BIO-2600: PATHOPHYSIOLOGY

Cuyahoga Community College

Viewing:BIO-2600 : Pathophysiology

Board of Trustees:
2017-05-25

Academic Term:
2017-08-28

Subject Code
BIO - Biology

Course Number:
2600

Title:
Pathophysiology

Catalog Description:
General mechanisms of disease processes and health problems including inflammation, degeneration, immunity, congenital, hereditary, neoplasia as well as diseases caused by deficiencies or excesses. The most commonly occurring diseases of body systems are surveyed.

Credit Hour(s):
3

Lecture Hour(s):
3

Lab Hour(s):
0

Other Hour(s):
0

Requisites

Prerequisite and Corequisite
BIO-2341 Anatomy and Physiology II.

I. ACADEMIC CREDIT

Academic Credit According to the Ohio Department of Higher Education, one (1) semester hour of college credit will be awarded for each lecture hour. Students will be expected to work on out-of-class assignments on a regular basis which, over the length of the course, would normally average two hours of out-of-class study for each hour of formal class activity. For laboratory hours, one (1) credit shall be awarded for a minimum of three laboratory hours in a standard week for which little or no out-of-class study is required since three hours will be in the lab (i.e. Laboratory 03 hours). Whereas, one (1) credit shall be awarded for a minimum of two laboratory hours in a standard week, if supplemented by out-of-class assignments which would normally average one hour of out-of-class study preparing for or following up the laboratory experience (i.e. Laboratory 02 hours). Credit is also awarded for other hours such as directed practice, practicum, cooperative work experience, and field experience. The number of hours required to receive credit is listed under Other Hours on the syllabus. The number of credit hours for lecture, lab and other hours are listed at the beginning of the syllabus. Make sure you can prioritize your time accordingly. Proper planning, prioritization and dedication will enhance your success in this course.

The standard expectation for an online course is that you will spend 3 hours per week for each credit hour.

II. ACCESSIBILITY STATEMENT

If you need any special course adaptations or accommodations because of a documented disability, please notify your instructor within a reasonable length of time, preferably the first week of the term with formal notice of that need (i.e. an official letter from the Student Accessibility Services (SAS) office). Accommodations will not be made retroactively.
III. ATTENDANCE TRACKING

Regular class attendance is expected. Tri-C is required by law to verify the enrollment of students who participate in federal Title IV student aid programs and/or who receive educational benefits through other funding sources. Eligibility for federal student financial aid is based in part on enrollment status.

Students who do not attend classes for the entire term are required to withdraw from the course(s). Additionally, students who withdraw from a course or stop attending class without officially withdrawing may be required to return all or a portion of their financial aid based on the date of last attendance. Students who do not attend the full session are responsible for withdrawing from the course(s).

Tri-C is responsible for identifying students who have not attended a course before financial aid funds can be applied to students’ accounts.

Therefore, attendance is recorded in the following ways:

- For in-person and blended-learning courses, students are required to attend the course by the 15th day of the semester (or equivalent for terms shorter than five weeks) to be considered attending. Students who have not met all attendance requirements for in-person and blended courses, as described herein, within the first two weeks or equivalent, will be considered not attending.
- For online courses, students are required to login at least two times per week and submit one assignment per week for the first two weeks of the semester, or equivalent to the 15th day of the term. Students who have not met all attendance requirements for online courses, as described herein, within the first two weeks or equivalent, will be considered not attending.

At the conclusion of the first two weeks of a semester or equivalent, instructors report any registered students who have “Never Attended” a course. Those students will be administratively withdrawn from that course. However, after the time period in the previous paragraphs, if a student stops attending a class or wants or needs to withdraw, for any reason, it is the student’s responsibility to take action to withdraw from the course. Students must complete and submit the appropriate Tri-C form by the established withdrawal deadline.

Tri-C is required to ensure that students receive financial aid only for courses that they attend and complete. Students reported for not attending at least one of their registered courses will have all financial aid funds held until confirmation of attendance in registered courses has been verified. Students who fail to complete at least one course may be required to repay all or a portion of their federal financial aid funds and may be ineligible to receive future federal financial aid awards. Students who withdraw from classes prior to completing more than 60 percent of their enrolled class time may be subject to the required federal refund policy.

If illness or emergency should necessitate a brief absence from class, students should confer with instructors upon their return. Students having problems with coursework due to a prolonged absence should confer with the instructor or a counselor.

