National Diabetes Fact Sheet
United States, 2005

General Information

What is diabetes?
Diabetes is a group of diseases marked by high levels of blood glucose resulting from defects in insulin production, insulin action, or both. Diabetes can lead to serious complications and premature death, but people with diabetes can take steps to control the disease and lower the risk of complications.

Types of diabetes
Type 1 diabetes was previously called insulin-dependent diabetes mellitus (IDDM) or juvenile-onset diabetes. Type 1 diabetes develops when the body's immune system destroys pancreatic beta cells, the only cells in the body that make the hormone insulin that regulates blood glucose. To survive, people with type 1 diabetes must have insulin delivered by injection or a pump. This form of diabetes usually strikes children and young adults, although disease onset can occur at any age. Type 1 diabetes accounts for 5% to 10% of all diagnosed cases of diabetes. Risk factors for type 1 diabetes may be autoimmune, genetic, or environmental. There is no known way to prevent type 1 diabetes. Several clinical trials of methods of the prevention of type 1 diabetes are currently in progress or are being planned.
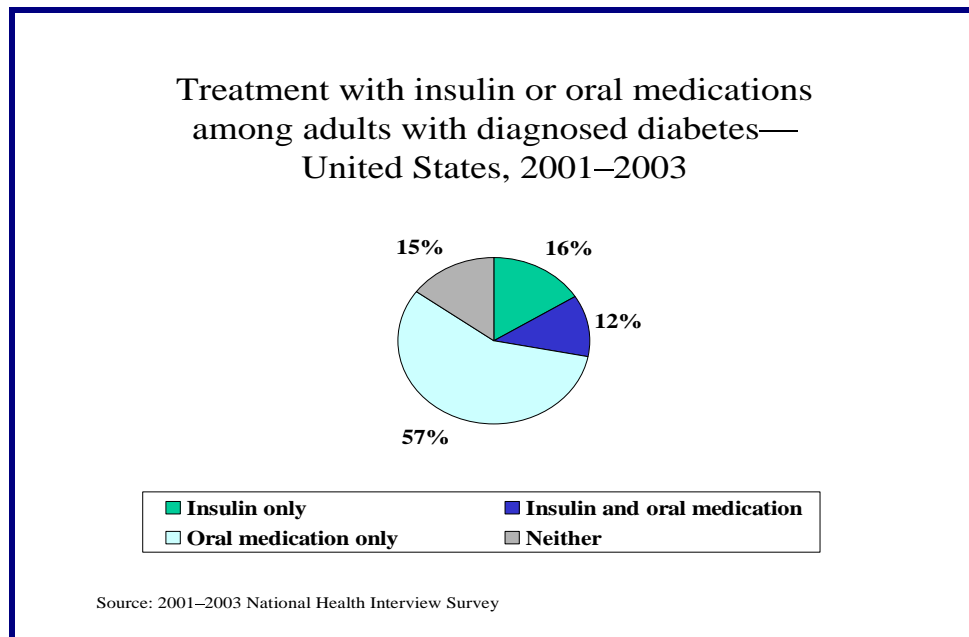
Type 2 diabetes was previously called non–insulin-dependent diabetes mellitus (NIDDM) or adult-onset diabetes. Type 2 diabetes accounts for about 90% to 95% of all diagnosed cases of diabetes. It usually begins as insulin resistance, a disorder in which the cells do not use insulin properly. As the need for insulin rises, the pancreas gradually loses its ability to produce it. Type 2 diabetes is associated with older age, obesity, family history of diabetes, history of gestational diabetes, impaired glucose metabolism, physical inactivity, and race/ethnicity. African Americans, Hispanic/Latino Americans, American Indians, and some Asian Americans and Native Hawaiians or Other Pacific Islanders are at particularly high risk for type 2 diabetes and its complications. Clinically-based reports and regional studies suggest that type 2 diabetes in children and adolescents, although still rare, is being diagnosed more frequently, particularly in American Indians, African Americans, and Hispanic/Latino Americans.

Gestational diabetes is a form of glucose intolerance diagnosed in some women during pregnancy. Gestational diabetes occurs more frequently among African Americans, Hispanic/Latino Americans, and American Indians. It is also more common among obese women and women with a family history of diabetes. During pregnancy, gestational diabetes requires treatment to normalize maternal blood glucose levels to avoid complications in the infant. After pregnancy, 5% to 10% of women with gestational diabetes are found to have type 2 diabetes. Women who have had gestational diabetes have a 20% to 50% chance of developing diabetes in the next 5–10 years.

