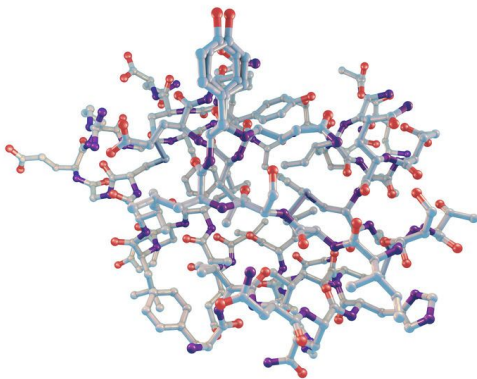


Understanding Your Child's Diabetes: What Are Insulin And Glucagon?



Your child's hormones are always at work. They tell each part of their body — from their skin to their heart to their kidneys — what to do and how to do it. They're essential to health and wellbeing, but when your child has diabetes, some of these hormones don't work as they should.

Insulin and glucagon are two hormones that play an important role in your child's blood sugar levels. Insulin is a hormone that lowers blood sugars by moving sugar out of the blood and into the cells of the body for energy. It's produced in the beta cells of the pancreas.

Glucagon is a hormone that's produced in the pancreas by the alpha cells. It acts as a messenger in the body to release stored sugars from the liver.

Your child's physician may prescribe injections (shots) of these hormones to help you manage your child's diabetes. Here's what you should know about using insulin and glucagon.

Insulin: Usage, Storage, and Additional Tips

There are several different types of insulin with different actions:

Insulin Type	Onset (when the insulin starts to work)	Peak (when the insulin is working its hardest)	Max Duration (how long the insulin will work)
Humalog – “Hg”	15 – 30 minutes	1/2 – 2 1/2 hours	3 – 6 1/2 hours
NovoLog – “Ng”	10 – 30 minutes	1 – 3 hours	3 – 5 hours
Apidra	5 – 15 minutes	45 – 75 minutes	2 – 4 hours
Lantus/Basaglar	3 – 4 hours	Almost no peak	24 hours
Levemir	3 – 4 hours	Almost no peak	6 – 23 hours
Tresiba	1 hour	Almost no peak	42 hours

How To Use Your Child’s Insulin

Initially, the child’s doctor will decide your child’s insulin dose. The time it is given depends on the type of insulin:

- Lantus/Basaglar/Levemir must be given at the same time every day. Tresiba works best when given at the same time every day.
- Humalog/NovoLog/Apidra work best when given before a meal. Do NOT give more frequently than every 2.5 hours.

When you store your child’s insulin:

- Keep insulin from extreme heat or cold temperatures (should be 40-85°F). Insulin will not be effective if it freezes (even slightly).
- Store unopened insulin in the refrigerator.
- Don’t use unopened insulin past the expiration date on the bottle/pen/cartridge.
- Store opened vials on insulin in the refrigerator or room temperature. (Be consistent with temperatures — don’t switch back and forth.)
- Don’t store opened non-disposable pen devices that use cartridges in the refrigerator.

- Mark opened insulin with the date it was opened and use it for no more than 28 days. Levemir is good for 42 days once opened. Tresiba is good for 56 days once opened.

Don't use the insulin if:

- It is cloudy, frosty in appearance, or if solid particles can be seen.
- The expiration date on an unopened bottle/pen/cartridge has passed.

Other Things To Keep In Mind About Your Child's Insulin

- Always communicate that the insulin is measured in “units” to make sure the proper dosage is used.
- To avoid errors in giving your child the wrong insulin, put a rubber band around the rapid-acting insulin.
- Be sure to check the manufacturer and type of insulin before leaving the pharmacy to make sure it is the same as what you have been using.
- If blood sugars are highly erratic without any clear reason, start a new bottle.
- Don't mix or dilute Lantus, Levemir, or Tresiba insulin in the same syringes with any other insulin or diluent.
- Always have back-up bottles of insulin available, but try not to open more than one bottle at a time to avoid confusion.
- It's a good idea to keep insulin in an insulated pack when you are away from home. (See Diabetes and Travel Teaching Sheet.)
- Never use insulin that has not been prescribed by your physician. There are several different concentrations of insulin, and this could be dangerous for your child.

Insulin: A Guide To Subcutaneous Injections And Insulin Pens

In order to give your child insulin, you'll do it through an injection (shot) or an insulin pen. It's important to give these shots properly to keep your child safe and healthy.

Insulin shots are given just below the outer layer of your child's skin (subcutaneously). The amount of medications for subcutaneous shots is small — no more than 1 mL (milliliter).

Getting Medication Ready For The Shot (Syringe)

1. Gather the supplies: a new syringe, vial of medicine, alcohol wipes, and a hard plastic container to throw away needles and syringes.
2. Wash your hands with soap and water.
3. Use a new alcohol wipe to clean the top of the medication vial. Allow the alcohol to dry.
4. Draw up the prescribed dose of medication into the syringe, as instructed.

