Foundations Objective Guide

Foundations Week 1: Genetics

Lecture	Session Objectives
Introduction to the Nucleus and Nucleic Acids	372 Describe the structure of the interphase nucleus, including the nucleolus, the nuclear membrane and nuclear matrix. 373 Distinguish between the different types of DNA and RNA by recognizing their biochemical structures, outlining their functions within the cell and summarizing their major structural similarities and differences. 374 Summarize the role of nuclear pores in regulating nuclear-cytoplasmic trafficking. 375 Using the fibroblast as an example, describe the structural and functional organization of: ribosomes, polysomes, rough endoplasmic reticulum and the Golgi apparatus.
Nucleus/Nucleic Acids	261 Describe the role of histones in the packaging of DNA into chromatin. 262 Distinguish structurally and functionally between euchromatin and heterochromatin in the interphase nucleus. 263 Define Barr body. 260 Describe the process of DNA replication. 264 Explain the roles of the different components of the protein synthetic machinery in regulating the complex trafficking patterns of newly synthesized proteins.
Gametogenesis – First 3 Weeks of Embryology	353 Define primordial germ cell. 354 Compare and contrast spermatogenesis and oogenesis. 356 Describe the process of fertilization and explain the process of sex-determination. 357 Briefly summarize the main features of follicular development and oocyte maturation. 358 List and briefly describe the steps in early embryonic development from fertilized egg to implanted blastocyst.

	359 Describe the process whereby a single-layered embryo becomes a bilayered embryo and distinguish between the various types of twinning. 360 List and briefly describe the key steps involved in gastrulation. 361 Explain how environmental factors can disrupt development leading to embryonic death during weeks 1-2 and congenital malformations from weeks 3 onward.
Down Syndrome	371 Describe how cytogenetic testing is used in the diagnosis and confirmation of disease 421 Explain how nondisjunction can occur during oogenesis and spermatogenesis. 422 Describe normal chromosome structure, function and nomenclature and the types of karyotypes resulting in Down syndrome. 423 Describe the techniques involved in obtaining a karyotype and what information it provides. 424 Describe alternative techniques for cytogenetic testing besides karyotype. 425 Discuss the factors influencing the risk of conceiving a child with Down syndrome, the prenatal screening and diagnostic options available and ethical problems posed by prenatal diagnosis of Down syndrome. 426 Describe the differences between a diagnostic and screening test. 427 Characterize the clinical features and health issues for individuals with Down syndrome and what services are available to them. 428 Discuss the impact of disability on the family, identify challenges the family may face and the services that are available to them.
Chromosome Syndromes	362 Summarize the features associated with Trisomy 18 and Trisomy 13. 363 Describe the features of 45,X and 47,XXY. 364 Define and provide examples of microdeletion syndromes. 12281 Describe how comparative genomic hybridization can detect genomic imbalances

Introduction to Anatomy 1 (MSK)	5400 Define the following anatomical term: position, planes, relations and movements. 5401 Identify the key anatomical features of the fibrous, cartilaginous, and synovial joints. 5402 Identify the key anatomical features of bones and bony features and their relevance to radiology. 5403 Identify the key anatomical features of muscles. 5404 Identify the key anatomical features of the vertebral column and muscles of the back. 5405 Identify the key anatomical features of the spinal cord, meninges, and spinal nerves.
Tutorial: Genetics 1	366 Draw a pedigree with proper symbols and describe the relationship between individuals in it. 367 Distinguish different types of inheritance patterns (autosomal recessive and dominant, mitochondrial, gonadal mosaicism, Y-linked and X-linked). 370 Describe the etiology of chromosome anomalies (including deletion, inversion, translocation, Robertsonian translocation, isochromosomes). 12773 Describe the risks to offspring of carriers of chromosome anomalies
Anatomy: Vertebral Column, Spinal Cord, Nerves and Meninges	582 Identify and describe the bones, joints, ligaments and soft tissues of the vertebral column. 583 Identify and number vertebral sections and vertebrae. 584 Identify the normal curvature of the spine. 585 Recognize normal features of the typical vertebrae in the cervical, thoracic, and lumbar portions of the spinal column 587 Identify the key anatomical features at C. 1 - C. 2 that are necessary to maintain stability (atlanto-occipital, atlanto-axial joints, transverse ligament, anterior longitudinal ligament). 592 Recognize the following structures: spinal nerve, dorsal root ganglion, ventral and dorsal rami.

	593 Identify different layers of meninges around the spinal cord. 594: Identify the spinal unit in the low lumbar (L. 4 / L. 5 and L. 5 / S. 1) region. 595 Explain the anatomical relationships between the nerve root and the low lumbar area. 596 Describe the effects of spinal nerve compression in the intervertebral foramina (in the cervical and the lumbar regions). 597 Explain the relationship between lumbar disc herniation and lower level nerves.
Histology: Histology of Muscles	391 Describe the structure of skeletal muscle tissue and its connective tissue components. 392 Describe the ultrastructure of the skeletal muscle fiber. 396 Discuss the role of muscle precursor cells in embryonic development and in the regeneration of adult muscle. 399 Distinguish structurally and functionally between cardiac, smooth and skeletal muscle.
Radiology: Introduction to Radiobiology and Radiology I	468 Explain the standard x-ray images required for the imaging of bone and joints. 469 Describe the various densities on routine x-ray imaging in order to identify and differentiate normal from abnormal. 13019 Describe the generation of x-rays and their interaction with matter. 13020 Describe the most important dose measurements, including absorbed energy dose (Gy), organ and effective doses, as well as relevant dose limits. 13021 List types and magnitudes of radiation risk from radiation exposure in medicine and compare it to radiation exposure from natural sources. 13022 Explain the effects of radiation exposure, including carcinogenic and teratogenic effects, emphasizing the increased vulnerability of children. 13023 List basic methods of radiation protection for patients and health care workers.

	13024 Describe the concepts of “as low as reasonably achievable” (ALARA) and “Image Wisely”.
Foundations Week 1 CDMQ	Any of the above objectives may be tested.

Foundations Week 2: Support & Movement

Lecture	Session Objectives
Introduction to Excitable Cells	5407 Describe the ionic gradients in neurons and muscles and compare passive vs active transport mechanisms. 5408 Explain the factors that influence the passive movement of ions across the membrane: concentration gradients vs electrical gradients. 5409 Explain the concept of equilibrium potential and apply the Nernst equation. 5410 Explain the origin of resting membrane potential, its dependency on ion concentration gradients and membrane permeability, and the essential role of the Na+/K+ ATPase in its maintenance.
Protein Synthesis	376 Understand the relationship that exists between the nucleotide sequences on mRNA and the order in which amino acids are assembled to make a polypeptide chain. 377 Explain the concept of a codon and why the genetic code is termed a degenerate code. 378 Summarize the steps in protein synthesis beginning with the nuclear gene and finishing with a polypeptide chain. 379 Describe the effects of antibiotics on the process of protein synthesis. 380 Summarize the process of mitochondrial protein synthesis.
Basis of Membrane Excitability	5412 Based on the properties of the voltage-gated channels, explain the action potential and its major characteristics (depolarization and repolarization phases, undershoot, all-or-none response, threshold, refractory period). 5414 Describe how action potentials propagate along axons. 5415 Describe the basic processes underlying synaptic transmission. 5416 Define neurotransmitter and a ligand-gated channel and explain the concept of EPSP and IPSP.

	11219 Explain the major characteristics of voltage-gated channels.
Tutorial: Genetics 2	386 Utilize a pedigree diagram to determine the risk of disease. 388 Appreciate the difference between phenotype and genotype. 389 Compare and contrast: nucleotide substitution, missense mutations, nonsense mutations, splice site mutations, deletions, insertions. and trinucleotide expansions. 390 Discuss the molecular techniques available to assess different types of gene mutations and recognize their advantages and disadvantages. 12774 Explain the concepts of anticipation, incomplete penetrance and variable expressivity.
Duchenne Muscular Dystrophy	438 Describe the chemical nature, structure (primary, secondary, tertiary and quaternary) and properties of proteins using myosin and actin as examples. 439 Recognize how different types of gene mutations result in abnormal protein production. 441 Describe the relevant and appropriate history, physical examination, diagnostic tools and investigations for a patient with a myopathy/muscular dystrophy. 442 Describe the features of Duchenne muscular dystrophy and compare them to Becker muscular dystrophy. 444 Describe therapeutic options available for someone with a muscular dystrophy. 12290 Define genetic heterogeneity and pleiotropy as they relate to myopathies/muscular dystrophies.
Introduction to Anatomy 2	5406 Identify the key anatomical features of the hip, thigh, knee, leg and foot.
Muscle Structure and Function	393 Describe the composition of the thick and thin filaments and explain the sliding filament mechanism of muscle contraction. 394 Summarize the main features of excitation-contraction coupling and explain the role of calcium in this process.

	395 Describe the neuromuscular junction and outline the steps involved in neuromuscular communication. 397 Describe the composition of a motor unit and list the factors that determine the fibre composition of different skeletal muscles. 398 List and describe the chemical forms of energy used in muscle contraction.
Tutorial: Membrane Excitability	400 Predict the effect of changing Na+, K+ or Clconcentration gradients or permeabilities on resting membrane potential. 401 Predict the effect of inhibiting Na+/K+ ATPase on resting membrane potential. 402 Predict the effect of changing Na+ or K+ concentration gradients on the amplitude and threshold of the action potential. 403 Predict the effect of blocking the voltage-gated and background (leaky) Na+ or K+ channels on the following features of the action potential: amplitude, duration, threshold. 404 Predict the effect of opening the following ligandgated channels on postsynaptic membrane potential: Na+ channels, K+ channels, Na+/K+ channels et Clchannels.
Anatomy: Back Muscles	589 Identify the major muscle groups which support and move the neck and head, muscles of the abdominal wall, and the key posterior muscle support for the low back. 591 Identify the Abdominal Aorta and its major branches.
Histology: Epithelial Tissues and Microscopy of Skin	514 Enumerate the histological features of the basic tissues of the human body 515 Describe the histology of the dermis and epidermis.
Radiology: Introduction to Radiology II	471 Develop a standardized approach for the detection and description of normal anatomy and radiologic findings. 476 Recognize the various modalities used for the imaging of bone and soft tissues. 477 Develop a standardized approach for imaging of bone and soft tissue abnormalities.

	478 Select the most appropriate modality for imaging of bone and soft tissue. 479 Compare and contrast the differences of the various imaging modalities. 480 Illustrate how various modalities can be complementary and add to the diagnosis of abnormal versus normal.
Foundations Week 2 CDMQ	Any of the above objectives may be tested.

Foundations Week 3: Spine & Pharmacology

Lecture	Session Objectives
Scoliosis	5417 Describe and contrast the different types of scoliosis (congenital, infantile, juvenile) in children. 5418 Describe the usual clinical findings associated with each type of scoliosis in children. 5419 Describe the investigations (of spine and other) needed in making the diagnosis and planning treatment in a child with scoliosis. 5420 Draw an appropriate Cobb angle, identify a Risser sign on x-ray and discuss its significance with respect to maturity. 5421 Describe the treatment principles (operative and nonoperative) for each type of scoliosis. 5422 Explain the long-term implications of scoliosis and/or spinal fusion for scoliosis, as these children enter adulthood
Neck Pain	266 Define and recognize different etiologies of cervical pain. 268 Describe relevant history, physical examination, diagnostic tools and investigations that relate to a patient with cervical pain. 269 Describe the possible treatment and prevention modalities available for managing patients with neck pain.
Vertebral Development - 4th Week Onward	406 Explain the underlying mechanism of organogenesis as it relates to the development of the basic embryonic body plan. 407 Describe the development of the neural tube with respect to the process of neurulation, the function of the notochord, and the process of spinal cord development. 452 Describe the normal development of the vertebral column with respect to cell line differentiation and structure formation. 683 Describe the common formation abnormalities that manifest clinically such as spina bifida and congenital scoliosis.

Spinal Development & Postural Disorders	679 Define scoliosis, kyphosis, and lordosis. 680 Describe the development of the normal contours of the spine. 681 Describe the clinical presentation, diagnosis, investigation, and treatment principles of scoliosis 682 Distinguish postural and pathological forms of kyphosis of the spine.
Tutorial: Genetics 3	365 Explain the concept of genomic imprinting. 408 Describe alternate mechanisms of inheritance (gonadal mosaicism, imprinting, multifactorial) and how they relate to risk. 409 Distinguish between a mutagen and a teratogen. 410 Describe how birth defects relate to genetic syndromes. 411 Recognize the ethical issues that can arise with genetic testing.
Spine: Spina Bifida and Back Pain	453 Recognize the critical periods of embryonic development and the mechanisms by which teratogens affect development (importance of timing, dose, duration). 454 Categorize the causes of birth defects (single gene, chromosome, multifactorial, teratogenic, mechanical) and outline their frequencies. 455 List the various types of neural tube defects and how they can be detected. 456 Discuss the principles involved in the treatment and prevention of spina bifida. 457 Describe the signs and symptoms associated with lower back pain. 458 Describe the physical exam and investigations appropriate for investigating back pain. 459 Discuss the principles involved in the treatment and prevention of back pain. 684 Define spondylolysis, spondylolisthesis. 685 Describe the clinical presentation, diagnosis, investigation, and treatment principles of spondylolysis, spondylolisthesis. 686 Define mechanical low back pain.

	687 Describe other common causes of back pain in children. 12289 Discuss individual and population-wide approaches to preventing disorders such as spina bifida (e.g., via folic acid supplementation).
Introduction to Pharmacology & Basics of Pharmacology	1526 Recognize the differences between pharmacokinetics and pharmacodynamics. 1527 Explain the importance of drug disposition processes of absorption, distribution, metabolism and excretion and related pharmacokinetics parameter. 1528 Define basic concepts of receptor theory. 1832 Describe a usual dose-response curve and explain what the curve would look like in the presence of a partial agonist, reversible antagonist and irreversible antagonist. 1536 Describe the following pharmacokinetic parameters and how they are derived, if applicable: clearance, volume of distribution, elimination rate constant, elimination half-life, bioavailability, first-pass effect, pro-drug, steady-state, time to steady-state, loading dose, maintenance dose, first-order kinetics, zeroorder kinetics. 1537 Differentiate between phase I and phase II drug metabolism and describe how metabolizing enzymes can be implicated in drug interactions. 1538 Recognize the importance of pharmacogenetics in drug metabolism 1539 Identify the main substrates, inhibitors and inducers of major drug metabolizing enzymes.
Pathology of the Lower Back	690 Describe the clinical presentation, approach to diagnosis and management of: cervical strain, degenerative disc disease, cervical radiculopathy, cervical stenosis, diffuse idiopathic skeletal hyperostosis, whiplash injury, infection. 5466 Provide a differential diagnosis for lower back pain in the adult.

	5467 Describe the clinical presentation, approach to diagnosis and management of lower back pain. 5468 Recognize when and what type of imaging is required to assist in the diagnosis and management of back pain. 5469 Recognize when the presentation of back pain is an emergency.
Anatomy: Hip	590 Describe the anatomical features of the bony pelvis. 598 Describe: Hip Joint, flexor, extensor, adductor and abductor muscles, femoral triangle and neurovascular relationship 599 Identify the bony landmarks of the hip and femur. 600 Identify the following features of the hip joint: multiaxial ball, articular surfaces of the hip joint (lunate articular surface, acetabular fossa, acetabular labrum), head of femur.
Histology: Connective Tissue	516 List the structural and functional characteristics of connective tissue and distinguish it from other basic tissue types. 517 Describe the functions carried out by different types of connective tissue. 518 Describe the three fundamental components found in all connective tissues. 519 Describe the biochemical composition and the sites of synthesis of the extracellular matrix components. 520 Define the structure and function of the connective tissue cell.
Radiology: Imaging of the Spine I (Anatomy)	481 Correlate three dimensional anatomy of the spine to two dimensional xrays. 482 Identify normal bony landmarks of the vertebra and discs on plain film. 483 Correlate normal bony landmarks of the vertebra and discs on Xray to CT and MRI. 484 Describe and identify normal alignment of the spine in the cervical, thoracic and lumbosacral regions.
Foundations Week 3 CDMQ	Any of the above objectives may be tested

Foundations Week 4: Introduction to Blood

Lecture	Session Objectives
Normal Marrow and Blood Function	167 List the components of blood, including the cellular and non-cellular components. 168 Describe the function of the various blood components. 12287 Identify the morphologic features of anemias of various causes.
Hematopoiesis and Cytokines	169 Identify the myeloid and erythroid precursors. 170 Describe the properties of the hematopoietic stem cell. 171 Describe the function and potential clinical application of the hematopoietic growth factors.
B12, Iron and Folate	1759 Describe the epidemiology, etiology and pathophysiology (including absorption and metabolic pathways) for iron, B12 and folate deficiency anemias. 1761 List the symptoms and physical findings for a patient presenting with iron, B12 and folate deficiency anemia. 1762 Formulate a diagnostic plan and differential diagnosis for patients presenting with iron, B12 and folate deficiency anemia. 1763 Compare laboratory findings with the pathology of iron, B12 and folate deficiency anemia. 1764 List treatment options for patients with iron, B12 and folate deficiency anemia.
Pancytopenia	769 Discuss the possible etiologies of bone marrow failure. 770 List the diagnostic tests that aid in the diagnosis of diseases of the blood and bone marrow. 771 Explain how allogeneic bone marrow transplant is used in various hematologic diseases. 2547 Review the basic function of the elements of the blood: red cells, white cells and platelets. 2548 Recognize the cardinal symptoms and signs of pancytopenia (anemia, leukopenia, neutropenia, thrombocytopenia).

	2550 Discuss the supportive treatments available for patients with pancytopenia.
Disorders of Growth	416 Explain the concepts of cell injury and cell death and distinguish between necrosis and apoptosis. 417 Describe the different ways in which cells can adapt their form or function as they respond to stresses in their environments. 418 Define the major types of cellular adaptations and growth disorders, and provide an example of each: hypertrophy, hyperplasia, atrophy, metaplasia and dysplasia. 419 Define: agenesis, aplasia, hypoplasia, dysgenesis, dystrophy.
Hematopoiesis 2: Red Cells and Platelets	1755 Describe the process of erythropoeisis. 1756 Describe platelet synthesis. 1757 Define the normal life span of red blood cells and platelets within the circulation. 1758 Describe the structure and composition, function and metabolic activities of red blood cells and platelets.
Diagnostic Tools in Hematology	250 Discuss the utility of a peripheral blood film. 251 Recognize the indications for a bone marrow examination. 252 Describe what is involved in a bone marrow examination.
Anatomy: Knee	607 Identify the features of the knee joint, including articular surfaces of the femur and tibia, and the soft tissue structures (Cartilage, ligaments, etc.) 608 Identify the muscles, including their origins and insertions, that flex (hamstrings, gracilis, sartorius, gastrocnemius) and extend (quadriceps femoris) the knee joint. 609 List the functions of the popliteus muscle and iliotibial band in the leg. 610 Describe the relationship of the neurovascular structures in the popliteal fossa to the major muscles and how the nerves and vessels branch into the leg. 11216 Identify the soft tissue structures of the knee (menisci, cruciate and collateral ligaments, articular surfaces, fibrous capsule and synovial membrane).

Histology: Bone & Cartilage	521 Describe bone as a connective tissue in terms of its cells, fibers and ground substance. 522 Distinguish the bone cell types in terms of their origin, structure, and primary functions. 523 Relate the physical properties of bone to specific tissue components. 524 List the bone tissue types and name the body sites where each may be found. 525 Differentiate between the two processes of bone formation in terms of embryonic tissue of origin, intermediate steps, the structure of the mature tissue, and location in the body. 526 Explain the effects of nutrients and hormones on bone tissue structure and function. 527 Recognize the types of bone, the cell types, and the different structures of bone in a photomicrograph or slide of bone tissue. 528 List the types of joints and compare them in terms of their structure, mobility and locaton. 529 Define the differences and similarities among the 3 types of cartilage. 530 Describe the function of 3 types of cartilage and relate them to their structural characteristics and location in the body. 531 Describe the steps in the histogenesis and growth of cartilage. 533 Recognize the type of cartilage present and identify its different components in a photomicrograph or microscopic slide.
Genetic Alterations in Cancer	247 Discuss the common types of cancer-associated genes and provide examples of each, discussing their normal function and their effects when normal function is lost. 248 Describe the common types of changes that can affect genes associated with cancer.
Foundations Week 4 CDMQ	Any of the above objectives may be tested.

Foundations Week 5 – Red Blood Cells

Lecture	Session Objectives
Oxygen Transport to Tissues	2694 Explain the role of hemoglobin in oxygen transport to tissues. 2695 Describe the composition and structure of hemoglobin. 2696 Draw the hemoglobin-oxygen binding curve. 2697 List the factors that affect oxygen binding to hemoglobin and describe their effects with reference to the oxygen binding curve. 2698 Describe the mechanism by which carbon monoxide alters the function of hemoglobin. 2699 Distinguish structurally and functionally between hemoglobin and myoglobin.
Hemoglobinopathies	2866 Differentiate hemoglobinopathies related to enzyme defects, abnormal hemoglobin production and abnormal hemoglobin structure. 2867 Describe the epidemiology, etiology and pathophysiology for sickle cell anemia and the thalassemias. 2868 Identify the psychosocial determinants of health in patients with sickle cell anemia and thalassemia. 2869 Name community and health resources available to patients and the families of patients with sickle cell anemia and thalassemia.
Hemolytic Anemias	1765 Categorize hemolytic anemias and describe the etiology, pathophysiology and epidemiology for the following hemolytic anemias: acquired non-immune hemolysis (mechanical damage, physiochemical damage, membrane abnormalities), acquired immune hemolysis (infections, autoantibodies, alloantibodies), membrane defects, abnormalities in red cell enzymes, hemoglobin synthesis abnormalities. 1767 List common symptoms and physical findings for a patient presenting with hemolytic anemia.

	1768 Formulate a diagnostic approach including relevant laboratory investigations for patients presenting with hemolytic anemia. 1769 Correlate laboratory findings with the pathology of each hemolytic anemias. 1770 Identify a basic treatment approach for patients with each hemolytic anemias.
Hemoglobinopathies	2522 List the symptoms and physical findings for a patient with sickle cell anemia and thalassemia. 2523 Compare laboratory findings with the pathology of sickle cell anemia and thalassemia. 2524 Identify treatment options for patients with sickle cell anemia and thalassemia. 2525 Differentiate the ethnic and genetic factors in the epidemiology of sickle cell anemia and thalassemia.
Normal Homeostasis	1803 Describe the role of each of the following in the regulation of blood coagulation: vascular endothelium, platelets, plasma coagulation factors and coagulation inhibition factors. 1804 Describe the homeostatic process of blood coagulation and inhibition. 1805 Discuss the following laboratory tests and the interpretation of normal and abnormal results: platelet function analysis, international normalized ratio and prothombin time, partial thromboplastin time, thrombin time, plasma fibrinogen and D-dimer.
Introduction to Autopsy	1220 Explain how and why an autopsy is performed. 1221 Identify where an autopsy is performed and who performs it. 1222 Explain the types of answers that an autopsy can provide. 1223 Indicate the timeframe for producing autopsy results. 1224 Recognize who may request an autopsy. 1225 Identify situations when a coroner needs to be called. 1226 Identify cases in which the family has to sign a consent to autopsy.

Hematology: Normal Blood and Marrow and Red Cell Disorders	253 Identify normal erythrocytes, leukocytes and platelets in a peripheral blood film. 254 Differentiate between megakaryocytes, erythopoietic cells and granulopoietic cells in a normal bone marrow.
Anatomy: Ankle	613 Identify the neurovasculature in the leg and in the foot. 614 Identify the bony landmarks of the following structures: tibia, fibula, tarsal bones, calcaneus, cuboid, and metatarsals. 620 Identify the muscle layers and arches of the foot. 621 Describe the innervation and dermatomes of the lower limbs by referring to the spinal root levels L4 - S3. 5424 Describe the ankle joint and muscle groups which act on it. 5425 Describe the joints of inversion and eversion and responsible muscles.
Radiology: Lower Limb	665 Describe the radiological anatomic features of the lower limb from hip to foot with emphasis on the bony and cartilagenous structures including ligaments. 666 Identify anatomic structures of the lower limb on Xrays. 667 Identify normal and abnormal features of common radiographic views of the lower extremities.
Foundations Week 5 CDMQ	Any of the above objectives may be tested.

Foundations Week 6: Coagulation & Transfusion

Lecture	Session Objectives
Introduction to Homeostasis	412 Define homeostasis and justify the need for and the roles of homeostatic mechanisms in biological systems. 413 Identify the key roles played by the autonomic nervous system (ANS) and the endocrine system in the regulation of homeostasis. 414 Briefly compare the functional differences between the sympathetic and parasympathetic divisions of the ANS. 415 Define the elements of a feedback cycle and recognize the importance of negative and positive feedback in maintaining homeostasis using body temperature regulation and fever as examples.
Flow Cytometry	1227 Define the term immunophenotype 1228 Discuss the basic principles of flow cytometry immunophenotyping: laser and fluorescently tagged antibodies 1229: Illustrate by case interpretation how flow cytometry can aid in the diagnosis of: acute leukemia, chronic lymphocytic leukemia and the lymphomas 14774 Identify the morphological features of a normal blood smear, reactice leukocytosis, eosinophilia and infectious mononucleosis
Abnormal Hemostasis	1835 Recognize the major clinical and laboratory characteristics of common hereditary bleeding disorders including: hemophilia A and B; von Willebrand's disease. 1836 Identify common acquired conditions associated with coagulation dysfunction and describe the factors that lead to coagulation dysfunction in: a. liver disease, b. disseminated intravascular coagulation, c. malignancy, d. multiple trauma and massive transfusion, e. Immune thrombocytopenia. 1837 Distinguish thrombocytopenias resulting from decreased platelet production, increased platelet destruction and splenic sequestration.

	1838 Differentiate coagulation factor deficiencies from platelet abnormalities.
Aberration of Hemostasis	2526 Identify common acquired conditions associated with coagulation dysfunction. 2527 Describe the fundamental mechanisms in normal hemostasis and fibrinolysis. 2528 Describe the pathophysiology and clinical presentation of disseminated intravascular coagulation. 2529 List some causes of disseminated intravascular coagulation and create a list of appropriate laboratory investigations used to diagnose a case of disseminated intravascular coagulation. 2531 Distinguish the coagulation abnormalities in disseminated intravascular coagulation from ITP (Idiopathic thrombopenic purpura) and TTP (Thrombotic thrombopenic purpura). 2831 Discuss the appropriate use of blood products in disseminated intravascular coagulation. 2832 Formulate an approach to the diagnosis of thrombocytopenia. 2833 Discuss the pathophysiology and clinical presentation of ITP. 2834 Outline the various treatment options for ITP.
Transfusion Medicine 1	1798 Identify the major blood groups characterized by ABO antigens and antibodies. 1799 Describe the Rh system of blood group classification and risks associated with Rh incompatibility, including hemolytic disease of the newborn. 1800 Define 'type and cross-match'. 1801 Describe complications associated with transfusion 1802 Identify the composition of the following blood products that may be given in a transfusion and common indications for use: whole blood, autologous blood, fresh frozen plasma, cryoprecipitate, albumin, immunoglobulin, concentrated red blood cells, platelets and coagulation factors.

Introduction to Inflammation	1011 Describe the features of acute and chronic inflammation. 1012 Explain the purpose of acute inflammation. 1013 Recognize the principal clinical signs and symptoms of acute inflammation and explain their genesis. 1014 Describe the mechanisms for the vascular changes and the formation of fluid and cellular exudates that accompany acute inflammation. 1015 Explain the function of neutrophils and monocytes in the acute inflammatory response. 1016 Explain the role of cell adhesion molecules in focusing the inflammatory response. 1017 Describe the process of phagocytosis and related events including the respiratory burst and the mechanism for microbial killing. 1019 Describe the components of a granuloma. 1020 List the differential diagnoses of granulomatous inflammation, selecting a particular body site as an example. 1021 Classify tissue types according to their regenerative capacity. 1022 Describe healing of a wound from the time of injury to scar formation. 1023 Identify acute and chronic inflammation in different tissues.
Introduction to Anatomy 3	5423 Identify the key anatomical features of the shoulder, arm, elbow, forearm and hand.
Transfusion Medicine 2	1806 Identify indications for use of the following: concentrated red blood cells, fresh frozen plasma, cryoprecipitate, immunoglobulin, platelets and coagulation factors
Anatomy: Shoulder	601 Contrast the stability and mobility between the hip joint and shoulder joint. 622 Identify the bony features of the shoulder girdle and the structural features of the shoulder joint. 624 Describe the primary muscles responsible for the movements of the shoulder joint, including the rotation of the scapula.

Radiology: Radiology of Hip and Pelvis	653 Describe the anatomical structure of the pelvis as it relates to a set of rings. 654 Identify the pelvic bony landmarks in standard AP, Lateral, Inlet, Outlet views. 655 Identify the hip joint and proximal femur landmarks in standard AP, True lateral and Frog lateral views. 656 identify injury location of hip and pelvis using bony landmarks describe the implications regarding clinical stability. 657 Identify common pathologies in the pelvis and hip and relate clinical symptoms and findings to same.
Foundations Week 6 CDMQ	Any of the above objectives may be tested.

Foundations Week 7: Thrombosis

Lecture	Session Objectives
DVT and Pulmonary Embolism	1811 Describe the pathophysiological processes that result in venous thrombosis. 1812 Recognize the signs and symptoms associated with deep vein thrombosis and pulmonary embolism. 1813 Describe the diagnostic tests used to diagnose deep vein thrombosis and pulmonary embolism. 1814 Formulate a diagnostic plan for patients presenting with suspected deep vein thrombosis and pulmonary embolism.
Introduction to the Immune System: Distinguishing Self from Non-Self	172 Review the different components of the innate immune system and their functions. 173 Review the different components of the adaptive immune response and their functions. 12012 Discuss the genetic organization and inheritance of MHC class I and class II genes. 12045 Review the central and peripheral lymphoid organs and tissues of the immune system and the roles of the different components. 12400 Describe the general functions of the immune system. 12656 Describe how the distinction between self and non self is established (major histocompatibility complex MHC). 12657 Define cytokines and their various mechanism of action within the immune response.(autocrine, paracrine, endocrine, etc.).
Innate Immunity	12006 Identify the cellular components of the innate immune system and their functions. 12007 Describe the role of complement and other acute phase reactants, including its activation and regulation. 12008 Describe the recognition of pathogen-associated molecular patterns (PAMP) and damage-associated molecular patterns (DAMP) through patternrecognition receptors (PRR). 12009 Describe the initial inflammatory response following infection.

	12658 Describe the barrier components of innate immunity (anatomic, physiologic, phagocytic, inflammatory). 12659 Describe the antiviral immune response in innate immunity (interferons), including its activation and regulation.
Acute and Chronic Thromboembolic Disease	12858 Describe the epidemiology of and pathophysiological processes that result in venous thrombosi: a) demonstrate an understanding of Virchow's triad; b) explain the mechanisms of hypoxia in acute pulmonary embolism. 12859 Recognize the signs and symptoms associated with deep vein thrombosis (DVT) and pulmonary embolism (PE). 12860 Describe the diagnostic tools used to diagnose DVT and PE: a) formulate an evidence -based diagnostic plan for patients presenting with suspected DVT and PE including the use of clinical prediction models, d - dimer testing, and choice of imaging studies. 12861 Explain the differences between anticoagulants, including mechanism of action, monitoring, and logistics of therapy: warfarin, unfractionated heparin, low molecular weight heparin, direct and indirect factor Xa inhibitors, and direct thrombin inhibitors: a) formulate an evidence -based therapeutic plan for patients with confirmed venous thromboembolism (VTE) 12862 Describe the risks of anticoagulant therapy related to bleeding and heparin - induced thrombocytopenia: a) have an understanding of the pathophysiology, investigations, and management of heparin induced thrombocytopenia. 12863 Recognize risk factors for development of VTE: a) hereditary thrombophilic disorders; b) acquired thrombophilic conditions (antiphospholipid antibodies, myeloproliferative disorders and malignancy); c) others: immobilization (stasis), surgery, trauma, pregnancy and hormonal therapy. 12864 Recognize the potential chronic complications of VTE (post-phlebitic

	syndrome, chronic thromboembolic pulmonary hypertension), their symptoms and options for management. 12865 Recognize situations requiring VTE prophylaxis and make evidence-based recommendations for such therapy.
What Makes Patients Clot?	1752 Recognize the characteristics of the following hereditary thrombophilic disorders: factor V Leiden, prothrombin gene mutation, protein C deficiency, protein S deficiency, antithrombin III deficiency, dysfibrinogenemia, hyperhomocysteinemia and elevated factor VIII. 1753 Identify the acquired thrombophilic conditions associated with the following: antiphospholipid antibodies, myeloproliferative disorders and malignancy. 1754 Describe the pathophysiology of common triggers for thrombosis which include: immobilization (stasis), surgery, trauma, pregnancy and hormonal therapy.
Adaptive Immunity: Cell-Mediated Immunity - Part 1	12011 Identify antigen-presenting cells and describe how they recognize, capture and present antigens to T cells. 12014 Describe the pathway of antigen presentation via MHC class II. 12015 Discuss the role of the lymph node in the immune response. 12401 Describe the structure of the T cell receptor. 12402 Describe how T-cell receptor diversity is established. 12403 Describe the immunological synapse, including the costimulatory signals required for effective T cell activation. 12660 Define an antigen and its role in the immune response. 12661 Describe the differentiation of naïve T cells into effector cells and describe the role of mature CD4+ T cells.
Hematology: White Cell Disorders	246 Explain the meaning of the term monoclonal. 12288 Identify the morphologic features of infectious mononucleosis, acute and chronic leukemias, myelodysplasia and myelofibrosis.

Anatomy: Axilla	629 Identify and describe the normal pattern of the brachial plexus, major peripheral nerves and associated vascular structures. 11217 Describe the relationship of the axillary artery to the brachial plexus and other structures surrounding it.
Radiology: Upper Limb	669 Relate anatomical structures to X-rays of the upper limb. 670 Identify normal and abnormal features of common radiographic views of the upper extremities.
Foundations Week 7 CDMQ	Any of the above objectives may be tested.

Foundations Week 8: Allergy & Immunology

Lecture	Session Objectives
Drug Allergies	552 Recognize the different mechanisms underlying the immune response to penicillin, including types I-IV hypersensitivity. 553 Describe the clinical presentations of IgE-mediated allergic reactions and types I-IV hypersensitivity. 554 Distinguish IgE-mediated from non-IgE-mediated reactions, including accelerated and delayed reactions. 555 Explain the types of testing (including limitations) available for penicillin allergy. 556 Describe penicillin cross-reactivity and identify alternative antibiotics for use in a penicillin allergic patient. 557 Recognize methods of penicillin/drug challenge tests and desensitization. 558 Define the different immune mechanisms of drug allergy and list examples of representative drugs. 559 Describe the mechanisms of non-immune drug induced anaphylaxis and adverse reactions and list examples of these e.g., direct mast cell degranulation caused by opiates and radio contrast media; vancomycin; COX 1 inhibition by ASA and other NSAIDs; unknown (e.g., sulfites, local anesthetics).
Severe Combined Immunodeficiency (SCID)	2551 Review the basic function of the cellular and humoral aspects of the immune system. 2552 List the screening diagnostic tests that aid in the diagnosis of primary immune deficiencies. 2553 Discuss the supportive treatments available for patients with primary immune deficiencies including replacement immune globulin therapy, antibiotics, nutritional supplementation, and psychological supports.
Adaptive Immunity: Cell-Mediated Immunity - Part 2	12013 Describe the pathway of antigen presentation via MHC class I. 12016 Discuss the various differentiated states and functions of T-cells including naïve, effector and memory cells

	12018 Describe how CD8 T-cells identify and kill their targets. 12664 Describe the differentiation of naïve T cells into effector CD8 T cells.
Adaptive Immunity: Humoral Immunity	176 Describe the structure of antibodies. 177 Discuss antibody gene organization and expression during B-cell development. 178 Describe T-cell independent and T-cell dependent antibody responses. 179 Recognize how antibody diversity is established. 180 Describe isotype switching and the various classes of antibodies and their functions. 12010 Describe the different functional roles of antibodies (opsonisation, neutralizing, etc). 12043 Describe the activation and regulation of the adaptive immune system. 12665 Describe the different hypersensitivity reactions (types I – IV).
Anaphylaxis	1553 Recognize the signs and symptoms of anaphylaxis. 1554 List the common causes of anaphylaxis. 1555 Describe the emergency treatment of anaphylaxis.
Environmental and Food Allergies	538 Recognize the atopic march, and the genetic and environmental factors influencing allergy. 539 Define the immunologic basis of food allergy. 540 Distinguish the differences between food allergy, food intolerance and non-IgE mediated food allergy. 541 Recognize the clinical manifestations of a food allergy, including biphasic anaphylaxis, and how to distinguish it from conditions mimicking food allergy. 792 Identify and compare the distinguishing features of allergic rhinitis vs infectious rhinitis vs chronic sinusitis. 794 Assess the impact of environmental factors on a patient with chronic cough. 12026 Choose the appropriate investigations and other tests needed to identify environmental and food allergies.

	12027 Describe the advantages, disadvantages and side effects of various treatment options for allergy. 12028 Describe the office management of a patient with a fatal food allergy including preventative strategies and an action plan in event of accidental ingestion using peanut allergy as a model.
Tolerance and Autoimmunity	188 Define central tolerance and describe the process of thymic selection of T-cells. 189 Define peripheral tolerance. 190 Describe anergy and the role of CTLA-4. 191 Describe the development and function of Tregulatory cells. 192 Discuss the role of cytokines in regulating immune responses. 12025 Discuss the general features and potential causes of autoimmunity.
Diagnostic Methods of Allergy Evaluation	249 Identify the major components of the complete blood count, including the red and white cell parameters and platelet count. 544 Define the immune basis of prick and intradermal allergy testing. 545 Describe the rationale for allergy testing and its role in management of allergic disorders including asthma. 546 Identify the risks and benefits of allergy testing. 547 Describe when allergy testing is of no benefit, and indentify unconventional and unproven methods of testing. 548 Define the rationale for immunotherapy. 549 Describe the limitations of allergy testing including extract potency, false positives and negatives, concomitant medication, and lack of confirmatory history. 550 Recognize the use of specific serum IgE testing for allergens - when and why, and how it compares to allergy skin testing. 551 Describe the mechanisms of anaphylaxis and allergic manifestations which are not diagnosable by allergy testing [e.g., physical urticarias, anaphylaxis from unknown mechanisms (cold, exercise-induced, sulfites), COX-1 inhibition (NSAIDs), complement

	mediated (drug), direct mast cell degranulation (opiates, radio contrast media)].
The Immune System: Putting It All Together	12041 Review the main components of the immune system. 12044 Discuss the coordination of the innate and adaptive systems. 12045 Review the central and peripheral lymphoid organs and tissues of the immune system and the roles of the different components. 12404 Review the activation and regulation of the innate immune system. 12405 Review the activation and regulation of the adaptive immune system.
Pathology: Acute Inflammation	350 Identify the major types of inflammatory cells involved in the acute inflammatory reaction in a tissue section. 351 Identify examples of acute inflammation and its effects on different tissues and organs. 567 Explain why chemical mediators are important in acute inflammation and name the principal groups of chemicals that have been proposed as mediators. 568 Recognize the common morphological presentations of acute inflammation, i.e., abscesses, cellulitis, ulcers and suppurative exudates. 569 Define the following sequelae of acute inflammation: organization, scarring, regeneration, repair and chronic inflammation. 570 Identify acute inflammation in different organs.
Anatomy: Elbow	631 Identify the bony structures of the humerus, radius and ulna. 632 Describe the movements of the elbow joint and between the radius and ulna. 635 Identify and describe the function of the muscles in the anterior and posterior compartment of the arm. 636 Describe the course of the neurovascular structures in the arm (brachial artery and vein, and median, ulnar and radial nerves)
Radiology: Introduction to Trauma	658 Describe the basic principles of trauma management in the care of a poly-traumatized patient.

