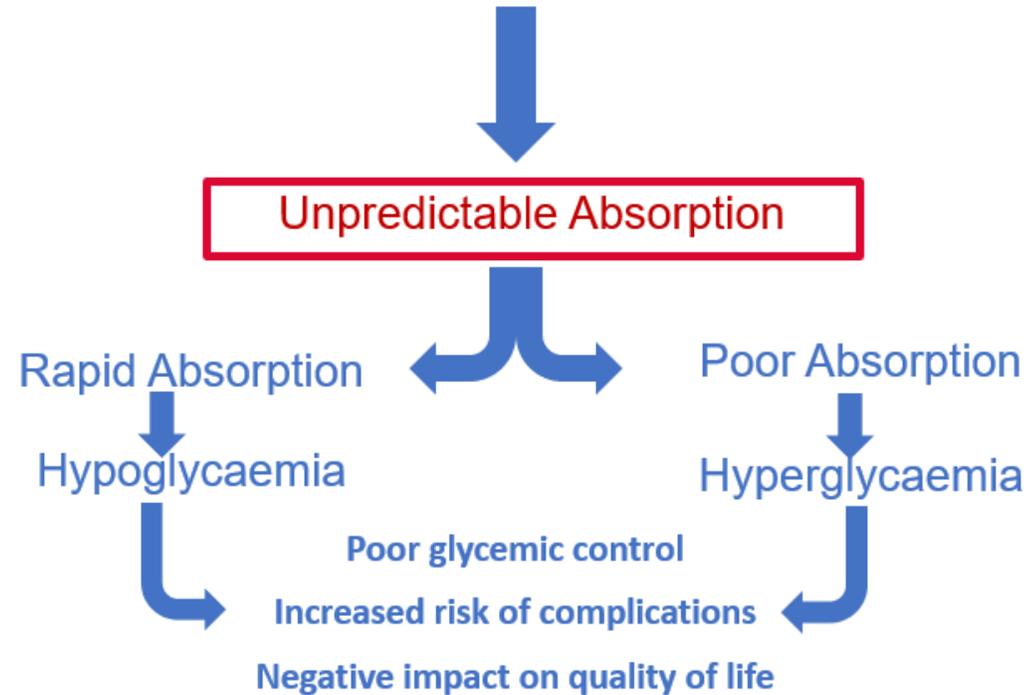
The potential consequences of poor injection technique

- Glycaemic variation (hypoglycaemia/hyperglycaemia) – risk of hospital admissions – poor control – increased risk of complications
- Lipohypertrophy
- Excess insulin requirement (weight gain, cost implications)
- Inaccurate dosing
- Poor efficacy of drug
- Risk of needlestick injury

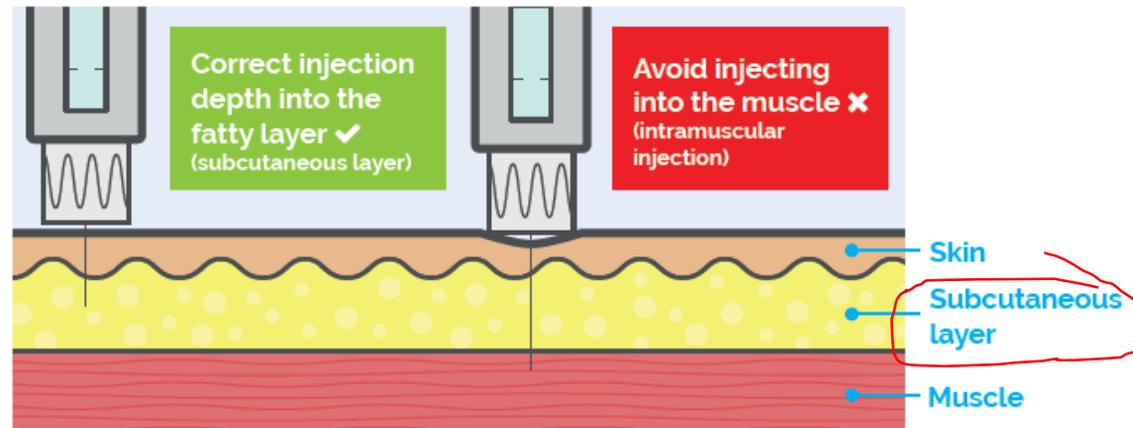


Good injection technique is crucial to achieve the expected absorption and action of insulin.

