

Human Diseases: A Systemic Approach, 7e (Zelman)

Chapter 2 Immunity and the Lymphatic System

2.1 Multiple-Choice Questions

1) The immune system protects the body by distinguishing _____.

- A) inside from outside
- B) positive from negative
- C) self from non-self
- D) upper from lower

Answer: C

Objective 1

2) Leukocytes that can engulf and destroy pathogens are known as _____.

- A) macrophages
- B) mast cells
- C) neutrophils
- D) phagocytes

Answer: D

Objective 2

3) Natural killer cells are a type of _____.

- A) albumin
- B) erythrocyte
- C) leukocyte
- D) plasma cell

Answer: C

Objective 2

4) _____ is a group of plasma proteins that assist in the destruction of foreign cells.

- A) Albumin
- B) Complement
- C) ELISA
- D) SLE

Answer: B

Objective 2

5) Interferons increase the activity of _____.

- A) erythrocytes and leukocytes
- B) macrophages and natural killer cells
- C) phagocytes and neutrophils
- D) plasma and complement

Answer: B

Objective 2

6) _____ can cause dehydration, nausea, disorientation, hallucinations, seizures, and convulsions.

- A) Hypersensitivity
- B) Hyposensitivity
- C) Very high fevers
- D) Very low fevers

Answer: C

Objective 2

7) After an injury, the damaged cells release potent chemical signals including _____.

- A) albumin and plasma
- B) complement and plasma
- C) histamines and kinins
- D) phagocytes and neutrophils

Answer: C

Objective 2

8) Adaptive immunity includes two separate but overlapping arms called _____.

- A) antigens and immunoglobulin
- B) B cells and T cells
- C) cell-mediated immunity and humoral immunity
- D) specific immunity and nonspecific immunity

Answer: C

Objective 3

9) _____ provide defense against extracellular antigens like bacterial toxins and bacterial cells.

- A) Antibodies
- B) Erythrocytes
- C) Histamines
- D) Neutrophils

Answer: A

Objective 3

10) _____ provide defense against viruses, abnormal cells, and other intercellular pathogens.

- A) Antibodies
- B) Cell-mediated immunity
- C) Humoral immunity
- D) Immunoglobulins

Answer: B

Objective 4

11) _____ are responsible for cell-mediated immunity.

- A) A cells
- B) B cells
- C) S cells
- D) T cells

Answer: D

Objective 4

12) Helper T cells become activated by _____ that was engulfed and digested by a phagocyte.

- A) a cytotoxic T cell
- B) an antigen
- C) complement
- D) erythrocytes

Answer: B

Objective 4

13) The helper T-cell clones stimulate antibody production by _____.

- A) B cells
- B) complement cells
- C) plasma cells
- D) T cells

Answer: C

Objective 4

14) Ninety percent of lupus patients are _____.

- A) children
- B) older adults
- C) men
- D) women

Answer: D

Objective 5

15) A common sign of _____ includes a butterfly rash across the cheeks and nose.

- A) ELISA
- B) FACS
- C) IgG
- D) SLE

Answer: D

Objective 5

16) Cutaneous or discoid lupus affects only the _____, and accounts for approximately 10% of all lupus cases.

- A) brain
- B) heart
- C) lungs
- D) skin

Answer: D

Objective 5

17) The rash associated with cutaneous lupus is commonly known as a discoid rash because the areas of the rash are _____.

- A) circular
- B) irregular
- C) painful
- D) red

Answer: A

Objective 5

18) The signs and symptoms of drug-induced lupus erythematosus are similar to those of _____.

- A) ART
- B) EIA
- C) HIV
- D) SLE

Answer: D

Objective 5

19) If a patient develops _____ lupus, the signs and symptoms will disappear within days to months.

- A) systemic

- B) cutaneous
- C) drug-induced
- D) neonatal

Answer: C

Objective 5

20) Scleroderma is a chronic autoimmune disease of the _____.

- A) brain
- B) connective tissue
- C) heart
- D) lungs

Answer: B

Objective 5

21) The most common initial signs and symptoms of _____ are secondary Raynaud's phenomenon, thickening and tightening of the skin of the fingers, and pain in two or more joints.

- A) anaphylaxis
- B) lupus
- C) scleroderma
- D) Sjögren's syndrome

Answer: C

Objective 5

22) _____ is a chronic, progressive autoimmune disease that affects the exocrine glands of the body.

