



INJECTION TECHNIQUES

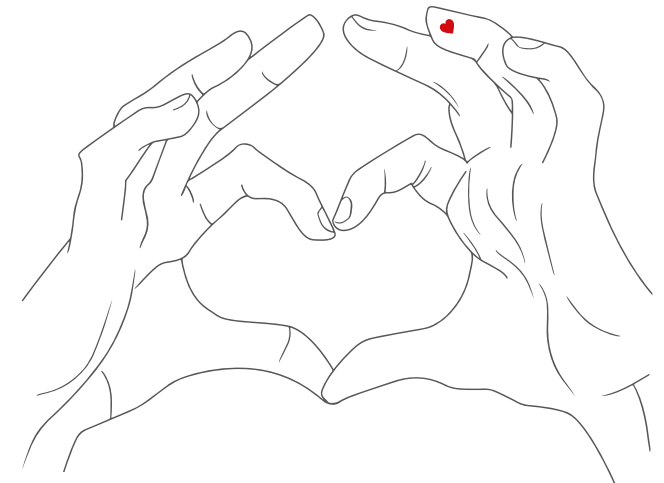
PRACTIAL GUIDELINES

Proper injection techniques

Dear User,

Thank you for trusting and choosing the Droplet brand. For your safety and convenience, we have prepared a **short guide** that will **help you improve insulin delivery techniques** and make your daily life with diabetes easier.

We are aware that success of a company depends on the condition of the surroundings in which it operates, thus we aspire to maintain balance with regard to three goals: business, community, and the environment.



Injection technique

The proper **injection technique** helps people with diabetes to achieve the **best possible health outcomes** by ensuring that the **relevant dose** of medication is delivered to the correct injection site, using the **proper needle size**¹.

The proper injection technique includes^{2,3}:

- injection site
- lifting a skinfold
- angle of injection
- site rotation
- needle length
- needle gauge

1 Adhikari S, Poudel RS, Rajbanshi L, Shrestha S. Assessment of Insulin Injection Practice of Nurses Working in a Tertiary Healthcare Center of Nepal. Nursing Research and Practice; 2018.

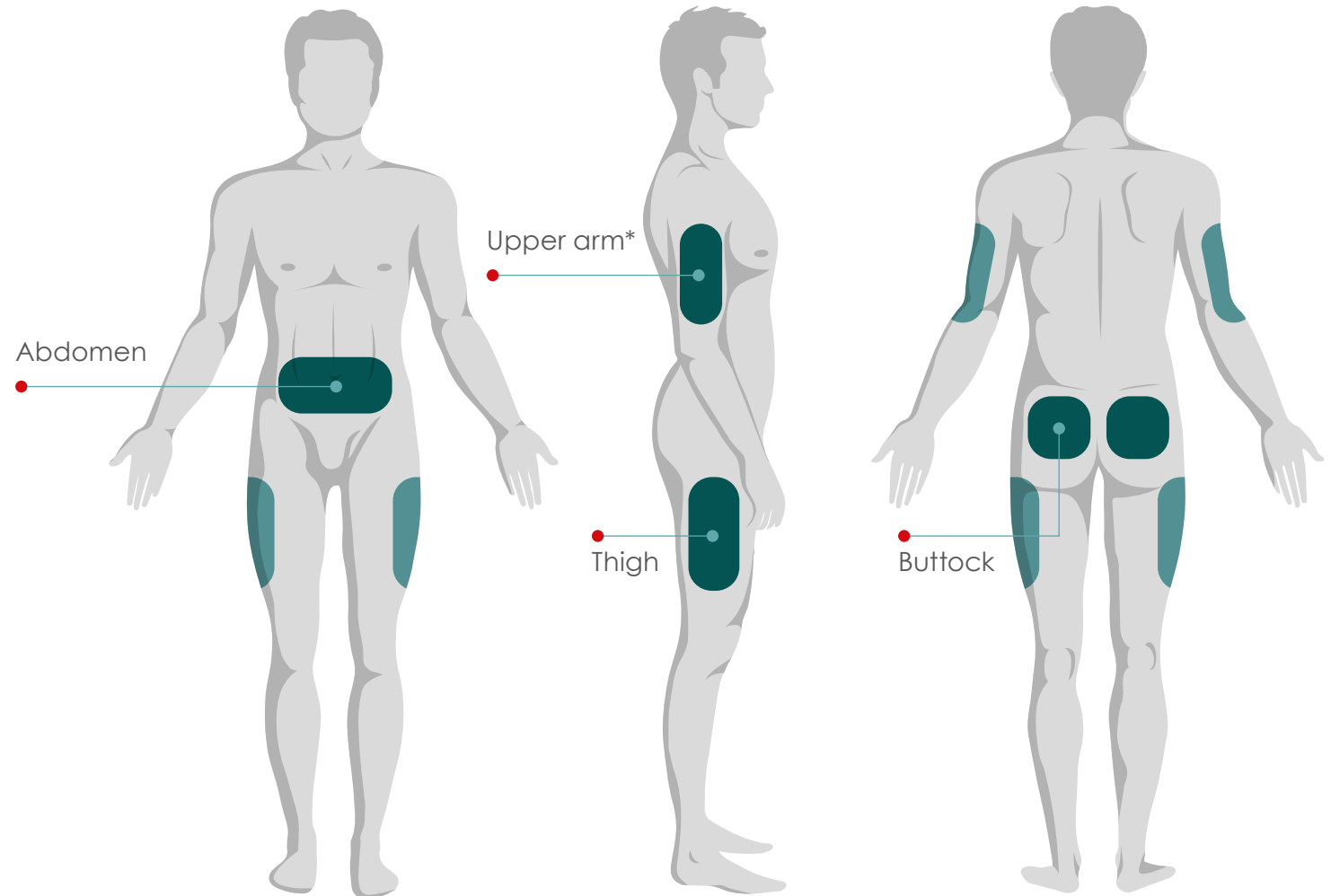
2 Frid AH, Kreugel G, Grassi G, Halimi S, Hicks D, Hirsch LJ, et al. New Insulin Delivery Recommendations. Mayo Clin Proc. 2016 Sep;91(9):1231-55.