IV. LEARNING OUTCOMES ASSESSMENT

Occasionally, in addition to submitting assignments to their instructors for evaluation and a grade, students will also be asked to submit completed assignments, called ‘artifacts,’ for assessment of course and program outcomes and the College’s Essential Learning Outcomes (ELOs). The artifacts will be submitted in Blackboard or a similar technology. The level of mastery of the outcome demonstrated by the artifact DOES NOT affect the student’s grade or academic record in any way. However, some instructors require that students submit their artifact before receiving their final grade. Some artifacts will be randomly selected for assessment, which will help determine improvements and support needed to further student success. If you have any questions, please feel free to speak with your instructor or contact the Learning Outcomes Assessment office.

V. CONCEALED CARRY STATEMENT

College policy prohibits the possession of weapons on college property by students, faculty and staff, unless specifically approved in advance as a job-related requirement (i.e., Tri-C campus police officers) or, in accordance with Ohio law, secured in a parked vehicle in a designated parking area only by an individual in possession of a valid conceal carry permit.

As a Tri-C student, your behavior on campus must comply with the student code of conduct which is available on page 29 within the Tri-C student handbook, available at http://www.tri-c.edu/student-resources/documents/studenthandbook.pdf. You must also comply with the College’s Zero Tolerance for Violence on College Property available at http://www.tri-c.edu/policies-and-procedures/documents/3354-1-20-10-zero-tolerance-for-violence-policy.pdf.

Outcomes

Course Outcome(s):
Communicate scientific aspects of disease using appropriate vocabulary related to the language of disease processes in pathology and pathophysiology.
Essential Learning Outcome Mapping:
Oral Communication: Demonstrate effective verbal and nonverbal communication for an intended audience that is clear, organized, and delivered effectively following the standard conventions of that language.
Information Literacy: Acquire, evaluate, and use information from credible sources in order to meet information needs for a specific research purpose.

Objective(s):
1. Use appropriate vocabulary related to the language of disease processes in pathology and pathophysiology.

Course Outcome(s):
Evaluate the pathophysiology of disease of the following body systems: cardiovascular, central/peripheral nervous system, genitourinary, gastrointestinal, hepatobiliary, musculoskeletal, endocrine, respiratory, and dermatological in addition to psychiatric disorders.

Essential Learning Outcome Mapping:
Information Literacy: Acquire, evaluate, and use information from credible sources in order to meet information needs for a specific research purpose.

Objective(s):
1. Identify the causes of congenital/hereditary, inflammatory, degenerative and neoplastic diseases, signs, and symptoms.
2. Evaluate nutritional disorders along with diseases resulting from them.
3. Evaluate the types of trauma and physical injury as well as the resulting burden of the sequelae due to trauma.

Course Outcome(s):
Integrate physiology and pathology to describe disease processes of body systems and their diagnosis, treatment, morbidity and mortality as well as prevention.

Essential Learning Outcome Mapping:
Oral Communication: Demonstrate effective verbal and nonverbal communication for an intended audience that is clear, organized, and delivered effectively following the standard conventions of that language.

Objective(s):
1. Evaluate factors related to the clinical diagnosis and treatment of diseases that are known for body systems: etiology, incidence (sex and age), signs and symptoms, diagnostic procedures, morbidity, mortality and prognosis.
2. Evaluate inflammation and inflammatory diseases.
3. Evaluate immune and hypersensitivity disorders and diseases resulting from these disorders.
4. Evaluate disorders of body fluids and electrolytes including fluid shifts and diseases resulting from them.
5. Evaluate the pathophysiology of endocrine disorders and the resulting diseases caused by endocrine disorders.
6. Evaluate the pathophysiology of disease of the following body systems: cardiovascular, central/peripheral nervous system, genitourinary, gastrointestinal, hepatobiliary, musculoskeletal, endocrine, respiratory, and dermatological.

