FIT Technique Plus*
Site Selection & Site Rotation

*Educational tools based on FIT Canada Recommendations for Injection Technique, updated February 11th, 2020

Meet George

49 year old ♂
Type 1 diabetes for 30 years
BMI = 23kg/m²

- A1c = 9.2%, FBG ranges from 2-18 mmol/L, pre meal 2-26 mmol/L, bedtime 7-17mmol/L.
- Long acting insulin: 38 units before bed.
- Rapid acting insulin: 10 units at breakfast, 8 units at lunch and 12 units at supper. Take 2-4 units sometimes with snacks.
- Correction factor: 1 unit of rapid acting insulin will lower his blood sugars 2.0 mmol/L.

Current Challenges

- Elevated A1c.
- Unexplained glycemic variability.

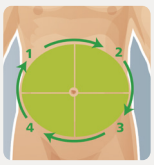
Injection Technique Review:

- **Site rotation:** does not use a structured pattern.
- **Site selection:** prefers to inject in his thighs, as they are the easiest for him to access, but will randomly use his abdomen.
- **Site inspection:** lipohypertrophy present at his two favourite injection sites (thighs).
- **Technique:** currently injects 6mm pen needle at a 90° angle, no skin lift. Admits using too much pressure on his pen needle, when he is in a hurry. Changes his pen needle every 2-3 days.
- **Did you know?** Poor injection technique practices can lead to lipohypertrophy. Insulin injected into areas of lipohypertrophy is not absorbed properly. This can lead to glycemic variability and increased hypoglycemia.[1]
- **Longer needles increase the risk of IM injection of insulin.**

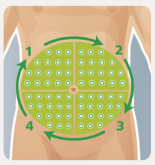
What does the research say?

Misnikova et al 2017[2]
Structured injection-technique training, including changing to a shorter needle (4mm and 5mm), resulted in a 1.0% reduction in A1C

Smith et al 2017[3]
Following an intensive education program on structured site rotation, lower levels of hypoglycemia were experienced with increased glycemic stability, resulting in improved A1c and a decrease in lipohypertrophc lesions.



Patton 2010[4]
To reduce risk of lipohypertrophy, structured site rotation within the same anatomical region is recommended. Each injection should be at least 1-2cm from the last.



Recommendations for George

- Avoid injecting into his lipohypertrophic sites in his thighs.
- Use a smaller needle, 4mm recommended, to avoid the risk of intramuscular injections
- Use the outer areas of his abdomen for injections, using a post card size area, rotating sites by 1-2 cm
- Increase blood glucose monitoring and reduce the insulin dose as necessary when switching to healthy injection sites
- Inspect his injection sites daily for any redness, swelling, irregular lumps or bumps
- Discouraged the reuse of his pen needles

George started a structured rotation plan for his insulin injections. By avoiding his lipohypertrophic sites and monitoring his glucose regularly, George was able to reduce his insulin dose and there was an improvement in his A1C.

FIT Canada Recommendation:

Patients should be assisted in developing a personalized rotation plan for their insulin injections to prevent lipohypertrophy and maintain consistent absorption.

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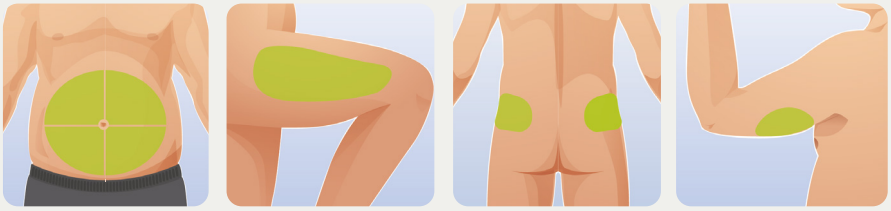
Did you know?

Where you inject insulin matters.
The preferred areas to inject are:
- abdomen
- thighs
- buttocks



abdomen | thigh | buttocks | back of arms

The back of the arm is not recommended for self-injection due to difficulty accessing the site. Caregivers who have been properly instructed in insulin injection technique may choose this site for convenience.

