

Aim

These protocols aim to provide the necessary guidance to enable insulin to be initiated safely and effectively

Objectives

1. To provide the suggested procedure for the initiation of insulin for people with diabetes which is evidence based and considered best practice
2. To ensure that the patient is able to self-inject independently, safely and effectively
3. To provide education and support for the patient, their family, providers and staff so that the care delivered to people with diabetes is consistent
4. To promote an empowering education program for all people with diabetes so that they are able to manage their condition

Guidelines for Education and Training

1. Education in insulin therapy, including reasons for insulin treatment, contraindications, complications and appropriate aftercare
2. Education on use of the equipment used in the procedure and its safe disposal
3. An understanding of different insulin's, their action and safe dose adjustments

A step by step approach is provided to teaching your patient the basics about starting insulin. The provider or staff performing the teaching should check off each item as it is completed to document teaching.

Patient information and handouts for use are attached.

- Discuss the process of starting insulin with the patient; encourage the patient to have a family member present if they so desire
- Allow the patient to ask questions and discuss, reassure about any fears they may have regarding insulin injections
- Advise the patient that you will explain each step of the procedure, take into account the patients ability
- Have the patient perform a blood glucose reading with their glucometer in the office and record on the glucose log sheet
- Demonstrate to the patient the use of device that has been prescribed for the delivery of insulin

- Demonstrate to the patient the correct technique for subcutaneous injection
- Have patient redemonstrate the steps above
- Support and assist patient in self-injecting insulin now
- Discuss possible injection sites and injection rotation
- Use patient literature to explain the above

- Discuss correct disposal of sharps
- Discuss storage of insulin and device used
- Discuss times of meals and insulin injections, emphasize the importance of a regular schedule for eating and insulin administration
- Discuss and give booklets about hypoglycemia, prompt recognition and treatment of
- Provide written information re insulin doses
- Discuss hyperglycemia, sick day rules and provide written information
- Discuss driving and implications now that patient has commenced insulin therapy
- Have patient redemonstrate insulin and blood glucose monitoring technique as many times as needed for them to be comfortable with self-care
- Discuss action of insulin and dose adjustment
- Review with patient what oral hypoglycemic agents to be stopped / taken

Flow Sheet for Teaching Insulin Use

- **Hands.** Wash hands with warm, soapy water using plenty of friction. Ask the patient to sing Happy Birthday while they wash their hands to ensure adequate hand washing.
- **Clean the site.** Make sure the injection site is cleansed with soap and water or an alcohol pad. The area should be dry before injecting.
- **Numbing the area.** This is usually not necessary but sometimes helps children feel better about a forthcoming shot. You can numb the area with ice; a bag of frozen vegetables (never put cold objects directly on the skin, wrap them in a hand towel or wash cloth).

Numbing creams that contain lidocaine are expensive and have some side effects and are not recommended for multiple daily injections.

Cold insulin right from the refrigerator can cause stinging when injected. It is fine to let your pen, or syringe warm up for 5 minutes, or, even the bottle of insulin for 5-10 minutes.

- **Pinch up a fold of skin** surrounding the site you've selected. Hold it firmly with one hand. You can inject insulin into muscle, but it is more painful. Inject into fat when possible.
- **Inserting the needle.** Faster is better, inserting slowly will cause more pain. Try inserting the needle almost like you would toss a dart.
- **Needle angle.** For adults or those with good fatty tissue, insert at a 90° angle. Thin adults and children may need to inject at a 45° angle. Try to get the needle all the way into fatty tissue below the skin, but not so deep that it hits the muscle below.
- **Injecting the insulin.** Push the syringe plunger all the way in with a slow steady motion or firmly press the insulin pen injection button. Wait ten seconds before removing the needle. Let go of the skin.
- **Remove the needle by pulling straight out.** Twisting or shifting the needle's position will cause pain. You may gently press on the injection site with your finger for a couple seconds. Do not rub or massage the skin where the insulin is injected; it can affect how fast the insulin is absorbed and acts within the body.
- **Dispose** of the syringe in a hard plastic container.

Rotating Injection Sites

Injecting in the same place much of the time can cause hard lumps or extra fat deposits to develop. These lumps are not only unsightly; they can also change the way insulin is absorbed, making it more difficult to keep your blood glucose on target.