Methods of Evaluation:
1. Examinations
2. Quizzes
3. Clinical case study evaluations and discussions
4. Oral Presentations
5. Written Presentations

Course Content Outline:
1. General Concepts of Disease: Principles of Diagnosis
   a. Evaluate common terms used to describe disease such as lesions, organic and functional disease, symptomatic and asymptomatic disease, etiology and pathogenesis.
   b. Describe the major categories of human disease
   c. Evaluate the approach that a practitioner uses to make a diagnosis and decide on a patient’s treatment.
   d. Describe various diagnostic tests/studies and procedures that can help a practitioner in making a diagnosis and deciding on proper treatment.
2. Cellular injury and dysfunction
a. Describe how cells are organized to form tissues and how tissues are organized to form organ systems
b. Describe how cells utilize the genetic code within DNA to convey genetic information to daughter cells during cell division in both somatic and germ cells (meiosis).
c. Explain the process by which the DNA in the nucleus directs the synthesis of enzymes and other proteins in the cytoplasm.
d. Explain how an aging cell becomes increasingly vulnerable to injury.
e. Explain how cells adapt to changing conditions: atrophy, hypertrophy, hyperplasia, metaplasia, dysplasia and increased enzyme synthesis.
f. Compare mechanisms of cell injury and cell death (necrosis, apoptosis).

3. Hereditary/Congenital disease
a. Describe common causes of congenital malformations and their approximate incidence
b. List abnormalities of sex chromosomes and describe their clinical manifestations
c. Describe some of the common genetic abnormalities and their methods of transmission
d. Describe some of the more important malformations resulting from intrauterine injury
e. Compare the methods of transmission and the clinical manifestations of phenylketonuria and hemophilia
f. Explain the process of amniocentesis and chronic villus sampling in the diagnosis of hereditary diseases during pregnancy.
g. Explain multifactorial inheritance including relevant factors contributing to transmission.
h. Evaluate the three common trisomies (21, 18 and 15) including clinical manifestations.
i. Describe various methods available to make a diagnosis of a congenital abnormality in a fetus.

4. Nutritional disorders
a. Explain how major nutrients function in normal homeostasis including a well-balanced diet.
b. Explain common causes of malnutrition and persons at risk for malnutrition especially kwashiorkor and marasmus in terms of physical findings and treatment.
c. Describe the consequences of common eating disorders such as anorexia nervosa, bulimia nervosa, binge eating disorder and obesity

5. Inflammation
a. List the characteristics and clinical manifestations of acute and chronic inflammation
b. Differentiate acute and chronic inflammation on the basis of their components such as fluid findings (serous, purulent, fibrinous and hemorrhagic), inflammatory cells and resolution.
c. Describe the possible clinical outcomes of an inflammatory reaction.
d. Describe the chemical mediators of inflammation and their interactions in the inflammatory process.
e. Describe the harmful effects of inflammation and how appropriate therapies limit those effects.
f. Explain the rationale behind modulation of the inflammatory process.
g. Compare inflammation and infection including appropriate terms related to these processes.

6. Infection
a. Describe the major groups of pathogenic bacteria and the characteristics by which they are classified.
b. Describe the mechanisms by which antibiotics inhibit the growth and metabolism of bacteria including the adverse affects of indiscriminate antibiotic use.
c. Describe the procedures used in antibiotic sensitivity testing and explain the principles by which the results are interpreted.
d. Explain the mode of action of viral infections and describe the body’s response to viral infection leads to recovery.
e. Describe the pathophysiology of infections cause by chlamydiae, mycoplasmas, ehrlichiae and rickettsiae
f. Discuss the spectrum of infections caused by fungi and the treatment of fungal infections including the factors that predispose humans to systemic fungal infections
g. Describe the pathophysiology and clinical effects of common parasitic infections that affect human including their treatment and acquisition

7. Immunity and hypersensitivity
a. Describe the basic features of cell-mediated and humoral immunity including the cells and mediators of these immune systems.
b. Compare immunity and hypersensitivity in terms of mechanism and suppression if necessary.
c. Describe the characteristics of antibodies and how the classes differ from one another.
d. Describe the manifestations and roles of the Type 1, Type 2, Type 3 and Type 5 hypersensitivity reactions including some examples of diseases that fit under the different types.
e. Evaluate autoimmune disease process in terms of theories and methods of treatment.

