Insulin Treatment in Diabetes

Diabetes mellitus (often called diabetes) is a chronic disease. It occurs when the body does not properly use the sugar (*glucose*) that is released from food. Glucose levels are controlled by a hormone called insulin, which is made by your pancreas. Depending on the type of diabetes you have, either:

- The pancreas does not make any insulin (Type 1).
- The pancreas makes too little insulin, and the body cannot respond normally to the insulin that is made (Type 2).

Without insulin, death can occur. Diabetes requires lifelong monitoring and treatment. This document will discuss the role of insulin in your treatment and provide information about insulin.

TREATMENT FOR DIABETES

LIFESTYLE CHOICES

Lifestyle choices can affect both the control of your diabetes, and your risk of complications from diabetes. Lifestyle choices are critically important in the overall management of diabetes. They are important even if you do not need to take insulin.

- Eat a healthy diet. Ask for help if you need it.
- Exercise regularly. Ask for help if you need it.
- Diet and exercise can help:
  - Reduce the amount of insulin you need.
  - Your body to use your insulin more effectively.
  - Reduce your risk of high blood pressure (or reduce your blood pressure, if it is high).
  - Reduce your cholesterol level.
  - Reduce your weight.

Healthy lifestyle choices play an important role in controlling cardiovascular disease (heart attack, stroke, vascular disease and others), which is a primary complication of diabetes. For optimal control of diabetes, you must reduce your cardiovascular risks and manage your blood sugar.

MEDICATIONS BESIDES INSULIN

Your caregiver may recommend medications for you in addition to insulin. This will depend on three things:

- Your diabetes type.
- How well insulin alone meets your treatment goals.
- Other health factors.

There are several different types of oral and injectable medications that help treat diabetes. Each of these other medications offers advantages and potential side effects. The goal is to control your diabetes the best way possible, which will reduce your risk of complications. Adding other medications can sometimes also reduce the amount of insulin you need. Your caregiver can tell you about other medications available besides insulin.

INSULIN

People with type 1 diabetes must take insulin to stay alive. Their body does not produce it. Others might require insulin in addition to, or instead of, other treatments. In either case, proper use of insulin is critical to control your diabetes.

There are a number of different types of insulin. (Researchers are working on a new inhaled insulin that does not require a shot). Usually you will give yourself injections, though others can be trained to give it to you. Or, you might have an insulin pump that delivers insulin continuously to a special needle that you place in the skin of your abdomen.

Using insulin requires that you check your blood sugar several times a day. The exact number of times and time

of day to check your sugar will vary depending on your type of diabetes, type of insulin and treatment goals. Your caregiver will direct you.

Generally, different insulins have different properties. This is a general guide – specifics will vary by product, and new products are introduced periodically.

- **Short acting insulin** starts working quickly (as soon as 5 minutes) and wears off in 3-5 hours (sometimes longer). This type of insulin works well when taken before a meal, to bring the sugar quickly back to normal. There are several different types of short acting insulin. Some work quickly and others last longer in your system.
- **Intermediate acting insulin** starts working in a few hours and wears off after about 10-20 hours. This insulin will lower your blood sugar for a longer period of time, but will not be as effective in lowering your sugar right after a meal.
- **Long acting insulin** mimics the small amount of insulin that your pancreas usually produces throughout the day. You need to have some insulin present at all times, as it is crucial to metabolism of brain and other cells. Long acting insulin is meant to be used either once or twice a day. It is usually used in combination with other types of insulin, or in combination with other diabetes medications.

Your caregiver will usually have a strategy in mind when treating you with insulin. This will vary with your type of diabetes, your diabetes treatment goals, and your health history. It is important that you understand something about this strategy so you may be a partner in treating your diabetes. Here are some terms you might hear:

- **Basal insulin**: You need to have a small amount of insulin present in your blood at all times. Sometimes oral medications will be enough. For other people, and especially for people with type 1 diabetes, insulin is needed. Usually intermediate or long acting insulin is used, once or twice a day.
- **Prandial** (meal-related) **insulin:** your blood sugar will rise rapidly after a meal. Short acting insulin can be used right before the meal to bring the sugar back to normal quickly. You might be instructed to adjust the amount of insulin depending on how much carbohydrate (starch) is in your meal.
- **Corrective insulin**: You might be instructed to check your blood sugar at certain times of the day. You then might use a small amount of short acting insulin to bring the sugar down to normal, if it is elevated.
- **Tight control** (also called intensive therapy): Keeping your blood sugar as close to your target as possible, and keeping the glucose from going too high after meals is called tight control. People with tight control of their diabetes may have fewer long term complications from their diabetes.
- **Glycohemoglobin** (also called glyco, glycosylated hemoglobin, Hemoglobin A1c, or A1c) level measures how well your blood sugar has been controlled during the past 1 to 3 months. It helps your caregiver see how effective your treatment is and decide if any changes are needed. Your caregiver will discuss your target glycohemoglobin with you.