Follow these two rules for proper site rotation:

- Same general location at the same time each day.
- Rotate within each injection site.

Injecting a dose of insulin with the insulin pen.

Injection site rotation is important for both insulin syringe and pen users.

Same Time, Same General Location

Insulin is absorbed at different speeds depending on where you inject, so it's best to consistently use the same part of the body for each of your daily injections. For example, do not inject your lunch bolus dose in the abdomen on Monday and in the thigh on Tuesday. If you have picked the thigh for your evening injection, then continue to use the thigh for all of your evening injections.

Most insulin enters the blood:

- Fastest from the abdomen (stomach)
- A little slower from the arms
- Even slower from the legs
- Slowest from the buttocks

Inject your mealtime bolus doses into the abdomen. Insulin is absorbed fastest when injected into this area. Fast absorption is needed at mealtimes to cover the carbohydrates you are about to eat.



Long-acting insulin could be injected into the thigh or buttocks.

If you mix two types of insulin in one shot, you can inject into the abdomen, arm, thigh, or buttocks.

Rotate Within an Injection Site

To avoid developing hard lumps and fat deposits, it is important to inject in different spots within a general part of the body.

- Change sides within an area. For example, if you inject your evening insulin in the thigh, try using the right thigh one evening, and the left thigh the next evening.
- You might find it useful to picture the face of a clock on your abdomen. That helps you to keep each of your injections at least one finger's width from the last injection.

Ask the patient to examine their abdomen and picture “Noon” below your belly button. Place the first injection at Noon, your second injection at 1 o'clock, the third injection at 2 o'clock, and the fourth injection at 3 o'clock. The patient will not come back to the “Noon” spot again until day 4, which gives that spot a chance to rest.

Smart Tips for Site Rotation

Work with your doctor and track your blood glucose levels carefully when you begin practicing site rotation. Over time, you and your doctor will learn which injection sites give you the best blood glucose control at different times of day.

- Do not inject close to the belly button. The tissue there is tougher, so the insulin absorption will not be as consistent.
- For the same reason, do not inject close to moles or scars
- If you inject in the upper arm, use only the outer back area (where the most fat is). It is hard to pinch the upper arm when you are injecting yourself. Try pressing your upper arm against a wall or door.
- If you inject in the thigh, stay away from the inner thighs. If your thighs rub together when you walk, it might make the injection site sore.
- Do not inject in an area that will be exercised soon. Exercising increases blood flow, which causes long-acting insulin to be absorbed at a rate that's faster than you need.
- Do not become a creature of habit! It might seem easier to find a spot that does not hurt and inject there all of the time. However, the result could be unpleasant swelling and lumps.



- Move to a new injection site every week or two.
 - Inject in the same area of the body, making sure to move around within that area with each injection, for one or two weeks.
 - Then move to another area of your body and repeat the process.
 - Use the same area for at least a week to avoid extreme blood sugar variations.
- Rotate the sides (right, left) of your body where you inject within your injection sites.

Injection Site Selection

The most common injection site is the abdomen (or stomach). The back of the upper arms, the upper buttocks or hips, and the outer side of the thighs are also used. These sites are the best to inject into for two reasons:

