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## **Intensive Control of Diabetes**

The results of recent research have convincingly demonstrated that people with type 1 diabetes who strive to achieve good blood sugar control have fewer diabetic complications. These complications include problems such as eye and kidney damage, heart disease, stroke, and poor blood supply to the feet and legs. Although the evidence is less clear for type 2 diabetes, maintaining consistent lower blood sugar has proven to reduce complications.

Let me give you an example to show you what this really means.

People who don't have diabetes have blood sugar levels from between 60 and 110 before meals. Diabetics considered to have fair control of their condition have blood sugar levels below 200 before meals. For many people, intensively managed diabetes would keep blood sugars below 140 before meals.

Intensive control of diabetes is especially important during pregnancy, when it can reduce risks to both mother and child. However, it's important to discuss the risks and benefits of intensive control of diabetes with your doctor or health care professional before making any changes in your treatment plan. It's also a good idea to first listen to the Kaiser Permanente Healthphone messages on type 1 diabetes and type 2 diabetes.

Adults with type 2 diabetes should first use diet and exercise to control their diabetes, along with home blood sugar testing. If that's not enough, they may have to add oral medication or, if necessary, they will have to inject insulin. Children with diabetes and adults with type 1 diabetes always inject insulin and must also rely on diet, exercise, and blood sugar testing to manage their diabetes.

Intensive control of diabetes first involves educating yourself thoroughly about diabetes and self-management. But it also involves a commitment to testing your blood sugar more often, being very dedicated to eating healthy foods, and exercising regularly. Finally, it means taking more frequent insulin injections and—for type 1 diabetics—modifying the amount of insulin you take each time.

To find out what makes your blood sugar go up or down, you'll want to test before and after you eat certain foods, engage in particular activities, or take specific medications. Then take whatever corrective action you and your health care professional have decided might help. For example, if testing shows that your blood sugar is too low, then drink ten to 15 grams of a fast-acting carbohydrate, such as half a cup of fruit juice or soda or a cup of milk. Wait 15 minutes and retest your blood sugar. Your blood sugar should be up by 40 to 60 points. If it's not in your desired range, repeat the drink and also eat a small snack, like crackers or peanut butter.

You may find that you need to snack before exercising, use less or more medication, or alter your diet in some other way. In any case, you'll need to keep a good record of your blood sugar tests throughout the day.

Since you will be taking three injections of regular insulin every day before each meal, the amount of each dose can vary somewhat depending on what your blood sugar is before the meal and how much you intend to eat. Your general pattern will determine what your standard dose should be, and your experience will help you decide when to vary the standard dose.

Type 1 diabetes requires a little more specific management. Blood glucose levels should generally be tested before meals and at bedtime. Occasionally, blood tests in the early morning hours can be helpful—say, around three or four a.m. Adding a regular insulin injection before lunch time can also result in better control. Furthermore, this lunch time practice will allow you to lower the amount of insulin in your morning dose.

It's important to work closely with your health care professional to figure out how best to manage your diabetes. It's essential that you are able to modify your insulin doses to a significant extent, but the plan for doing so should be worked out with your advisor. In addition, you should get regular hemoglobin A1C tests to measure your average blood sugars over the past two to three months. To be in good control, these test results should be below 8.5 and ideally around 7.5. People without diabetes have hemoglobin A1C levels between 4 and 6.5.

For type 1 diabetes, an additional tool for working on intensive control is the Portable Insulin Infusion Pump. Some people have found this to be very helpful. Discuss this with your health care professional; Kaiser Permanente has specially trained people to assist with this device.



For additional health information you can trust:

- Log on to our members-only Web site at [www.kaiserpermanente.org/california](http://www.kaiserpermanente.org/california), then click the "Kaiser Permanente Members Only" button
- Visit your local Kaiser Permanente Health Education Center
- Check your Kaiser Permanente Healthwise Handbook
- Listen to the Kaiser Permanente Healthphone messages at 1-800-33 ASK ME (1-800-332-7563)

To get your free Handbook and Healthphone Directory, call 1-800-464-4000.

The information presented here is not intended to diagnose health problems or to take the place of professional medical care. If you have persistent health problems or if you have additional questions, please consult with your doctor or other health care professional.

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