ALL INFORMATION IN THIS SYLLABUS IS SUBJECT TO THE WRITTEN POLICIES AND PROCEDURES OF THE SCHOOL OF NURSING, STEPHEN F. AUSTIN STATE UNIVERSITY, NACOGDOCHES, TEXAS.

IN THE CASE OF COMMISSION, OMISSION, AMBIGUITY, VAGUENESS, OR CONFLICT, THE POLICIES AND PROCEDURES OF THE SCHOOL OF NURSING SHALL CONTROL.

EACH STUDENT SHALL BE RESPONSIBLE FOR ACTUAL AND/OR CONSTRUCTIVE KNOWLEDGE OF THE POLICIES AND PROCEDURES OF THE SCHOOL OF NURSING AND FOR COMPLIANCE THEREWITH.

EACH STUDENT IS RESPONSIBLE FOR ALL INFORMATION IN THIS SYLLABUS.

This syllabus is provided for informational purposes only.
Faculty Contact Information
Brightspace is the primary form of communication for this course; use the SFA email address only if Brightspace is unavailable.

Name: Anne Collier, MSN, RNC-OB
Department: Nursing
Email: anne.collier@sfasu.edu
Phone: 936-468-7708
Office: Room 113 (Annex-top of hill)
Office Hours: Please email for an appointment.
Monday 1:00-3:00 pm
Tuesday 1:00-3:00 pm
Wednesday 1:00-3:00 pm
Thursdays 1:00-3:00 pm
Additional times available upon request.

Class Meeting Time and Place
304.001 Mondays and Wednesdays 9:00 – 10:30
304.002 Mondays and Wednesdays 10:30 – 12:00
304.003 Tuesdays and Thursdays 9:00 – 10:30
304.003 Tuesdays and Thursdays 10:30 – 12:00
Room 111/113 All Sections - unless otherwise stated on course calendar.

Textbooks and Materials (Required)

Unabridged Course Description
This course establishes an initial foundation for the pathophysiological aspects of evidence-based nursing. This course will apply basic concepts from core courses, anatomy and physiology, chemistry and microbiology to pathophysiological alterations.

Number of Credit Hours
3 credit hours (3 hours didactic). This course typically meets twice a week in 1.5 hours segments for 15 weeks and has an additional final week. Students have significant weekly reading assignments and are required to take major exams and a comprehensive final examination. The didactic preparation and activities average a minimum of 9 hours a week outside of classroom hours.

Course Prerequisites and Co-requisites
Prerequisites: BIO 238 and 238
Co-requisites: BIO 308 or BIO 309

Program Learning Outcomes
The graduate will:
1. Apply knowledge of the physical, social, and behavioral sciences in the provision of nursing care based on theory and evidence based practice.
2. Deliver nursing care within established legal and ethical parameters in collaboration with clients and members of the interdisciplinary health care team.
3. Provide holistic nursing care to clients while respecting individual and cultural diversity.
4. Demonstrate effective leadership that fosters independent thinking, use of informatics, and collaborative communication in the management of nursing care.
5. Assure responsibility and accountability for quality improvement and delivery of safe and effective nursing care.
6. Serve as an advocate for clients and for the profession of nursing.
7. Value continuing competence, growth, and development in the profession of nursing.

General Education Core Curriculum Objectives/Outcomes
None

Student Learning Outcomes
The student will:
1. Relate previously acquired concepts and principles of the arts, sciences, and humanities as foundational content for an understanding of pathophysiological alterations.
2. Describe moral, ethical, economic, political and legal issues involved in pathophysiological alterations.
3. Explain how holistic, socio-economic, spiritual, and ethno-cultural characteristics of a client affect pathophysiological alterations.
4. Introduce critical thinking concepts related to the effects of pathophysiological alterations on the complete body system.
5. Define biological, chemical and medical terms used in nursing practice.

Course Requirements
Exam 1  17%
Exam 2  17%
Exam 3  17%
Exam 4  17%
Final Exam  17%
Total            100%

Grading Policy:
A = 90 - 100%
B = 80 - 89%
C = 70 - 79%
D = 60 - 69%
F = Below 60%
Policy 1.7 for all courses:
1. Rounding is confined to the final course grade.
2. Grades on individual exams, assignments, quizzes, and projects are recorded in the gradebook (Brightspace) in their original form without rounding.
3. Final course grades are rounded to the closest whole number using the 0.5 math rule and using one decimal point to the right of the whole number. If the final course grade is not a whole number, the following rounding rules apply:
   a. If the decimal attached to a whole number is 0.5 or greater, then round up to the next whole number (equal to or greater than 85.50 = 86).
   b. If the decimal attached to a whole number is less than 0.5, then round down to the previous whole number (equal to or less than 85.49 = 85).

