

- 2) liver enzymes necessary for detoxification of some substances are often lacking
- 3) fewer nutritional reserves
- 4) less body fat to insulate against cold
- ii. elderly
 - 1) decrease in immune function
 - 2) decline in homeostatic mechanisms
 - 3) depression; isolation; malnutrition
- 2. sex - some diseases are more prone to one gender than the other
 - i. men more likely to develop gout
 - ii. women more likely to develop osteoporosis
- 3. genetic makeup (familial tendencies for: diabetes, asthma, migraines, etc.)
- 4. stress - increases body's production of corticosteroids, which decreases immune system function
- 5. lifestyle - personal habits in regard to diet, exercise, weight control, smoking, alcohol consumption, sexual practice
- 6. occupation - exposure to loud noises, pollutants, repetitive movements, heavy equipment, high places, etc.
- 7. preexisting illness
 - i. illnesses can lower body's resistance and make individuals more susceptible to other diseases
 - ii. chronic illness interferes with proper function of some body systems, therefore complicating disease
- 8. environmental exposure
 - i. prolonged exposure to cold or heat can lower the body's resistance
 - ii. exposure to allergens
 - iii. long-term exposure to sunlight
 - iv. long-term exposure to occupational chemicals

III. Two Main Disease Categories

A. Disease processes can be categorized into one of two groups: structural or functional

a. **Structural Disease** (sometime called *Organic Disease*)

- 1. involves physical and biochemical changes within the cells
- 2. structural changes in cells are initiated by two types of agents:
 - i. **Exogenous** - those that are external, i.e. trauma, chemical injury, and microbial infections.
 - ii. **Endogenous** - those that are internal, i.e. vascular insufficiency, immunological/ autoimmune reactions, and diseases that are a result of abnormal metabolism.
- 3. The hallmark characteristic of structural disease is the **lesion**.
 - i. The word lesion comes from Latin language and means "to hurt."
 - ii. **Lesion** is a widely used term to describe many types of cellular changes that result in tissue abnormalities. (cuts, fractures, masses, etc.)
 - iii. Lesions are primarily detected by observation with the naked eye or with a microscope.

b. **Functional Disease** (sometimes called physiological disease)

- 1. Diseases in which the onset begins without the presence of any lesion.
- 2. The basic change is physiologic and is referred to as a pathophysiologic change.

3. Examples of functional disease are tension headaches and functional bowel syndrome.
4. Although mental illnesses have been considered functional disorders, present research now indicates that many have a genetic or organic basis (on a biochemical level).

B. Examples Of Varying Effects Of Structural And Functional Diseases

Disease	Type of Disease	Nature of Manifestations
Common cold	Structural (viral infection)	Structural (runny nose; sneezing)
Tension headaches	Functional (muscle spasm)	Functional (pain)
Benign tumor that produces mass	Structural (tumor)	Structural (mass)
Exogenous obesity caused by craving food	Functional (hunger)	Structural (obesity)
Cancer of esophagus	Structural (cancer)	Functional (inability to eat)

IV. Closer Look at Causes of Disease

A. To better understand and identify different structural diseases and their cause, they are commonly subclassified:

1. Infectious Diseases

- a. those diseases that are caused by invasion and colonization of pathogenic microorganisms
- b. examples of pathogenic infection: fungal infection, bacterial infection, and viral infection

2. Neoplasms (“new growth”)

- a. the uncontrolled growth of abnormal cells
- b. growth may be benign or malignant (cancerous)

3. Immunologic Diseases

- a. Three immunologic categories:
 - i. overreaction by immune system (hypersensitivity)
 - ii. underreaction by immune system (immune deficiency disease such as AIDS)
 - iii. autoimmune disease – destruction of one’s own tissues by antibodies produced by one’s own immune system

4. Nutritional Diseases

- a. diseases created by insufficient resources for the body
 - i. protein deficiency – difficulty in healing or formation of new body tissue; decrease in antibody production
 - ii. vitamin or mineral deficiencies – may lead to interference in biochemical reactions of metabolism

b. Obesity

5. Metabolic Diseases

- a. an upset in the biochemical reactions that govern body processes or metabolism
- b. Subclassified as nutritional because the upset is often connected to carbohydrate, fat, or protein metabolism

6. Genetic Diseases

- a. inherited or hereditary diseases due to transmission of defective gene(s) or chromosome(s) from one or both parents
- b. examples of genetic diseases might be: diabetes, Down Syndrome, hemophilia, cleft lip