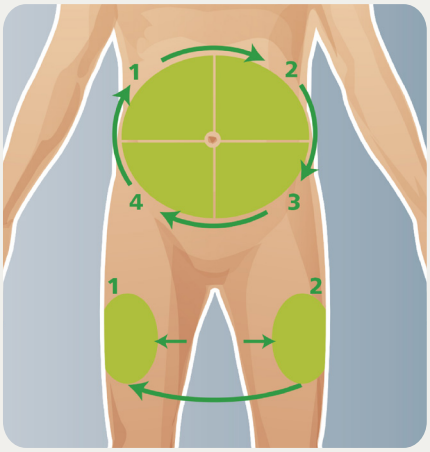
Did you know?

A structured rotation pattern can help prevent problems at injection sites. Structured rotation means rotation between injection sites and within an injection site.

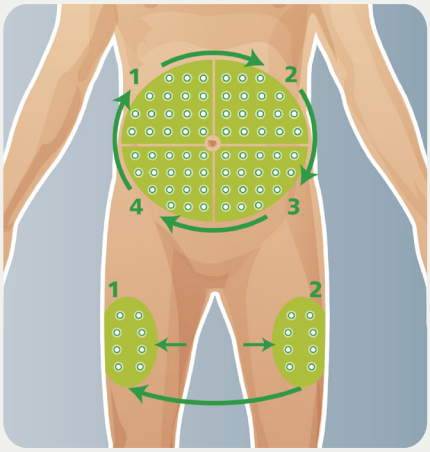
For example,

1. Divide your abdomen injection area into 4 areas.
2. Divide each area into smaller sections, trying to maximize the smaller sections. Use only one section each week.
3. Rotate within that section, in a circular pattern, with the next injection being 1-2cm (finger-width) from your last.
4. Rotate to the next section the following week, etc.

rotate the site you use



rotate within the site you use



Did you know?

Risk of lipohypertrophy at your injection sites is higher when you don't change your needle and when you don't rotate your injection sites with each injection.

When you inject into an area of lipohypertrophy, your insulin might not be absorbed properly. You may experience fluctuating blood sugars and hypoglycemia. To prevent this, do not inject into an area of lipohypertrophy and examine your sites before each injection. Reducing your insulin dosage could be necessary if you change from an area of lipohypertrophy to an area with healthy tissue. **Steps for site inspection:**

1. Stand up and feel the area where you normally inject.
2. Look and feel for puffiness, raised areas, redness, hardness or lumpiness.
3. Discuss any concerns with your health care professional.

My Site Rotation Plan

It's all about keeping your injection sites healthy. Establish a routine and keep track!

There are many examples of how to rotate your injection sites. Your health care professional can assess your sites to help you design a site rotation plan that will work best for you and try to maximize the smaller areas.

See next page for an example of an injection site rotation plan.

1. Famulla, S. Hovelmann U, Fischer A. et al. Insulin Injection Into Lipohypertrophic Tissue: Blunted and More Variable Insulin Absorption and Action and Impaired Postprandial Glucose Control Diabetes Care 2016;39:1486–1492
2. Misnikova IV, Gubkina VA, Lakeeva TS, Dreval AV. A Randomized Controlled Trial to Assess the Impact of Proper Insulin Injection Technique Training on Glycemic Control. Diabetes Ther. 2017;8:1309-1318. doi: 10.1007/s13300-017-0315-y
3. Smith M, Clapham L, Strauss K. UK lipohypertrophy interventional study. Diabetes Res Clin Pract. 2017;126:248-253. doi: 10.1016/j.diabres.2017.01.020
4. Patton SR, Eder S, Schwab J, Sisson CM. Survey of insulin site rotation in youth with type 1 diabetes mellitus. J Pediatr Health Care. 2010;24:365-371. doi: 10.1016/j.pedhc.2009.11.002