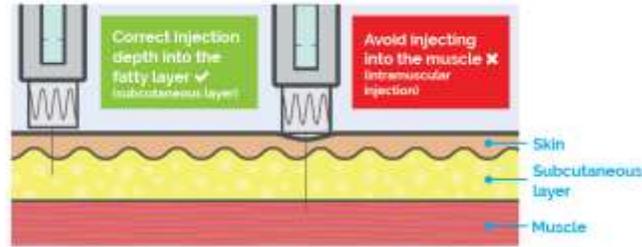
The implications of poor injection technique



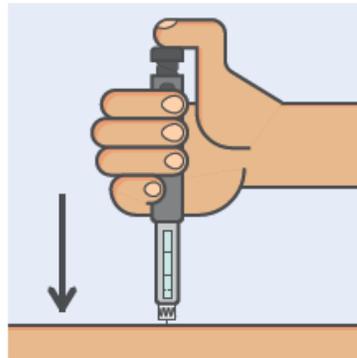
Where should insulin and GLP-1 RA be injected and how can you ensure this happens?



Should a person's BMI/weight influence needle length?



4mm



Fully insert the needle into the skin at 90 degrees, keeping the pen stable

Press dose button until dose fully injected

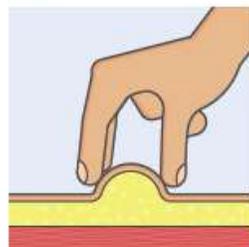


Are lifted skin folds required when self-injecting?



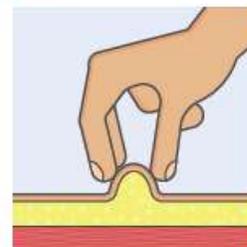
How to perform a correct lifted skin fold

1



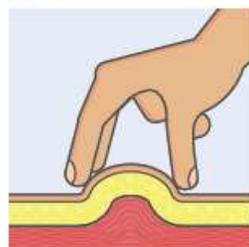
Raise a fold of skin between thumb and fingers

2



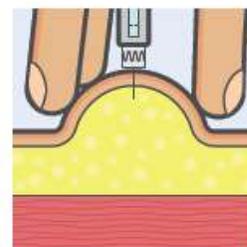
Try not to pinch the skin too tightly

3



Do not grasp too much tissue to avoid raising the muscle

4



Insert needle into skin at 90 degree angle and inject

Remove needle while still holding skin fold

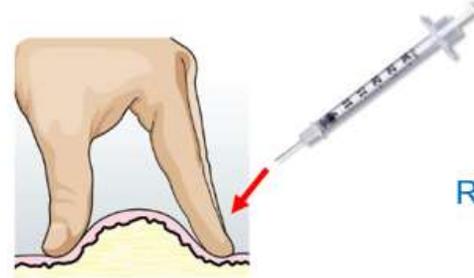
Release skin fold once needle withdrawn



Be awareif district nurses or carers are giving injection



Only available with 8mm or 12mm needle – risk of IM injection



Risk of needlestick injury

There is legislation in place to try to protect healthcare professionals from harm...

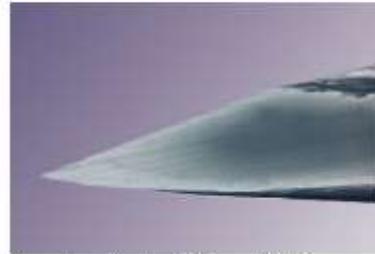


But you have to know how to use them correctly!!!