8. Disturbances in blood and body fluids
a. Describe the functions of blood vessels and platelets in controlling bleeding
b. Explain the mechanisms of blood coagulation including the factors involved in the process
c. Describe the laboratory tests used to evaluate hemostasis
d. List the most common clinically significant disturbances of hemostasis and their clinical manifestations
e. Described the causes, effects and treatment of venous thrombosis including the pathogenesis of pulmonary embolism along with clinical manifestations and treatment.
f. Describe the cause, effects and treatment of arterial thrombosis

g. Explain the major clinical disturbances leading to edema.

h. Describe the pathogenesis of hypercoaguable states and factors that increase susceptibility to these states especially cancer.

i. Describe the clinical manifestations of the shock state and the etiology of the various type of shock.

j. Explain the underlying concepts relating to regulation of the concentrations of electrolytes in the body fluid compartments.

k. Describe common disturbances and pathogenesis of water balance.

l. Explain the physiological mechanisms involved in control of body pH along with the consequences of derangements of body pH.

m. Define the roles of the kidneys and the lungs in the control of body pH.

9. Neoplasms

a. Review the names of different cell types, and understand on what basis they are classified as labile, stable, or permanent.

b. Describe the pathogenesis and clinical implications of hyperplasias and neoplasms.

c. Compare hypertrophy and hyperplasia in terms of: the difference between physiologic and pathologic hypertrophy or hyperplasia;which cell types undergo hypertrophy and which undergo hyperplasia.

d. Describe the difference(s) between hyperplasia/hypertrophy, atrophy, metaplasia, and dysplasia.

e. Compare inflammatory lesions, hyperplasia, benign neoplasms, and malignant neoplasms in terms of behavior, morphology, and treatment.

f. Describe the conventions used in naming benign and malignant neoplasms.

g. Describe the histomorphologic criteria that are used to diagnose and describe cancer.

h. Evaluate the relationship between mutation, transformation, premalignant lesions (dysplasia), in situ cancer, local invasion, and metastasis.

i. Describe how carcinomas and sarcomas differ in tissue of origin and spread.

j. Explain the concept of staging a malignancy, and demonstrate how stage relates to malignancy prognosis and therapy.

k. Describe the most common carcinomas and how they differ in epidemiology and survival rate.

l. Describe the most common cancers that occur in pediatric, middle-aged and older patients.

m. Describe the process of cell transformation.

n. Evaluate the roles of oncogenes and tumor suppressor genes in cancer development.

o. Describe what is meant by the multistep model of carcinogenesis.

p. Describe the types of agents that have been implicated in the development of cancers (chemical carcinogens, radiation, oncogenic viruses, and inherited mutations).

q. List the manifestations of cancer and describe how cancer causes them.

r. Describe and compare the major forms of cancer therapy.

s. Define stage and describe how stage is determined for different cancers.

t. Describe how stage correlates with prognosis and survival.

10. Diseases processes associated with the female reproductive system and pregnancy

a. List the most frequent conditions of the genital system for which women seek medical attention.

b. Describe the signs and symptoms by which disorders of the female genital tract come to attention, and define the words by which menstrual irregularities are described.

c. Describe the components of a gynecologic history and physical examination.

d. Describe the role of Pap smear, colposcopy, cone biopsy, dilation and curettage, ultrasound, and laparoscopy in evaluation of female genital diseases.

e. List the common sexually transmitted diseases and the complications they cause in the female genital tract.

f. List common causes of vaginal or vulvar itching and describe their cause, predisposing conditions, and treatments.

g. Define endometriosis, describe how it arises, and identify the symptoms and complications it causes.

h. Describe the cause and treatment of dysfunctional uterine bleeding, and recognize how this is differentiated from normal menstruation.

i. Describe how obesity contributes to the pathogenesis of diseases in the female genital tract.

j. Describe the causes, lesions, and manifestations of polycystic ovary disease.

k. Define menopause and list its short-term and long-term effects on the health of women.

l. List the most common benign neoplasms of the uterus and ovary and describe how they come to medical attention.

m. Compare the risk factors, relative incidence, and mortality of cancers of the uterus, ovary, and cervix.

n. Describe the role of high-risk HPV in the pathogenesis of cervical cancer and describe how Pap tests are used to recognize HPV infection and preinvasive squamous lesions of the cervix.

o. Discuss how ectopic pregnancy arises and why it is life threatening.

p. Define placental abruption and describe why it can be life threatening to the fetus and the mother.

q. Define preeclampsia and eclampsia and describe the current understanding of how these conditions arise and how to definitively treat them.

r. Describe what is meant by a “molar pregnancy” and describe how it arises.
s. Evaluate the causes of infertility including anatomic, psychologic, and physiologic derangements, and recognize how much infertility results from “male” versus “female” factors.

