



Diabetes

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Diabetes– Outline

- ▶ Overview
 - ▶ Types of diabetes.
 - ▶ Gestational diabetes.
 - ▶ Prediabetes.
 - ▶ Signs and symptoms of diabetes.
 - ▶ Complications of diabetes.
 - ▶ Prevention and treatment of diabetes.
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Diabetes– Overview

- ▶ Diabetes describes a condition in which the body cannot make proper use of sugar in food because the pancreas does not make enough insulin, or the insulin produced is ineffective, or a combination of both..
- ▶ Diabetes results in damage to variety of organs, if not treated properly eventually leads to death.

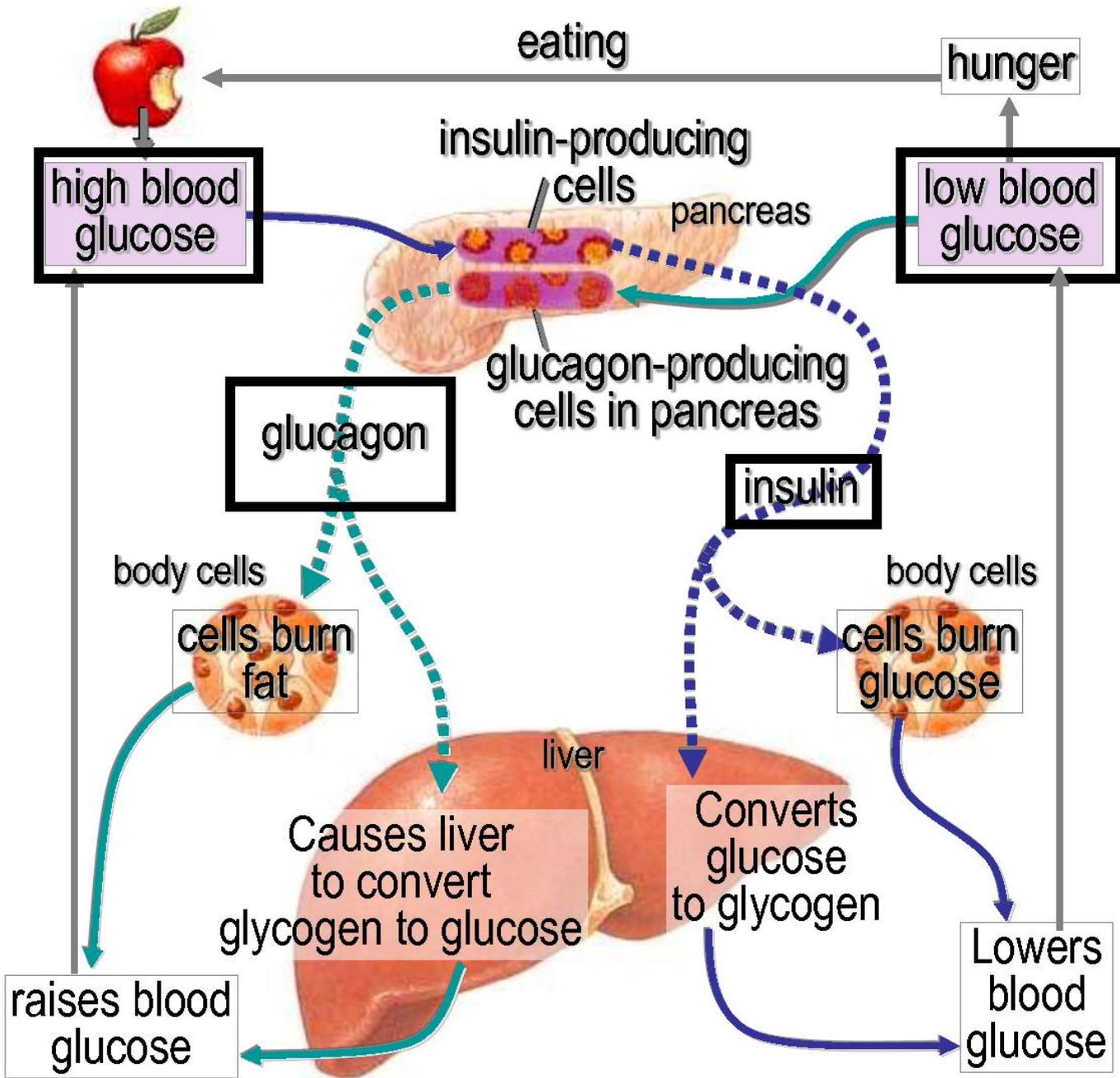
Definition & Terminology

- ▶ Diabetes mellitus : sugar diabetes (in Latin Mellitus means honey sweet)

- ▶ Diabetes Insipidus: (*insipidus* means "without taste" in Latin).

