

# DIABETES BACKGROUND

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Diabetes is a chronic disease that occurs when the pancreas produces little or no insulin, or when the pancreas produces insulin but it is resisted by the body. Insulin is a hormone the body needs to regulate blood sugar (glucose), the body's energy source.

The American Diabetes Association (ADA) estimates that almost 30.3 million children and adults in the U.S. have diabetes (approximately 9.4 percent of the population). Approximately 1.25 million American children and adults have type 1 diabetes. Globally, there are 425 million adults (20-79 years) living with diabetes; by 2045 this will rise to 629 million according to the International Diabetes Federation (IDF).

## Types of Diabetes

Two of the most common forms of diabetes are type 1 diabetes and type 2 diabetes.

	Type 1	Type 2
<b>Biology</b>	<ul style="list-style-type: none"><li>▪ Pancreas produces no insulin</li></ul>	<ul style="list-style-type: none"><li>▪ Pancreas does not produce enough insulin, or it is resisted by the body</li></ul>
<b>Cause</b>	<ul style="list-style-type: none"><li>▪ The body's immune system destroys pancreatic beta cells, the only cells in the body that make insulin</li></ul>	<ul style="list-style-type: none"><li>▪ Usually begins when the cells do not use insulin properly, called insulin resistance. The need for insulin rises, and the pancreas gradually loses ability to produce it</li></ul>
<b>Risk Factors</b>	<ul style="list-style-type: none"><li>▪ Although the exact cause is unknown, factors that may signal an increased risk include family history, environmental factors, autoimmune disorders, dietary factors and geography</li></ul>	<ul style="list-style-type: none"><li>▪ Associated with obesity, family history of diabetes, history of gestational diabetes, impaired glucose metabolism, physical inactivity and race/ethnicity</li></ul>
<b>Onset</b>	<ul style="list-style-type: none"><li>▪ Usually diagnosed in children and young adults, although disease onset can occur at any age</li></ul>	<ul style="list-style-type: none"><li>▪ Typically associated with older age</li><li>▪ Although rare in children and adolescents, it is being diagnosed more frequently, especially among certain ethnic groups</li></ul>
<b>Prevalence</b>	<ul style="list-style-type: none"><li>▪ 1.25 million children and adults in the U.S.</li><li>▪ Over 1.1 million children globally</li></ul>	<ul style="list-style-type: none"><li>▪ 382.5 million people worldwide</li><li>▪ In adults, accounts for 90 percent of diagnosed cases of diabetes</li></ul>
<b>Treatment</b>	<ul style="list-style-type: none"><li>▪ Daily insulin therapy delivered by injection or a pump, close monitoring, a healthy diet and regular exercise</li></ul>	<ul style="list-style-type: none"><li>▪ A healthy diet and regular exercise, along with oral or injected medications. As type 2 diabetes progresses, insulin therapy may be required</li></ul>

## **Managing Diabetes**

It can be extremely challenging for people with diabetes to keep their blood sugar levels within the normal range, since food, exercise, hormones and stress, among other things, can have an impact. As a result, people with diabetes are at risk for:

- Hypoglycemia (low blood sugar) – a condition that can cause confusion, disorientation, loss of consciousness, and in the worst cases can result in coma or death.
- Hyperglycemia (high blood sugar) – a condition that can contribute to long-term complications and is characterized by symptoms such as increased thirst, headaches, trouble concentrating, blurred vision, frequent urination and fatigue, among others.

It is important to treat hyperglycemia because it can lead to serious complications:

- Cardiovascular disease, including heart disease and stroke
- Nerve damage (neuropathy)
- Kidney failure
- Eye damage (retinopathy), potentially leading to blindness
- Foot damage, potentially leading to amputation
- Skin infections

Studies have shown that reducing blood sugar levels – even small amounts – can have a significant impact on the risk of complications.

## **Diabetes Facts**

- Globally, the IDF estimates 629 million people will be affected by 2045.
  - Every seven seconds one person dies from complications related to diabetes
  - One in two people with diabetes don't know they have it
- In the U.S., the ADA estimates that as many as 1 in 3 American adults will have diabetes by 2050.
  - 1.5 million are diagnosed with diabetes every year
  - 7.2 million are undiagnosed
  - 84.1 million have prediabetes – a condition where blood sugar levels are higher than normal
  - Diabetes kills more Americans every year than AIDS and breast cancer combined

## **Economic Costs of Diabetes**

- Globally, the IDF estimates diabetes cost \$727 billion in 2017 and will rise over \$800 billion by 2040.
- In the U.S., the ADA estimates that the total cost of diagnosed diabetes to be \$327 billion. Direct medical costs totaled \$237 billion, and \$90 billion reduced productivity costs (disability, work loss, premature mortality).
  - People with diabetes have medical expenditures that are approximately 2.3 times higher than people without diabetes
  - 1 in 7 health care dollars is spent treating diabetes and its complications
  - The largest components of medical expenditures are for:
    - Hospital inpatient care (30 percent)
    - Prescription medications to treat complications of diabetes (30 percent)
    - Diabetes medications and diabetes supplies (15 percent)
    - Physician office visits (13 percent)

Sources:

- International Diabetes Federation. <http://www.diabetesatlas.org/>
- American Diabetes Association. <http://www.diabetes.org/>
- The Diabetes Control and Complications Trial Research Group. The effect of intensive treatment of diabetes on the development and progression of long-term complications in insulin-dependent diabetes mellitus. N Engl J Med. 1993;329(14):977-986. <http://www.nejm.org/doi/full/10.1056/NEJM199309303291401>