Other types of diabetes result from specific genetic conditions (such as maturity-onset diabetes of youth), surgery, drugs, malnutrition, infections, and other illnesses. Such types of diabetes account for 1% to 5% of all diagnosed cases.

Treating diabetes

- To survive, people with type 1 diabetes must have insulin delivered by injection or a pump.
- Many people with type 2 diabetes can control their blood glucose by following a healthy meal plan and exercise program, losing excess weight, and taking oral medication.
- Many people with diabetes also need to take medications to control their cholesterol and blood pressure.
- Diabetes self-management education (DMSE) is an integral component of medical care.
- Among adults with diagnosed diabetes, 16% take insulin only, 12% take both insulin and oral medication, 57% take oral medication only, and 15% do not take either insulin or oral medications.

Treatment with insulin or oral medications
among adults with diagnosed diabetes—
United States, 2001–2003

15% 16%

12%

57%

- Insulin only
- Oral medication only
- Insulin and oral medication
- Neither

Source: 2001–2003 National Health Interview Survey

Prediabetes: Impaired glucose tolerance and impaired fasting glucose

- Prediabetes is a condition that raises the risk of developing type 2 diabetes, heart disease, and stroke. People with prediabetes have blood glucose levels higher than normal but not high enough to be classified as diabetes.
- People with prediabetes have impaired fasting glucose (IFG) or impaired glucose tolerance (IGT). Some people have both IFG and IGT.
- IFG is a condition in which the fasting blood sugar level is 100 to 125 milligrams per deciliter (mg/dL) after an overnight fast. The level is higher than normal but not high enough to be classified as diabetes.
- IGT is a condition in which the blood sugar level is 140 to 199 mg/dL after a 2-hour oral glucose tolerance test. This level is higher than normal but not high enough to be classified as diabetes.
- In a cross-section sample of U.S. adults aged 40–74 years tested from 1988 to 1994, 33.8% had IFG, 15.4% had IGT, and 40.1% had prediabetes (IGT or IFG or both). Applying these percentages to the entire U.S. population in 2000, an estimated 35 million adults aged 40–74 had IFG, 16 million had IGT, and 41 million had prediabetes **(there is overlap between the IFG and IGT groups)**.
- More recent estimates from 1999 through 2002 indicate that among U.S. adults aged 20 years and older, 26% had IFG, which was similar to the prevalence in 1988–1994 (25%). Applying this percentage to the entire U.S. population yields an estimated 54 million American adults with IFG in 2002. Because IGT was not measured in 1999–2002, these data suggest that at least 54 million American adults had prediabetes in 2002.
- Progression to diabetes among those with prediabetes is not inevitable. Studies have shown that people with prediabetes who lose weight and increase their physical activity can prevent or delay diabetes and even return their blood glucose levels to normal.

National Estimates on Diabetes

The estimates on diabetes in this fact sheet were derived from various data systems of the Centers for Disease Control and Prevention, the outpatient database of the Indian Health Service (IHS), the U.S. Renal Data System of the National Institutes of Health, the U.S. Census Bureau, and published studies. Estimates of the total number of persons with diabetes and the prevalence of diabetes in 2005 were derived using 1999–2002 National Health and Nutrition Examination Survey (NHANES), 1999-2003 National Health Interview Survey (NHIS), 2003 IHS data, and 2005 resident population estimates. Many of the estimated numbers and percentages of people with diabetes were derived by applying diabetes prevalence estimates from health surveys of the civilian, noninstitutionalized population to the most recent 2005 resident population estimates. These estimates have some variability due to the limits of the measurements and estimation procedures. The procedures assumed that age-race-sex–specific percentages of adults with diabetes (diagnosed and undiagnosed) in 2005 are the same as they were in earlier time periods (e.g., 1999–2002) and that the age-race-sex percentages of adults with diabetes in resident population is identical to that in the civilian, noninstitutionalized population. Deviations from these assumptions may result in over- or under-estimated numbers and percentages. For further information on the methods for deriving total, diagnosed, and undiagnosed prevalence of diabetes from NHANES data, see http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5235a1.htm. More detail on the data sources, references, and methods are available at http://www.cdc.gov/diabetes/pubs/references.htm.

Diabetes Prevalence

> **Total prevalence of diabetes in the United States, all ages, 2005**
>
> **Total:** 20.8 million people—7.0% of the population—have diabetes.
> **Diagnosed:** 14.6 million people
> **Undiagnosed:** 6.2 million people

Prevalence of diagnosed diabetes in people aged 20 years or younger, United States, 2005

About 176,500 people aged 20 years or younger have diabetes. This represents 0.22% of all people in this age group.