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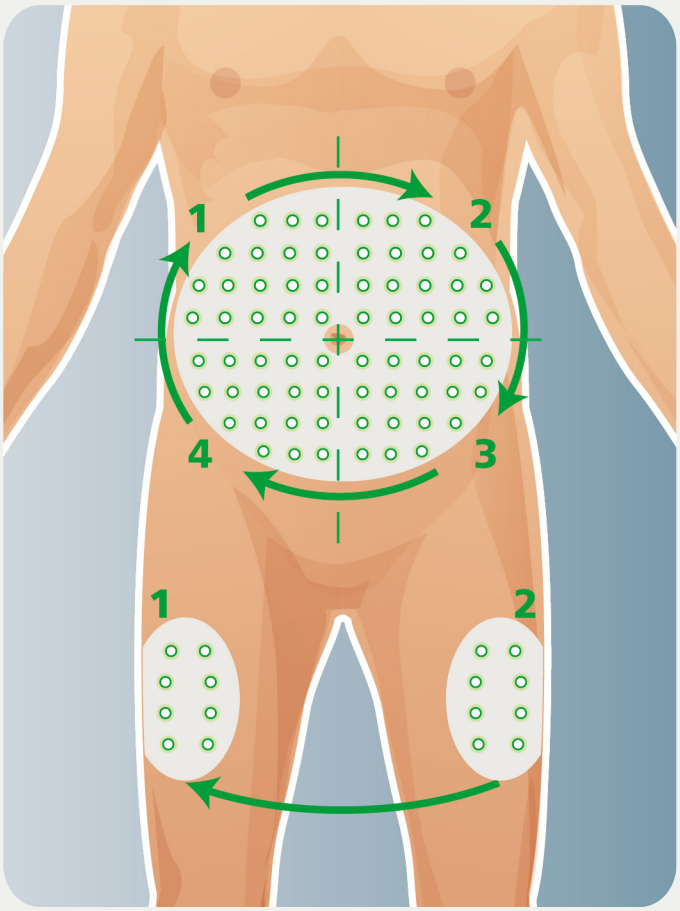
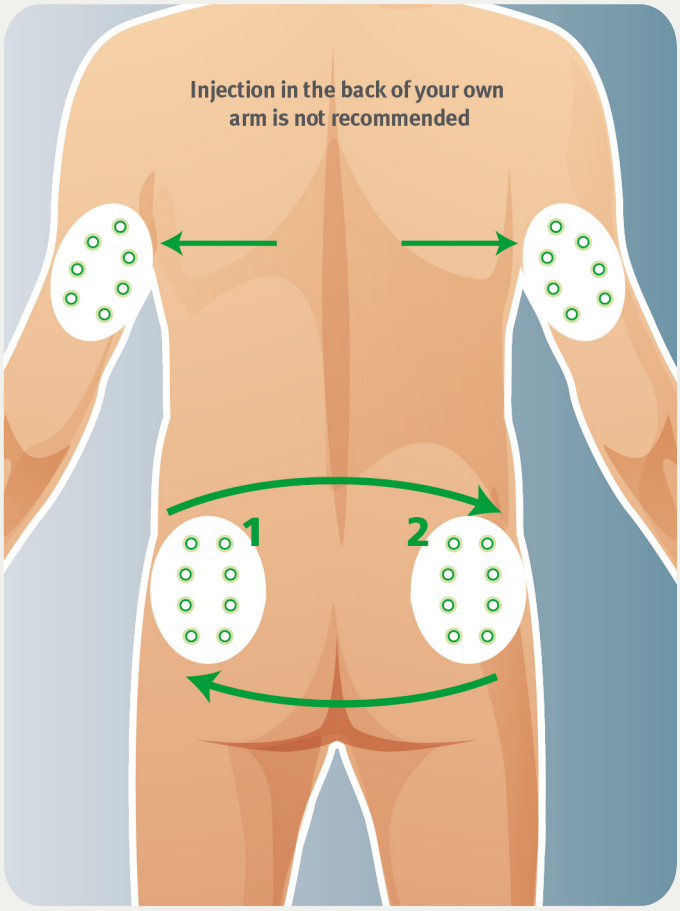
My Site Rotation Plan





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