



# 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/m<sup>2</sup>

- A1c = 9.2%, FBG ranges from 2-18 mmol/L, pre meal 2-26 mmol/L, bedtime 7-17mmol/L.
- Long acting insulin: 24 units before breakfast and 14 units before bed.
- Rapid acting insulin: 1:10 ratio at breakfast, 1:8 ratio with remaining meals and 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 4mm pen needle at a 90° angle, no skin lift. 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.<sup>1</sup>
- **Longer needles increase the risk of IM injection of insulin.**

### What does the research say?

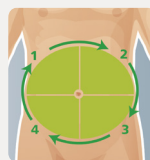
#### Hirsch 2014<sup>3</sup>

To reduce the risk of intramuscular injections, the most suitable injection sites for adults are the abdomen, thighs and buttocks.



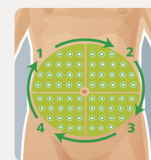
#### Bartsch 2006<sup>4</sup>

The abdomen has the most consistent absorption and is preferred site for injection with consideration given to patient preference.



#### Patton 2011<sup>5</sup>

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 abdomen.
- Use a smaller needle, 4mm recommended, to avoid the risk of intramuscular injections
- Use the outer areas of his abdomen for injections, rotating sites by at least 1-2 cm apart
- 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, or irregular lumps
- Discouraged the reuse of his pen needles

Follow up A1c in 3 months showed improvement in his glycemic control. Danny continues to use a structured rotation plan and keeps track in his logbook.

### FIT Canada Recommendation:<sup>6</sup>

Patients should be taught a personalized rotation for their injection sites 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?

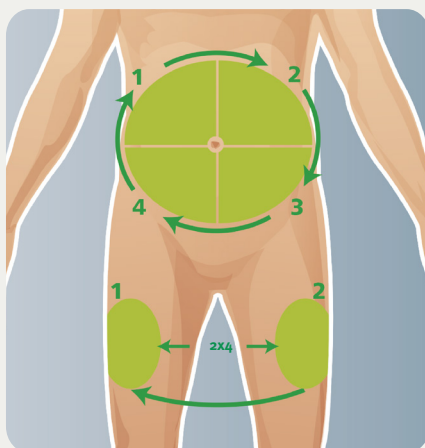


A structured rotation pattern can help prevent problems at injection sites. Structured rotation means rotation between injection sites and within an injection site.

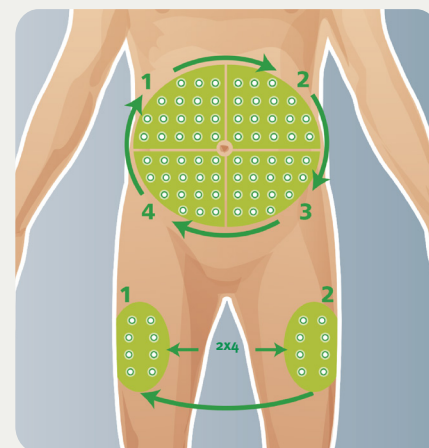
For example,

1. Divide your abdomen injection area into 4 areas.
2. Divide each area into smaller sections. Use only one section each week.
3. Rotate within that section, in a circular pattern, with the next injection being 1-2cm 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.

Injecting into an area of lipohypertrophy may prevent your insulin from working the way it should. That's why it's important to rotate properly and check your site before you inject.<sup>1</sup>

#### 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.

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.

2. Diabetes Care 2016;39:1486-1492

3. Frid, A. Hirsch, L. Menchoir, A. Worldwide injection technique questionnaire study: Injecting complications and the role of the professional. Mayo Clinic Proc. 2016;91:1224-1230.

4. Hirsch L. Bryon K. Gibney M. The intramuscular risk at insulin injection sites; measurement of the distance from skin to muscle and rational for shorter-length needles for subcutaneous insulin therap . Diabetes Technol The. 2014;16:867-873.





