

# A Sweet Sickness

The disease known as *diabetes* has been around for centuries. Even the ancient Egyptians wrote about it. In its beginning stages, diabetes can cause dehydration and extreme thirst. Later, it can cause heart and blood problems, blindness, and even death.

Ancient doctors recognized one main symptom of diabetes: the passing of too much urine. They even thought diabetes made flesh melt into urine. As the English doctor Thomas Willis strangely observed in 1679, the urine of diabetics is "wonderfully sweet."

Despite these hints, experts were clueless about the cause of diabetes and how to treat it. Doctors prescribed exercise and various diets. However, nothing helped the patient live more than a year.

## Investigation

A major turning point came in 1889. Two European researchers, Oscar Minkowski and Joseph von Mering, removed a dog's *pancreas*, an organ that lies behind the stomach. They hoped to figure out the pancreas's function. A short time later, the dog developed symptoms of diabetes—thirstiness, weight loss, and blurred vision—and eventually died.

The biggest breakthrough came in 1921. A research team from the University of Toronto found a substance produced in the pancreas of a healthy dog. Two of the scientists, Frederick Banting and Charles Best, gave the substance to a diabetic dog, and its condition improved.

Banting and Best then treated a 14-year-old diabetic patient, Leonard Thompson, in 1922. The teen weighed only 65 pounds and was close to death. But when the researchers injected him with the substance they had named *insulin*, his symptoms disappeared. Leonard gained weight and became strong again. News of the insulin treatment spread around the world.

## Solution

Doctors now know that diabetes occurs when the body fails to make or properly use insulin. Insulin helps the body turn starches and other foods into *glucose* (a form of sugar)—a source of energy needed for daily life. In diabetics, extra glucose builds up in the blood. Insulin does not cure diabetes, but regular injections of it have helped millions of people with diabetes lead long lives.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. Which problem can diabetes cause in people?
  - A hearing loss
  - B blindness
  - C brain tumor
  - D broken bones
  
2. According to the passage, what *solution* was most successful in helping patients that had diabetes?
  - A injecting patients with insulin
  - B removing a patient's pancreas
  - C increasing the amount of exercise a patient does
  - D changing a patient's diet
  
3. In paragraph 4, why does the author say that a major turning point came in 1889?
  - A Because doctors understood the symptoms of diabetes, they could treat the disease by making patients drink more water.
  - B After the dog developed diabetic symptoms, researchers understood that the liver could be removed to treat the disease.
  - C Despite the dog dying when researchers removed his pancreas, doctors developed special glasses to treat blindness for diabetics.
  - D Since researchers understood the pancreas that was related to diabetes, they could study that organ more closely for a solution.
  
4. Read the following sentences and answer the question below: "Despite these hints, experts were clueless about the cause of diabetes and how to treat it. Doctors prescribed exercise and various diets. However, nothing helped the patient live more than a year."

In this context, the word **prescribed** means

- A caused a disease
  - B observed symptoms of a disease
  - C treated a disease
  - D investigated a cure for a disease
  
5. The primary purpose of this passage is to
  - A describe how doctors studied diabetes and came up with a treatment
  - B describe how diabetes affects the health of patients that have it
  - C investigate the treatment of diabetic dogs in research trials
  - D persuade the reader that funding is needed to cure diabetes

6. According to the passage, what is the main symptom of diabetes?

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7. Why did it take such a long time to discover the treatment to diabetes?

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8. The question below is an incomplete sentence. Choose the word that best completes the sentence.

Doctors treated 14 year old diabetic patient Leonard Thompson with insulin \_\_\_\_\_ he had diabetes, and was close to death.

- A but
- B if
- C because
- D so

9. Answer the questions based on the sentence below.

Diabetic patients need insulin regularly to help them live long lives.

Who? diabetic patients

What? \_\_\_\_\_

When? \_\_\_\_\_

Why? \_\_\_\_\_

10. Read the vocabulary word and definition below and complete questions 10a, 10b, and 11.

**Vocabulary Word:** breakthrough (break · through): an important discovery that happens suddenly or after many failures; breakthrough can help solve a challenging problem

10a. Read the five sentences below and underline the word **breakthrough** in each sentence.

1. Tablet computers were a breakthrough in how people used technology.
2. After practicing gymnastics for months, the gymnast had a breakthrough and was able to do a back handspring.
3. He made a breakthrough when he solved the complex math problem that he had never been able to solve before.
4. The artist's work was considered a breakthrough in the art world, as nobody had seen anything like it.
5. By getting the two leaders to work together, the meeting was considered a breakthrough for peace after years of fighting.

10b. Which image shows something that was a great breakthrough for the world?



11. When someone learns how to read, is that breakthrough? Explain.

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## Teacher Guide &amp; Answers

**Passage Reading Level:** Lexile 950

**Passage Text Structure:** Problem/Solution – the writer poses a problem and suggests possible solutions

**Passage Summary:** “A Sweet Sickness” describes the disease diabetes, and how doctors have worked through history to create a successful treatment to help patients with this disease.