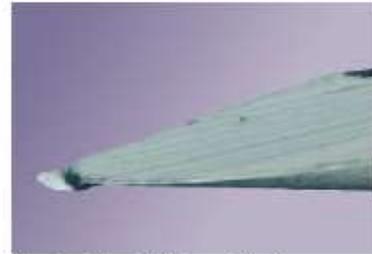
How many times should a pen needle be used?



Once only



Unused needle at x 370 magnification



Used needle at x 370 magnification



Same needle at x 2000 magnification

Look D, Strauss K. *Diabetes Journal* 1998; 10: 531-34



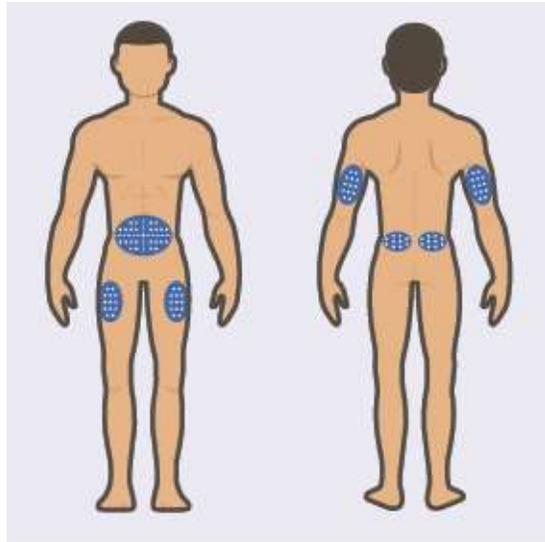
- Review needles
- What size?
- Single use?
- Left in situ on pen?
- Angle of insertion?
- Lifted Skin fold performed?





What about site selection?

What are appropriate sites for injection?



Abdomen

Upper outer aspect of thighs

Upper outer quadrant of buttocks

Upper underside of arms

The rate of absorption of some insulins varies according to the site of delivery.

- ✔ The abdomen is the preferred site for the injection of soluble insulin (as it absorbed faster in this area).
- ✔ The thighs and buttocks are the preferred sites for Neutral Protamine Hagedorn (NPH) insulin where absorption is slowest.
- ✔ When pre-mixed insulin is being injected, it is suggested that the abdomen is used in the morning, and the thigh or buttock in the evening.

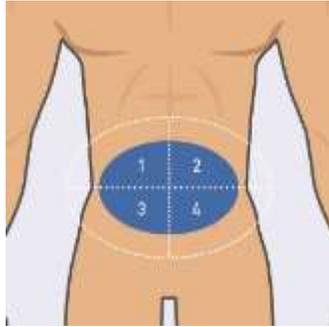


Which sites are being used?

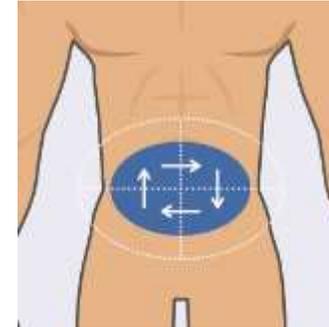




What about site rotation?



Because he knew the importance of daily injection site rotation, George went to extremes to avoid problems.



Are injections within a site being rotated?



Lipohypertrophy is a common consequence of poor injection technique



How common do you think it is?

Blanco (2013)¹ **64%**

Grassi (2014)² **49%**

Expect to find it in over half of your patients who use insulin



But if you don't **SUSPECT** it - you won't **DETECT** it!



Lipohypertrophy (LH) appears as thickened 'rubbery' lesions, they appear over time in the subcutaneous tissue of overused injection sites but can vary in shape and size



- Lipohypertrophy (LH) is disfiguring.
- Unpredictable and delayed absorption resulting in glycaemic variation^{1,2,3}.
- Malabsorption from lipohypertrophic sites may lead to patient giving unnecessarily large doses of insulin (cost implications)⁴.

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What causes Lipohypertrophy?