	659 Identify the radiological films required for the assessment of the general trauma patient. 660 Assess the standard "three views" films of the c-spine for adequacy of technique and explain the normal characteristics in reading these films. 661 Describe the use of and basic interpretation of the chest X-ray and the pelvis X-ray in the context of trauma management. 662 Describe the diagnosis and approach to a vascular injury of the extremity. 663 Describe the early management of closed and open fractures. 664 Define fracture, dislocation, and subluxation.
Foundations Week 8 CMDQ	Any of the above objectives may be tested.

Foundations Week 9: Soft Tissue Injury

Lecture	Session Objectives
MSK Congenital Disorders	704 Define developmental dysplasia of the hip (DDH) and contrast with teratogenic congenital dislocation of the hip. 705 Describe the clinical presentation, approach to diagnosis and management of DDH. 706 Define Club foot (AKA congenital talipes equinovarus) and contrast with simple metatarsus varus and calcanovalgus foot deformities. 707 Describe the clinical presentation, approach to diagnosis and management of club foot deformity.
Wound Healing	571 Describe the pathophysiology of uncomplicated wound healing. 572 Describe the complications of wound healing and possible means to prevent or treat such complications. 573 Describe scar formation and clinical treatments for abnormal scars (ie keloid).
Clinical Approach to MSK Tumors	716 Describe the clinical presentation of bone cancer. 717 Describe the radiographic findings / patterns associated with MSK tumors. 718 Explain the clinical and radiological presentations that suggest benign rather that malignant tumors. 719 Describe the imaging used in the identification of bone tumors. 720 List the neoplasias that commonly metastasize to bone. 721 Describe a differential diagnosis for lytic or osteoblastic bone lesions. 722 Describe the clinical presentation and radiologic diagnosis of common benign and soft tissue tumors: Lipoma, Osteoid osteoma, Non-ossifying fibroma. 723 Describe the clinical presentation and radiologic diagnosis of osteosarcoma.
Pediatric Musculoskeletal/Orthopaedics	295 Describe the organisms and clinical presentation of major types of joint infections.

	711 Propose a differential diagnosis for a limp in a child differentiating between children near walking stage, toddler and older age groups. 712 Describe the clinical presentation, approach to diagnosis and management of the following conditions: Legg-Calves-Perthes disease, Slipped Capital Femoral Epiphesis, Transient synovitis.
Approach to Soft Tissue Disorders	713 Describe the pathology and list the physical findings of carpal tunnel syndrome. 714 Describe an approach to the assessment and diagnosis of common upper extremity soft tissue disorders and injuries: 1-Rotator cuff injuries, 2-Biceps tendon rupture, 3-Medial and lateral epicondylitis, 4-AC joint injuries, 5-De Quervain's tenosynovitis. 715 Describe an approach to the assessment and diagnosis of common lower extremity soft tissue disorders and injuries, e.g., ankle sprains, plantar fasciitis, meniscal tears, cruciate (ACL) tears, collateral ligament (LCL, MCL) tears, patelofemoral syndrome, trochanteric bursitis, iliotibial band syndrome.
Introduction to Biomechanics with Emphasis on the Hip and Knee	708 Discuss the concepts of forces across joints in posture and locomotion. 709 Describe the mechanisms of degenerative joint disease as they apply to maldistribution of mechanical forces across the lower limb joints. 710 Demonstrate an understanding of mechanical forces across joints in explaining the Trendelenberg sign & gait, abductor lurch gait, and how use of a cane or crutch can help with ambulation in painful hip joint pathology.
Anatomy: Wrist	639 Identify the muscles and neurovascular structures in the anterior (flexor/pronator) and posterior (extensor/supinator) compartments of the forearm, noting their relations. 641 Identify the distal ends of the radius and ulna, carpal bones, metacarpals and phalanges and their articulations. 644 Define carpal tunnel syndrome and identify the structures that are involved.

	645 Identify the muscular compartments of the hand. 647 List the innervation and blood supply to the hand
Radiology: Imaging of the Spine II (Pathology)	485 Distinguish normal alignment from mal-alignment. 486 Identify the benefits of imaging with CT & MRI compared to plain x-ray. 487 Choose the appropriate imaging tool for detection of normal vs abnormal bone, disc and nerves. 14646 Describe and recognize the common pathologies of the spine including disc disorders, fractures and infection
Radiology: Radiology of Infection	493 Describe the typical radiologic features of septic arthritis. 494 Describe the radiologic features of acute and chronic osteomyelitis. 495 Explain the importance of early recognition of infection. 496 Select imaging methods appropriate for identification of bone, joint and soft tissue infections.
Foundations Week 9 CDMQ	Any of the above objectives may be tested.

Foundations Week 10: Soft Tissue and Microbiology

Lecture	Session Objectives
Lupus	1300 Discuss the mechanisms of development and progression of autoimmune diseases. 1301 Recognize the typical clinical presentation of systemic lupus erythematosus (SLE) and understand how pathogenic autoantibodies might lead to their appearance. 1302 Generate an appropriate differential diagnosis. 1303 List diagnostic tests and procedures helpful in confirming the diagnosis of systemic lupus erythematosus (SLE). 1304 Discuss appropriate treatment and follow-up care for systemic lupus erythematosus (SLE).
Spondylarthropathies	726 Define the following terms: spondyloarthropathy, ankylosing spondylitis, Reiter's syndrome and enthesopathy. 727 Describe the clinical features of inflammatory back pain and contrast with those of mechanical back pain. 728 List the four seronegative spondyloarthropathies. 729 Describe the pathophysiology of the four spondyloarthropathies with emphasis on the interaction of environmental (infectious) and genetic (HLA-B27) factors. 730 Describe the clinical features of the four spondlyoarthopathies and contrast their extraarticular features with those of rheumatoid arthritis. 731 Explain the possible contributions of the following mechanisms to spondyloarthopathy pathogenesis: molecular mimicry, hypersensitivity and persistent organism. 732 Describe the radiological and laboratory features of spondyloarthropathies.
Pathology of Monoarthritis	508 Explain the pathophysiology of crystalline arthropathy. 509 Compare and contrast the clinical presentation and pathological features of gout and pseudogout.

	510 Describe approaches to treatment of gout and hyperuricemia. 511 Explain the pathogenesis of bone and joint infections and the common etiologic microorganisms 512 Describe the pathologic features of acute joint infections. 513 State the importance of early recognition of joint infections.
NSAIDs and DMARDs	5431 Describe the synthetic pathway (including key enzymes) for prostaglandins, thromboxanes, and leukotrienes from arachidonic acid and list the drugs affecting each enzyme. 5432 List the pharmacological actions of PGE2, PGF2, PGI2, TXA2 and the leukotrienes on smooth muscle, microvascular permeability, platelet function, sensory nerve endings, gastric and intestinal secretions, and the temperature regulation centre. 5433 Differentiate the mechanism of action of aspirin and acetaminophen. 5434 Compare and contrast the mechanism of action of aspirin, ibuprofen and selective COX-2 inhibitors. 5435 Explain the adverse effects and potential adverse drug interactions associated with inhibition of the COX1 pathway and describe the significance of COX2 5436 Describe the pharmacologic properties, contraindications and complications associated with these DMARDs (azathioprine, hydroxychloroquine, gold salts, methotrexate, infliximab).
Adult Musculoskeletal/Orthopaedics	270 Define osteoarthritis (OA) & rheumatoid arthritis (RA). 724 Describe clinical presentation, diagnosis and management of common upper extremity soft tissue disorders and injuries e.g., rotator cuff injuries, biceps tendon rupture, medial and lateral epicondylitis, AC joint injuries, De Quervain's tenosynovitis. 725 Describe the clinical presentation, diagnosis and management of common lower extremity soft tissue disorders and injuries e.g., ankle sprains, plantar fasciitis, meniscal

	tears, cruciate (ACL) tears, collateral ligament (LCL, MCL) tears, patelofemoral syndrome, trochanteric bursitis, iliotibial band syndrome
Pathophysiology of Osteoarthritis and JIA	280 Explain the pathogenesis of joint destruction in rheumatoid arthritis. 281 Identify the differences between healthy and diseased cartilage. 282 Describe the pathogenesis of osteoarthritis. 283 List the medical conditions leading to osteoarthritis, and describe how each leads to changes in articular cartilage. 284 Describe the cellular interactions in a joint that lead to osteoarthritis. 285 Describe inflammatory and immune pathways in the affected joints that produce arthtitis. 695 Define criteria for the diagnosis of juvenile idiopathic arthritis (JIA). 696 Describe the clinical presentation and management of children diagnosed with JIA. 697 Describe long term medical issues in patients afflicted with JIA.
Introduction to Infectious Diseases	207 Give a general classification of the different types of antimicrobial agents (antibiotics, antivirals, antifungals, etc.). 211 Outline principles of prescribing antimicrobial agents. 12890 Describe the role of the host in infectious diseases. 12891 Give a general classification of microorganisms (bacteria, virus, fungi, parasites). 12892 Recognize the various diagnostic modalities used for the detection of microorganisms in infectious diseases. 12893 Describe the various roles that an infectious diseases specialist may have.
Introduction to Microbiology	201 Recognize the general differences between Gram positive, Gram negative bacteria and mycobacteria cell wall composition. 202 Describe the function and relevance of bacterial structures and virulence determinants in the infectious disease process.

	203 Describe the mechanism of cell and tissue damage in bacterial pathogenesis. 12667 Describe the gram stain reaction. 12668 Describe the important steps in bacterial pathogenesis (attachment, colonization, invasion, etc).
Gram Positive Bacteria	205 Recognize medically important Gram positive pathogens in common infectious diseases. 12030 Identify important virulence factors among Gram positive bacteria (using Staphylococcus aureus and Streptococcus pyogenes as examples). 12670 Give a general classification for medically important Gram positive bacteria. 12886 Describe which gram positive organisms are part of the normal human microbiome (colonization, carrier state, etc.).
Gram Negative Bacteria	12031 Recognize medically important Gram negative pathogens in common infectious diseases. 12032 Identify important virulence factors among Gram negative bacteria (using Escherichia coli and Pseudomonas aeruginosa as examples). 12671 Give a general classification for medically important Gram negative bacteria. 12887 List which gram negative organisms are part of the normal human microbiome (colonization, carrier, etc.).
Microbiology: Introduction to Diagnostic Microbiology 1	234 Discuss the goals of laboratory diagnosis of infectious diseases and the diagnostic cycle in the clinical setting by following the diagnostic process through specimen set-up, culture identification, susceptibility testing, results interpretation and reporting. 235 Recognize the importance and limitations of laboratory diagnosis of infectious diseases using simulated specimens. 236 Explain the diagnostic value and limitations of the Gram stain by examining actual patient specimens. 12888 Identify microorganisms from examination of gram stains and other common staining methods.

Pathology: Chronic Inflammation	504 Identify the major types of inflammatory cells involved in chronic inflammation in a tissue section. 505 Identify a granuloma in a tissue section. 507 Identify by light microscopy chronic inflammation in different organs.
Radiology: Arthritis	488 Describe the common radiologic findings seen in osteoarthritis and inflammatory arthritides (rheumatoid arthritis and crystal arthropathies). 489 Identify the distribution of typical arthritides (osteoarthritis, crystal arthropathy and rheumatoid arthritis) in the knee, hip & pelvis and hand & wrists. 490 Classify the patterns of arthritides. 491 Describe the radiological modalities that can be used to determine distribution of arthritides. 492 Select the typical xrays used in an arthritis series.
Foundations Week 10 CDMQ	Any of the above objectives may be tested.

Foundations Week 11: Rheumatology & Microbiology

Lecture	Session Objectives
Acute Pneumonia	1288 Describe the epidemiology and natural history of acute pneumonia syndrome. 1289 Describe the potential causes of acute bacterial pneumonia syndrome, in relation to the organism causing the illness and pathogenesis. 1290 Discuss ways to prevent pneumonia. 1291 Describe the general characteristics of the herpes virus family associated with human disease. 1292 Recognize varicella-zoster virus (VZV) as the cause of chicken pox and shingles (zona). 1293 Explain the epidemiology, natural history, mode of transmission, spectrum of disease and consequences of VZV infection. 1294 Discuss the possible public health and infection control concerns of VZV, including the role of vaccine in prevention.
Varicella	1291 Describe the general characteristics of the herpes virus family associated with human disease. 1292 Recognize varicella-zoster virus (VZV) as the cause of chicken pox and shingles (zona) 1293 Explain the epidemiology, natural history, mode of transmission, spectrum of disease and consequences of VZV infection. 1294 Discuss the possible public health and infection control concerns of VZV, including the role of vaccine in prevention.
Viral Pathogens and Diseases	213 Describe the basic structure and major characteristics of a virus. 214 Describe the general life cycle of a virus. 12406 Describe the general mechanisms of virus transmission and disease production.
Vaccination and Prevention of Transmission of Microbes	196 Discuss the history and impact of vaccination. 197 Recognize the difference between active and passive immunization.

	198 Describe the immune response to vaccines (primary immune response vs secondary immune response). 199 Describe the various types of vaccines (inactivated, component, live-attenuated). 12672 Define herd immunity.
Viral Hepatitis	218 Recognize the most common agents responsible for viral hepatitis, including hepatitis A, hepatitis B and hepatitis C 219 Discuss the epidemiology, routes of transmission and risk factors for infections due to hepatitis A, B and C. 220 Describe the general management approaches of hepatitis A, B and C. 221 Recognize factors influencing disease progression and treatment outcomes, such as alcohol abuse or HIV coinfection. 12889 Interpret the diagnostic tests for hepatitis A, B, C.
Rheumatology	271 Describe clinical, radiological and laboratory features of OA & RA. 272 Describe extra-articular features of RA. 273 Describe the rheumatoid factor test and its significance. 274 Describe the pathophysiology of RA. 276 Explain the pathogenesis of joint destruction in RA. 277 Identify the radiological features of RA on X-ray. 278 Describe approaches to treatment of RA. 279 Contrast features of RA with OA both clinically and radiologically. 293 List the most common causes of an acute monoarthritis. 294 Describe relevant history, diagnostic tools and investigations of a patient presenting with an acute monoarthritis. 296 Describe the clinical and laboratory findings of gout. 297 Describe mechanisms of hyperuricemia. 298 Describe mechanisms of crystal-induced inflammation. 299 Describe clinical and laboratory features of pseudogout as well as disease associations. 5429 Compare and contrast the mechanisms of action of the following drugs used in the

	management of gout: colchicines, allopurinol, probenecid and sulfinpyrazone. 5430 Describe the dangerous side effects of colchicines.
Introduction to Antibiotics	12050 Classify the most commonly used antibiotics. 12051 Describe the mechanisms of cell wall synthesis inhibitors, inhibitors of protein synthesis and inhibitors of DNA replication. 12052 Describe the general spectrum of activity of antibiotics against Gram positive, Gram negative and anaerobic bacteria. 12055 Discuss the common mechanisms of resistance and recognize factors contributing to the development of resistance.
Antimicrobial Stewardship	211 Outline principles of prescribing antimicrobial agents. 12053 Recognize the determinants of antibiotics choice in treating infections. 12054 Recognize common adverse events associated with antibiotics. 12056 Describe the principles of appropriate antibiotic usage. 12673 Describe the principles of antimicrobial stewardship.
Microbiology: Introduction to Diagnostic Microbiology 2	234 Discuss the goals of laboratory diagnosis of infectious diseases and the diagnostic cycle in the clinical setting by following the diagnostic process through specimen set-up, culture identification, susceptibility testing, results interpretation and reporting. 235 Recognize the importance and limitations of laboratory diagnosis of infectious diseases using simulated specimens. 236 Explain the diagnostic value and limitations of the Gram stain by examining actual patient specimens. 12888 Identify microorganisms from examination of gram stains and other common staining methods
Radiology: Introduction to Fractures (Child)	675 Identify features of normal bones in the immature skeleton at varying ages. 676 Describe the normal growth plate of a child's bone and illustrate the use of the Salter-Harris classification of growth plate injuries, as applied to radiographic examples.

	677 Describe radiographic changes and principles of treatment associated with diagnosis of growth plate arrest in the injured immature skeleton. 678 Identify normal and abnormal findings as related to traumatic injury in children.
Foundations Week 11 CDMQ	Any of the above objectives may be tested.

Foundations Week 12: HIV

Lecture	Session Objectives
Introduction to Mycology	231 Recognize the morphological characteristics of yeast and filamentous fungal pathogens. 232 Recognize the clinical classification, common etiology and impact of human mycoses including superficial, cutaneous, sub-cutaneous and disseminated infections. 233 Discuss the available treatment options and mechanisms of action of anti-fungal agents including amphotericin B, the azoles, and echinocandins.
Introduction to Mycobacteria	12063 Recognize the epidemiology and mode of transmission of tuberculosis and contrast with those of other mycobacteria. 12064 Recognize the spectrum of disease associated with tuberculosis (TB) infection, including pulmonary and extra-pulmonary TB. 12065 Discuss the management of individuals with tuberculosis infection including public health issues. 12066 Discuss the issues related to mycobacterial infection in the context of other comorbidities such as HIV infection. 12068 Discuss the clinical presentation and management of other clinically relevant non-tuberculous mycobacteria
HIV Diseases: Transmission and Clinical Management	223 Describe the risk factors and modes of HIV transmission. 224 Describe the life-cycle of HIV 226 Recognize the clinical progression of HIV infection and its complications. 227 Explain the mechanism of action for each of the main classes of antiretroviral agents, the goals of treatment, and the importance of adherence. 12062 Recognize the most common opportunistic infections associated with advanced HIV infection and the role of prophylaxis. 12894 Appreciate the effects of HIV on the immune system.

	12895 Recognize the major co-morbidities associated with HIV infection.
HIV	1284 Recognize the epidemiology (local and global) and risk factors for HIV infection. 1285 Recognize the laboratory methods for diagnosis and management of HIV infected individuals (adults and children). 1286 Understand the natural history of HIV infection (including common opportunistic infections) and how that influences patient management including prophylaxis. 1287 Recognize the indications for treatment and the principles of combination antiretroviral therapy. 2545 Recognize the unique aspects of HIV infection and its management in children and during pregnancy. 2546 Recognize how HIV impacts on the natural history and management of co-infections including hepatitis C, tuberculosis and syphilis. 12110 Discuss the ethical balance between protecting the patient's privacy while protecting the health of others whom he/she may have infected.
Introduction to Parasitology	229 Describe the significance of parasitic diseases and their contribution to global morbidity and mortality. 12674 Provide an overview of parasites responsible for disease in humans. 12675 Describe vector borne parasitic infections using malaria as an example. 12676 Provide an overview of intestinal parasitic diseases spread by: fecal-oral route, contaminated soil and contaminated food.
Introduction to Infection Control	1279 Describe the appropriate infection control precautions and isolation measures to prevent transmission of infections in the clinical setting. 1281 Describe the blood-borne pathogens that can be transmitted via a needle stick injury. 1283 Describe the appropriate methods of hand hygiene and its importance in infection prevention. 12677 Describe the different ways infections can be transmitted.

	12678 Describe the appropriate methods of wearing personal protective equipment for the different isolation precautions used in health care settings. 12679 List important health-care associated infections, such as Clostridium difficile and methicillin-resistant Staphylococcus aureus (MRSA).
Interactive Cases in Infectious Diseases	1276 Describe the more serious infectious disease syndromes encountered in clinical practice (e.g. sepsis, meningitis, endocarditis and pneumonia). 12680 Review the common pathogens that cause serious infectious diseases.
Microbiology: Introduction to Diagnostic Microbiology 3	234 Discuss the goals of laboratory diagnosis of infectious diseases and the diagnostic cycle in the clinical setting by following the diagnostic process through specimen set-up, culture identification, susceptibility testing, results interpretation and reporting 235 Recognize the importance and limitations of laboratory diagnosis of infectious diseases using simulated specimens. 236 Explain the diagnostic value and limitations of the Gram stain by examining actual patient specimens. 12888 Identify microorganisms from examination of gram stains and other common staining methods
Radiology: Radiology of Tumors	497 Describe radiologic findings indicative of bone tumors. 498 Describe the radiologic findings that distinguish aggressive from non-aggressive MSK tumors. 499 Select the most common imaging methods used for identification of bone tumors. 500 Describe the typical radiologic finding seen in common benign soft tissue and bone tumors (lipoma, osteoid osteoma, non ossifying fibroma). 501 Describe the typical radiologic findings seen in common malignant soft tissue and bone tumors (liposarcoma, osteosarcoma, Ewings sarcoma & metastasis).

	502 Propose the most appropriate imaging method for identification of tumor matrix and tumor staging.
Radiology: Introduction to Fractures (Adult)	671 Describe the initial management of a fracture with respect to splinting and radiographic investigation. 672 Describe the basic management options (including pros and cons) for a fracture: cast, external fixation, percutaneous pinning, open reduction, intramedullary fixation. 673 Describe the neurovascular examination of the peripheral nerves for the upper and lower extremities. 674 Identify normal and abnormal findings as related to traumatic injury in adults.
Foundations Week 12 CDMQ	Any of the above objectives may be tested

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Unit 1 Lecture Objectives

Unit 1 Week 1: The Normal Heart

Lecture	Session Objectives
Basic Cardiac Structure & Function: Four Myths Debunked	2026 List the structures that make up the right heart border on an antero-posterior or postero-anterior x-ray of the thorax. 2027 Correctly define the concept of coronary dominance. 2028 State the major source of calcium ions allowing for myocardial contraction. 2029 Describe why myocardial relaxation is an energy-requiring process.
Introduction to the Cardiovascular System	1369 Describe the basic anatomy and physiology of the cardiovascular system. 1370 Distinguish functionally between the right heart and the left heart.
Introduction to the Electrical Activation of the Heart	1373 Explain the concept of action potential. 1374 Discuss the processes of impulse formation and impulse conduction. 1375 Describe the electrical anatomy of the heart and the various functions of its components. 1376 Review the myocardial electrical activity as measured on the electrocardiogram (ECG). 1377 Recognize P, QRS and T waves on an ECG and describe what they represent. 1378 Determine heart rate on an ECG and calculate the QRS axis. 1379 Demonstrate a systematic approach to ECG interpretation.
Myocardial Contraction	1380 List the components of the sarcomere and describe their function. 1381 Compare and contrast cardiac muscle cells with skeletal muscle cells. 1382 Explain the concept of excitation-contraction coupling. 1383 Outline the roles of adenosine triphosphate (ATP) and calcium in cardiac muscle contraction.

	1384 Recall that myocardial relaxation is an energy-requiring process.
Applied Cardiovascular Physiology	1345 Describe the process of right and left heart catheterization. 1346 Recall the normal pressures measured during right and left heart catheterization. 1347 Describe the pulmonary capillary wedge pressure as a measure of left atrial pressure. 1348 State the oxygen saturations measured during right and left heart catheterization in an individual with a normal heart. 1349 Calculate cardiac output by means of Fick method. 1351 List two indications each for right and left heart catheterization 1385 Distinguish between physiologic systole and clinical systole. 1386 Describe the 2 phases of clinical systole and the 4 phases of clinical diastole. 1387 Draw and label a Wigger's diagram, including left atrial, left ventricular and aortic pressure waveforms 1880 Explain the following formulas: a) blood pressure = cardiac output x total peripheral resistance; b) cardiac output = forward stroke volume x heart rate; c) stroke volume = end-diastolic volume – end-systolic volume.
Ventricular Function	1389 Describe the concepts of preload and afterload as they apply to ventricular function. 1390 Define contractility and discuss how it is measured clinically. 1391 Define compliance and apply the concept to ventricular (diastolic) function. 1392 List the determinants of end-diastolic volume 1393 Draw and label a pressure-volume loop for normal ventricular function. 1394 Draw and explain the Frank-Starling curve for normal ventricular function
Smooth Muscle and Coronary Physiology	1395 List endogenous vasodilators and vasoconstrictors and describe their mechanisms of action.

	1396 Contrast between endothelial-dependent and endothelial-independent vasodilatation. 1397 Discuss the concept of endothelial function. 1398 Describe the mechanisms of action of nitrates and adenosine on blood vessels.
ECG #1	1415 Apply a logical approach to the interpretation of ECGs. 1416 Calculate heart rate by means of the count-off method. 1417 Recall the definition of normal sinus rhythm. 1418 Calculate the QRS axis on an ECG. 1419 State the normal values for the 3 intervals on ECG: PR, QRS and QT. 1420 List the 3 conditions that must be met in order to produce a narrow QRS.
Histology: Histology of the Heart	1409 Name, identify and describe the three layers of the heart. 1410 Compare and contrast the endocardium in the different sections of the heart. 1411 Explain the differences between skeletal muscle and cardiac muscle. 1413 Distinguish between veins and arteries and identify their histological layers. 1993 Describe the components of the impulse-generating and conducting systems of the heart 1994 Distinguish between the contractile cardiomyocyte and the Purkinje fiber.
Anatomy: Anatomy of Heart and Pericardium	957 Describe the layers and function of the pericardium. 958 Describe and locate the pericardial cavity and it's sinuses. 959 Describe the anatomical placement of the heart and the points of auscultation. 960 Describe the borders of the heart including it's vascularization. 961 Locate the sulci of the heart. 962 Name and describe the anatomy of heart valves, moderator bands, and myocarcidum. 963 List the parts of the heart.

	964 Compare and contrast the left vs the right heart anatomically 965 Locate and describe the coronary artery branches and territories they supply and explain the concept of dominance. 967 List and locate the coronary veins and describe their drainage.
Autonomic Nervous System	1876 Identify the two arms of the autonomic nervous system (ANS). 1877 Describe the anatomy of the ANS, specifically as it pertains to the heart and to the vascular system. 1878 Discuss how the ANS produces its effects on the cardiovascular system. 1879 List the stimuli that evoke ANS responses and the hemodynamic effects of those responses.
Unit 1 Week 1 CDMQ	Any of the above objectives may be tested.

Unit 1 Week 2: Heart Failure

Lecture	Session Objectives
Pressure/Volume Loops in Cardiac Physiology	2814 Define preload, afterload and contractility 2815 Identify the four phases of the cardiac cycle and demonstrate where they are located on the pressure-volume loop 2817 Describe how cardiac load and contractility affect pump function.
Physiology of Abnormal Ventricular Function	1058 Describe the compensatory mechanisms of heart failure taking into account: neurohormonal alterations, ventricular hypertrophy and remodeling. 1080 Define preload, afterload, compliance and contractility, using a compliance curve for individual muscle fibers and the heart. 1081 Define cardiac output and stroke volume. 1082 Describe the Fick equation for the calculation of cardiac output and apply it to clinical cases. 1083 Be able to construct pressure/volume loops in various conditions of preload, afterload, and contractility. 1084 Describe the clinical and theraputic implications of alterations in preload, afterload, and contractility. 1085 Describe Starling's Law of the Heart and relate it to the clinical aspects of ventricular dysfunction. 1086 Apply knowledge of compliance curves to clinical problems.
Heart Failure	1057 Classify the types of heart failure: systolic, diastolic, left-sided and right-sided. 1059 Recognize the precipitating factors in heart failure. 1060 Describe the clinical presentation of heart failure including symptoms, signs and functional class. 1061 Recognize the modalities of prevention and treatment of heart failure including: diuretics, vasodilators, beta-blockers,

	aldosterone antagonists, inotropes and additional therapies. 1062 Describe clinical evaluation and investigations for heart failure. 1065 Define congestive heart failure. 1066 Describe the pathophysiology of heart failure as it relates to neuro-hormonal and Frank Starling compensatory mechanisms. 2034 List examples of conditions that cause left-sided, right-sided, systolic or diastolic heart failure.
Radiology: Introduction to Cardiac Imaging 1 - CXR	895 Describe the normal anatomy of the heart and great vessels on plain radiographs and on computed tomography (CT). 896 Identify enlargement of the cardiac chambers on plain radiography. 897 Identify interstitial pulmonary edema on plain radiography.
Chronic Heart Failure	1041 Classify types of heart failure and describe the types of ventricular dysfunction that can occur in ischemic heart disease and cardiomyopathy 1042 Describe the determinants of contractile function in the intact heart using illustrative pressure-volume loops 1043 Explain pathophysiological sequelae of heart failure on other organ systems. 1044 Describe the compensatory mechanisms which occur in heart failure: cardiac, renal, neurohormonal, and automatic. 1045 Develop a clinical problem solving strategy for chronic heart failure including acquiring appropriate data relevant to the history, physical exam and lab investigation. 1046 Discuss management of heart failure with reference to general measures, pharmacologic treatment to include an understanding of beta blockers, afterload reducing agents, digitalis and diuretics. 1047 Discuss the role of devices (implantable cardioverter defibrillators and cardiac resynchronization pacemakers) in chronic heart failure.

	1048 Devise a heart failure follow up routine to prevent avoidable morbidity and mortality.
Shock	1027 Define shock and explain it using the physiological principles of compliance, blood pressure and cardiac output. 1028 Describe the role of the normal circulatory system at all levels (cells, tissue, organs and system) 1029 Differentiate the types of shock. 1030 Classify conditions which lead to abnormal circulation and may lead to a condition of shock. 1031 Identify the clinical manifestations of shock. 1032 Explain the compensatory mechanisms used in shock. 1033 Describe the complications of shock 2036 Review the clinical manifestation of heart failure.
Acute Decompensated Heart Failure	2032 Define acute decompensated heart failure and describe its different presentations 2037 Recognize the modalities for treatment of acute compensated heart failure including: diuretics, vasodilators, inotropes and mechanical support. 2038 Distinguish between pulmonary edema of cardiogenic and non-cardiogenic origin. 12951 List precipitants for acute decompensated heart failure. 12952 Review the clinical assessment in relation to clinical hemodynamic profiles (congestion and perfusion).
ECG #2	1323 List 3 conditions that can account for a wide-complex QRS. 1324 State the criteria for right atrial and left atrial enlargement. 1325 Apply criteria for left ventricular hypertrophy (LVH, Sokolow-Lyon) and list several conditions that can cause LVH. 1326 Identify right ventricular hypertrophy on a 12-lead ECG. 1415 Apply a logical approach to the interpretation of ECGs

Cardiomyopathy	1141 Recall and identify the pathophysiology of myocardial diseases and cardiomyopathies 1320 Define and classify cardiomyopathies 1321 Describe the etiology, pathology, pathophysiology, clinical findings, physical exam, diagnostic studies, treatment, and prognosis of the following: Dilated cardiomyopathy, Hypertrophic cardiomyopathy and Restrictive cardiomyopathy.
Regulation of the Effective Circulating Volume	11261 Explain in 2 or 3 sentences what the term Effective Circulating Volume (ECV) means, including mention of why this volume is important. 11262 List the anatomic ECV detectors and describe what it is that is actually detected. 11263 List in general the effector mechanisms responsible for maintenance of the ECV. 11264 Describe the effects of heart failure on the ECV and the renal response to these effects.
Pharmacologic Treatment of Heart Failure	2039 Recall the therapeutic strategy for the management of heart failure. 2040 Describe how the pharmacologic mechanism of a drug addresses the specific pathophysiologic derangement responsible for heart failure. 2041 List the mechanism of action, indications, contraindications and principle side effects of the major classes of cardiac drugs: Vasodilators: ACEI, ARB, Nitrates, diuretics, Analgesia – morphine, Pressor amines and Beta blockers. 2042 Recognize the cost/benefits of drug therapy and consequences on quality of life (QOL).
Unit 1 Week 2 CDMQ	Any of the above objectives may be tested.

Unit 1 Week 3: Coronary Artery Disease

Lecture	Session Objectives
Complications of Post Acute Myocardial Infarction	2649 Describe the role of plaque rupture in Acute Myocardial Infarction (AMI) 2650 Identify and understand the complications of AMI
Anti-Anginal Therapies	2043 Describe the relationship between myocardial oxygen supply and demand in the development of angina 2044 Classify anti-anginal agents and describe their physiological mechanism of action and adverse effects. 2045 Describe concurrent optimal medical therapies for patient with angina. 2046 Describe the indications for more aggressive anti-anginal intervention such as revascularization
Ischemia	1099 Describe the coronary circulation. 1100 Explain the concept of myocardial supply and demand 1101 Explain the consequences of ischemia. 1102 List pathological examples in which the blood flow does not meet the demands of the body. 1103 Describe the pathophysiology of mocardial ischemia 1104 Define and classify the different types of angina. 1106 Describe the manifestations and treatment of angina.
Pathology of Atherosclerosis	1093 State the prevalence and complications of atherosclerosis. 1094 List and describe the risk factors for the formation of atherosclerosis. 1095 Describe the pathogenesis of atherosclerosis. 1096 List the consequences of atherosclerosis and the organs affected. 1097 Describe the treatment and prevention of atherosclerosis.

Myocardial Ischemia Testing - Exercise ECG/MPI/Stress Echo	1125 Recognize the concept of and the indications for stress testing. 1126 Recognize the different techniques of stress testing. 1127 Describe the advantages and limitations of each type of stress testing and explain the rationale for the performance of non-invasive testing. 1128 Explain the mechanism of action of the following myocardial stressors: exercise, dobutamine, dypiridamole, adenosine.
Stable CAD	1119 Recognize the continuum of ischemic heart disease from stable ischemic syndrome to acute coronary syndrome. 1122 Recognize the concepts of unstable angina pectoris and myocardial infarction. 1612 Describe the pathophysiology of the early and late changes in myocardial infarction. 1613 Outline the treatment of ST-elevation myocardial infarction (STEMI). 1614 Itemize and describe the pathophysiology of the major complications of STEMI as they related to: Recurrant ischemia, Arrhythmias, Myocardial dysfunction, Right Ventricular Infarction, Mechanical Complications, Pericarditis, Thromboembolism. 1615 Describe the therapeutic approach to acute MI and it's complications.
Acute Coronary Syndromes + Antithrombotic and Reperfusion Therapy	1114 Describe the pathophysiology of acute coronary syndrome and ST elevation Myocardial infarction (STEMI). 1115 List and describe the complications of acute coronary syndrome 1116 Distinguish between reversible and irreversible cardiac damage 1117 State the prevalence of the complications of acute coronary syndrome and STEMI 1118 Describe the diagnostic tests and management of acute coronary syndrome 1617 Recognize the factors leading to plaque instability.

	1618 Explain the mechanism of platelet activation and coagulation cascade. 1619 Distinguish between acute ACS and STEMI. 1620 List the pharmacological agents used in the treatment of ACS. 1621 Recognize indications for invasive investigations and treatment in stable angina and acute coronary syndrome. 1087 Recognize the pharmacology of thrombolytics and antiplatelet agents. 1088 Explain the coagulation cascade and platelet receptors and differentiate the mechanisms of action of anticoagulation agents and antiplatelets 1089 List the contraindications to the use fibrinolytic agents 1090 List the mechanical therapies of reperfusion in acute coronary syndrome 1091 Recognize the indications and limitations of mechanical versus pharmacological treatment of acute coronary syndrome 1092 Describe the advantages and limitations of primary PCI versus thrombolytic therapy in the treatment of ST elevation myocardial infarction (STEMI).
ECG #3	1415 Apply a logical approach to the interpretation of ECGs. 1831 Recognize the ECG manifestations of reperfusion after STEMI. 11267 Identify and interpret ST segment depression on ECG. 11268 Identify and interpret ST segment elevation on ECG 11269 Identify and interpret Q waves on ECG.
Anatomy: Introduction to Blood Vessels	970 Define: vein, artery, capillary and anastomosis 971 Describe the circulation of blood flow in the systemic and pulmonary circuits. 972 Summarize the role and pathway of blood flow in the hepatic portal circulation.

	973 Compare and contrast arteries and veins, arterioles and venules, and describe capillary beds 974 Identify the following structures: superior and inferior vena cava, pulmonary arteries, pulmonary veins, aortic arch, aorta, subclavian arteries and veins, brachiocephalic trunk. 975 Identify the major arteries and veins of the upper and lower limbs.
Histology: Histology of Blood Vessels	1412 Name and describe the function of the layers of the blood vessels. 1414 Compare and contrast the histological organization of arteries vs veins 1992 Name and describe the three layers (tunics) of the wall of the heart.
Clinical and Pathological Ischemia and Infarction	1099 Describe the coronary circulation. 1100 Explain the concept of myocardial supply and demand. 1101 Explain the consequences of ischemia. 1102 List pathological examples in which the blood flow does not meet the demands of the body 1129 Review the pathology of the coronary arteries and how plaque complications lead to clinical manifestations in the myocardium. 1130 Discuss the pathology of acute and old myocardial infarcts. 1134 Discuss the mechanical complications of acute myocardial infarcts. 2901 Recognize the pathophysiology of mocardial ischemia. 2902 Classify and define the different types of angina and describe the manifestations & treatment of angina.
Unit 1 Week 3 CDMQ	Any of the above objectives may be tested.

Unit 1 Week 4: Valvular Heart Disease

Lecture	Session Objectives
Rheumatic Fever & Heart Disease	1981 Describe the epidemiology of rheumatic fever including populations at risk and individuals are at risk. 1982 Describe the pathogenesis of rheumatic fever. 1983 Outline the Jones Criteria for the diagnosis of acute rheumatic fever 1984 Describe the primary and secondary methods for prevention for acute rheumatic fever(ARF) 1985 Describe the clinical presentation, course, and treatment of acute rheumatic fever. 2896 Describe the long term sequelae of acute rheumatic fever
Valvular Heart Disease	1439 Describe the etiology, patho physiology (pressure/volume loops, Wiggers diagram), clinical manifestations (heart sounds, murmurs, pulses, JVP) of valvular (aortic, pulmonary, mitral, tricuspid) stenosis and regurgitation 1440 List the causes of mitral valve stenosis and regurgitation 1441 Describe the pathophysiology of mitral valve stenosis and regurgitation on the flow of blood and heart sounds 1442 List the causes of aortic stenosis and describe its effects on the flow of blood and heart sounds. 1444 Draw a Wiggers diagram contrasting normal heart function with: mitral valve stenosis, mitral valve regurgitation, aortic stenosis, tricuspid regurgitation, tricuspid stenosis, pulmonary regurgitation and pulmonary stenosis
Pulmonary Hypertension - Part 1	12137 Define pulmonary hypertension and identify the methods by which it is commonly measured 12138 Classify pulmonary hypertension into five groups (as per the WHO

	classification/Venice criteria) and give examples of each. 12139 Describe the pathophysiology of pulmonary hypertension secondary to left heart disease (WHO group 2). 12140 Describe the anatomic and functional changes that occur in the pulmonary arteries as a consequence of chronic pulmonary hypertension 12141 Define cor pulmonale and outline its clinical manifestations and management.
Surgery of Valvular Disease	1944 Recognize the indications for valvular surgery for aortic or mitral valve disease. 1945 Compare the risks and benefits of mechanical versus tissue valves. 1946 Describe the percutaneous options for the treatment of valvular disease
Stable Valvular Heart Disease	1431 Describe the mechanics of normal atrioventricular and semi-lunar valve function. 1432 Describe the relationship of the normal heart sounds to the cardiac cycle and correlate the timing to the ECG. 1433 Explain the concept of stenosis, insufficiency (regurgitation) and pressure gradients 1434 Outline the causes of valve dysfunction. 1435 List and explain the diagnostic investigations used to evaluate valvular dysfunction including: a. History & physical b.ECG, c. CXR, d. Echo, e. Cardic catheterization , f. MRI, g. Exercise testing. 1436 Correlate the signs and symptoms of valvular dysfunction with the physiological disturbance. 1437 Describe the treatment modalities, medical/ surgical/ interventional, to correct the disturbance, improve symptoms or slow progression of cardiac dysfunction.
Endocarditis	1421 Define the diagnostic criteria and most relevant diagnostic tests for endocarditis.

