



# Detecting, treating & preventing lipohypertrophy



# Detecting lipohypertrophy<sup>1</sup>

Lipohypertrophy (lipo) is common.<sup>1</sup> A Spanish study<sup>2</sup> found lipo in **64.4%** of injecting patients, while an Italian study<sup>3</sup> found the prevalence to be **48.7%**, and in a Chinese study it was **53.1%**.<sup>1</sup> Absorption of insulin injected into lipo may be erratic and unpredictable, which can lead to hyperglycaemia, unexpected hypoglycaemia, or increased glucose variability.<sup>1,4,5</sup>

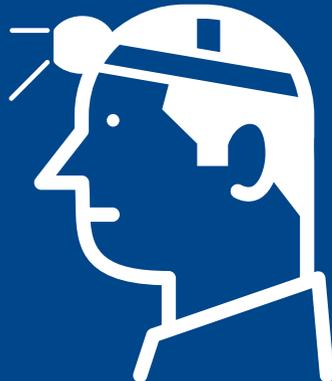
Detailed below is the recommended technique for detecting and palpating hypertrophic lesions.

## Prepare for the examination

▶ The **room must be warm** to prevent the patient from chilling. While this ensures patient comfort, more importantly it prevents shivering and muscle tension, which can interfere with the examination and mask the presence of lipohypertrophy (lipo).



▶ Use **directional task lighting** if possible. Light should always be oblique to the skin surface, preferably not overhead. Use of an examination light that is fully articulated and adjustable is ideal. If an examination light is not available, the use of a head worn light is a good alternative.

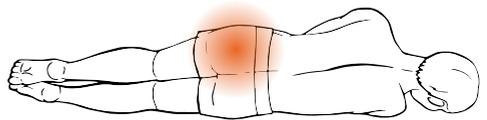


# Visual examination of injection sites<sup>1</sup>

1. Firstly, inform the patient and **gain consent for the examination**. Ask the patient which sites they use for injections and ask them to describe any abnormalities at their injection sites. Record in the patient's notes where the abnormalities are on the body and for how long they have been present.
2. Ask the patient to disrobe, keeping only their underclothes on. To examine the abdomen and thigh injection zones, **position the patient laying down on their back**, ideally on an examination bed.
3. Ask the patient to **raise their knees and fold their arms across their chest**. The muscles of the abdomen and thigh quadriceps should all be fully relaxed and soft, ready for the examination.



- ▶ To examine the **buttock area**, ask the patient to lie on alternate sides and flex their knees towards their chest to relax their gluteal muscles, examining the upper facing buttock area. Underclothes may need to be repositioned to assess the buttocks.



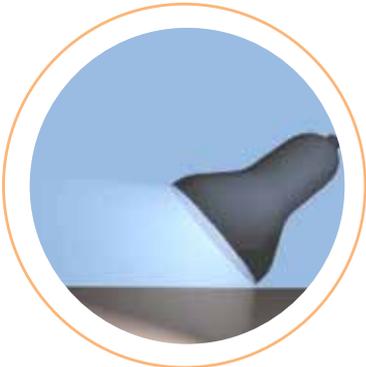
- ▶ If you do not have an examination bed, ask the patient to sit upright in a chair with their hands resting in their lap and their legs at right angles to the floor. You can **examine the thighs** from this sitting position.
- ▶ To **examine the abdomen** and buttocks ask the patient to stand up and let their arms hang by their sides. You can now examine the abdomen and buttocks from this position.

# Visual examination of injection sites<sup>1</sup>



**4. Wash your hands thoroughly and follow infection control procedures.**

Warm your hands before touching the patient. Cold hands may cause tension and mask lipo lesions.



**5. Visually examine the injection sites using the angled lamp to highlight any subtle rises and dips across the skin.** Lipo is usually manifested as a raised or mound like convex area sitting above the surrounding skin surface.

There is seldom any variation in skin colour or hair distribution, making detection sometimes difficult. However it could be visible as a cluster of injection points. Occasionally lipohypertrophic areas can be manifested as shiny or hyper-pigmented, especially in darker skins. You may also notice some hair loss.



**6. If you detect lipo, mark the centre point with a marker pen** suitable for use on the skin. This will help you when you palpate the site.