Nursing students must have a minimum grade of “C” in this course to progress.

http://www.sfasu.edu/academics/colleges/sciences-math/nursing/student-resources/nursing-policies

Exams
Composed of 50 questions (multiple formats). All tests will be computerized and taken in room 115 of the DeWitt School of Nursing. If computerized testing is not feasible, a paper and pencil test may be substituted. Students will be able to review any incorrect questions and rationales at the conclusion of the test. Unexcused absences from exams will not be made up. Please call before exams to make arrangements for an excused absence or tardy. Students arriving late will not be allowed to begin the exam if any student has left the testing room. Students that begin the exam late will complete the exam with only the remaining time available. No time extensions will be given. Faculty reserve the right to substitute alternate exam format for make-up exams. Students are responsible for all lectures and reading assignments.

Testing Expectations
1. All belongings must be left at the front of the room. Please turn off cell phones before placing them in at the front of the room.
2. No hats, caps, hoodies, drinks/food, calculators, sunglasses, electronic devices (including smart watches), note cards/paper are allowed.
3. Students will be allowed to bring a pen/pencil and/or earplugs to their desk. A scratch piece of paper will be provided.
4. Faculty have the right to assign student seats at any time.
5. Students should not magnify the font on the computer screen. Students needing accommodations should have prior arrangements with disability services.
6. During the exam, faculty will only answer questions regarding technical issues. No content questions will be answered.
7. After leaving the exam, please be courteous of those still taking the exam. Noise in the hallway outside of the exam room should be minimal.

Classroom attendance
Students are adult learners. Therefore, it is up to the student to make the decision to attend class or not. However, we recommend that students attend class regularly. Students are responsible for all materials assigned and/or presented in each class, any
information presented by your classmates, and all announcements (verbal and
email/Brightspace). Active and informed participation in classroom discussion is
expected. Talking among students during lecture will not be tolerated, as it is disruptive
to other students trying to learn.

Brightspace
Students must have the required computer access and programs to support the on-line
course through SFASU Brightspace. To access Brightspace, visit http://d2l.sfasu.edu, and
log in using your mySFA username and password. Google Chrome or Mozilla Firefox are
the recommended web browsers. Internet Explorer is no longer supported.

To learn more about Brightspace, visit SFA ONLINE at http://www.sfaonline.info/ and
https://d2l.sfasu.edu/d2l/home. Students are responsible for the ability to use Brightspace.
For assistance with technical issues and Brightspace proficiency, contact student support
in the Center for Teaching and Learning (CTL) at d2l@sfasu.edu or call 936-468-1919.
For general computer support (not related to Brightspace), contact Information
Technology Services at 936-468-HELP (4357) or at helpdesk@sfasu.edu.

Academic Integrity (A-9.1)
Academic integrity is a responsibility of all university faculty and students. Faculty
members promote academic integrity in multiple ways including instruction on the
components of academic honesty, as well as abiding by university policy of penalties for
cheating and plagiarism.

Definition of Academic Dishonesty
Academic dishonesty includes both cheating and plagiarism. Cheating includes but is not
limited to (1) using or attempting to use unauthorized materials to aid in achieving a
better grade on a component of a class; (2) the falsification or invention of any
information, including citations, on an assigned exercise; and/or (3) helping or attempting
to held another is an act of cheating or plagiarism. Plagiarism is presenting the words or
ideas of another person as if they were your own. Examples of plagiarism are (1)
submitting an assignment as if it were one’s own work when, in fact, it is at least partly
the work of another; (2) submitting a work that has been purchased or otherwise obtained
from a internet source or another source; and (3) incorporating the words or ideas of an
author into one’s paper without giving the author due credit. Please read the complete

Withheld Grades Course Grades Policy (5.5)
At the discretion of the instructor of record and with the approval of the academic unit
head, a grade of WH will be assigned only if the student cannot complete the course work
because of unavoidable circumstances. Students must complete the work within one
calendar year from the end of the semester in which they receive a WH, or the grade
automatically becomes an F, except as allowed through policy [i.e., Active Military
Service (6.14)]. If students register for the same course in future semesters, the WH will
automatically become an F and will be counted as a repeated course for the purpose of
computing the grade point average.
The circumstances precipitating the request must have occurred after the last day in which a student could withdraw from a course. Students requesting a WH must be passing the course with a minimum projected grade of C.