	1422 Classify endocarditis according to clinical course, host substrate, and infecting organism. 1423 Describe the pathogenesis of, and list the predisposing conditions for the development of, endocarditis. 1425 List the most important organisms responsible for endocarditis. 1426 Itemize and describe the pathophysioloy of the numerous complications of endocarditis, such as mechanical injury, embolic phenomena, and immune injury 1428 Describe the cardinal clinical manifestations and the principles of treatment of endocarditis.
Pericardial Disease	1885 Review the anatomy and function of the pericardium. 1887 Describe the following pathophysiological conditions: tamponade, constrictive pericarditis and restrictive pericarditis. 1888 Compare and contrast pericardial effusion and cardiac tamponade. 1890 Define and describe the mechanism involved in pulsus paradoxus. 1892 Compare and contrast acute vs. chronic pericarditis. 1893 Describe the laboratory tests and diagnostic tools used in the detection of pericarditis. 1894 Describe the acquired diseases of and list the congenital diseases of the pericardium.
Mechanisms of Arrhythmia	2074 Define bradycardia. 2075 Describe the general and specific mechanisms of bradyarrhythmia. 2076 Identify the two electrical structures of the heart that can account for bradycardia. 2077 Describe the two levels of AV block. 2078 Explain why 1° (first degree) heart block in and of itself does not account for bradycardia. 2079 Distinguish between 2° (second degree) type 1 and type 2 heart blocks in terms of

	both ECG manifestation and clinical implication. 2080 Recognize 3° (third degree) heart block (also known as complete heart block). 2081 Define tachycardia. 2082 Describe the general and specific mechanisms of tachyarrhythmia. 2084 Describe the algorithm and mechanisms of narrow-complex and wide complex tachycardia. 2085 Describe the different mechanisms and types of narrow-complex tachycardia 2086 Describe the different mechanisms and types of wide complex tachycardia. 2087 Distinguish between ventricular tachycardia and supraventricular tachycardia with aberrancy.
Heart ECHO/valve	2047 Itemize the three modalities generally performed with cardiac ECHO. 2048 Describe the standard transthoracic 2-D echocardiographic views. 2049 Describe the physiology of contractility, hemodynamic gradients, valve areas, degree of regurgitation as derived by cardiac echo. 2050 Recognize and describe the cardinal echocardiographic features of normal and abnormal cardiac valves. 2632 Recall pressure-volume loops in varying conditions of preload, afterload and contractility. 2633 Explain the principles of cardiac ultrasound with emphasis on the assessment of LV function. 2634 Describe the utility of cardiac ECHO on assessing acute and chronic heart failure.
Pathology: Pathology of Valvular Disease	1146 Identify the valves in a normal heart and their anatomical position 1147 Identify for each valve: the annulus, the leaflets, the closing margins of the leaflets, the free edge of the leaflets, the chordae tendoneae (chords), the papillary muscles, and the commissures.

	1148 Recognize the commonest cause of mitral valve insufficiency, mitral stenosis, and aortic valve disease
Aortic Pathology and Peripheral Arterial Disease	12129 Describe the incidence, pathogenesis, clinical manifestations, work-up and treatment of true aortic aneurysms 12130 Compare and contrast between true aneurysms of the ascending thoracic aorta and those of the descending thoracic and abdominal aorta. 12131 Compare and contrast between true and false aneurysms (pseudoaneurysms) of the aorta 12132 Describe the pathogenesis, classification (Stanford Classification), clinical manifestations, work-up and treatment of acute aortic dissection. 12133 Describe the incidence, pathogenesis, clinical manifestations and work-up of peripheral arterial disease (PAD). 12134 Delineate the medical and mechanical (surgical and percutaneous) interventions used in the treatment of PAD. 12135 Outline the clinical characteristics of the two large vessel vasculitides: Takayasu arteritis and giant cell arteritis 12136 Define the problem of varicose veins and answer the following question: why would varicose veins be of concern to a cardiac surgeon (give two reasons)?
Unit 1 Week 4 CDMQ	Any of the above objectives may be tested.

Unit 1 Week 5: Congenital Heart Disease

Lecture	Session Objectives
Cardiovascular Embryology	1676 Describe the embryonic origins (primordial) of the cardiovascular system. 1677 Explain circulation in the embryo, a fetus and the newborn. 1678 Describe the process of looping and septation of the heart. 1679 Describe the origins of congenital abnormalities of the heart and great vessels.
Physiology of Congenital Heart Disease	1697 List the major differences between the adult and fetal circulations. 1698 Explain the role of pulmonary vascular resistance in the presentation of congenital heart disease 1699 Describe the normal transition to extrauterine life.
Radiology: Introduction to Cardiac Imaging 2 - CT, MRI	898 Name one indication for cardiac CT angiography. 899 List two indications and two contraindications for cardiac MRI. 900 Explain the disadvantages of cardiac CT angiography. 11266 Describe the normal anatomy of the heart and great vessels on computed tomography (CT).
Pediatric Case (Cardiology)	1787 Describe 3 genetic causes of congenital heart disease 1788 List indications for surgical closure of large left to right shunts. 1789 Explain the delay in presentation of large left to right shunts. 1790 Recognize the normal right ventricular dominance of neonatal ECG's. 2691 Identify and analyse ethical issues posed by religious and cultural beliefs and customs (e.g., refusal of blood transfusions).
Outline of Congenital Heart Disease	1700 Design and explain a scheme for aiding the diagnosis and management of the myriad of congenital heart defects (i.e., cyanotic vs.

	non-cyanotic, normal or low pulmonary flow vs. excess pulmonary flow). 1701 Explain how congenital heart disease causes cyanosis 12120 Describe the method and utility of the hyperoxic test to aid in the diagnosis of congenital heart disease 12121 Recognize the signs of critical left ventricular obstruction. 12122 Understand the action and indications for prostaglandin E1 (PGE1).
ECG #4	1328 Define sinus tachycardia. 1329 Distinguish between sinus node and AV node causes of bradycardia. 1330 Distinguish between the several types of AV block. 1331 Demonstrate a logical approach to the ECG interpretation of tachycardia. 1332 Recognize atrial flutter and atrial fibrillation. 1333 List factors that distinguish ventricular tachycardia (VT) from supraventricular tachycardia (SVT) with aberrancy. 1415 Apply a logical approach to the interpretation of ECGs
Arrhythmia Treatments	2088 Recognize the indications for permanent pacemaker implantation as treatment for bradycardia. 2089 Describe the three most common types of pacemaker. 2090 Outline the Vaughn-Williams classification for antiarrhythmic agents and list representative drugs from each class. 2091 Describe the types of tacchyarrhythmia which could be treated by ablation 12118 Distinguish between rate-control and rhythm-control strategies in atrial fibrillation. 12119 Describe the approach to stroke risk management in atrial fibrillation and atrial flutter.
Clinical Problems in Pediatric Cardiology	12123 Outline an approach to the child with chest pain, including a differential diagnosis.

	12124 Outline an approach to the child with palpitations. 12125 Outline an approach to the child with syncope, list the signs and symptoms suggesting a cardiac cause for syncope, and describe the basic mechanism of vasovagal syncope. 12126 Distinguish the features of an innocent vs. pathologic murmur. 12127 Describe the signs and symptoms of congestive heart failure in an infant. 12128 Describe the major clinical features of Kawasaki Syndrome (including diagnostic criteria) and its cause and racial prevalences; give a differential diagnosis.
Unit 1 Week 5 CDMQ	Any of the above objectives may be tested.

Unit 1 Week 6: Oncology

Lecture	Session Objectives
Introduction to Neoplasia	1557 Define neoplasia and describe the features that differentiate benign versus malignant neoplasms 11372 Describe the process of tumor genesis. 11373 Explain tumor staging and grading. 11374 Discuss the concept of tumor metastasis.
Introduction to Radiation Oncology	11381 Explain how radiation therapy works. 11382 Discuss the possible advantages and disadvantages of radiation therapy 11383 Explain the use of radiation therapy as primary treatment in certain cancers 11384 Discuss the role of palliative radiation therapy.
Neoplasms: Melanoma With Bone Mets	1545 Discuss the risk factors associated to skin cancer. 1546 Describe the different clinical features of a malignant skin lesion. 1547 Describe the general approach to screening staging, diagnosing and treatment for cancer (using melanoma as an example). 1548 Discuss the treatment modalities for early stage melanoma – surgery, radiation and systemic therapy 1551 Illustrate the importance of multidisciplinary approach in cancer care. 12324 Discuss the treatment modalities for advanced melanoma – surgery, radiation and systemic therapy. 12325 Describe the presentation and discuss treatment options of a spinal cord compression secondary to metastatic melanoma.
Introduction to Systemic Treatment	11378 Briefly describe the mechanism of action for each class of chemotherapeutic agents. 12319 Describe the different classes of chemotherapy agents. 12320 Discuss specific side effects associated with each class of chemotherapy agents.

	12321 Provide a brief overview of Biological/Targeted agents used in the treatment of different malignancies.
Introduction to Colorectal Cancer	11387 Describe the role of systemic therapy as it relates to neoadjuvant, adjuvant and palliative treatment. 12304 Describe the risk factors associated with colon cancer. 12305 Describe the clinical presentation of colon cancer. 12306 Describe the steps involved in making a diagnosis of colon cancer. 12307 Explain how colon cancer is staged. 12308 Outline the approach to making treatment decisions in colon cancer patients. 12309 Name the main categories of systemic therapy used for colon cancer and give an example for each category. 12310 Develop and understanding for the importance of a multidisciplinary approach in the care of the colon cancer patient.
Introduction to Lung Cancer	11387 Describe the role of systemic therapy as it relates to neoadjuvant, adjuvant and palliative treatment. 12311 Describe the risk factors associated with lung cancer. 12312 Describe the clinical presentation of lung cancer. 12313 Describe the steps involved in making a diagnosis of lung cancer 12314 Describe the histological classification of lung cancer. 12315 Explain how lung cancer is staged. 12316 Outline the approach to making treatment decisions for lung cancer patients. 12317 Name the main categories of systemic therapy used in lung cancer and give an example for each category 12318 Develop and understanding for the importance of a multidisciplinary approach in the care of the lung cancer patient.
Tumor Board Rounds - Part 1	12322 Describe the need for Tumor Board Rounds.

	12323 Illustrate the importance of a Tumor Board Round in making treatment decisions for patients with cancer. 12333 Describe the approach to the presentation of a cancer patient being discussed at a tumor board round.
Tumor Board Rounds - Part 2 (Breast Cancer)	11387 Describe the role of systemic therapy as it relates to neoadjuvant, adjuvant and palliative treatment. 12326 Describe the risk factors associated with breast cancer. 12327 Describe the clinical presentation of breast cancer. 12328 Describe the steps involved in making a diagnosis of breast cancer. 12329 Explain how breast cancer is staged. 12330 Outline the approach to making treatment decisions for breast cancer patients. 12331 Name the main categories of systemic therapy used in breast cancer and give an example for each category. 12332 Develop an understanding for the importance of a multidisciplinary approach in the care of the breast cancer patient.
Pathology: Neoplasms	1562 Review the major gross and microscopic features of benign versus malignant neoplasms. 1563 Review major features of the cytologic appearance of benign versus malignant cells 1564 Review the concepts of invasion and metastasis.
Radiology: Introduction to Radiological Features of Cancerous Lesions	11406 List and describe the various radiological modalities used in cancer diagnosis and management. 11407 Describe the radiological features used to differentiate benign from malignant lesions. 11408 Identify cancer screening tools
Unit 1 Week 6 CDMQ	Any of the above objectives may be tested.

Unit 1 Week 7: Normal Airway & Lungs

Lecture	Session Objectives
Anatomy of the Respiratory System	2703 Recognize the structure, terminology and topography of the respiratory system including trachea, bronchi, pleura and lungs
Pulmonary Mechanics 1	2473 Illustrate the pressure-volume curve of the respiratory system, and use the curve to define compliance and functional residual capacity 2474 Recognize how changes that occur in muscle activity alter respiratory system pressures to cause inspiration and expiration, and list the muscles involved in these activities. 12088 Define the terms pressure, flow, resistance, and compliance. 12089 Describe how the chest wall and alveoli interact via the pleural space to create the mechanical properties of the respiratory system. 12090 Describe the effects of common disease states and surfactant on the pressure-volume curve of the respiratory system.
Gas Exchange 1	2272 Estimate the PC02 and P02 from values given for alveolar gas composition and barometric pressure 12091 Calculate normal arterial-alveolar oxygen gradient (PA-a02) and indicate the normal range for PA-a02. 12092 Define partial pressure, anatomical and physiological dead spaces, and alveolar ventilation, and describe how to calculate alveolar ventilation when dead space, tidal volume and respiratory rate are given. 12093 Explain how oxygen and carbon dioxide are carried in the blood. 12094 Explain the significance of the shape of the normal oxyhemoglobin dissociation curve and the consequence of changes in the oxyhemoglobin dissociation curve. 12095 Recognize why ventilation-perfusion matching is necessary to optimize oxygenation, and the mechanisms the lung

	uses to preserve ventilation-perfusion matching 12096 Explain why differences in ventilation or perfusion in lung units reduce arterial PO2, and explain why the presence of lung units with high VA/Q do not compensate for the presence of lung units with low VA/Q.
Respirology: Fundamentals, iPads and Dead Trees	12295 Describe how the chest wall and alveoli interact via the pleural space to create the mechanical properties of the respiratory system. 12296 Illustrate the pressure-volume curve of the respiratory system, and use the curve to define compliance and functional residual capacity. 12297 Recognize how changes that occur in muscle activity alter respiratory system pressures to cause inspiration and expiration, and list the muscles involved in these activities. 12298 Describe the normal anatomy of the chest on plain films (radiographs). 12299 Explain the significance of the shape of the normal oxyhemoglobin dissociation curve. 12300 Estimate the pC02 and P02 from values given for alveolar gas composition and barometric pressure 12301 Recognize why ventilation-perfusion matching is necessary to optimize oxygenation, and the mechanisms the lung uses to preserve ventilation-perfusion matching 12302 Explain why differences in ventilation or perfusion in lung units reduce arterial PO2, and explain why the presence of lung units with high VA/Q do not compensate for the presence of lung units with low VA/Q 12303 Recognize values and flow-volume loops obtained by spirometry that would be indicative of an obstructive or restrictive disorder
Pulmonary Mechanics 2	2480 Recognize the causes of dynamic hyperinflation.

	2481 Explain the concept of work of breathing and explain how patients with lung disease can minimize their work of breathing. 2483 Describe how the equal pressure point affects the shape of the flow-volume loop during spirometry, and recognize how gas trapping occurs.
PFT/Spirometry/Methacholine Challenge	2500 Describe how spirometry is used to diagnose lung disease 2501 Describe how spirometry is performed and recognize the factors that may prevent a spirometry test from giving a reliable result. 2502 Recognize the factors that may prevent a spirometry test from giving a reliable result. 2503 Recognize the shape of a normal time-volume curve and flow-volume loop. 2504 Recognize values and flow-volume loops obtained by spirometry that would be indicative of an obstructive, restrictive or mixed disorder. 2505 Describe the measurement of lung volumes and diffusing capacity. 2506 Explain how bronchodilator response is determined. 2507 Describe how the methacholine challenge test is performed, list the indications for its use, and describe how it is interpreted.
Radiology: Introduction to Chest and Sinus Radiology	902 Recall the basic principles of X-rays. 903 Recall how a chest X-ray is obtained. 904 Describe the normal anatomy of the chest and paranasal sinuses on plain films. 11342 Recognize airspace disease, interstitial disease, a lung nodule or mass and a pleural effusion on plain films.
Histology: Respiratory System	1189 Describe the histology of the respiratory epithelium, and demonstrate the ability to identify the different tissue layers making up the respiratory tract (i.e., mucosa, submucosa, cartilage layer and adventitia). 1190 Recognize the concept of the mucociliary blanket. 1191 Describe the structure of the alveoli.

	1192 Explain how the alveoli allow for gas exchange. 1193 Identify the components of the trachea, bronchi and bronchioles. 1686 Compare and contrast the conducting portion and the respiratory portion of the respiratory system.
Anatomy: Upper Airway	1215 Identify the following structures relating to the larynx: base of tongue, vallecula, epiglottis, aryepiglottic folds, arytenoids, true vocal cords, false vocal cords, pharyngeal walls, hypopharynx, hyoid, thyroid cartilage, cricoid cartilage, thyroid hyoid membrane. 3337 Identify the following structures of the Nasal Cavity: Inferior, middle and superior turbinates, Septum, Mucosa, Choana, Inferior, middle and superior meati, nasal ala, nasal tip and nasal dorsum, olfactory nerve and the cribiform plate; Little's Area. 3338 Identify and describe the three parts of the pharynx. 3339 Describe the location and function of the adenoids, palatine tonsils and lingual tonsils, and define Waldeyer's Ring. 3341 Indicate the position of the true vocal cords during phonation and respiration 3342 List the cartilages of the larynx. 3343 Name the nerves responsible for the motor function and sensation of the larynx. 3344 Identify the maxillary, ethmoid, frontal and sphenoid sinuses and the drainage sites for each of the sinuses, and explain the relationship of the sinuses to the orbit and the brain.
Gas Exchange 2	2488 Explain the factors determining the rate of diffusion across the alveolar-capillary membrane 2499 Describe how the alveolar PO2, diffusing capacity, transit time and venous PO2 have on pulmonary end-capillary PO2. 11334 Describe the regional differences in ventilation and perfusion in the lung, why they occur, and how they affect PaO2.

	12099 Understand the difference between arterial oxygen content and oxygen delivery
Unit 1 Week 7 CDMQ	Any of the above objectives may be tested.

Unit 1 Week 8: The Lungs in Health & Failure

Lecture	Session Objectives
Obstructive Sleep Apnea	2288 Recognize the risk factors for obstructive sleep apnea (OSA) and outline the differences between pediatric and adult OSA 2290 Explain what happens in the upper airway during an episode of sleep apnea, and the pathophysiology of obstructive sleep apnea (OSA) 2291 List other forms of sleep-disordered breathing. 2292 Describe typical findings on the polysomnogram in a patient with obstructive sleep apnea, including the examination of multiple simultaneous variables 2293 List the key treatments available for the management of obstructive sleep apnea in children, adults and individuals with cognitive impairment, such as trisomy 21 and briefly explain how continuous positive airway pressure (CPAP) works to treat OSA. 2420 Describe the common symptoms, clinical history, and typical physical examination findings of obstructive sleep apnea. 12097 Explain how OSA leads to daytime sleepiness and other cognitive side effects, cardiovascular abnormalities, and pulmonary hypertension. 12098 Describe how the severity of obstructive sleep apnea is determined.
The Lungs and the Environment - Indoor/Outdoor Air Pollution	11347 Recognize the contaminants that may affect indoor air quality and influence respiratory health. 11348 List important outdoor air pollutants, their important causes, and their effects on health.
Radiology: Introduction to CT of the Chest and Sinuses	903 Recall how a chest X-ray is obtained. 905 Recognize a mediastinal and a lung window on a CT scan of the chest. 906 Recognize airspace disease, interstitial disease, a lung nodule or mass and a pleural effusion on CT scan

	907 List 3 indications for a CT scan of the chest. 11344 Describe the normal anatomy of the chest, including the lungs and mediastinum and paranasal sinuses on CT scan.
Control of Ventilation	932 Describe the anatomic structures involved in control of breathing and their function. 933 Explain the homeostatic mechanisms used to control Pa02 and PaCO2 934 Differentiate disorders of control of breathing (Won't Breathe Disorders) from mechanical disorders (Can't Breathe Disorders). 935 Understand the use of arterial blood gases and spirometry to determine the cause of respiratory failure in a patient. 2425 Define central, obstructive and mixed apneas.
Blood Gases	1739 List the independently measured values in arterial blood gases and outline the normal values of these variables 1741 Describe the measurement of oxygenation: saturation vs partial pressure of the gases versus arterial oxygen content. 1743 Define respiratory acidosis and alkalosis, and metabolic acidosis and alkalosis, and explain how respiratory and metabolic compensation occur 2451 Develop an approach to identifying acute and chronic metabolic acidosis and alkalosis, including mixed disorders 2462 Define the following terms: acute respiratory acidosis, acute respiratory alkalosis, chronic respiratory acidosis, chronic respiratory alkalosis, metabolic acidosis and metabolic alkalosis. 2463 Explain the inter-relation between HCO3 and PCO2. 12104 Explain how compensation occurs in blood gas disorders, identify the importance of the normal compensation values, and describe how this can be used to determine whether relevant compensation has occurred.

Upper Airway Anatomy	1194 Recognize the pathway of air travel from the environment through the nose to the lung 1197 Describe the vascular and nerve supply to the nose. 1198 List and briefly describe the four main physiological functions of the nose including filtration and protection, humidification and warming, olfaction, vocal resonance. 1203 Define anosmia and hyposmia and create a short differential diagnosis (2 per category) for anosmia based on the following: 1) neural etiology, obstructive etiology. 1205 Recognize how a loss of olfaction may lead to a loss of sense of taste. 1206 Recognize otolaryngology as a specialty
Obstructive Sleep Apnea	2288 Recognize the risk factors for obstructive sleep apnea (OSA) and outline the differences between pediatric and adult OSA 2289 List the important clinical information used to determine the severity of obstructive sleep apnea (OSA) and explain which physiologic impairments lead to the serious outcomes of OSA, including the effects of sleep fragmentation and sympathetic nervous system activation in the development of daytime sleepiness and cardiovascular consequences. 2290 Explain what happens in the upper airway during an episode of sleep apnea, and the pathophysiology of obstructive sleep apnea (OSA). 2291 List other forms of sleep-disordered breathing. 2292 Describe typical findings on the polysomnogram in a patient with obstructive sleep apnea, including the examination of multiple simultaneous variables 2293 List the key treatments available for the management of obstructive sleep apnea in children, adults and individuals with cognitive impairment, such as trisomy 21 and briefly explain how continuous positive airway pressure (CPAP) works to treat OSA.

	2294 Explain how positive airway pressure therapy works to treat obstructive sleep apnea, briefly explain the difference between constant airway pressure support and bi-level support, and briefly describe the different types of patient interfaces available for patients on positive airway pressure therapy 2418 Recognize the pathophysiology of CO2 narcosis and the need for controlled flow O2 therapy 2419 Recognize the indications and results of home O2 therapy 2420 Describe the common symptoms, clinical history, and typical physical examination findings of obstructive sleep apnea. 2423 Distinguish the various forms of chronic respiratory failure and develop an approach to individuals with combined causes of respiratory failure. 2424 Explain the pathophysiology of chronic pulmonary hypertension and recognize why cor pulmonale develops.
Oxygen Delivery: Heart, Lungs and RBCs	1338 Trace the oxygen delivery system from ambient air to the cellular level. 1339 Define oxygen content, oxygen saturation and partial pressure of oxygen. 1340 Describe the mechanisms of hypoxemia and relate them to their position in the alveolar O2 equation. 1341 Outline the methods of clinical and laboratory assessment of cyanosis, hypoxemia and tissue hypoxia. 1342 Compare the effects of methemoglobin and sulfhemoglobin on oxygen delivery and content as a method to understand oxygen delivery.
Respiratory Failure	2458 Define respiratory failure and distinguish between acute and chronic respiratory failure, and between hypoxic and hypercapneic respiratory failure. 2461 List the causes of hypoxemia and hypercapnia, and describe an approach to

	determining the cause of respiratory failure, including combined respiratory failure. 2465 Define acute respiratory distress syndrome (ARDS) and describe its pathophysiology and effect on gas exchange. 12100 Briefly discuss management strategies for ARDS, including the use of a mechanical ventilator. 12101 Explain the mechanisms of acute respiratory acidosis, chronic respiratory acidosis, and acute respiratory alkalosis. 12102 Explain how the alveolar-arterial O2 gradient can be used to help determine the cause of respiratory failure. 12103 Outline important causes of ARDS, and describe its clinical manifestations and radiographic appearance.
Embryology, Physiology of the Newborn, Respiratory Distress in the Newborn	2329 Review the key development stages of lung embryogenesis. 2330 Describe the roles of pulmonary fluid, fetal breathing movements, and surfactant production in lung development and the prevention of infant respiratory distress syndrome. 2331 Identify the pulmonary and cardiovascular changes which need to occur at birth to permit a smooth transition to extra-uterine breathing. 2332 Describe the key aspects of neonatal pulmonary physiology. 2333 Recognize the clinical presentation and differential diagnosis of respiratory distress in the newborn, and describe the approach management, including the role of surfactant therapy. 2334 Recognize the causes, presentation and radiographic appearance of respiratory distress syndrome and bronchopulmonary dysplasia
Sleep Lab Sessions	1748 Describe the respiratory and non-respiratory indications for nocturnal polysomnography (PSG). 1749 List the usual physiological variables measured during polysomnography (PSG).

	1751 Describe the physiologic findings in the various forms of sleep-disordered breathing. 2336 Explain the normal effects of sleep on respiration and recognize normal findings on the sleep study. 2337 Describe how central and obstructive sleep apnea, and hypopnea are distinguished in the sleep laboratory. 2340 Describe the common treatments for obstructive sleep apnea, including positive pressure mask ventilation (CPAP and BiPAP), tracheostomy, surgery, and dental appliances.
Basics of Exercise Physiology and Exercise Testing	2320 Describe the changes in ventilation and cardiac output that occur during exercise. 2321 Explain the relationship between oxygen consumption, carbon dioxide production and workload during exercise. 2322 Describe the significance and determination of maximum oxygen consumption (VO2max), maximum workload (Wmax), and anaerobic threshold. 2323 Recognize the factors that limit exercise in healthy people, and recognize how and why cardiac or pulmonary function may limit exercise during disease states.. 2325 Explain the concept of exercise-induced bronchospasm. 2327 Identify the indications for exercise testing and its limitations.
Introduction to Ventilators, CPAP, BiPAP	11335 List the indications for mechanical ventilation, and outline when oxygen therapy, invasive ventilation, and non-invasive ventilation should be used for a patient in acute or chronic respiratory failure. 11336 Describe the advantages and disadvantages of invasive and non-invasive ventilation. 11337 List the key respiratory parameters that can be controlled with a ventilator, and explain how these parameters are affected by the patient's underlying respiratory system physiology.

	11338 Explain how positive airway pressure therapy works to treat obstructive sleep apnea, briefly explain the difference between constant airway pressure support and bi-level support, and briefly describe the different types of patient interfaces available for patients on positive airway pressure therapy.. 12105 Recognize the indications, results, and complications of home O2 therapy, including the pathophysiology of CO2 narcosis and the need for controlled flow O2 therapy, and describe how supplemental oxygen may be delivered in the home. 12106 Define mechanical ventilation and the terms “invasive ventilation” and “non-invasive ventilation”.
Unit 1 Week 8 CDMQ	Any of the above objectives may be tested.

Unit 1 Week 9: Airway Diseases

Lecture	Session Objectives
Rhinitis	1363 Recognize the prevalence of rhinosinusitis. 1364 Define allergic rhinitis, vasomotor rhinitis and rhinitis medicamentosa. 1365 Identify the presenting symptoms for allergic rhinitis, vasomotor rhinitis and rhinitis medicamentosa. 1366 Identify the physical exam findings suggesting allergic rhinitis, vasomotor rhinitis and rhinitis medicamentosa 1367 Describe how a family physician, allergist and otolaryngologist may all play a role in the treatment of rhinitis.
Approach to Cough	1963 Outline the basic pathophysiologic mechanism of cough. 1964 Develop a differential diagnosis for a patient presenting with a cough. 1965 Outline the details of the history in a patient presenting with a cough (acute and chronic). 1966 Describe the methodology used in investigating a patient who presents with cough alone.
Asthma	1731 State the prevalence and epidemiology of asthma in children and adult. 1732 Explain the pathophysiology of asthma including causes of airway obstruction in asthma, and the mechanisms of inflammation related to asthma, and describe the histological changes that occur in the airways during the progression of chronic asthma. 1734 List triggers associated with asthma attacks. 1735 List the symptoms and findings on the physical examination associated with asthma. 1736 List the typical changes seen during pulmonary function testing in individuals with asthma, and describe how this helps in the diagnosis of asthma.

	1737 Briefly describe the pharmacological and non-pharmacological treatments of asthma.
Respiratory Pharmacology	2470 Explain the mechanism of action, adverse effects and appropriate use of the following medications: short- and long-acting bronchodilators, short- and longacting anticholinergic inhaled medications, methylxanthines, leukotriene receptor antagonists and corticosteroids - inhaled and systemic. 2471 Describe the function and correct use of the different types of inhalers devices.
COPD	919 Define chronic obstructive pulmonary disease (COPD), chronic bronchitis, emphysema and bronchiectasis 920 Trace the pivotal role of smoking in the development and progression of COPD 923 Define and trace the etiology of a COPD exacerbation. 2453 Explain the pathophysiology of chronic bronchitis and emphysema, and compare and contrast chronic obstructive pulmonary disease (COPD) and asthma. 2456 Describe symptomatic management of chronic obstructive pulmonary disease (COPD), including pharmacotherapeutics, pulmonary rehabilitation, and patient education and support, and describe how COPD affects the quality of life of patients. 12112 Recognize the symptoms, physical signs, radiographic appearance, and effects on pulmonary function of chronic bronchitis and emphysema. 14696 Provide a differential diagnosis for an individual presenting with an acute exacerbation of COPD, and describe an approach to distinguish between these possible diagnoses. 14697 Discuss the treatment of an acute exacerbation of COPD.
Asthma and Chronic Rhinosinusitis	936 Describe the symptomatic presentation of asthma in the child and adult patient.

	939 Describe a logical approach to the use of medications to treat asthma, and describe factors which can interfere with the achievement of good asthma control. 940 Describe how to initially assess the severity of asthma based on clinical findings and initial laboratory tests. 941 Develop an action plan for asthma in a clinical setting 1646 Compare and contrast upper respiratory tract infection (URTI), acute sinusitis and chronic rhinosinusitis. 1647 List the 4 most common pathogens in acute rhinosinusitis. 1649 Define Samter's triad. 1650 List the pertinent symptoms and signs in a patient presenting with acute and chronic rhinosinusitis and list risk factors for the development of rhinosinusitis. 1651 Explain the concept of acute complicated rhinosinusitis and recognize that a sinus infection can spread to the brain, orbit and cavernous sinus. 1652 Describe the treatment of acute rhinosinusitis. 1653 Recognize when and when not to order sinonasal imaging. 11346 List important triggers for asthma in children and adult.
Cystic Fibrosis Lab	2438 Indicate how cystic fibrosis is diagnosed, its pathophysiology, genetics, microbiology, and common symptoms. 2439 State the prevalence and prognosis of cystic fibrosis. 2440 Describe the treatment of cystic fibrosis, including nutrition, physiotherapy, pharmacological treatments, lung transplant and psycho-social support, and understand the roles of the various members of the multidisciplinary team in carrying out these treatments. 12117 List the organ systems frequently affected in cystic fibrosis. 12918 Define bronchiectasis, and describe its effects on respiratory function.

Acute and Complicated Rhinosinusitis	1646 Compare and contrast upper respiratory tract infection (URTI), acute sinusitis and chronic rhinosinusitis. 1647 List the 4 most common pathogens in acute rhinosinusitis. 1649 Define Samter's triad. 1650 List the pertinent symptoms and signs in a patient presenting with acute and chronic rhinosinusitis and list risk factors for the development of rhinosinusitis 1651 Explain the concept of acute complicated rhinosinusitis and recognize that a sinus infection can spread to the brain, orbit and cavernous sinus. 11345 Describe the treatment of acute rhinosinusitis and describe how a family physician, allergist and otolaryngologist may all play a role in the treatment of rhinosinusitis
Adenotonsillar Disease	1155 Identify the following structures: palatine tonsils, adenoids, lingual tonsils, Waldeyer's ring, tonsillith. 1157 Describe the role of the tonsils/adenoids in the immunosurveillance system. 1159 Recognize how infectious tonsillitis may affect other organ systems 1160 Explain how to grade the size of tonsils. 1161 Compare and contrast the clinical presentation, diagnosis and treatment of tonsillitis, peritonsillar cellulitis, peritonsillar abscess and mononucleosis. 1162 Recognize the symptoms and signs suggesting adenotonsillar hypertrophy. 1163 List the absolute and relative indications for tonsillectomy and adenoidectomy.
Pathology: Airway Diseases of the Respiratory Tract	4128 Identify inflammatory changes of the respiratory mucosa. 4129 Identify a nasal polyp. 4132 Identify the pathologic changes in COPD (emphysema/bronchitis) bronchiectasis, cystic fibrosis, asthma and pediatric viral bronchiolitis.

Anatomy: Lower Respiratory Tree	11351 Identify the following: trachea, mainstem bronchi, bronchi to right upper lobe (RUL), right middle lobe (RML), right lower lobe (RLL), left upper lobe (LUL), left lower lobe (LLL), bronchioles, lobes of the lung, mediastinum, diaphragm, pleura, ribs, sternum. 11352 List the differences between the left and the right main stem bronchi.
Radiology: Abnormal Airways	908 List the most important radiographic findings in patients with asthma, emphysema and cystic fibrosis. 909 Identify centrilobular emphysema and bronchiectasis on CT scan. 910 Recognize the radiographic appearance of 2 common complications of asthma. 911 List 2 indications for a CT scan in patients with cystic fibrosis 912 List one indication for a CT scan in patients with suspected emphysema.
Unit 1 Week 9 CDMQ	Any of the above objectives may be tested.

Unit 1 Week 10: Pneumonitis

Lecture	Session Objectives
Sarcoidosis	1968 Review the basic pathology of sarcoidosis 1969 Identify the usual presentation of sarcoidosis. 1970 List the widespread systemic involvement and manifestations of sarcoidosis. 1971 Assess how sarcoidosis may fit into the family of interstitial lung diseases 1972 Describe the basic principles of investigation and management of sarcoidosis.
Approach to Antibiotics for Respiratory Infections	1643 Describe how bacterial resistance influences treatment decisions and outcome in respiratory tract infections 2384 Describe an approach to the use of antibiotics for the outpatient treatment of community-acquired pneumonia 11353 List the common classes of antibiotics used for respiratory infections, and the types of bacteria each major class of antibiotics is generally effective against.
Community and Hospital-Acquired Pneumonia	2377 List the host defenses that protect people from developing pneumonia. 2378 Define and explain the differences between community-acquired pneumonia, health care-associated pneumonia, and hospital-acquired pneumonia. Compare and contrast the common organisms responsible for each type of pneumonia and their management. 2379 Describe radiologic features of lobar pneumonia and interstitial pneumonia. 2380 Compare and contrast typical and atypical pneumonia and describe the organisms commonly causing both types of pneumonia in the normal adult host, the immunocompromised host and the elderly. 2382 List the signs and symptoms of pneumonia and describe the diagnostic measures used to diagnose it and determine

	the infecting organism. List the indications to proceed with testing for specific organisms. 2385 Describe key measures for the prevention of pneumonia. 12109 Indicate the main classes of antibiotics used to treat community-acquired, health care-associated and hospital-acquired pneumonia. Discuss the current guidelines recommended for the treatment of each type of pneumonia.
Tuberculosis	2405 Discuss the public health importance of tuberculosis (TB) from a global and Canadian perspective and identify which groups of Canadians are at greater risk for TB infection. 2406 Discuss the microbiologic properties of Mycobacterium tuberculosis and its mode of spread. 2407 Describe the pathogenesis and histopathology of Mycobacterium tuberculosis infection including the role of the immune system. 2408 Compare clinical and radiographic features of primary and reactivation pulmonary tuberculosis. 2409 Discuss the use and interpretation of the tuberculin skin test. 2410 Discuss the general principles of treatment of active and latent TB infection, and how control measures are used to prevent spread of TB infections 12113 Outline how control measures are used to prevent spread of TB infection.
Pediatric Stridor and Acute Respiratory Infections	1642 Explain why respiratory infections are common and serious in children, and why children are more susceptible to respiratory infections 1644 Recognize underlying conditions that may predispose children to respiratory tract infections. 2020 Identify the causative organism(s), presentation, diagnosis, and treatment of common pediatric respiratory tract infections: epiglottitis, croup, pertussis, bronchiolitis,

	bacterial pneumonia, viral pneumonia and mycoplasmal pneumonia. 2021 Describe the differences between sturtor, inspiratory stridor and expiratory wheezing. 2022 Develop an approach to determining the cause of respiratory distress associated with stridor or wheezing in children and recognize important non-infectious causes of stridor, such as laryngomalacia 2023 Identify life-threatening pediatric airway emergencies based on history and physical examination.
Pneumonia and COPD	2415 Describe the causes and manifestations of acute exacerbations of chronic bronchitis. 2440 Describe the treatment of cystic fibrosis, including nutrition, physiotherapy, pharmacological treatments, lung transplant and psycho-social support, and understand the roles of the various members of the multidisciplinary team in carrying out these treatments. 11354 Describe the symptoms and radiographic appearance of pneumonia, and explain how to assess pneumonia severity. 12107 Explain how pneumonia can precipitate respiratory failure in an individual with underling lung disease. 12108 Describe the management of pneumonia, and how to decide whether someone with pneumonia should be admitted to hospital. 14696 Provide a differential diagnosis for an individual presenting with an acute exacerbation of COPD, and describe an approach to distinguish between these possible diagnoses. 14697 Discuss the treatment of an acute exacerbation of COPD.
Interstitial Lung Diseases	1724 Define interstitial lung disease, and understand the differences between idiopathic and secondary interstitial lung diseases. 2445 Review the signs and symptoms of interstitial pneumonitis.

	2446 List the diagnostic procedures used for investigating the patient presenting with interstitial lung disease. 11357 Describe the key clinical and radiographic features of the common idiopathic interstitial lung diseases, and common classes of secondary interstitial lung disease. 11358 Describe the treatment of idiopathic interstitial pneumonia. 12111 Recognize the effects of interstitial lung disease on pulmonary function tests and arterial blood gases.
Occupational Lung Diseases	11349 Describe key causes, symptoms and types of occupational lung disease. 11350 List common occupational exposures that lead to occupational asthma.
Radiology: Radiology of Interstitial Lung Disease	11359 Review the key features of the common idiopathic interstitial lung diseases on the chest radiograph and CT Chest 11360 Describe the key radiographic features of common secondary interstitial lung diseases. 11361 Describe how CT imaging can assist with the diagnosis of interstitial pneumonitis.
Pathology: Pathology of Interstitial Lung Disease	1721 Describe the normal interstitium and the changes in cells and lung architecture that may occur in interstitial lung disease. 11362 Describe the key pathologic features of the common idiopathic interstitial lung diseases. 11363 Describe the pathologic features of common secondary interstitial lung diseases: sarcoidosis, pneumoconiosis, and collagen vascular disease and compare and contrast their pathological features 11364 Describe the key pathologic features of pulmonary vascular diseases.
Pathology: Respiratory Infections	11366 Describe the pathologic stages of pneumonia caused by Streptococcus pneumoniae.

	11367 List the key pathologic findings in bacterial lobar pneumonia, bronchopneumonia and atypical pneumonia. 11368 Describe the pathologic features of infectious interstitial pneumonia, including viral pneumonia. 11369 Outline the pathology of common complications of pneumonia.
Radiology: Radiology of Respiratory Infections	913 Identify croup, lobar pneumonia, bronchopneumonia and interstitial pneumonia on plain x-rays and CT scan. 915 Interpret a soft tissue neck x-ray and identify features consistent with each of the following: epiglottitis, supraglottitis and retropharyngeal space infection. 916 List the radiographic features of complications of pneumonia, including empyema and lung abscess. 917 List 3 indications for a CT scan of the neck and chest in the setting of an infection 12726 Identify the common long-term radiological findings of the common granulomatous infections (TB, Histoplasmosis).
Unit 1 Week 10 CDMQ	Any of the above objectives may be tested.

Unit 1 Week 11: Lung Cancer

Lecture	Session Objectives
Multidisciplinary Tumor Board	2351 State the incidence, risk factors, prevalence and prognosis of lung cancer. 2352 Describe the different types of lung cancer, their prevalence, and their presentation. 2353 Explain the clinical staging of lung cancer (TNM classification). 2354 Describe the treatment for lung cancer according to various staging/cell types. 2355 Describe the appropriate use of the different modalities for managing lung cancer, and the role of multidisciplinary consultation and management. 2356 Describe common and important complications of lung cancer, and the use of different treatment modalities to manage these complications.
Radiology: Radiology of Lung Neoplasms	887 Recognize the difference between a benign and malignant lung nodule on plain films and CT scan 888 Explain the most common radiologic appearance of squamous cell, small cell and adenocarcinoma of the lung.
Pleural Fluid Physiology and Non-Malignant Effusions	2359 Explain the factors relating to the development of pleural effusions. 2362 List common causes of transudative and exudative pleural effusions. 2363 List the signs and symptoms associated with pleural effusions. 2364 Differentiate between a parapneumonic effusion and an empyema. 2370 Define pleural effusion and its relationship to pleural anatomy. 12169 List diagnostic tests required for diagnosis of pleural effusion.
Lung Cancer	2342 Describe the pathological classification of lung cancer, the known risk factors and patterns, and chest radiographic and CT appearance of each type of lung cancer.

