Notes: Immune System and Pathology

Objectives

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Why Do We Get Sick?

- Organisms or substances that cause disease are known as _____.
- Disease occurs when these pathogens get into our body and cause _____.
- Pathogens can be:
  - Protists
  - Bacteria
  - Viruses
  - Other nonliving particles

Bacterial Disease

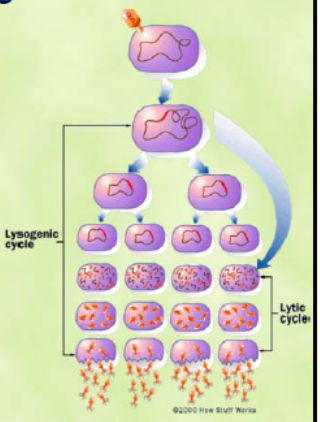
- Bacteria can _____equilibrium in the body by interfering with normal functions
- There are two main ways that this happens:
  - _____cells and tissues for food
    - Example: *Myobacterium tuberculosis*
  - Release _____ that interfere with normal functions
    - Example: *Streptococcus*

Non-living Pathogens

- Viruses also disrupt the body's _____
- Most times viruses are more _____ regarding which cells they attack.
  - Example: Poliovirus attacks nerve cells
- Viruses attack cells by _____ genetic information into the cell.
- Tiny particles that act as pathogens are called _____.
  - May cause disease by forming protein clumps

Viral Infections

- There are two stages that viral infections go through:
  - Lysogenic
  - Lytic
- During the _____ stage the viral DNA or RNA replicates indefinitely
- During the _____ stage the infected cell begins to produce more viruses from the genetic information and the cell eventually bursts, or lyses



How do you prevent disease?

- Once infected, bacterial diseases can be treated with _____, or compounds that block the growth and reproduction of bacteria.
  - Too many antibiotics can lead to more resistant bacteria
- Viruses cannot be treated in this way.
- Bacterial and viral diseases can be best prevented by _____
- A vaccine introduces a preparation of _____ _____ pathogens to the body allowing the body's immune system to work

The Human Immune System!

- Our bodies come equipped with a defense system against disease
- The _____ has two defenses in place:
  - Primary Defenses
  - Secondary Defenses

Our body, the fortress

- The wall, our _____
  - Keep pathogens out because they cannot _____ it
  - _____ creates an acidic environment that kills pathogens
  - _____ traps pathogens that try to slip in through the openings, such as nose or mouth
- The guards, _____
  - When pathogens get through the skin, white blood cells called _____ leave blood vessels and enter tissues to "eat" the invading bacteria – this is what causes _____.

Our body's personal army!

- If pathogens get through the primary defenses, they trigger the _____
- Any pathogen that triggers this is called an _____
- Our body's have cells called _____, or _____that are able to recognize antigens
- When an antigen is detected, the B cells grow and divide rapidly to form plasma cells and memory B cells.

Our body's personal army!

- The plasma cells, then produce _____ which recognize and bind to antigens
- This makes it easier for phagocytes to _____ the antigens
- Antibodies are made specifically for each antigen
- Millions of _____ remain in the body once the pathogen is gone
- These memory B cells decrease the response time because they are able to more quickly make _____ for specific antigens.
- _____ introduce weakened antigens, which lead to the creation of memory B cells

_____
_____
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Part II, Pathology

____ 1. Antibiotics
a. include penicillin and tetracycline.
b. may prevent bacteria from making new cell walls.
c. can be effective treatments for bacterial diseases.
d. All of the above

____ 2. Which of the following is *not* a way of preventing a foodborne illness at home?
a. washing kitchen utensils thoroughly in cold water
b. keeping cooked and raw foods separate during storage
c. washing fresh fruits and vegetables before eating them
d. refrigerating leftovers promptly

____ 3. Antibiotics are ineffective against viral infections because
a. host cells protect the viruses.
b. viruses have enzymes that inactivate the antibiotics.
c. antibiotics interfere with cellular processes that viruses do not perform.
d. viral protein coats block the antibiotics from entering the virus.

____ 4. Which of the following is *not* a viral disease of humans?
a. hepatitis
b. SARS
c. shingles
d. All of the above are viral diseases of humans.

____ 5. HIV causes AIDS by
a. converting a proto-oncogene to an oncogene.
b. damaging a person's blood vessels.
c. destroying the covering of a person's nerves.
d. gradually destroying a person's immune system.___

_____ 6. Diseases are caused by
a. pathogens.
b. cigarette smoke.
c. fungi.
d. all of the above

_____ 7. Antibiotics fight infections by
a. preventing viruses from replicating.
b. killing bacteria.
c. killing infected cells.
d. growing green mold that inhibits bacterial growth.

_____ 8. The inflammatory response can cause
a. permanent immunity.
b. pain, swelling, and fever.
c. antibodies to bind to antigens.
d. killer T cells to attack infected cells.

_____ 9. If the skin is cut or broken, an infection can result from microorganisms

a. already inside the body.
b. on the skin.
c. in the blood.
d. in the mucus.

_____ 10. Humoral immunity is carried out by

a. killer T cells.
b. lymphocytes.
c. antibodies.
d. macrophages.

_____ 11. The germ theory of disease states that infectious diseases are caused by

a. toxins.
b. microorganisms.
c. heredity.
d. materials in the environment.

_____ 12. An infectious disease is one that is caused by

a. heredity.
b. materials in the environment.
c. pathogens.
d. hemophilia.

_____ 13. How are infectious diseases spread?

a. through coughing, sneezing, or physical contact
b. through contaminated water and food
c. by infected animals
d. all of the above

_____ 14. Compounds that kill bacterial cells without harming the cells of humans or other animals are called

a. antiviral drugs.
b. insecticides.
c. antibiotics.
d. carcinogens.

_____ 15. The body's nonspecific defenses against invading pathogens include

a. antibiotics.
b. mucus, sweat, and tears.
c. antibodies.
d. killer T cells.

_____ 16. The bodyÕs most important nonspecific defense is

a. the skin.
b. cell-mediated immunity.
c. the inflammatory response.
d. permanent immunity.

_____ 17. An immune response is triggered by a(an)

a. antibiotic.
b. antibody.
c. antigen.
d. histamine.

18. A(n) _____ is a substance that can be obtained from bacteria or fungi and can be used as a drug to fight pathogenic bacteria.

19. _____ are effective at treating strep throat but not at treating colds.

20. Any opening in the skin is a potential entrance for _____.

36.

21. A(An) _____ is any disease-causing organism.

22. Antibiotics are used to treat infectious diseases caused by _____.

23. A weakened or mild form of a pathogen injected to produce immunity is a _____.

24. Suggest a reason why bacteria that are resistant to antibiotics are becoming common in hospitals.

25. Describe the relationship between antigens and antibodies.

26. What are three general causes of disease?

27. Describe one way that antibiotics fight infection.

28. How does the skin act as a nonspecific defense against pathogens?