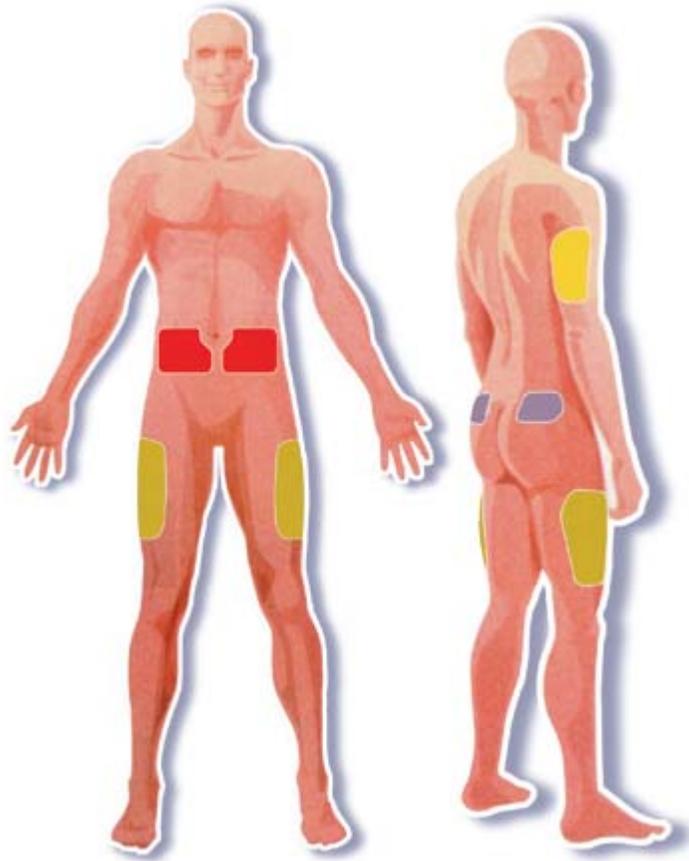
- They have a layer of fat just below the skin to absorb the insulin, but not many nerves - which means that injecting there will be more comfortable than injecting in other parts of your body.
- They make it easier to inject into the subcutaneous tissue, where insulin injection is recommended.

Depending on your body type, you'll find that certain injection sites work better than others.

- Some people, for example, prefer injecting in the abdomen because the insulin absorbs well there.
- Injecting in the abdomen isn't right for everyone, especially young children or people who are so thin and/or heavily muscled that they can't pinch up a half-inch of fat.



**Camden Coalition of
Healthcare Providers**
Camden Citywide Diabetes Collaborative





Insulin and Insulin Analogues Table

Insulin Preparation	Onset of action	Peak	Duration of Action	Comments
Rapid-acting Lispro (Humalog) Aspart (Novolog) Glulisine (Apidra)	5 to 15 minutes	1 to 2 hours	4 to 5 hours	
Short-acting Regular (recombinant) (Humulin R) (Novolin R)	20 to 60 minutes	2 to 4 hours	8 to 10 hours	Inject 30 min prior to meal
Intermediate-acting Isophane (NPH) (Humulin N) (Novolin N)	1 to 2 hours	4 to 8 hours	10 to 20 hours	
Long-acting Detemir (recombinant) (Levemir) Glargine (Lantus)	1 to 2 hours 1 to 2 hours	Relatively flat Relatively flat	12 to 20 hours 20 to 24 hours	Administered once to twice daily (12 hours apart), can be kept w/o refrigeration up to 42 days Usually administered once daily
Mixed Multiple preparations NPH/Regular mix Humulin 70/30 Novolin 70/30 Aspart Protamine/Aspart Novolog Mix 70/30 Lispro Protamine/Lispro Humalog Mix 75/25	20 to 60 minutes 5 to 15 minutes	Dual peak (short & intermediate up to 12 hrs) Dual peak (fast & intermediate)	Dual duration (8 to up to 20 hours) Dual duration-up to 24 hours	Glycemic control may not be as tight with mixed insulins as the ratio of the two preparations cannot be altered Administer twice daily at breakfast and dinner Individuals who do not have regular access to food will be at a higher risk for significant hypoglycemia

Storage and Handling Insulin

Always read the instructions that come with your insulin. Bottles of insulin, either open or unopened, generally last for one month when stored at room temperature (59 to 86°F). A bottle is considered open if its seal has been punctured. If you remove the cap but don't puncture the seal, the bottle is still considered unopened.

If stored in a refrigerator, unopened bottles are good until the expiration date printed on the bottle. Opened bottles that are stored in a refrigerator should be used within one month of being opened. Many people store their unopened bottles in the refrigerator and keep open bottles at room temperature because they find it uncomfortable to inject cold insulin.

Don't use bottled insulin past the expiration date printed on the label. And no matter what the expiration date is, throw away a bottle one month after you open it. To help you keep track, write the date that you opened the bottle on the bottle's label.

With insulin pens and their cartridges, storage life ranges from ten days to one month. Check the chart below for shelf life details on popular brands.

Length of time an insulin pen can be at room temperature

Insulin	Time (days)
Novolin R	28
Novolin N	14
Novolin 70/30	10
Novolog	28
Humalog	28
Lantus	28
Levemir	42