**Students with Disabilities**
To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004/468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aides to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to [http://www.sfasu.edu/disabilityservices/](http://www.sfasu.edu/disabilityservices/).

**Acceptable Student Behavior**
Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy D – 34.1). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom. Students who do not attend class regularly or who perform poorly on class projects/exams may be referred to the Early Alert Program. This program provides students with recommendations for resources or other assistance that is available to help SFA students succeed.

**Technology Requirements**
All students are required to have access to a laptop or desktop computer for academic and testing purposes. You may view the complete list of technical requirements below for Windows and Mac computers. We do not currently support mobile devices for Examsoft or HESI exams (iPads, Androids, etc). We do not support any computer systems other than Windows or Mac (no Chromebooks, Linux devices, etc). For questions regarding laptop hardware or software, please contact The SFA Help Desk at [https://help.sfasu.edu/TDClient/2027/Portal/Home/](https://help.sfasu.edu/TDClient/2027/Portal/Home/) or 936-468-HELP.

At all times, the computer should be capable of running the software below or contain the necessary hardware listed. It is the responsibility of the student to ensure that his/her computer has the required software installed upon admission, and it is updated throughout his/her time as a student.

Upon admission, students will attend an orientation session. The orientation for each course provides instructions on how to access each of the software programs used in the DeWitt School of Nursing program.

**Technology Requirements Mac Laptops/Desktops**
- Operating System – OS 10.14 Mojave (or newer)
• Hard Drive – 250 GB hard drive or solid state drive
• RAM – 8 GB
• Battery Life – Minimum of 6 hours required (8 hours recommended).
• High Speed Internet Connection – We require a minimum connection speed of 20 Mbps.
• Safari Browser (free)
• Mozilla Firefox Browser (free)
• Chrome Browser (free)
• Microsoft Office 365 – Is provided to you through your My SFA account. Your Microsoft Office 365 can be installed on up to 5 additional devices.
• SFASU Duo Authentication – You will be required to verify your identity using dual authentication on a mobile device.
• SFASU Jacks Email – You will be required to read your SFASU Jacks email. It is recommended that you access your account daily and connect to a mobile device so you never miss any critical announcements.
• Examsoft Examplify – Software will be provided upon admission. All testing is completed using this software platform.
• Adobe Reader (free)
• Adobe Flash Player (free)
• Anti-Virus Solution – We support Sophos for MAC (free version). There is also a paid version, but this is not required or necessary. We only support Sophos at exams. If you choose to use another anti-virus solution and encounter problems, you will have to contact the vendor or general helpdesk for support.
• Scanning Capabilities – You may use a mobile app (such as Turbo Scan) or visit a store which provides scanning services (such as Fed Ex Office).
• Webcam
• Computer Microphone
• Computer Headset and/or Ear Buds

Technology Requirements Windows Laptops/Desktops
• Operating System – Windows 10. We do not support 7 or 8.
• Processor - Intel Core 2 Duo, i3, i5 or i7 processor
• Hard Drive – 250 GB hard drive or solid state drive
• RAM – 8 GB
• Battery Life – Minimum of 6 hours required (8 hours recommended).
• High Speed Internet Connection – We require a minimum connection speed of 20 Mbps.
• Internet Explorer Browser (free)
• Mozilla Firefox Browser (free)
• Chrome Browser (free)
• Edge Browser (for Windows 10 users only) free
• Microsoft Office 365 – Is provided to you through your My SFA account. Your Microsoft Office 365 can be installed on up to 5 additional devices.
• SFASU Duo Authentication – You will be required to verify your identity using dual authentication on a mobile device.
- SFASU Jacks Email – You will be required to read your SFASU Jacks email. It is recommended that you access your account daily and connect to a mobile device so you never miss any critical announcements.
- Examsoft Examplify – Software will be provided upon admission. All testing is completed using this software platform.
- Adobe Reader (free)
- Adobe Flash Player (free)
- Anti-Virus Solution – We only support Windows Defender (Windows 10). Before testing, disable any other anti-virus programs that you may have other than Windows Defender. We do not provide support for any antivirus solution with exams other than Windows Defender. If you choose to use another anti-virus solution and encounter problems, you will have to contact the vendor or general helpdesk for support.
- Scanning Capabilities – You may use a mobile app (such as Turbo Scan) or visit a store, which provides scanning services (such as Fed Ex Office).
- Webcam
- Computer Microphone
- Computer Headset and/or Ear Buds

**Electronic Devices**
Computers, notebooks, or electronic tablets may be used, preferably in the back rows of the classroom. Cell phones may be used for class activities only. Disruptive use of cell phones will not be tolerated.