Diabetes– Overview Cont'd

- ▶ Insulin is a hormone that is needed to convert sugar, starches and other food into energy needed for daily life.
(pancreas).
 - ▶ The cause of diabetes continues to be a mystery, although both genetics and environmental factors such as obesity and lack of exercise appear to play roles.
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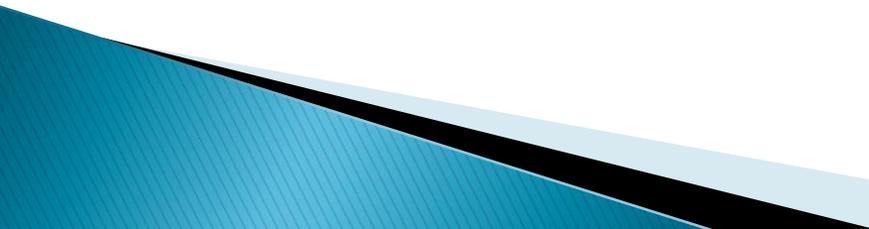


Duelling hormones from the pancreas controls blood sugar

Diabetes– Overview Cont'd

- ▶ There are 20.8 million children and adults in the United States, or 7% of the population, who have diabetes.
- ▶ While an estimated 14.6 million have been diagnosed with diabetes,
- ▶ unfortunately, 6.2 million people are unaware that they have the disease.
- ▶ *Worldwide over 246 million people have diabetes. By 2020, that number is expected to rise to 380 million.*

Diabetes – Overview Cont'd

- ▶ One in two minorities born in 2000 will develop diabetes in their lifetime if current trends continue.
 - ▶ The total annual economic cost of diabetes in 2007 was estimated to be \$174 billion.
 - ▶ Diabetes is the fifth leading cause of death by disease and currently has no cure.
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The Genetics of Diabetes

- ▶ Unlike some traits, diabetes does not seem to be inherited in a simple pattern.
 - ▶ Yet clearly, some people are born more likely to get diabetes than others.
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Types of diabetes: Type 1 diabetes

- ▶ Results from the body's failure to produce insulin.
- ▶ *It is estimated that 5–10% of Americans who are diagnosed with diabetes have type 1 diabetes.*
- ▶ Appears at <40 yrs and in childhood.

Known as

***Insulin Dependent Diabetes, (IDD). or
Juvenil Diabetes***

Types of diabetes: Type 2 diabetes

- ▶ Results from *insulin resistance* (a condition in which the body fails to properly use insulin), combined with relative insulin deficiency.
- ▶ *Most Americans who are diagnosed with DM have type 2 diabetes.*
- ▶ usually appears in middle-aged or older people.

Type 2 diabetes: Cont'd

- ▶ Type 2 diabetes develops slowly over a period of years.
 - ▶ Some people may not notice any symptoms at all and their diabetes is only picked up in a routine medical check up.
 - ▶ Some people may put the symptoms down to 'getting older' or 'overwork'.
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The people most at risk of Type 2 diabetes:

Are people aged over 40 years and :

1. have a family history of diabetes
 2. **are overweight**
 3. have high blood pressure, heart disease or have had a heart attack
 4. **have had a borderline high blood glucose test**
 5. are women with polycystic ovary syndrome who are overweight.
 6. **are women who have had high blood glucose levels during pregnancy (gestational diabetes).**
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Gestaitonal diabetes

- ▶ You are 28 weeks pregnant. Your health care provider has just told you that you have gestational diabetes.
 - ▶ **Should you be concerned about gestational diabetes?**
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Gestational diabetes

The short answer: yes.

- ▶ Gestational diabetes affects about 4% of all pregnant women
- ▶ 135,000 cases in USA each year.

What is gestational diabetes?

Pregnant women who have never had diabetes before but who have high blood sugar (glucose) levels during pregnancy are said to have gestational diabetes.

- ▶ **The cause of gestational diabetes is unknown.**
“Hormones from the placenta block the action of the mother's insulin in her body”
- ▶
- ▶ **This problem is called insulin resistance.**

How G.diabetes can affect the baby?

