Air Conduction and Respiration
02PUL001  Describe the embryologic origins and development of the lung and airway.
02PUL002  Describe the gross anatomical features of the lung and airway and the basic structure and organization of the thoracic wall.
02PUL003  Identify the cellular and histological components, including being able to discriminate the regions, of both the conducting and respiratory portions of the respiratory track.
02PUL004  Demonstrate an understanding of lung function tests by relating findings to the physiology of the system.
02PUL005  Describe the biochemical mechanisms of the delivery of O2 and the removal of CO2.
02PUL006  Apply arterial blood gas data to describing the acid base status of a patient. Define four primary types of acid-base imbalances and compensatory mechanisms.
02PUL007  Describe the major factors facilitating respiration.
02PUL008  Describe the defense mechanism of the respiratory system.
02PUL009  Identify the medications used for long-term control of asthma. Relate the mechanism of action for each and the rationale for its therapeutic use.
02PUL010  Identify the agents used as quick-relief medications. Relate the mechanism of action for each and the rationale for its therapeutic use.

Cardiovascular System and the Autonomic Nervous System
02CVS001  Understand the basic arrangement of the autonomic nervous system in the body particularly in the thoracic region.
02CVS002  Explain control and/or influence on cardiovascular function by the autonomic nervous system, the central nervous system, reflex behavior and hormones.
02CVS003  Describe structural and functional aspects of cardiac muscle, including arrangement and communication among the individual cells, the role of calcium in muscle contraction / relaxation, excitation-contraction coupling, energy production for contraction, and force / velocity and length / tension relationships.
02CVS004  Describe the development and adult structure of the heart and vascular system, including the changes seen at or near the time of birth.
02CVS005  Describe the microscopic structure of the heart, blood and lymphatic vessels.
02CVS006 Demonstrate a working knowledge of the relationships of the heart to the structures of the thorax and to the body surface.

02CVS007 Explain the cardiac cycle, including the coordination of pressures, blood flow, volume changes, heart sounds and electrical activity in one complete cardiac cycle.

02CVS008 Explain the intrinsic regulation of cardiac function (Frank-Starling Law of the heart) and the factors, which affect that regulation.

02CVS009 Interpret a normal electrocardiogram and explain how it relates to physiological events in the cardiac cycle.

02CVS010 Explain the cellular basis for cardiac impulse conduction and describe the electrical conduction system of the heart in terms of location, cellular morphology and function.

02CVS011 Contrast normal and abnormal heart function associated with congenital heart defect, ischemia, congestive failure and rhythm irregularities.

02CVS012 Compare and contrast normal and abnormal blood flow including regulation and the forces involved.

02CVS013 Describe the effects produced by the sympathetic and parasympathetic components of the autonomic nervous system on the heart, vasculature, and lungs in terms of the neurotransmitters released by the preganglionic and postganglionic neurons, and the receptor subtypes that respond to these neurotransmitters.

02CVS014 Compare and contrast the sympathetic and parasympathetic components of the autonomic nervous system in terms of the prototypic drugs that act at all of these receptor subtypes & the typical use of these drugs, and the mechanism of action for each of these drugs.

02CVS015 Identify the classes of drugs that act on the heart. Describe the mechanism of action of each class, and identify the prototypes as well as therapeutic uses of each class.

02CVS016 Identify the classes of drugs that act on the vasculature. Describe the mechanism of action of each class, and identify the prototypes as well as therapeutic use(s) of each class.

**Immunology**

02IMM001 Describe the gross and microscopic structure and function of the spleen, thymus, tonsils and lymph nodes, including their location and organization in situ.

02IMM002 Explain the humoral and cellular mechanisms contributing to innate and adaptive immunity.

02IMM003 Describe the mechanisms and outcomes of phagocytosis, complement activation, and acute and chronic inflammatory reactions.

02IMM004 Compare and contrast the structure and function of T and B lymphocytes and the mechanisms involved in their activation.

02IMM005 Describe the mechanisms by which antigenic specificity is generated and contributes to the clonal diversity of lymphocytes.

02IMM006 Compare and contrast Type I Immediate, Type II Ab-mediated cytolysis, Type III Immune complex mediated and Type IV delayed hypersensitivities.
02IMM007  Describe and compare the types and mechanisms of autoimmunity.
02IMM008  Describe the cellular and subcellular mechanisms leading to deficiencies in innate and adaptive immune responses.
02IMM009  Describe innate and adaptive immune responses responsible for clearing infectious agents.
02IMM010  Describe the ways in which the immune system can be manipulated to enhance or inhibit the immunological outcome.
02IMM011  Describe the tissue location and key features of the molecular pathways for the synthesis of prostaglandins and leukotrienes. Explain the molecular action of commonly used inhibitors of their production.

