

## Type 2 Diabetes

Diabetes is a disease of too much sugar (glucose) in the blood. Type 2 diabetes is caused by insulin resistance of the cells and abnormal insulin production by the pancreas. Insulin is a hormone that moves sugar from the blood into the cells where it is needed for energy. Insulin resistance means that the insulin is less effective at moving the sugar out of the blood and into the cells.

29.1 million people in the U.S have diabetes, about 9.3% of the population. There is no cure for diabetes, but with medical help it can be managed, and the risk of complications reduced.

**Monitoring Diabetes** – Following diabetes closely to achieve blood sugars as near normal as possible is important for decreasing the risk and severity of complications of diabetes including: heart disease, kidney disease, blindness and leg amputation.

- **Blood Glucose** - is a measure of the amount of sugar in the blood at the time it is tested. Blood sugar changes from moment to moment depending on when and what you ate and your activity level.

**Goal Blood Glucose Levels (for most people)**

Before meals and when exercising	80-120 mg/dl
Two hours after meals	less than 160 mg/dl
At Bed Time	100-140 mg/dl

- **Hemoglobin A1C (HA1C)** - is a blood test that indicates how well controlled your blood sugar has been over the past 3 months. Risk of complications from diabetes approximately doubles with every 1 point rise in HA1C.

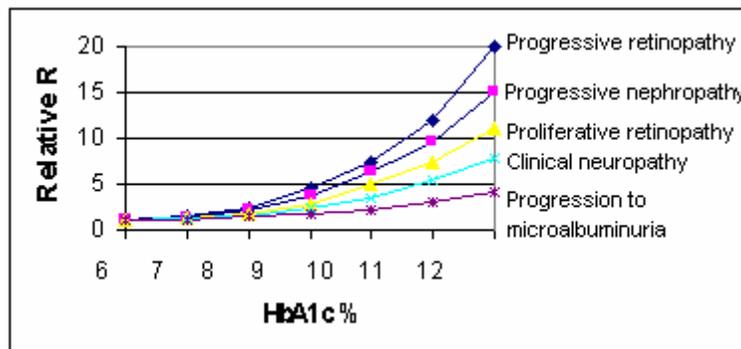
**HA1C Goals**

Normal	4.0-6.0 %
Diabetic Goal	less than 7.0 %

**HA1C correlation with average Blood Glucose Levels**

HA1C (%)	6	7	8	9	10	11	12
Average Blood Glucose Level (mg/dl)	135	170	205	240	275	310	345

**Increase of diabetic complications as HA1C increases**



Retinopathy = Eye Disease  
Nephropathy = Kidney Disease

Neuropathy = Nerve Damage  
Microalbuminuria = Early Kidney Disease

**Home Blood Glucose Monitoring** – You can check your own blood sugar wherever you are with a portable device called a glucometer. This will allow you and your doctor to know how your sugar is doing at various times of the day and when you are not feeling well.

**High Blood Sugar (>240 mg/dl)** High

blood sugar can occur from not enough medication, dietary indiscretion or infection. If you experience any of the symptoms below check with your doctor.

Symptoms of high blood sugar include:

- constant thirst
- frequent urination
- feeling tired
- blurred vision
- frequent infections
- slow healing injuries
- unplanned weight loss

**Low Blood Sugar (<70 mg/dl)** Low

blood sugar can occur from too much medicine, skipping meals, increased activity, alcohol or illness. If you experience any of these symptoms drink orange juice or eat some food high in sugar, then call someone for help. Then contact your doctor to see if your medication needs adjusting and to make a plan of action if these symptoms occur again.

Symptoms of low blood sugar include:

- feeling shaky or light headed
- feeling weak
- breaking out in a cold sweat
- having a headache
- feeling confused
- slurred speech
- staggering gait
- blurred vision

**Lifestyle Modifications** - are an important part of the management of type 2 diabetes, even though medications are usually also necessary to reach goal blood sugars and HA1C.

- **Obtain/ Maintain a Healthy Weight** (Body Mass Index (BMI) of 25 or less). Know your BMI. If your BMI is >25, make a goal of losing 10 pounds.
- **Exercise** – Physical activity decreases insulin resistance and improves the body's ability to use blood sugar. Work with your doctor to develop a plan to increase your physical activity. Work up to walking 10,000 steps (or 5 miles) a day; join a fitness center; or find some other way to follow the surgeon general's recommendation of 30 minutes of moderate intensity activity on all or most days of the week.
- **Nutrition** – Eat three balanced meals including a variety of foods at each meal. Do not skip meals.
  - \* Limit fat intake to no more than 30% of calories
  - \* Limit Saturated Fat to no more than 10% of calories
  - \* Choose low fat and nonfat dairy products
  - \* Eat lean meats (turkey and chicken breast, lean beef, fish)
  - \* Limit animal fats (butter, cream, fatty cuts of meat, sausage, bacon, whole milk products, ice cream)
  - \* Limit hydrogenated fats and partially hydrogenated fats (hydrogenated peanut butter, stick margarine, shortening). Read ingredient list on labels carefully.
  - \* Increase fiber intake – choose whole grain products and increase consumption of fruits, vegetables, beans and peas.
  - \* Limit concentrated sweets (Sugar, candy, sweetened soda, Jam/ Jelly, syrup, cookies, pastry and other foods sweetened with significant quantities of sugar)
- **Moderation of Alcohol Consumption** – Limit Alcohol intake to 2 or less drinks per day for men and 1 or less drinks per day for women. Alcohol has a negative effect on blood glucose levels and on blood pressure.
- **Do Not Smoke or use Tobacco products** – Smoking greatly increased the risk of developing vascular disease in people with diabetes. This can lead to heart attack, stroke, blindness and limb amputations.