# Palpation examination of injection sites<sup>1</sup>



1. **Warm hands** by rubbing them together or washing them in warm water, following infection control procedures.
2. **Bring clinical examination gel to near body temperature** by placing the tube in your pocket near to your skin surface or placing some gel in your hands and warm it for a few moments before applying it to the patient's skin.
3. **Apply the clinical exam gel liberally** on the area to be examined. Palpate with your fingertips.
4. Work the gel towards the injection area with **light massage motions, forward thrusts and circular sweeps**. Lipo is identified by a change in the soft highly-plastic feel of the subcutaneous fat tissue which is replaced by a harder, more rubbery and less plastic tissue.

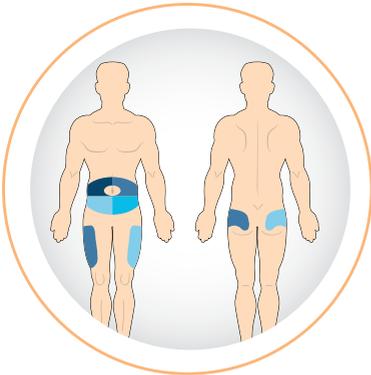
Often, the edges of the abnormal lipohypertrophic area are clearly evident. It is relatively easy, with some practice, to identify the transitional zone which steps up from the surrounding soft tissue.

# Measuring and documenting lipo<sup>1</sup>



1. Determine by palpation the extent of the lipo zone. Using a skin-safe marker pen, draw a line around its exact border. The shape is sometimes circular but it can be any shape.

2. Measure the distance along its longest axis and record. Use body maps if available or body landmarks for reference to record the exact position. If possible (and with permission of the patient) **photograph without using flash and from a distance of one metre.**



3. Using the oblique light source will reveal surface contours. Use the photograph and measurement records to follow evolution of the lipo lesion over the long-term.

# Post examination care<sup>1</sup>



1. Teach the patient to conduct **self-examination** for lipos at regular intervals. The use of a hand or body lotion may help locate lipos more easily.

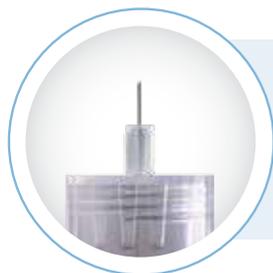
2. **Review sites** at every clinical visit thereafter.

3. Advise the patient they **must not inject into the lipohypertrophic area** until they are told it is safe to do so by their healthcare professional.



4. Avoiding lipos and injecting into healthy tissue often results in lower insulin dose requirements. Ask the patient to monitor their blood glucose levels closely, being **very vigilant for hypoglycaemia**. **Dose adjustment by a qualified healthcare professional may be required.**

5. **Review the patient's injection technique.**



Patients who switch from injecting into lipo to normal tissue are at risk of hypoglycaemia. Dose adjustment may be required by a qualified healthcare professional.<sup>1</sup>

# Tips for educating patients<sup>1</sup>

Patients who inject or infuse their diabetes medication can develop poor technique which reinforces the need for regular patient reviews and ongoing education.

- 1. Stop re-using needles.** Needles are developed for single-use only. Patients should be taught to use a new needle *every time* they inject to reduce the risk of injection site complications.
- 2. Use a short needle.** All patients should use a 4mm or 5mm pen needle, or 6mm insulin syringe to minimise pain and reduce the risk of accidental intramuscular risk due to using larger injection zones.
- 3. Make use of the latest needle technology** such as advanced needle geometry and extra thin-walled needles to make dosing easy and minimise discomfort when injecting into healthy tissue.
- 4. Correctly rotate injection/infusion sites.** Patients should be taught to space out their injections approximately 1-2cm (at least one adult fingerbreadth) from each other. An injection site rotation grid can be helpful for patients.

**Patients should be given an easy-to-follow rotation plan so that a single injection site is used no more frequently than every four (4) weeks.** For example, divide an injection area into quadrants, using one (1) quadrant per week, and rotating quadrant-to-quadrant in a consistent clockwise direction.



#### References:

1. Frid AH, Kreugel G, Grassi G et al. *Mayo Clin Proc.* September 2016;91(9):1231-1255. 2. Blanco M, Hernández MT, Strauss KW, et al. *Diabetes Metab.* 2013;39(5):445-453. 3. Grassi G, Scuntero P, Trepiccioni R, et al. *J Clin Translat Endocrinol.* 2014;1(4):145-150. 4. Famulla S, Hövelmann U, Fischer A, et al. *Diabetes Care.* 2016 Jul 13;pii: dc160610. 5. Hovelmann U, Famulla S, Hermanski L, et al. *Diabetes.* 2015;64(suppl 1):A254-A255.

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