



# FIT Technique Plus\*

## Continuous Subcutaneous Insulin Infusion (CSII)

\*Educational tools based on FIT  
Canada Recommendations for  
Injection Technique



### Practical FIT Tip (Pickup 2014):<sup>5</sup>

Sudden onset of unexplained hyperglycemia, particularly if accompanied by nausea and vomiting, should prompt blood and urine ketone assessment, administration of insulin via an alternate source (e.g., insulin pen or syringe), followed by an assessment of the infusion set, insulin tubing and reservoir and changing if required.

### Special considerations:

All CSII patients who become pregnant may require adjustments to their infusion sets, site locations and frequency of site changes.

## Lipo (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. To decrease the risk of lipohypertrophy:

1. Patient should be encouraged to self-inspect infusion sites, skin and fields of fat frequently. Sites should be inspected by HCP regularly or at least annually.
2. Advise to stop infusion into these lesions and insert cannula into healthy tissue.
3. Cannula should be changed every 48–72 hours (or per manufacturer's recommendation) in order to minimize infusion site adverse events and potential metabolic deterioration.
4. Teach to rotate infusion sites along the same principles that injecting patients are taught to rotate injection sites.

5. Scan the QR code to learn more about injection site selection and rotation:



## Skin integrity (Did you know?)

To achieve stable glycemic control, insulin delivery and absorption must be appropriate and predictable. However, infusion sets have been described as the “Achilles heel” in pump use, accounting for negative patient experiences and discontinuation. Numerous people report skin sensitivity as an issue.

### Pump therapy patients should consider the following:

1. The shortest needle/cannula available, to minimize the risk of intramuscular (IM) infusion.
2. The smallest diameter needle/cannula to reduce pain and the occurrence of insertion failure.
3. Angled insertion sets or steel cannula sets for those who experience infusion site complications with perpendicular (ninety degree) infusion sets.
4. Anyone who experiences a hypersensitivity reaction to cannula material or adhesive should be considered for alternative options (alternative sets, tapes, or skin barriers).
5. Everyone should remove adhesive from their skin.



6. Referral to a healthcare professional if severe skin reactions are noted – may be an allergic response.

## Helpful resources

Infusion Set Comparison: [diabetesnet.com/diabetes-technology/infusion-set-comparison](https://diabetesnet.com/diabetes-technology/infusion-set-comparison)

Skin Care for Sensors and Pumps: [diabeteseducatorsalcalgary.ca/devices/skin-care.html](https://diabeteseducatorsalcalgary.ca/devices/skin-care.html)

Patient Tip Sheets: [pantherprogram.org/skin-solutions](https://pantherprogram.org/skin-solutions)





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### Did you know? (troubleshooting hyperglycemia)<sup>6</sup>

There is a greater risk of diabetic ketoacidosis (DKA) in pump users.

#### Recommendations:

1. Sudden onset of unexplained hyperglycemia, particularly if accompanied by nausea and vomiting, should prompt blood ketone (urine) assessment, administration of insulin via an alternate source (e.g., insulin pen or syringe), followed by an assessment of the infusion set, insulin tubing and reservoir and insulin changing, if required.
2. Check glucose level 2 hours after any site change.
3. Know your DKA prevention protocol.
4. Any unexplained glucose variability should have infusion sites checked for lipohypertrophy, nodules, scarring, inflammation or other skin and subcutaneous (SC) conditions that could affect insulin flow or absorption.
5. Silent occlusion of insulin flow should be suspected in any patient with unexplained glucose variability or unexplained hyperglycemia.
6. If silent occlusions or flow interruptions are suspected, continuous subcutaneous insulin infusion (CSII) patients should be considered for alternative cannula.

#### Practice Tip:

Know and follow DKA prevention protocol as provided by your HCP.



### Notes

#### References:

1. Messer LH, et al. Preserving skin integrity with chronic device use in diabetes. *Diabetes Technol Ther.* 2018;20(Supplement 2): S2-54-64.
2. Kastner JR, et al. In vivo study of the inflammatory tissue response surrounding a novel extended wear kink-resistant insulin infusion set prototype compared with a commercial control over two weeks of wear time. *J Diabet Sci Technol.* 2022; 1-10.
3. Barlas t, et al. Evaluation of lipohypertrophy in patients with type 1 diabetes mellitus on multiple daily injections or continuous subcutaneous insulin infusion. *Endocrine Pract.* 2023;29(2):119-126.
4. Wersäll JH, et al. Insulin pump therapy is associated with higher rates of mild diabetic ketoacidosis compared to injection therapy: A 2-year Swedish national survey of children and adolescents with type 1 diabetes. *Pediatr Diabetes.* 2022 Nov;23(7):1038-1044.
5. Pickup JC, et al. Nonmetabolic complications of continuous subcutaneous insulin infusion: a patient survey. *Diabetes Technol Ther.* 2014;16:145-149.
6. FIT Forum for Injection Technique Canada - Recommendations for Best Practice in Injection Technique (4<sup>th</sup> Edition). Available from: [https://fit4diabetes.com/wp-content/uploads/2023/08/FIT-Pocket-Guide\\_EN-2022.pdf](https://fit4diabetes.com/wp-content/uploads/2023/08/FIT-Pocket-Guide_EN-2022.pdf).

