

# DIABETES



Contrary to what most people believe, diabetes is not caused by consuming too much sugar. Diabetes occurs when the body cannot efficiently use food as energy because of the lack of the hormone “insulin” or as a result of a blockage in the function of insulin. The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) estimates that 6 percent of the United States population, or 16 million persons, have diabetes.

There are two types of diabetes mellitus. About 10 to 15 percent of diabetics have Type I (insulin dependent) diabetes. This usually occurs in childhood and results when the pancreas makes little or no insulin. Type II (noninsulin dependent) diabetes is far more common. Approximately 85 to 90 percent of all diabetics have Type II, which occurs when there is interference with the body’s ability to use the insulin that is produced by the pancreas. Type II is most often found in the elderly and is frequently associated with obesity. More than 50 percent of diabetic related complications may be prevented with early detection, *tight* control of blood glucose, and lifestyle changes.



## OTHER CAUSES OF DIABETES

People can also develop diabetes as a result of some other disorder such as hemochromatosis (a hereditary metabolic disorder), surgical removal of the pancreas (as for cancer), tumors of endocrine organs (eg, pituitary gland) which causes diabetes through the overproduction of hormones, primary tumors of the pancreas (cancer), and corticosteroid drugs (used to treat arthritis and asthma) which may cause a drug induced diabetes.

### ■ TYPE I

**Insulin Dependent Diabetes Mellitus (IDDM) - Type I** This occurs when the pancreas is unable to make insulin. The exact cause for this is unknown but it is considered to be an autoimmune disease in which the antibodies (produced in the body) destroy the cells in the pancreas that make insulin. It is often more common in families with a history of type I diabetes (genetic). If a viral infection has injured the pancreas, type I diabetes may also occur. Insulin is required daily.

**SIGNS AND SYMPTOMS** Drowsiness; fruity breath; constant thirst; sudden weight loss; increased urination.

**TREATMENT** Balanced diet, weight control, and a regular exercise program.

**DRUG TREATMENT** Insulin is required.

Humalog, a new prescription drug (1996) that causes the body to mimic, more closely, the way a healthy body releases insulin.

**SURGICAL TREATMENT** Pancreatic transplant has been successful in some patients whose diabetes was so difficult to control that it became life threatening.

### ■ TYPE II

**Noninsulin Diabetes Mellitus (NIDDM) - Type II** This results from the body resisting insulin's ability to lower blood sugar. This form of diabetes is by far the most common type, and is usually seen or diagnosed after the age of 30. The exact cause of this disorder is not known, but is more likely to develop in a person who is overweight, has a family history of diabetes, has high blood sugar when pregnant, has a newborn baby over nine pounds, is over 40 years of age, or has high blood pressure.

**SIGNS AND SYMPTOMS** Weight gain; frequent urination; itchy skin; infections; slow healing of sores; numbness in the extremities (hands and feet).



## ■ TYPE I AND TYPE II

### SIGNS AND SYMPTOMS

Fatigue; blurred vision; increased hunger.

### TREATMENT

For many type II diabetics, eating a healthy diet, maintaining a healthy weight, and exercise can eliminate the need for drug treatment.

### DRUG TREATMENT

**Metformin (Glucophage)**, a new drug that slows the liver's release of sugar in the blood.

**Precose (ACARBOSE)**, a new drug that helps to slow the intestine's absorption of food and even out the blood sugar levels.

**Triglitazone (Resulin)**, a new drug that targets insulin resistance by making cells more sensitive to the body's own insulin.

For both types of diabetes, the goal of treatment is to keep blood sugar at a low level, or as close to normal as possible. Eat nutritious, low-fat foods, exercise, and maintain a healthy weight to help prevent adverse conditions from affecting the eyes, kidneys, heart, or nerves and decrease the onset of infections.

## COMPLICATIONS OF DIABETES

The two most common problems to arise from uncontrolled diabetes are diabetic coma and hypoglycemia (low blood sugar). Both can cause a diabetic to become suddenly unconscious. If you are on medication, always carry identification with your medical history and needs for appropriate treatment.