- A) Anaphylaxis
- B) lupus
- C) scleroderma
- D) Sjögren's syndrome

Answer: D

Objective 5

23) The hallmark symptoms of _____ are dry eyes and mouth.

- A) anaphylaxis
- B) lupus
- C) scleroderma
- D) Sjögren's syndrome

Answer: D pg

Objective 5

24) There are several different types of hypersensitivity. Type I is known as _____.

- A) cytotoxic
- B) delayed
- C) immediate
- D) immune-complex

Answer: C

Objective 6

25) There are several different types of hypersensitivity. Type II is known as _____.

- A) cytotoxic
- B) delayed
- C) immediate
- D) immune-complex

Answer: A

Objective 6

26) There are several different types of hypersensitivity. Type III is known as _____.

- A) cytotoxic
- B) delayed
- C) immediate
- D) immune-complex

Answer: D

Objective 6

27) There are several different types of hypersensitivity. Type IV is known as _____.

- A) cytotoxic
- B) delayed
- C) immediate
- D) immune-complex

Answer: B

Objective 6

28) The most common type of allergy is _____.

- A) Type I
- B) Type II
- C) Type III
- D) Type IV

Answer: A

Objective 6

29) A Type I allergic reaction is triggered by _____, the immunoglobulin that responds to the presence of allergens.

- A) IgA
- B) IgD
- C) IgE
- D) IgG

Answer: C

Objective 6

30) An example of _____ hypersensitivity is the response to an incompatible blood transfusion.

- A) cytotoxic
- B) delayed
- C) immediate

D) immune-complex

Answer: A

Objective 6

31) The delay in Type IV hypersensitivity occurs because the allergy is due to the action of _____.

A) B cells

B) histamine

C) mast cells

D) T cells

Answer: D

Objective 6

32) Allergy shots induce the production of _____ in the blood, which coats the allergen and blocks it from binding to IgE in the tissues.

A) IgA

B) IgD

C) IgG

D) IgM

Answer: C

Objective 6

33) AIDS is characterized by a reduction in the number of _____.

A) B cells

B) mast cells

C) Reed-Sternberg cells

D) T cells

Answer: D

Objective 7

34) The _____ stage of an HIV infection is when an HIV-infected patient experiences symptoms

but has not yet developed AIDS.

- A) first
- B) second
- C) third
- D) fourth

Answer: C

Objective 7

35) The human immunodeficiency virus infects and kills _____.

- A) antibodies
- B) B cells
- C) cytotoxic T cells
- D) helper T cells

Answer: D

Objective 7

36) HIV is diagnosed using a(n) _____ to detect HIV antibodies in the blood.

- A) C-reactive protein test
- B) flow cytometry test
- C) agglutination test
- D) ELISA test

Answer: D

Objective 7

37) At the _____ stage the patient has one of the AIDS indicators diseases and a helper T cell count of less than 200.

- A) first
- B) second
- C) third
- D) fourth

Answer: D

Objective 7

38) The etiology of Hodgkin's lymphoma is _____.

- A) autoimmune
- B) bacterial
- C) idiopathic
- D) viral

Answer: C

Objective 8

39) Non-Hodgkin's lymphoma is a cancer of the body's _____.

- A) autoantibodies
- B) immune system
- C) inflammatory response
- D) lymphocytes

Answer: D

Objective 8

40) _____ may be treated with chemotherapy, radiation therapy, or a bone marrow transplant.

- A) Hodgkin's lymphoma
- B) Lupus
- C) Scleroderma
- D) Sjögren's syndrome

Answer: A

Objective 8

2.2 True/False Questions

1) Nonspecific immunity must be primed by an initial exposure to an antigen before it can protect the body against disease.

Answer: False

Objective 2

2) Nonspecific immunity is present at birth and provides immediate, short-term protection against any antigen.

Answer: True

Objective 2

3) Secretions such as tears, saliva, sweat, and sebum contain chemicals that destroy foreign invaders.

Answer: True

Objective 2

4) While complement is part of nonspecific immunity, it helps both nonspecific and specific immunity.

Answer: True

Objective 2

5) Natural killer cells recognize and eliminate virus-infected cells and bacteria-infected cells.

Answer: False

Objective 2

6) The inflammatory response can be triggered by infection, trauma, intense heat, and chemicals.

Answer: True

Objective 2

7) Specific immunity is also known as adaptive immunity.

