

# How does the body protect us from pathogens?

Use with textbook pages 46-55.

## The Immune System Fights Pathogens and Infection

The immune system has three lines of defence against pathogens that cause disease and infection.

### *First Line: Body Structures and Secretions*

- Body structures include skin and hairs and hair-like structures in your nose and throat.
- Secretions include mucus, sweat, and body acids.

### • INNATE – *White Blood Cells and Inflammation*

- White blood cells can surround and kill pathogens.
- Inflammation happens when an area is hurt or infected. The affected area gets red and swollen. White blood cells move in to kill pathogens and keep infection from spreading.

### • ACQUIRED *Specialized White Blood Cells*

- Specialized white blood cells recognize a pathogen after fighting it so they can respond quickly if the same pathogen invades the body again.

## Types of Disease Occurrence

- An **epidemic** occurs when a disease affects more people in a certain area than would normally be expected.
- An **outbreak** is an epidemic in a limited area.
- A **pandemic** is an epidemic that spreads over many countries or the whole world.

## Immunity and Impacts of Disease

Some people in a population have a natural ability to resist the pathogens that cause a disease. This is called immunity. Over time, immunity spreads through a population. As a result, fewer people die or get sick when a disease occurs.

Disease has social and economic impacts on society. When people are sick, or in cases of an outbreak, they may not be able to work or travel. Businesses lose money. Medical costs increase.



### Create an Outline

Make an outline of the information in this section. Use the headings, numbered points, and bulleted points to help you.



### Reading Check

1. Identify the three lines of defence against pathogens.

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2. What is immunity and how does it develop in a population?

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## The First Line of Defence

Use with textbook page 48.

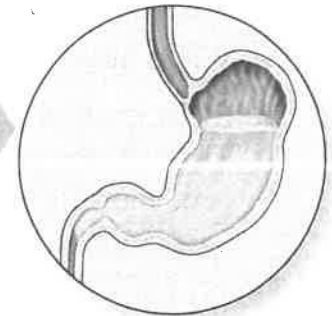
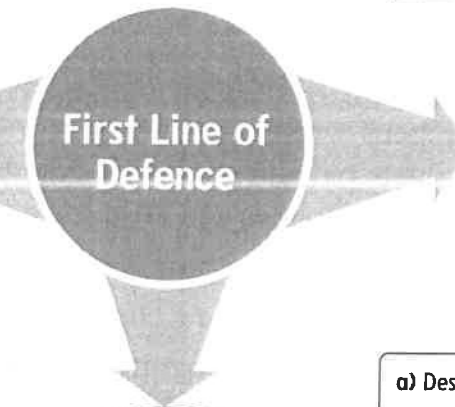
1. Give the function of the immune system.

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2. In the diagram, identify three parts of the body that are part of the immune system's first line of defence. For each part of the body, provide a description, describe its structure, and give its function in the space provided.

1. \_\_\_\_\_

2. \_\_\_\_\_



**a) Description:**  
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\_\_\_\_\_

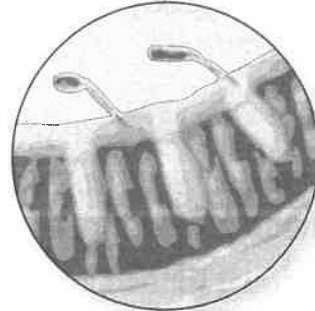
**b) Structure:**  
\_\_\_\_\_  
\_\_\_\_\_

**c) Function:**  
\_\_\_\_\_  
\_\_\_\_\_

**a) Description:**  
\_\_\_\_\_  
\_\_\_\_\_

**b) Structure:**  
\_\_\_\_\_  
\_\_\_\_\_

**c) Function:**  
\_\_\_\_\_  
\_\_\_\_\_



3. \_\_\_\_\_

**a) Description:**  
\_\_\_\_\_  
\_\_\_\_\_

**b) Structure:**  
\_\_\_\_\_  
\_\_\_\_\_

**c) Function:**  
\_\_\_\_\_  
\_\_\_\_\_

## The Body's Lines of Defence

Use with textbook pages 48-49.

In each of the following scenarios, indicate which of the human body's lines of defence (first, innate or acquired) would be responsible for defending it against pathogens.

1. A student touches a doorknob that has some viruses on it. Which line of defence will try to protect the student from the viruses on her hand?  
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2. A boy breathes in some air-borne viruses floating in the room. Which line of defence will try to protect the boy from the viruses that entered through his nose?  
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3. A girl eats a piece of contaminated meat that has been left out for hours. Which line of defence will try to protect the girl from the *Salmonella* on the meat?  
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4. The hepatitis virus is attacking the liver cells and producing more viral particles in the body. Which line of defence will try to protect the individual from the hepatitis virus that is in the body?  
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5. A man has a large, deep wound in his leg because he was cut by a sharp piece of metal. The break in the skin on his leg starts to become red and swollen. Which line of defence will try to protect the man?  
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6. A woman has bronchitis. She is experiencing shortness of breath, and has a persistent cough and a high fever. Which line of defence will try to protect the woman from the pathogen that is making her sick?  
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7. A young boy accidentally steps on a rusty nail with his bare foot. He now has a puncture wound and his foot starts to become inflamed. Which line of defence will try to protect the boy from the bacteria that cause tetanus?  
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