- ▶ Although insulin does not cross the placenta, glucose and other nutrients do.
- ▶ So extra blood glucose goes through the placenta, giving the baby high blood glucose levels.
- ▶ This causes the baby's pancreas to make extra insulin to get rid of the blood glucose.
- ▶ *Since the baby is getting more energy than it needs to grow and develop, the extra energy is stored as fat.*

How gestational diabetes can affect the baby? **Consequences:**

- ▶ *Macrosomia*, or a "fat" baby.
- ▶ Damage to their shoulders during birth.
- ▶ low blood glucose levels :Hypoglycemia newborns may have at birth.
- ▶ Breathing problems.
- ▶ *Babies with excess insulin become children who are at risk for obesity and adults who are at risk for type 2 diabetes.*

Treating gestational diabetes

1. **Diet:** limit intake by 30% or less of daily calories.
 2. **Physical exercise**
 3. **Insulin Injections**
 - ▶ Gestational diabetes usually goes away after pregnancy.
 - ▶ But once you've had gestational diabetes, your chances are 2 in 3 that it will return in future pregnancies.
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Pre-diabetes

- ▶ *Pre-diabetes is a condition that occurs when a person's blood glucose levels are higher than normal but not high enough for a diagnosis of type 2 diabetes.*
- ▶ 54 million Americans have pre-diabetes.
- ▶ Recent research has shown that some long-term damage to the body, especially the heart and circulatory system, may already be occurring during pre-diabetes.

Diabetes = Hyperglycemia

- ▶ **Hyperglycemia: elevated blood sugar**

Normal Blood sugar level 80–110 mg/dl

- ▶ Blood glucose goes up after eating but 1 or 2 hours (< 160) later returns to the normal range.

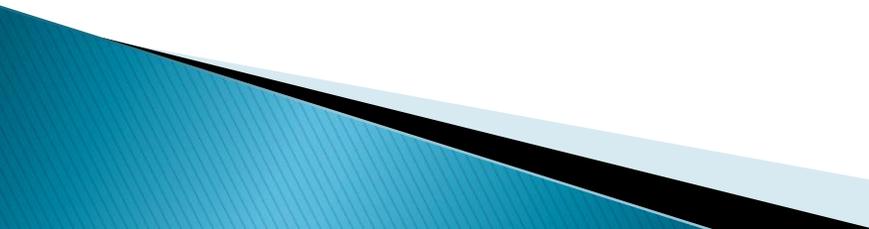
What are the signs and symptoms of diabetes?

- ▶ being very thirsty
- ▶ urinating often
- ▶ feeling very hungry or tired
- ▶ losing weight
- ▶ having sores that heal slowly
- ▶ having dry, itchy skin
- ▶ Loss of feeling or tingling in the feet .
- ▶ blurred vision