3 World Health Organization (2010) Best practices for injections and related procedures toolkit. Geneva: WHO.

Injection sites

The recommended injection sites are:

- Abdomen
- Thigh
- Buttock
- Upper arm²

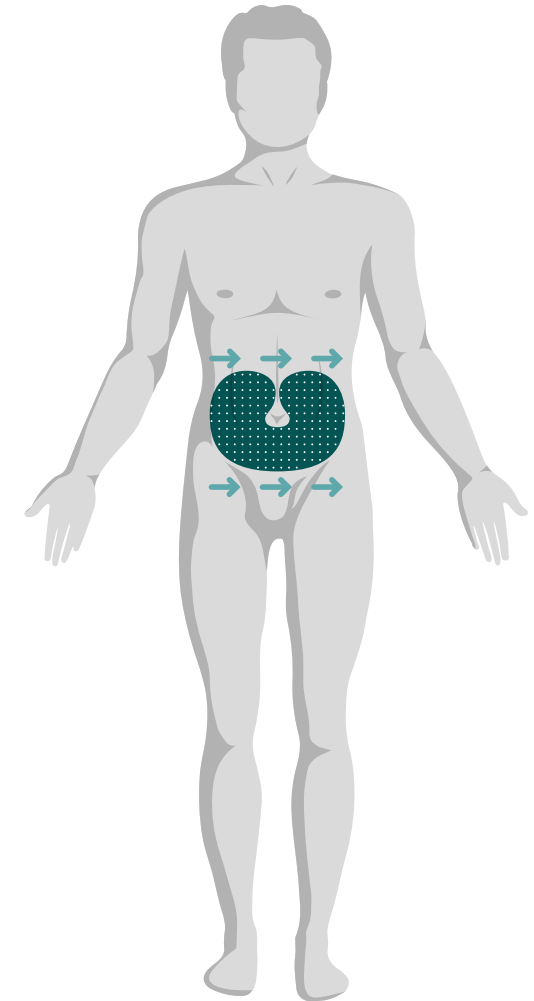


* with help of a third party

2 Frid AH, Kreugel G, Grassi G, Halimi S, Hicks D, Hirsch LJ, et al. New Insulin Delivery Recommendations. Mayo Clin Proc. 2016 Sep;91(9):1231-55.

Site rotation

- **Regular rotation** of the injection site helps to maintain healthy tissue and avoid from damage called lipohypertrophy (LH)³.
- Further injections should be **spaced at least 1 cm** from previous injection³.
- Injections in the **belly should** be approximately **4 cm away from the navel**. The tissue close to the belly button is tougher, so the insulin absorption will be incorrect⁴.