The primary causative factors are:

- **Duration** of insulin use with longer duration associated with more LH (p=0.001) **12% less than 5 years / 84% 16-20 years use**
- Incorrect site **rotation** (p=0.004)
23% with weekly rotation / 90% chose randomly
- An association between **needle reuse** and presence of LH (p=0.004)
20% single use / 75% 4-5 times





- Make examination of injection sites part of a regular review.
- Encourage person to inspect the site before injecting.



Case

- Type 1 Diabetes admitted to ITU with severe prolonged hypoglycaemia.
- This occurred within 4 hours of his first ever flu vaccination at the GP surgery → ? reaction to vaccine
- On examination – severe lipohypertrophy found. It was discovered later that patient injects rapid insulin into his arms and long acting insulin into his stomach. He was given flu vaccine into arm, the practice nurse noted lipohypertrophy and suggested he avoid that area (but no advice given with regard to dose reduction).

What happened next.....

- Patient injected 58 units of NovoRapid into his abdomen away from the lipo at the next mealtime.
(His usual dose was 58 -72 units NovoRapid with meals and 110 units Lantus at night)
- After assessment and discharge he was well controlled on 5-14 units NovoRapid with meals (1unit to 7g CHO) and 48 units Lantus daily.





If on occasion the patient changes from an area of LH to normal tissue but gives the same dose, there is a risk of hypoglycaemia.

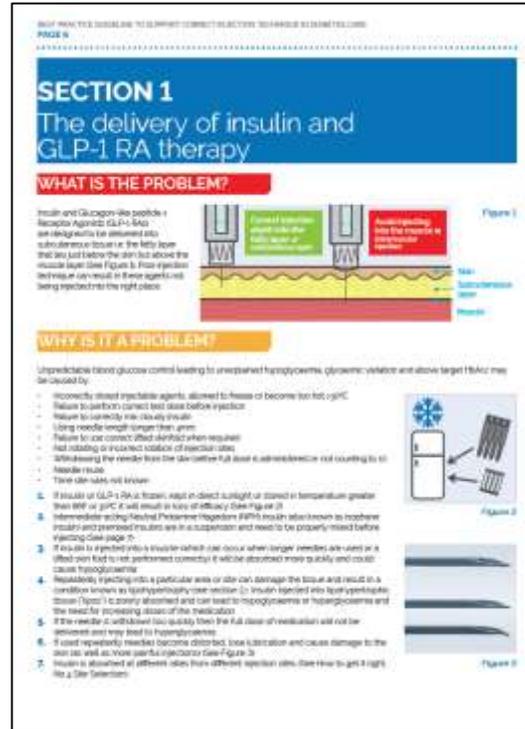
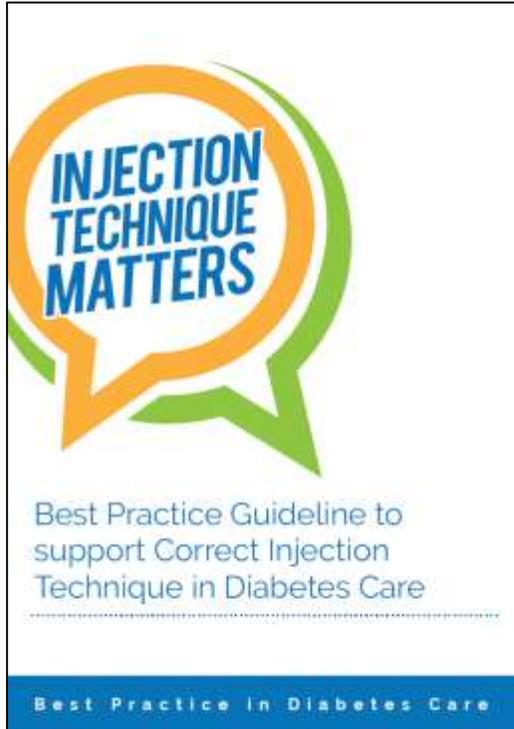


Summary

- Raise awareness (amongst HCPs & people with diabetes)
- Promote best injection technique practice (refer to [Injection Technique Matters Guideline](#))
- Encourage HCPs and people with diabetes that examination of injection sites should be part of regular practice.
- Any abnormalities should be documented in the patient's notes and reassessed at subsequent consultations.
- Individuals should be taught to examine their own injection sites and how to detect lipohypertrophy (and encouraged to do so regularly).