Answer: True

Objective 3

8) The first exposure to an antigen triggers cell-mediated immunity.

Answer: False

Objective 3

9) Memory T cells are responsible for a more potent and rapid antibody response during subsequent exposures to the same antigen.

Answer: False

Objective 4

10) Because of reduced antibody production, vaccines are less likely to produce immunity in older people.

Answer: True

Objective 4

11) Autoimmunity has no known cause, but it can be easily prevented.

Answer: False

Objective 4

12) The etiology of lupus is idiopathic.

Answer: True

Objective 5

13) Lupus can be easily diagnosed using a flow cytometry test.

Answer: False

Objective 5

14) Scleroderma is four times more common in men than in women.

Answer: False

Objective 5

15) Of the two major forms of scleroderma, the more common is systemic sclerosis scleroderma.

Answer: False

Objective 5

16) The etiology of scleroderma is idiopathic.

Answer: True

Objective 5

17) Sjögren's syndrome can be classified as primary or secondary.

Answer: True

Objective 5

18) Scleroderma can be cured with the use of anti-inflammatory drugs, immunosuppressive drugs, and vasodilators.

Answer: False

Objective 5

19) The etiology of Sjögren's syndrome is idiopathic.

Answer: True

Objective 5

20) Sjögren's syndrome can be cured or prevented by taking NSAIDs or over-the-counter medications for dry eyes and dry mouth.

Answer: False

Objective 5

21) A normally harmless antigen that causes an allergic reaction is called an allergen.

Answer: True

Objective 6

22) AIDS indicator diseases are infections that do not normally occur in a person protected by a healthy immune system.

Answer: True

Objective 7

23) ART therapy is the recommended treatment for an HIV infection.

Answer: True

Objective 7

24) Hodgkin's lymphoma is marked by the presence of a type of cell called the Reed-Sternberg cell.

Answer: True

Objective 8

25) In some non-Hodgkin's lymphomas, the best treatment option may be a "wait and watch" approach.

Answer: True

Objective 8

2.3 Short-Answer Questions

1) _____ is the body's ability to resist infectious disease.

Answer: Immunity

Objective 1

2) An _____ is any foreign substance that, when introduced into the body, activates the immune system.

Answer: antigen

Objective 1

3) Nonspecific immunity is also known as _____ immunity.

Answer: innate

Objective 2

4) Leukocytes like macrophages and neutrophils can engulf and destroy pathogens, a process called _____.

Answer: phagocytosis

Objective 2

5) _____ are antiviral proteins produced by some animal cells after a viral infection.

Answer: Interferons

Objective 2

6) A _____, or an abnormally high body temperature, is a systematic response to an infection.

Answer: fever

Objective 2

7) Some of the benefits of _____ include slowing the growth rate of some pathogens, increasing the effect of interferons, enhancing phagocytosis, stimulating antibody production, and accelerating tissue repair.

Answer: fever

Objective 2

8) _____ prevents the spread of pathogens, disposes of cell debris and pathogens, and aids in repair of damaged tissue.

Answer: Inflammation

Objective 2

9) During the inflammatory response, debris and dead and dying cells may accumulate, forming _____.

Answer: pus

Objective 2

10) Antibodies are also called _____.

Answer: immunoglobulins

Objective 3

11) A helper _____ cell is also called a CD4 cell.

Answer: T

Objective 4

12) _____ T cells are also called CD8 cells.

Answer: Cytotoxic

Objective 4

13) As humans age, the _____ atrophies, causing a sharp decrease in the number and type of T cells produced.

Answer: thymus

Objective 1

14) An Enzyme _____ (EIA) test uses an enzyme to label either the antibody or the antigen.

Answer: immunoassay

Objective 1

15) C-reactive protein test and erythrocyte sedimentation tests measure general levels of _____ in the body.

Answer: inflammation

Objective 1

16) _____ occurs when individuals develop antibodies called autoantibodies to their own tissues or self antigens.

Answer: Autoimmunity

Objective 1

17) _____ is a chronic autoimmune disease that can affect various parts of the body, including the skin, joints, heart, lungs, blood, kidneys, and the brain.

Answer: Lupus

Objective 5

18) Seventy percent of people with lupus have the systemic form, called systemic lupus _____ (SLE).

Answer: erythematosus

Objective 5

19) _____ lupus is a rare condition acquired from maternal autoantibodies.