³ Hirsch LJ, Strauss KW. The Injection Technique Factor: What You Don't Know or Teach Can Make a Difference. Clin Diabetes. 2019 Jul;37(3):227-233. <https://pmc.ncbi.nlm.nih.gov/articles/PMC6640874/>

⁴ World Health Organization (2010) Best practices for injections and related procedures toolkit. Geneva: WHO.

Lifting a skinfold

Lifting a skinfold **IS REQUIRED:**



- In **children** who are **slim**, when injecting into the **limbs** or **abdomen**, especially when using a **4 mm** or **5 mm needle**.



- In **adults** who use **8 mm pen needle** and / or inject at **45 angle** in order to avoid injecting into muscle⁶.

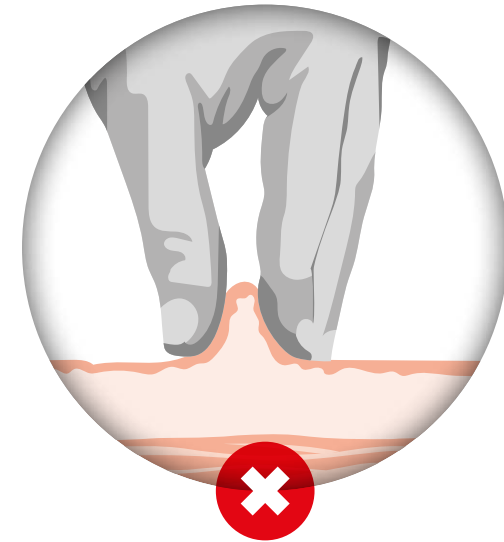
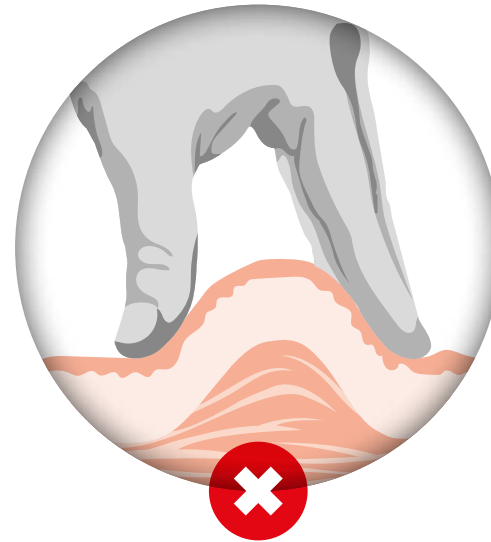
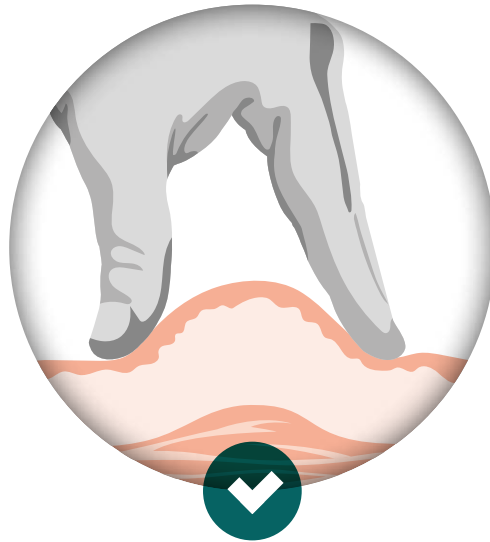
² Frid AH, Kreugel G, Grassi G, Halimi S, Hicks D, Hirsch LJ, et al. New Insulin Delivery Recommendations. Mayo Clin Proc. 2016 Sep;91(9):1231-55.

⁵ The First UK Injection Technique Recommendations 2nd Edition October 2011.

⁶ King L. Subcutaneous insulin injection technique. Nurs Stand 2003 May 7-13;17(34):45-52.

Lifting a skinfold

A correct fold is made by lifting the skin with the thumb and index finger (possibly adding the middle finger)^{2,5}.



² Frid AH, Kreugel G, Grassi G, Halimi S, Hicks D, Hirsch LJ, et al. New Insulin Delivery Recommendations. Mayo Clin Proc. 2016 Sep;91(9):1231-55.

⁵ The First UK Injection Technique Recommendations 2nd Edition October 2011.