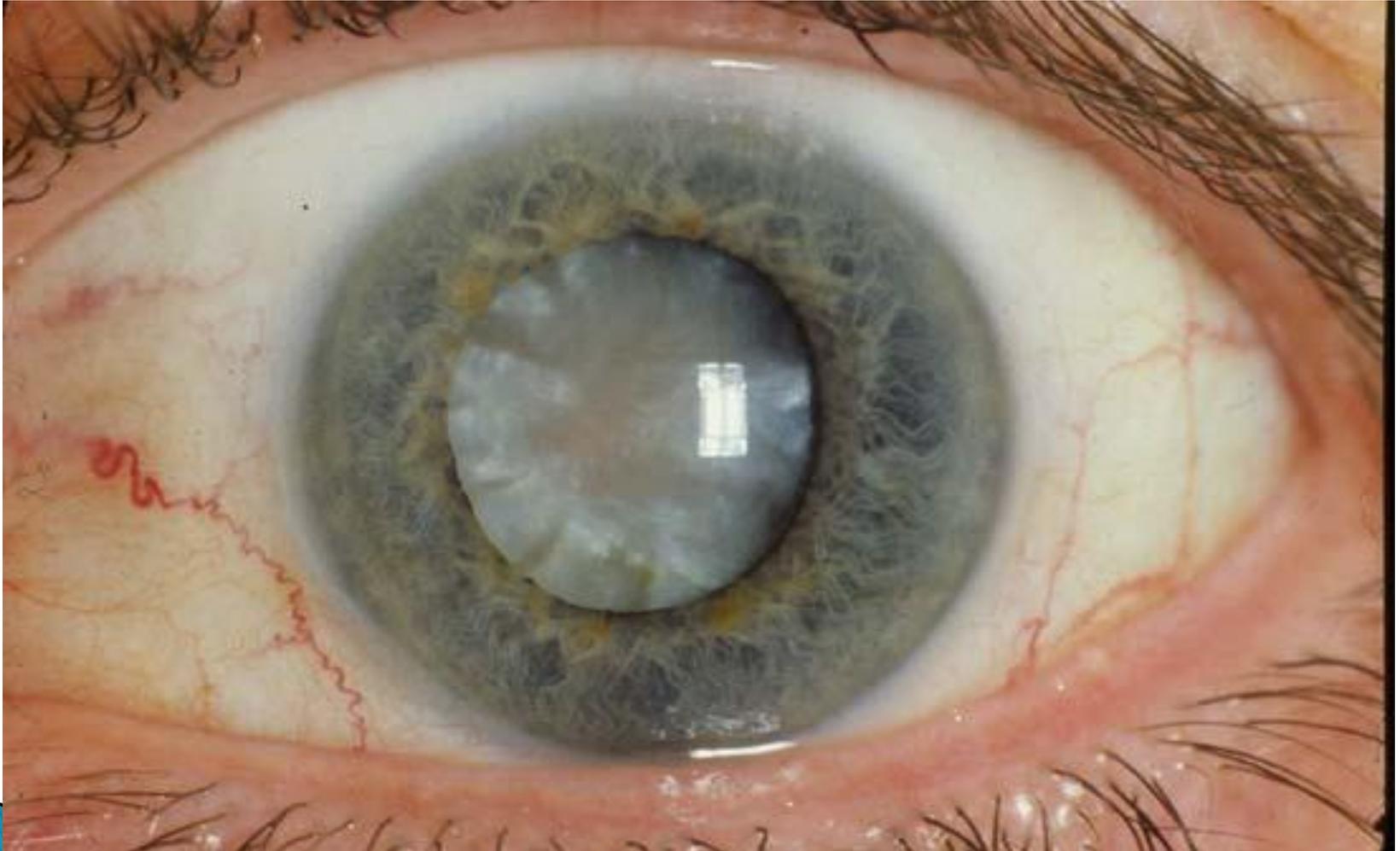
Diabetes– Complications

1. **Heart and Blood Vessels:**
2. **Eyes: Cataract (opacification of the lens)**
3. **Kidneys: renal failure**
4. **Nerves: neuropathy (nerve dysfunction)**
5. **Feet : foot ulcers: non healing**

Others:

- ❑ **Digestion: constipation**
 - ❑ **Mouth: gums, and teeth**
 - ❑ **sexual response : erectile dysfunction**
 - ❑ **mood changes : depression.**
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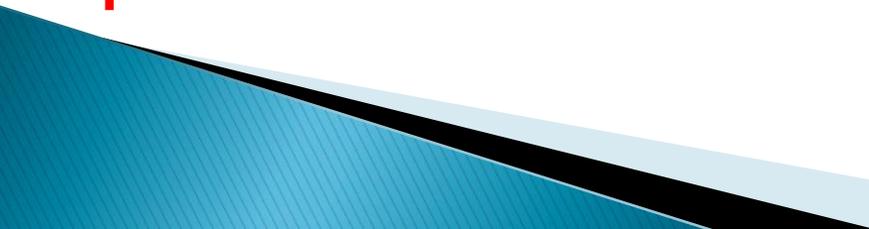
Cataract : Opacification of the lens. Complication of diabetes



How can diabetes affect cardiovascular health?

- ▶ Cardiovascular disease is the leading cause of early death among people with diabetes.
- ▶ Adults with diabetes are two to four times more likely than people without diabetes to have heart disease or experience a stroke.
- ▶ At least 65% of people with diabetes die from heart disease or stroke.
- ▶ About 70% of people with diabetes also have high blood pressure.