t. Evaluate benign and malignant stromal tumors of the breast including pathology and treatment options.

u. Evaluate the difference between in situ and invasive carcinoma of the breast.

v. Describe the magnitude of the problem of breast cancer in the United States, and be able to cite key statistics relating to lifetime risk, prevalence, mortality, and median age at diagnosis of breast cancer including the prognostic factors for breast cancer in both women and men including common lesions.

w. Name the most common surgical procedures performed on the breast and the physical examination of the breast.

x. Evaluate lesions that can mimic breast cancer by forming a palpable lump and describe the role of mammography and ultrasound in evaluating mammary tissue, including the screening recommendations for breast cancer.

y. Evaluate the pathology of acute mastitis, under what conditions it occurs, and how it is treated.

z. Describe the lesions encompassed by the terms fibrocystic change and list those lesions that impart a higher risk for subsequent development of breast cancer.

11. Male Reproductive Disease

a. Describe and evaluate some of the most common medical diseases, cancers, and surgical interventions male genital tract.

b. Evaluate the physical and laboratory examination of the male genital organs, including cystoscopy.

c. Describe the role of PSA, radiography, and renal biopsy in diagnosing diseases of the male genital tracts.

d. List and describe the most common genetic and congenital conditions male genital tract including: cryptorchidism; mumps orchitis; bacterial prostatitis; benign prostatic hypertrophy; prostate cancer and testicular cancer.

12. Endocrine Disease

a. Evaluate the syndromes related to excess or deficiency of adrenocorticotropic hormone, growth hormone, antidiuretic hormone, thyroid hormone, parathyroid hormone, glucocorticoids, catecholamines, mineralocorticoids, and insulin.

b. Describe the general principles of diagnosis of endocrine diseases, including the role of laboratory analysis.

c. List signs and symptoms of hyposecretion and hypersecretion of the pituitary, thyroid, parathyroid, adrenal, and pancreatic islet hormones.

d. Evaluate the most common diseases of the endocrine organs.
   i. Diseases of the pituitary gland: panhypopituitarism, gigantism and acromegaly, diabetes insipidus
   ii. Diseases of the thyroid gland: hypothyroidism and hyperthyroidism
   iii. Disease of the parathyroid glands: hyperparathyroidism
   iv. Diseases of the Adrenal Gland: Addison Disease and Cushing Disease
   v. Diseases of the Pancreatic Islets of Langerhans: diabetes mellitus

e. Evaluate neoplasms of the endocrine system.
   i. Pituitary adenomas
   ii. Thyroid Neoplasms: C-cell tumors, follicular, medullary and anaplastic carcinomas
   iii. Adrenal Neoplasms: adrenal medullary adenomas, pheochromocytomas
   iv. Pancreatic Neuroendocrine Tumors
   v. Multiple endocrine Tumor Syndromes
   vi. Ectopic Hormone-Producing Cancers

f. Compare and contrast type 1 and type 2 diabetes mellitus including the acute and chronic complications of diabetes mellitus.

13. Renal Disease

a. Evaluate common symptoms of urinary disease such as urinary frequency, dysuria, nocturia, urgency, flank pain, hematuria, oliguria and anuria.

b. Describe the physical and laboratory examination of urological diseases.

c. Compare and contrast the nephrotic and nephritic syndromes including: primary glomerular disease such as minimal change disease and systemic diseases such as diabetes mellitus, amyloidosis and systemic lupus erythematosus including the role of immune-mediated injury in glomerular diseases.

d. Compare and contrast autosomal recessive and autosomal dominant polycystic kidney diseases.

e. Evaluate urinary tract infections and their treatments.


g. Evaluate end-stage renal failure and its treatment including the types of dialysis.

h. Describe the pathology of urinary tract neoplasms including renal cell carcinoma and transitional cell carcinoma.