	2343 Recognize the many presentations of lung cancer, including intra- and extra-thoracic manifestations. 2344 Recognize the common causes of hemoptysis, and develop an approach to the investigation of hemoptysis 2345 Describe the chest radiographic and CT appearance of each type of lung cancer. 2346 Develop an approach to differentiate malignant from non-malignant lung nodules. 2348 Define the terms "operability" and "resectability" with respect to lung cancers. 2349 Describe the emotional issues associated with the diagnosis of lung cancer, for both the patient and the family. 2350 Recognize the goals of end-of-life decision making and palliative care. 2681 Discuss ethical aspects of resource allocation in cases where treatment is futile. 2682 Discuss how the link between cigarette smoking and lung cancer was revealed.
Physiology of Voice and Hoarseness	1856 Explain how the lungs, larynx and upper airway all contribute to voice. 1858 Describe the nerve supply to the larynx and explain the movement of the vocal cords during phonation and respiration 1863 Explain how a vocal cord nodule develops. 1864 Define the symptoms of laryngeal disease including hoarseness, odynophagia, dysphagia and stridor. 1866 Provide a differential diagnosis for the patient presenting with hoarseness.
Head and Neck Malignancy	866 Recognize the different levels of care offered by different institutions including the type of staff. 886 List 3 common sites of tumour occurrence in the head and neck. 2011 Recognize the concept of a primary malignant tumour and lymph node metastasis in the oral cavity/oropharynx/larynx/neck. 2014 List the risk factors for squamous cell carcinoma of the head and neck.

	2015 Identify the common presenting symptoms for cancer of the following locations: oral cavity, oropharynx and larynx. 2016 Describe the features of a malignant lesion in the oral cavity, larynx and neck. 2017 Explain the concept of tumour staging. 2018 Recognize the management strategies for patients with head and neck cancer.
Pleural Malignancy	2367 Develop an understanding of pleural malignancy. 2368 Explain the difference between primary and secondary malignancies of the pleura and describe their symptomatology. 12170 List common sites of origin of malignant pleural effusions 12724 Describe where a chest tube should be placed and explain the anatomic rationale for chest tube placement; discuss the indications and risk of thoracentesis.
Pleural Diseases	12171 Outline the basics of how a thoracentesis is performed. 12172 List indications for thoracentesis and chest tube placement. 12173 Describe the use of suction drainage. 12174 Describe when it is appropriate to remove the chest tube. 12175 Describe complications of thoracentesis and chest tubes insertions 12176 Describe the management of recurrent malignant pleural effusion.
Pathology: Cancer of the Lung and Airways	2683 Identify the pathologic changes in the four common types of lung cancer. 2684 Identify the pathologic changes in head and neck malignancies. 2686 Identify the pathologic changes in acute and chronic pulmonary embolism. 4138 Identify the pathologic features of mesothelioma.
Airway Obstruction & Trach's	1209 Identify the parts of a tracheostomy tube including: inner canula, introducer, tracheostomy tube, phalanges, tracheostomy tie, cuff, and cork.

	1210 Compare and contrast tracheostomy and cricothyroidotomy. 1213 List three indications for placement of a tracheostomy tube. 1631 Recognize how pathology in the upper airway may contribute to airway obstruction. 1632 Recognize the presenting signs of a patient with airway obstruction. 1633 Explain how upper airway infections (e.g. supraglottitis) may lead to airway obstruction.
Unit 1 Week 11 CDMQ	Any of the above objectives may be tested.

Unit 1 Week 12: Lymphoma

Lecture	Session Objectives
Lymphatic Function & Anatomy	1024 List the components of the lymphatic system. 1025 Describe the general anatomy/structure of lymph nodes and the spleen with respect to lymph and blood flow 1026 Describe the purpose of the lymphatic system, including the functions of the lymph nodes and spleen.
Malignant Lymphomas and Multiple Myeloma	782 Describe the clinical presentation of lymphoma. 783 Provide a simple classification system for lymphoma. 784 Differentiate between Non-Hodgkin's lymphoma and Hodgkin's lymphomas with respect to clinical presentation and prognosis. 785 Describe the Ann Arbor staging system for lymphoma. 786 Describe the genetic mechanisms involved in the development of lymphoma. 787 Discuss the diagnosis, stagging and clinical presentation of multiple myeloma.
Lymphoma	778 List the non-malignant causes of lymphadenopathy and describe features that characterize a malignant, versus a benign lymph node 779 Describe the steps involved in making a diagnosis of lymphoma. 780 Explain how lymphoma is staged. 781 Briefly outline the treatment options in lymphoma and in particular Hodgkin's lymphoma 2541 Describe the Ann Arbor Staging for lymphoma. 12253 Recognize the common clinical features and complications of plasma cell myeloma. 12254 List and describe the laboratory tests used in the diagnosis and work up of plasma cell myeloma.

	12255 Develop an understanding for the importance of the staging systems for plasma cell myeloma. 12256 Outline the general treatment options for plasma cell myeloma.
Anatomy: Thorax & Diaphragm	951 List the parts of the sternum. 952 Name the different types of ribs and their parts 953 Name and describe the importance of the inter-costal muscles. 954 Name and describe the location of the inter-costal nerves, arteries and veins 955 Describe the innervation and vascularization of the diaphragm. 956 List the three major hiatuses and the vessels that go through each.
Pathology: Myeloma and Lymphoma	12335 Recognize plasma cell myeloma (multiple myeloma) in the bone marrow aspirate. 12336 Recognize rouleaux formation in the peripheral blood. 12337 Recognize the more common lymphomas, including Hodgkin's disease, follicular lymphoma, and diffuse large B-cell lymphoma.
Unit 1 Week 12 CDMQ	Any of the above objectives may be tested.

Unit 1 Week 13: Leukemia

Lecture	Session Objectives
Flow Cytometry	1227 Define the term immunophenotype. 1228 Discuss the basic principles of flow cytometry immunophenotyping: laser and fluorescently tagged antibodies. 1229 Illustrate by case interpretation how flow cytometry can aid in the diagnosis of: acute leukemia, chronic lymphocytic leukemia and the lymphomas.
Leukemia	243 Discuss the diagnostic tests used for the acute and chronic leukemias (specifically: chronic lymphocytic leukemia, acute lymphoblastic leukemia and acute myeloid leukemia). 244 Discuss the clinical features of the acute and chronic leukemias (specifically chronic lymphocytic leukemia, acute lymphoblastic leukemia and acute myeloid leukemia). 245 Compare and contrast acute lymphoblastic leukemia and acute myeloid leukemia with respect to laboratory findings and clinical features. 12412 Categorize leukemias into acute leukemias (acute lymphoblastic leukemia and acute myeloid leukemia) and chronic leukemias (chronic lymphocytic leukemia and chronic myeloid leukemia).
White Blood Cell Morphology - Part 2 (Malignant Hematology)	246 Explain the meaning of the term monoclonal 14775: Identify the morphological features of acute and chronic leukemias, myelodysplasia and myeloproliferative disorders (polycythemia vera, essential thrombocytosis and myelofibrosis
Leukemia (Lecture)	243 Discuss the diagnostic tests used for the acute and chronic leukemias (specifically: chronic lymphocytic leukemia, acute lymphoblastic leukemia and acute myeloid leukemia). 244 Discuss the clinical features of the acute and chronic leukemias (specifically chronic

	lymphocytic leukemia, acute lymphoblastic leukemia and acute myeloid leukemia). 245 Compare and contrast acute lymphoblastic leukemia and acute myeloid leukemia with respect to laboratory findings and clinical features. 12412 Categorize leukemias into acute leukemias (acute lymphoblastic leukemia and acute myeloid leukemia) and chronic leukemias (chronic lymphocytic leukemia and chronic myeloid leukemia).
Leukemia (TBL)	772 Name and describe the diagnostic tools involved in the diagnosis of leukemia. 773 Interpret basic flow cytometry results in peripheral blood or bone marrow samples. 774 Recognize the clinical features of the acute leukemias. 775 Explain the importance of genetic alterations in leukemia with regard to prognosis. 776 Compare and contrast the prognosis of the acute leukemias in adults and children 777 Outline a general treatment plan for the acute leukemias 5426 Recognize the importance of cell-cycle specificity of chemotherapeutic agents and justify the use of combinations of these drugs to treat cancer. 5427 Explain the mechanism of action and major toxicities of each of the following major classes of chemotherapeutic agents: drugs that act on DNA (cisplatin, cyclophosphamide, nitrosureas); antimetabolites (5-fluorouracil, gemcitabine, methotrexate); natural products (doxorubicin); antimitotics (paclitaxel, vinblastine, vincristine); steroids (prednisone); antiestrogens (aromatase inhibitors, tamoxifen); miscellaneous agents (interferon).
Pulmonary Hypertension - Part 2	1334 List the causes of pulmonary arterial hypertension (WHO group 1). 1335 Describe the pathophysiology of pulmonary arterial hypertension.

	1336 Describe the clinical characteristics of idiopathic pulmonary arterial hypertension 1337 Outline the treatments of pulmonary arterial hypertension and their mechanisms of action. 12167 Describe the pathophysiology of pulmonary hypertension secondary to lung disorders, hypoxemia, or both (WHO group 3) 12168 Describe the pathophysiology of pulmonary hypertension secondary to chronic thrombotic or embolic disorders (WHO group 4).
Angiography and Interventional Radiology	1623 Recognize the scope and fundamental principles of interventional radiology 1624 List the risk factors for complications of an intervention. 1625 Recognize the angiographic appearance of common arterial and venous diseases. 1626 Explain the purpose of various types of drains, devices and intravascular therapies performed with image guidance. 1627 Recognize the potential impact of a proposed intervention on pre-existing illness, and related feasibility of the intervention. 1628 Recognize the importance of accurate, current, clinical information on radiology consultation forms.
Myeloproliferative Disorders and Myelodysplasia	1779 List the myeloproliferative disorders (polycythemia rubra vera, essential thrombocytosis, myelofibrosis and chronic myeloid leukemia). 1780 Define myelodysplasia and describe the etiology, clinical presentation, and hematologic findings. 1781 Describe the etiology, clinical presentation, and hematologic findings of the following myeloproliferative disorders: polycythemia rubra vera, essential thrombocytosis and myelofibrosis. 1783 Identify the diagnostic approaches, the treatment options and prognostic factors for myelodysplasia.

	1784 Identify the diagnostic approaches to, the treatment options and prognostic factors for the following myeloproliferative disorders: polycythemia rubra vera, essential thrombocytosis and myelofibrosis.
Anatomy: Neck & Mediastinum	1217 Identify the triangles of the neck and the location of lymph nodes within the neck 1219 Identify the following structures within the neck: carotid artery, jugular vein, larynx, strap muscles, thyroid, sternocleidomastoid muscle, clavicle, sternal notch, esophagus, recurrent laryngeal nerve, vagus nerve and phrenic nerve. 2064 Describe the limitations of the mediastinum. 2065 List the organs found in the mediastinum.
Imaging of Venous Thromboembolism and Pulmonary Hypertension	890 Recognize a central pulmonary embolus on a CT scan. 891 List the radiographic findings of pulmonary hypertension on plain films and a CT scan. 892 List the different imaging modalities used in the investigation of patients with suspected venous thrombosis and embolism. 893 Describe the role of CT and MRI in the investigation of patients with pulmonary hypertension. 894 List the advantages, disadvantages, indications and contraindications of a CT scan in the investigation of patients with suspected pulmonary embolism.
Epistaxis	2001 List the blood supply to the nose. 2002 Identify Kiesselbach's plexus/Little's area. 2003 Recognize the difference between anterior and posterior epistaxis. 2004 List the risk factors for epistaxis. 2005 List and explain the treatment options for acute management of anterior epistaxis. 2006 List and explain the treatment options for acute management of posterior epistaxis.

	2007 Describe how to potentially prevent epistaxis.
Unit 1 Week 13 CDMQ	Any of the above objectives may be tested.

Unit 1 Week 14: Kidney Anatomy & Function

Lecture	Session Objectives
Tour of the Nephron	1595 Describe the effects of afferent and efferent arteriolar tone on renal blood flow and GFR. 1596 Explain the role of prostaglandins and the effect of NSAIDs in glomerular filtration. 12427 Define glomerular filtration rate. 12428 Define creatinine clearance. 12429 Describe tubular transport systems in the major areas of the nephron.
Glomerular Filtration	1589 Define the following terms: glomerular filtration, filtration fraction, and clearance of a substance by the kidney 1592 List substances which can be filtered through the glomerulus in normal and pathological conditions. 1594 Describe the mechanisms of autoregulation of the glomerular filtration rate (GFR) and renal blood flow. 1596 Explain the role of prostaglandins and the effect of NSAIDs in glomerular filtration. 1598 State several methods to estimate the glomerular filtration rate.
Trouble Voiding	1910 Define glomerular filtration. 1912 State the limitations of calculations of the glomerular filtration rate. 1913 Propose a diagnostic approach for a patient with hematuria and differentiate glomerular from non glomerular hematuria. 1914 Describe a diagnostic approach for prostate cancer. 1915 List possible treatment strategies for prostate cancer. 2871 Explain why urinary tract obstruction can result in decreased glomerular filtration rate (GFR).
Renal Tubular Function	1580 Describe what is meant by Fractional excretion 1601 List the major transport functions of the: proximal tubule, thick ascending limb/loop of Henle, distal tubule and collecting tubule

	1602 Describe types of tubular transport systems, identifying major mechanisms for Na transport in each major nephron segment. 1603 Provide one example of a sodium transport system in each major nephron segment, by sketching the tubular cell(s) and the transport sites.
Kidney Stones	1510 Know the possible symptoms associated with kidney stones. 1511 Define renal colic and provide a differential diagnosis for the symptoms. 1512 List the most common chemical components of renal stones. 1513 Recognize ways to prevent the formation of kidney stones.
Basic Urology	1452 Describe the physiological and neurological processes involved in micturition, including voluntary control of micturition, innervation and movement of the ureter 1453 List common causes, pathophysiologic mechanisms and consequences for the following problems of micturition: urinary retention (acute obstruction vs. chronic obstruction, complete obstruction vs. incomplete obstruction) and incontinence. 1454 List the symptoms and possible causes of bladder outlet obstruction. 1455 Define oliguria and list general possible causes for a decrease in urine flow rate
Basic Urology: Interactive Cases	1453 List common causes, pathophysiologic mechanisms and consequences for the following problems of micturition: urinary retention (acute obstruction vs. chronic obstruction, complete obstruction vs. incomplete obstruction) and incontinence. 1595 Describe the effects of afferent and efferent arteriolar tone on renal blood flow and GFR. 1914 Describe a diagnostic approach for prostate cancer. 1915 List possible treatment strategies for prostate cancer.

	2872 Review the causes and investigation of an enlarged prostate gland.
Anatomy: Anatomy of the Kidney	1005 Describe the location of the kidneys, ureters, urinary bladder and urethra 1006 Describe the arterial blood supply, venous return and innervation of the kidney. 1007 Describe the location of the prostate gland. 1008 Describe the functional anatomy of the uretero-vesical junction. 1695 Compare the urethras of males and females. 1710 Identify the structures and regions in a gross mid-sagittal section of the kidney.
Histology: Histology of the Kidney	1449 Define the term nephron. 1451 Describe and illustrate the arterial blood flow to the nephron including the afferent arteriole, efferent arteriole and the vasa recta. 1696 Describe the histology of the prostate gland. 1711 Describe the structure, function and location of each component of a nephron and the urinary tract and be able to identify these structures in histological sections or images 1712 Describe the components of the juxtaglomerular apparatus and their function. 1714 Trace the flow of the urinary filtrate from the urinary space of Bowman's capsule to the exterior, naming in order the tubules and the urinary tract components through which it flows and changes it undergoes in its composition. 1916 Draw and list the functions of the following structures in the nephron and glomerulus: glomerulus (afferent arteriole, efferent arteriole, capillaries, Bowman's space, endothelial cells, mesangial cells, epithelial cells, basal membrane, podocytes, capillary lumen) and nephron (glomerulus, proximal convoluted tubule, descending limb, loop of Henle, thick ascending limb, macula densa, distal convoluted tubule, cortical collecting duct and medullary collecting duct).

	1917 Describe the anatomical and histological features of the glomerulus which prevent filtration of large molecular weight substances. 1918 Describe the physical and functional differences between cells in the proximal vs distal nephron segments and explain the functional role of: mitochondria, basal infolding, apical vesicles, brush border, in renal tubule epithelial cells. 1919 Explain the function of the peritubular capillary network and the vasa recta
Unit 1 Week 14 CDMQ	Any of the above objectives may be tested.

Unit 1 Week 15: Acute Kidney Injury

Lecture	Session Objectives
Acute Kidney Injury (AKI)	1456 List the main diagnostic categories of acute kidney injury (AKI). 1457 Describe the main renal response to a decrease in intravascular volume. 1458 Recognize when renal replacement therapy is needed in AKI. 1459 List reasons for hyperkalemia in acute kidney injury (AKI). 2873 Describe the pathophysiology of acute tubular necrosis (ATN). 2874 Describe the usual course of ATN.
Sodium Homeostasis	1514 List the major sites of the nephron where sodium reabsorption takes place and the relative amount of sodium reabsorbed at each location. 1515 Describe how sodium balance is maintained in normal conditions. 1516 List the sites and describe the mechanisms of action of the following diuretics: (a) thiazides, (b) loop diuretics, (c) potassium sparing diuretics. 1517 Explain the concept of effective circulating volume, and describe how this is sensed. 4459 List and describe the effects of the major factors that control Na transport in the kidney. 4460 Describe the effects of increased and decreased effective circulating volume on Na transport systems in the kidney
Potassium Homeostasis	1955 Describe the distribution of potassium in the extracellular fluid (ECF) and intracellular fluid (ICF). 1956 Comment on the importance of potassium distribution between ECF and ICF as it relates to pH. 1957 Describe the regulation of potassium (reabsorption and secretion) at various places in the nephron. 1958 Explain the role of the principal cell in potassium regulation.

	1959 List the factors affecting potassium secretion.
Edema	1480 Define edema. 1482 Explain the variations of changes in Starling forces that contribute to the formation of edema in patients with renal disease. 1483 List the therapeutic approaches, pharmacological and non-pharmacological, for the treatment of edema. 1484 Describe the relationship between sodium homeostasis and the volume of the various body fluid compartments. 1485 Define the term “effective circulating volume” 1487 Explain the role of the lymphatic system in body fluid volume homeostasis.
AKI Case	1456 List the main diagnostic categories of acute kidney injury (AKI). 1457 Describe the main renal response to a decrease in intravascular volume. 1458 Recognize when renal replacement therapy is needed in AKI. 1459 List reasons for hyperkalemia in acute kidney injury (AKI). 2873 Describe the pathophysiology of acute tubular necrosis (ATN). 2874 Describe the usual course of ATN.
Potassium Pathophysiology	1960 Describe the mechanisms affecting potassium secretion. 1961 Explain why patients with severely abnormal blood potassium levels require immediate care. 1962 Describe therapies used for treatment of patients with abnormal blood potassium levels and explain their mechanisms of action.
Potassium Pathophysiology (Cases)	2880 Describe treatments of hyperkalemia that shift potassium into cells from plasma. 2881 Describe treatments of hyperkalemia that remove potassium from the body. 2882 Explain reasons that hyperkalemia can occur in those with chronic kidney disease.

Anatomy: Anatomy of Blood Vessels	1009 Identify the great arteries and veins of the upper part of the body: right and left internal jugular and subclavian veins; right and left brachiocephalic veins; superior vena cava (SC); the azygos vein; arch of the aorta and the descending thoracic aorta; pulmonary trunk, right and left pulmonary arteries and ligamentum arteriosum connecting the aortic arch and left pulmonary artery noting the course of the left recurrent laryngeal nerve hooking below the ligamentum and the aortic arch; brachiocephalic trunk, common carotid (right and left), and subclavian (right and left) arteries; external and internal carotid arteries; axillary, brachial, radial and ulnar arteries and corresponding veins and venae comitantes; internal thoracic arteries and veins, both sides; posterior intercostal arteries and veins, right side; cephalic vein; basilic vein; median cubital vein. 1610 Identify the following great arteries and veins of the lower part of the body: abdominal aorta, right and left common iliac arteries and veins, inferior vena cava (IVC), origins of the celiac trunk, superior and inferior mesenteric arteries, right and left renal arteries and veins, right and left testicular/ovarian arteries and veins, inferior phrenic arteries, median sacral artery, origin of right and left internal iliac artery and the corresponding veins, external iliac arteries and veins, femoral arteries and veins, popliteal, anterior and posterior tibal arteries and corresponding veins, great saphenous vein and small saphenous vein.
Unit 1 Week 15 CDMQ	Any of the above objectives may be tested.

Unit 1 Week 16: Chronic Kidney Disease

Lecture	Session Objectives
Chronic Kidney Disease	1904 Compare the differences and similarities between chronic renal failure and AKI. 1905 Describe the common and important clinical manifestations of chronic kidney disease, and explain the pathophysiology of each. 1906 List the complications of chronic kidney disease with decreased glomerular filtration rate (GFR) and the therapeutic interventions for treatment. 2875 State the stages of chronic kidney disease.
Treatment of CKD	1479 List the treatment modalities and indications for specific treatment of chronic kidney disease with severely decreased GFR, i.e. dialysis and transplantation. 2903 Explain some of the pros and cons of each of the forms of renal replacement therapy.
Glomerular Diseases: Clinical and Pathological Perspectives	1491 List and describe the clinical syndromes with which patients with glomerular disease may present and name actual diseases for each syndrome. 1492 Explain the effect of glomerular changes on normal glomerular function, i.e. how the changes in the glomerulus affect the following: proteinuria, hypoalbuminemia, edema, hematuria, hypertension, hyperlipidemia and glomerular filtration rate. 1494 Describe an immunopathogenic mechanism involved in one of the various forms of glomerulonephritis and how it affects glomerular morphology. 1913 Propose a diagnostic approach for a patient with hematuria and differentiate glomerular from non glomerular hematuria. 2879 Define nephrotic syndrome.
CKD	1470 List 5 common causes of chronic kidney disease.

	2875 State the stages of chronic kidney disease. 2876 List biochemical changes that are a consequence of chronic decrease in glomerular filtration rate (GFR). 2877 List clinical changes that are a consequence of chronic decrease in GFR. 2878 List treatments of the consequences of chronic decrease in GFR. 2893 Discuss ethical aspects of organ transplantation (buying organs, international market, etc.). 2894 Discuss ethical issues in deciding on further treatment for terminally sick cases.
Urinary Tract Infection	1565 List the major body defense mechanisms against urinary tract infection (UTI) and the factors associated with increased susceptibility to UTI. 1567 List the bacterial organisms commonly responsible for UTIs, indicating the most important virulence factors and relative incidence in different patient populations 1569 Describe the clinical implications of infection relapse vs reinfection. 1570 Describe the clinical implications of asymptomatic vs symptomatic urinary tract infections. 1571 Describe the approach to treatment and prevention of urinary tract infections including clinical and pathogenic factors which determine the choice, route, and duration of therapy; upper and lower tract disease; acute, recurrent, and chronic infections. 2823 Describe the clinical presentations of UTI in patients of different gender and age group: infancy, childhood, older child, adolescent, adult and distinguish upper tract symptoms from lower tract symptoms.
Investigation of Renal Diseases	1654 List the major radiologic tests used to investigate renal disease. 1655 Describe the basic use of urinalysis to investigate renal diseases.

	1656 State the tests that should be done to investigate a case of glomerular disease and state why each is the most appropriate one to use in this situation. 1847 Describe the basic use of urinalysis to investigate renal diseases.
Pathology: Renal Disease	1149 Recognize the clinical pathological correlation of biological progression and gross and microscopic features of Polycystic disease. 1151 List the commonest disease processes leading to obstruction or reflux and describe the gross features of these diseases and their complications 1152 Describe the gross and microscopic features of renal vascular disease (hypertension, atherosclerosis). 1154 Recognize the general principles of a chronic immune complex mediated glomerulonephritis as illustrated by Systemic Lupus Erythematosis (SLE). 4755 Recognize the features of segmental fibrosis in glomeruli that occur as a result of increased single nephron perfusion in remaining nephrons in states of chronic loss of total nephron number.
Renal Response to Nephron Loss	1473 Describe the “adaptive” physiological changes that occur in glomerular filtration rate and tubular function which occur in chronic renal failure. 1478 List interventional approaches to delay the progression of chronic kidney disease with decreased glomerular filtration rate (GFR)
Unit 1 Week 16 CDMQ	Any of the above objectives may be tested.

Unit 1 Week 17: Congenital & Metabolic Abnormalities

Lecture	Session Objectives
Tubulointerstitial Diseases	1922 Define renal tubulo-interstitial (T-I) disease. 1923 Distinguish renal tubulo-interstitial disease clinically and pathologically from glomerular disease. 1924 List the general categories of disease that result in T-I disease. 1925 Describe the common clinical presentations/manifestations of T-I disease, indicating pathogenesis/pathophysiology
Acid Base Homeostasis	1936 Describe the process of bicarbonate reabsorption in the kidney. 1937 Describe the process of renal H+ elimination or secretion in the regulation of pH and note the importance of ammonium and phosphate in this process. 1938 State the role of ammoniagenesis in acid base regulation. 1939 List the functions of intercalated cells in acid-base balance.
Acid Base Pathophysiology	1926 Identify normal and abnormal blood pH. 1927 Define the four primary types of acid-base disturbances. 1931 Explain how the bicarbonate buffer system provides effective protection against the fall in blood pH. 1934 List the common/important causes of high anion gap and normal anion gap metabolic acidosis. 1935 Describe the consequences of the loss of bicarbonate in stool and urine on blood acid-base balance . 2883 Explain the meaning of the term anion gap. 2884 Describe how anion gap changes in acid base disturbances.
A Congenital Conundrum	1460 Describe vesicoureteral reflux (pathogenesis, natural history, indications for medical versus surgical therapy). 1461 List the imaging methods for investigation of structural abnormalities of the

	urinary tract. Describe the indications/role of each in different age groups. 1462 Define enuresis and indicate its incidence by age group, major causes, and approach to treatment. 1463 Describe the mechanism by which the kidney concentrates urine. Indicate major nephron sites, their integrated actions, and regulatory factors. 1466 Describe the process of renal H+ elimination or secretion in the regulation of pH and note the importance of ammonium and phosphate in this process.
Acid Base Workshop	1928 Identify which primary type of acid-base disturbance is present given sample blood gas values. 1929 Confirm the type of acid-base disturbance (primary, secondary or mixed) given blood gas samples by determining whether there is appropriate compensation 1932 Calculate the anion gap given electrolyte values of a patient. 1933 Apply the data obtained by the calculation of the anion gap and osmolar gap to clinical cases. 1934 List the common/important causes of high anion gap and normal anion gap metabolic acidosis.
Water Homeostasis	1463 Describe the mechanism by which the kidney concentrates urine. Indicate major nephron sites, their integrated actions, and regulatory factors. 1573 Define what is meant by plasma osmolality and effective osmolality, and list major solutes that contribute to both. 1575 Describe the major factors which determine distribution of fluid among the 3 major body fluid compartments. 1577 List the osmotic and non-osmotic factors that regulate secretion of vasopressin (AVP) (= antidiuretic hormone (ADH). 1581 Define polyuria and describe what is meant by the term diabetes insipidus.

	1583 Describe why hyponatremia is clinically important. 1584 Describe the general treatment approaches to hypo- and hypernatremia. 1587 Explain the pathophysiological basis of hypo- and hypernatremia. 11790 Explain briefly why water balance is important.
Fluid and Water Homeostasis	1575 Describe the major factors which determine distribution of fluid among the 3 major body fluid compartments. 1582 Describe the physiologic response to: (a) ingestion of 2 liters of water; (b) 24 hrs. of water deprivation; (c) ingestion of a large salt load; (d) daily injections of ADH. 1584 Describe the general treatment approaches to hypo- and hypernatremia. 1585 Recognize the potential complication of acute therapy of hyponatremia. 1586 Describe the categories of disorders which result in polyuria and give at least one clinical example of each 1588 List the various treatments of hypernatremia.
Unit 1 Week 17 CDMQ	Any of the above objectives may be tested.

Unit 1 Week 18: Hypertension

Lecture	Session Objectives
Introduction to Hypertension	1500 Explain the pathophysiological mechanisms responsible for renovascular hypertension in the 2 kidney, 1 clip Goldblatt hypertension model and the 1 kidney, 1 clip model. 1501 State epidemiological, clinical and laboratory features which help distinguish between essential hypertension and secondary causes of hypertension. 1502 List the complications of hypertension, and identify the presence and extent of target organ damage. 1503 Define renovascular hypertension, and describe the clinical findings, pathophysiology, specific diagnostic techniques, and approach to treatment. 1504 List disease processes which may result in renovascular hypertension. 1505 List radiologic investigations which are of diagnostic benefit in the determination of the etiology of renovascular hypertension. 1506 Describe the morphologic and functional effects of benign and accelerated hypertension on the kidney. 2849 Describe the renin-angiotensin-aldosterone system, including sites and regulation of production of the various components, their physiologic effects, feedback control, and integrated actions in the regulation of fluid, electrolyte, and blood pressure regulation.
Hypertension: Essential and Secondary Forms	1495 Define hypertension. 1496 Explain the pathophysiological mechanisms of hypertension including: BP regulation, the pathophysiology of essential hypertension and the role of the kidneys. 1497 Explain the mechanisms of secondary forms of hypertension, such as: Renal hypertension, Renovascular hypertension, Primary hyperaldosteronism, and Pheochromocytoma.

	1498 Describe the appropriate assessment of the hypertensive patient including: a. pertinent features of the history, including assessment of target organ involvement, and assessment for essential vs secondary forms of hypertension; b. blood pressure measurement, and the diagnostic criteria for hypertension; c. physical examination pertinent to hypertension, including assessment of target organ damage and global cardiovascular risk; d. recommended laboratory tests and imaging methods. 1499 Outline the management of hypertension including: a. the rationale for treatment and the basis for blood pressure targets; b. non-pharmacological treatment of hypertension; c. pharmacological treatment of hypertension, including the mechanisms of action of classes of anti-hypertensive drugs, their indications and contra-indications, and their side effect profiles; d. management of global cardiovascular risk.
Pharmacology of Hypertension (Cardiovascular Drugs)	1507 List treatment factors for hypertension as they relate to pathophysiological mechanisms, risk factor prevention, non-pharmacological and pharmacological tactics 1508 For each of the following classes of drugs, indicate (a) the mechanism of antihypertensive effect; and (b) secondary effects/complications: (1) diuretics; (2) anti-adrenergic agents (beta-blockers, etc.); (3) calcium antagonists; (4) angiotensin converting enzyme inhibitors and angiotensin receptor blockers. 1509 List factors affecting compliance in the treatment of hypertension.
Hypertension Cases	2889 Identify the cause of hypertension for a clinical case. 2890 Describe the process of making the diagnosis of hypertension in a clinical situation. 2891 Develop a treatment strategy for different clinical cases of hypertension.

Unit 1 Week 18 CDMQ	Any of the above objectives may be tested.

Unit 2 Lecture Objectives

Unit 2 Week 1: Oral Health

Lecture	Session Objectives
Deep space neck infections Event Type: Self-learning Module	2956 Identify the parapharyngeal space, the retropharyngeal space and the prevertebral space. 2957 Identify the worrisome symptoms and signs that suggest a parapharyngeal space infection, a retropharyngeal space infection and Ludwig's angina. 2958 Recognize the requirement for aggressive management for deep space neck infections.
Dental trauma and dental emergencies Event Type: Self-learning Module	3002 List the causes of odontogenic infection. 3003 Identify the primary maxillary and mandibular spaces involved in odontogenic infection. 3004 Provide a differential diagnosis for upper face swelling in a young child and discuss how this would change with an older child. 3005 Recognize how a dental infection can spread through the deep spaces of the neck and into the mediastinum. 3006 State the 3 types of tooth fracture and comment on the significance in the primary and permanent dentition. 3007 List the common causes of orofacial injuries and recognize current management principles."
Functional anatomy of the oral cavity and dentition	2987 List the components of the oral cavity. 2990 Describe the muscles used in mastication and their nerve supply. 2992 Describe the anatomy of the tooth and supporting bone in cross section and the significant features of each component. 2993 Explain and differentiate primary and permanent dentition including normal eruption, timing, occlusion and function. 2998 Recognize the association of dental anomalies with syndromes and identify 2 such associations."

Taste and salivary glands	2947 Describe the distribution of taste buds in the tongue. 2948 Recognize the features suggestive of a benign or malignant neoplasm of the salivary glands. 2949 Describe the nerve supply to the tongue including motor, sensory and special sensory components. 2950 Describe the location of the major and minor salivary glands and indicate the nerve supply to the major salivary glands. 2952 List the functions of saliva and list 3 causes of xerostomia. 2955 Define sialadenitis and sialolithiasis and know the presenting features of each.
Oral lesions - part 1	2959 Differentiate the features of a benign vs malignant lesion. 2960 Prepare a differential diagnosis for white lesions, red lesions and masses in the oral cavity. 2961 Describe and identify the following: i. primary herpetic gingovostomatiti, ii. Candidiasis, iii. Aphthous ulcer, iv. Lichen planus, v. Leukoplakia. 2963 List the treatment modalities that may be utilized in the treatment of squamous cell carcinoma of the head and neck. 2964 Recognize the potential for reconstruction of defects following treatment for head and neck cancer. 3055 Describe the risk factors for and presenting symptoms/signs of squamous cell carcinoma of the oral cavity and oropharynx.
Physiology of swallowing and dysphagia	2926 Describe the oral, pharyngeal and esophageal phases of swallowing. 2927 List the investigations that can be utilized to evaluate swallowing and explain how they are performed. 2928 Define dysphagia and odynophagia. 2929 Recognize the symptoms and/or signs of dysphagia that mandate a full investigation.
Anatomy: Oral cavity, oropharynx and salivary glands	2965 Define Oral Cavity: Lips, cheeks, palate. 2966 Name the muscles of mastication and their innervations.

	2967 Describe the anatomy of Temporomandibular Joint (TMJ). 2969 Identify the nerves responsible for the gag reflex. 2973 Identify the fascia and spaces of the neck. 2974 Recognize the anatomical triangles of the neck. 2975 Define the major arteries that feed the face and the neck."
Radiology: Imaging of the neck/mandible	3816 Describe the imaging anatomy of the oropharynx, oral cavity and mandible. 3817 Describe the role of plain films, CT and MRI in the evaluation of patients presenting with infections or neoplasms of the upper neck. 3818 List the indications and contraindications of iodine and gadolinium based contrast agents used in CT and MR imaging.
Dental and periodontal pathology and odontogenic infections	3012 Demonstrate infant oral assessment and explain the rationale for early assessment and what is meant by anticipatory guidance. 3013 Characterize intraoral soft tissues and compare and contrast oral mucosa and gingiva. 3014 Explain the dental caries process and recognize the causes of dental decay. 3015 Explain the significance of the multifactorial and transmissible nature of dental caries. 3016 Define Early Childhood Caries (ECC) and discus the potential consequences and impact on paediatric health. 3017 Identify ECC risk factors, recognize early clinical signs of decay through infant oral examination and recognize the need for early intervention. 3018 List 3 common paediatric oral lesions, briefly state the signs/symptoms and comment on management. 3019 Explain the periodontal disease process and identify contributing factors. 3023 Compare and contrast hyperaemic and hyperplastic gingiva.

	3024 Suggest possible causes of halitosis based on an understanding of the components of the oral cavity and oropharynx. 3026 Recognize that premature loss of primary teeth is an important diagnostic event and explain why this warrants immediate investigation. 3030 Recognize the connection between oral and systemic health in the provision of quality comprehensive patient care."
Cleft lip and palate – craniofacial anomalies	2931 Define and identify the different types of cleft lip and cleft palate. 2932 Describe the abnormal embryological process that leads to a cleft lip/palate. 2933 Recognize the feeding difficulties that can ensue for a baby born with a cleft lip/palate and the resources available to help the baby and parents. 2934 Explain why a patient with a cleft palate is at risk for eustachian tube dysfunction and serous otitis media. 2935 Identify the disciplines that may be involved in the management patients with cleft lip/palate and recognize the importance of multidisciplinary and interprofessional care in this regard. 3059 Recognize the role of genetic counselling for cleft lip/palate. 11973 Explain the moulding benefits of the NAM (naso-alveolar molding) on patients. 11974 Indicate the most appropriate timing for repair of cleft lip and palate. 11975 Explain why patients with cleft palate may experience hypernasality and describe the approach to manage this problem."
The Neck Mass	2936 Identify the lymphatic drainage of the oral cavity and oropharynx. 2938 Compare and contrast the differential diagnosis of a neck mass in the pediatric vs the adult population. 2939 List the components that are required to adequately describe a neck mass. 2940 Provide a differential diagnosis of a midline and a lateral neck mass.

	2942 Compare and contrast the features of an inflammatory/infectious neck mass, a benign neck mass and a malignant neck mass. 2944 Recognize the utility of a fine needle aspiration biopsy in obtaining the pathological diagnosis of a neck mass. 2945 Describe the embryology of brancial cleft cysts and sinuses and their location in the head and neck."
Unit 2 Week 1 CDMQ	Any of the above objectives may be tested.

Unit 2 Week 2: Esophagus & Stomach

Lecture	Session Objectives
Deep space neck infections Event Type: Self-learning Module	4093 Define the term “extraesophageal manifestations of gastroesophageal reflux disease (GERD)”, list 3 non- gastrointestinal systems that are commonly affected by GERD and provide an example of a symptom and/or sign for each of the listed systems. 4094 Provide a differential diagnosis for hoarseness and, using clinical clues, differentiate laryngopharyngeal reflux (LPR) from other causes of hoarseness. 4095 List the symptoms most commonly associated with laryngopharyngeal reflux (LPR). 4096 Identify the following laryngeal structures and describe the change(s) that may occur if exposed to chronic laryngopharyngeal reflux (i.e., Identify laryngopharyngeal signs associated with LPR): A. True vocal cords, B. False vocal cords, C. Arytenoids, D. Interarytenoid area, E. Location of upper esophageal sphincter. 4097 Describe an algorithm for the assessment and management of LPR."
Concepts of functional bowel disease	5394 Explain the concept of ‘functional' versus ‘organic disease (disorders) in the gastrointestinal and other systems. 5395 Differentiate illness from disease. 5396 Describe the interaction of mind and gut. 5397 Discuss normal versus abnormal bowel habit. 5398 Emphasize the importance of the placebo response (placebo effect plus ‘natural history') to the understanding and administration of all treatment.
Introduction to gastrointestinal development and structure	12806 Describe the embryological origins of the foregut, midgut and hindgut. 12807 Identify the anatomical structures, blood supply, and innervation associated with the foregut, midgut and hindgut. 12808 Identify the histological features of the following structures: esophagus, stomach,

	duodenum, jejunum, ileum, colon, pancreas, gall bladder, biliary tree, liver.
GI Motility	3119 Summarize the process of normal gastric contractility and emptying. 3120 Outline the normal mechanism of swallowing. 3121 Outline the mechanisms behind esophageal persistalsis and their coordination with esophageal sphincter tone, at rest and in response to swallowing. 3123 Explain normal contractility of the intestines in the fed and fasting states. 3124 Outline the mechanisms underlying the maintenance of fecal continence. 4623 Describe the normal process of defecation.
GERD Part 1	3100 Describe the mucosal protective mechanisms of the esophagus. 3101 Discuss the epidemiology and risk factors for GERD. 3102 Illustrate the pathophysiological mechanisms behind GERD as an imbalance between injurious and protective factors. 3103 Recognize the clinical presentation and complications of GERD. 3104 Summarize the diagnosis and management of GERD. 3106 Recognize the typical and atypical symptoms of reflux. 3108 Identify red flag symptoms that compel further investigation of reflux. 3109 Demonstrate a clinical approach to dysphagia. 3110 Classify the etiologies of dysphagia. 3111 Describe the diagnostic evaluation of dysphagia. 3126 Identify the main causes of odynophagia. 4644 Describe the physiological basis of abdominal pain. 4645 Apply a systematic approach to abdominal pain. 4646 Differentiate between functional and organic causes of abdominal pain. 4647 Outline the medical management of abdominal pain.