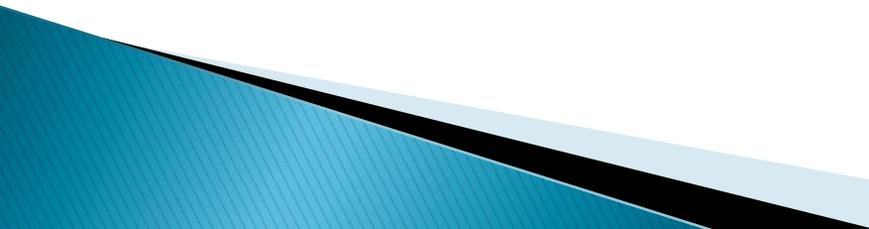
How can diabetes affect the sexual response?

- ▶ Many people with diabetic nerve damage have trouble having sex.
 - ▶ For example, men can have trouble maintaining an erection and ejaculating.
 - ▶ Women can have trouble with sexual response and vaginal lubrication.
 - ▶ Both men and women with diabetes can get urinary tract infections and bladder problems more often than average.
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Things that do not cause diabetes:

- ▶ Eating sweets or sugar does not cause diabetes
 - ▶ Stress does not cause diabetes although it may make the symptoms worse in people who already have the condition.
 - ▶ sometimes an accident or an illness may reveal diabetes if it is already there, but they do not cause it.
 - ▶ You cannot catch diabetes from somebody, nor can you give it to anyone.
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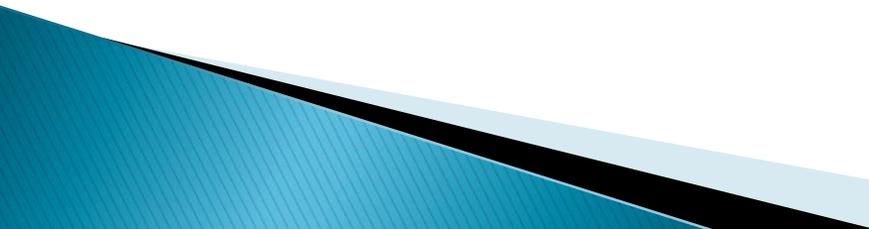
Treatment of diabetes

- ▶ **Although diabetes cannot yet be cured, it can be managed very successfully.**
 - ▶ **The aim of diabetes management is to keep blood glucose levels as near to normal as possible (70–110 mg/dl) before meals and up to 160 mg/dl two hours after a meal).**
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Treatment of diabetes

- ▶ **Type I:** Insulin injections and diet
 - ▶ **Type II:** Diet control, Drugs (oral hypoglycemic agents) .
 - ▶ Physical exercise
 - ▶ Treatment of complications
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Blood sugar surveillance

- ▶ Fasting blood sugar level, lab test
 - ▶ Daily blood sugar (1–4x) –finger prick
 - ▶ Long–term blood glucose levels (HbA1c) should be checked every three or four months, or at least once a year.
 - ▶ This level is measured as a percentage and should ideally less than 6.5.
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The HbA1c

- ▶ In the blood stream are the red blood cells, which are made of a molecule, haemoglobin.
 - ▶ Glucose sticks to the haemoglobin to make a 'glycosylated haemoglobin' molecule, called haemoglobin A1C or HbA1C.
 - ▶ The more glucose in the blood, the more haemoglobin A1C or HbA1C will be present in the blood.
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Curing Type 2 Diabetes Mellitus With Bariatric Surgery(Obesity surgery).(BMI>30–35)

- ▶ This paper reported that 121 of 146 patients (82.9%) with type 2 diabetes and 150 of 152 patients (98.7%) with glucose impairment maintained normal levels of plasma glucose, HbA1c and insulin after RYGB.(Gastric bypass).
- ▶ The role in normal weight patients is still under investigations.

Key messages

- ▶ Keeping blood glucose, blood pressure, and cholesterol in control can make a difference in reducing your risk for heart attack or stroke.

In diabetics

- ▶ Annual dilated eye exams and routine foot exams and blood pressure checks can prevent blindness, amputations, heart disease, kidney disease, and strokes.

A close-up photograph of a person's hand holding a small white rectangular sign. The person is wearing blue scrubs and has a stethoscope around their neck, suggesting they are a healthcare professional. The sign contains the text: "People with diabetes are living longer." The background is a blurred blue color, matching the scrubs.

“People with diabetes are living longer.”

References

- ▶ www.ADA.com
- ▶ www.diabetes.org.uk
- ▶ Curing Type 2 Diabetes Mellitus With Bariatric Surgery: British Journal of Diabetes and Vascular Disease. 2012;12(4):173–176.
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