

HUDSON COUNTY SCHOOLS OF TECHNOLOGY

MEDICAL SCIENCE PROGRAM

CURRICULUM GUIDE MEDICAL SCIENCE ELECTIVE – PATHOPHYSIOLOGY

COURSE DESCRIPTION

Students enrolled in the **Medical Science Elective- Pathophysiology** course will study the relationship of alterations in the normal physiology of the human body. Assessment of laboratory and clinical situations will enable the students to understand deviations in the various body systems. Pathophysiology allows the students to understand the etiology, causes, treatment, prevention and appropriate health education for the various diseases causing alterations in body function.

Course Outline

- 1) Fundamentals Of Pathophysiology
 - a) Cell physiology
 - i) Biological theories of aging
 - b) Homeostasis
 - c) Disease/Illness
- 2) Cancer
 - a) Prevention
 - b) Early detection
 - c) Types
 - d) Causes, sign/symptoms, treatment
- 3) Infection
 - a) Infection-causing microbes
 - b) Review infectious process
 - c) Risk factors
 - d) Common infections
 - e) Treatments
- 4) Genetics
 - a) Transmission traits
 - b) Types disorders
 - c) Teratogens
- 5) Integumentary System
 - a) Anatomy/Physiology-review
 - b) Disorders
 - i) Causes
 - ii) Signs/Symptoms
 - iii) Diagnostic tests
 - iv) Treatment
 - v) Prevention

- 6) Endocrine System
 - a) Anatomy/Physiology-review
 - b) Disorders
 - i) Causes
 - ii) Signs/Symptoms
 - iii) Diagnostic tests
 - iv) Treatment
 - v) Prevention
- 7) Cardiovascular System
 - a) Anatomy/Physiology-review
 - b) Signs/Symptoms
 - c) Diagnostic tests
 - d) Treatment
 - e) Prevention
- 8) Respiratory System
 - a) Anatomy/Physiology-review
 - b) Blood
 - c) Fluid and electrolytes
 - d) Lymph-immunity
 - e) Disorders
 - i) Causes
 - ii) Signs/Symptoms
 - iii) Diagnostic tests
 - iv) Treatments
 - v) Prevention
- 9) Neurological System
 - a) Anatomy/Physiology-review
 - b) Stages of altered arousal
 - c) Motor impulse transmission
 - d) Intracranial pressure (ICP)
 - e) Theories of pain
 - f) Disorders
 - i) Causes
 - ii) Signs/Symptoms
 - iii) Diagnostic tests
 - iv) Treatments
 - v) Prevention
- 10) Sensory System
 - a) Anatomy/Physiology
 - b) Disorders
 - i) Causes
 - ii) Signs/Symptoms
 - iii) Diagnostic tests
 - iv) Treatments
 - v) Prevention
- 11) Gastrointestinal System

- a) Anatomy/Physiology-review
 - b) Accessory organs
 - c) Disorders
 - i) Causes
 - ii) Signs/Symptoms
 - iii) Diagnostic tests
 - iv) Treatment
 - v) Prevention
- 12) Renal System
- a) Anatomy/Physiology-review
 - b) Disorders
 - i) Causes
 - ii) Signs/Symptoms
 - iii) Diagnostic tests
 - iv) Treatments
 - v) Prevention
- 13) Musculoskeletal System
- a) Anatomy/Physiology-review
 - b) Disorders
 - i) Causes
 - ii) Signs/Symptoms
 - iii) Diagnostic tests
 - iv) Treatments
 - v) Prevention
- 14) Reproductive System
- a) Anatomy/Physiology-Review
 - b) Disorders
 - i) Causes
 - ii) Signs/Symptoms
 - iii) Diagnostic tests
 - iv) Treatments
 - v) Prevention

Methods of Instruction

- 1) Independent Projects
- 2) Lecture
- 3) Discussions
- 4) Audio-Visual Aids
- 5) Computer
- 6) Practicum
- 7) Guest Speakers
- 8) Field Trips

Evaluation

Process for Student Evaluation

- A. Achievement in unit tests and final exam

- B. Student conferences
- C. Evaluation of written assignments and class projects
- D. Student self evaluation
- E. Teacher evaluation

Process for Curriculum Evaluation

- A. Written student evaluation of course
- B. Clinical experience
- C. Student self evaluation

Goals and Objectives

All students enrolled in the **Medical Science Elective-Pathophysiology** course will address the following Goal and Objectives as well as the New Jersey State Department of Education Core Curriculum Standards in the subject areas of Science (**SCCS**) and Comprehensive Health and Physical Education (**CHPE**).

Goal: The students will have a better understanding of alterations in normal physiology and its impact on the human organism.