**Covid-19 Mask Policy**
Masks (cloth face coverings) must be worn over the nose and mouth at all times in this class and appropriate physical distancing must be observed. Students not wearing a mask and/or not observing appropriate physical distancing will be asked to leave the class. All incidents of not wearing a mask and/or not observing appropriate physical distancing will be reported to the Office of Student Rights and Responsibilities. Students who are reported for multiple infractions of not wearing a mask and/or not observing appropriate physical distancing may be subject to disciplinary actions.


**Unit Objectives**

**UNIT I**

Cellular Biology; Altered Cellular and Tissue Biology, Fluids and Electrolytes, Acids and Bases; Innate Immunity: Inflammation and Wound Healing; Adaptive Immunity; Alterations in Immunity

Cellular Biology
1. Discuss the functions of cell membrane receptors and principal types of ligands.
2. Describe methods and processes of cellular communication and types of signaling.
3. Describe the process of energy generation and utilization by the cell to support cellular function.
4. Describe the role of ATP in the cell.
5. Describe the processes of passive transport, diffusion, hydrostatic pressure, and osmosis.
6. Name the four basic tissue types.

Altered Cellular and Tissue Biology
1. Describe the cellular adaptations made in each of the following processes: atrophy, hypertrophy, hyperplasia, dysplasia, and metaplasia.
2. Discuss causative factors of each of the above cellular adaptations.
3. Identify the most common cause of cellular injury.
4. Describe the mechanism of cellular injury that can occur because of the following causes: hypoxia, free radicals, and reactive oxygen species.

Fluids and Electrolytes, Acids and Bases
1. Discuss the two functional fluid compartments of the body.
2. Discuss the ways water moves between plasma and interstitial fluid.
3. Explain Starling forces.
4. Describe the causation, pathophysiologic process, and clinical manifestations of edema.
5. Discuss the regulatory processes for sodium and water balance in the body, including the role of antidiuretic hormone, renin-angiotensin-aldosterone, and atrial natriuretic hormone.
6. Define hypotonic, isotonic, and hypertonic alterations in water balance and give an example of each.
7. Identify the basic causes and clinical manifestations of hypernatremia, hyponatremia, hyperchloremia, and hypochloremia.
8. Discuss the causes and clinical manifestations of water deficit.
9. Discuss the causes and clinical manifestations of water excess.
10. Discuss the clinical manifestations and treatments for the syndrome of inappropriate secretion of ADH (SIADH).
11. Discuss the distribution, function, and regulation of potassium in the body.
12. Identify the basic causes and clinical manifestations of hyperkalemia and hypokalemia.
13. Discuss the role of hydrogen ion concentration in cellular function and dysfunction.
14. Describe how the plasma buffering systems help prevent significant fluctuations in pH.
15. Explain how the lungs and the kidneys regulate acid-base balance.
16. Differentiate between respiratory and metabolic acid-base disorders by causes and mechanisms of compensation.

Innate Immunity: Inflammation and Wound Healing
1. Identify innate immunity versus adaptive immunity.
2. Describe the composition, function, and purpose of physical, mechanical, and biochemical barriers.
3. Discuss the importance of normal flora in relation to opportunistic infections.
4. Describe the process of inflammation.
5. Describe the steps of the acute inflammatory response.
6. Identify the three plasma protein systems that mediate the inflammation response.
7. Discuss what the term cascade means.
8. Diagram the complement, clotting, and kinin systems, noting where they converge.
9. Describe two control mechanisms for the protein systems, and explain how they provide a check and balance system for inflammation.
10. Discuss each of the cell types (granulocytes, platelets, lymphocytes, natural killer cells, and monocytes) involved in the inflammatory response, and explain their individual roles and relative importance to the process.
11. Discuss how phagocytosis can actually promote the inflammatory process.
12. Compare and contrast the roles of cellular products, particularly cytokines, in the inflammatory process.
13. Describe the process and sequence of phagocytosis.
14. Differentiate between local and systemic responses to acute inflammation based on clinical manifestations.
15. Identify the histologic characteristics of chronic inflammation, focusing on the differences between resolution and repair.
16. Describe tissue healing by primary and secondary intention.
17. Describe the different types of dysfunctional wound healing that can occur during the reconstructive phase.

