



## Pathophysiology

Pathophysiology involves the study of functional or physiologic changes in the body that result from disease processes. This subject builds on knowledge of the normal structure and function of the human body. Disease development and the associated changes to normal anatomy and/or physiology may be obvious or may be hidden with its quiet beginning at the cellular level. As such, pathophysiology includes some aspects of pathology, the laboratory study of cell and tissue changes associated with disease.

This course provides an introduction to pathophysiology for students in a variety of academic programs for the health professions. The student will learn the fundamental concepts and processes in pathophysiology, specific disorders/diseases of the various body systems, and the physiological changes related to aging, stress and other factors affecting the body, as well as Pharmacology and Medical Imaging.

We trust that students will enjoy studying these topics and proceed with enthusiasm to more detailed studies within their individual specialties. Using this module, the student will develop a knowledge base from which to seek additional information.

It is assumed that students have studied anatomy and physiology prior to commencing a pathophysiology course.

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## Course Overview

### Course Goals

Our goals and principles for *Pathophysiology* are the following:

- To present current information and concepts simply but accurately.
- To present the student with a building block approach: basic science and how it relates to human biology, the body's various mechanisms that respond to the disorders/diseases, the general overview of body systems and their specific disorders, other biological factors outside of the physiology of each system that contribute to instances of disorders/disease and, finally, those environmental factors not directly attributed to a biological function or condition that may contribute to pathophysiology throughout a number of body systems.
- To provide the practitioner in a health profession with the prerequisite knowledge to recognize and understand a client's problems and the limitations and implications of certain treatment measures; to reduce exacerbating factors; to participate in preventive programs; and to be an effective member of a health care team.

## Syllabus

<b>Course Format</b>	This is a self-paced online course. You can study the course content, take the course quizzes, complete the assignments, and interact with the other participants in the course via discussion forum(s) on your own schedule.
<b>Learning Resources</b>	<ul style="list-style-type: none"> <li>• You will be contacted within one business day of enrolment to confirm your shipping address for the textbook for this program, which will arrive within 10 business days of your confirmation.</li> <li>• LearnItOnlineNow.com [LION] provides its supplemental pathophysiology learning materials via online lessons, PDFs, and other interactive and passive content. You will be connected to the learning platform immediately upon confirmation of your course purchase.</li> </ul>
<b>Assignments</b>	<ul style="list-style-type: none"> <li>• Quizzes</li> <li>• Practice Assignments</li> <li>• Discussion Forums</li> <li>• Midterm Quiz</li> <li>• Final Exam assigned to complete the course</li> <li>• Forum participation optional</li> </ul>
<b>Grading</b>	<p>Successful completion of this course is contingent upon the following factors:</p> <ul style="list-style-type: none"> <li>• Study all content sections</li> <li>• Complete and pass all activities with a grade of 60%</li> </ul> <p>A course certificate is issued on successful completion.</p>
<b>Completion Timeframe</b>	<p>You have unlimited access to LearnItOnlineNow.com to complete your course materials. Take all the time you need to review the materials, practice the objectives, and complete the assignments. Your access will never expire!</p> <p><b>Recommended hours of study: 198</b></p>
<b>Instruction Method</b>	<ul style="list-style-type: none"> <li>• Self-paced, independent study.</li> <li>• Instructor-created curriculum guides you through the material.</li> <li>• No facilitator contact is provided for this course.</li> </ul>

## Learning Objectives

By the end of this course, you will be able to:

