

Meet Ann



52 year old ♀
Type 2 diabetes
for 12 years

- Injecting 30/70 biphasic mix insulin for the past 7 years.
- Injecting 50 units before breakfast and 30 units before evening meal.
- Using an 8mm pen needle.
- HbA1c has been drifting up over the last 18 months from 62 mmol/mol to her most recent value of 74 mmol/mol.

Current Challenges

- 1 Unexplained glycaemic variability.
- 2 Occasional episodes of unexplained hypoglycaemia.



Injection Technique Review:

- **Site selection:** uses her abdomen and occasionally will use thighs but finds injections there “burn”.
- **Site rotation:** rotates by moving from left to right on her abdomen, similar location either side, examination indicates evidence of lipohypertrophy.
- **Technique:** injects at a 90° angle, no lifted skin fold and does not resuspend her insulin before each injection.
Ann has developed a few short-cuts that may be contributing to her erratic readings. She does not:
 - resuspend her insulin before injecting;
 - rotate her sites properly; or
 - perform a lifted skin fold with her 8mm pen needle.

What does the research say?

Gibney 2010¹

Inadvertent intramuscular (IM) injections may **increase pain** and/or **adversely affect blood glucose control**.



Chowdry 2003²

Injecting into areas of lipohypertrophy can result in a significant **delay in insulin absorption** and cause **fluctuating blood glucose results**.



Berard 2011³

Exercise, increased skin temperature and massaging at the injection site can **increase the absorption rate of insulin** and potentially **result in hypoglycemia**.



Recommendations for Ann:



Resuspend cloudy insulin (roll 10 times, tip 10 times, visual check) before each injection to ensure that she is receiving the proper mixture of insulin.



Use a shorter pen needle to reduce pain and potential risk of IM injections. Inject at a 90° angle without a lifted skin fold.



Use a structured rotation pattern including injections into abdomen and thighs. Avoid areas of lipohypertrophy.



Consider reducing insulin dosage to prevent hypoglycaemia when using healthy injection sites.

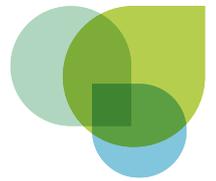


Monitor glucose levels at least twice daily at varying times and book a follow up in 2 weeks.

Ann returned for follow up 2 weeks later. She is using 4 mm pen needles and following a structured rotation pattern. She carefully mixes her cloudy insulin. Her day-to-day results have been much more predictable with no episodes of hypoglycemia and no “burning” on injection. Ann can now start to adjust her insulin with more confidence and improve her likelihood of reaching her HbA1c goal with a much lower chance of experiencing hypoglycemia.

FIT UK Recommendations:³

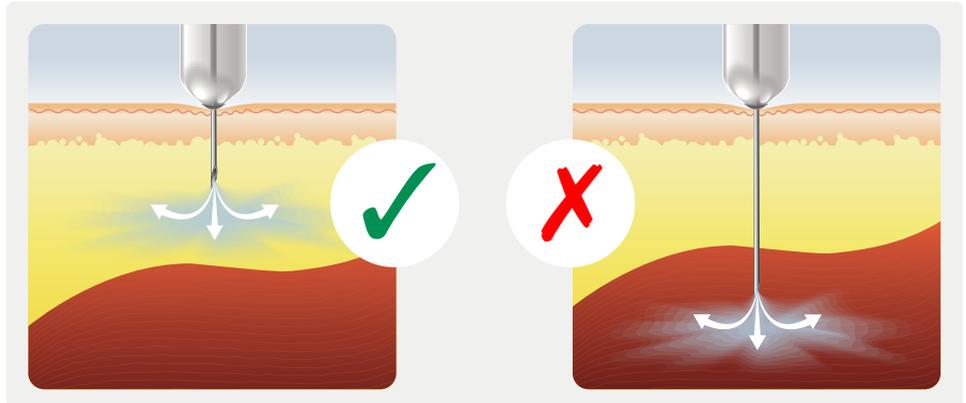
Insulin is absorbed fastest from the abdomen. The upper arm and lateral side of the thigh, not proximal to the knee, have moderate absorption rates and the buttocks is the slowest absorbed site and may be preferred if slow absorption is desired.



Did you know?

Where you inject matters.

- 1 Insulin should be injected into the subcutaneous, or “fatty layer” of your skin where absorption is predictable and consistent.
- 2 An accidental injection into your muscle can actually speed up the action of your insulin and could result in a low blood glucose.



Did you know?

How you inject matters

- 4, 5 and 6mm needles are suitable for all adults with diabetes, however, the risk of an injection into the muscle increases as the needle gets longer. If you are extremely lean, you may need to inject into a lifted skin fold.
- Avoid injecting into damaged skin, scars or moles as absorption may not be consistent at those sites.

- A structured site rotation plan can reduce your risk of developing lipo hypertrophy at your injection sites. Rotate between your injection sites (ie. rotate between your abdomen, thighs and buttocks) and rotate within your injection sites (ie. your next injection within a site should be 2-3cm from your last).



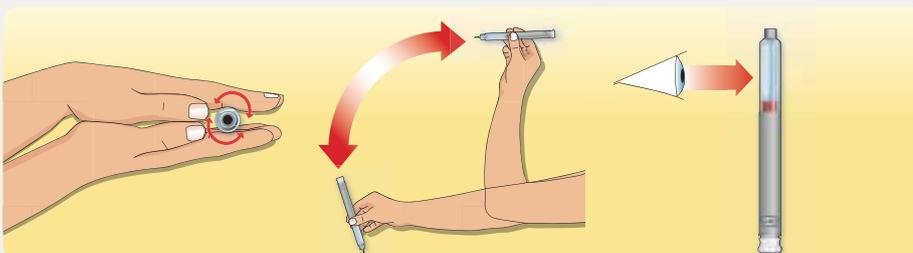
- Hold the needle in the skin for a count of 10 after your injection is complete. Proper hold time will ensure that you receive your complete dose of insulin and reduce the risk of insulin dripping from the pen or leaking from your skin.



Did you know?

How you prepare your insulin affects how it works If you are using a cloudy insulin (NPH or mixed insulin), you need to ensure that it is properly mixed before each injection.

It's easy. Roll it between your hands 10 times, tip it 10 times and visually check to ensure that it has a consistent, milky appearance.



Did you know?

Some factors can speed up the absorption of your insulin and affect your blood glucose control.



1. Gibney MA, et al. Skin and subcutaneous adipose layer thickness in adults with diabetes at sites used for insulin injections: implications for needle length recommendations. *Curr Med Res Opin* 2010;26(6):1519-30. 2. Chowdhury TA, Escudier V. Poor glycaemic control caused by insulin induced lipo hypertrophy. *Brit Med J* 2003;327:383-4. 3. Hicks D, et al. *The First UK Injection Technique Recommendations 2nd Edition October 2011.*