Adaptive Immunity
1. Distinguish between natural and acquired immunity.
2. Define and describe humoral and cell-mediated immunity.
3. Describe the differences between active and passive immunity.
4. Define antigen and differentiate between the various types of antigens.
5. Identify the classes of immunoglobulins.
6. Describe what direct and indirect effects of an antibody mean.
7. Define and describe the differences between secretory and systemic immune systems.
8. Define and describe clonal diversity and clonal selection.
9. Differentiate between a primary and secondary immune response.
10. Discuss the alterations in immunity for infants and the elderly.

Alterations in Immunity
1. Discuss the immune response involved in the development of types I, II, III and IV hypersensitivity reactions.
2. Describe the pathophysiology and clinical manifestations of anaphylaxis.
3. Discuss the mechanisms of autoimmune disorders.
4. Identify the differences between primary and secondary immunodeficiency disorders.

UNIT II
Alterations in Hormonal Regulation: Alterations of Renal and Urinary Tract Function

Alterations in Hormonal Regulation
1. Identify three ways target cells fail to respond to hormones, creating hormonal dysfunction.
2. Compare the syndrome of inappropriate antidiuretic hormone secretion (SIADH) and diabetes insipidus concerning causative factors, pathophysiology, manifestations, treatment, and prognosis.
3. Discuss the causes of hyper- and hypopituitarism while considering the populations at highest risk for developing these disorders.
4. Discuss the manifestations and consequences of pituitary adenomas and prolactinomas.
5. Explain the progression of hyperthyroidism through Graves disease and thyroid storm in relation to cellular changes, manifestations, treatments, and complications.
6. Discuss the causes, treatment options, and outcomes for disorders that produce hypothyroidism.
7. Differentiate between primary and secondary hyperparathyroidism.
8. Discuss the similarities and differences in the onset, etiology, and pathophysiology of type 1 and type 2 diabetes mellitus.
9. Describe the acute complications of diabetes mellitus with a focus on differential detection and treatment.
10. List the chronic complications of diabetes mellitus and discuss how good control of blood glucose limits the cellular degeneration in each instance.
11. Describe the function, uses, and mechanisms of the polyol pathway.
12. Compare hypercortical function (Cushing disease and syndrome) and hypocortical function (Addison disease), including causative factors, pathophysiology, manifestations, treatment, and prognosis.
15. Describe tumors of the adrenal medulla.

Alterations of Renal and Urinary Tract Function
1. Discuss the causes and effects of obstruction in various locations within the urinary tract.
2. Describe the pathophysiology of kidney stone formation.
3. Compare and contrast the types of stones.
4. Describe what is meant by neurogenic bladder and overactive bladder syndrome.
5. List the anatomic causes of resistance to urine flow and the signs of urinary obstruction.
6. Describe the two most common tumors of the renal and urologic systems: renal carcinoma and bladder tumors.

7. Discuss the etiology, infectious agents, manifestations, treatments, and complications of urinary tract infections.

8. Describe acute and chronic pyelonephritis; include the pathophysiology, clinical manifestations, evaluation, and treatments of each.

9. Identify the causes of glomerulonephritis and the resulting changes in glomerular structure and function.

10. Compare and contrast acute, rapidly progressive, and chronic glomerulonephritis.

11. Describe the progression of nephrotic syndrome from causation through complications.

12. Differentiate between prerenal, intrarenal, and postrenal causes of acute renal failure.

13. Describe the pathophysiology of acute tubular necrosis (ATN).

14. Discuss the clinical manifestations, treatment options, outcomes, and complications of acute renal failure.

15. Discuss the clinical manifestations of chronic renal failure and explain what is meant by the term uremia.

UNIT III
Alterations of Hematologic Function, Structure and Function of the Cardiovascular and Lymphatic Systems; Alterations of Cardiovascular Function; Alterations of Pulmonary Function

Alterations of Hematologic Function
1. Define anemia.
2. List the various methods of classifying the anemias.
3. Describe the manifestations of anemia and discuss the pathophysiology that generates them.
4. Compare and contrast the pathophysiology underlying iron deficiency, pernicious, and folate deficiency anemias.
5. Describe the normocytic-normochromic anemias.
6. Describe the different types of alterations in leukocyte function.
7. Classify leukemia as it relates to the maturity of the cells and appearance of the total leukocyte count and differential.
8. Identify the causes of thrombocytopenia.
9. List the various causes of impaired hemostasis.
10. Discuss the pathophysiology and manifestations of disseminated intravascular coagulation.
11. Discuss the conditions that predispose an individual to the development of thrombi.