Objectives: The students will be able to:

- a) Discuss the structure of cells and how cells reproduce, age and die. (**SCCS 5.6:14, 5.7:10**)
- b) Discuss what homeostasis is and how it affects the body. (**CHPE 2.1:16, 2.1:17**)(**SCCS 5.1:8**)
- c) Identify the factors that cause disease. (**CHPE 2.1:15**)
- d) Relates how diseases develop. (**CHPE 2.1:15**)
- e) Discuss the causes of abnormal cell growth lists seven warning signs of cancer. (**SCCS 5.7:10**)
- f) Relates how cancers are classified.
- g) Understands the process of how cancer metastasizes.
- h) Identify pathophysiologic tests and treatments for common types of cancer.
- i) Relates how the body naturally prevents infection. (**CHPE 2.1:16, 2.1:17**)
- j) Discuss four types of infective microorganisms and their invasion of the body.
- k) Discuss causes, pathophysiology, diagnostic tests and treatments for several common infectious diseases. (**CHPE 2.1:15**)
- l) Relate the function of the skin and its epidermal appendages. (**CHPE 2.1:15**)
- m) Relate the causes, pathophysiology, diagnostic tests and treatment for skin disorders (e.g. lesions, dermatitis, burn, ulcers, and scleroderma). (**CHPE 2.1:15**)
- n) Explain how well-being including one's response to daily stresses of life is reflected in the skin. (**CHPE 2.1:15**)
- o) Discuss cell-mediated immunity, humoral immunity and the complement system network. (**CHPE 2.1:16, 2.1:17**)
- p) Discuss the pathophysiology, signs and symptoms, diagnostic tests and treatment for Allergic Rhinitis, Anaphylaxis, Lupus Erythematosus, Rheumatoid Arthritis and Acquired Immunodeficiency Syndrome. (**CHPE 2.1:15, 2.1:18**)

- q) Understands the role of genes and chromosomes and how cells divide. (SCCS
- r) 5.7:10)
- s) Understands the types of genetic abnormalities and how they are inherited. (SCCS
- t) 5.7:10)
- u) Relate the causes, pathophysiology, diagnostic tests and treatments for several common genetic disorders (e.g. Cleft Lip/Palate, Cystic Fibrosis, Downs, and Hemophilia). **(CHPE 2.1:15)**
- v) Understand the role of the hypothalamus in regulating hormones. **(SCCS 2.1:15)**
- w) Relate the function of the adrenals, pancreas, pituitary gland and thyroid.
- x) Relate the pathophysiology, signs and symptoms, diagnostic tests and treatments for several Endocrine Disorders (e.g. Diabetes Mellitus, Diabetes Insipidus, and Hyperthyroid). **(CHPE 2.1:15)**
- y) Understand the neurochemical ventilation control system, understand the pathophysiology, diagnostic tests and treatments for several Respiratory Diseases (e.g. Pulmonary Edema, Collapse Lung).
- z) Understand the relationship between oxygen supply and demand.
- aa) Relate the risk factor for Cardiovascular Diseases. **(CHPE 2.1:15)**
- bb) Relate the causes, pathophysiology, diagnostic tests and treatments for several common Cardiac Disorders (e.g. Heart Failure, Myocardial Infarct). **(CHPE 2.1:15)**
- cc) Discuss the structure of the Neurological System. **(CHPE 2.1:15)**
- dd) Discuss how the Neurological System functions. **(CHPE 2.1:15)**

- ee) Relate the causes, pathophysiology, diagnostic tests and treatments for several common Neurological Disorders (e.g. Alzheimer's, CVA, Epilepsy, Gillian Barre). **(CHPE 2.1:15)**
- ff) Relate the functions of the organs of the Sensory System. **(CHPE 2.1:15)**
- gg) Relates the causes, pathophysiology, diagnostic tests and treatment for various eye disorders (e.g. Strabismus, Diplopia, Myopia, Glaucoma). **(CHPE 2.1:15)**
- hh) Relate the causes, pathophysiology for various ear disorders (e.g. Meniere's, Otosclerosis). **(CHPE 2.1:15)**
- ii) Discuss the structure and function of the blood and its components. **(CHPE 2.1:15)**
- jj) Relate the pathophysiology, signs and symptoms, diagnostic tests and treatments for common blood disorders. **(CHPE 2.1:15)**
- kk) Discuss the structure and function of the digestive system and related organs. **(CHPE 2.1:15)**
- ll) Relate the causes, pathophysiology, signs and symptoms, diagnostic tests and treatments for common Digestive Disorders (e.g. Appendicitis, Cholecystitis, Cirrhosis, Chron's, Ulcers). **(CHPE 2.1:15)**
- mm) Discuss how the Renal System functions.
- nn) Discuss the causes, pathophysiology, signs and symptoms, diagnostic tests and treatments for several common Renal System Disorders (e.g. Acute and Chronic Failure, BPH, Renal Calculi) **(CHPE 2.1:15, 2.5:10)**
- oo) Discuss the function of the Musculoskeletal System. **(CHPE 2.1:15)**
- pp) Discusses bone growth its formation and renewal.

- qq) Relates the causes, pathophysiology, diagnostic tests and treatments for Musculoskeletal Disorders (e.g. Gout, Osteoporosis, Fractures). **(CHPE 2.1:16, 2.5:10, 2.5:11, 2.6:10, 2.6:11)**
- rr) Understand the function of the organs of the male and female Reproductive System. **(CHPE 2.1:15, 2.4:15)**
- ss) Relates the causes, pathophysiology, diagnostic tests and treatments for various disorders of the female Reproductive System (e.g. Menstrual alterations, Endometriosis, Fibrocystic Breast). **(CHPE 2.4:15, 2.4:19, 2.4:20, 2.4:21)**
- tt) Relates the causes, pathophysiology, diagnostic tests and treatment for various disorders of the male Reproductive System (e.g. Sexual Dysfunction, BPH, Cryptorchidism, Gynecomastia). **(CHPE 2.4:15, 2.4:19, 2.4:20, 2.4:21)**