NRSG 258: Principles of Pathophysiology
Credits: 3 lecture
Semesters Offered: F, Sp, Su
Prerequisites: BIOH 201, 211 and CHMY 123

Course Description: This course provides an introduction to the abnormal functioning of human cells, tissues, and organ systems, and the physiological adaptations that occur. Commonly encountered age-related variations will be addressed. The influences of environment, genetics, nutrition, and culture will be emphasized. Current research that explains the changes that accompany a particular syndrome or disease will be considered.

Course Objectives: The student will:

1. Discuss the epidemiology, etiology, risk factors, physiological adaptations, treatments, and clinical manifestations of selected disease processes. (F2)
2. Examine the relationships of nutrition, genetics, culture, and environment to selected diseases. (F9, 10)
3. Explain how changes in one body system affect changes in another.
4. Discuss the impact of current research on our understanding of pathophysiology.
5. Students will demonstrate behaviors that are congruent with the MSU Code of Conduct, CON Student Handbook, ANA Code of Ethics, Scope and Standards of Practice, and Social Policy Statements in all class related interactions. (F3-11)

Recommended Content and Concepts:

Course content will include epidemiology, etiology, risk factors, physiological adaptations and clinical manifestations of selected disease processes for all systems across the life span. The role of nutrition, genetics, culture, and environment in disease processes will be included. Distinctions between age-related changes and pathology will be made. The impact of current research on our understanding of pathophysiology will be discussed.

Part I: Basic Concepts of Pathophysiology
I. Unit I: The cell and tissue biology, cellular environment, genetic basis for disease
   A. Cellular biology
   B. Genes and genetic disease
   C. Altered cell and tissue biology
   D. Fluid and electrolytes, acids, and bases

II. Unit II: Self defense mechanisms-Components and actions of the immune system
   A. Immune response
   B. Inflammation
   C. Hypersensitivities, infections, and immunodeficiency
   D. Stress and disease
   E. Body Systems and Diseases*
III. Unit III: Cellular proliferation-Neoplasia
   A. Overview of cellular structure and function
   B. Biology of cancer
   C. Tumor spread and clinical manifestations
   D. Cancers in adults and children

IV. Unit IV: Neurologic system
   A. Overview of the nervous system: cells, nerves, CNS, PNS, ANS, chronobiology
   B. Pain, temperature, sleep, and sensory
   C. Concepts of neurologic dysfunction
      1. Alterations in arousal and cognition
      2. Alterations in homeostasis (Increased intracranial pressure-cerebral edema, hydrocephalus)
      3. Alterations in motor function
   D. CNS disorders
      1. Cerebrovascular disorders
      2. Infection and inflammation
      3. Trauma
      4. Degenerative disease
      5. Tumors, seizures, encephalopathies

V. Unit V: Endocrine system
   A. Mechanisms of hormonal regulation overview
   B. Endocrine disorders
      1. Hypothalamic-pituitary disorders
      2. Thyroid and parathyroid disorders
      3. Pancreatic disorders
      4. Adrenal disorders

VI. Unit VI: The hematologic system
   A. Overview of structure and function
   B. Alterations of erythrocyte function
      1. Anemia
      2. Polycythemia
   C. Alterations in leukocyte function
      1. Infectious mononucleosis
      2. Leukemia
      3. Multiple myeloma
   D. Alteration in lymphoid function
      1. Lymphomas
   E. Platelet dysfunction / Coagulopathies

VII. Unit VII: The cardiovascular system
   A. Overview of structure and function
   B. Disorders of arteries and veins
      1. Arteriosclerosis/atherosclerosis
2. Hypertension
3. Aneurysm
4. Thrombus/embolus
5. Coronary artery disease
6. Myocardial ischemia/infarction
7. Peripheral vascular disease

C. Disorders of the heart wall and structures
1. Cardiomyopathies
2. Heart failure
3. Pericarditis/endocarditis
4. Congenital disease

D. Conduction abnormalities/dysrhythmias
E. Shock

VIII. Unit VIII: The pulmonary system
A. Overview of structure and function
B. Acute respiratory failure
C. Obstructive pulmonary disease
   a. Asthma
   b. Bronchitis
   c. Emphysema
   d. Cystic fibrosis
   e. Bronchopulmonary dysplasia
D. Respiratory tract infections
   a. TB
   b. Pneumonia
E. Pulmonary vascular disease
F. Lung cancer

IX. Unit IX: The renal and urologic systems
A. Overview of structure and function
B. Urinary tract obstruction / structural abnormalities
C. Urinary tract infection
D. Glomerular disorders
E. Renal failure

X. Unit X: The reproductive system
A. Overview of structure and function
B. Disorders of the female reproductive system
   1. Hormonal and menstrual dysfunction
   2. Infection and inflammation
   3. Benign growths
   4. Cancer
C. Disorders of the male reproductive system
   1. Disorders of the prostate gland
      BPH
Cancer
1. Infections and inflammation
D. Disorders of the breast
E. Congenital disorders

XI. Unit XI: The digestive system
A. Overview of structure and function
B. Disorders of the GI tract
   1. Motility disorders
   2. Gastritis
   3. Peptic ulcer disease
   4. Malabsorption syndromes
   5. Inflammatory bowel disease
   6. Infections and obstruction
C. Disorders of nutrition
   1. Obesity
   2. Anorexia/Bulimia
D. Disorders of the liver and gall bladder
E. Cancer

Unit XII: The musculoskeletal and integumentary systems
A. Overview of structure and function
B. Musculoskeletal injuries
C. Metabolic and infectious bone disease
D. Skeletal muscle disorders
   Fibromyalgia
   Inflammatory muscle disease
   Congenital defects
   Rheumatoid/osteoarthritis
   Muscular dystrophy
   Inflammation/infection of the skin
   Cancer
* Some/all of the overview may be done as independent study.

Suggested Student Learning Activities: (optional Learning activities revised August 2008 for on-line delivery)
Power point lectures using Camtasia and MP3 format
Guest speakers for some on-line lectures
On-line videos & video links for some lectures
Discussion board for student initiated topics
Case studies
Patient chart reviews as examples for course content
Readings
Quizzes and final exam
Approved by UAAC: May, 2018
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