Lifting a skinfold

THE OPTIMAL SEQUENCE when injecting into a skinfold is as follows²:

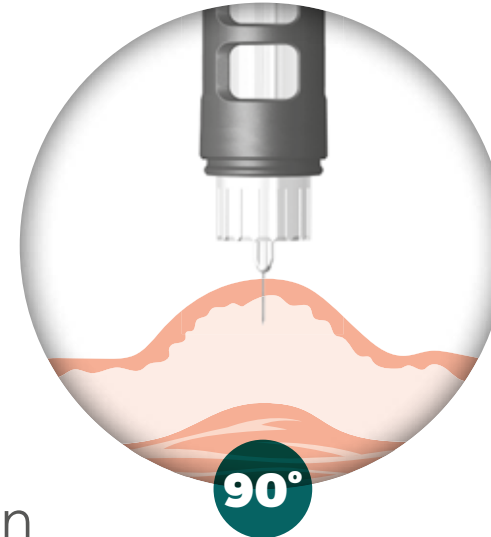
- 1 Gently **lift a skinfold**.
- 2 **Inject the insulin slowly at a 90 angle** to the surface of the skinfold.
- 3 Do not aspirate the needle.
- 4 Let the needle remain in the skin for a **count of 10 after the plunger** is depressed.
- 5 **Withdraw the needle** from the skin at the same angle it was inserted.
- 6 Release the skinfold.
- 7 **Do not massage** the injection site.
- 8 Dispose of the used needle safely.

2 Frid AH, Kreugel G, Grassi G, Halimi S, Hicks D, Hirsch LJ, et al. New Insulin Delivery Recommendations. Mayo Clin Proc. 2016 Sep;91(9):1231-55.

Angle of injection

WITH SKIN FOLD:

- **Creating a skin fold is highly recommended for slim individuals and children⁶.**
- Alternatively, insertion at a 45-degree angle is sensible. Both techniques can be combined.
- The use of a lifted skin fold or injection at a 45-degree angle is suggested whenever a pen needle longer than 6 mm is used^{2,8}.



2 Frid AH, Kreugel G, Grassi G, Halimi S, Hicks D, Hirsch LJ, et al. New Insulin Delivery Recommendations. Mayo Clin Proc. 2016 Sep;91(9):1231-55.

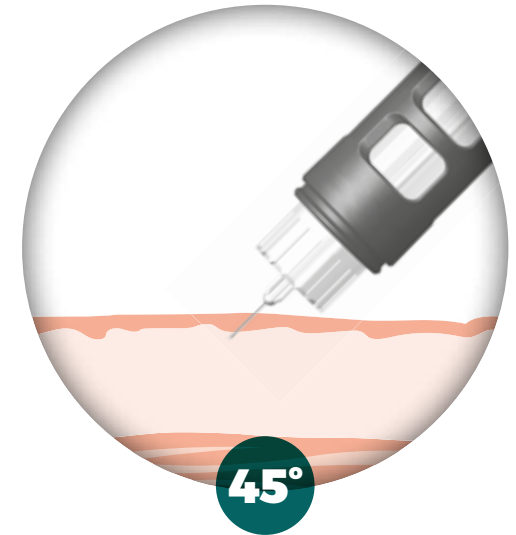
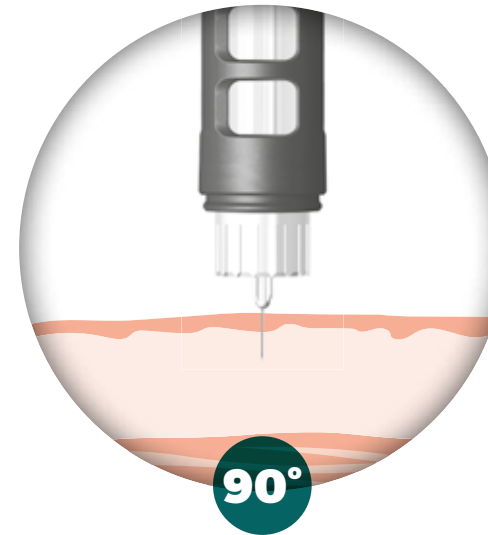
7 Danne T, Bangstad HJ, Deeb L, Jarosz-Chobot P, Mungaie L, Saboo B, Urakami T, Battelino T, Hanas R; International Society for Pediatric and Adolescent Diabetes. ISPAD Clinical Practice Consensus Guidelines 2014. Insulin treatment in children and adolescents with diabetes. Pediatr Diabetes. 2014 Sep;15 Suppl 21:115-34.