	4648 Define dyspepsia. 4649 Apply a clinical approach to dyspepsia. 4650 Discriminate organic from functional causes of dyspepsia. 4651 Recognize red flag symptoms that warrant endoscopic investigation of dyspepsia. 4652 Discuss the management of organic and functional (non- ulcer) dyspepsia. 5382 Demonstrate a clinical approach to odynophagia.
Physiology: Esophageal and gastric	3096 Describe the mucosal protective mechanisms of the esophagus and stomach. 3097 Illustrate the role of the stomach in the digestion of food. 3098 Explain the processes making up normal gastric secretion. 3099 Summarize the regulatory mechanisms controlling gastric digestion, secretion and emptying. 4622 Summarize the process of normal gastric contractility and emptying.
Pediatric and gastrointestinal disorders	3143 Recognize the clinical presentation and physical exam findings of PS. 3144 Identify the metabolic and electrolyte abnormalities associated with PS. 3145 Describe the embryogenesis of MD. 3146 Summarize the different clinical presentations of MD. 3147 Define intussusception. 3148 Recognize the clinical presentation of intussusception. 3149 Discuss the investigation and treatment of intussusception. 4653 Describe the embryogenesis of malrotation. 4654 Recognize the clinical presentation of malrotation and volvulus. 4655 Describe the embryogenesis of HD. 4656 Recognize the clinical presentation of HD. 4657 Explain the principles of treatment of HD.
Clinical pathological conference: Barrett’s esophagus, carcinoma, eosinophilic esophagitis	3112 Define Barrett's esophagus. 3113 Discuss the epidemiology and risk factors for Barrett's esophagus.

	3114 Illustrate the underlying pathogenesis and clinical relevance of Barrett's esophagus. 3115 Summarize the diagnosis and management of Barrett's esophagus. 3116 Classify the different types of esophageal tumours. 3117 Differentiate between the two primary types of esophageal carcinoma in terms of their epidemiology, etiology, clinical presentation, complications and prognosis. 3118 Outline the diagnosis, staging, management and prevention of the two primary types of esophageal carcinoma. 3809 Describe the epidemiology, clinical presentation/diagnosis and management of eosinophilic esophagitis. 4742 Identify the morphological features of GERD, Barett's esophagus. 4743 Identify the morphological features of Barett's dysplasia (low grade, high grade). 4744 Identify the morphological features of eosinophilic esophagitis. 4745 Identify the morphological features of esophageal carcinoma (squamous and adenocarcinoma).
Content Orientation: Esophagus, stomach, duodenum, peritoneum	4627 Describe location of the esophagus and recognize the two sphincters and identify the 3 constrictions. 4628 Identify the anatomical features of stomach and duodenum. 4629 Review the principal vascular and nerve supply of the esophagus and the gastroduodenal area. 4630 Review the gross anatomical relationships of the stomach, duodenum and surrounding structures. 4631 Define peritoneal coverings of the abdominal viscera. 4723 Identify the anatomical features of stomach and duodenum.
Histology: Esophagus, stomach, duodenum peritoneum	4632 Describe the histology of the esophagus. 4633 Describe the histology of the stomach and duodenum.

	4634 Describe the musculature of the upper, middle and lower thirds of the esophagus. 4635 Describe the musculature of the stomach. 4676 Describe the histology of the mucosal lining of the esophagus and the mucosal protective mechanisms of the stomach."
Anatomy: Esophagus, stomach, duodenum, peritoneum	4627 Describe location of the esophagus and recognize the two sphincters and identify the 3 constrictions. 4628 Identify the anatomical features of stomach and duodenum. 4629 Review the principal vascular and nerve supply of the esophagus and the gastroduodenal area. 4630 Review the gross anatomical relationships of the stomach, duodenum and surrounding structures. 4631 Define peritoneal coverings of the abdominal viscera. 4723 Identify the anatomical features of stomach and duodenum. 4724 Review the principal vascular and nerve supply of the esophagus and the gastroduodenal area. 4725 Review the gross anatomical relationships of the stomach, duodenum and surrounding structures. 4726 Define peritoneal coverings of the abdominal viscera.
Embryology: GI tract	4636 Summarize the embroyological origin and development of the esophagus and stomach. 4637 Summarize the embryological origin and development of the small and large intestines and their associated structures. 4638 Summarize the embryological origin and development of the pancreas, gall bladder and biliary ducts. 4639 Explain the embryological origin and development of the liver. 4731 Understand the following congenital anomalies of the gastrointestinal tract: (from the anatomical, embryological and clinical point of view): Esophageal atresia and

	tracheo- esophageal fistula, Duodenal atresia/stenosis/annular pancreas , Malrotation,Intestinal atresia , Meconium ileus, Duplications and Hirshsprung's disease
Clinical pathological conference: H. Pylori, peptic ulcer disease, gastric cancer	3134 Describe the microbiological classification and virulence factors of Helicobacter Pylori H (Pylori). 3135 Outline the global epidemiology and clinical significance of H. Pylori infection. 3136 Summarize the pathogenesis, diagnosis and management of H. Pylori infection. 3137 Outline the etiology and pathophysiology behind Peptic Ulcer Disease (PUD). 3138 Discuss the epidemiological risk factors, clinical presentation and complications of PUD. 3139 Describe the diagnosis and management of PUD. 3141 Discuss the epidemiology, etiology, clinical presentation, complications and prognosis of gastric adenocarcinoma. 3142 Outline the pathophysiology, diagnosis, staging, management and prevention of gastric adenocarcinoma. 3813 Recall the general causes and classification gastritis. 3814 Describe the management of gastritis. 4733 Describe the role of double contrast upper gastrointestinal series in the identification and characterization of gastric cancer and peptic ulcer disease. 4734 Describe the role of cross-sectional imaging in the staging and follow up of advanced Gastric Cancer
Esophageal Obstruction	4624 Identify common structural conditions which affect the esophagus. 4625 Describe the pathophysiology leading to structural conditions of the esophagus. 4626 Explain the diagnosis and management of structural disorders of the esophagus.
Unit 2 Week 2 CDMQ	Any of the above objectives may be tested.

Unit 2 Week 3: Small Intestine & Colon

Lecture	Session Objectives
Adult functional bowel disease	4658 Define IBS according to ROME III criteria. 4660 Explain the epidemiology, pathophysiology, clinical features, diagnosis and prognosis of IBS. 4661 Outline the pharmacological and non-pharmacological management of IBS. 4662 Recognize ‘red flag' features suggesting a diagnosis other than IBS. 4663 Define constipation. 4664 Describe risk factors for and the classification of constipation. 4665 Discuss the clinical features of constipation. 4666 Apply a clinical approach to constipation. 4667 Summarize the diagnostic workup and symptomatic management of constipation.
Pediatric functional bowel disease	4668 Define functional bowel diseases for children. (ROME III) 4669 Explain the clinical features, diagnosis and treatment for functional diseases in children.
Microbiology of the gut: Normal and abnormal	3155 List the normal microbiological flora of the small and large intestine. 3156 Classify the etiology of infectious gastroenteritis by pathogen and their mechanism of action. 3157 Describe risk factors and pathogenesis of infectious gastroenteritis. 3158 Outline the clinical presentation, diagnosis and management of infectious gastroenteritis. 3159 Discuss specific situations associated with infectious gastroenteritis including hospital-acquired diarrhea, traveller's diarrhea and food-poisoning. 3160 Describe the microbiology of C. difficile including virulence factors. 3161 Discuss the epidemiology, risk factors and pathogenesis of CDAD as it relates, especially, to nosocomial K infection.

	3162 Describe the clinical presentation and complications of CDAD. 3163 Outline the diagnosis, management and prevention of CDAD.
Physiology: GI electrolyte balance	3164 Explain the mechanism and regulation of intestinal fluid and electrolyte absorption.
Acute and chronic diarrhea	3160 Describe the microbiology of C. difficile including virulence factors. 3161 Discuss the epidemiology, risk factors and pathogenesis of CDAD as it relates, especially, to nosocomial K infection. 3162 Describe the clinical presentation and complications of CDAD. 3163 Outline the diagnosis, management and prevention of CDAD. 3165 Define diarrhea. 3166 Distinguish acute from chronic diarrhea in terms of clinical features and etiology. 3167 Categorize the etiologies of chronic diarrhea into secretory, inflammatory and osmotic. 3168 Describe the clinical features of each category of diarrhea. 3169 Apply a clinical approach to diarrhea. 3170 Outline the diagnostic workup and symptomatic management of diarrhea. 3192 Define IBD in terms of Crohn's Disease (CD), Ulcerative Colitis (UC) and Indeterminate Colitis. 3193 Describe the epidemiology and proposed pathogenesis (in general) of IBD. 3194 Outline the clinical features of CD and UC. 3195 Explain the diagnosis, management and prognosis of CD and UC. 3196 Differentiate Crohn's and UC with respect to sites of involvement, clinical presentation, extra-intestinal manifestations, complications and management.
Surgical Problems in GI	3202 Explain the epidemiology and pathogenesis of appendicitis. 3203 Describe the clinical features, diagnosis and complications of appendicitis. 3204 Outline the medical and surgical management of appendicitis.

	3205 Define hemorrhoids, fissures, fistulas and perianal abscesses. 3206 Describe the pathophysiology and clinical features of the each type of perianal disease. 3207 Outline the medical and surgical management of each type of perianal disease. 4445 Describe the epidemiology, etiology and pathogenesis of anal cancer. 4446 Discuss the clinical presentation, diagnosis, staging and management of anal cancer. 4685 Demonstrate a systematic internal and external anal exam. 12815 Classify the various types of hernias including diaphragmatic, inguinal, femoral, ventral, incisional and internal. 12816 Summarize the pathogenesis, clinical features and complications (including incarceration and strangulation) of abdominal hernias. 12817 Manage a patient presenting with an abdominal hernia. 12818 Recognize alarm features of abdominal hernias indicating that emergent management is required.
Clinical pathological conference: Inflammatory bowel disorders (IBD) and other colitis	3192 Define IBD in terms of Crohn's Disease (CD), Ulcerative Colitis (UC) and Indeterminate Colitis. 3193 Describe the epidemiology and proposed pathogenesis (in general) of IBD. 3194 Outline the clinical features of CD and UC. 3195 Explain the diagnosis, management and prognosis of CD and UC. 3196 Differentiate Crohn's and UC with respect to sites of involvement, clinical presentation, extra-intestinal manifestations, complications and management. 3197 Define microscopic colitis in terms of lymphocytic and collagenous colitis. 3198 Describe the epidemiology and pathogenesis of microscopic colitis. 3199 Outline the clinical features of microscopic colitis.

	3200 Explain the diagnosis and management of microscopic colitis. 4673 Describe the epidemiology, pathophysiology, clinical presentation, diagnosis, management and prognosis of ischemic colitis. 4750 Identify the pathologic and histologic features of the different types of IBD. 4751 Identify the pathologic types and implications of dysplasia in IBD. 4752 Identify the pathologic and histologic features of microscopic colitis. 12684 Select the most indicated imaging modalities to diagnose inflammatory bowel disease. 12685 Select the most indicated imaging modalities to diagnose complications of inflammatory bowel disease. 12686 Identify the pathologic and histologic features of ischemic colitis."
Content Orientation: Jejunum, ileum, colon	4677 Identify the anatomical features of the jejunum, ileum and large bowel. 4678 Review the principal vascular and nerve supply of the small and large bowel. 4679 Describe the musculature of the small and large bowel. 4681 Identify the anatomical features, divisions and relative boundaries of the small and large intestines.
Histology: Jejunum, ileum, colon	4680 Describe the histology of the duodenum, small intestine and colon. 4682 Describe the principal musculature, vascular supply and innervation of the small and large intestines. 4683 Describe the different layers making up the walls of the intestines and their corresponding cell types.
Surgical problems in GI – Part B	3183 Describe the epidemiology, etiology and pathogenesis of diverticular disease. 3184 Differentiate between the various clinical manifestations of diverticular disease (including diverticulosis, diverticulitis and diverticular bleeding) in terms of their clinical presentation, complications, diagnosis and management.

	3185 List the surgical indications associated with diverticular disease. 3186 Classify the causes of gastrointestinal obstruction into small intestinal and colonic obstruction. 3187 Differentiate between small and large bowel obstruction in terms of their clinical presentations. 3188 Describe the pathophysiology, diagnosis, management and outcomes of intestinal obstruction. 3189 Define ileus. 3190 Describe the etiology, pathophysiology, clinical features, diagnosis and management of ileus. 3191 Define pseudo-obstruction. 4670 List various causes of pseudo-obstruction. 4671 Discuss the clinical features, diagnosis, management and complications of pseudo-obstruction. 4672 Differentiate between ileus, small intestinal obstruction, colonic obstruction and colonic pseudo-obstruction in terms of their presentation and management.
Clinical pathology conference: colorectal cancer	3808 Classify polyps into benign and pre-malignant categories and according to pathological features. 4105 Describe, in general, features of the major hereditary gastrointestinal polyposis syndromes including Hereditary Non-Polyposis Colorectal Cancer (HNPCC), Familial Adenomatous Polyposis (FAP) and Peutz-Jeghers Syndrome. 4106 Explain the adenoma – carcinoma sequence and rationale behind colon cancer screening. 4108 Describe the epidemiology, etiology and risk factors for colonic adenocarcinomas. 4109 Outline the clinical presentation, diagnosis and staging of colonic adenocarcinomas. 4440 Discuss the prevention, management and prognosis of colonic adenocarcinomas. 4441 Summarize the options and guidelines for colon cancer screening and surveillance.

	4749 Identify the morphological features of the different types of colonic polyps. 4753 Identify the morphological features of colonic carcinoma. 12681 Identify the best radiological imaging modality to screen for colonic polyps. 12682 Identify the best radiological imaging modality to screen for colon cancer. 12683 Identify the best radiological imaging modality to stage colon cancer."
GI bleeding	3208 Define upper and lower GI bleeding. 3209 Outline the etiologies and clinical features of upper and lower GI bleeding. 3210 Apply a systematic clinical approach to GI bleeding. 3211 Outline the investigation and management of GI bleeding. 3212 Recognize clinical indicators suggesting urgent versus non- urgent assessment. 4124 Demonstrate an investigative approach to occult and obscure GI bleeding.
Unit 2 Week 3 CDMQ	Any of the above objectives may be tested.

Unit 2 Week 4: Pancreas, Biliary, Nutrition

Lecture	Session Objectives
Nutrition and vitamin and mineral supplements	4559 Identify credible sources to advise patients on safety and efficacy of dietary supplements. 4560 Explain the concept of bioavailability as it pertains to dietary supplements. 4561 Identify individuals at risk for nutrient inadequacy. 4562 Explain the basis for appropriate nutrient supplementation.
Physiology: Digestion and Absorption	3213 Discuss the normal physiology of the pancreas and gall bladder. 3214 Summarize the luminal and cellular processes involved in the digestion and absorption of macronutrients, including protein, lipids and carbohydrates. 3215 Discuss the luminal and cellular processes involved in the digestion and absorption of micronutrients. 3216 Outline the neural and hormonal mechanisms that regulate the processes of digestion and absorption of micronutrients.
Pancreas and Biliary Disease	3220 Describe the etiology, risk factors and clinical presentation of gallstone disease including cholelithiasis, cholecystitis, choledocholithiasis and cholangitis. 3221Discuss the pathogenesis, diagnosis and management of gallstone disease. 3222 List the etiology, risk factors and clinical presentation of acute pancreatitis. 3223 Discuss the pathophysiology, diagnosis, management and prognostic factors of acute pancreatitis. 3224 Summarize the complications associated with severe acute pancreatitis. 3228 Recognize the manifestations of jaundice on physical exam 3229 List the etiology, risk factors and clinical presentation of chronic pancreatitis 3230 Discuss the pathophysiology, diagnosis and management of chronic pancreatitis. 3231Differentiate between the disease entities of acute and chronic pancreatitis.

	3232 List the benign and malignant tumours of the pancreas. 3233 Outline the classification, natural history, risk factors and clinical presentation of pancreatic neoplasms 4686 Describe the diagnosis, the diagnostic workup and management of pancreatic neoplasms. 5383 List the etiologies of jaundice. 5384 Discuss the underlying pathophysiology of jaundice. 5385 Apply a systematic approach to jaundice
Physiology: Bile Salts	3213 Discuss the normal physiology of the pancreas and gall bladder. 3216 Outline the neural and hormonal mechanisms that regulate the processes of digestion and absorption of micronutrients. 3220 Describe the etiology, risk factors and clinical presentation of gallstone disease including cholelithiasis, cholecystitis, choledocholithiasis and cholangitis. 3221 Discuss the pathogenesis, diagnosis and management of gallstone disease. 3248 Describe the mechanism of bile production, metabolism and excretion and the enterohepatic circulation. 3251Describe the clinical consequences of steatorrhea. 3253 Recognize the manifestations of jaundice on physical exam. 5384 Discuss the underlying pathophysiology of jaundice.
Clinical radiological conference: Non-neoplastic, biliary and pancreatic diseases	3220 Describe the etiology, risk factors and clinical presentation of gallstone disease including cholelithiasis, cholecystitis, choledocholithiasis and cholangitis. 3221 Discuss the pathogenesis, diagnosis and management of gallstone disease. 3222 List the etiology, risk factors and clinical presentation of acute pancreatitis. 3223 Discuss the pathophysiology, diagnosis, management and prognostic factors of acute pancreatitis. 3224 Summarize the complications associated with severe acute pancreatitis.

	3225 List the etiology, risk factors and clinical presentation of chronic pancreatitis 3226 Discuss the pathophysiology, diagnosis and management of chronic pancreatitis. 4735 List the imaging modalities commonly used to investigate biliary, and pancreatic disease. 4736 Identify the gallbladder, pancreas, biliary tree, liver on CT scan. 4737 Describe the US appearance of acute cholecystitis. 4738 Describe the common complications of acute pancreatitis identified on CT. 4756 Recognize the pancreatic diseases associated with Cystic Fibrosis.
Malabsorption	3251Describe the clinical consequences of steatorrhea. 3254 Discuss the epidemiology and proposed pathogenesis of Celiac disease. 3255 Describe the clinical features, associated diseases and complications of Celiac disease. 3256 Summarize the diagnosis and management of Celiac disease. 4747 Discuss the malabsorption associated with pancreatic insufficiency.
Histology: Pancreas and biliary tract	4452 Outline the normal basic histology of the pancreas, gall bladder and biliary ducts. 4690 Describe the histology of the exocrine pancreas and the function of the exocrine glands.
Content Orientation: Pancreas and biliary tract	3034 Identify the pancreas and biliary tree. 3035 Explain the functional relationship between the pancreas and biliary tree. 3710 Describe the anatomy of the pancreas, its blood supply and relationship to the liver and small intestines. 4453 Outline the normal basic anatomy of the pancreas, gall bladder and biliary ducts. 4687 Observe the pancreas, gall bladder and biliary tree. 4688 Explain the functional relationship between these organs.

	4689 Review the principal vascular and nerve supply of the pancreas, gall bladder and biliary tree.
Radiology: Imaging anatomy of the pancreas, biliary tree	5367 List the imaging modalities commonly used to investigate biliary, and pancreatic disease. 5368 Identify the gallbladder, liver, pancreas, biliary tree, liver on CT scan.
Clinical pathologic conference: Pancreatic and biliary tumors	12267 Describe the common clinical presentations and differential diagnoses of cholangiocarcinoma and pancreas adenocarcinoma. 12268 List the diagnostic modalities that could be used to diagnose pancreaticobiliary carcinoma (US, CT, MRI, ERCP). 12269 Identify the indications for the use of each diagnostic modality (US, CT, MRI, ERCP) in pancreas and biliary neoplasms. 12270 Describe the gross appearance of hepatobiliary neoplasm (double duct sign, mass compression, etc. - not details but just the appearance). 12271 List the criteria to differentiate resectable from non resectable tumour. 12272 Identify the follow up imaging and potential therapeutic image guided intervention for the treatment of pancreaticobiliary neoplasm.
Nutritional Assessment and Support	3262 Evaluate the nutritional status of a malnourished patient. 3263 Describe the different methods of nutrition support available to malnourished patients.
Unit 2 Week 4 CDMQ	Any of the above objectives may be tested.

Unit 2 Week 5: Liver

Lecture	Session Objectives
Approach to liver solitary masses	11996 Demonstrate an approach to solitary liver masses.
Nausea and vomiting	3150 Outline the pathophysiology of nausea and vomiting. 3151 Classify the causes of nausea and vomiting. 3152 Apply a clinical approach to nausea and vomiting. 3153 Describe the management of nausea and vomiting.
Hepatic Function	3264 Explain the role of the liver in protein, carbohydrate and lipid metabolism. 3265 Summarize the normal production, excretion and metabolism of bile by the liver
Hepatic Metabolism of Drugs	4412 Explain the role of drug metabolism in drug absorption and elimination. 4413 Understand Phase I and Phase II reactions as they relate to drug metabolism. 4414 Know the implications of CYP450 genotype (polymorphism). 4415 Describe mechanisms of drug interactions related to hepatic biotransformation and identify the main substrates, inhibitors and inducers of major drug metabolizing enzymes. 4416 Know the effects of liver disease on drug choice. 4693 Describe the main hepatic processes responsible for drug metabolism. 4694 Illustrate the normal metabolism of alcohol by the liver. 4695 Diagram the normal hepatic metabolism of acetaminophen. 4696 Describe the pathophysiology of acetaminophen overdose. 4697 Recognize the risk factors and clinical presentation of acetaminophen-induced hepatotoxicity. 4698 Summarize management and complications of acetaminophen overdose
Acute and Chronic Liver Disease	3267 Discuss the nature and function of the hepatic transaminases.

	3268 Recognize the type of hepatic injury by the pattern of elevations in liver enzymes. 3269 Apply a systematic approach to a patient presenting with elevated liver enzymes. 3270 List the viruses that most commonly infect the liver. 3271 Outline the virology and life cycles of the Hepatitis A, B, C, D and E viruses. 3272 Summarize the epidemiology, pathogenesis, clinical features, complications and diagnosis of Hepatitis A, B, C and D. 3273 Describe the general management, prognosis and prevention of Hepatitis A, B and C. 3274 Define cirrhosis. 3275 Classify the etiologies of cirrhosis into pre-hepatic, primary hepatic and post-hepatic causes. 4699 Explain the clinical features and diagnosis of cirrhosis. 4700 Apply a systematic approach to the patient presenting with cirrhosis. 4701 Recognize the stigmata of chronic liver disease on physical exam.
Acute and Chronic Liver Disease Part A	3270 List the viruses that most commonly infect the liver. 3271 Outline the virology and life cycles of the Hepatitis A, B, C, D and E viruses. 3272 Summarize the epidemiology, pathogenesis, clinical features, complications and diagnosis of Hepatitis A, B, C and D. 3273 Describe the general management, prognosis and prevention of Hepatitis A, B and C. 3282 Describe the epidemiology, classification and pathogenesis of ALD. 3283 Explain the clinical presentation, diagnosis and complications of ALD. 3284 Outline the pharmacological and non-pharmacological management and prognosis of ALD. 3285 Describe the epidemiology and risk factors for NAFLD. 3286 Explain the pathogenesis, clinical features and associations of NAFLD.

	3287 Summarize the diagnosis, management and prognosis of NAFLD."
Acute and Chronic Liver Disease Part B	3301 Describe the epidemiology, pathogenesis, clinical features, complications and prognosis of the cholestatic liver diseases including primary biliary cirrhosis and primary sclerosing cholangitis. 3302 Outlines the diagnosis and management of the cholestatic liver disorders. 3303 Recall the pathogenesis and clinical features of disorders which affect the liver including hemochromatosis, Wilson's disease, Budd-Chiari, autoimmune hepatitis and alpha-1- antitrypsin deficiency."
Histology: The liver	3040 Describe the histology the liver. 3041 Describe the function of the hepatocyte and of the portal triads. 4455 Outline the microanatomy of the liver, from the organization of the hepatic parenchyma into lobules down to the cell types which make up and surround the hepatic sinusoids.
Content Orientation: The Liver	3038 Describe anatomy and innervation of the liver. 3039 Describe the portal and systemic vascular systems of the liver and their integration with each other. 4456 Identify the surface and segmental anatomy of the liver. 4705 Describe the vascular anatomy of the liver: i. Portal ii. Systemic
Radio-pathology conference: liver tumors	4118 Recognize the radiological anatomy of the liver on cross- sectional imaging (CT/MR). 4119 List the various common benign and malignant tumors of the liver. 4120 Outline the role of various imaging modalities, CT, US and MRI in characterizing liver tumours with cross-modality correlation. 4709 Classify neoplasms that commonly affect the liver into benign and malignant categories. 4710 Demonstrate an approach to solitary liver masses.

	4754 Identify the macroscopic and microscopic features of most common benign and malignant hepatic neoplasms: hepatic adenoma and hepatocellular carcinoma.
Clinical pathological conference: NASH, alcohol and other hepatitides	3292 Review the normal metabolism of alcohol by the liver. 3295 Recall the risk factors and clinical presentation of tylenol- induced hepatotoxicity. 3296 Restate the pathophysiology, management and complications of tylenol overdose. 3297 Restate the viral entities that most commonly affect the liver. 3298 Review the epidemiology, classification, clinical presentation, complications and prognosis of viral hepatitis. 3299 Describe the epidemiology, classification and pathogenesis of ALD. 3300 Explain the clinical presentation, diagnosis and complications of ALD. 4417 Identify the normal structures of liver and vasculature. 4418 Identify the liver types of cells. 4419 Define the microscopic features of steatohepatitis: alcoholic and NASH. 4420 Describe the microscopic features of viral hepatitis B and C. 4421 List the microscopic features of the cholestatic disorders: primary billiary cirrhosis and primary sclerosing cholangitis. 4422 Describe the features of cirrhosis. 4711 Outline the pharmacological and non-pharmacological management and prognosis of ALD. 4712 Describe the epidemiology and risk factors for NAFLD. 4713 Explain the pathogenesis, clinical features and associations of NAFLD. 4714 Summarize the diagnosis, management and prognosis of NAFLD
Complications of Cirrohosis	3276 Describe some of the complications of cirrhosis including ascites (including spontaneous bacterial peritonitis), hepatic encephalopathy, portal hypertensive bleeding, hypersplenism and hepatorenal syndrome.

	3277 Outline the pathogenesis of cirrhotic complications. 3278 Summarize the diagnosis, management and prevention of cirrhotic complications. 3279 Recognize the stigmata of chronic liver disease on physical exam. 3280 Demonstrate a focused, evidence-based physical exam for the detection of ascites. 4702 Distinguish clinically the different grades of encephalopathy. 4703 Demonstrate a focused physical exam for the detection of encephalopathy.
Unit 2 Week 5 CDMQ	Any of the above objectives may be tested.

Unit 2 Week 6: Metabolism I

Lecture	Session Objectives
Hormonal determinants of appetite	4637 Summarize the embryological origin and development of the small and large intestines and their associated structures. 4638 Summarize the embryological origin and development of the pancreas, gall bladder and biliary ducts. 4639 Explain the embryological origin and development of the liver.
Lipodystrophic syndromes	3664 Describe the clinical findings of genetic and drug induced lipodystrophy. 3663 Outline the causes of lipodystrophy.
Lipid Metabolism and Genetics	3620 Name 5 classes of lipoproteins and 5 apoproteins. 3621 State the location and one major function of apoproteins A1, B-100,B-48, CII, CIII, E, apo(a). 3622 State the location and function of 3 enzymes: lipoprotein lipase, hepatic lipase, lecithin cholesterol acyl transferase. 3623 Define the following genetic conditions: familial hypercholesterolemia, familial combined hyperlipidaemia, familial LPL deficiency, Apo CII deficiency, familial dysbetalipoproteinemia and hypercholesterolemia. 3624 Recognize the following physical signs: Xanthochromia striata palmaris, Xanthomas - tendinous, eruptive, planar, tuberous, palmar and xanthelesmas, Corneal arcus and Lipemia retinalis. 3654 Draw the three major pathways in lipoprotein and fat metabolism labelling the lipoproteins, receptors, apoproteins and enzymes involved in each step.
Approach to Lipid Disorders	3624 Recognize the following physical signs: Xanthochromia striata palmaris, Xanthomas - tendinous, eruptive, planar, tuberous, palmar and xanthelesmas, Corneal arcus and Lipemia retinalis. 3625 State the lab tests needed to assess someone for a lipid disorder.

	3626 Describe the appropriate history relevant to lipoprotein metabolism. 3627 Name 5 classes of drugs used in the treatment of lipid disorders and identify the main mechanism of action of these drugs. 3629 Describe the effect of each class of drug (named in objective 3627) on serum lipid/lipoprotein levels."
Pancreatitis and Hypertryglyceridemia	3620 Name 5 classes of lipoproteins and 5 apoproteins. 3621 State the location and one major function of apoproteins A1, B-100,B-48, CII, CIII, E, apo(a). 3622 State the location and function of 3 enzymes: lipoprotein lipase, hepatic lipase, lecithin cholesterol acyl transferase. 3623 Define the following genetic conditions: familial hypercholesterolemia, familial combined hyperlipidaemia, familial LPL deficiency, Apo CII deficiency, familial dysbetalipoproteinemia and hypercholesterolemia. 3624 Recognize the following physical signs: Xanthochromia striata palmaris, Xanthomas - tendinous, eruptive, planar, tuberous, palmar and xanthelesmas, Corneal arcus and Lipemia retinalis. 3625 State the lab tests needed to assess someone for a lipid disorder. 3626 Describe the appropriate history relevant to lipoprotein metabolism. 3632 List the genetic and secondary causes of: hypercholesterolemia alone, hypertriglyceridemia alone, hypercholesterolemia and hypertriglyceridema and hypoalphalipoproteinemia (low HDL-C). 3633 Describe dietary changes that may be helpful to reduce lipid levels. 3634 Identify lifestyle factors affecting serum lipid levels. 3638 Interpret results of plasma cholesterol, triglycerides (Tg) and HDL-C and translate the results in terms of lipoproteins, ie, calculate LDL-chol, VLDL-chol.

	3654 Draw the three major pathways in lipoprotein and fat metabolism labelling the lipoproteins, receptors, apoproteins and enzymes involved in each step. 3656 Identify the main mechanisms involved in secondary hyperlipidaemia seen in hypothyroidism, diabetes mellitus, nephrotic syndrome, chronic renal failure, cirrhosis, cholestasis.
Obesity / adipocyte physiology and pathophysiology	3655 Explain the role of adipocytes in lipid metabolism.
Secondary causes of lipid disorders	3632 List the genetic and secondary causes of: hypercholesterolemia alone, hypertriglyceridemia alone, hypercholesterolemia and hypertriglyceridema and hypoalphalipoproteinemia (low HDL-C). 3656 Identify the main mechanisms involved in secondary hyperlipidaemia seen in hypothyroidism, diabetes mellitus, nephrotic syndrome, chronic renal failure, cirrhosis, cholestasis.
Ultrasound	14502 Define the basic principles of ultrasound physics. 14503 Define point of care ultrasound and diagnostic ultrasound and list some of the main differences between the two. 14504 Develop a basic understanding of the common artifacts in ultrasound, knobology and selection of an appropriate transducer. 14505 List some of the pitfalls and limitations of diagnostic ultrasound and be aware of the challenges to acquiring high quality images. 14506 List some of the pitfalls and limitations of point of care ultrasound."
Genetic Syndrome of Disordered Lipoprotein Metabolism	3623 Define the following genetic conditions: familial hypercholesterolemia, familial combined hyperlipidaemia, familial LPL deficiency, Apo CII deficiency, familial dysbetalipoproteinemia and hypercholesterolemia. 3632 List the genetic and secondary causes of: hypercholesterolemia alone, hypertriglyceridemia alone, hypercholesterolemia and

	hypertriglyceridema and hypoalphalipoproteinemia (low HDL-C). 3644 Define the following genetic conditions: familial hypercholesterolemia, familial combined hyperlipidaemia, familial LPL deficiency, Apo CII deficiency, familial dysbetalipoproteinemia and hypercholesterolemia. 3646 Interpret results of plasma cholesterol, Tg and HDL-C and translate the results in terms of lipoproteins. Ie. calculate LDL-chol, VLDL-chol
Lipid cases: Cardiovascular risk assessment and management	3637 Describe how risk factors are used to assess treatment targets in people with hyperlipidemia. 3640 Descibe the factors that influence the need for treatment of the lipid disorder. 3641 Recognize the important role played by allied health care staff in the overall management of patients with lipid disorders. 3642 Recognize the importance of health promotion and disease prevention. 3646 Interpret results of plasma cholesterol, Tg and HDL-C and translate the results in terms of lipoproteins. Ie. calculate LDL-chol, VLDL-chol. 3684 Interpret results of an oral glucose tolerance test. 11226 Discuss impaired glucose tolerance and impaired fasting glucose as it relates to metabolic syndrome and risk for type 2 diabetes. 11227 Describe strategies to prevent type 2 diabetes.
Diabetes prevention case studies and literature update	3636 Define primary and secondary prevention. 3637 Describe how risk factors are used to assess treatment targets in people with hyperlipidemia. 3639 Enumerate lifestyle factors affecting serum lipid levels. 3640 Describe the factors that influence the need for treatment of the lipid disorder.

	3641 Recognize the important role played by allied health care staff in the overall management of patients with lipid disorders. 3642 Recognize the importance of health promotion and disease prevention. 3643 Recognize the need to teach patients about the role of lipids in coronary artery disease.
Drug Therapy for Lipid Disorders	3627 Name 5 classes of drugs used in the treatment of lipid disorders and identify the main mechanism of action of these drugs. 3629 Describe the effect of each class of drug (named in objective 3627) on serum lipid/lipoprotein levels. 3640 Describe the factors that influence the need for treatment of the lipid disorder. 12826 Discuss the side effects and benefits of the commonly used lipid lowering drugs. 12827 Discuss how risk factor assessment as well as results of lipid and lipoprotein testing influence the choice of lipid lowering therapy
Nutritional Therapy for Dyslipidemia	3633 Describe dietary changes that may be helpful to reduce lipid levels.
Unit 2 Week 6 CDMQ	Any of the above objectives may be tested.

Unit 2 Week 7: Metabolism II

Lecture	Session Objectives
Complications of diabetes	3724 Explain the pathophysiology of diabetic ketoacidosis. 3725 Describe the major symptoms and signs and laboratory findings in diabetic ketoacidosis. 3726 Discuss the principles of management for DKA. 3730 Describe the incidence of diabetic retinopathy in type 1 and type 2 diabetes. 3733 Outline ways of preventing worsening of diabetic nephropathy. 3735 Describe the different stages of diabetic retinopathy. 3736 Describe the fundoscopy findings in diabetic retinopathy. 3749 Describe the pathogenesis of microvascular disease in diabetes. 3750 Discuss the importance of glycemic control in preventing microvascular complications. 3751 Outline other risks besides hyperglycemia for the development of microvascular complications. 3752 Describe the incidence and prevalence of nephropathy in type 1 and type 2 diabetes. 3753 Describe (pathology, signs, symptoms) the sequential phases in the progression of diabetic nephropathy. 3754 Define microalbumenuria, incipient nephropathy, proteinuria, overt proteinuria, end stage renal disease. 3760 Describe the prevalence of diabetic neuropathy. 3761 Describe the main clinical subgroups (classification) of diabetic neuropathy and the symptoms associated with them. 3762 Describe the prevalence of coronary artery disease and large vessel disease in type 1 and type 2 diabetes. 3763 Discuss pathogenetic factors associated for macrovascular disease in diabetes mellitus.

	3764 Outline ways of preventing macrovascular disease in someone with diabetes. 3791 Define hypoglycemia.
Glucose Homeostasis	3665 Describe the islets of Langerhans and its hormone producing cells. 3666 Describe the mechanism of insulin action at the cellular level and the structure of the insulin receptor. 3668 Discuss the main effects of insulin and glucagon. 3669 Discuss the normal regulation of insulin and glucagon secretion. 3670 Define glycolysis, gluconeogenesis, glycogenolysis, and glycogenesis. 3671 Describe the main factors determining the blood glucose level during fasting and post-prandial state (post-meal). 3672 Describe the effect of exercise on glucose control.
Introduction to Diabetes	3675 Explain the main effects of insulin deficiency on glucose, lipid and protein metabolism. 3677 Describe the diagnostic criteria for diabetes mellitus. 3678 Describe the different types of diabetes mellitus and their distinguishing characteristics (classification). 3679 Discuss the role of genetic factors, the immune system and precipitating events and factors, in the development of type I diabetes. 3681 Describe the incidence of type I with respect to age, gender, race and geographical occurrence. 3695 Explain insulin resistance. 11218 Describe the current screening guidelines for type 2 diabetes and list the risk factors for the development.
Management of Type II Diabetes	3672 Describe the effect of exercise on glucose control. 3676 Define diabetes mellitus. 3677 Describe the diagnostic criteria for diabetes mellitus.

	3684 Interpret results of an oral glucose tolerance test. 3686 Describe the steps of insulin administration. 3687 Recognize that diabetes mellitus is a self-management disease for which the affected individual and family have to take the major responsibility. 3689 Compare the mechanism of action of the available types of oral hypoglycemic agents. 3690 Outline an appropriate history and physical examination of a patient with diabetes mellitus including assessment for long- term complications. 3691 Define hypoglycemia. 3692 Identify the main causes of hypoglycemia in diabetic individuals. 3693 Describe the major symptoms and signs of acute hypoglycemia.
Pathology of Diabetes	3711 Describe the pathological changes in the pancreas for type 1. 3712 Describe the pathological changes in pancreas for type 2. 4619 Understand and recognize the pancreatic pathology in type 1 diabetes. 4620 List understand and recognize pathology of the major complications of Diabetes, such as: Microvascular changes in diabetes general aspects, Microvascular Effects in retina, Microvascular changes in nerves, Renal Pathology in Diabetes and Atherosclerosis in Diabetes. 4621 Describe the special aspects of pathology of infection in diabetes.
Histology: Endocrine pancreas	11997 Describe the histology of the hormone producing cells.
Hypoglycemia Cases	3766 Discuss the role of counterregulatory hormones during hypoglycemia. 3767 Describe the major symptoms and signs of acute hypoglycemia. 3768 List causes of hypoglycemia in the non-diabetic population and contrast fasting and postprandial hypoglycemia

Treatment of Diabetes	3706 Discuss the main principles of therapy for type I including diet, exercise, blood glucose monitoring and insulin administration. 3707 Discuss the management principles of type 2 including diet, exercise, home blood glucose monitoring, oral hypoglycemic agents and insulin. 3708 Review steps of insulin administration. 3709 Compare the mechanism of action of the available types of oral hypoglycemic agents.
Acute Emergencies and Chronic Complications of Diabetes	3724 Explain the pathophysiology of diabetic ketoacidosis. 3725 Describe the major symptoms and signs and laboratory findings in diabetic ketoacidosis. 3726 Discuss the principles of management for DKA. 3727 Describe the pathogenesis of microvascular disease in diabetes. 3728 Discuss the mechanisms and clinical effects of macrovascular disease in diabetes mellitus. 3729 Describe the mechanisms and clinical effects of microvascular disease in diabetes mellitus. 3730 Describe the incidence of diabetic retinopathy in type 1 and type 2 diabetes.
Practical Aspects of Diabetes Care - RN	3713 Review the main principles of therapy for type 1 including diet, exercise, blood glucose monitoring and insulin administration. 3714 Review the management principles of type 2 including diet, exercise, home blood glucose monitoring, oral hypoglycemic agents and insulin. 3715 Describe capillary blood glucose measurements including barriers to patients be able to do them. 3716 Recognize the importance of education about diabetes as an essential component of the management of the disease. 3718 Recognize the importance of a healthy lifestyle and attitude for the continuing

	management of diabetes and prevention of long-term complications. 3719 List and recognize the important role of other health professionals and the multidisciplinary team approach to the overall management of diabetes mellitus. 3720 Recognize that the attitude of health professionals, including physicians, to diabetes mellitus and its many problems, is critical to a successful management of the disease.
Practical Aspects of Diabetes Care - RD	3713 Review the main principles of therapy for type 1 including diet, exercise, blood glucose monitoring and insulin administration. 3714 Review the management principles of type 2 including diet, exercise, home blood glucose monitoring, oral hypoglycemic agents and insulin. 3715 Describe capillary blood glucose measurements including barriers to patients be able to do them. 3716 Recognize the importance of education about diabetes as an essential component of the management of the disease. 3718 Recognize the importance of a healthy lifestyle and attitude for the continuing management of diabetes and prevention of long-term complications. 3719 List and recognize the important role of other health professionals and the multidisciplinary team approach to the overall management of diabetes mellitus. 3720 Recognize that the attitude of health professionals, including physicians, to diabetes mellitus and its many problems, is critical to a successful management of the disease.
Understanding Diabetes and Insulin Resistance Syndrome	3676 Define diabetes mellitus. 3695 Explain insulin resistance. 3699 Compare and contrast type 1 and type 2 diabetes with respect to epidemiology, etiology, risk factors, clinical presentation, acute and chronic complications and treatment.