Answer: Neonatal

Objective 5

20) Sjögren's syndrome often affects women during their childbearing years, suggesting a link with Sjögren's syndrome and the hormone _____.

Answer: estrogen

Objective 5

21) An _____, or hypersensitivity, is an extreme immune response to a harmless antigen.

Answer: allergy

Objective 6

22) Allergy problems arise because the IgE binds to mast cells and induces them to release _____ and other potent chemicals responsible for allergy symptoms.

Answer: histamine

Objective 6

23) The signs and symptoms of _____ include a sudden drop in blood pressure, narrowing of the airways, rapid and weak pulse, hives, and nausea and vomiting.

Answer: anaphylaxis

Objective 6

24) The cause of AIDS is HIV, a _____ that carries its genetic information as RNA rather than DNA.

Answer: retrovirus

Objective 7

25) Hodgkin's _____, also known as Hodgkin's disease, is a cancer of the immune system.

Answer: lymphoma

Objective 8

2.4 Case Study

1) Andrew was stung by a bee while playing outside with his friends. Swelling developed immediately where the bee sting had occurred. A few minutes later, Andrew was wheezing.

1. What is happening to Andrew?
2. To which antibody did the bee venom bind?
3. What treatment should be given?

Answer:

1. Type I hypersensitivity
2. IgE
3. Epinephrine, glucocorticoids, or cortisone may be used to reduce the immune response and stabilize the vascular system.

2.5 Discussion Questions

1. Describe the difference between specific immunity and nonspecific immunity.

Answer: Specific immunity responds to antigens of specific pathogens. Nonspecific immunity is present at birth and provides immediate, short-term protection against any antigen. Once the adaptive immune system encounters and responds to an antigen, the body is able to respond quickly to future exposures of the same antigen. Nonspecific immunity prevents entry and spread of disease-causing microorganisms by means that include physical barriers such as intact skin and mucous membranes as well as cellular and chemical defenses.

2. List two of the five Immunoglobulins and describe their function.

Answer:

1. IgG: Principle component of the primary and secondary response to an antigen. Crosses the placenta and protects the fetus. Activates complement.
2. IgM: First antibody produced in the primary response to an antigen. Activates complement.
3. IgA: Protects mucosal surfaces by interfering with the ability of pathogens to adhere to cells.
4. IgE: Stimulates the release of histamine and other chemicals that mediate inflammation and allergic responses.
5. IgD: Activates B cells.

3. Compare and contrast the difference between helper T cells and cytotoxic T cells.

Answer: Helper T cells become activated by an antigen that was engulfed and digested by a phagocyte and presented to the helper T cell. The helper T cell clones stimulate antibody production by plasma cells, increase phagocytosis, and stimulate cytotoxic T cells and natural killer cells. Cytotoxic T cells (also called CD8 cells) are activated by antigens displayed in infected cells, abnormal cells, and transplanted organs and tissue. In response to these antigens, an activated cytotoxic T cell kills infected and abnormal cells and also kills transplanted organs and tissues.

4. Describe the effect that aging has on the immune system.

Answer: Immune system function declines with advancing age, leading to greater risk for infection and decreased ability to fight infectious diseases. The thymus atrophies, causing a sharp decrease in the number and type of T cells produced. When older people encounter a new antigen, the body is less able to recognize and defend against it. It takes longer for macrophages to destroy bacteria, viruses, cancer cells, and other antigens. The amount of antibody production is also reduced.

5. Explain why lupus can be difficult to diagnose.

Answer: Because lupus signs and symptoms mimic those of other illnesses, are sometimes vague, and may come and go, lupus can be difficult to diagnose. No single test will confirm the diagnosis of lupus. Lupus tends to be chronic and relapsing, often with symptom-free remissions that can last for years.

6. Explain why Sjögren's syndrome is often misdiagnosed or underdiagnosed.

Answer: The signs and symptoms of Sjögren's syndrome mimic those of menopause, drug side effects, or diseases like lupus, rheumatoid arthritis, fibromyalgia, and multiple sclerosis.

7. HIV infection has four distinct phases. Compare and contrast the first and second stage.

Answer: The first stage is the primary HIV infection stage, which follows exposure to HIV, lasts a few weeks, and is accompanied by a short flulike illness. The second stage is the clinically asymptomatic stage, which lasts an average of 10 years. During the second stage, patients do not have symptoms, but they can transmit the infection, and HIV continues to multiply, infecting and killing helper T cells.