- Define the study of pathophysiology including its relationship to the Health Information Management profession
- Explain the importance of an individual's medical history in determining disease
- Describe common cellular changes and common causes of cell damage
- Describe common types of cell necrosis
- Describe the type of normal defenses in the body and the role it plays in preventing diseases
- Recognize the signs of inflammation and how it affects the body
- Explain the effects of chronic inflammation
- Discuss the modes of treatment of inflammation
- Understand the body's reaction during the course of a fever
- Describe the types of healing and the factors affecting the healing process
- Identify the type of natural defense for the immune response
- Describe the normal immune response
- List the components of the immune system and the main purpose of each
- Describe some of the uses for performing diagnostic tests in immunology
- Describe the basic structure and characteristics of bacteria and viruses
- Discuss the similarities and differences between active viral infection and latent viral infection
- Name other types of infectious agents
- Describe the purpose of a normal flora and identify the various locations in the body where they can be found
- Name the sources and give examples of hazardous materials in the environment that affect the body
- Identify common toxic chemicals and discuss how they can enter the body
- Discuss the toxic effects of lead on the body
- Discuss the effects of hyper and hypothermia on the body
- Identify the three ways that insects/bugs can cause a disease
- Discuss possible causes and effects of contaminated food and/or water on the the body
- Describe common types of skin lesions
- Describe the different diagnostic tests to identify lesion types
- Discuss the common inflammatory disorders of the skin, its causes, the symptoms and treatment measures
- Discuss the common types of bacterial, viral and fungal infections of the skin, its causes, the symptoms and treatment measures
- Compare skin cancers, describing the lesions, causes, and treatment measures
- Discuss the common types of nail, hair follicle, and sweat gland disorders, its causes, the symptoms and treatment measures
- Identify diagnostic tests commonly performed for bone, muscular and joint disorders
- Describe the types of bone fractures, the healing process and potential complications
- Compare dislocation, sprains and strains
- Describe the pathophysiology of osteoporosis, identifying the predisposing factors and possible complications
- Describe the common bone tumors
- Describe the characteristics of muscular dystrophy
- Describe the effects of fibromyalgia
- List and describe the characteristics of the different types of arthritis
- Compare osteoarthritis and rheumatoid arthritis, identifying their similarities and differences
- Describe the common manifestations of nausea, vomiting, diarrhea, and constipation
- List the basic diagnostic tests used to diagnose disorders of the digestive system



- List some common therapies used to treat digestive system disorders
- Differentiate between a cleft lip and cleft palate
- Describe common oral infections
- Explain the common causes of dysphagia
- Differentiate the types of hiatal hernias and explain their effects
- List the causes of gastritis and describe the common signs and symptoms
- Describe the causes, signs, and complications of peptic ulcer
- Describe the pathophysiology, causes, and signs of gastric cancer
- Compare Crohn's disease and ulcerative colitis
- Explain how diverticulosis and diverticulitis develop
- Describe the causes and characteristics of colorectal carcinoma
- Describe the common causes, signs, and effects of intestinal obstruction
- Describe the pathophysiology of peritonitis and the possible complications
- Describe the pathophysiology and signs and symptoms of gallbladder disorders
- Discuss the types of jaundice
- Describe manifestations and types of hepatitis
- Describe the pathophysiology and signs and symptoms of cirrhosis
- Describe the pathophysiology and signs and symptoms of acute pancreatitis
- Describe the types of cardiac dysrhythmias and list the common causes of cardiac arrest
- Discuss the causes and effects of congestive heart failure (left side and right side failure)
- Describe the types of congenital heart defects and the common effects of each abnormality
- Discuss rheumatic fever and how it can lead to the development of rheumatic heart disease
- Describe the pathophysiology of infectious endocarditis, pericarditis, and myocarditis
- The student is expected to:
  - Describe the common diagnostic tests for cardiovascular function
  - Describe the general treatment measures for cardiac disorders (nutritional, lifestyle, and drugs)
  - Explain the role of cholesterol and lipoproteins in the development of atheroma
  - Identify the factors leading to atherosclerosis
  - Describe and compare angina and myocardial infarction
  - Describe common vascular disorders associated with complications during Diabetes and Pregnancy
  - Describe common vascular disorders associated with the following systems: Digestive, Respiratory, Urinary, Neurologic, and Eyes
  - Explain the effects of essential hypertension
  - Describe the signs and symptoms, tests and treatment of peripheral vascular disease and atherosclerosis
  - Discuss aortic aneurysm and differentiate between the different types
  - Discuss the factors causing varicose veins, the signs and symptoms, and the areas where it may develop
  - Describe the common treatment and preventive measures often seen with venous disorders
  - Describe the pathophysiology, etiology, signs and symptoms and treatment for hypotension and shock
  - Describe the pathophysiology and complications of cystic fibrosis and lung cancer
  - Describe the outcome of aspiration
  - Compare the types of asthma and describe the pathophysiology and manifestations of an acute attack
  - Compare emphysema and chronic bronchitis
  - Describe the cause and effects of pulmonary edema and embolus
  - Explain the effects of pleural effusion
  - Compare the types of pneumothorax and describe mediastinal flutter