About one in every 400 to 600 children and adolescents has type 1 diabetes.

Although type 2 diabetes can occur in youth, the nationally representative data that would be needed to monitor diabetes trends in youth by type are not available. Clinically-based reports and regional studies suggest that type 2 diabetes, although still rare, is being diagnosed more frequently in children and adolescents, particularly in American Indians, African Americans, and Hispanic/Latino Americans.

Total prevalence of diabetes among people aged 20 years or older, United States, 2005

Age 20 years or older: 20.6 million or 9.6% of all people in this age group have diabetes.
Age 60 years or older: 10.3 million or 20.9% of all people in this age group have diabetes.
Men: 10.9 million or 10.5% of all men aged 20 years or older have diabetes.
Women: 9.7 million or 8.8% of all women aged 20 years or older have diabetes.

Estimated total prevalence of diabetes in people aged 20 years or older, by age group— United States, 2005
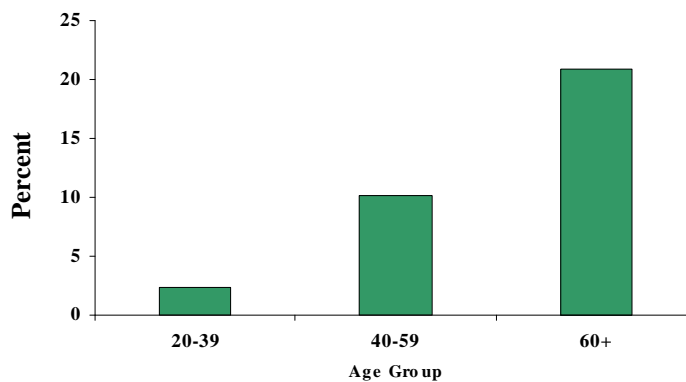
Source: 1999–2002 National Health and Nutrition Examination Survey estimates of total prevalence (both diagnosed and undiagnosed) were projected to year 2005.

Total prevalence of diabetes by race/ethnicity among people aged 20 years or older, United States, 2005

Non-Hispanic whites: 13.1 million, or 8.7% of all non-Hispanic whites aged 20 years or older have diabetes.

Non-Hispanic blacks: 3.2 million, or 13.3% of all non-Hispanic blacks aged 20 years or older have diabetes. After adjusting for population age differences, non-Hispanic blacks are 1.8 times as likely to have diabetes as non-Hispanic whites.

Hispanic/Latino Americans: After adjusting for population age differences, Mexican Americans, the largest Hispanic/Latino subgroup, are 1.7 times as likely to have diabetes as non-Hispanic whites. If the prevalence of diabetes among Mexican Americans was applied to the total Hispanic/Latino population, about 2.5 million (9.5%) Hispanic/Latino Americans aged 20 years or older would have diabetes. Sufficient data are not available to derive estimates of the total prevalence of diabetes (both diagnosed and undiagnosed diabetes) for other Hispanic/Latino groups. However, residents of Puerto Rico are 1.8 times as likely to have diagnosed diabetes as U.S. non-Hispanic whites.

American Indians and Alaska Natives: 99,500, or 12.8% of American Indians and Alaska Natives aged 20 years or older who received care from IHS in 2003 had diagnosed diabetes. Applying the rate of undiagnosed diabetes in the total U.S. population to the American Indians and Alaska Natives who receive care from IHS gives an estimate of 118,000 (15.1%) American Indians and Alaska Natives aged 20 years or older with diabetes (both diagnosed and undiagnosed diabetes). After adjusting for population age differences, the total prevalence of diabetes in this group is lowest among Alaska Natives (8.1%) and highest among American Indians in the southern United States (26.7%) and in southern Arizona (27.6%). Taking into account population age differences, American Indians and Alaska Natives are 2.2 times as likely to have diabetes as non-Hispanic whites.

Asian Americans and Pacific Islanders: The total prevalence of diabetes (both diagnosed and undiagnosed diabetes) is not available for Asian Americans or Pacific Islanders. However, in Hawaii, Asians, Native Hawaiians, and other Pacific Islanders aged 20 years or older are more than 2 times as likely to have diagnosed diabetes as whites after adjusting for population age differences. Similarly, in California, Asians were 1.5 times as likely to have diagnosed diabetes as non-Hispanic whites. Other groups within these populations also have increased risk for diabetes.