**Medications** - Your doctor may prescribe medications to you to help your body use glucose better, thereby lowering your blood sugar and HA1C. Take your medications every day as prescribed by your doctor. If you have side effects or low blood sugar reactions, contact your doctor.

**Diabetic Foot Care** – People with diabetes are at increased risk of foot injury, and may not feel when something is wrong with their feet. Take your shoes and socks off when you go in your doctor's examining room so your doctor can check your feet at each exam.

- Wash your feet daily (do NOT soak them) and dry them thoroughly

- Examine your feet for scratches, cuts, sores, blisters, swelling, redness and any other abnormalities. Make sure to check between your toes and the bottoms of your feet.
- If your doctor tells you it is OK to cut your own toenails, cut toenails carefully being careful not to cut into the corners. Otherwise see a podiatrist for nail trimming.
- Be careful with corns and calluses. Do NOT cut them or cover them with tape. You may file them gently with a pumice stone.
- Do NOT go barefoot, even in the house.
- Wear comfortable, supportive shoes; throw away old or badly worn shoes; break in new shoes slowly.
- If you are unable to care for your feet yourself, your doctor may refer you to a podiatrist.

**Diabetic Eye Care** – Diabetes increases the risk of disease of the back of the eye (retinopathy), which can lead to decreased vision or blindness.

- See an Eye Doctor (Ophthalmologist) yearly for a complete eye exam.
- Keep your diabetes under good control with a HA1C less than 7.0.
- Keep your blood pressure under good control with a blood pressure less than 130/80.

**Diabetic Dental Care** – Regular dental care and good oral hygiene are important for people with diabetes. Diabetes increases the risk of gum infection.

- Brush and floss your teeth at least two times a day
- See a dentist at least every 6 months.
- Keep your diabetes under good control with a HA1C less than 7.0.

**Blood Pressure** – Both high blood pressure and diabetes can cause damage to veins and organs. Good blood pressure control can reduce the risk of vascular problems including heart disease, kidney disease and eye disease.

- Keep your blood pressure under good control with a blood pressure less than 130/80.
- Do NOT Smoke
- Keep your diabetes under good control with a HA1C less than 7.0.
- If your blood pressure is above goal, talk to your doctor about life style modifications that can lower your blood pressure
- Your doctor may prescribe medications to lower your blood pressure, take them every day as prescribed.

**Heart Disease** – Diabetes increases the risk of heart disease. Your doctor will check cholesterol and other heart disease risk factors to assess your risk of heart disease.

- Talk to your doctor about life style modifications that can lower your risk of heart disease
- Keep your diabetes under good control with a HA1C less than 7.0.
- Keep your blood pressure under good control with a blood pressure less than 130/80.
- Keep you bad cholesterol (LDL Cholesterol) under good control with an LDL of less than 80 mg/dl
- Do NOT Smoke
- If you are over 40 years old your doctor may recommend you take an Aspirin on a daily basis, if you are not allergic to aspirin
- Your doctor may prescribe medications to lower your cholesterol, take them every day as prescribed

**Kidney Disease** – Diabetes increases the risk of kidney disease and kidney failure. Your doctor will check your urine for trace amounts of protein to assess the health of your kidneys

- Keep your diabetes under good control with a HA1C less than 7.0.
- Keep your blood pressure under good control with a blood pressure less than 130/80.
- Drink plenty of water each day
- Your doctor may prescribe medication to protect your kidneys, take it every day as prescribed.

### **Sick Day Guidelines**

- If you are too ill to eat normally call your doctor and give details of your illness
- Do not stop taking your medication just because you can't eat. Instead, discuss the best course of action with your health care provider
- If you are unable to eat, drink sweetened beverages instead of diet beverages (Juice, regular soda, Gatorade) this will be your source of calories while you are unable to eat.
- When sick, take your temperature every morning and evening. If your temperature is above 99.0 degrees Fahrenheit increase your fluid intake.
- If you are throwing up, and unable to keep fluids down, call your doctor immediately.
- Check your blood sugar at least every 4 hours. Call your doctor if your blood sugar is <60 mg/dl or consistently above 240 mg/dl
- If you have trouble breathing call your doctor immediately or have someone take you to an emergency medical center.

### **Call Your Doctor if:**

- Feeling Confused or unable to think clearly
- Blood glucose stays below 70 mg/dl even after taking juice or sugary snack
- Blood glucose is above 240 mg/dl for 24 hours
- Temperature is above 101 degrees Fahrenheit
- Weight loss of more than three pounds in one day
- Trouble breathing
- Inability to keep food down for more than six hours
- Unable to keep liquids down
- Severe Diarrhea
- Abdominal Pain

### **Diabetic Teaching Classes**

This handout only covers the bare minimum of information about diabetes and the care and treatment of diabetes. Talk to your doctor about attending Diabetic Teaching Classes in order to learn more.

### **More Information Available**

- Call the CDC's Toll Free Diabetic Line at 1-877-232-3422 and request a FREE copy of their booklet "*Take Charge of Your Diabetes.*"
- Look on line at <http://www.cdc.gov/diabetes>