### ■ DIABETIC COMA (KETOACIDOSIS)

This is more commonly a complication for type I diabetes and is an excessive amount of acid in the blood. It occurs when there is little or no insulin in the body, causing sugar levels to soar. At this point, the body cannot burn sugar and begins to burn fat. This in turn produces by-products called ketones. Ketones cause acid in the blood from which abnormalities can occur, resulting in coma, and eventually, death. This is most often caused by not receiving scheduled insulin injections on time.

### SIGNS AND SYMPTOMS

Increased urination and unquenchable thirst; weakness and drowsiness; vomiting, diarrhea, and abdominal pain. When breathing becomes deeper and more rapid, unconsciousness soon follows.

### TREATMENT

Treatment with immediate insulin and intravenous fluids are important.



## ■ DIABETIC FOOT

People with diabetes often develop poor circulation in the extremities due to atherosclerosis. At the same time, nerve damage diminishes the normal warning signs of foot pain so that infections and injuries go unnoticed. One-fifth of the hospitalizations for diabetes are due to foot infections. One hundred and twenty thousand amputations a year are performed because of diabetic complications.

## ■ HYPOGLYCEMIA

Hypoglycemia is a symptom and not a disease, which is a low amount of glucose in the bloodstream. When not enough glucose circulates to the nervous system and other cells, they become starved for energy. This can be caused by injection of too much insulin, an excessive production of insulin by the pancreas, or a low intake of food.

### SIGNS AND SYMPTOMS

Sweating, nervousness; inability to concentrate; fast heartbeat, dizziness; blurred vision; weakness; fatigue; irritability, confusion; abdominal pain; numbness in mouth, hands, and feet.

### TREATMENT

Immediate intake of sugar (eg, orange juice, apple juice, soda, hard candy, honey, or glucose tablet/gel). If symptoms persist, repeat after 15 to 20 minutes. If symptoms still continue, go directly to the Emergency Department of a hospital, preferably with someone else to help you. To prevent further episodes, your physician may change your medication program.

## ■ MACROVASCULAR DISEASE

Diabetic patients are highly susceptible to the atherosclerotic narrowing of the large blood vessels that cause such complications as heart attacks, stroke, and poor peripheral circulation. Prevention of high cholesterol levels by life style modification, diet and exercise are always used.

### SIGNS AND SYMPTOMS

Chest pain; sweating; weakness; pain in an extremity.

### DRUG TREATMENT

Two classes of cholesterol lowering agents/drugs are also used. The classes of drugs are called “statins” or HMG-COA reductase inhibitors. They reduce LDL levels. Hypertension can be managed with antihypertension medication using diuretics, beta blockers, ACE inhibitors and calcium channel blockers. Individual treatment plans are recommended. Aspirin has been shown to reduce the incidence of coronary artery occlusion if there is no known complication which would prohibit its use (eg, active peptic ulcer).

### SURGICAL TREATMENT

Surgical intervention using angioplasty and coronary artery bypass surgery are also useful in treating symptomatic narrowing of the coronary arteries.



## ■ NEPHROPATHY

This is an abnormal state of the kidneys, and initially presents with early signs of damage to the kidney. The problem progresses with marked reduction of the kidney's capacity to carry out its normal function of eliminating waste products from the body. Kidney damage has declined in people with IDDM by educating the patient for tight control of glucose levels.

### SIGNS AND SYMPTOMS

Blood in urine; back pain; difficulty in urinating.

### TREATMENT

Modify your diet to limit the intake of protein. Take only enough to prevent malnutrition.

### DRUG TREATMENT

Angiotensin converting enzyme (ACE) inhibitors, which slow the production of a hormone called angiotensin, are commonly used in treating hypertension with nephropathy.

Antacids are given to bind dietary phosphates in the intestine to prevent absorption.