Estimated age-adjusted total prevalence of diabetes in people aged 20 years or older, by race/ethnicity— United States, 2005
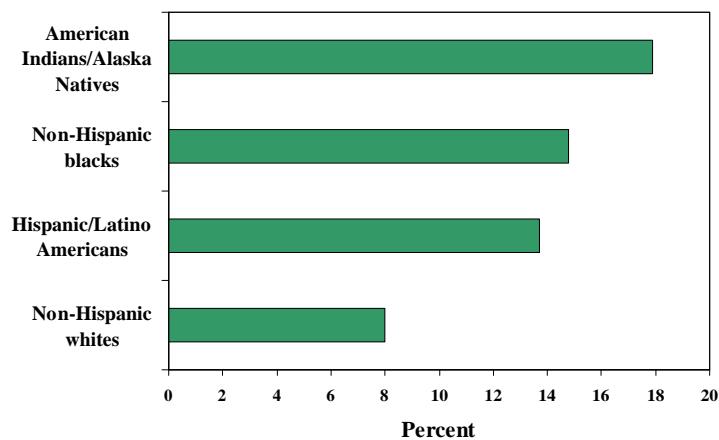
Source: For American Indians/Alaska Natives, the estimate of total prevalence was calculated using the estimate of diagnosed diabetes from the 2003 outpatient database of the Indian Health Service and the estimate of undiagnosed diabetes from the 1999–2002 National Health and Nutrition Examination Survey. For the other groups, 1999–2002 NHANES estimates of total prevalence (both diagnosed and undiagnosed diabetes) were projected to year 2005.

Incidence of diabetes, United States, 2005

1.5 million new cases of diabetes were diagnosed in people aged 20 years or older in 2005.

Estimated number of new cases of diagnosed diabetes
in people aged 20 years or older, by age group—
United States, 2005

Source: 2001–2003 National Health Interview Survey estimates projected to year 2005.
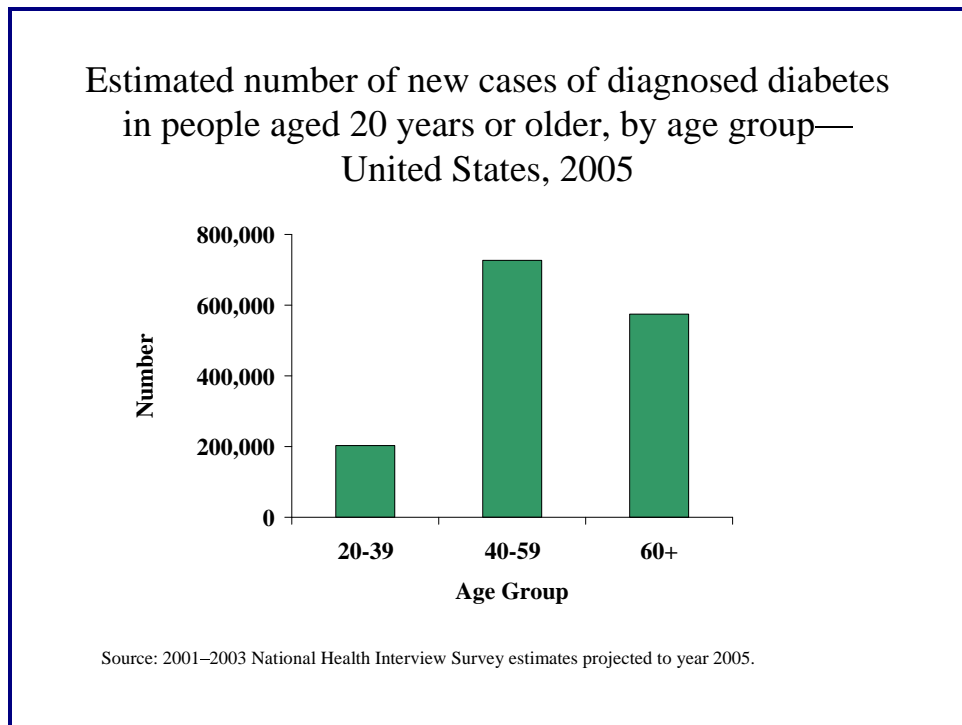
Deaths among people with diabetes, United States, 2002

- Diabetes was the sixth leading cause of death listed on U.S. death certificates in 2002. This ranking is based on the 73,249 death certificates in which diabetes was listed as the underlying cause of death. According to death certificate reports, diabetes contributed to a total of 224,092 deaths.
- Diabetes is likely to be underreported as a cause of death. Studies have found that only about 35% to 40% of decedents with diabetes had it listed anywhere on the death certificate and only about 10% to 15% had it listed as the underlying cause of death.
- Overall, the risk for death among people with diabetes is about twice that of people without diabetes of similar age.