Structure and Function of the Cardiovascular and Lymphatic Systems
1. Diagram the circulatory system, describing the functions of the heart and the pulmonary and systemic circulatory systems.
2. Describe the cardiac cycle.
3. Diagram the structures of the heart and location of the great vessels.
4. Describe the function and location of the components of the cardiac conduction system.
5. Identify the components of an electrocardiogram.
6. Discuss how factors influencing cardiac output reflect cardiac performance; include ejection fraction, preload, afterload, stroke volume, heart rate, and the neurological and hormonal regulation of the heart rate.
7. Use the Frank-Starling law to demonstrate the interrelationship between preload, afterload, and contractility.
8. Compare and contrast the structure and function of arteries, veins, and capillaries.
9. Describe the critical role of the endothelium for vascular function.
10. Discuss factors influencing the systemic blood pressure and blood flow.
11. Identify the factors that regulate blood pressure.
12. Discuss the function of the renin-angiotensin-aldosterone system in regulating blood pressure.

Alterations of Cardiovascular Function
1. Describe the alterations in vascular flow (including thrombus formation, emboli, traumatic injury, atherosclerotic plaques, vasospastic disease, and varicosities) that result in outcomes such as deep venous thrombosis (DVT), stasis ulcers, chronic insufficiencies, and superior vena cava syndrome.
2. Discuss the differences between primary, secondary, complicated, and isolated systolic hypertension.
3. Discuss the importance of malignant hypertension.
4. Describe the clinical symptoms and underlying pathophysiology of postural and idiopathic hypotension.
5. Describe the differences between true and false aneurysms.
6. Describe the differences between a thrombus and an embolus.
7. Describe the symptoms and pathophysiology of Buerger and Raynaud disease.
8. Identify the risk factors for atherosclerosis and the progression to myocardial infarction.
9. Identify the characteristics of peripheral arterial disease.
10. Discuss the progression of coronary artery disease from ischemia to infarction, including clinical symptoms, diagnostic evaluation of myocardial infarction, and critical timing for intervention.
11. Compare and contrast the acute coronary syndromes.
12. Describe the pathophysiology, symptoms, and evaluation for the pericardial disorders.
13. Compare and contrast dilated, hypertrophic, and restrictive cardiomyopathy in terms of etiology, pathophysiology, and clinical manifestations.
14. Identify the different types of valvular dysfunction and describe the alterations in blood flow through the heart seen in each disorder; include the clinical manifestations of each disorder.
15. Describe how acute rheumatic fever is contracted and how it leads to rheumatic heart disease and valvular injury.
16. Discuss the pathophysiology and manifestations of infective endocarditis.
17. Compare left and right heart failure, including causation, manifestations, treatment, and complications.

Structure and Function of the Pulmonary System
   1. Trace a molecule of air inhaled from the environment as it travels through the pulmonary system; list the conducting airways, their location, and their function.
   2. Identify the structures involved in gas exchange.
   3. Discuss the importance of surfactant.
   4. Describe the structures that surround the pulmonary system.
   5. Identify the factors essential to successful ventilation, perfusion, and diffusion.
   6. Discuss mechanical receptors and chemoreceptors, noting the location, function, and importance of each in respiration.
   7. Discuss the properties of compliance and elastic recoil as they relate to the normal function of the lung in ventilation.
   8. Describe the mechanics of breathing.
   9. Describe the partial pressure of oxygen and its measurement.
  10. Discuss how ventilation and perfusion are interrelated.
  11. Discuss the importance of the oxyhemoglobin dissociation curve for evaluating effective gas exchange.
  12. Describe the mechanisms of carbon dioxide transport from the body tissues to the lungs and factors affecting carbon dioxide diffusion across the alveolar membrane.
  13. Discuss the major causes of pulmonary vasoconstriction.