7. Congenital Disease (also referred to an *anomaly* or *defect*)

- a. a defect in fetal development that may create a functional (physiologic) or structural (physical) abnormality which presents itself at birth

- b. these defects may be genetic; they may be exposure to chemicals, drugs, or viruses during the pregnancy; they may be a spontaneous event
- 8. Trauma
 - a. a physical force that mechanically disrupts the structure of the body (therefore, disrupts body function)
 - b. result of trauma is generally referred to as an injury
 - c. results of trauma include bruises, abrasions, cuts, fractures, burns, etc.
- 9. Physical Agents - diseases that result from physical agents such as temperature extremes, electrical shock, radiation, and poisons
- 10. Inflammatory Diseases - diseases that are usually secondary to primary disease such as infection or autoimmune disease.

V. The Disease Process

A. Manifestations of Disease

- a. To treat a patient, a physician must first know the manifestations of a disease.
- b. **Manifestation** refers to how a disease “presents or shows itself”.
- c. Manifestation is also called **clinical presentation** and includes both *signs* and *symptoms*.
 - 1. **Signs**
 - i. objective physical observations as noted by the person who examines the patient
 - ii. this examination is called a **physical** or the **physical examination**
 - iii. during the physical, the health professional may use techniques such as:
 - **auscultation** (use of stethoscope to listen to body cavities)
 - **palpation** (feeling lightly or pressing firmly on internal organs or structures)
 - **percussion** (tapping over various body areas to produce vibrating sound that is indicative of air, fluid, size of organ)
 - iv. examples of signs are: temperature, blood pressure, respiratory rate, abnormal heart sounds, mass, enlarged organs, edema
 - 2. **Symptoms** refer to the patient’s awareness of abnormalities or discomfort. Symptoms are not measurable and are based on the patient’s subjective perception, i.e. pain, nausea, weakness, fatigue, dizziness
- d. The written description of symptoms in the patient’s record is referred to as the **patient history**.

B. Care of the Patient

- a. Caring for the patient involves three major steps:
 - 1. obtaining a history to ascertain the patient’s symptoms and to review any past or present medical problems that might relate
 - 2. performing a physical examination on the patient
 - 3. laboratory tests, radiologic, and clinical procedures to detect chemical and physiologic abnormalities to aid in establishing the diagnosis

C. Etiology and Related Terms

- a. The **etiology** of disease is its cause (term literally means the study of causes).
 - 1. If the cause of a disease has never been discovered (disease is unknown), the cause is referred to as **idiopathic**.
 - 2. One may also refer to an idiopathic disease as “unknown etiology”.
- b. **Iatrogenic** disease (*-iatro* = medicine, physician) means that the disease arose as a result of a prescribed treatment
 - 1. examples:

- i. Cushing-like Syndrome as a result of steroid therapy
 - ii. immunosuppression and/or anemia as a result of chemotherapy
 - c. A **nosocomial** disease is one that was acquired from a clinical setting (e.g. hospital; physician's office; clinic).
 - 1. postoperative patient develops staph infection from surgical instrument that wasn't properly sterilized
 - 2. child develops cold after being exposed to other sick children at the pediatrician's office
- D. Diagnosis
 - a. Process of assigning a name to a patient's condition.
 - b. When clusters of findings with more than one disease are found, they are called **syndromes**.
 - c. Diagnosis is needed to determine the treatment and potential outcome of a disease.
- E. Treatment (therapy)
 - a. Treatment of a disease should be as precise as possible in order to attempt a cure.
 - b. Treatment interventions may include: exercise, nutritional modifications, physical therapy, medications, surgery, and education
 - c. Three common therapies are:
 - 1. **Supportive therapy** – conservative therapy that includes rest, optimal nutrition, fluids, possible antibiotics to prevent a secondary infection while the immune system is recovering
 - 2. **Palliative therapy** – not a curative therapy; provides relief from signs and symptoms of their disease
 - i. Examples of this therapy might include: steroids, pain relievers, possible surgery (removal of tumor, etc.)
 - ii. This treatment used for terminal illnesses and other serious chronic conditions for which there is no cure.
 - 3. **Preventive therapy** – care that is given to *prevent* disease, i.e. Examples of preventive therapy might include: mammograms, blood pressure screenings, routine dental care, colon cancer tests
- F. Prognosis
 - a. The prognosis is the predicted or expected outcome of the disease
 - b. Prognosis is often listed as:
 - 1. Good (full recovery)
 - 2. Guarded (full recovery may or may not occur)
 - 3. Poor (not expected to recover)

