Vaccine Education Module: The Immune System

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Roles of the Immune System

The immune system protects the body by:

• Recognizing the presence of infection
• Containing the infection and working to eliminate it
• Regulating itself so it does not damage the body
• Remembering pathogens to prevent diseases from recurring
Components of the immune system

Dynamic communication network made up of:

• Cells
• Tissues
• Organs
Organs of the Immune System

- Tonsils
- Adenoid glands
- Thymus
- Lymph nodes
- Lymphatic vessels
- Spleen
- Peyer’s patches
- Appendix
- Bone marrow
Pathogens

Organisms that can cause disease:

- Bacteria
- Viruses
- Parasites
- Fungi
Example of a Type of Bacteria

Courtesy CDC, Public Health Image Library (PHIL)
Example of a Type of Bacteria

Courtesy CDC
Influenza Virus

Photo Credit: Cynthia Goldsmith, CDC
Five Types of White Blood Cells

- Neutrophils: Phagocytose bacteria and fungi
- Eosinophils: Kill parasites, destroy cancer cells and are involved in allergic reactions
- Basophils: Release histamine and act in blood clotting
- Monocytes: Become macrophages; digest dead or damaged cells and pathogens
- Lymphocytes: Two major classes of these white blood cells
  - T cells
  - B cells
White Blood Cells

Courtesy CDC, PHIL
White Blood Cell

Courtesy CDC, PHIL
T Cells

- Activate B cells to produce antibodies
- Activate macrophages to destroy antigens that have been tagged by antibodies
- Kill our own cells that are infected with viruses
B Cells

- Produced in the bone marrow
- Primary role is to produce antibodies
Antibodies

Y-shaped molecules with two distinct regions

• Constant region

• Variable region allows different antibodies to recognize different antigens
Antibodies

- Proteins that neutralize antigens and prepare them for destruction by phagocytes
- Programmed to recognize and bind to the antigen so that it can be destroyed
- Activate a group of proteins called complement, which assist in killing pathogens