

# DIABETES CONTROL MATTERS

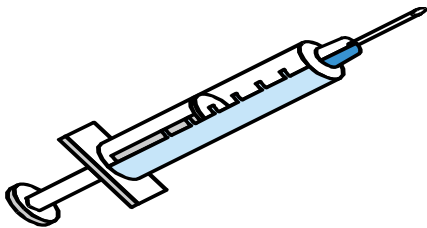
## YOU CAN BE AN INSULIN EXPERT

### WHAT IS INSULIN?

Insulin is a hormone secreted by the pancreas. Insulin can only be administered by injection and is created in the lab to be as close to human insulin as possible. In the near future, previously used pork insulins will no longer be available. Human insulin is the least likely to cause an insulin allergy.

### HOW DOES THE PANCREAS WORK?

A normal pancreas releases a steady trickle of insulin into the bloodstream 24 hours a day. During meals, it produces a sudden burst of insulin that helps the body digest the glucose (sugar) in the blood. Your body uses glucose for energy, like a car uses gasoline. If you have diabetes, your pancreas may not make the amount of insulin you need or you may not be able to use the insulin your body makes, so you must take insulin injections to keep your blood sugar level from getting too high.



### WHO NEEDS INSULIN?

If you have Type 1 diabetes:

- Your body does not make insulin at all.
- Your body must have insulin to survive, so you need insulin every day to replace what is missing.
- There are no pill forms of insulin. There are new medications being introduced, which may work with your insulin, but they will not work alone for people with Type 1 diabetes.

If you have Type 2 diabetes:

- Your body does not make enough insulin or use your insulin effectively to keep your glucose at the recommended levels.
- Diabetes pills can help increase the amount of insulin your body produces or can help you use your insulin better, but they are not always able to control your blood sugar using the safe maximum dosages. If this happens, adding insulin injections can help to control your blood glucose.

### INSULIN DO'S & DON'TS

*Details, details, details. In an insulin plan, they really matter! Spare yourself the trouble that comes from carelessness by following these quick tips.*

#### MIXING

- ◆ Wash your hands before mixing insulin.
- ◆ Roll insulin bottles gently between your palms to mix. **Don't** shake bottles.
- ◆ Wipe the tops of both insulin bottles with an alcohol swab before mixing.
- ◆ Check for air bubbles before injecting insulin. Get rid of bubbles by lightly tapping the syringe.
- ◆ Draw the rapid-acting insulin first (regular or lispro).
- ◆ **Don't** let intermediate-acting insulin get into your bottle of rapid-acting insulin.

#### INJECTING

- ◆ Choose injection sites in the abdomen unless you have been directed otherwise.
- ◆ Rotate your injection site regularly within a selected area.
- ◆ Try to inject your insulin at the same times each day.
- ◆ Give insulin injections about one inch apart.
- ◆ **Don't** inject insulin near your belly button or near scars.

#### STORING

- ◆ Store unopened bottles in the refrigerator.
- ◆ Have an extra bottle of insulin on hand for emergencies.
- ◆ **Don't** store insulin in extremely cold or hot temperatures, such as the freezer or a sunny windowsill.
- ◆ **Don't** use insulin that is out of date.
- ◆ **Don't** use insulin if it contains small, white particles that do not break down.
- ◆ **Don't** use insulin that sticks to the bottle and appears frosty.



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## INSULINS AVAILABLE IN THE U.S.

Insulin can be grouped into four categories, depending on when it starts working (onset), when it works best (peak), and how long it lasts (duration). A fifth category is also available and includes pre-mixed combinations. Your doctor will design an insulin combination that best suits your individual routine.

Most people need more than one kind of insulin to meet their needs. Keep in mind that no insulin type works exactly the same for everyone. Some factors that affect the insulin's action are: your age, where you inject the insulin, and how much you inject. It might take some experimenting, but by working with your doctor and diabetes educator you can find a combination that's right for you.

## INSULIN ABSORPTION & SITE SELECTION

Absorption depends on the type of insulin, the species of insulin, the site of injection, the dosage, exercise, temperature, and whether the site is massaged.

Injection Site	Absorption Rate
Abdomen	Fastest (preferred)
Arm	Fast
Thigh	Slower
Buttocks	Slowest

Name of Insulin	Onset (starts working)*	Peak Effect (works best)*	Duration (how long it lasts)*
Lispro / Humalog (rapid acting)	Within 15 minutes	30 – 90 minutes	2 – 4 hours
Regular (short-acting)	30 – 45 minutes	2 – 4 hours	6 – 8 hours
NPH and Lente (intermediate-acting)	1 – 2 hours	6 – 10 hours	14 – 24 hours
Ultralente (long-acting)	4 - 6 hours	8 – 20 hours	24 – 36 hours
70/30	0 – 1 hour	3 – 13 hours	12 – 20 hours
50/50 (pre-mixed combinations)	0 – 1 hour	3 – 12 hours	12 – 20 hours

\*Onset, peak and duration are highly individualized and variable depending on insulin type, injection site, age of patient and dose.

## CAN I USE PRE-MIXED INSULIN?

Pre-mixed insulin is handy for people whose insulin plans don't change often. It is also helpful for people who have trouble measuring their insulin doses. However, if your lifestyle causes you to change your insulin plan sometimes, mixing your own insulin will give you more flexibility. Discuss your typical schedule with your doctor to decide if pre-mixed insulin is a good choice for you.

## SPECIAL CONSIDERATIONS FOR ILLNESS

- **ALWAYS** take your insulin when you are sick.
- If you can not eat take liquids that contain carbohydrate (sugar) every hour:
 

½ c. juice	¼ c. regular pudding
¼ c. custard	¼ c. regular jello
½ c. ice cream	1 c. cream soup
- Test your blood sugars before every meal and at bedtime.
- Ask your physician for specific blood glucose ranges for when to contact the office.

## AMERICAN DIABETES ASSOCIATION GOALS FOR BLOOD GLUCOSE

	Normal	Goal
Before meals	<110 mg/dl	80-120 mg/dl
2 hours after meals	<140 mg/dl	<180 mg/dl
Bedtime	<120 mg/dl	100–140 mg/dl
Hemoglobin A1c	<6%	<7%