14. Respiratory Disease

a. Compare and contrast the concepts of restrictive and obstructive lung diseases, and describe how they differ in terms of etiology, lung function, and manifestations.

b. Describe the deleterious effect of smoking on the health of the lung, and identify the diseases with which smoking is most strongly correlated.

c. Describe physical symptoms and clinical signs of altered lung function and laboratory tests that can be done to further define pulmonary diseases.
d. Describe the causes, manifestations, and treatment of congenital and genetic diseases affecting the lung (respiratory distress syndrome of the newborn, cystic fibrosis, and alpha-1 antitrypsin deficiency disease).

e. Describe similarities and differences among lobar, broncho-, and interstitial pneumonia in terms of cause, location, manifestations, predisposing conditions, causative organism, and treatment.

f. Describe the natural history of tuberculosis, in particular the difference between primary and secondary tuberculosis.

g. Describe the more common granulomatous diseases of the lung.

h. Describe the pathology of the four types of obstructive pulmonary diseases.

i. Describe the causes, manifestations, and treatment of asthma.

j. Evaluate chronic obstructive pulmonary disease and its relationship to chronic bronchitis and emphysema, and describe how chronic bronchitis and emphysema differ clinically and histologically.

k. Evaluate the pathology of the most important acute and chronic interstitial lung diseases and describe the causes, manifestations, and treatment of each.

l. Evaluate manifestations, and treatment of various vascular disorders affecting the lung, such as pulmonary embolism, pulmonary hypertension, and pulmonary infarct.

m. Describe the clinical and histologic classification of pulmonary neoplasms, and become familiar with the staging system for lung cancer.

n. Describe the causes, manifestations, and treatment of lung cancers.

15. Cardiovascular Disease

a. Evaluate the pathophysiology of vascular diseases including the diagnostic instruments and tests used to screen for and detect diseases of the vascular system.

b. Describe the most common congenital anomalies of the vascular system, and differentiate between hemangioma and lymphangioma.

c. Compare and contrast the terms arteriosclerosis, atherosclerosis, and arteriolosclerosis.

d. Evaluate the pathophysiologic development of atherosclerotic plaques, and name the vessels most commonly involved with atherosclerosis.

e. Discuss four ways in which atherosclerotic lesions can cause complications.

f. Discuss the risk factors for the development of atherosclerosis, and discuss how the development of atherosclerotic lesions can be prevented.

g. Evaluate hypertension, review the systolic and diastolic components of a blood pressure reading, differentiate between essential and secondary hypertension in terms of cause and treatment, and describe the symptoms and clinical manifestations of hypertension including the critical role of screening, lifestyle modifications, and pharmaceutical therapy in decreasing morbidity and mortality associated with hypertension.

h. Evaluate vasculitis, describe how it compromises organ function, and provide examples of vasculitic diseases.

i. Differentiate thrombophlebitis and varicose veins in terms of the vessels affected, etiology, complications, diagnosis, and treatment.

j. Compare “cardiac death” and “sudden cardiac death,” and name some of the major causes of each.

k. Describe common physical signs and symptoms that indicate heart disease, including angina pectoris, shortness of breath, pleural fluid, ascites, peripheral edema, neck vein distention, and murmurs.

l. Describe how each of the following tests or procedures is helpful in evaluation of a patient with heart disease: blood pressure, electrocardiogram, serum enzyme levels, echocardiogram, stress test, and cardiac catheterization.

m. Describe the most common congenital anomalies of the heart, what functional disturbance they cause, how they manifest, and how they lead to heart failure.

n. Describe the mechanisms by which coronary artery atherosclerosis can lead to myocardial infarction.

o. Describe the pathogenesis, complications, and manifestations of myocardial infarction.

p. Describe the pathogenesis of rheumatic heart disease and list its complications.

q. Discuss predisposing factors and consequences of infective endocarditis and myocarditis.

r. Compare and contrast the pathogenesis and effects of systemic and pulmonary hypertension on the heart.

s. Compare and contrast cardiogenic shock and congestive heart failure in terms of acuteness, severity, causes, and manifestations.

16. Central and Peripheral Nervous System Disease

a. Evaluate peripheral Nervous system disease such as: hereditary motor and sensory neuropathies, amyotrophic lateral sclerosis, myasthenia gravis, Guillain-Barre syndrome and diabetic neuropathy.

b. Compare a focal and a generalized neurologic deficit.

c. Evaluate the causes of increased intracranial pressure and relate why increased intracranial pressure is dangerous.

d. Describe the diagnostic tests utilized in diagnosing central nervous system disease, including cerebrospinal fluid analysis, angiography, electroencephalogram, computed tomography, and magnetic resonance imaging.