Complications of diabetes in the United States

Heart disease and stroke

- Heart disease and stroke account for about 65% of deaths in people with diabetes.
- Adults with diabetes have heart disease death rates about 2 to 4 times higher than adults without diabetes.
- The risk for stroke is 2 to 4 times higher among people with diabetes.

High blood pressure

- About 73% of adults with diabetes have blood pressure greater than or equal to 130/80 millimeters of mercury (mm Hg) or use prescription medications for hypertension.

Blindness

- Diabetes is the leading cause of new cases of blindness among adults aged 20–74 years.
- Diabetic retinopathy causes 12,000 to 24,000 new cases of blindness each year.

Kidney disease
- Diabetes is the leading cause of kidney failure, accounting for 44% of new cases in 2002.
- In 2002, 44,400 people with diabetes began treatment for end-stage kidney disease in the United States and Puerto Rico.
- In 2002, a total of 153,730 people with end-stage kidney disease due to diabetes were living on chronic dialysis or with a kidney transplant in the United States and Puerto Rico.

Nervous system disease
- About 60% to 70% of people with diabetes have mild to severe forms of nervous system damage. The results of such damage include impaired sensation or pain in the feet or hands, slowed digestion of food in the stomach, carpal tunnel syndrome, and other nerve problems.
- Almost 30% of people with diabetes aged 40 years or older have impaired sensation in the feet (i.e., at least one area that lacks feeling).
- Severe forms of diabetic nerve disease are a major contributing cause of lower-extremity amputations.

Amputations
- More than 60% of nontraumatic lower-limb amputations occur in people with diabetes.
- In 2002, about 82,000 nontraumatic lower-limb amputations were performed in people with diabetes.

Dental disease
- Periodontal (gum) disease is more common in people with diabetes. Among young adults, those with diabetes have about twice the risk of those without diabetes.
- Almost one-third of people with diabetes have severe periodontal disease with loss of attachment of the gums to the teeth measuring 5 millimeters or more.

Complications of pregnancy
- Poorly controlled diabetes before conception and during the first trimester of pregnancy can cause major birth defects in 5% to 10% of pregnancies and spontaneous abortions in 15% to 20% of pregnancies.
- Poorly controlled diabetes during the second and third trimesters of pregnancy can result in excessively large babies, posing a risk to both mother and child.

Other complications
- Uncontrolled diabetes often leads to biochemical imbalances that can cause acute life-threatening events, such as diabetic ketoacidosis and hyperosmolar (nonketotic) coma.
- People with diabetes are more susceptible to many other illnesses and, once they acquire these illnesses, often have worse prognoses. For example, they are more likely to die with pneumonia or influenza than people who do not have diabetes.

Preventing diabetes complications

Diabetes can affect many parts of the body and can lead to serious complications such as blindness, kidney damage, and lower-limb amputations. Working together, people with diabetes and their health care providers can reduce the occurrence of these and other diabetes complications by controlling the levels of blood glucose, blood pressure, and blood lipids, and by receiving other preventive care practices in a timely manner.

Glucose control
Studies in the United States and abroad have found that improved glycemic control benefits people with either type 1 or type 2 diabetes. In general, every percentage point drop in A1C blood test results (e.g., from 8.0% to 7.0%) reduces the risk of microvascular complications (eye, kidney, and nerve diseases) by 40%.

Blood pressure control
- Blood pressure control reduces the risk of cardiovascular disease (heart disease or stroke) among persons with diabetes by 33% to 50%, and the risk of microvascular complications (eye, kidney, and nerve diseases) by approximately 33%.
- In general, for every 10 mm Hg reduction in systolic blood pressure, the risk for any complication related to diabetes is reduced by 12%.

Control of blood lipids
- Improved control of cholesterol or blood lipids (for example, HDL, LDL, and triglycerides) can reduce cardiovascular complications by 20% to 50%.

Preventive care practices for eyes, kidneys, and feet
- Detecting and treating diabetic eye disease with laser therapy can reduce the development of severe vision loss by an estimated 50% to 60%.
- Comprehensive foot care programs can reduce amputation rates by 45% to 85%.
- Detecting and treating early diabetic kidney disease by lowering blood pressure can reduce the decline in kidney function by 30% to 70%. Treatment with ACE inhibitors and angiotensin receptor blockers (ARBs) are more effective in reducing the decline in kidney function than other blood pressure lowering drugs.