- Patients should be advised to avoid injecting into areas of lipohypertrophy until tissue returns to normal (this can take months or even years)
- People who inject should be taught to check for signs of Lipohypertrophy & report any abnormalities.
- Rest areas of Lipohypertrophy BUT discuss with HCP before switching to a different site (dose adjustment may be required to minimise risk of hypoglycaemia).

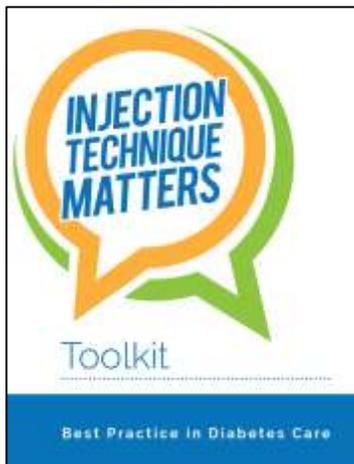




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All you need to know about Lipoatrophy (Lipo)

What is a lip? It's a fatty covering over your skin.

What causes a lip? Lack of insulin or not injecting insulin correctly can lead to lip loss.

What if I lip? Look at the lip on the left. It's a sign of lip loss. The lip on the right is healthy.

What if I lip? I have lip? Look at the lip on the left. It's a sign of lip loss. The lip on the right is healthy.

Importance of Lipoatrophy: It is important to check the correct site for your insulin and ensure it is important not to inject into areas where lip loss has occurred. It is important to use a simple rotation system to ensure that lip loss does not occur in the same place.

How to rotate sites: 1. Choose a site and rotate to a new site. 2. Rotate to a new site.

Injection Needles

Things you need to know about injections

Types of needles: Insulin syringes, pen needles, and insulin pumps.

Storage: Store insulin in a cool, dry place. Do not freeze or expose to heat.

Safe Disposal: Dispose of needles in a sharps container.

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Key things to remember if you use injectable medication to treat your diabetes

- Check your insulin is still good to use.
- Check your insulin is still good to use.
- Check your insulin is still good to use.

Use the checklist below to help make sure you are getting the best from your insulin medication.

After checking your medication:

- Do you always check expiration dates on insulin bottles or pens?
- Do you always check the insulin is still good to use?
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Key things to remember if you use injectable medication to treat your diabetes

Every month check for signs of Lipoatrophy:

- Look for changes in the colour of your skin in the areas you inject insulin. It may be pale, red, or itchy.
- Look for changes in the texture of your skin in the areas you inject insulin. It may be lumpy or bumpy.
- Look for changes in the shape of your skin in the areas you inject insulin. It may be sunken or raised.

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How deep to inject

10 Steps to giving an injection using a pen device:

- Wash your hands.
- Remove the cap from the pen.
- Roll the pen to mix the insulin.
- Hold the pen in your hand.
- Adjust the dose.
- Hold the pen at a 90-degree angle.
- Insert the needle.
- Inject the insulin.
- Hold the pen for a few seconds.
- Remove the needle.

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Key things to remember if you use injectable medication

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Live Demo



HOW TO EXAMINE FOR LIPOS

- ✔ Always inspect for lipohypertrophy in good light
- ✔ Gain consent to examine
- ✔ Look for changes in contour of skin
- ✔ Warm, clean hands
- ✔ Use water soluble gel
- ✔ Use tips of fingers
- ✔ Work towards suspected area of lipohypertrophy with a light massage-like motion (Figure 10)
- ✔ Push deep into tissue through fat to feel muscle below (if possible) then push forward toward until lipohypertrophic tissue is felt
- ✔ Feel for a change in the subcutaneous tissue
- ✔ Document size and position of lipohypertrophy
- ✔ Advise avoid using area for at least 3-6 months
- ✔ Re-examine at next visit