**Musculoskeletal System**

02MUS001  Describe the superficial aspects of the extremities, including an overview of the innervation and vasculature, with consideration of potential clinical problems. Include the concept of fasciae and osteofascial compartmentation.
02MUS002  Describe the microscopic structure of skeletal muscle, tendon, ligaments, bone, cartilage, and adipose tissue.
02MUS003  Describe the processes of development and healing for both bone and muscle.
02MUS004  Describe the functional morphology of the extremities with regard to skeletal foundation, muscle position and function, nerve supply and vulnerabilities.
02MUS005  Describe the principles of locomotion and potential disturbances in the gait.
02MUS006  Describe the functional and clinical anatomy of the lower limb and foot with regard to musculoskeletal and neurovascular elements.
02MUS007  Describe the general morphology of joints, specific joints of the extremities and potential clinical problems associated with their morphological disruption.
02MUS008  Compare and contrast the electrical, biochemical, and mechanical aspects of the process of striated and smooth muscle contraction.
02MUS009  Correlate the structure and basic glycobiology of cell surface and extracellular molecules to their function in connective tissues and basement membranes.

**Biomedical Ethics**

02BME001  Compare the concepts of personhood as an all-or-nothing event or as a gradient, using arguments for and against each of these positions.
02BME002  Describe the elements of informed consent, and the situations in which surrogate decision-making is required.
02BME003  Identify the circumstances in which minors are allowed to make medical decisions for themselves.
02BME004  Describe the possible standards by which a surrogate might make a medical decision for another.
Health Disparities
02HDS001  Compare statistics concerning the ethnic mix of the United States and North Dakota populations.
02HDS002  Describe the association between minority status, poverty, poor health insurance, poor health, and failure to receive beneficial health services.
02HDS003  Describe how the following factors might produce the disparity in receipt of beneficial services: differences in need and preference; structural factors in the health care system; and discrimination.

Human Development
02HDE001  Recognize the major developmental milestones the first 6 years of life, and describe red flags for developmental problems.
02HDE002  Compare and contrast the developmental theories of Freud, Skinner, Piaget, Erickson and Kohlberg.

Inter-professional Care
02IPC001  Describe the roles of the orthopedic surgeon and physical therapist in rehabilitation of ACL injuries.

Medical Care Across the Lifespan
02MCL001  Describe the major elements of well-child care and prevention.

Nutrition
02NUT001  Describe the AAP recommendations regarding infant nutrition until age one year with an emphasis on the rationale for breastfeeding.
02NUT002  Describe the role of nutrition in the genesis and prevention of cardiovascular disease.

Physical Examination
02PEX001  Describe the general approach to the physical examination and demonstrate the ability assess the general appearance of the patient.
02PEX002  Demonstrate the ability to perform the four modalities of physical examination.
02PEX003  Demonstrate the ability to obtain the vital signs (blood pressure, pulse, respirations, and temperature).
02PEX004  Demonstrate basic knowledge of the signs and symptoms of musculoskeletal, lymphatic, cardiovascular and pulmonary disease.
02PEX005  Apply knowledge of the anatomy and physiology of the lymphatic, musculoskeletal, cardiovascular and pulmonary systems to explain normal and abnormal physical findings.

02PEX006  Demonstrate the ability to perform the physical examination of the musculoskeletal, superficial lymphatic, cardiovascular and pulmonary systems.

02PEX007  Describe the basic principles of imaging of cardiovascular and pulmonary systems.

**Patient Wrap-Up**

PWU-SEI001  Observe and reflect on the patient's experience with disease and the ways in which disease impacted the patient's occupation, finances, and family.

PWU-SEI002  Observe and reflect on patient's experience with the healthcare system.

PWU-SEI003  Observe and reflect on the coping skills used by the patient.

PWU-DPR001  Observe and evaluate the professional values exhibited by the physician.

PWU-DPR002  Observe and evaluate the communication skills of the physician.

PWU-DPR003  Observe and evaluate the patient-centeredness exhibited by the physician.

PWU-CSK001  Observe and evaluate the clinical reasoning skills exhibited by the physician.

PWU-CSK002  Apply basic science concepts to patient diagnoses and treatment.

**Patient-Centered Learning (PCL)**

PCL-CSK001  Demonstrate the ability to define and solve clinical problems based on a patient case.

PCL-CSK002  Demonstrate the ability to apply knowledge of basic sciences to clinical manifestations and presentation in a patient case.

PCL-CSK003  Demonstrate the ability to generate hypotheses based on the clinical presentation and underlying pathogenesis of disease in a patient case.

PCL-PTE001  Demonstrate the ability to actively listen to and reflect on information presented or discussed in learning objectives by other students.

PCL-PTE002  Demonstrate the ability to deliver concise, clear, scientifically-based presentations or discussions of learning objective topics.

PCL-PTE003  Demonstrate the ability to display knowledge of subject area in learning objective presentation that is beyond information covered in presentation or discussion.

PCL-PIF001  Demonstrate the ability to generate learning objectives based on deficiencies in the student's understanding of a patient case.

PCL-PIF002  Demonstrate the ability to gather evidence-based information from multiple resources that is relevant and sufficient to address learning issues generated from a patient case.

PCL-PIF003  Demonstrate responsibility to team through leadership and fulfillment of group duties.

PCL-PIF004  Demonstrate ability to assess learning needs, strengths, and limitations.
PCL-PIF005  Demonstrate ability to respond appropriately to feedback.

PCL-PIF006  Demonstrate ability to treat others in team with respect, show openness to different views, and discuss differences non-judgmentally.

PCL-PIF007  Demonstrate effort to continuously strive for excellence in all activities.