8 Australian Diabetes Educators Association (ADEA). Clinical Guiding Principles for Subcutaneous Injection Technique. Canberra: 2015.

Angle of injection

WITHOUT SKIN FOLD:

- For the average adult, the 4 mm pen needles are appropriate and can be injected at a 90-degree angle to the skin surface.
- Although in obese patients longer pen needle can be used.
- Injection of drug to children without a skinfold is not recommended^{2,7,8}.



2 Frid AH, Kreugel G, Grassi G, Halimi S, Hicks D, Hirsch LJ, et al. New Insulin Delivery Recommendations. Mayo Clin Proc. 2016 Sep;91(9):1231-55.

7 Danne T, Bangstad HJ, Deeb L, Jarosz-Chobot P, Mungaie L, Saboo B, Urakami T, Battelino T, Hanas R; International Society for Pediatric and Adolescent Diabetes. ISPAD Clinical Practice Consensus Guidelines 2014. Insulin treatment in children and adolescents with diabetes. Pediatr Diabetes. 2014 Sep;15 Suppl 21:115-34.

8 Australian Diabetes Educators Association (ADEA). Clinical Guiding Principles for Subcutaneous Injection Technique. Canberra: 2015.

Needle length / needle gauge

AGE	BMI	NEEDLE LENGTH*	
		Without skin fold straight injection	With skin fold angled or straight injection
Children	-	-	4mm, 5mm
Slim adults	-	-	4mm, 5mm, 6mm, 8mm, 10mm
Adults	Average	4mm	5mm, 6mm, 8mm, 10mm, 12mm
	Overweight (BMI>25)	4mm, 5mm, 6mm	8mm, 10mm, 12mm

*Consult your healthcare professional for assistance in choosing the appropriate needle length, injection technique and site.

Practical information

- | | |
|----------------|-----------|
| 1 Needle reuse | 3 Leakage |
| 2 Bubbling | 4 IFU |



- **Pen needles** are sterile and for **single use only**.
- **Sterility is guaranteed** if the needle seal is **unbroken**.

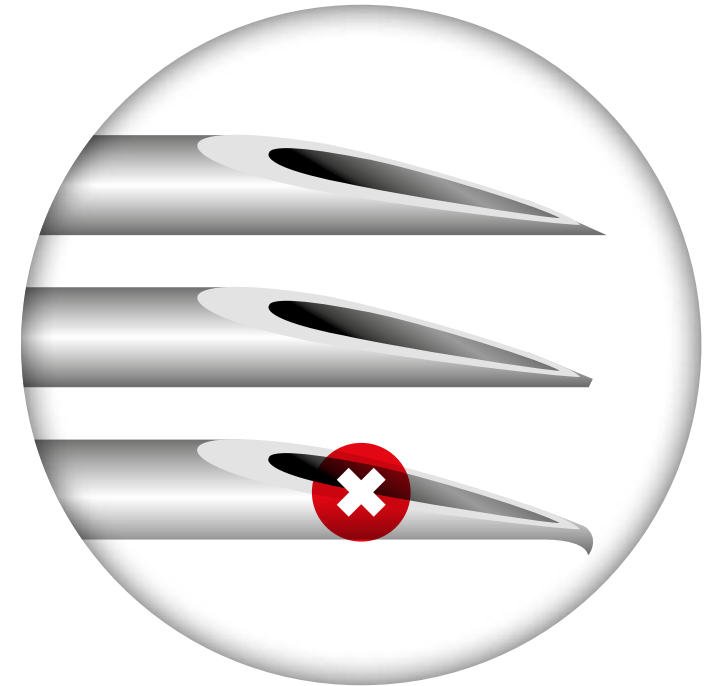
REMEMBER!

Pen needles should be **used only once** and disposed of in a sharps container and must **not be shared with other person!**