Renal dialysis is usually necessary when the kidney function deteriorates to levels less than 10 percent of normal. This is called "end stage renal disease."

## ■ NEUROPATHY

This is an abnormal degenerative condition affecting the peripheral nerves of the body. The diabetic may unconsciously injure the feet resulting in ulcers and other skin lesions.

### SIGNS AND SYMPTOMS

Sensation of burning, pain, and ultimately, loss of feeling.

### DRUG TREATMENT

Amitriptyline is often the most effective medication for improving the symptoms by altering the nerve conduction.

### TREATMENT

When neuropathy affects the gastrointestinal tract (gastroparesis), changing the diet to small, low fat meals can help prevent the feeling of fullness, nausea, and vomiting caused by poor emptying of the digestive tract.

## ■ RETINOPATHY

Retinopathy is a noninflammatory disease of the retina (eye) which occurs as a complication of diabetes.

### SIGNS AND SYMPTOMS

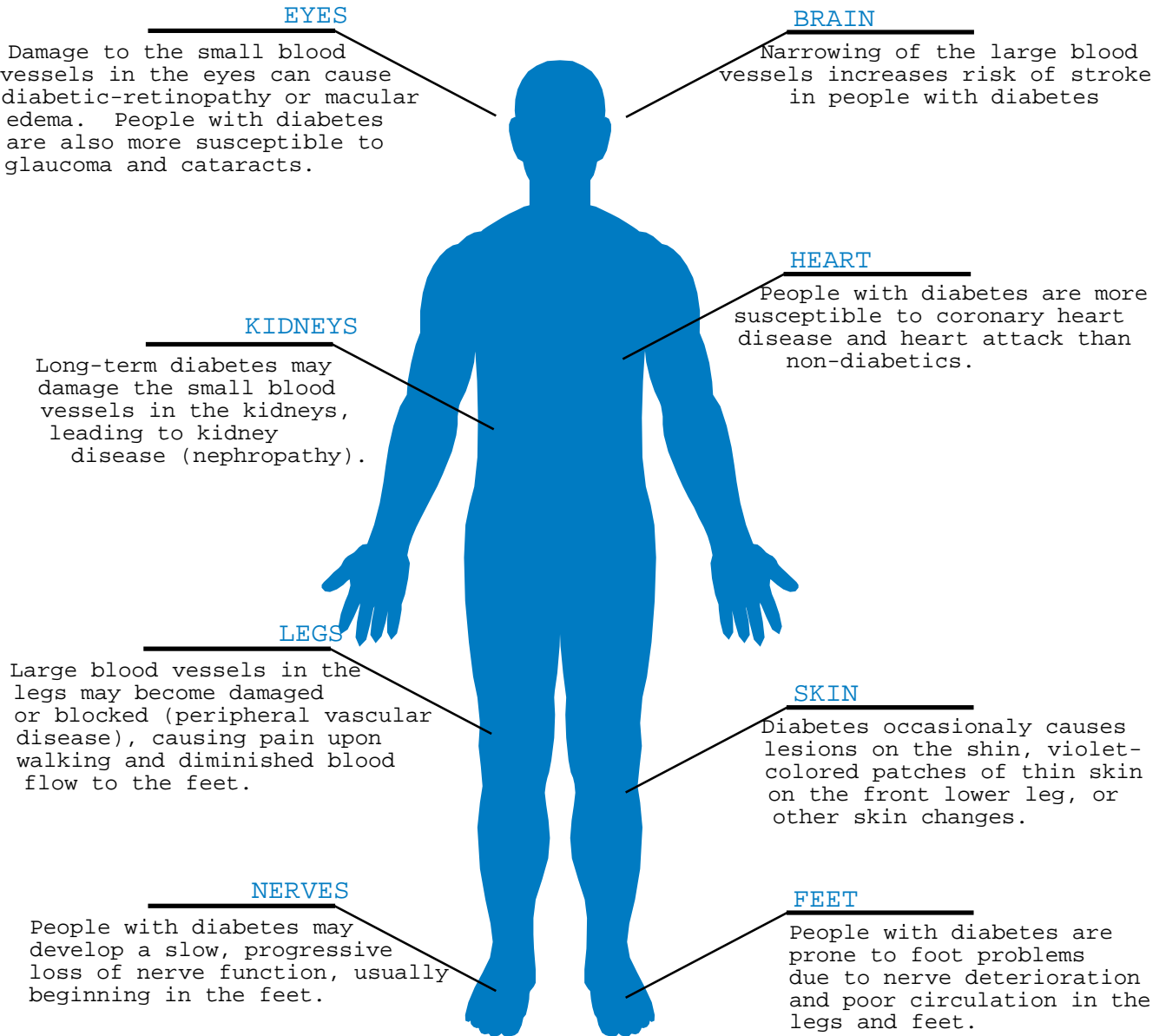
Initially, "blurring of vision."

