

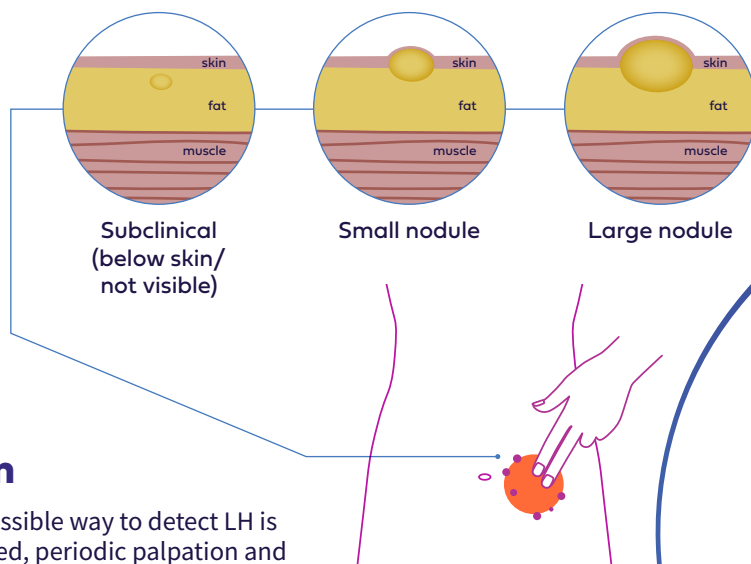
Lipohypertrophy Recommendations



The FITTER Forward recommendations educate how to reduce risk and manage lipohypertrophy for people with diabetes.

About Lipohypertrophy (LH)

- LH is an enlargement of adipocytes that present as swelling or induration of fat tissue
- Risk factors for developing LH include incorrect site rotation, longer duration of insulin use, and needle reuse



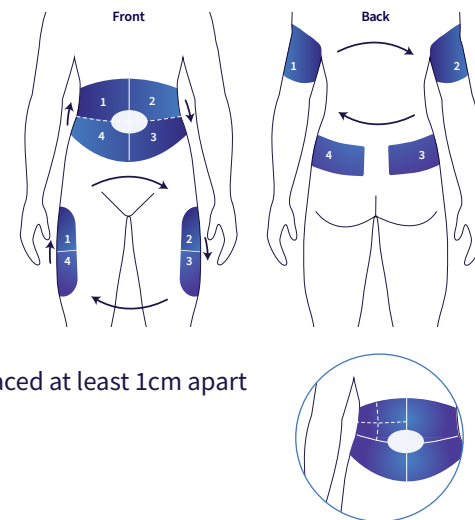
Detection

- The most accessible way to detect LH is using structured, periodic palpation and visual examination of all injections sites
- Ultrasound technology can also be used to detect LH, and is a sensitive and objective tool when available
- If detected, document size and position of LH
- Patients should avoid injecting insulin into the affected area for 3-6 months until healed
- Consider adjusting the insulin dose to make up for poor insulin absorption when injected into LH

37-64%
of adults with
diabetes taking
insulin have LH

Site Rotation

- Recommended sites for injection are the **abdomen, thigh, buttock, and upper arm**
- Correct rotation technique has the highest protective value against LH
- Each injection site can be divided into sections and systematically rotated through on a weekly basis
- Each injection should be spaced at least 1cm apart

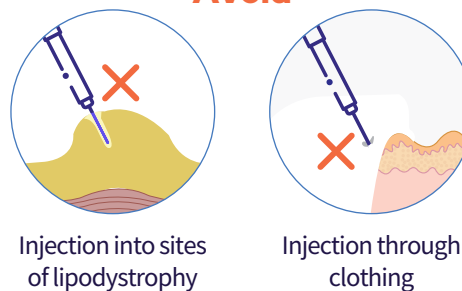


Why does it matter?

In a 2024 meta-analysis of 37 studies, LH was associated with:

- Higher prevalence of unexplained hypoglycemia
- Uncontrolled glycemia
- Unknown glycemic variability
- Higher insulin doses

Avoid



Access the full
manuscript here:

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Klonoff DC et al. Mayo Clin Proc. 2025;100(4):682-699.
doi:10.1016/j.mayocp.2025.01.004