Needle reuse

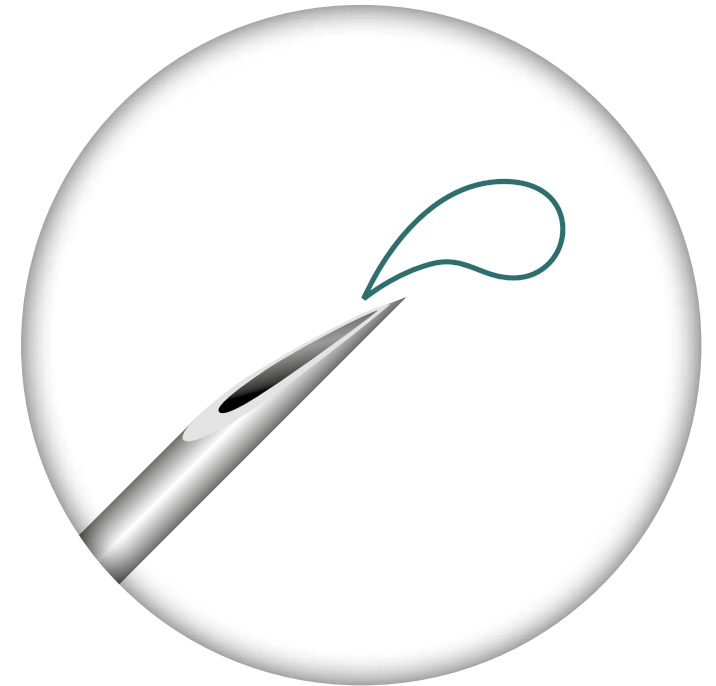
Risk of needle reuse:

- increase the risk of the **needle breaking off** in the skin,
- cause **lipohypertrophy**,
- **dull or bend the tip**, causing pain, bleeding, bruising, or scarring,
- increase the risk of **infection** because the needle is no longer sterile.²



How to prevent insulin bubbling?

- If air bubbles are found in the syringe, **tap on the barrel** to bring them to the surface. They may then be removed by pushing the plunger up.
- **Avoid** vigorous **shaking** as it affects accurate dosing.
- Remember to **make a priming** of the drug.
 - Priming entails seeing at least a **drop of insulin** at the tip of the needle. Once free flow is verified, the patient may dial the desired dose and inject.²



Insulin leakage

How to prevent leakage of insulin²?

- Use **thin-wall** or extra-thin-wall pen needle.
- **Count to 10 after the plunger** is fully depressed before removing the needle from the skin. This allows enough time for the injected medication to spread out through the tissue planes and to cause the tissue to expand and stretch.
- **Split larger doses** of drug / insulin.
- **Reduce the volume of drug** injected to a **maximum of 800 µL** at one time.⁹
- **Avoid** injecting a **site** showing signs of **skin damage (lipohypertrophy)**.*

* If necessary, contact healthcare professional

² Frid AH, Kreugel G, Grassi G, Halimi S, Hicks D, Hirsch LJ, et al. New Insulin Delivery Recommendations. Mayo Clin Proc. 2016 Sep;91(9):1231-55.

⁹ Guo X, Wang W. Challenges and recent advances in the subcutaneous delivery of insulin. Expert Opin Drug Deliv. 2017 Jun;14(6):727-734.

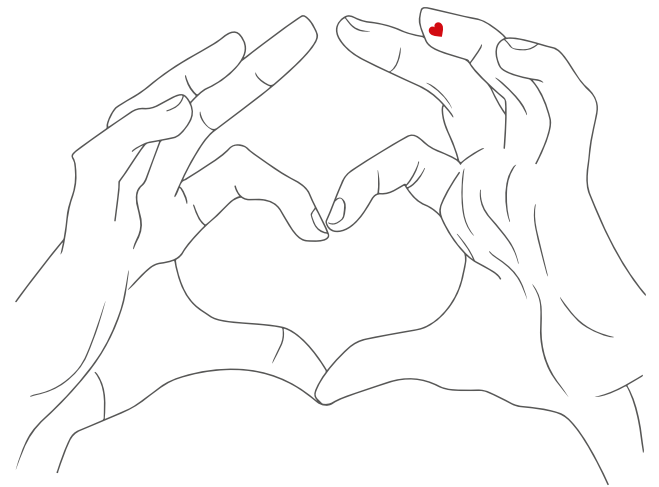
Instruction for use

Information for users included in IFU for Droplet pen needle:

- Read and follow **INSTRUCTIONS FOR USE** before using your pen needles and pen injector (IFU video can be found on our website: www.htl-strefa.com)
- Before each injection, check that your **pen injector contains the correct type of medication.**
- Ask your **healthcare professional** which **needle gauge** and **length** is best for you.

We hope that this short guideline will be useful and will help you improve your injection technique.

GOOD LUCK!



HTL-STREFA S.A.
ul. Adamówek 7
95-035 Ozorków
info@htl-strefa.pl
www.htl-strefa.com
www.mtdglobal.com

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high tech lab
a company of MTD Group

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Medical Technology and Devices