	3700 Interpret results of an oral glucose tolerance test. 3701 Discuss the role of, the beta cell, obesity, the liver and the peripheral cell and genetic factors, in the development of type 2 diabetes. 3702 Describe the pathological changes in the pancreas for type 2 diabetes. 3703 Describe the incidence of type 2 with respect to age, gender, race, and geographical occurrence. 3704 Describe the following conditions: metabolic syndrome, polycystic ovarian syndrome and Cushing syndrome. 3705 Explain the key metabolic abnormalities that lead to insulin resistance.
Unit 2 Week 7 CDMQ	Any of the above objectives may be tested.

Unit 2 Week 8: Bone, Thyroid, Parathyroid

Lecture	Session Objectives
Thyroid cancer	3992 Describe four types of thyroid cancer and their clinical behavior. 4008 Discuss the types of cancers that invade the thyroid. 4009 List the risk factors for the development of thyroid cancer. 4010 Describe the investigation, management and follow-up of thyroid cancer.
Treatment of Osteoporosis	4361 Describe lifestyle and environmental measures that can be considered to prevent bone loss and/or fracture. 4362 Discuss pharmacologic therapy available to treat and prevent osteoporosis. 4363 Describe the mechanism of action of the classes of drugs used in the therapy of osteoporosis.
Thyroid Physiology	3968 Illustrate, with the aid of a diagram, the hypothalamic- pituitary-thyroid feedback axis and regulation. 3969 Illustrate, with the aid of a diagram, the steps in the synthesis and release of the thyroid hormones. 3970 Describe the regulation of thyroid function. 3971 Describe the state of thyroid hormone in the blood and the metabolism of thyroid hormone. 3972 Explain the thyroid hormone action at the cellular level.
Calcium Metabolism	3973 Describe the function of the parathyroid hormone (PTH). 3974 Explain the physiological actions of PTH on bone, kidneys and intestines. 3975 Describe vitamin D metabolism and action on target tissue. 3976 Describe the regulation of 1,25(OH) 2D3. 3977 Explain the regulation of serum calcium using a diagram. 3978 Describe the physiological action of calcitonin.

Management of a Thyroid Nodule	3979 Define the term thyroid nodule. 3980 Discuss the different causes of thyroid nodules. 11214 Describe the investigation and management of a thyroid nodule. 14742 Discuss resource stewardship when ordering investigations for suspected endocrine disease
Histology: Thyroid/Parathyroid	3048 Explain the embryological development of the thyroid gland. 3049 Describe the different cell types within the thyroid gland and their function. 3050 Describe the different cell types within the parathyroid gland and their function.
Thyroid Investigation	3981 Explain the use of the following thyroid function tests in clinical practice: TSH, free T4, free T3, thyroglobulin, thyroid- binding globulins and proteins, thyroid antibodies (anti TPO, thyroid stimulating immunoglobulins, anti-thyroglobulin antibodies), thyroid ultrasound, nuclear imaging of the thyroid, radioactive iodine uptake, fine needle aspiration biopsy of the thyroid and other relevant tests of the thyroid as per current guidelines (such as genetic profiling). 3983 Describe the important signs, symptoms and causes of thyrotoxicosis (hyperthyroidism) and hypothyroidism. 3984 Discuss the clinical features and diagnostic testing that can be used to differentiate the various causes of thyrotoxicosis and hypothyroidism. 12828 Discuss the investigation and diagnosis of thyrotoxicosis and hypothyroidism
Parathyroid/Thyroid Metabolic Bone Disease	3987 Define osteodystrophy. 3989 Explain the pathophysiology of osteodystrophy. 3990 Explain the pathophysiology of Paget's disease. 12291 Describe the pathological findings of various forms of osteodystrophy. 12292 Describe the pathological findings of the various forms of thyroid cancer.

	12293 Describe the pathological findings seen in common thyroid disorders.
Thyroid disorders: Hyper and hypothyroidism	3983 Describe the important signs, symptoms and causes of thyrotoxicosis (hyperthyroidism) and hypothyroidism. 3993 Describe important signs and symptoms of hypothyroidism. 3994 Discuss the use of thyroid function tests in the diagnosis of hypothyroidism. 3995 Discuss common causes of primary and secondary hypothyroidism. 3997 Discuss the use of thyroid function tests in the diagnosis of hyperthyroidism. 3999 Describe the pathophysiology of hyperthyroid Graves' disease. 4000 Define and describe acute, subacute and chronic thyroiditis. 4001 Describe the clinical course of postpartum thyroiditis. 5327 Describe the three phases of subacute thyroiditis.
Bone remodelling / Osteoporosis	4002 Describe the normal bone (re)modeling system. 4003 Define osteoporosis and briefly describe the different types of osteoporosis. 4005 Name common forms of fractures resulting from osteoporosis. 4006 Outline risks for development of osteoporosis in men and women. 4007 Describe tests that can be done to assess presence of osteoporosis.
Unit 2 Week 8 CDMQ	Any of the above objectives may be tested.

Unit 2 Week 9: HPA

Lecture	Session Objectives
Multiple Endocrine Neoplasia	4364 List the clinical findings associated with each of the MEN (multiply endocrine neoplasia) syndromes. 4365 Outline an approach to screening at risk patients and their families for endocrine tumors associated with MEN. 4366 Discuss the common genetic mutations associated with MEN syndromes and their mode of inheritance.
Cushing's Syndrome	4087 Define Cushing's syndrome and Cushing's disease. 4088 Name the 3 categories of causes of Cushing's syndrome and their frequency. 4089 Name the symptoms and signs of Cushing's syndrome. 4090 Describe 2 screening tests for Cushing's syndrome. 4091 Explain the steps needed to make the diagnosis of Cushing's syndrome and to determine its cause. 4092 Name the treatment modalities available for each form of Cushing's syndrome.
Physiology of the hypothalamic / Pituitary axis (HPA)	4012 Discuss the regulation of the hypothalamic, pituitary adrenal axis. 4013 Describe the embryology & anatomy of hypothalamic pituitary axis including endocrine cell types. 4014 Describe regulation and clinical effects of the pituitary hormones. 4015 Discuss the clinical syndromes associated with hyperthyposecretion of the pituitary hormones.
Normal Growth and Puberty	4061 Name the hormones and other determinates of: a) prenatal growth, and (b) postnatal growth. 4062 Explain the control of growth hormone and IGF-1 secretion and their action. 4063 Describe the normal patterns of growth hormones secretion during childhood and adolescence.

	4064 Describe the normal growth patterns during infancy, childhood and adolescence. 4065 Describe the normal secretory patterns of GnRH. LH, FSH and sex steroid secretion in males and females in utero, infancy, childhood and puberty. 4066 Describe the hypothalamic-pituitary-gonadal axis and the hypothalamic-pituitary-adrenal axis and their involvement in normal pubertal development. 4067 Describe the postulated mechanism(s) of normal pubertal maturation. 4068 Describe the normal sequence of events during the development of secondary sexual characteristics in boys and girls and the hormones responsible for these changes."
Investigation of Short Stature	4027 Describe the investigation and management of children with short stature. 4028 Describe the methods and limitations of testing for growth hormone deficiency. 4029 List the criteria for growth hormone therapy. 4030 Outline an appropriate history and physical examination in a child with short stature. 4031 Calculate midparental height and expected final adult height. 4032 Recognize normal and abnormal growth patterns on a growth chart and the interplay between growth and puberty. 4033 Choose appropriate investigations for the assessment of a child with short stature. 4034 Interpret the results of a bone age assessment.
Physiology of the Adrenal Gland	4024 Describe the basic structure of steroids and list which organs produce steroids. 4026 Describe the regulation of each of the three groups of adrenocortical steroid hormones with particular attention to the difference between mineralocorticoid and glucocorticoid regulation. 4035 Categorize steroids into major classes and their physiological action.

	4036 Describe the circulation and metabolism of steroids. 4037 Name the 3 groups of hormones synthesized in the adrenal cortex and related the different cell types to hormone production. 4038 Recognize the multiple steps and enzymes required for the production of steroids and name the major precursers and enzymes involved in steroidogenesis. 4039 Discuss how steroids interact with their receptor and cause target tissue responses. 4040 Discuss the principal physiological effects of each group of hormones. 4041 Describe the regulation of each of the three groups of adrenocortical steroid hormones with particular attention to the difference between mineralocorticoid and glucocorticoid regulation.
Adrenal Disorders	4042 Define adrenocortical insufficiency and Addison's disease. 4043 Distinguish between primary and secondary adrenocortical insufficiency and their clinical presentation. 4044 Discuss the clinical diseases & syndromes associated with over and under secretion of hormones in the adrenal glands including disorders of glucocorticoids and its precursors, mineralalacorticoids and catecholanieux and their metabolites. 4046 Describe the clinical presentation, investigation and management of adrenal disorders.
Pituitary and Adrenal Disorder Cases	4430 Prolactinoma: Presentation, diagnostic testing, differential diagnosis and treatment. 4431 Addison's disease: be familiar with common signs and symptoms of Addison disease, diagnosis and treatement. 4432 Sheehan syndrome: Panhypopituitarism : review hormonal replacement therapy.
Anatomy of the Adrenal Gland	3051 Describe the anatomy of the adrenal gland. 4021 Describe the location, blood supply, lymphatic drainage and innervation of the adrenal glands.

	12948 Describe the location, anatomical features, and vasculature of the thyroid gland. 12949 Identify the pituitary gland, the pituitary infundibulum, the hypothalamus, the sellar diaphragm, and the sella turcica.
Histology: Hypophysis and adrenal cortex	3042 Compare the embryological origin of the adrenal cortex and medulla. Name two common locations of aberrant tissue. 3043 Describe the histology of the adrenal cortex and medulla. 11998 Describe the histology of the hypophysis.
Radiology: Imaging of the hypothalamic pituitary axis	12688 Recognize the anatomy of the pituitary gland, the sella and the suprasellar regions on imaging (CT, MRI). 12689 Name and identify common benign and malignant lesions of the sella and suprasellar regions. 12690 Describe the differences between microadenoma and macroadenoma of the pituitary gland. 12691 Describe the role of contrast media in the study of sellar and suprasellar pathology. 12692 List some important clinical scenarios that would warrant urgent imaging of the pituitary and some for non urgent investigation.
Disorders of Growth and Development	4030 Outline an appropriate history and physical examination in a child with short stature. 4031 Calculate midparental height and expected final adult height. 4032 Recognize normal and abnormal growth patterns on a growth chart and the interplay between growth and puberty. 4033 Choose appropriate investigations for the assessment of a child with short stature. 4034 Interpret the results of a bone age assessment. 4069 Describe the variations of normal pubertal development in males and females. 4070 Define delayed puberty and precocious puberty in boys and girls. 4071 Name the causes and clinical manifestations of delayed and precocious

	puberty in boys and girls; distinguish between normal variants and pathological causes. 4072 Describe the investigation and management of children with a) delayed puberty, b) precocious puberty."" 4073 Describe the indications for and interpretations of LHRH stimulation tests. 4076 Explain how bone age is determined. 4077 Describe the relationship between chronological age, height age and bone age for various growth disorders. 4078 Describe the investigation and management of children with short stature. 4079 Describe the methods and limitations of testing for growth hormone deficiency. 4080 List the criteria for growth hormone therapy. 4082 Know how to obtain accurate height measurements and plot them correctly on a growth curve. 5328 Outline the management of a child with delayed or precocious puberty.
Unit 2 Week 9 CDMQ	Any of the above objectives may be tested.

Unit 2 Week 10: Female Physiology

Lecture	Session Objectives
Introduction to female reproductive organ development and structure	12812 Describe the embryological origins of the female reproductive system. 12813 Describe the anatomical structures, blood supply, and innervation associated with the female reproductive system. 12814 Identify the histological features of the ovaries, vagina and vulva, fallopian tubes, uterus and cervix.
Female Physiology	3891 Define the function of the hypothalamus and the pituitary gland in relation to the menstrual cycle and reproductive physiology. 3892 Explain the functional relationship between the hypothalamus, the pituitary gland and the ovary. 3893 Describe the principal effects of FSH, LH, estrogen, progesterone, thyroid stimulating hormone, growth hormone and prolactin on the menstrual cycle and female reproductive physiology. 3894 Categorize the stimulatory/inhibitory mechanisms regulating the hypothalamic/pituitary/ovarian axis from birth to senescence. 3895 Locate and describe the synthesis of steroid sex hormones. 3897 Define the terms menarche, adrenarche, pubarche, telarche. 3898 Explain the physiological events triggering menarche. 3899 Define perimenopause and menopause. 3900 Describe the physiological events which lead to menopause.
Ammenorrhea and PCOS	3901 Define premature ovarian failure (POF) and categorize its known causes. 3902 Contrast POF and menopause. 3905 Discuss the potential health implications of POF. 3906 Briefly discuss treatment options for POF (exclusive of fertility treatments). 3956 Define amenorrhea and contrast it with menopause.

	3958 Identify pathological hormonal mechanisms which lead to amenorrhea. 3959 Discuss the impact of amenorrhea on fertility. 3960 Discuss the potential health implication of amenorrhea. 3961 List and describe the treatment options to redress normal menstrual cycles. 10532 Explain and identify the multiple factors which may influence the menstrual cycle, including hyperandrogenic and hyperinsulinemic state. 10533 Explain, identify and evaluate the impact of polycystic ovaries (PCO) on endocrine and cardiovascular systems using clinical signs and symptoms, laboratory data, imaging and surgical techniques. 10534 Explain, identify and evaluate the impact of polycystic ovaries (PCO) as a risk factor for malignancy and infertility using clinical signs and symptoms, laboratory data, imaging and surgical techniques. 10640 Describe the relevant findings on history, physical examination, laboratory tests and diagnostic imaging used in evaluation of amenorrhea, and how they point to the etiology of amenorrhea. 10641 Formulate a differential diagnosis of amenorrhea. 10642 Describe the pharmacologic, non-pharmacologic and the surgical treatment options for amenorrhea. 10647 Propose an approach to evaluating a patient with polycystic ovary syndrome (PCOS) with respect to diagnostic criteria, including relevant findings on history, physical examination, laboratory tests and imaging. 10648 Describe potential complications of PCOS
Menstrual Cycle	3926 Describe the ovarian cycle of follicular development in terms of recruitment, maturation, ovulation, lutenization, corpus luteum formation and atresia. 3927 Indicate the respective effects of ovarian hormones (estrogen, progesterone, androgen)

	on the menstrual cycle and on the endometrium. 3929 Understand the functional and histological differences between proliferative, secretory and menstrual endometrium. 3930 Describe the effect of ovarian hormones on the breast, uterus/cervix and vagina. 3931 Explain the process of oogenesis and list the steps in primary and secondary follicular development. 3933 Describe the layer surrounding the follicles generated during oogenesis. 3934 Explain the process of ovulation with respect to the hormones affecting each stage and associated clinical manifestations. 3935 Describe the corpus luteum and its functions. 3936 Describe and illustrate the three phases of menstruation with respect to the hormonal changes. 3937 Define the parameters of a normal menstrual cycle in terms of its frequency, duration, flow. 5014 Illustrate the normal hormonal fluctuations across the menstrual cycle. 5015 Correlate these hormonal fluctuations to changes occurring at the level of the ovary and endometrium.
Menopause	3944 Relate the perimenopausal hormonal functions to the associated changes in the menstrual cycle and fertility. 3945 List common signs and symptoms of menopause. 3946 Correlate the physiological mechanisms underlying the process of menopause and its associated clinical presentations. 3947 Describe the effects of hormonal changes on lipid metabolism in post-menopausal women. 3948 Identify the effects of hormonal changes on the cardiovascular system in post-menopausal women. 3949 Describe the effects of hormonal changes on bone metabolism in post-menopausal women.

	3950 Discuss the biopsychosocial impact of menopause. 10538 List investigations that are useful in menopause patients. 10539 Describe and recognize the following regarding menopause: non-pharmacologic and pharmacologic management, including effects on other organ systems. 12837 Define menopause.
Content Orientation: Female	3060 Describe the functional anatomy of the uterus, cervix, vulva, vagina, ovaries, and fallopian tubes. 3061 Recognize the differences between the parametrium, myometrium and endometrium. 3062 Recognize the differences between the mesovarium and mesosalpinx. 3063 Identify the important anatomical structures surrounding the uterus including pelvic blood supply and ureters. 3064 Describe the structural ligamentous support of, the lymphatic drainage of, and the innervation of the uterus. 3067 Describe the ovarian blood supply and lymphatic drainage. 3068 Describe the four fornices of the vagina. 3069 Describe the innervation of the vagina. 3070 Describe the anatomy of the bony pelvis including its joints (lumbosacral, sacroiliac, symphysis, pubis and sacrococcygeal) and their clinical relevances to the practice of obstetrics. 3071 Describe the muscles forming the pelvic diaphragm and their function.
Histology: Female	3072 Recognize and identify the following normal microscopic structures of the ovaries: cortex and medulla, germinative epithelium, primordial follicles, secondary follicles, graffian follicles, oocytes, cumulus oophorus, zona pellucida, internal and external theca, blood vessels, lymphatic vessels and corpus luteum. 3073 Name and identify the various layers of the fallopian tubes. 3074 Identify the myometrium and endometrium.

	3075 Identify the following structures on the cervix: Squamous and glandular epithelium, cervical glands and clefts, Transformation zone. 3076 Recognize and describe the normal microscopic appearance of the vagina and vulva.
Embryology: Female	3769 Explain the origin of the germ cells, their migration and settlement in the genital ridges. 3770 Explain the origin of the secondary sex organs in female. 3771 Recognize the critical period in the development of sex organs (both primary and secondary). 3772 Describe the role of both genetic and environmental factors on the development and differentiation of external genitalia in female.
Abnormal uterine bleeding	3938 Describe menorrhagia, oligomenorrhea, menometrorrhagia, metrorrhagia. 3939 Classify abnormal uterine bleeding in ovulatory and anovulatory bleeding. 3940 Categorize abnormal uterine bleeding into anatomical, medical/pharmacological, and biochemical hormonal causes. 3941 Elaborate a clinical approach to abnormal uterine bleeding in perimenarchal, reproductive, peri and post-menopausal women. 3942 Elaborate a clinical approach to abnormal uterine bleeding and briefly discuss available treatment options (pharmacological and surgical management). 5016 Compare the normal menstrual cycle with anovulatory conditions such as polycystic ovarian syndrome, premature ovarian failure and menopause. 10667 Formulate a differential diagnosis of vaginal bleeding with respect to pre-menarchal, pre-menopausal and post-menopausal causes. 10669 Describe the etiology and presenting signs and symptoms of anovulatory causes of vaginal bleeding, (including menopause, PCOS and ovarian tumours).

Vaginal Discharge	10651 Formulate a differential diagnosis of vaginal discharge and vaginal pruritus. 10652 Describe and identify normal physiological discharge and cervical mucus production. 10653 Describe the following regarding candidiasis: etiology, risk factors, signs and symptoms, findings on physical examination, investigations and management. 10655 Describe the following regarding bacterial vaginosis: etiology, risk factors, signs and symptoms, findings on physical examination, investigations and management. 10656 Describe the following regarding vulvoginal atrophy: etiology, risk factors, signs and symptoms, findings on physical examination, investigations and management.
Unit 2 Week 10 CDMQ	Any of the above objectives may be tested.

Unit 2 Week 11: Physiology of the Reproductive System

Lecture	Session Objectives
Introduction to male reproductive organ development and structure	12809 Describe the embryological origins of the male reproductive system. 12810 Identify the anatomical structures, blood supply, and innervation associated with the male reproductive system. 12811 Identify the histological features of the testis, epididymis, prostate, seminal vesicles and penis.
Physiology of Reproduction	4139 Define events preceding fertilization: ovulation, tubal transport, sperm activation, sperm capacitation, sperm transport, acrosome reaction. 4140 Describe the molecular and cytological events that lead to fertilization: sperm zona binding, sperm oolemma binding, sperm decondensation and pronuclear formation, male and female pronucleii form, first cleavage division. 4141 Describe the biochemical and molecular aspects of the life of the embryo before implantation. 4142 Explain the physiological role of the corpus luteum from ovulation through early gestation. 4143 Describe the genetic content of the ovum and spermatozoa before conception. 4144 Explain the meiotic division at conception and its impact on fetal development. 4145 Describe the process of fertilization in terms of ovum preparation, spermatozoa preparation, and union of gametes. 4146 Describe the physiological changes and adaptations that occur to allow embryo implantation. 4147 Explain the function of the placenta in terms of metabolism, transport, paracrine and endocrine secretions. 4148 Name the two components of the placenta. 4149 Compare and contrast the histological and functional features of the epiblast and hypoblast.

	4150 Define decidual reaction. 4151 Explain the process of vascularization of the embryo. 4152 Describe the anatomy and physiology of placental circulation. 4153 Describe the anatomy and physiology and fetal cardiovascular circulation. 4154 Explain the normal physiological changes associated with pregnancy in the breast, cardiovascular system, hematological system, GI tract, GU system, uterus, ovary, pituitary, and hypothalamus. 10546 Describe the physiological adaptations of the body to accommodate blood loss, including clinical signs and symptoms reflective of these. 10547 Explain and recognize pregnancy adaptations which are protective against blood loss during labour
Social factors and teratogens in Pregnancy / Alcohol, tobacco and illicit drug use in pregnancy	4171 Describe the fetal-placental-maternal unit in relation to pharmakinetics. 4172 Compare and contrast fetal and maternal mechanisms involved in clearance of toxic substances. 4173 Explain the effects of smoking, alcohol, illicit drugs on pregnancy and the fetus. 4174 Describe the common teratogenic effects of thalidomide, anticonvulsants, anticoagulants, and ACE inhibitors on fetal development. 4175 Describe the effect of diethyl stilbestrol on the female reproductive organs and external genitalia. 4177 Describe the physician's role in cultivating healthy attitudes in the management of addictions in pregnancy. 4178 Review available resources to support pregnant and new mothers with addictions. 4179 Review the legal recourses in place to protect the fetus in cases of harmful maternal addictions. 10627 Describe the interaction between pregnancy and the following: alcohol, smoking and other substance abuses.
Antenatal care and prenatal screening	4191 State the signs and symptoms of normal pregnancy.

	4192 Describe methods available to establish gestational age and their relative accuracy. 4193 Explain the role of ultrasound examination in the diagnosis of early pregnancy and identification of multiple pregnancy including types of placentation. 4194 Recognize the preventative steps recommended for routine antenatal care. 4195 Explain the rational for a complete physical exam including pap test and pelvic exam during pregnancy. 4196 Explain the rationale for routine prenatal tests required for appropriate antenatal care. 4197 Describe the various methods of prenatal diagnosis for neural tube defects, genetic disorders and anatomical disorders. 4198 Describe the medical, psychological and ethical implications of positive prenatal diagnostic tests. 10555 List and describe the prenatal diagnostic tools available to a woman, including risks and benefits of each. 10556 Interpret the results of the integrated prenatal screening test (IPS). 10628 Counsel patients on risks and benefits of the following: history of genetic abnormalities, advanced maternal age, substance abuse, nutrition and exercise, medical and environmental hazards, immunizations and depression. 10558 Describe the causes and epidemiologic pattern of each of the following: maternal death rates, fetal death rates, neonatal death rates and perinatal death rates. 10559 Describe the physiological course of a normal pregnancy, and identify both maternal and fetal factors (medical and social) which distinguish an at-risk pregnancy.
Labour and Delivery	4199 Define labor. 4200 Review the relevant obstetrical landmarks of the female pelvis that are important in the management of labor. 4201 Explain the hormonal mechanisms involved in the initiation of labor. 4202 Describe the signs and symptoms signaling the onset of labor.

	4203 List the stages of, and describe the mechanisms of, labor. 4205 Describe the cardinal movements of labor. 4206 Discuss the management of normal spontaneous labour. 4208 Describe the management of third stage of labour. 4209 Describe the pharmacological effects and clinical application of prostaglandins and oxytocic agents in the peripartum period. 10543 Identify the factors that influence blood loss during and shortly after third stage of labour. 10564 Describe the characteristics of false labour. 10565 Describe the initial assessment of a labouring patient. 10569 Describe the methods of monitoring the mother and fetus during labour and list indications for each. 10582 List abnormal patterns of labour at each stage, including normal ranges of duration for stages 1, 2 and 3.
Content Orientation: Perineum and external genitali	3084 Recognize the boundaries of the perineum around the male and female genital anatomy. 3085 Describe the composition of the female and male urogenital triangle, perineum and their relationships to surrounding structures. 3086 Identify the superficial perineal muscles around the male and female genital anatomy. 3087 Recognize the urogenital diaphragm. 3088 Name and identify the main components of the external female genitalia. 3089 Recognize the external and internal anatomy of the penis. 3090 Describe the position of the corpus spongiosum and corpus cavernosum. 3091 Review the principal vascular and nerve supply of perineum and external female and male genitalia.
Pathology of Pregnancy	11229 Describe the gross and histological features of normal placenta. 11230 List the indications for pathological examination of the placenta.

	11231 Describe the gross and histological appearance of the main pathologic conditions seen in the placenta 11232 Understand the pathogenesis and clinical presentation of spontaneous abortion and ectopic pregnancy. 11233 List the risk factors and complications of ectopic pregnancy. 11234 Describe the pathological features of spontaneous abortion, and the role of pathological examination of tissues of miscarriage. 11235 Understand the pathogenesis and classification of gestational trophoblastic diseases. 11236 Discuss the risk factors of gestational trophoblastic diseases. 11237 Compare and contrast complete and partial hydatiform mole. 11238 Describe the clinical and pathological features of choriocarcinoma.
Analgesia during Labour	4210 Describe the pain pathway for labor and delivery. 4211 List the various modalities of analgesia and anesthesia available to pregnant women during labor and differentiate these modalities in terms of indications, advantages, disadvantages, and common side effects. 4213 List the complications which may occur with the use of the various modalities of pain control during labor. 4214 List and appraise alternative modalities of pain control during labor. 4215 Assess the impact of appropriate emotional support on pain management during labor and delivery.
Isoimmunization	10597 Describe the red blood cell antigens. 10598 Describe the use of immunoglobulin prophylaxis during pregnancy, including: dose, timing, type, risks, benefits, indications and contraindications. 10599 Describe the clinical circumstances under which isoimmunization is likely to occur. 10600 Describe the clinical presentation of maternal isoimmunization, including the

	laboratory tests and imaging used to aid in making the diagnosis. 10601 Describe the laboratory, imaging and invasive techniques used to determine the severity of fetal involvement isoimmunization.
Unit 2 Week 11 CDMQ	Any of the above objectives may be tested.

Unit 2 Week 12: Sensitive Issues

Lecture	Session Objectives
Breast Pathology	5025 Differentiate between benign and malignant breast conditions based on clinical presentation, imaging and pathology. 5026 List risk factors for the development of breast cancer. 5027 Explain the concept of Bi-Rads and its importance for risk assessment of breast cancer. 5028 Given specific clinical presentations, select appropriate investigations and treatment options.
Infection in Pregnancy	10626 Describe the interaction between pregnancy and the following infectious diseases: herpes, rubella, group B streptococcus, hepatitis, HIV, HPV, other sexually transmitted infections (STIs), cytomegalovirus (CMV), toxoplasmosis, varicella and parvovirus. 10634 Describe and list the following regarding maternal HIV infection: epidemiology, screening, perinatal effects of HIV/AIDS, effect of pregnancy, vertical transmission, management and recommendations (refer to CBL module on Human immunodeficiency virus infections - HIV scheduled during week 11 in the Foundations Unit). 11228 List and describe TORCH and parvovius B19 infections.
Female Sexual Function	4317 Define healthy sexuality. 4319 Examine psychological factors affecting sexual development and pathology. 4320 Compare and contrast the male and female physiological response during sexual activity. 4322 Define sexual dysfunction. 4323 Identify the main sexual dysfunction for males and females. 4324 Evaluate diagnostic tools available to identify sexual dysfunction in both males and females.

	4325 State the prevalence and common cause of hyposexual desire disorder (HSDD). 4329 Recognize the impact of sexual dysfunction on biopsychosocial health. 4330 Discuss the role of healthcare professionals with regards to sexual health and dysfunction.
Benign Breast Disease	4283 Describe the pathogenesis of fibrocystic breast disease in males and females. 4284 Describe the pathogenesis of fibroadenoma, breast cysts and breast abscess. 4287 Discuss investigation and management of benign breast disease. 4288 Compare and contrast the clinical presentation of benign vs malignant breast disease. 4289 Explore the relationship between benign disease of the breast and cancer. 11244 Recognize that diagnosis is always multidisciplinary, and that mismatches between clinical, imaging and pathology must always be resolved. 11245 State how pathology correlates with clinical and radiological presentation and differential diagnosis of common breast pathology. 11246 Compare and contrast benign and malignant presentations of breast disease. 11247 List the basic gross and microscopic features of common breast pathology. 11252 Explain the pathogenesis of proliferative and non- proliferative fibrocystic changes of the breast.
Breast Cancer	4290 Describe the pathogenesis of breast cancer. 4291 List the hormonal receptors present in certain breast cancers and describe their significance in the pathogenesis of these cancers. 4292 Identify common sites of metastasis from breast cancer. 4293 Review the breast cancer classification system (TNM). 4314 Describe the treatment approach and management of breast cancer.

	4315 Discuss the biopsychosocial impact of breast cancer. 5025 Differentiate between benign and malignant breast conditions based on clinical presentation, imaging and pathology. 5026 List risk factors for the development of breast cancer. 5027 Explain the concept of Bi-Rads and its importance for risk assessment of breast cancer. 5028 Given specific clinical presentations, select appropriate investigations and treatment options. 11244 Recognize that diagnosis is always multidisciplinary, and that mismatches between clinical, imaging and pathology must always be resolved. 11245 State how pathology correlates with clinical and radiological presentation and differential diagnosis of common breast pathology. 11246 Compare and contrast benign and malignant presentations of breast disease. 11247 List the basic gross and microscopic features of common breast pathology. 11251 Review macroscopic and microscopic features of common benign and malignant breast pathology. 11253 Recognize proliferative breast disease as a risk factor for breast cancer. 11254 Recognize that pathogenesis in breast cancer includes some specific familial factors. 11255 Define the terms duct carcinoma in situ (DCIS), lobular carcinoma in situ (LCIS), invasive ductal carcinoma and invasive lobular carcinoma. 11256 Describe the major components of TNM staging and grading in breast cancer. 11257 Recognize the meaning of predictive and prognostic factors in relation to breast cancer. 11258 Explain how microscopic features of breast malignancy are used in risk analysis and therapeutic decision making. 11259 Identify the most important prognostic factors in breast carcinoma.

	11260 Explain how estrogen receptor, progesterone receptor, and HER2/neu status can be tested for and why this is done.
Histology: Breast	3092 Describe the histology of the adult female breast.
Radiology: Screening mammography	12273 Review the background and evidence supporting the use of screening mammography, ultrasound (US) and magnetic resonance imaging (MRI). 12274 Describe Canadian population-based screening programs, their performance indicators and their costs. 12275 Provide an overview of mammographic abnormalities and their work-up.
Radiology: Staging of breast cancer	12943 Cover the TMN staging of breast cancer. 12944 Demonstrate the extent of breast cancer preoperatively for the surgeon. 12945 Illustrate the importance of radiological-pathological correlation for all image-guided breast biopsies. 12946 Review the imaging of locally advanced disease and discuss when neoadjuvant treatment is used. 12947 Explain the concept of BI-RADS in breast imaging and its importance for risk assessment of breast cancer.
Post-Partum Breastfeeding	10577 List the components of routine post-partum care of mother and infant. 10579 Formulate a differential diagnosis and management plan of the most common postpartum abnormalities of the breast. 10580 List the benefits of breast feeding and communicate. 10581 Describe factors associated with breastfeeding: such as frequency, duration, inadequate production of milk and correct positioning of infant.
Contraception	4343 Discuss the need for contraceptive and barrier methods in sexually active males and females. 4344 Compare and contrast various forms of contraception (hormonal and non-hormonal)

	in terms of effectiveness, advantages and disadvantages, risks and benefits, indications and contraindications. 4345 Describe absolute and relative contraindications to the use of hormonal contraceptives. 4346 Explain the pharmacological mechanism of action of combined estrogen/progesterone contraceptives in preventing pregnancy. 4347 Describe the mode of action of progesterone-only contraceptives and list their clinical indications. 4348 Describe the mechanisms of action of intrauterine devices (IUD) and systems (IUS) containing progesterone. 4349 Compare and contrast indications, contraindications and complications of IUD's and IUS's. 4350 Describe surgical sterilization methods for males and females, their respective effectiveness, indications and potential complications. 4351 Describe various contraceptive barrier methods: diaphragm, cervical cap, contraceptive foam, male and female condom and compare efficacy. 10660 Describe the mechanism of action of hormonal and non- hormonal methods of contraception.
Unit 2 Week 12 CDMQ	Any of the above objectives may be tested.

Unit 2 Week 13: Male Physiology

Lecture	Session Objectives
Male Physiology	3917 Define the function of the hypothalamus and pituitary gland in relation to male reproductive physiology. 3918 Explain the functional relationship between the hypothalamus, the pituitary gland and the testis. 3919 Categorize the stimulatory/inhibitory mechanisms regulating the hypothalamic/pituitary/testicular axis from birth to senescence. 3920 Describe and locate the production of male steroid sex hormones. 3921 Describe androgen transport and action. 3922 Explain the physiological roles of androgens at puberty and throughout all life stages. 3924 Explain the interactions required by the neurologic, vascular, endocrine and urologic systems to produce a normal erection and ejaculation. 3925 Describe the process of spermatogenesis.
HPV	4335 Compare and contrast the relationship of HPV in benign vs. precancerous pathology. 4337 List a brief differential diagnosis for vulvar warts. 4388 Explain how HPV is related to lower genital tract disease (warts, squamous intra-epithelial lesions, carcinoma). 4628 Identify the anatomical features of stomach and duodenum. 10635 Interpret the results of a Pap smear, and the clinical implications and management options for each. 12693 Describe ways to prevent HPV infection: safe sex practices, condoms, vaccination. 12829 Review treatment options for external genital warts. 12830 Name the two vaccines available for HPV prevention and the subtype of HPV against which they protect. 12831 Describe colposcopic assessment.

	12832 Name indications for HPV-DNA testing. 12833 List treatment options for cervical dysplasia.
STI	4299 List infectious agents commonly associated with sexually transmitted infections (HPV condyloma, gonorrhea, herpes, chlamydia, syphilis, Hep B, HIV and trichomonas) and their clinical presentations. 4301 Formulate the appropriate treatment options for the STIs (HPV condyloma, gonorrhea, herpes, chlamydia, syphilis, Hep B, HIV and trichomonas). 4305 Discuss the biopsychosocial impact of STIs. 4332 Describe the prevalence and trends of sexually transmitted infections (STI) in relation to demographics. 4333 Describe the transmission of sexually transmitted infections (STI) - HPV condyloma, gonorrhea, herpes, chlamydia, syphilis, Hep B, HIV, trichomonas.. 4334 List the anatomical sites affected by the sexually transmitted infections (STI) - HPV condyloma, gonorrhea, herpes, chlamydia, syphilis, Hep B, HIV, trichomonas. 4336 Describe the causes, diagnosis, treatment and complications of salpingitis. 4338 Review the diagnostic tools available for sexually transmitted infections (STI). 4340 Compare efficacy of various preventative measures against sexually transmitted infections (STI). 4341 Review the legal requirements and protocols for reporting sexually transmitted infections (STI). 10632 Describe to the patient the following factors regarding commonly encountered STIs: risks and benefits of performing the test, indications for doing each, interpretation of the results, available treatment and management options, reporting requirements, insurance and disability issues. 10657 Describe the following regarding chlamydia, gonorrhea and herpes genitalis: etiology, risk factors, signs and symptoms,

	findings on physical examination, investigations and management. 10658 Describe the following regarding pelvic inflammatory disease (PID): etiology, risk factors, signs and symptoms, findings on physical examination, investigations, management and complications.
Content Orientation: Male	3077 Describe the functional anatomy of the following: scrotum and its content, testes, tunica vaginalis, epididymis, spermatic fascia and cord, vas deferens, seminal vesicle, prostate. 3078 Define the layers of skin which comprise the scrotum. 3079 Describe the vasculature of the male genital system – testes, prostate, seminal vesicles and vas deference. 3080 Describe the lymphatic drainage of the testes, prostate, seminal vesicles.
Histology: Male	3081Identify the following structures of the testes: seminiferous tubules, testicular interstitium, spermatogonia, primary spermatocytes, secondary spermatocytes, spermatozoa, Sertoli cells, epididymis (and its cell layers). 3082 Describe the histology of the prostate. 3083 Identify the erectile tissue in the penis.
Embryology: Male	3773 Explain origin of the germ cells, their migration and settlement in the genital ridges. 3774 Recognize the origin of the secondary sex organs in male. 3775 Identify the critical period in the development of sex organs (both primary and secondary). 3776 Recognize the role of both genetic and environmental factors on the development and differentiation of external genitalia in the male. 3777 Explain the importance of sex chromosomes in sex determination and differentiation. 3778 Recognize the role played by testosterone in the development of secondary sex organs in male.

	3779 Explain the process and purpose of the decent of testes to the scrotum.
Scrotal Pathology	4221 Define the terms: varicocele, hydrocele, spermatocole, epidymal cyst, acute orchitis, acute epididymitis and testicular torsion and compare and contrast their clinical presentations. 4223 List diagnostic tools for, and describe treatment options for, varicocele, hydrocele, spermatocole, epidymal cyst, acute orchitis, acute epididymitis and testicular torsion. 4225 Explain the pathogenesis of testicular torsion and complications. 4226 Recognize the need for urgent management of testicular torsion. 4227 State the prevalence and risk factors for testicular cancer. 4228 Explain the pathophysiology of testicular cancer. 4229 List the treatments for testicular cancer. 4230 Outline post-cancer care and support. 4231 Demonstrate the impact of testicular cancer on biopsychosocial factors. 4302 List the differential diagnoses for scrotal pain. 4303 Describe the pathogenesis of orchitis and epididymitis. 4304 Describe the causes, diagnosis, treatment and complications of orchitis and epididymitis.
Erectile Dysfunction and Andropause	3951 Define andropause and explain the physiological/pathological events which lead to it. 3952 List the common signs and symptoms of andropause. 3953 List and describe the appropriate investigations available to diagnose andropause. 3954 Describe the available treatment options to treat andropause if/when appropriate. 3955 Discuss the biopsychosocial impact of andropause. 4924 Describe the normal histology of peripheral nerve. 4925 List axon types found in peripheral nerves, relating diameter to function.

	4926 Compare and contrast electrical conduction in myelinated and unmyelinated axons. 4927 Describe the clinical approach to the characterization of neuropathy. 4928 Describe degenerative disk disease and radiculopathic syndromes.
Unit 2 Week 13 CDMQ	Any of the above objectives may be tested.