- Describe the pathophysiology of infant and adult respiratory distress syndrome
- Describe acute respiratory failure and the resulting changes in blood gases
- List and describe common upper respiratory tract infections
- Discuss influenza, including the causes, signs and symptoms, treatments, and preventions
- List and describe common lower respiratory tract infections
- Describe and compare the different types of pneumonia
- Describe SARS and compare its similarities and differences with the flu
- Discuss the development of tuberculosis and the difference between primary and secondary tuberculosis
- Discuss the types and causes of incontinence and retention
- List the basic diagnostic tests, drugs, and dialysis for urinary system disorders
- Discuss the causes, signs and symptoms, and treatments of:
  - Urinary tract infections (including cystitis and pyelonephritis)
  - Inflammatory disorders (glomerulonephritis and nephrotic syndrome)
- Explain common signs and symptoms of urinary obstruction
- List the common causes of urinary calculi
- Explain how hydronephrosis develops and its effect on the kidneys
- Describe the causes and signs and symptoms of renal cell carcinoma and bladder cancer
- Explain how nephrosclerosis affects the kidneys and blood pressure
- List some examples of congenital renal disorders and identify their manifestations
- Compare the common causes, pathophysiology, signs and symptoms of acute and chronic renal failure
- Describe the common congenital female reproductive structural abnormalities
- Describe the common menstrual disorders
- Describe endometriosis and its complications
- Explain how pelvic inflammatory disease develops and its effects
- Describe the lesions of fibrocystic disease and breast cancer
- Compare the common benign and malignant tumors in the cervix, uterus, and ovaries
- Describe the causes of infertility in males and females
- Describe the common sexually transmitted diseases caused by bacteria, viruses, and protozoans
- Describe the common structural defects impairing vision
- Describe common infections in the eye and their effects of vision
- Explain how intraocular pressure may become elevated and affect vision
- Describe how the retina may become detached
- Explain the four methods of acquiring immunity
- Describe the clinical effects of the different types of hypersensitivity reactions
- Describe anaphylaxis including the signs and symptoms and emergency treatment methods
- Discuss autoimmune disorders
- Explain the causes and effects of immunodeficiency
- Describe the immune response and the stages of development of AIDS
- Explain the movement of water between body components that results in edema
- Describe the cause and effect of dehydration
- Discuss the causes and signs of hyponatremia and hypernatremia
- Describe the causes and signs of hypocalcemia and hypercalcemia
- Describe the causes and signs of hypokalemia and hyperkalemia
- Explain how metabolic acidosis and alkalosis, and respiratory acidosis and alkalosis develop and their effect on the body
- Explain how hormone levels are controlled under normal and abnormal conditions
- Describe Type 1 and 2 Diabetes



- Describe the early signs, common degenerative effects, and diagnostic tests and treatment of diabetes
- Explain the relationship between the parathyroid hormone and calcium
- Discuss the effect of a pituitary tumor
- Describe the causes of goiter
- Explain the effects of excess and deficient thyroid hormones
- Compare the effects of Cushing's and Addison's diseases
- Distinguish between benign and malignant tumors and its characteristics
- List the warning signs of cancer
- Explain the local and systemic effects of cancer
- Describe common diagnostic tests for cancer
- Discuss the spread of malignant tumors by invasion, metastasis, and seeding
- Describe how the spread of malignant tumors is related to the staging of cancer
- Discuss carcinogenesis and the stages of cancer development
- Discuss possible treatment measures, including radiation and chemotherapy, as well as nutrition
- Discuss the 3 examples of malignant tumors - skin cancer, ovarian cancer, and brain cancer
  - Describe the pathophysiology, manifestations, diagnostic tests and treatments for hemophilia and disseminated intravascular coagulation
- Compare acute and chronic leukemia – pathophysiology and signs
- Describe the general tests and treatments for leukemia
- Describe the pathophysiology, signs and treatments of Hodgkin's and non-Hodgkin's lymphoma and multiple myeloma
- Discuss the major functions and components of blood, blood grouping, and general understanding of the blood clotting pathway
- Identify major blood diagnostic tests and therapies
- Describe the pathophysiology, manifestations, diagnostic tests and treatments for different types of anemias and polycythemias
- Describe the possible effects of increased intracranial pressure on level of consciousness, motor and sensory functions, vital signs, vision and language
- Explain the effects of herniation
- Compare the effects of brain tumors in different areas of the brain
- Compare transient ischemic attacks to cerebrovascular accidents
- Differentiate the causes of strokes, and describe the immediate and long-term effects
- Explain how cerebral aneurysms develop and their complications
- Compare types of head injuries, and describe the factors contributing to brain damage
- Describe the effect of a hematoma on the brain
- Explain how seizures may be related to infection or injury
- Describe how spinal cord injuries may occur
- Describe the possible complications of spinal cord injury
- Describe the pathophysiology, signs and symptoms, and treatment of hydrocephalus and cerebral palsy
- Describe the signs of increasing intracranial pressure in the neonate
- Describe the types of spinal bifida and their effects on children
- Differentiate the types of seizures, how they develop and possible precipitating factors
- Describe the pathophysiology of chronic degenerative disorders including MS, Parkinson's disease, ALS, and Huntington's disease
- Describe the changes in the brain as Alzheimer's disease develops
- Describe the etiology and pathophysiology of herniated intervertebral discs



