

MassMedLink to Health

Information on Type 2 Diabetes

Diabetes affects nearly 20.8 million people in the United States. It is a disease in which your body does not make or use insulin properly to regulate blood sugar, which is also known as glucose. Glucose is a major source of energy for our body. When you eat, your pancreas produces insulin, which helps move glucose from blood into your cells.

There are two types of diabetes: Type 1 and Type 2. Type 1 diabetes occurs when your pancreas does not produce any insulin. Type 2 diabetes occurs when your pancreas does not produce enough insulin or your pancreas makes insulin but the insulin is not properly utilized by your body.

An important part of controlling diabetes is monitoring your blood glucose levels. The best way to self monitor your diabetes is to use a device called a blood glucose meter or glucometer. Your health care team will show you how to use the meter and the best time for you to check your glucose. Generally, you may check your glucose levels before meals, 1 to 2 hours after meals, at bedtime, and sometimes at 2 or 3 AM. Another monitoring parameter for glucose is A1c. This test is ordered by your physician through a blood test. A1c measures the 3 month average of your blood glucose levels and is usually checked every 3-6 months.

If you have diabetes, it is important to know what to do if your blood sugar is too high or too low. Signs of high blood sugar, also known as hyperglycemia, include headache, blurry vision, excessive thirst, hunger, upset stomach, frequent urination, and a fruity smell on your breath. An ideal glucose level before a meal should be between 90-130 mg/dl and less than 180mg/dl after a meal. If your glucose readings run higher than this, make sure to discuss this with your physician, nurse, or diabetic counselor.

Signs and symptoms of low blood sugar, also known as hypoglycemia, include nervousness, irritability, blurry vision, light-headedness, sleepiness, confusion, and tiredness. If your blood glucose is under 70 mg/dl or if you start feeling symptoms of hypoglycemia, eat or drink something with about 15 grams of carbohydrates. This can be either a ½ cup of orange or grape juice, 2 glucose tablets, 2 to 4 pieces of hard candy, 5 gumdrops, 1-2 tablespoons of honey, ½ a can of regular soda, or 2 tablespoons of cake icing. Wait 15 to 20 minutes then recheck your blood sugar. If it is still under 70 mg/dl, eat or drink something again. If your blood glucose is still below 70 mg/dl, call your doctor or have someone take you to the hospital.

If you have Type 2 diabetes, your doctor may prescribe one or more types of the following oral diabetes medications. Sulfonylureas, a class of oral diabetes medication, include glipizide, glyburide, and glimepiride generic name for Amaryl.

These medications help the pancreas secrete more insulin. Possible side effects of these medications include nausea, headache, diarrhea, rash, and hypoglycemia.

Metformin generic name for Glucophage, is the only drug in a class called biguanides. This medication helps decrease the amount of glucose produced in the liver, and also helps the body respond better to insulin. Possible side effects of metformin include nausea, bloating, cramping, and diarrhea. A rare but possible side effect is lactic acidosis due to a build up of metformin in the body. Tell your doctor if you experience unexplained stomach upset, muscle pain, or breathing difficulty.

Alpha-glucosidase inhibitors, another class of oral diabetes medication, include Precose brand name for acarbose. This medication helps delay the digestion of carbohydrates in your intestine, thus lowering your blood glucose levels after eating. Possible side effects include gas, bloating and diarrhea.

Thiazolidinedione, another class of diabetes medication, include Actos brand name for pioglitazone, and Avandia brand name for rosiglitazone. These medications help your muscle cells become more sensitive to insulin and also help reduce the release of glucose by your liver. Possible side effects include headache, swelling, muscle pain, and upper respiratory tract infection. These drugs can cause liver damage. It is recommended to have a liver function test prior to starting these medications and every two months for the first year and periodically thereafter.

Prandin brand name for repaglinide, and Starlix brand name for nateglinide, are two medications that belong to a class called meglitinides. These drugs help your pancreas release more insulin. These medications should be taken just before meals to help keep glucose levels from rising. Possible side effects include headache, hypoglycemia, and upper respiratory tract infection.

Januvia brand name for sitagliptin belongs to a new class called DPP-4 inhibitors. This medication works by increasing the insulin released from your pancreas and decreasing glucose released from your liver. Side effects include headache, diarrhea, upper respiratory tract infections, and hypoglycemia.