Getting Medication Ready For The Shot (Insulin Pen)

1. Gather the supplies: new pen needle, insulin pen, alcohol wipes, and a hard plastic container to throw away pen needles
2. Wash your hands with soap and water.
3. Remove the insulin pen cap.
4. Use a new alcohol wipe to clean the top of the insulin pen for 10 seconds. Allow alcohol to dry.
5. Remove the paper cover on the sterile pen needle. A new needle should be used with each injection.
6. Gently screw the pen needle straight onto the top of the insulin pen.
7. Remove the clear cover, and then remove the smaller colored cover.
8. Prime the needle to ensure it's working properly.
 - Turn the dial on the bottom of the pen to 2 units, then press and hold the dial until insulin comes out of the needle. Repeat until you see insulin come out of the needle tip.
 - Turn the dial on the bottom of the pen to 2 units, then press and hold the dial until insulin comes out of the needle. Repeat until you see insulin come out of the needle tip.
 - If you don't see insulin after the third attempt, put the clear plastic cap back on the pen needle, twist the pen needle to remove it from the pen, and throw it away in a hard plastic container.
 - Get a new pen needle and repeat the above steps.
 - Once you see insulin coming out of the tip of the pen needle, the needle is primed.
9. Priming MUST be done before every injection.
10. Once the insulin pen is primed, dial the prescribed or calculated dose of insulin into the pen.

Preparing The Site For The Shot

1. Choose a spot. The preferred spots are the hips, backs of upper arms, top of thighs, and abdomen.
2. Avoid areas that are bruised or have signs of an infection, like redness or swelling. Remember to rotate spots with each shot.
3. Cleanse the spot with a new alcohol wipe.
4. Allow alcohol to dry (about 10 seconds).

Performing The Shot

1. Grasp skin on both sides of the spot between your thumb and forefinger (similar to a pinching position).
2. Hold the syringe or pen-like a pencil at a 90-degree angle.
3. Using a quick, smooth motion, insert the entire needle into the pinched skin.
4. Slowly press down on the syringe plunger, and release your grasp on the skin.
 - If using an insulin pen, slowly press and hold down on the insulin pen dial. Once the insulin pen dial returns to zero, count to 10 slowly.
5. Release your pinch on the skin, and remove the needle smoothly, pulling out at the same angle as it was inserted.
 - If using an insulin pen, cover the injection site with your finger for a couple of seconds. Avoid using a tissue or cotton balls for this.
6. Do not place the plastic cover back on the needle.
 - If using an insulin pen, place the clear plastic cover back on the needle.
7. Remove the syringe and discard it in a puncture-proof sharps container.
 - If using an insulin pen, twist the pen needle to remove it, and place it in a hard plastic container.

Remember — insulin pens are for individual use only, and they are not to be shared.

Glucagon: Usage And Additional Tips

Give a Glucagon injection or Baqsimi (glucagon) nose spray when your child's low blood sugar causes seizures (uncontrolled movements), if your child is unable to wake up, or if your child is unable to drink safely. When in doubt — give glucagon!

How To Use Your Child's Glucagon Shot

1. If possible, check your child's blood sugar before giving this injection.
2. Remove the cap from the bottle.
3. Uncover the needle, and put it through the rubber stopper of the bottle.
4. Push in the fluid.
5. Gently swirl the bottle until the powder has completely dissolved.
6. Turn the bottle upside down. Draw out the amount the doctor has ordered:
 - 0.5 cc if your child is younger than 5 years
 - 1 cc if your child is older than 5 years
7. Inject the Glucagon (just as you would an insulin injection) into the outer thigh or upper arm.
8. Roll your child to his/her side.

Treating Your Child After Administering Glucagon Or Baqsimi

1. After they've received glucagon, your child should start to wake up and respond within 15 minutes. If your child is not awake in 15 minutes, call 911.
2. As soon as your child is awake and can swallow, start giving them sugared fluids.
3. Recheck their blood sugar – if it's less than 70, continue to give them sugared fluids, similar to treating low blood sugar.
4. Once their blood sugar is over 70, give your child 15 grams of carbohydrate.
5. Continue to check the blood sugar every 15 minutes until it's over 100.
6. Continue to check the blood sugar every hour to make sure it stays above 100.
7. Call the Diabetes Clinic (402-955-3871) after treatment and your child is awake and alert or with any questions or concerns.

Helpful Tips About Glucagon And Baqsimi

1. Always carry Glucagon or Baqsimi with you and your child.
2. Do not hesitate to use Glucagon or Baqsimi. Both are safe medicines and may be life-saving.
3. Keep the medication at room temperature (59-86 degrees F). Do not leave it in the car. If Glucagon is mixed, it is stable in the refrigerator for up to 48 hours.
4. Replace your kit if outdated. However, if it's expired and you have no other option, still use it!
5. Review the instructions each month.
6. Contact the Diabetes Clinic at 402-955-3871 if you have problems getting Glucagon or Baqsimi from the pharmacy.

Do you still have questions about your child's insulin or Glucagon or Baqsimi? Contact the diabetes team at [Children's Diabetes Center](#), Children's Hospital & Medical Center at [402-955-3871](tel:402-955-3871) to find out more about how to safely manage your child's diabetes with these medications.

Visit us online at www.childrensomaha.org/diabetes