1. Which problem can diabetes cause in people?

- A hearing loss
- B blindness**
- C brain tumor
- D broken bones

2. According to the passage, what *solution* was most successful in helping patients that had diabetes?

- A injecting patients with insulin**
- B removing a patient’s pancreas
- C increasing the amount of exercise a patient does
- D changing a patient’s diet

3. In paragraph 4, why does the author say that a major turning point came in 1889?

- A Because doctors understood the symptoms of diabetes, they could treat the disease by making patients drink more water.
- B After the dog developed diabetic symptoms, researchers understood that the liver could be removed to treat the disease.
- C Despite the dog dying when researchers removed his pancreas, doctors developed special glasses to treat blindness for diabetics.
- D Since researchers understood the pancreas was related to diabetes, they could study that organ more closely for a solution.**

4. Read the following sentences and answer the question below: “Despite these hints, experts were clueless about the cause of diabetes and how to treat it. Doctors prescribed exercise and various diets. However, nothing helped the patient live more than a year.”

In this context, the word **prescribed** means

- A caused a disease
- B observed symptoms of a disease
- C treated a disease**
- D investigated a cure for a disease

5. The primary purpose of this passage is to

- A describe how doctors studied diabetes and came up with a treatment**
- B describe how diabetes affects the health of patients that have it
- C investigate the treatment of diabetic dogs in research trials
- D persuade the reader that funding is needed to cure diabetes

6. According to the passage, what is the main symptom of diabetes?

**Suggested answer:** In paragraph 2, ancient doctors found the main symptom of diabetes was the passing of too much urine. [paragraph 2]

7. Why did it take such a long time to discover the treatment to diabetes?

**Suggested answer:** Doctors didn't have the same technology or ways to study how the body works when they first tried to treat diabetes. As years passed, doctors built on previous discoveries as they were able to expand their research. [paragraphs 2, 3, 4, 5]

8. The question below is an incomplete sentence. Choose the word that best completes the sentence.

Doctors treated 14 year old diabetic patient Leonard Thompson with insulin \_\_\_\_\_ he had diabetes, and was close to death.

- A but
- B if
- C **because**
- D so

9. Answer the following questions based on the sentence below.

Diabetic patients need insulin regularly to help them live long lives.

Who? diabetic patients

What? **need insulin**

When? **regularly**

Why? **to help them live long lives**

10. ReadWorks recommends that you teach this vocabulary word to the whole class out loud using the four steps listed below.

**Vocabulary Word:** breakthrough

**Step 1:** Introduce the word

- a. Teacher writes the word on the board and divides it into syllables: (break · through)
- b. Teacher says: "This word is breakthrough. What is the word?" [All students reply together out loud: "breakthrough."]

**Step 2:** Provide a child-friendly definition

- a. Teacher says: "A breakthrough is an important discovery that happens suddenly or after many failures. A breakthrough can help solve a challenging problem."
- b. Teacher says: "In the passage, the author describes the biggest breakthrough in treating diabetes as the discovery of a substance that helped a diabetic dog."
- c. Teacher says: "What is the word?" [All students reply together out loud: "breakthrough."]

**Step 3:** Practice the word

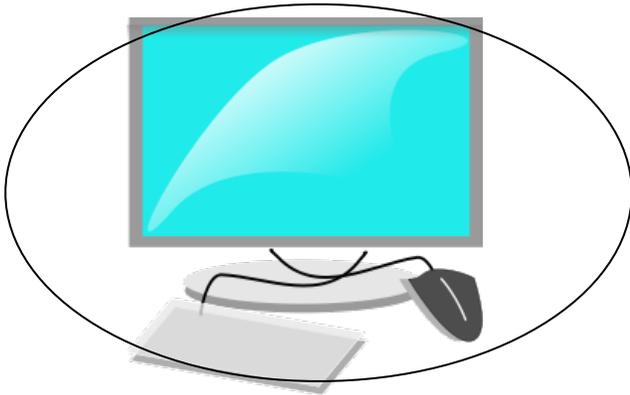
Teacher provides examples and additional opportunities to repeat the word. Read the 1<sup>st</sup> sentence out loud to your students. Begin reading it again and when you come to the vocabulary word prompt students to say the vocabulary word out loud. Then, finish reading the sentence out loud to your students.

- 10a.**
1. Tablet computers were a breakthrough in how people used technology.
  2. After practicing gymnastics for months, the gymnast had a breakthrough and was able to do a back handspring.
  3. He made a breakthrough when he solved the complex math problem that he had never been able to solve before.
  4. The artist's work was considered a breakthrough in the art world, as nobody had seen anything like it.
  5. By getting the two leaders to work together, the meeting was considered a breakthrough for peace after years of fighting.

**Step 4:** Check for student understanding

This step can be completed as a whole class activity or as an independent practice.

- 10b.** Which image shows something that was a great breakthrough for the world?



- 11.** When someone learns how to read, is that a breakthrough? Explain.

**Suggested answer:** Yes because it is a very important thing to learn that greatly impacts an individual's life.

*Suggested Additional Vocabulary:* various, blurred, substance