Insulin treatment requires your careful attention. Treatment plans will be different for different people. Some people do well with a simple program. Others require more complicated programs with multiple insulin injections daily. You will work with your caregiver to develop the best program for you. Regardless of your insulin treatment plan, you must also do your best on weight control, diet and food choices, exercise, blood pressure control and cholesterol control.

BENEFITS OF DIABETES TREATMENT

Research shows that optimal treatment of your diabetes will reduce the risk of kidney, eye and nerve complications. If you have Type 1 diabetes, your risk of heart and vascular disease also decreases with good diabetes control. The better you control your diabetes (and lower your glycohemoglobin), the lower your risk of complications.

RISKS OF INSULIN

Although insulin treatment is important, is does have some risks:

- Insulin treatment can be difficult, complicated and costly. Frequent follow-up with your caregiver, at least

early on, is usually needed.

- Insulin can cause your blood sugar to go too low (*hypoglycemia*). This can be a dangerous complication that must be quickly recognized and treated.
- Weight gain can occur.
- You must learn to inject insulin properly. Improper technique can cause hypoglycemia, skin injury or irritation, or other problems.
- Other medicines used for diabetes can have other complications. Discuss your medications and their complications with your caregiver.

GOALS OF DIABETES CARE

The goal of treating your diabetes is to allow you to live as long as you can with as few complications as possible. Several factors help you work towards this goal:

- You should achieve a blood sugar as close to normal as possible without causing hypoglycemia. Generally, this means a glycohemoglobin of between 6.5% and 7%.
- You should achieve and maintain an ideal body weight.
- You should exercise regularly.
- Your blood pressure should be under 130/80.
- You cholesterol should be controlled, with your LDL under 100. Your target may be different depending on your health factors.
- You should not smoke.
- You should be up to date on immunizations, including influenza and pneumonia.
- You should be monitored for eye, kidney, heart and vascular health regularly. Preventative medicines are sometimes used for these conditions.
- Your specific goals may vary, depending on your health factors. You should discuss these issues with your caregiver.

HOME CARE INSTRUCTIONS

- **Do not** smoke.
- Eat a healthy diet, as instructed. Ask for help if you need it.
- Exercise regularly. Ask for help if you need it.
- Stay up to date on your immunizations.
- See your caregiver on a regular basis.
- Follow your diabetes care plan carefully. Take medicines and insulin as directed. Check your blood sugar as directed, and keep track of it in a log. Be sure you understand your glycohemoglobin and other diabetes goals. Be sure you understand how to detect and treat hypoglycemia.
- Follow your care plan for blood pressure and elevated cholesterol, if you have these problems.
- Do your blood tests as directed. This is important and helps monitor your diabetes.
- Check your feet every night for sores or wounds.
- See your eye doctor once a year.
- If you have an illness that causes loss of appetite, vomiting and/or diarrhea, you should speak with your caregiver about temporary changes in your insulin doses and other medications.

SEEK CARE IF:

- You are having problems keeping your blood sugar at target range.
- You are having episodes of hypoglycemia.
- You feel you might be having side effects from your medicines.
- You have symptoms of an illness that is not improving after 3-4 days.
- You have a sore or wound that is not healing.
- You notice a change in vision or a new problem with your vision.
- You develop fever of more than 100.5° F (38.1° C).

SEEK IMMEDIATE MEDICAL CARE IF:

- Your blood sugar goes below 70, especially if you have confusion, lightheadedness or other symptoms with it.
- Your blood sugar is very high (as advised by your caregiver) twice in a row.
- An unexplained oral temperature above 102.0° F (38.9° C) develops.
- You pass out.
- You have chest pain and/or trouble breathing.
- You have a sudden, severe headache
- You have sudden weakness in one arm and/or one leg.
- You have sudden difficulty speaking and/or swallowing.
- You develop vomiting and/or diarrhea that is getting worse or not improving after 1 day.

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