Unit 3 Lecture Objectives

Unit 3 Week 1: Mood Disorders

Lecture	Session Objectives
Assessment of suicide risk	5163 Describe the epidemiology of suicide. 5164 Compare and contrast suicide attempters versus suicide completers. 5165 Describe the assessment of a suicidal patient. 5166 Describe the difference between active and passive suicidal ideation. 5167 Describe the management of a suicidal patient. 5168 Recognize the risk factors for suicide in different demographic groups (e.g., adolescents, elderly, indigenous groups). 5169 List the preventive strategies for suicide 5170 Recognize the need to support family/friends who have lost an individual to suicide.
Introduction to psychiatry	5112 Explain the difference between normal and abnormal emotions, thoughts and perceptions. 5113 Describe the broad categories of psychiatric disorders. 5114 Describe the basics of the psychiatric interviewing process, including listing and definingr the components of a psychiatric history. 5115 List and define the components of a mental status exam. 5117 Explain the biopsychosocial model of understanding mental illness. 5118 Describe the importance of using a biopsychosocial approach to mental illness with respect to management. 5119 Demonstrate knowledge concerning psychiatric epidemiology. 5120 Demonstrate awareness of medicolegal and ethical issues related to

	psychiatric practice, including involuntary hospitalization and treatment. 12707 Recognize the impact of the stigma of mental illness
Mood disorders	5126 Create a differential diagnosis of depressive symptoms in child, adolescent, adult and elderly populations, including other psychiatric and medical illnesses that may present with similar symptoms. 5127 Explain the concept of pseudo-dementia 5128 Describe how to start an antidepressant medication in the general population, and in more medically frail populations 5130 List the common and dangerous side effects of commonly prescribed antidepressant medications. 5131 Describe the expected course of recovery from depressive disorder and bipolar disorder when appropriately treated. 5132 Describe the follow-up monitoring process necessary for common antidepressant treatment. 5133 Describe the length of treatment with antidepressants for depressive disorders and with mood stabilizers for bipolar disorder. 5134 Demonstrate knowledge of evidence-based psychological treatments which are effective for depressive disorders and bipolar disorder across the life span. 11370 Describe how depressive symptoms differ in the elderly compared to a younger adult population.
Neurocognitive disorders	5146 Explain the diagnostic criteria for major and minor neurocognitive disorder and delirium. 5147 List the most common causes and differential diagnoses for major neurocognitive disorder and other conditions causing cognitive changes in the elderly.. 5148 Differentiate the course and presenting features of neurocognitive disorders, delirium and depressive disorders.

	5149 Describe the pharmacologic and non-pharmacologic interventions to be considered in the treatment of neurocognitive disorders, including Alzheimer disease, as described in the guidelines of the 2008 Canadian Consensus Conference on the Diagnosis and Treatment of Dementia. 5150 Describe the epidemiology, course and prognosis of neurocognitive disorders, including Alzheimer disease, vascular disease, Lewy Body disease and frontotemporal lobar degeneration 12711 Given a clinical scenario, recognize delirium and differentiate from neurocognitive disorders 12712 Discuss how depression in an elderly patient can present as a neurocognitive disorder. 12713 List potentially reversible causes of cognitive impairment. 12714 Employ pharmacological treatments for neurocognitive disorders 12715 Recognize behavioural and psychological symptoms of neurocognitive disorders. 12716 Discuss psychosocial treatments for neurocognitive disorders. 12717 Identify medications which may contribute to cognitive impairment in the elderly.
Differential diagnosis of mood disorders	5333 Recognize treatment strategies to address mood symptoms presenting as part of a medical condition or substance use disorder 12708 Describe the differential diagnosis of mood disorders including other medical conditions and substances that produce the same symptoms. 12709 Describe how a diagnosis of a mood disorder is made. 12710 List the depressive and bipolar disorders.
Mini mental status exam	5140 Perform the screening Folstein (mini-mental status examination) MMSE and

	(Montreal Cognitive Assessment) MoCA exam. 5141 Explain the indications for use of the Folstein MMSE and MoCA exam. 5142 Interpret results of the MoCA and Folstein MMSE exam.
Dementia - Pathology and pathophysiological concepts	5324 Recognize the role of protein misfolding as a common pathogenetic denominator of neurodegenerative diseases. 5325 Recognize the basic gross pathological and histopathological hallmarks of common neurodegenerative dementias. 5326 Describe some of the emerging pathophysiological concepts in our understanding of the molecular causation of neurodegeneration.
ECT	5143 Explain the indications, contraindications and side effects of electroconvulsive therapy (ECT). 5144 Describe the procedure of ECT.
Psychopharmacology of mood disorders	5153 Describe the neurotransmitter systems and neuroanatomical pathways that are implicated in mood disorders. 5154 List the common classes of antidepressant medications and give one example from each 5155 Describe first line pharmacologic treatment of major depressive disorder and bipolar disorder, across the lifespan. 5156 Explain the mechanism of action and side effect profile of selective serotonin reuptake inhibitors (SSRIs), serotonin-norepinephrine reuptake inhibitors (SNRIs), tricyclic antidepressants (TCAs) and lithium and valproic acid. 5157 List the common drug interactions with lithium. 5158 Describe monitoring of SSRIs and mood stabilizers. 5159 Describe the role of antipsychotic medication in the treatment of mood disorders.

Somatic symptoms and related disorders	5306 Describe in general terms the clinical features of somatic symptoms and related disorders, including somatic symptom disorder, illness anxiety disorder, conversion disorder (functional neurologic symptom disorder), psychological factors affecting other medical conditions, as well as body dysmorphic disorder (an obsessive compulsive and related disorder). 5307 Describe the general principles behind biopsychosocial interventions used for the management of somatic symptoms and related disorders. 5308 Describe the diagnostic criteria of factitious disorders: including with predominantly psychological signs and symptoms and physical signs and symptoms. 5309 Describe the condition of Malingering.
Unit 3 Week 1 CDMQ	Any of the above objectives may be tested.

Unit 3 Week 2: Psychosis

Lecture	Session Objectives
Psychiatric assessment and MSE of psychotic illness	5238 Discuss the key questions to ask a patient presenting with auditory hallucination 5239 Discuss the key questions to ask a patient presenting with paranoia 5240 Discuss the typical mental status findings seen in a patient presenting with a psychotic illness.
Psychosis	5171 Recognize the epidemiology of psychotic illness. 5172 Explain the role of genetics in the etiology of psychotic illness. 5173 Describe the symptoms and signs seen in psychotic illnesses. 5174 Compare and contrast schizophrenia with other psychotic disorders 5175 Describe psychotic disorders due to a general medical condition and substance use disorders 5176 Describe the presentation and management of psychoses across the life span. 5177 Describe the biopsychosocial interventions used for the management of schizophrenia, schizoaffective disorder and delusional disorder. 5178 Explain the extent of disability associated with psychotic illness.
Schizophrenia	5179 Describe the impact of first episode psychosis on normal development and behaviour in young adults. 5180 Recognize the problems associated with loss of insight in patients with psychotic illness. 5181 Recognize the association between psychotic illness and substance use disorders 5182 Explain the concepts of recovery and rehabilitation as they relate to schizophrenia. 5183 Describe first line treatment for schizophrenia using an atypical antipsychotic medication, including counseling a patient

	regarding mechanism of action, side effects and length of treatment 5187 Demonstrate knowledge of important considerations in management/treatment decisions when treating patients with first episode psychosis. 5189 Describe how to start an antipsychotic medication, including baseline medical workup. 5193 Describe the expected course of recovery from schizophrenia when appropriately treated. 5194 Describe the follow-up monitoring process necessary with for antipsychotic medication. 5195 Describe the duration of treatment with antipsychotic medication for treatment of schizophrenia. 5196 Recognize evidence-based psychologic treatments which are effective for treatment of schizophrenia 5197 Recognize psychosocial interventions necessary for recovery from schizophrenia. 5198 Explain the importance of family and caregiver support in treating persons with schizophrenia. 5199 Describe the impact of substance use disorders on severity of psychotic symptoms 5200 Describe treatment strategies for patients with concurrent substance use disorders and schizophrenia 5201 Explain the risk of harm to self or others in persons with schizophrenia. 5202 Describe the impact of stigma as it relates to persons with a diagnosis of schizophrenia 11371 Describe prodromal symptoms of psychotic illness seen in adolescents and young adults.
Substance use disorders	5218 Demonstrate an understanding of substance use disorders. 5219 List the different symptoms and signs of alcohol, opioid, benzodiazepine,

	stimulants (cocaine, amphetamine) and cannabis withdrawal and intoxication. 5220 Explain the management of different substance use disorders (alcohol, opioid, benzodiazepine, stimulants and cannabis), including detoxification and treatment. 5221 Describe what is meant by harm reduction. 5222 Define the concepts associated to a substance use disorder, including tolerance and withdrawal. 5223 Describe the epidemiology of alcohol use disorders. 5224 Apply the CAGE questionnaire and understand the implications 5225 Differentiate between normal alcohol consumption and problem drinking. 5226 Describe the presentation and management of substance use disorders across the life span. 5227 Describe the mesolimbic dopaminergic pathway (reward pathway) related to substance use disorders. 5228 Describe the risks associated with relapse in substance use disorders. 5264 Describe a pharmacological strategy to taper and discontinue benzodiazepines.
Clinical vignettes: Substance intoxication and withdrawal	5262 List the common and dangerous side effects of benzodiazepines. 5334 List symptoms of alcohol use disorder, as well as intoxication and withdrawal. 5335 Describe a treatment plan for a patient who wishes treatment for alcohol use disorder 5336 Describe the assessment and treatment of alcohol withdrawal. 5337 List symptoms of sedative, hypnotic or anxiolytic use disorder, as well as intoxication and withdrawal 5338 Describe a treatment plan for a patient with sedative, hypnotic or anxiolytic use disorder 5339 List the signs and symptoms of opioid withdrawal.

	5340 Describe a treatment plan for opioid use disorder. 12721 Understand how to use laboratory investigations in cases of suspected substance use disorder
Neuropsychiatry	12718 Describe what neuropsychiatry is and how the brain and behaviour are related. 12719 Describe the functional neuroanatomy of the limbic system 12720 Describe the neurobiological basis for mood disorders, anxiety disorders, psychotic disorders, substance use disorders and cognitive disorders, including memory difficulties and frontal lobe dysfunction.
Neurotransmitters and psychosis	5341 Explain the dopamine pathways and their function. 5342 Describe the dopamine hypothesis of schizophrenia 5343 Describe the interplay between serotonin and dopamine receptors with respect to the mechanism of atypical antipsychotic medication. 5344 Recognize the differences in affinity for the dopamine receptor among different antipsychotic pharmacological medications. 5345 Recognize the concept of “fast on-fast off” binding of dopamine receptors
Movement disorders	5203 Demonstrate an understanding of movement disorders (Extrapyramidal symptoms - EPS). 5204 Describe and recognize the different movement disorders (extrapyramidal symptoms). 5205 List the risk factors and treatment for the different movement disorders. 5206 Describe the neuroanatomical theories for the pathophysiology of the different movement disorders. 5207 Compare and contrast the side effect profile of the atypical to the typical antipsychotic pharmacological drugs with respect to EPS.

Eating disorders	5294 Describe the diagnostic criteria and epidemiology of anorexia nervosa, bulimia nervosa and binge eating disorder 5295 Describe the biopsychosocial interventions used for the management of anorexia nervosa, bulimia nervosa and binge eating disorder
Psychopharmacology of psychotic illness	5229 List the classes of medication used for psychopharmacological treatments for psychotic illness 5230 Explain the different options for prescribing antipsychotic medication including tablet, rapid oral disintegrating, liquid and long acting intramuscular 5231 Describe the difference between the mechanism of action of typical and atypical antipsychotic medications 5232 Describe the metabolic side effects associated with antipsychotic medications and monitoring requirements associate with these. 5233 Describe the use of anticholinergic medications to treat side effects of antipsychotic medications. 5234 Describe extrapyramidal symptoms seen in association with use of antipsychotic medications. 5235 Describe the presentation and management of tardive dyskinesia. 5236 Describe the presentation and management of neuroleptic malignant syndrome. 5237 Explain the indications and monitoring requirements for use of clozapine.
Mental health legislation	5208 Recognize that there is legislation that influences the practice of medicine; including psychiatry. 5209 Explain the concepts related to the Health Care Consent Act (including informed consent and capacity to consent to treatment. 5210 Describe the steps used by clinicians to obtain informed consent for patients 5211 Describe the key issues relating to assessment of capacity to consent to treatment.

	5212 Describe what a substitute decision maker is and what their role is. 5213 Explain the Mental Health Act, including concepts of involuntary assessment and admission to hospital. 5214 Recognize the patients legal rights associated with involuntary admission to hospital. 5215 Define informed consent. 5216 Compare and contrast the assessment for capacity to consent to treatment versus informed consent. 5217 List the criteria to certify a person under the mental health act.
Unit 3 Week 2 CDMQ	Any of the above objectives may be tested.

Unit 3 Week 3: Anxiety and Stress

Lecture	Session Objectives
Psychiatric Assessment of Anxiety Disorders	5310 List the key questions to ask a patient presenting with a complaint of anxiety in order to confirm a diagnosis of panic disorder. 5311 List the key questions to ask a patient presenting with anxiety to confirm a diagnosis of generalized anxiety disorder. 5312 Describe the typical mental status findings seen during assessment of a person presenting with an anxiety disorder
Anxiety and stress overview	5243 Explain the epidemiology of anxiety disorders. 5253 Outline the main features of separation anxiety disorder in children. 5258 Discuss differences in presentation, etiology and treatment considerations of anxiety disorders in children and the elderly as compared to younger adult populations. 5388 List the difference between normal levels of stress and anxiety, and when stress and anxiety become part of psychiatric illness. 11404 Describe the biopsychosocial interventions used for management of anxiety disorders, including social anxiety disorder and specific phobia. 14645 Discuss the DSM-5 diagnostic criteria for panic disorder, agoraphobia, generalized anxiety disorder, social anxiety disorder and specific phobia.
Psychotherapy	5245 Describe the general psychiatric indications for psychotherapy. 5248 Define the purpose of psychological defense mechanisms and describe mature and immature defense mechanisms including: denial, splitting, projection, reaction formation, rationalization. 5249 Describe what is meant by transference, counter-transference and therapeutic alliance and how these relate to all patient encounters.

	5250 Briefly describe the following psychotherapies: psychodynamic, cognitive behavioural therapy, interpersonal therapy, and dialectical behavioural therapy. 12722 Demonstrate the ability to use a specific problem described by a patient to highlight the links between thoughts, feelings and behaviours and to explain the rationale for various treatment options. 12914 Describe neural correlates of psychotherapy.
Anxiety disorders and related disorders	5252 Describe the diagnostic criteria and epidemiology of anxiety disorders including generalized anxiety disorder, panic disorder as well as a related disorder, obsessive-compulsive disorder. 5254 Describe anxiety disorders due to general medical conditions and substance induced anxiety disorder. 5256 Describe the biopsychosocial interventions used for management of anxiety disorders including: panic disorder, generalized anxiety disorder and a related disorder, obsessive-compulsive disorder 5257 Propose a treatment plan for obsessive compulsive disorder that includes both pharmacological and nonharmacological interventions. 5259 Formulate a differential diagnosis of anxiety symptoms including other psychiatric and medical illnesses that may present with similar symptoms. 5260 Describe the indications for use of antidepressants in patients with anxiety disorders. 5261 Describe the indications for use of benzodiazepines in the treatment of anxiety disorders. 5265 Describe the expected course of recovery from anxiety disorders when appropriately treated 5266 Describe the length of treatment with antidepressants for treatment of obsessive-compulsive disorder.

	5267 Demonstrate knowledge of evidence-based psychologic treatments which are effective for anxiety disorders across the life span. 5268 Demonstrate awareness of psychosocial interventions necessary for recovery from anxiety disorders across the life span. 5269 Explain the risk of concurrent substance use disorders in people with anxiety disorders. 11409 Describe the risk of a substance use disorder and tolerance associated with use of benzodiazepines.
Disruptive behaviour disorders	5270 Describe the diagnostic criteria, epidemiology, etiology, course, prognosis, and differential diagnosis of: attention deficit hyperactivity disorder, oppositional defiant disorder and conduct disorder. 5271 Describe the impact of disruptive behaviour disorders on school performance and social development. 5272 Describe the biopsychosocial interventions used for the management of: attention deficit hyperactivity disorder, oppositional defiant disorder and conduct disorder.
Normal child and adolescent development	5273 Describe the normal development of children, from infancy to adolescence. 5274 Explain the major theories of development, including the work of Sigmund Freud, Erikson and Piaget. 5277 Describe the theory of attachment described by Bowlby.
Trauma – stressor related disorders	5281 List the different types of trauma that people may be exposed to at different times in their lives including sexual/physical and emotional abuse, trauma in military settings, and trauma associated with refugees from different cultural settings. 5282 Describe the psychiatric sequelae associated with trauma including post traumatic stress diorder, acute stress disorder,

	dissociatve disorders and borderline personality disorder. 5283 List common comorbid psychiatric illnesses associated with Post traumatic stress disorder. 5284 Describe differences in presentation of PTSD in children and adults. 5285 Describe a biopsychosocial treatment plan for post traumatic stress disorder including use of medication and different psychotherapeutic modalities.
Insomnia assessment and management	5286 List the common psychiatric and medical conditions associated with a presentation of insomnia. 5287 Describe the key features in assessing insomnia. 5288 Propose a treatment plan for insomnia including being aware of the indications for pharmacologic and nonpharmocologic interventions. 5289 Discuss when to refer a patient to a sleep disorder clinic for assessment of insomnia.
Psychiatric assessment of children and adolescents	5290 Describe how to conduct a family assessment with respect to a child adolescent problem. 5291 Describe the differences in an assessment of a child / adolescent compared to an adult. 5292 Discuss issues related to patient confidentiality with respect to the assessment of children and adolescents. 5293 Recognize the unique challenges involved in interviewing children and adolescents.
Personality disorders	5296 Describe the general diagnostic criteria for a personality disorder. 5297 State the classification of personality disorder in three clusters. 5298 Describe the main enduring pattern of each personality disorder type. 5300 Describe the mental disorders associated with self-injurious behaviors.

	5301 List the biological, demographic, economic, social and developmental factors associated with self-injurious behavior. 5302 Describe the pertinent factors in the recognition of the potential of self-injurious behavior. 5303 List criteria for borderline personality disorder. 5304 Describe common psychiatric comorbidities asociated with borderline personality disorder. 5305 Describe a treatment approach to borderline personality disorder including use of hospitalization, outpatient care, pharmacological treatment and psychotherapy
Autism spectrum disorders	12413 Describe the diagnostic criteria, the epidemiology, the etiology and the prognosis of autism spectrum disorders. 12414 Describe the biopsychosocial interventions that can be applied in the treatment of autism spectrum disorders.
Unit 3 Week 3 CDMQ	Any of the above objectives may be tested.

Unit 3 Week 4: The Eye

Lecture	Session Objectives
Refractive errors	3618 Contrast, in basic terms, four types of refractive error (myopia, hyperopia, astigmatism and presbyopia), emphasizing the anatomic and/or physiologic differences between each type.
Ophthalmic therapeutics, surgery and lasers	3617 Explain, in basic terms, the treatment for acute angle-closure glaucoma and its physiologic basis. 3619 Describe current strategies to combat world blindness. 5450 Contrast the treatment options for the most common and important causes of chronic visual loss in adults, including cataracts, glaucoma, macular degeneration and diabetic retinopathy.
Anatomy of the eye and orbit	3593 List and identify bones of the orbital walls and identify common pathologic processes associated with them, including orbital trauma and orbital cellulitis. 3594 Explain the basis for the action of each extraocular muscle based on its anatomic location. 3595 Describe the ocular coats of the eye and their functions, including the retina, choroid, sclera and conjunctiva. 3596 Describe the anatomic location and physiologic function of the cornea, aqueous humour, lens, ciliary body, vitreous, retina and optic nerve.
Chronic visual loss	3604 Describe the clinical features of the most common and important causes of chronic visual loss in adults, including cataracts, glaucoma, macular degeneration and diabetic retinopathy. 5450 Contrast the treatment options for the most common and important causes of chronic visual loss in adults, including cataracts, glaucoma, macular degeneration and diabetic retinopathy.
Glaucoma	3607 Differentiate the main types of glaucoma, emphasizing differences in

	pathophysiology, presentation and management. 3617 Explain, in basic terms, the treatment for acute angle-closure glaucoma and its physiologic basis.
Sudden painless loss of vision	3610 Describe the features of the most common and important causes of sudden visual loss in adults, including trauma, retinal detachment, local and systemic vascular diseases, and acute angle-closure glaucoma.
Amblyopia	3599 Define the terms amblyopia. 3600 Classify amblyopia into subtypes based on etiology, including deprivational, refractive and strabismic. 3601 Describe three techniques for treatment of amblyopia.
Pediatric ophthalmic emergencies	3611 Based on clinical characteristics, differentiate between common and important vision-threatening and non-vision threatening causes of red eye in infants, including infantile glaucoma, neonatal conjunctivitis, undisclosed trauma, and orbital/periorbital cellulitis. 3612 Formulate a management strategy for the common and important causes of red eye in infants, including timely and appropriate referral to a specialist. 3613 Describe the significance of a decreased red reflex in the primary care setting, particularly with respect to the urgency of specialist referral. 3614 Create a differential diagnosis for a decreased or absent red reflex, including cataract, cloudy cornea, vitreous opacity and fundus pigmentation.
The red eye	3592 Demonstrate proficiency in the basic ophthalmic clinical examination skills, and describe the significance of abnormal findings in the context of an ophthalmic emergency. 3597 Based on clinical characteristics, differentiate between common and important

	vision-threatening and non-vision threatening causes of red eye in adults, including trauma and corneal abrasion, corneal ulcer, acute angle-closure glaucoma, uveitis and conjunctivitis. 5389 Outline primary care physician's responsibilities in routine screening for vision problems.
Orbital anatomy	5004 Identify the superior orbital fissure, the optic canal, and the common tendinous ring of Zinn, and discuss the structures that travel through them. 5005 Describe the anatomy of eyelids and lacrimal apparatus. 5007 Name the extraocular and intraocular muscles and their function. 5008 Describe the innervation of the eye, including the optic nerve, the oculomotor nerve, the ophthalmic nerve, the nasociliary nerve, the frontal nerve, the lacrimal nerve, the trochlear nerve, the abducens nerve, and the autonomic supply, including the ciliary ganglion. 5009 Describe blood circulation in the eye. Define the boundaries and contents of the bony orbit.
Appearance and imaging of the optic nerve and visual pathways	3608 Identify the normal and abnormal optic disc. 3609 Describe the significance of abnormalities of the optic nerve, particularly with respect to optic nerve swelling and pallor.
Ocular histology	3431 Recognize the basic histological subtypes of the eye, correlating histologic structure to basic ocular physiology. 3799 Define the terms used to describe the topography of central nervous organisation (medical, lateral, coronal, saggital, rostal, caudal, dorsal, ventral, superior, inferior, ipsi- and contra-lateral) 5006 Describe the anatomy of the eyeball and the composition of its three layers.

The eye and systemic disease	12142 Link common types of visual loss to their systemic disease associations. 12143 Describe the appropriate investigations/screening when a vision-threatening systemic condition is identified.
Unit 3 Week 4 CDMQ	Any of the above objectives may be tested.

Unit 3 Week 5: Introduction to Neurology

Lecture	Session Objectives
Neuroanatomic tracts and lesion localisation	12415 List important neuroanatomical pathways to master for clinical practice. 12416 Explain the meaning of “lesion” in neurology. 12417 Describe the basic principles of ‘localizing' a lesion in neurology
Overview of the nervous system	4757 Outline the overall anatomical organization of the central nervous system (CNS) and the peripheral nervous system (PNS). 4758 Distinguish grey and white matter, listing key structures comprising each at the level of the cerebrum, cerebellum and spinal cord. 4759 Explain how anatomical orientation terminology applies to the CNS: medial, lateral, dorsal, ventral, anterior, superior, rostral, caudal, ipsi and contralateral. 4760 Explain how the cellular composition of nervous tissue is designed for signal transmission. 4761 Outline the overall functional specialization of major structures of the CNS: cerebral lobes, basal ganglia, thalamus, cerebellum, brainstem, spinal cord. 4762 Describe the meninges and the production, function and circulation of cerebrospinal fluid. 4763 Outline the general organization of afferent (sensory) and efferent (motor) pathways in the CNS. 4764 Provide an overview of cerebral arterial and venous circulation and their importance to neuronal energy metabolism
Approach to neurological diagnosis	4765 Discuss the general approach to a neurological diagnosis: determining if the cause is neurological, determining the lesion's localization, and determining its precise etiology. 4766 Describe the range of symptoms associated with neurological disease.

	4767 Describe a systematic approach to the neurological examination. 4768 List key clinical examination findings that help localize the anatomical level of neurological dysfunction. 4769 Itemize the range of laboratory tests used for neurological diagnosis.
Tumours	4770 Apply the neurological diagnostic principles to a patient presenting with a progressiveunilateral deficit. 4771 Discuss the anatomical/clinical correlations for the frontal lobe. 4772 Discuss the differential diagnosis of "space-occupying lesions" of the brain. 4773 Describe the epidemiology, classification, prognosis and treatment of cerebral gliomas. 4805 Discuss visual pathways from optic nerve to occipital cortex. 4806 Describe visual deficits expected with lesions at different levels of the visual pathways. 4807 Apply neurological diagnostic principles to a patient presenting with a progressive visual field deficit. 4808 Discuss metastatic brain tumours: prevalence, mode of spread, tissue of origin, clinical presentation, diagnostic tests, treatment and prognosis. 4809 Discuss metastatic involvement of nerve plexuses and spine. 5390 Summarize legal classification of blindness and describe primary care physician's role in advocating for a patient who is legally blind. 5391 Summarize primary care physician's role in screening aging patients for visual loss.
Gross anatomy of CNS	4791 Identify on gross specimens the lobes of the cerebrum, sulci and named fissures of the cortical surface. 4838 Describe the arterial vasculature of the central nervous system (CNS), with special reference to the anterior circulation, posterior

	circulation, circle of Willis, and regions of the brain supplied by major individual arterial branches (ACA, MCA, PCA, basilar, superior cerebellar artery, PICA, AICA). 4873 Describe the normal anatomy of the meninges and the dural folds: falx cerebri, falx cerebelli, sellar diaphragm, and tentorium cerebelli. 12421 Identify the cortical motor areas, the post-central gyrus, Broca's area and Wernicke's area. 12846 Identify the middle meningeal artery.
Principles of neuro-radiology	4796 Outline the principles, indications, risks of CT and MRI in neuroimaging 4797 Describe signal characteristics of bone, CSF, cortex and white matter on CT and MRI. 4798 Identify normal neuroanatomical structures on CT and MRI: cortex, lobes, fissures, ventricles, basal ganglia, thalamus, brainstem, cerebellum, spinal cord
Neuro-histology of the CNS	4794 Describe tissue preparation, staining and microscopic techniques relevant to neurohistology. 4795 Identify the histological features of spinal cord and cerebral cortex. 4876 List the major ascending and descending spinal tracts and be able to identify them on specimens. 4935 Localize descending motor tracts on serial brain/spinal cord sections.
Cortical anatomy	4783 Describe histological features of the cerebral cortex. 4784 Describe the anatomical landmarks of cortical regions on the superior, inferior and medial aspects of the hemispheres. 4785 Describe specific functional regions of cerebral cortex and contrast with association cortex. 4786 Define cerebral dominance
Primary tumors of CNS	4787 Discuss the epidemiology and theories of pathogenesis of primary CNS tumours.

	4788 Describe the principles of the World Health Organization (WHO) classification of nervous system tumours. 4789 Discuss major types of primary tumours of the nervous system. 4790 Describe the process of malignant transformation of glial tumours.
Motor pathways	4774 Define and give examples of lower motor neurons. 4775 Describe motor units and their recruitment to produce muscle contraction. 4776 Explain the deep tendon reflex. 4777 Outline the structure and function of the muscle spindle. 4778 Discuss the anatomical features and function of the direct motor pathway. 4779 Define and give examples of indirect motor pathways, with special emphasis on the corticoreticulospinal pathway. 4780 Discuss the pathophysiology of spasticity. 4781 Compare and contrast clinical features of disorders of upper and lower motor neurons. 4782 Briefly outline the role of other anatomical structures in the execution of movement: spinal reflexes, basal ganglia and cerebellum.
Sensory pathways	4799 Describe the anatomical features of the somatosensory pathways. 4800 Explain the effects of damage to these pathways at different locations. 4801 Describe in general terms the mechanisms for generation of electrical signals by sensory stimuli (sensory transduction). 4802 Discuss the means by which the characteristics of sensory stimuli are encoded by signals to the cerebral cortex. 4803 Define receptive fields of neurons. 4804 Briefly explain the effects of lesions at peripheral vs. central levels of the auditory pathway.

	4999 Compare visual pathway anatomy to other sensory pathways. 5000 Describe the anatomical basis of hemi neglect. 5470 Describe the basic characteristics of Hemineglect.
Language and memory	4810 Describe cortical regions dedicated to language and their connections. 4811 Define cerebral dominance for language and the impact of handedness. 4812 Discuss clinical disorders of speech and language production. 4813 Describe the different forms of memory. 4814 Outline the neuroanatomical substrates of memory. 4815 Briefly describe the proposed physiological basis for memory. 4816 Discuss clinical syndromes of memory impairment.
Unit 3 Week 5 CDMQ	Any of the above objectives may be tested.

Unit 3 Week 6: Stroke & Trauma

Lecture	Session Objectives
Brain death	4856 Define brain death and list the criteria for its diagnosis. 4857 Describe the clinical importance of diagnosing brain death to family members and health professionals. 4858 Describe the apnea test and list other common confirmatory tests used in the determination of brain death. 4859 Explain the concept and diagnosis of brain death to a patients' family, effectively and compassionately 4860 Outline the option of organ donation.
Ischemic stroke	4817 Define stroke and give an outline of its clinical classification. 4818 Outline the pathophysiology of electrical failure and neuronal death caused by cerebral ischemia, including a mention of chemical, ionic and neurotransmitter mechanisms. 4819 Describe the process of autoregulation of cerebral blood flow and the concept of ischemic penumbra. 4820 Discuss the mechanism of action, indications, and key contraindications for the use of intravenous thrombolysis and the endovascular treatment of acute stroke. 14647 Discuss strategies for secondary prevention of stroke.
Stroke	4824 Define transient ischemic attack (TIA), stroke, lacune, ischemic and hemorrhagic infarction, and intracerebral hemorrhage 4825 Outline the mechanisms of embolic, atherothrombotic and lacunar strokes, and describe the key differences in their clinical presentations. 4826 List major clinical manifestations of ischemia in the following arterial territories: medical cerebral artery (MCA), anterior cerebral artery (ACA), posterior cerebral artery (PCA) and basilar.

	4827 Outline the rationale and indication for laboratory investigations in patients with stroke: neuroimaging, doppler, angiography, cardiac investigations, blood tests. 4828 Discuss the timing of rTPA in acute stroke. 4829 Outline pharmacologic and non-pharmacologic principles of secondary stroke prevention.
Hemorrhagic stroke	4830 Discuss the epidemiology and etiology of cerebral aneurysms 4831 List the common anatomic sites of aneurysmal formation. 4832 Describe the common clinical manifestations of a) a sentinel bleed and b) an aneurysmal rupture and c)compression from giant unruptured aneurysms 4833 Describe the investigation and management principles of patients with suspected subarachnoidhemorrhage (SAH). 4834 Discuss potential complications of SAH, including vasospasm and hydrocephalus. 4835 Discuss how hemorrhagic stroke differs from ischemic stroke in its clinical and radiologic presentation. 4836 List the most common causes and manifestations of subarachnoid and intracerebral hemorrhage
Spinal injury	4843 List the disorders that can affect the spinal cord. 4844 Describe the epidemiology and clinical manifestations of spinal injury at the cervical, thoracic and lumbar levels. 4845 Define spinal shock. 4846 Describe the emergency management of a patient with suspected spinal injury. 4847 Describe the major spinal cord syndromes including Brown-Séquard syndrome, central cord syndrome, anterior cord syndrome and posterior cord syndrome. 4848 Discuss medical and surgical therapy in acute spinal trauma.
Anatomy of the brainstem and cerebellum	3380 Name and identify the following midbrain structures: cerebral peduncles,

	substantia nigra, tegmentum, cerebral aqueduct, periaqueductal grey matter, tectum, CN nuclei 3-4. 3381 Name and identify the following pontine structures: cerebellar peduncles, basis pontis, tegmentum, 4th ventricle, CN nuclei 5-7. 3382 Name and identify the following medullary structures: pyramid, olive, tegmentum, CN nuclei 5, 8-12, gracile and cuneate nuclei. 3383 Name the following white matter tracts in the brainstem: corticospinal, medial lemniscus, spinothalamic tract
Brainstem, cranial nerve and cerebellum	4792 Identify on gross specimens the three segments of the brainstem. 4793 Identify anatomical landmarks of the cerebellum including the lateral lobes and the flocculo-nodular lobe and their primary functions. 12422 Identify on gross specimens the anatomic landmarks of the brainstem and the twelve cranial nerves.
Neuro-radiology of stroke	4840 Explain the rationale for the choice of neuroimaging technique(s) for stroke patients, and describe the key features of ischemic and hemorrhagic stroke on CT and MR imaging.
Stroke	4841 Describe the gross and microscopic pathological features of ischemic stroke. 4842 Describe the gross and microscopic pathological features of intracranial hemorrhage
Head injury and coma	3437 Define consciousness and coma. 3438 Discuss intracranial pressure and the clinical causes and consequences of intracranial hypertension 3439 Explain the relationship of systemic blood pressure, partial pressure of oxygen (pO2) and carbon dioxide partial pressure (pCO2) on intracranial pressure. 3441 Describe herniation syndromes (uncal, tonsillar) in terms of the anatomical structures involved and clinical manifestations.

	3442 Describe the following types of acquired brain injury: concussion, contusion, epidural hematoma, subdural hematoma, subarachnoid hemorrhage. 14648 Discuss the acute management of concussion, including return to play considerations. 14649 Define post-concussion syndrome and discuss the approach to its management.
Electrical signalling and synaptic transmission	4849 Describe the electrochemical determinants of the resting membrane potential and generation of an action potential. 4850 Describe the structure of a synapse (pre and post synaptic elements, cleft). 4851 Describe the following elements in synaptic transmission: action potential spread to axon terminal, opening of voltage gated calcium channels, vesicle docking and release, spread of transmitter molecule and receptor binding, neurotransmitter metabolism. 4852 Explain the importance of excitatory and inhibitory postsynaptic potentials in relation to the generation of action potentials. 4853 Describe the major classes of neurotransmitters and list important examples in each category 4854 Describe the mechanisms by which neurotransmitters may act on postsynaptic neurons. 4855 List the main excitatory and inhibitory neurotransmitters of the CNS.
Unit 3 Week 6 CDMQ	Any of the above objectives may be tested.

Unit 3 Week 7: Infectious, Inflammatory, and Demyelinating Disorders

Lecture	Session Objectives
Lumbar Puncture and CSF Analysis	4895 Describe the technique of lumbar puncture, its indications and chief contraindications. 4896 List common tests used in, and information obtained from, cerebral spinal fluid (CSF) analysis. 4897 Describe the typical CSF profiles of a) bacterial meningitis; b) viral meningitis; c) herpes simplex encephalitis (HSE); d) subarachnoid hemorrhage 4898 Define oligoclonal banding and describe the typical CSF profile seen in multiple sclerosis (MS). 4899 Describe the typical CSF profile in Guillain-Barre syndrome (GBS).
Infections of the CNS	3424 List the common clinical manifestations of bacterial meningitis, and describe potential morbidity and mortality. 3425 Describe the pathogenesis of meningitis: spread of infective organism, inflammatory response. 3426 List common causative agents for bacterial meningitis in an infant, child, normal adult and immunocompromised host. 3427 Compare and contrast the CSF findings in bacterial, viral, tuberbulous and fungal meningitis. 428 Discuss the principles of recognition and early management of bacterial meningitis and justify the choice of first empirical antibiotic therapy 3429 List the types of virus that can cause viral meningitis, describe the usual clinical syndrome and contrast it with bacterial meningitis. 3435 Compare and contrast the nature and mode of spread of prion disorders to other infectious diseases 3436 Describe the clinical manifestations of Creutzfeld-Jacob disease (CJD), its pathology and prognosis, and explain the relationship

	between CJD and bovine ("variant") spongiform encephalopathy. 4861 Describe the pathogenesis, clinical and radiological presentation of brain abscess. 5111 Discuss "slow virus" infections of the CNS, using subacute sclerosing panencephalitis (SSPE) and progressive multifocal leukoencephalopathy (PML) as examples
Infections and inflammatory disorders of the nervous system	4862 Compare and contrast the syndromes of encephalitis and meningitis 4863 Discuss the pathophysiology of herpes simplex encephalitis: mode of spread, gross and microscopic pathology. 4864 Discuss the possible complications of herpes encephalitis. 4865 Describe the mechanism of action of acyclovir and its main toxicity. 4866 Describe the structure of myelin in both the CNS and PNS and illustrate the key differences between the two. 4867 Explain the propagation of action potentials in both myelinated and unmyelinated axons including determinants of resting membrane potential, ion channel distribution and electrical properties of myelin. 4868 Discuss the consequences of demyelination on action potential propagation differentiating between the effects of conduction slowing and conduction block. 4869 Discuss the pathogenesis, pathology and pathophysiology of GBS. 4870 Define molecular mimicry and discuss how it pertains to inflammatory autoimmune conditions such as GBS. 4871 Recognize the dangerous potential complications of GBS such as respiratory failure and dysautonomia. 4872 Review the management and usual temporal course in GBS and identify several indicators of poorer prognosis

Basal ganglia and the spinal cord	4933 Identify the following on gross brain specimens: basal ganglia, thalamus, substantia nigra and red nucleus. 4934 Identify anterior and posterior roots, cauda equina, relationship of spinal nerves / ganglia to spinal foramina
Pathology: Infections and demyelinating disorders	4875 Describe the pathological findings of common and serious intracranial infections including bacterial meningitis, JSE, brainabsecess and CJD. 4877 Describe the normal appearance of CNS white matter and the structure of a normal, healthy myelinated peripheral nerve fibre and contrast this with the demyelinated lesions in multiple sclerosis and Guillain-Barre syndrome. 4878 Discuss the evolution histologically from acute to chronic MS plaques
Radiology: Infections and demyelinating disorders	4879 Define Dawson's fingers and outline the key distinguishing radiologic features of MS plaques. 5001 Discuss the evaluation, radiologically, from active to chronic MS plaques. 12145 Describe the radiological findings of common and serious intracranial infection including bacterial meningitis, HSE, brain abscess and CJD.
Peripheral neuropathies	4924 Describe the normal histology of peripheral nerve. 4925 List axon types found in peripheral nerves, relating diameter to function. 4926 Compare and contrast electrical conduction in myelinated and unmyelinated axons. 4927 Describe the clinical approach to the characterization of neuropathy. 4928 Describe degenerative disk disease and radiculopathic syndromes. 4929 Define and give examples of entrapment and traumatic neuropathies. 4930 Prepare an outline of the classification of polyneuropathies.

	4932 Review the mechanism and different clinical syndromes of diabetic neuropathy.
Multiple sclerosis	4880 Discuss the epidemiology of multiple sclerosis including prevalence, patient demographics, racial and latitudinal effects. 4881 List the different courses of MS, their relative frequencies and be able to depict these types graphically plotting disability against time. 4882 Describe common MS attack presentations, including optic neuritis, transverse myelitis and the "useless hand syndrome". 4883 Explain the pathophyisology of Uhthoff's and Lhermitte's phenomenon. 4884 State the key components underlying diagnostic criteria for MS. 4885 Briefly outline the role of a) MRI b) CSF analysis and c) evoked potentials in the investigation of possible MS. 4886 Explain the mechanism of clinical recovery from an acute MS attack, pathologically and pathophysiologically. 4887 Briefly discuss the usual treatment of MS attacks, the available disease modifying drugs for MS and several symptomatic treatments of chronic MS symptoms.
Unit 3 Week 7 CDMQ	Any of the above objectives may be tested.

Unit 3 Week 8: Neuromuscular Disorders

Lecture	Session Objectives
Amyotrophic lateral sclerosis (ALS)	4944 Correlate neurological signs with lesions of upper and lower motor neurons at different levels of the neuraxis. 4945 Describe the epidemiology, pathology and prognosis of amyotrophic lateral sclerosis (ALS). 4946 Compare and contrast ALS and genetic syndromes of spinal muscular atrophy . 4947 Discuss the approach to “breaking bad news” in the setting of ALS .
Movement disorders	4900 Briefly discuss the basal ganglia connections and their relationship to motor pathways. 4901 Compare and contrast clinical manifestations of hypokinetic and hyperkinetic movement disorders. 4902 Describe the pathology and main neurotransmitter abnormality in Parkinson's disease . 4903 Discuss the basic approaches to the treatment of Parkinson's disease . 4904 Discuss other extrapyramidal diseases: essential tremor, tic disorders, Huntington's disease, Wilson's disease . 4938 Recognize key movement disorder patterns: tic, chorea, athetosis, tremor, myoclonus, hemiballismus, dystonia, psychogenic.
Neurodegenerative disorders	4905 Apply neurological diagnostic principles to two cases of progressive tremor. 4906 Describe the clinical syndrome of parkinsonism. 4907 Discuss the differential diagnosis of parkinsonism. 4908 Apply knowledge of basal ganglia neurotransmitter circuits to the management of Parkinson's disease. 4909 Compare and contrast rigidity and spasticity.