Estimated diabetes costs in the United States in 2002

Total (direct and indirect): $132 billion
Direct medical costs: $92 billion
Indirect costs: $40 billion (disability, work loss, premature mortality)

These data are based on a study by the Lewin Group, Inc., for the American Diabetes Association and are 2002 estimates of both the direct (cost of medical care and services) and indirect costs (costs of short-term and permanent disability and of premature death) attributable to diabetes. This study used a specific cost-of-disease methodology to estimate the health care costs due to diabetes.

Acknowledgments

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- Agency for Healthcare Research and Quality
  http://www.ahrq.gov/browse/diabetes.htm
- American Association of Diabetes Educators
  http://www.aadenet.org
- American Diabetes Association
  http://www.diabetes.org*
- Centers for Disease Control and Prevention
  http://www.cdc.gov/diabetes
  http://www.cdc.gov/nchs
- Centers for Medicare and Medicaid Services
  http://cms.hhs.gov
- Department of Veterans Affairs
  http://www.va.gov/health/diabetes
- Health Resources and Services Administration
  http://www.hrsa.gov
- Indian Health Service
  http://www.ihs.gov/MedicalPrograms/Diabetes/index.asp
- Juvenile Diabetes Research Foundation International
  http://www.jdrf.org*
- National Diabetes Education Program, a joint program of NIH and CDC
  http://www.ndep.nih.gov
  http://www.cdc.gov/diabetes/ndep/index.htm
- National Institute of Diabetes and Digestive and Kidney Diseases of the National Institutes of Health
  http://www.niddk.nih.gov
- U.S. Department of Health and Human Services, Office of Minority Health
  http://www.omhrc.gov

Note

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Diabetes Glossary

- **Blood glucose** is the main sugar found in the blood and the body's main source of energy. The **A1c blood test** is used to measure a person's average blood sugar level over the past 2 to 3 months.

- **Blood pressure** is the force of blood on the inside walls of blood vessels, measured by analyzing both the **systolic blood pressure**, the pressure when the heart pushes blood out into the arteries, and the **diastolic blood pressure**, when the heart is at rest.

- **Blood lipid** is a term for fat in the blood stream, and is measured with a lipid profile blood test. The lipid profile test measures total **cholesterol**, the fat produced by the liver and found in some foods, **triglycerides**, the storage form of fat in the body, **HDL cholesterol**, fat that takes extra cholesterol from the blood to the liver for removal, and **LDL cholesterol**, fat that takes excess cholesterol around the body to where it's needed, but excess ultimately rests on the inside of artery walls.

- **Diabetic ketoacidosis** is a condition in which very high blood sugar levels along with a very low level of insulin result in a dangerous accumulation of ketones -- substances produced when the body breaks down fat for energy -- in the blood and urine. **Hyperosmolar nonketotic syndrome** is another condition in which one's blood sugar levels become very high and necessary ketones are not present in the blood or urine. Coma or death can result if both of these conditions are not treated.

- **Insulin** is a hormone that is needed to convert sugar, starches, and other food into energy needed for daily life.

- **Metformin** is a medicine pill used to treat type 2 diabetes because it lowers blood sugar levels by reducing the amount of sugar produced by the liver and helping the body respond better to insulin.

- **Maturity-onset diabetes of the young** is a kind of type 2 diabetes that accounts for 1 to 5 percent of people with diabetes and is a result of a defect in a single gene.

- **Non-traumatic lower-limb amputation** is a procedure to remove through surgery damaged feet or legs, where the injury was not caused by trauma (e.g., the injury was not caused by a car accident).

- **Diabetic retinopathy** is diabetic eye disease that results from damage to the small blood vessels in the retina, the back part of the eye that contains the cells that respond to light. It may lead to loss of eyesight. **Laser therapy**, one possible treatment option, uses a strong beam of light to seal the leaking blood vessels in the eye.

- **End-stage renal disease** is kidney failure requiring dialysis or a transplant to survive.

- **Glucose intolerance** is a condition in which the body has blood sugar levels higher than normal, but not high enough to classify as diabetes. It is diagnosed using an **oral glucose tolerance test** which requires a fasting period of 8 to 12 hours and the blood sugar is measured both fasting and 2 hours after drinking a high-sugar drink.