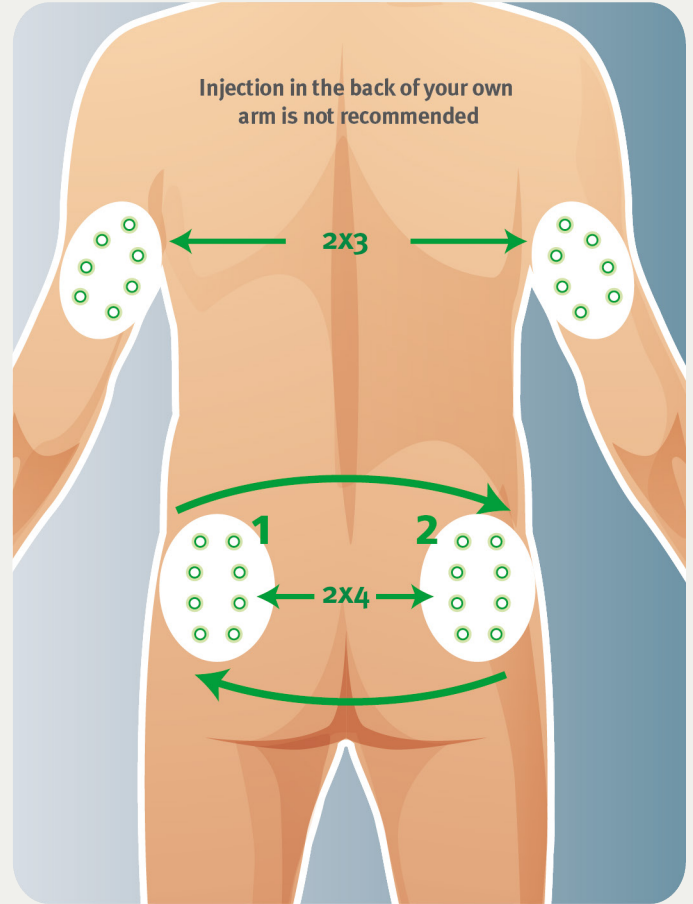
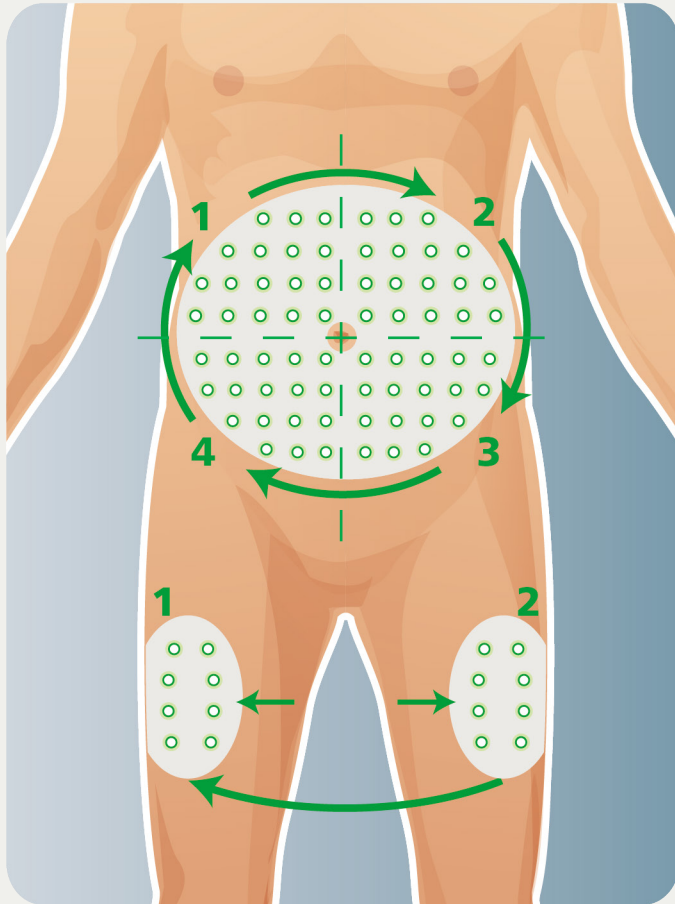
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### My Site Rotation Plan



### Notes...

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