### TREATMENT

Laser photocoagulation halts or slows the decline in vision in the majority of patients when it is done early. It does not restore vision. Its success in preserving good visual acuity in daytime makes it worth the side effects.



## AREAS OF THE BODY AFFECTED BY COMPLICATIONS OF DIABETES





## MANAGING DIABETES

The proper treatment of diabetes depends on the patient. First, the understanding of the disease is extremely important. A diabetic patient must pay strict attention to the risk factors that can be treated, such as atherosclerosis, tobacco addiction, and hypertension. Simple life style changes lower the risk of cardiovascular complications. Taking an aspirin each day or lowering the blood pressure can decrease the incidence of stroke and heart attack. Intensive therapy that keeps blood sugar levels as close to normal as possible reduces damage to the eyes by 76 percent, to the kidneys by 35 to 56 percent, and to the nerves by 60 percent.

A diabetic patient needs to appreciate the value of strictly adhering to the treatment recommended\* and avoid all the common risk factors.

1. Schedule regular appointments with your physician.
2. If you take insulin or oral hypoglycemic agents, contact your physician if you contract a virus or other infection.
3. Have an annual eye examination.
4. Have regular blood and urine tests to monitor the effect of the treatment.
5. Make a regular examination for your feet to check for sores that might indicate a circulatory problem.
6. Dietary weight control.
7. Exercise daily, walking is ideal.
8. No smoking.
9. Reduction of dietary fats or, if necessary, simply lose weight.
10. Be attentive to blood pressure; keep below 130 mm Hg. Systolic, 85 mmHg. Diastolic.
11. Avoid injury, particularly to the feet.

\* The ideal treatment of diabetes is “tight control” using self-monitoring of blood glucose, blood pressure, and weight. This should be combined with episodic monitoring and review of the glyconated hemoglobin (A1C) by the health care provider with ongoing patient education. Today, if one million people went on tight control, in nine years there would be 330,000 fewer people with progressive retinopathy. There would be 121,000 fewer people needing laser therapy to save their vision, and 35,000 fewer people with definite signs of kidney disease.



## AT RISK WEIGHT CHART

The chart below shows weights 20 percent heavier than recommended for men and women with a medium frame. If your weight is at or above the amount listed for your height, you may be at risk for diabetes.

Height (feet/inches) Without shoes	Weight (pounds) Without clothing	
	Women	Men
4'-9"	134	
4'-10"	137	
4'-11"	140	
5'-0"	143	
5'-1"	146	157
5'-2"	150	160
5'-3"	154	162
5'-4"	157	165
5'-5"	161	168
5'-6"	164	172
5'-7"	168	175
5'-8"	172	179
5'-9"	175	182
5'-10"	178	186
5'-11"	182	190
6'-0"		194
6'-1"		199
6'-2"		203
6'-3"		209

## ON THE HORIZON



A new wristwatch that uses electrical currents to painlessly check the wearer’s blood sugar level could help people with diabetes monitor their condition — without the dreaded finger stab. The GlucoWatch could gain FDA approval soon.