e. Evaluate causes, lesions, and manifestations of each specific disease such as: Cerebrovascular accident (Stroke), traumatic brain injury, epilepsy, encephalitis, parathesia, dysthesias, cerebral herniation, congenital malformations, cerebral palsy, anencephaly, meningomyelocoele, spina bifida, multiple sclerosis, Parkinson disease, meningitis, vascular dementia, encephalitis, aneurysms and concussion/contusions.
f. Compare developmental brain malformations with developmental brain destructive lesions in terms of pathogenesis and clinical expression.

g. Compare meningitis with encephalitis in terms of pathogenesis, location of lesion, and clinical expression.

h. Describe how rabies should be suspected, diagnosed, and treated.

i. Describe the relationship between cerebrovascular accidents and atherosclerosis.

j. Describe the cells in the brain are most vulnerable to anoxia as a consequence of cerebrovascular accidents.

k. Evaluate patients with brain concussion in terms of monitoring and treatment.

l. Compare epidural and subdural hematomas in terms of pathogenesis and development of symptoms.

m. Compare Alzheimer disease with Parkinson disease in terms of age of onset, symptoms, and brain changes.

n. Describe Creutzfeldt–Jakob disease in terms of pathophysiology.

o. Explain how congenital hydrocephalus differs from acquired hydrocephalus in terms of pathogenesis and clinical expression.

p. Evaluate brain and central nervous system neoplasms in terms of manifestations and treatment.

17. Skin Disease

a. Evaluate benign and malignant disorders of the skin in terms of pathology and treatment.

18. Mental Illness and Substance Abuse

a. Evaluate mental illnesses such as: Depressive and Bipolar Disorders, Anxiety, Obsessive-Compulsive, Trauma-Related, and Stressor-Related Disorders. Schizophrenia, Substance-Related and Addictive Disorders, Personality Disorders, Neurodevelopmental Disorders, Mental Disorders Due to Another Medical Condition, and Somatic Symptom Disorders.

b. Compare psychiatric disorders from functional disorders.

19. Trauma and Physical Injury

a. Evaluate the pathology and morbidity of physical injuries such as: Mechanical Injuries, Missile Wounds, Major Body Trauma: Abdominal Injury, Chest Injury, Spinal Injury, Head Injury, Thermal Injury such as Burns, Electrical Burns, Excessive Heat, Frostbite, (Hypothermia), Solar Radiation, X-Radiation and Gamma Radiation.

20. Musculoskeletal Disease

a. Compare the relative frequency of joint disease and bone disease, and state how they are likely to differ in their consequences.

b. Identify the most common and most serious problems affecting bones and joints.

c. Evaluate the common manifestations (symptoms and signs) of bone and joint diseases.

d. Describe the common laboratory, radiographic, and clinical procedures used to diagnosis diseases of the bones and joints.

e. Describe how localized developmental abnormalities differ from generalized genetic abnormalities of the skeletal system in terms of frequency and likely outcome, and give examples of each.

f. Describe the genetic abnormalities in achondroplasia, osteogenesis imperfecta, and Marfan syndrome, and describe the appearance of individuals affected by these diseases.

g. Compare and contrast sprain, strain, and subluxation.

h. List the most common causes of low back pain and describe how a herniated disc develops.

i. Describe the various kinds of fracture and understand how fractures heal and which factors impair healing.

j. Evaluate the pathophysiology of septic arthritis and describe how it arises and is treated.

k. Compare haemogenous osteomyelitis with secondary osteomyelitis in terms of cause, affected population, and outcome.

l. Evaluate the pathophysiology of osteopenia and osteoporosis, and describe how bone loss is detected including some of the causes and complications of osteoporosis and describe who is most likely to have it.

m. Compare osteoporosis and osteomalacia in terms of cause, affected population, and laboratory findings.

n. Evaluate degenerative and rheumatoid arthritis in terms of pathology and treatment.

o. Relate how laboratory tests and procedures (e.g., creatine kinase, electromyography, muscle biopsy) are helpful in evaluation of a person with muscle disease.

p. List the causes, lesions, and major manifestations of each of the common muscle diseases: Duchenne Dystrophy, Myotonic Dystrophy, autoimmune muscular disease and muscular/bone neoplasms.

q. Compare the signs and symptoms of neurogenic muscle disorders with those of myopathic disorders.

r. Explain why it is important to separate dystrophic, inflammatory, and neurogenic causes of muscle weakness.

Resources