Alterations of Pulmonary Function
   1. Identify the clinical indicators of pulmonary disease.
   2. Define hyperventilation and hypoventilation.
   3. Discuss alterations in arterial blood gas values that indicate pulmonary disease.
   4. Differentiate among ischemia, hypoxia, and hypoxemia.
   5. Define acute respiratory failure and identify risk factors.
   6. Discuss the clinical manifestations and underlying mechanisms of atelectasis.
   7. Describe how inhaling toxic or allergenic substances causes respiratory dysfunction.
   8. Describe the pathophysiology associated with pulmonary edema.
   9. Describe similarities, clinical manifestations, underlying mechanisms, and consequences of obstructive pulmonary diseases.
  10. Discuss the role of inflammation in asthma.
  11. Compare and contrast the clinical symptoms and underlying mechanisms of bacterial pneumonia, viral pneumonia, and tuberculosis.
  12. Describe the cellular changes, clinical manifestations, treatments, outcomes, and complications of pulmonary embolus.
  13. Discuss the risk factors and pathologic changes associated with pulmonary hypertension.

UNIT IV
Alterations in Cognitive Systems, Cerebral Hemodynamics, and Motor Function; Disorders of the Central and Peripheral Nervous Systems and Neuromuscular Junction; Alterations of Digestive Function

Alterations in Cognitive Systems, Cerebral Hemodynamics, and Motor Function
1. Differentiate among the different types of seizures.
2. Describe the causes and manifestations of dementia.
3. Describe the pathophysiology of Alzheimer disease.
4. Define cerebral perfusion pressure.
5. List the causes of increased intracranial pressure (ICP) and the associated clinical manifestations.
6. Describe the normal process of autoregulation in the cerebral blood vessels and explain how autoregulation fails when ICP rises dramatically.
7. Describe the mechanisms and manifestations of the herniation syndromes.
8. List the causes of cerebral edema and give examples of the pathophysiology producing each cause.
9. Describe the causes and manifestations of hydrocephalus.
10. Describe the causes and manifestations of Parkinson disease.

Disorders of the Central and Peripheral Nervous Systems and Neuromuscular Junction
1. Identify the causes of low back pain.
2. Describe the disorders produced by interruption to cerebral vascular flow with reference to location, manifestations, and rehabilitation potential.
3. Describe the differences between types of headaches.
4. Describe infectious processes that occur in the central nervous system.
5. Explain the pathophysiology of a brain abscess.
6. Explain how an HIV infection can affect the nervous system.
7. Explain the pathophysiology of the degenerative disorders of the spine.
8. Explain the pathophysiology and clinical manifestations of multiple sclerosis.
9. Explain the pathophysiology of amyotrophic lateral sclerosis.
10. Describe the pathophysiology and clinical manifestations of myasthenia gravis.

Alterations of Digestive Function
1. Describe the pathophysiologic alterations that lead to diarrhea, constipation, and abdominal pain.
2. Differentiate between parietal pain, visceral pain, and referred pain.
3. Discuss the signs and symptoms and physiologic response to acute gastrointestinal bleeding.
4. List and briefly explain the various disorders of motility of the gastrointestinal tract.
5. Identify the consequences of obstruction at various sites in the gastrointestinal tract.
6. Describe the causes, manifestations, treatments, outcomes, and complications of gastritis.
7. Compare the three main types of peptic ulcers: duodenal, gastric, and stress.
8. Discuss the postgastrectomy syndromes as they relate to long-term complications of partial or complete gastrectomy.
9. Discuss the clinical effects of pancreatic insufficiency, lactase deficiency, and bile salt deficiency.
10. Compare and contrast ulcerative colitis and Crohn disease.
11. Discuss the pathophysiology, clinical manifestations, and treatment of diverticulitis, appendicitis, irritable bowel syndrome, and vascular insufficiency.
12. Discuss the pathophysiology, clinical manifestations, and treatment of obesity.
14. Discuss the five major complications of liver dysfunction: portal hypertension, ascites, hepatic encephalopathy, jaundice, and hepatorenal syndrome.
15. Discuss the pathophysiology of viral hepatitis and fulminant hepatitis.
16. Discuss the causation, treatment options, and prognosis for alcoholic and biliary cirrhosis.
17. Discuss the pathophysiology of cholelithiasis and cholecystitis.
18. Compare and contrast acute and chronic pancreatitis.
19. Discuss the risk factors, incidence, manifestations, treatment, morbidity, and mortality of the various cancers of the digestive system.
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