VI. Additional Terminology

- **Communicable disease** – a disease that can be transmitted from one person to another
- **Epidemic** – a disease that affects many people in a given region at the same time
- **Endemic** – a disease that appears to be indigenous to a particular area or region (not of epidemic proportions)
- **Localized disease** – disease is confined to one area of body
- **Systemic (generalized) disease** – disease that spreads throughout the body or to many systems
- **Asymptomatic (Sub-clinical) disease** – a disease in which symptoms are not noticeable to the patient; presence of disease (signs) is detected by routine physical or tests

- *Self-limiting disease* – a disease that does not require treatment to be cured; will resolve on its own
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- I. Research and report on a specific disease or disorder.
 - II. Design a poster to represent examples of disease categories.
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Pathophysiology Basics Quiz Key

<http://www-med.stanford.edu/school/smysp/nojava/explore/careers/career20.html> - epidemiology site

http://www.ascp.org/general/pub_resources/pathologist.asp - good site for pathologist

<http://www.bls.gov/oco/ocos096.htm> - histologist site

http://www.collegeview.com/career/ask_experts/pathology.html - forensic pathologist site

Successful completion of Quiz: Pathophysiology Basics.

For reinforcement, the student will list and define key terms.

For enrichment, the student will read and report on a Forensic Pathology report.

REFLECTIONS

Name _____

Date _____

Period _____

Quiz: Pathophysiology Basics

- _____ 1. An abnormal functional change in the body is termed:
a. disease
b. diagnosis
c. etiology
d. idiopathic
- _____ 2. The sequence of events that leads from the cause to the signs and symptoms is called:
a. disease
b. etiology
c. pathogenesis
d. syndrome
- _____ 3. The study of causes is termed:
a. diagnosis
b. etiology
c. pathology
d. pathogenesis
- _____ 4. The process of assigning a name to a patient's condition is called:
a. disease
b. diagnosis
c. etiology
d. syndrome
- _____ 5. Symptoms, signs, and laboratory findings are what aspects of disease?
a. biochemical
b. congenital
c. manifestations
d. developmental
- _____ 6. Evidence of disease as perceived by the patient is called:
a. lesions
b. injuries
c. signs
d. symptoms
- _____ 7. A written description of symptoms is called:
a. complaints
b. signs
c. manifestations
d. history
- _____ 8. Physical observations by the health professional are referred to as:
a. signs
b. symptoms
c. manifestations
d. history
- _____ 9. A cellular change that result in a tissue abnormality is broadly referred to as:
a. necrosis
b. inflammation
c. lesion
d. injury
- _____ 10. Neoplasms and injuries are all forms of:
a. functional disease
b. structural disease
- _____ 11. A congenital disease is one that is:

- a. genetically acquired
b. acquired by sexual contact
- c. present at birth
d. functional
- _____ 12. A disease that is passed from one person to another is called:
a. generalized disease
b. communicable disease
c. epidemic
d. nosocomial disease
- _____ 13. A disease that develops quickly and does not last a long period of time is:
a. acute disease
b. iatrogenic disease
c. chronic disease
d. idiopathic disease
- _____ 14. Etiology means:
a. of unknown cause
b. the probable outcome of a disease
c. cause of disease
d. a physical or structural injury
- _____ 15. Treatment in which terminally ill patient is provided relief from the signs & symptoms is called:
a. preventive treatment
b. supportive treatment
c. hospice
d. palliative treatment
- _____ 16. When symptoms are not noticeable in the presence of disease this is called:
a. asymptomatic disease
b. chronic disease
c. localized disease
d. iatrogenic disease
- _____ 17. Use of a stethoscope to listen to body cavities is called:
a. percussion
b. auscultation
c. palpation
d. palliative
- _____ 18. When a disease arises as a result of a prescribed treatment, this is referred to as:
a. iatrogenic disease
b. nosocomial disease
c. idiopathic disease
d. functional disease
- _____ 19. Homeostasis describes:
a. genetic predisposition for metabolic disease
b. state of maintaining normal balance in body
c. how a disease manifests itself
d. a nutritional upset in the body
- _____ 20. Neoplasms refer to:
a. infectious disease
b. uncontrolled growth of abnormal cells
c. an upset in biochemical reactions
d. bone callus surrounding fracture

Answers Quiz: Pathophysiology Basics

- a.
- c.
- b.
- b.
- c.
- d.
- d.
- a.
- c.
- b.
- c.
- b.
- a.
- c.
- d.
- a.
- b.
- a.
- b.
- b.