There are also combination medications that contain two medications from different classes such as Avandamet which contains metformin and rosiglitazone or Glucovance which contains metformin and glyburide.

In addition to oral medications and insulin, there are some injectable medications that are available to treat diabetes. Symlin brand name for pramlintide, is administered subcutaneously and is used in conjunction with other medications to treat Type 1 and Type 2 diabetes. The common side effects are headache, nausea, vomiting, and loss of appetite. Another injectable medication is Byetta brand name for exenatide. This drug works by stimulating the release of insulin from your pancreas and is approved for Type 2 diabetes. Byetta must be administered

subcutaneously before meals. Side effects include nausea, vomiting, diarrhea, and hypoglycemia.

With advanced Type 2 diabetes you may need to use insulin. There are many types of insulin available. Types of insulin are characterized by the onset of action and the duration of action. Some types of insulin are fast acting and are given close to meal times. Other types are long acting and may only need to be injected once daily. Your physician will determine what type, how much, and when you should take your insulin. If you have any questions regarding proper technique for injecting insulin, please contact your diabetic nurse, physician, or pharmacist.

It is important that people with diabetes have their blood pressure closely monitored and treated. High blood pressure increases the chance of having a heart attack, stroke, kidney damage, and eye diseases. Be sure to check your blood pressure regularly and take steps to lower your blood pressure such as losing weight, quitting smoking, avoiding alcohol, decreasing salt intake and reducing stress. If these steps do not help lower your blood pressure consult your physician.

Diabetes can also cause kidney complications. Elevated glucose and high blood pressure cause your kidneys to work harder and lose their filtering ability over time. This leads to the accumulation of toxic waste products and thus results in kidney failure. It is important to have your kidney function tested regularly.

People with diabetes are also more susceptible to eye diseases such as glaucoma, cataracts, and retinopathy. Signs of retinopathy include blurry vision, floating spots, not being able to see things out of the sides of your eyes, and trouble seeing at night. It is important to have a yearly dilated eye exam by an eye doctor.

People with diabetes may experience nerve damage known as neuropathy. Signs of nerve damage include tingling, burning, itching, deep aching, or numbness in your feet, legs, or hands. Therefore, it is very important to have regular foot exams. Untreated injuries to your legs and feet can lead to amputation. Keep your feet clean, dry and your toe nails trimmed. Neuropathy can also affect your heart rate, blood pressure, digestion. It can cause impotence in men, and loss of sensation in women. To prevent or lessen neuropathy, it is important that you get yearly check-ups for nerve damage by your physician.

Drinking alcohol is not recommended because it may cause hypoglycemia and can lower your blood glucose for up to 8 to 12 hours after your last drink. If you do drink alcohol, follow the Dietary Guidelines for Americans recommendation of no more than 2 drinks per day for men and no more than one drink per day for women.

Following the ABCs of diabetes may be helpful in preventing the long-term complications of diabetes. The ABCs include:

- A...for A1C

- Your physician will check your A1C level through a blood test every 3 to 6 months. Your goal is to be below 7%.
- **B...for Blood pressure**
 - Check your blood pressure regularly and at every visit to the doctor. Your goal is to be below 130/80 mm Hg.
- **C...for Cholesterol**
 - Have your cholesterol checked annually. Aim for an LDL, or bad cholesterol, of less than 100, triglycerides of less than 150 and an HDL, or good cholesterol, greater than 40 for men or greater than 50 for women.
- **D...for Diet**
 - Eat the right amount of healthy foods. Choose whole grain breads, calcium-rich dairy products, fresh fruits and vegetables, and lean meats such as chicken, and fish.
- **E...for Exercise**
 - Aim for 30-60 minutes per day of moderate physical activity. This can include walking, jogging, or hiking.

Keeping your diabetes in check is possible by following the ABCs, taking your medications properly, and reporting changes to your health care team.

We encourage you to speak with one of our MassMedLine pharmacists to review questions you may have about the information provided, or questions regarding your specific medications. Also if you have difficulty affording your medications, MassMedLine case managers are available to assist you.

References available upon request

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