- Compare disorders of schizophrenia, depression and panic disorders with regards to pathophysiology and effects on behaviour
- Identify the classification of burns and effects of burn injury
- Describe fractures, dislocations, sprains, and strains
- Compare the types of head injuries, and the effect of hematoma and trauma on the brain
- Describe how spinal cord injuries may occur including the stages in post-traumatic period
- Describe pneumothorax as caused by an injury to chest and flail chest
- Discuss eye traumas and ways to prevent them
- Discuss how frostbites can occur, its signs, and treatment measures
- Describe the effect of heavy metal, food, and carbon monoxide poisoning on the body
- Understand the stages of fetal development and the basic effects on the mother
- Describe the impact of maternal hormonal changes on the body systems
- Discuss the potential problems of hypertension, gestational diabetes, placental problems, blood clotting problems, Rh incompatibility
- Describe the roles of specified members of health care team both traditional and alternative
- Describe the basic concepts of the common types of alternative therapies

## About the eBook

The textbook is organized into five major sections followed by the appendices:

<b>Section I</b>	<b>Basic Concepts of Disease Processes</b>	Introduction to pathophysiology includes medical terminology and basic cellular changes. Topics such as fluid, electrolyte, and acid-base imbalances, basic pharmacology and pain are covered. The core information for each topic is complemented by the inclusion of a specific disease/condition as an immediate clinical application at the end of each chapter.
<b>Section II</b>	<b>Defense/Protective Mechanisms</b>	Topics such as inflammation and healing, infection, and immunity are covered. Specific areas included are a review of body defenses, healing involved in specific trauma such as burns, basic microbiology, review of the immune system components, and mechanisms.
<b>Section III</b>	<b>Pathophysiology of Body Systems</b>	Selection of specific disorders is based on incidence and occurrence, as well as on the need to present a variety of pathophysiological processes and etiologies to the student. For major disorders, information is provided on pathophysiology, etiology, clinical manifestations, significant diagnostic tests, common treatment modalities, and potential complications. Other selected diseases are presented in less detail, but significant, unique features are highlighted.
<b>Section IV</b>	<b>Biological Factors Contributing to Pathophysiology</b>	Normal physiological changes related to cancer, adolescence, pregnancy, and aging, with their relevance and affect on disease processes and the treatment of the affected individual, are described. Specific disorders associated with cancer and the developmental stages are discussed.
<b>Section V</b>	<b>Environmental Factors and Pathophysiology</b>	Factors such as immobility, stress, substance abuse, and environmental hazards are the major components in this section. Affects of the various environmental factors on the various body systems and potential complications beyond physical pathologies are discussed. New research and data are included as these are areas of increasing concern with regards to pathophysiology and patient health.
<b>Appendices</b>	<b>Additional Information</b>	Ready References include lists of anatomic terms, abbreviations and acronyms, a selection of diagnostic tests, an example of a medical history, a disease index, and drug index. A glossary and a list of additional resources complete this resource.

## Help/Support

### Technical Support

We want to make sure that you have the support you need while proceeding through the course. For any questions or concerns, including technical or administrative issues, please email [techsupport@learnitonline.com](mailto:techsupport@learnitonline.com).

### Technology Requirements

To navigate successfully you will need the following on your computer:

- A Web browser with JavaScript and cookies enabled
- A stable Internet connection
- Adobe Reader

### *Ready to go?*

[Access Pathophysiology Now!](#)