	5392 Summarize the physician's duty in reporting a patient with a neurodegenerative condition who is still driving. 12855 Discuss the differential diagnosis of tremor. 12856 Apply knowledge of the parkinsonian syndrome to enable differentiation of parkinsonian tremor from essential tremor. 12857 Recognize the natural history and treatment of essential tremor. 12915 Discuss the differential diagnosis of tremor. 12916 Apply knowledge of the parkinsonian syndrome to enable differentiation of parkinsonian tremor from essential tremor. 12917 Recognize the natural history and treatment of essential tremor
Autonomic nervous system	4888 Outline the major functions of the autonomic nervous system. 4889 Compare and contrast the autonomic nervous system with the somatic nervous system. 4890 Describe the chief central and peripheral anatomical components of the autonomic nervous system. 4891 Compare and contrast the sympathetic and the parasympathetic systems, including spinal distribution, ganglia location, neurotransmitters and general function. 4892 List common symptoms and signs of autonomic dysfunction. 4893 Explain the findings in Horner's syndrome. 4894 Explain three types of neurogenic bladder: spastic, flaccid and detrusor-sphincter dyssynergia.
Disorders of muscle, neuromuscular junction	4916 Describe general and specific clinical features of muscle disorders. 4917 List and describe laboratory tools for the diagnosis of myopathy. 4918 Discuss the classification of diseases of muscle. 4919 Compare and contrast inflammatory myopathies.

	4920 Describe the syndrome of muscular dystrophy and provide a classification of most common pediatric and adult onset forms. 4921 Review the structure and function of the neuromuscular junction. 4922 Discuss clinical and laboratory features of diseases of the neuromuscular junction. 4923 Discuss the pathophysiology and treatment of myasthenia gravis
White matter and ventricles	4874 Name the major cerebrospinal fluid (CSF) containing structures, including the lateral ventricles and the intracranial cisterns created in the subarachnoid space. 12847 Describe the anatomic correlates pertinent to the production, flow and reabsorption of cerebrospinal fluid. 12848 Identify the following structures of the limbic system: fornix, amygdala, mammillary bodies and hippocampus. 12849 Identify intercortical, commissural and projection fibers on sections of the brain. 12850 Identify the internal capsule and the associated fibers in the anterior limb, posterior limb and genu.
Pathology of movement disorders and muscle	4936 Describe the neuropathology of Parkinson's disease, Huntington's disease, progressive supranuclear palsy and ALS . 4937 Recognize muscle histopathologic patterns in denervation atrophy, re-innervation, muscular dystrophy, inflammatory myopathies.
Pharmacology of local and general anaesthetic	12152 Explain the theory of the mechanism of action of both inhalation and intravenous anesthetics. 12153 Compare commonly used inhalation anesthetics (desflurane, sevoflurane and isoflurane) with respect to their pharmacokinetic properties, effects on various organ systems and biotransformation. 12154 Compare commonly used intravenous anesthetics (propofol, thiopental and ketamine) with respect to their

	pharmacokinetic properties, effects on various organ systems and biotransformation. 12155 List the most common side effects of general anesthetic agents. 12156 Discuss the mechanism of action of local anaesthetics. 12157 List significant differences between amide and ester-type local anesthetics. 12158 List common adverse effects of local anesthetics and list treatments for these adverse effects
Developmental CNS disorders	4939 Discuss key chronological steps in normal brain development and maturation. 4940 Relate the neuro-embryological sequence to common developmental disorders of the brain and spinal cord 4941 Discuss examples of vascular, toxic, metabolic and infectious developmental disorders of the CNS . 4942 Describe the syndrome of cerebral palsy . 4943 Discuss examples of genetic developmental disorders affecting neuronal proliferation, migration, organization and myelination.
History of neurology	12851 Recognize the impact of two important epidemics of neurologic disease on the evolution of the following specialties: Neurology, Psychiatry, Sleep Medicine, Rehabilitation Medicine and Critical Care Medicine.
Unit 3 Week 8 CDMQ	Any of the above objectives may be tested.

Unit 3 Week 9: Paroxysmal Disorders

Lecture	Session Objectives
Syncope	4989 List the differential diagnoses in a patient with an episode of reduced level of consciousness. 5002 Describe distinguishing features of syncope, epileptic seizure, psychogenic seizure, and hypoglycemia.
Restless leg syndrome	12146 Describe the key clinical criteria needed to make a diagnosis of restless legs syndrome. 12147 Describe the differences and similarities between restless legs syndrome and periodic limb movement disorder. 12148 Describe the etiology behind restless legs syndrome and periodic limb movement disorder. 12149 Describe complications of restless legs syndrome and periodic limb movement disorder if left untreated. 12150 Identify conditions that increase the risk of having restless legs syndrome and periodic limb movement disorder. 12151 Outline an appropriate management plan, including pharmacotherapy, for the treatment of restless legs syndrome and periodic limb movement disorder.
Seizures and epilepsy	4960 Compare and contrast the terms: epilepsy, epileptic seizure, epilepsy syndrome. 4961 List several common etiologies that provoke seizures. 4963 State the prevalence and overall prognosis of epilepsy. 4964 Describe the chemical nature, receptors and main functions of gamma-aminobutyric acid (GABA) and glutamate. 4965 Compare and contrast the pathophysiology of partial and generalized epilepsy. 4966 Discuss the international classification of epileptic seizures.

	4967 List and briefly summarize important features of partial (e.g. temporal lobe, benignrolandic) and generalized epilepsy syndromes (tonic-clonic, absence, myoclonic). 4968 Define the term status epilepticus
Paroxysmal disorders	4948 Define a seizure and list common etiologies that provoke seizures. 4949 Discuss the main feature of febrile convulsion and their prognosis. 4951 Discuss features on history that helps distinguish migrainous aura vs. focal seizure. 4952 Describe criteria that may help distinguish a benign primary cephalalgia from more ominous secondary headaches due to intracranial pathology
Headache	3399 List pain-sensitive structures of the head region. 3400 Give an outline of the international classification of headache. 3401 Describe the clinical features and diagnostic criteria of migraine. 3402 Discuss the pathophysiology of migraine, including the aura and headache phases including a mention of spreading depression, trigeminovascular connections and the role of serotonin pathways. 3404 Describe the distinguishing features of the following headache subtypes: tension, cluster, trigeminal neuralgia, temporal arteritis, subarachnoid hemorrhage (ruptured aneurysm)
Pharmacology of migraine	4969 List the classes of medication used in the acute treatment of migraine and in migraine prophylaxis and for each, state the probable mechanism of action. 4970 Discuss drug-induced cephalagia and analgesic rebound headaches. 14500 Discuss management principles and selection of migraine treatment in co-existing disorders. 14501 Discuss the efficacy and safety pharmacology of different drug formulations

	(injection, tablet, wafer, powdered formulation, or nasal spray) based on patient clinical features.
Pharmacology of epilepsy	4971 Discuss the principles of rational epilepsy management: choice of medication, advantages of monotherapy, dose-related and idiosyncratic side-effects, value of blood level monitoring. 4972 List the proposed mechanism of action of major epileptic medications. 4973 Outline management principles for the treatment of status epilepticus
Putting it all together: Motor and sensory systems	12424 Identify major landmarks of the central nervous system and correlate them with a known function. 12425 Review the organization of the CNS as a motor effector and the proposed roles of the component parts. 12426 Review the anatomical organization of sensory systems.
Epilepsy	4977 List some clinical indications for EEG monitoring. 4978 Briefly outline the basic principles and the source of voltage fluctuations recorded during an EEG 4979 Classify brain-wave frequencies by Hz as alpha (normal), beta (fast), theta (slow) and delta (really slow). 4980 Recognize important EEG abnormalities such as spikes, spike-wave discharges and cortical slowing. 4981 Identify different types of seizure types by observable clinical characteristics and simultaneous EEG recording.
Sleep disorders	4984 Describe the stages of normal sleep and describe how normal sleep is regulated by the brain. 4985 Discuss the usual classification of sleep disorders. 4986 Briefly describe the technique of polysomnography and list the electrical and physiological variables monitored.

	4987 List and describe the cardinal manifestations of narcolepsy. 4988 Define and give examples of parasomnias
Unit 3 Week 9 CDMQ	Any of the above objectives may be tested.

Unit 4 Lecture Objectives

Unit 4 Week 1: Geriatrics I

Lecture	Session Objectives
Introduction to geriatrics	11440 Describe the aging demographic changes in Canada in the next 25 years and estimate how these demographic changes will affect the future healthcare system in Canada. 11442 How will demographics of aging in Canada affect health care for the older persons and impact our future medical careers. 12896 Prepare for group project presentations. 12897 Demonstrate qualities of excellent collaboration and teamwork in planning the group presentation. 12958 Discuss important aspects of geriatrics as a career choice. 12959 Describe the role and importance of geriatric medicine across all of medicine. 12960 List the "geriatric giants" that will be presented during the Integration Unit
Healthy aging	12342 Describe expected longevity, functional, and quality of life changes accompanying normal aging. 12343 Compare and contrast "usual aging" changes with "successful aging". 12344 Describe the role of the primary health care provider in promoting successful aging 12345 List evidence-based successful aging interventions targeting elderly patients in the primary care setting. 14758 Explain the evidence on strategies for maintaining cognitive health.
Mrs. Brown	12247 List and perform important common cognitive assessment tests. 12248 Describe an approach to treatment / management of dementia. 12249 Describe clinical features and an appropriate history/physical, laboratory and

	neuro-imaging workup, of the 5 common dementias. 12250 Describe the clinical issues encountered in patients with common types of dementia as they transition through the stages: mild, moderate, severe and palliative. 12961 Describe an approach to disclose a new diagnosis of dementia to a patient and his/her family. 12962 Be able to complete a driving assessment as part of the management of a patient with dementia.
Principles of geriatric assessment	11443 Describe common principles of assessment of older person. 12769 Describe how to evaluate baseline (premorbid) and current functional abilities (both basic and instrumental activities of daily living) using reliable sources of information. 12770 Identify how the principles of geriatric assessment may be used to evaluate "geriatric giants". 12771 Outline factors that should prompt referral to specialized geriatric services.
The dizzies	11471 Explain the potential impact chronic dizziness has on function and quality of life. 11472 Describe the common causes of chronic dizziness in the elderly. 11473 Describe interventions that may help with the management of chronic dizziness
Dementia diagnosis and management	11518 Describe the principles related to screening for cognitive impairment in high risk elderly and simple tests or tools that can be used. 11519 Describe the MMSE (Mini-Mental State Examination) and the MoCA (Montreal Cognitive Assessment) tools. 11520 Compare and contrast common assessment tools in dementia in terms of their utility, advantages and limitations. 12969 Review dementia diagnostic criteria. 12970 Be able to link neuro-anatomy to different cognitive domains and tests.

	14755 Describe the presentation of the common types of dementia. 14756 Describe non-pharmacologic management strategies for dementia. 14757 Describe pharmacologic management strategies for patients with dementia.
Biology of aging and atypical presentation of disease in elderly	12766 Discuss causes of atypical presentations of illness in older patients. 12767 Review alterations in physiology of the various organ systems that occur with aging. 12768 Recognize atypical presentations of specific conditions in the elderly
Driving	11421 Recognize the implications of age and neurologic diseases (such as dementia) on driving safety. 11422 Outline the health professional's role in assessing fitness to drive including the legal responsibility of physicians in Ontario to report at risk drivers, reporting procedures and consequences of not doing so. 11423 Describe the in-office assessment of an older driver based on history, physical examination and cognitive condition, including the resources available for more in depth assessment. 11424 Describe the consequences of driving cessation on patients' social and occupational well-being, and resources available to the older person and their caregivers.
Dementia experience and community services for seniors	11524 Describe the impact of dementia on a person with dementia and his/her family. 11525 Illustrate the importance of the caregiver in the support of a person with dementia with an emphasis on the issues of caregiver burden and burnout. 11526 Describe the role of community-based and institutionally-based services to support the person with dementia and their caregivers. 12963 Describe the impact of loss of autonomy on people with dementia and their caregivers.

	12964 List dementia-specific community resources that are available for patients and their families. 12965 Describe the different living accommodations available for people with dementia (in-home care, retirement home, long-term care). 12966 Describe the role of the Dementia Society. 12967 Discuss the difference between a retirement home and a long term care facility.
Aging, drugs and polypharmacy	11463 Explain the basic principles of altered pharmacokinetics and pharmacodynamics in normal aging. 11464 Identify common potential problems associated with polypharmacy. 11465 List cardinal principles of drug management in the elderly (start low, go slow, drug review). 11466 Describe the role and importance of the pharmacist, the family and community agencies in managing an elderly person on multiple medications. 14516 List different validated tools for appropriate prescribing in the elderly.
Delirium	11533 Describe key factors in the differentiation between delirium and dementia as a cause of confusion in the elderly. 11534 Design an approach to the diagnosis of delirium, including a differential diagnosis of common causes. 11535 Describe simple principles of the prevention and management of delirium in the elderly.
Urinary incontinence	11474 List the common causes of acute urinary incontinence. 11475 Develop a differential diagnosis for chronic urinary incontinence in an older patient. 11476 Describe an algorithmic approach to the assessment and investigation of chronic urinary incontinence.

	12968 Describe management strategies of urinary incontinence tailored to the geriatric population.
Unit 4 Week 1 CDMQ	Any of the above objectives may be tested.

Unit 4 Week 2: Geriatrics II

Lecture	Session Objectives
Travel medicine	12257 Describe the approach to risk assessment used for preparing those traveling to low and middle income countries. 12258 Define the VFR (visiting friends and relatives) traveller, and understand why they are at increased risk for travel-related infectious diseases. 12259 Outline prevention strategies that help minimize the health risks related to travel.
Aging, drugs, polypharmacy and appropriate prescribing	11467 Identify factors that may lead to patient noncompliance, and interventions that may improve compliance with therapy. 14521 Apply validated tools to the completion of a medication review in the elderly. 14522 Develop an approach to de-prescribe inappropriate medications in the elderly. 14523 Review common presentations of adverse drug reactions in the elderly. 14524 Recognize a patient presenting with a prescription cascade.
Mr. Leblanc	11455 List the major causes and risk factors for falls in an older patient. 11456 List the medical, psychological, social and functional impacts of falls (fear, dependency, withdrawal). 11457 Develop a plan of targeted interventions to deal with the modifiable risk factors for falls. 11458 Demonstrate the ability to perform a screening assessment of balance and gait in an older patient. 11459 Describe the approach to assessment and management of osteoporosis in the elderly. 14515 Outline the relationship between pain and falls in the elderly.
Ethical framework and complex decision making 101	12971 Recognize and articulate clinical ethics issues across clinical settings, and describe a decisional approach to these.

	12972 Identify at least three common ethical challenges pertinent to health care in the elderly, children, youth and patients living with a terminal diagnosis. 12973 Recognize that all clinicians are influenced by their personal ethics and values and be able to identify at least three strategies to mitigate this if conflicts occur. 12974 Apply an ethical framework to address complex clinical issues including: goals of care and resuscitation orders, capacity and care, informed consent.
Ethical challenges and future planning	11545 List important ethical principles and describe how they are of particular relevance to older persons with dementia. 11547 List common ethical challenges encountered when caring for older persons with dementia (stage based approach). 12772 Define substitute decision maker (SDM). What is the hierarchy of SDMs? When does an SDM act? 12979 Develop an approach to discussing future planning and goals of care with your elderly patients.
Elder abuse	11527 Define elder abuse. 11528 Describe the prevalence and impact of elder abuse in Canada. 11529 Develop an approach to screen, recognize and manage elder abuse. 12978 Review physician obligations to report elder abuse and list community resources available to help deal with this.
Behavioural and psychological symptoms of dementia	11542 Describe the prevalence, common behavioural and psychological symptoms of dementia and their impact. 11543 Describe a behavioural “cluster” approach to the categorization of behavioural and psychological symptoms of dementia. 11544 Describe a practical algorithmic approach to the assessment of behavioural and psychological symptoms of dementia. 12980 Review non-pharmacologic management strategies of behavioural and

	psychological symptoms of dementia – including the PIECES approach. 12981 Identify instances where pharmacologic management is necessary in the treatment of symptoms of dementia. 14518 Describe the indications, risks, alternatives and contra-indications of physical and chemical restraints.
What's different about depression in the elderly	11536 Describe the epidemiology and risk factors for depression as well as the risks associated with untreated depression in older person. 11537 Describe how to screen for and diagnose major depressive disorder in an older person. 11538 Describe different presentations of depression in older person. Describe other illnesses that present with symptoms similar to depression.
Capacity assessment	11539 Describe the guiding principles in assessing capacity. 11540 Discuss the clinical and legal definitions of being capable. 11541 Describe the approach on when and how to assess capacity.
Unintentional weightloss	11552 Develop an approach for obtaining and documenting the pertinent history and physical examination for an older person presenting with weight loss. 11553 Describe the components of a comprehensive evaluation plan. 11554 Discuss the role of the interdisciplinary team and community resources in the management of a complex elderly patient. Describe the common etiologies of unintentional weight loss in the older adult. 12984 Review medications that may lead to weight loss.
Aging and chronic illness	12733 Explain the interaction between aging and chronic disease. 12734 Review hypertension guidelines and management as they relate to the elderly.

	12735 Review important principles of chronic heart failure in the elderly. 12736 Review diabetes guidelines and management as relates to the elderly
Frailty	11460 Describe a construct of frailty: contributing factors and an overall definition. 11461 Prepare an approach describing strategies to prevent frailty in elderly persons. 11462 Demonstrate the ability to perform a screening assessment for frailty and develop a management approach for frailty, including utilization of a multidisciplinary team approach.
Unit 4 Week 2 CDMQ	Any of the above objectives may be tested.

Unit 4 Week 3: ENT & Cultural Safety

Lecture	Session Objectives
What's a tube?	11858 Define the terms: “myringotomy and tube” and “tympanostomy tube” 11859 List the indications for placement of a tympanostomy tube. 11860 Describe, in general terms, the procedure “myringotomy and tube placement”. 11861 Identify a tympanostomy tube on physical examination. 11862 Describe how to manage tympanostomy tube otorrhea.
Tinnitus	11499 Define tinnitus and differentiate “subjective” from “objective” tinnitus. 11500 List the major points in history taking in patients with a complaint of tinnitus. 11501 Provide a differential diagnosis of patients presenting with subjective tinnitus. 11502 Provide a differential diagnosis of patients presenting with objective tinnitus. 11503 Recognize the collaborative nature of treatment with their colleagues in audiology in managing tinnitus. 11504 List five treatment strategies that can be utilized for patients with subjective tinnitus.
Interdisciplinary geriatric assessment	11468 Identify the roles of the common team members of an interdisciplinary geriatric team with respect to patient assessment and management. 11469 Discuss the role of a program of geriatric screening and intervention in an emergency department and its benefits to the healthcare system. 11470 Describe the physician's “roles” in an interdisciplinary team.
Physiology of balance	11477 Describe the location and structure of the vestibule and the semicircular canals. 11478 Recognize that the labyrinth, vision, proprioception and the cerebellum all contribute to balance.

	11479 Explain how the labyrinth responds to movement
Peripheral vertigo	11480 List the major points in history taking in patients presenting with a complaint of dizziness. 11481 Differentiate between “dizziness”, “vertigo”, “disequilibrium” and “lightheadedness”. 11482 Based on history and physical examination, differentiate between benign positional vertigo, Meniere's disease and vestibular neuronitis. 11483 Explain the concept of “central etiology” versus “peripheral etiology” for vertigo. 11484 Describe the pathophysiology of, and management strategies for, benign positional vertigo, Meniere's disease and vestibular neuronitis.
Ear anatomy	11492 Describe the components of the external ear, the middle ear and the inner ear. 11493 Explain how sound travels from a source through the external, middle and inner ears. 11494 Identify the components of the cochlea. 11495 Identify the components of the labyrinth. 11496 List the major points in history taking in patients with an otological complaint. 11497 Describe how to properly examine an ear and identify the following structures with an otoscope: external acoustic meatus (ear canal), tympanic membrane, handle of malleus, middle ear cavity and cone of light. 11498 Describe how to perform a tuning fork test
Physiology of hearing	11863 Explain how sound travels from a source to the temporal lobe. 11864 Explain how mechanical energy is transformed to electrical energy in hearing. 11865 Define and differentiate between conductive hearing loss and sensorineural hearing loss.

	11866 Describe the neural pathways involved in the stapedial reflex. 11867 Describe the following components of an audiogram: pure tone audiometry and tympanometry
Adult hearing loss	11896 List the major points in history taking in adults with hearing loss. 11897 Describe the following components of an audiogram: pure tone audiometry, tympanometry and speech discrimination. 11898 Distinguish between sensorineural hearing loss and conductive hearing loss on an audiogram. 11899 Create a differential diagnosis of adult sensorineural hearing loss and adult conductive hearing loss. 11900 Explain how noise exposure may result in hearing loss. 11901 Compare and contrast the following with respect to presenting symptoms and signs, typical audiogram findings and management strategies: presbyacusis, otosclerosis, sudden sensorineural hearing loss, vestibular schwannoma, noise-induced hearing loss.
Otitis media	11892 Define the middle ear cavity. 11893 Compare and contrast acute otitis media and serous otitis media with respect to natural history, etiology, prevalence, symptoms and signs. 11894 List the complications of acute otitis media. 11895 Describe the contemporary management of acute otitis media
Disease of external ear	11925 Define the components of the external ear. 11926 Define and identify: aural atresia, microtia, accessory auricles and auricular hematoma (with respect to the pinna). 11927 Define, identify and list management strategies for: ear wax, otitis externa, necrotizing otitis externa and foreign body (with respect to the external acoustic meatus).

	11928 Explain how to counsel a patient on the prevention of wax impaction. 11929 Recognize the contraindications to otic drops use
Aural rehabilitation	11932 Recognize the importance of aural rehabilitation in the management of hearing loss in both the pediatric and adult patient. 11933 Describe environmental modification/aids that a patient with hearing loss might utilize. 11934 Recognize the spectrum of types of hearing aids, and the role of the audiologist and hearing aid dispenser in creating a hearing aid for a patient. 11935 Define bone-anchored hearing appliance (BAHA). 11936 Describe the criteria required to be considered for a cochlear implant. 11937 Appraise the multidisciplinary nature of management of a patient with hearing loss
Pediatric audiology and hearing loss	11868 Describe the infant hearing screening program. 11869 Recognize the spectrum of hearing tests that can be utilized in different pediatric age groups. 11870 Identify the presenting symptoms and signs of a child with hearing loss. 11871 Recognize the importance of hearing to maximize speech and language acquisition. 11872 List the major points in history taking in children with hearing loss. 11873 List the childhood groups with a high risk of suffering from hearing loss. 11874 Provide a differential diagnosis of a child with sensorineural hearing loss. 11875 Provide a differential diagnosis of a child with conductive hearing loss
Pharmacology brand vs generic drugs and biological vs biosimilar	13007 Describe the requirements for Canadian and international regulatory approvals for the interchangeability and bioequivalence for brand name and generic pharmaceutical and biological drugs (i.e. subsequent entry biologics [SEB]).

	13008 Apply the principles of bioequivalence for brand name and generic pharmaceutical and biological drugs to clinical therapeutic choices, and describe how this may affect drug interchanges and monitoring for drug safety and efficacy.
Emerging infectious diseases	11930 Outline the importance of: a) emerging diseases on health globally; and b) recognizing and managing these illnesses. 11931 Review the impact of emerging disease transmission based on the interrelatedness as a result of movement of people, animals, food and commercial goods.
Culturally competent medicine	11850 Recognize the importance and need for delivery of culturally competent medical care in Canada. 11851 Discuss ways to incorporate culturally competent care into their medical practice.
Refugee health	11578 Review the demographics related to new immigrants and refugees to Canada. 11579 Discuss illustrative cases dealing with the care of new Canadians, and related to: a) accessing health care in Canada; b) screening for and treatment
Unit 4 Week 3 CDMQ	Any of the above objectives may be tested.

Unit 4 Week 4: Pain

Lecture	Session Objectives
Pain pathophysiology	11607 Outline the neuroanatomical structures and nociceptive pathways that are involved with a stimulus in the great toe being perceived as pain in the brain. Be able to draw a schematic diagram with at least eight labelled structures. 11683 Describe how somatic nociceptive pain differs from visceral nociceptive pain using their knowledge of neurophysiological transmission and perception. 11684 Describe how neuropathic pain differs from nociceptive pain using their knowledge of neurophysiological transmission and perception. 11686 Define the physiological processes of transduction, transmission, modulation and perception. 11687 Explain how three similar appearing patients having the identical physical trauma or injury may report significantly differing levels of pain, basing your answer on spinal cord/brain stem neurophysiological mechanisms. 11688 Describe the physiological mechanism by which large doses of opioids may actually make pain worse. Outline a rational choice of analgesic therapy for such cases. 11689 Explain the probable physiological mechanisms, including sites of action, for at least four common analgesics.
What is pain?	11605 Define pain as per the IASP (International Association for the Study of Pain). 11606 Classify the different types of pain according to their source of origin. 11607 Outline the neuroanatomical structures and nociceptive pathways that are involved with a stimulus in the great toe being perceived as pain in the brain. Be able to draw a schematic diagram with at least eight labelled structures.

	11609 Describe the meaning of the expression that ‘pain pathways are not “hard-wired” '. 11610 Name three distinct, clinically relevant, inhibitory neurotransmitters released from neuronal pathways that descend from the brainstem, terminate in the substantia gelatinosa and are important for analgesia. 11611 List the four distinct locations of analgesic action of opioids. 11613 List three classes of drugs that may decrease pain by counteracting nociceptive sensitization.
Assessing and addressing acute pain	11608 Outline the basic concept of the gate control theory of pain control. 11614 List five reasons why acute pain should be treated effectively. 11615 Outline the fundamentals of an acute pain history. 11616 Describe the meaning and mechanisms of referred pain and pain that radiates in a particular direction. Give two examples of each. 11617 Describe three separate and complementary ways that acute pain can be assessed. 11618 List some of the challenges with assessing and treating acute pain in young children, the elderly and culturally diverse groups. 12346 List the commonly used modalities for acute pain management.
Pain	11619 Outline the “ladder approach” to acute pain management. 11620 Define the role of foundational analgesics, anti-hyperalgesics and adjunctives in relation to opioids for acute pain. 11621 Describe the merits of multimodal analgesia vs primary opioid therapy for moderate/severe acute pain. 11622 Compare the use of codeine with tramadol as a second step analgesic. 11623 Outline a standard approach to management of renal colic, fractured ribs and

	prolapsed intervertebral disc with sciatica in the emergency department patient. 11624 Outline the starting dosages for morphine, hydromorphone and oxycodone in the opioid-naïve patients and indicate the normal patient to patient range in daily opioid dose requirements. 11658 Describe the validated tools used to assess chronic pain patients (e.g. Brief Pain Inventory, DN4, Opioid Risk Tool, CAGE-AID questionnaire). 11660 List the major classes of medications used to treat chronic pain and describe their site of action, mechanism of action and possible side effects (e.g. NSAID's (cox-1 and cox-2), acetaminophen, tricyclic anti-depressants, selective norepinephrine reuptake inhibitors, anti-convulsants, opioids, and cannabinoids). 12181 List the essential components of a chronic pain history. 12184 Define opioid tolerance, opioid dependence and opioid addiction. 12185 List the expectations from the College of Physicians and Surgeons of Ontario when prescribing opioids for chronic nonmalignant pain. 12866 List a thorough differential diagnosis of low back pain. 12867 List red and yellow flags of low back pain.
Avoiding complications of analgesic drugs for acute pain	11664 List five examples of medical/surgical complications from overtreatment of acute pain. 11665 Outline the most common causes of acetaminophen toxicity. 11666 List five contraindications for nonsteroidal anti-inflammatory drugs (NSAIDs) for acute pain and explain how COX-2 inhibitors are different. 11667 Detail why codeine has been incorrectly classified as a weak opioid. 11668 Outline the factors that determine the extent to which codeine is metabolized to morphine.

	11669 Explain how tramadol and tapentadol differ pharmacologically from the partial agonist/antagonist class of opioids and why this is clinically very relevant. 11670 List the clinical manifestations of the serotonin syndrome and how it relates to use of tramadol and tapentadol. 11671 List the common side effects of opioids for acute pain. 11672 Compare and contrast the complications of opioids vs NSAIDs for acute pain. 11673 Describe the approach to suspected opioid overdose in the acute pain patient, how to safely administer naloxone, and list potential complications from naloxone use. 11674 List three examples of appropriate use of a gabapentinoid for acute pain. 11675 Explain the risk of adding a coanalgesic to the treatment of a patient already in a state of morphine failure for acute pain.
Chronic pain and its assessment	11627 Define chronic pain based on the IASP guidelines. 11628 Outline how the pathophysiology of chronic pain differs from pain transmission in the acute setting. 11629 Define the terms allodynia, hyperalgesia, dysesthesia, hypoesthesia and paresthesia. 11630 Define nociceptive and neuropathic pain and differentiate them using history, physical examination, validated screening tools and diagnostic tests (Brief Pain Inventory, DN4). 11632 Describe the clinical features and initial treatment of the following pain syndromes: painful diabetic neuropathy, phantom limb pain and post-surgical pain syndromes. 12188 Outline how to conduct a chronic pain assessment through history, physical exam and investigations.

Opioids in chronic non-malignant pain	11676 Outline a rational step-wise approach to prescribing opioids for chronic non-cancer pain making reference to the National Opiate Use Guidelines (NOUG). 11677 Describe how the CAGE-AID questionnaire and the Opioid Risk Tool are used to screen for patients at risk for opioid addiction or aberrant behaviour. 11678 List the essential components of an opiate contract between a physician and his/her patient. 11679 Define how a physician avoids problems with the patient and the licensing medical authority when prescribing opioids for chronic nonmalignant pain. 11681 Differentiate between physical dependence, pseudo-addiction and addiction. 11682 Outline various strategies for the treatment of opioid addiction such as methadone maintenance treatment (MMT) programs and the role of buprenorphine. 13017 Discuss the role of cannabinoids in chronic pain, including indications and regulations for medicinal marijuana. 14559 Articulate core issues surrounding the "opioid epidemic" and the risk/benefit balance of the use of alternative therapies in chronic pain management.
Drug schedules and pharmacology of non-prescription medications	12434 Describe and discuss the general pharmacologic classes and ingredients in Over-the-Counter (OTC) medications e.g. analgesic, cough & cold drugs (expectorant, decongestant, antitussive), antihistamine, antipyretic, gastrointestinal drugs, etc. 12435 Explain and recognize the main efficacy, indications, and toxicities of OTC medications e.g. analgesic, cough & cold drugs (expectorant, decongestant, antitussive), antihistamine, antipyretic, gastrointestinal drugs, etc. 12436 Demonstrate an understanding of prescription and non-prescription drug scheduling from both a national and provincial perspective.

Indigenous and Canadian perspective in substance use	12879 Describe the prevalence of addiction, particularly alcohol and substance abuse in the indigenous population and compare it to the Canadian society. 12880 Describe the effect and impact of oxycodone hydrochloride (OxyContin) abuse from a bio-psychosocial perspective 12881 Identify factors that contribute to oxycodone hydrochloride or other substance abuse in indigenous people and others who face this addiction and its consequences, at the individual, family and community level. 12882 Develop a strategy as a class for addressing addictions: a) assessing and assisting the patients and their families; b) defining the role of the physician and other professionals (pharmacist, police, mental health staff, etc.) in preventing the problem and treating it; c) educating society and the community about the problem.
Interdisciplinary management of chronic pain	11633 Explain an overall approach to treat chronic pain syndromes from a biopsychosocial standpoint. 11634 List several examples of chronic pain scenarios that may require referral to a multidisciplinary pain clinic.
Chronic pain syndromes	12747 Explain the role of psychological factors in the development of chronic pain and the barriers that lead to poor clinical outcomes" 11631 Explain the diagnostic criteria, natural history and initial treatment of fibromyalgia, complex regional pain syndrome type 1 and 2, postherpetic neuralgia, trigeminal neuralgia, painful diabetic neuropathy, phantom limb pain and post-surgical pain syndromes.
Unit 4 Week 4 CDMQ	Any of the above objectives may be tested.

Unit 4 Week 5: Palliative Care

Lecture	Session Objectives
Delirium in palliative care	11806 Define delirium according to the DSM-5 core diagnostic criteria. 11807 Recognize delirium and list the non-core clinical features. 11808 Describe the different clinical presentations of the three subtypes of delirium. 11809 List three commonly used ‘screening tools' for delirium. 11810 Identify possible reversible causes of delirium. 11811 Discuss the treatment of common underlying causes of delirium. 11812 Describe how the symptoms of delirium at the end-of-life can be managed quickly and effectively. 11813 Describe the importance of communication with both the family and healthcare team.
Bowel obstruction in palliative care	12213 Identify risk factors for the development of malignant bowel obstruction. 12214 Describe at least two mechanisms causing malignant bowel obstruction. 12215 Describe the typical symptoms and signs of a malignant bowel obstruction. 12216 Determine if an obstruction is partial or complete. 12217 Discuss the role of a patient's goals of care in determining the approach to managing a malignant bowel obstruction. 12218 Describe the systematic approach to managing the symptoms of a malignant bowel obstruction. 12219 Suggest appropriate medication and routes of administration to manage the pain in a malignant bowel obstruction. 12220 Describe the mechanisms causing nausea and vomiting in a malignant bowel instruction. 12221 Suggest appropriate antiemetric medication and routes of administration in the

	medical management of malignant bowel obstruction. 12222 Suggest other medications used in the management of malignant bowel obstruction such as octreotide, hyoscine, butyl bromide and corticosteroids and their routes of administration. 12223 Identify possible surgical interventions that may be helpful in the management of a malignant bowel obstruction. 12224 Describe a systematic approach to managing recurrent malignant bowel obstruction. 12225 List the necessary resources to care for someone at home with malignant bowel obstruction at end-of-life
Introduction to palliative care	11704 Describe models of hospice palliative care and the principles on which these are based. 11705 Discuss interprofessional collaboration in palliative and end-of-life care as a fundamental concept. 11707 Explain "total pain" incorporating the roles that psychological, social, emotional and spiritual concerns, along with physical symptoms, play in producing the pain experience. 11709 Recognize the importance of the systematic use of assessment tools in palliative care (e.g. Edmonton Symptom Assessment System (ESAS), Palliative Performance Scale (PPS) and screening tools for delirium). 12210 Describe the impact of major symptoms in terminally ill patients. 12211 Describe the role of the physician in providing end-of-life care. 12212 Describe the key role of other professionals in caring for a person at the end of life.
Assessment and management of cancer pain in palliative car	11717 Outline the WHO (World Health Organization) approach to the management of cancer pain.

	11718 Describe an approach to comprehensive pain assessment in palliative care. 11719 Describe the specific pharmacokinetic and pharmacodynamic properties when choosing opioids for patients at the end of life. 11720 Describe common side effects of opioids and an approach to their management that anticipates and prevents these. 11721 Describe and deal with patient and family concerns or myths about opioid use at the end-of-life. 11722 Explain the concepts of tolerance, physical dependence and addiction as they relate to the use of opioids in palliative care. 11723 Discuss routes of administration of opioids. 11724 Describe the use of adjuvant medications and other modalities in pain management. 12927 List other pharmacological and interventional techniques for the management of patients with refractory cancer pain
Mr. Harold Johnson	11708 Identify the components of a holistic, interprofessional assessment and plan of care for a terminally ill patient. 11727 Demonstrate patient and family centered as well as interdisciplinary approaches to assessing pain in a patient with advanced progressive illness. 11728 Systematically assess symptoms in a terminally ill patient and participate in the evidence-based holistic and interprofessional management of these symptoms. 11729 Explain the appropriate prescription of opioids (with titration and rescue dosing). 11730 Recognize the different ways that patients and families cope with illness and death. 11731 Discuss the importance of the physician-patient relationship in end-of-life decision making.

	11732 Identify factors that may interfere with communication of bad news to dying patients and their families. 11735 Demonstrate awareness that care and decision-making by patients, physicians and other team members may be influenced by their personal and professional experiences of loss. 11737 Identify local resources that could be helpful in providing support for terminally ill patients and their families. 14519 Describe how patients may turn to complementary medicine for management of symptoms associated with their cancer (eg: acupuncture, reiki, massage therapy, etc).
GI symptoms	11755 List five common causes of nausea and vomiting in palliative care patients. 11756 Develop a management plan for a palliative care patient with constipation. 11757 Select an anti-emetic on the basis of the inferred underlying mechanism for nausea or vomiting.
Depression, anxiety, and dignity conserving therapy in palliative care	11781 Describe the challenges of diagnosing major depression in palliative care patients. 11782 State the incidence of depression in palliative care patients. 11783 Discuss the pharmacological and non-pharmacological management of major depression and anxiety in palliative care patients. 11784 Define the issues leading to suffering in palliative and end-of-life care patients. 11786 Discuss the role of hope when facing death and strategies that nurture and maintain hope in realistic yet compassionate ways in palliative care settings. 11787 Describe key questions that may support dignity-conserving work (care to conserve or bolster the dignity of dying patients) in hospice palliative care.
Anorexia-cachexia syndrome and fatigue, in end-stage disease	12226 Describe the roles of hydration & nutrition in palliative care patients.

	12227 Describe the clinical implications of the pathophysiological mechanisms of cachexia and anorexia in patients with advanced cancer and AIDS. 12228 List three pharmacological agents that could improve appetite in patients with advanced cancer or AIDS. 12230 Describe causes of cancer-related fatigue. 12231 Discuss evidence based management of fatigue in patients with advanced cancer. 12762 Describe the anorexia-cachexia syndrome in advanced illness, and its potential causes
Emergencies in palliative care	12868 List four common emergencies in palliative care. 12869 List at least three cancers which commonly cause spinal cord compression. 12870 Explain the rationale for urgent and early diagnosis of spinal cord compression. 12871 Identify common signs and symptoms of spinal cord compression. 12872 Describe the management of spinal cord compression in palliative care patients. 12873 Identify three signs and symptoms of superior vena cava obstruction. 12874 Describe the management of superior vena cava obstruction in palliative care patients. 12875 Describe the clinical presentation of cardiac tamponade. 12876 Identify patients who are at increased risk for catastrophic hemorrhage. 12877 Describe key steps in the management of catastrophic hemorrhage in palliative care patients. 12878 Explain how a patient's “goals of care” may influence how a palliative care emergency is managed. 12928 Differentiate between spinal cord compression and cauda equina compression
Palliative sedation for the management of refractory symptoms at the end of life	11777 Identify why patients at the end of life may request MAiD.

	11778 Discuss withholding and withdrawing of therapies such as medically-assisted hydration, medically-assisted nutrition and ventilation, and the differences between these and MAiD. 12759 Outline an approach to respond to 'request to die' statements. 12760 Describe common indications for palliative sedation at the end of life. 12761 Describe how palliative sedation differs from Medical Aid in Dying (MAiD). 12929 Outline a checklist before initiating palliative sedation as part of best practice. 12930 List pharmacological agents that have been used to provide palliative sedation at the end of life.
Caring and self-awareness	11710 Identify common triggers for personal and professional stress in care of the dying. 11711 Demonstrate awareness of their own fears and attitudes towards dying and death and how to access a support system. 11712 Discuss how their own attitudes may potentially impact care delivered to a dying patient. 11734 Describe how personal concerns about caring for patients and families at the end of life and/or personal experiences of death and dying influence patient-physician communication. 11736 Describe the effect other physician's personal experiences and beliefs on the assessment and management of a patient's pain and other symptoms.
Grief and bereavement - story telling the bereaved caregiver	11749 Describe psychosocial and spiritual issues that dying persons and their families may face. 11788 Describe the features of normal grief and complicated grief. 11789 Describe risk factors for complicated grief.
Introduction to pediatric palliative care	11845 Define the different categories of life-limiting illness in children.

	11846 Describe the differences between pediatric and adult palliative care. 11847 Discuss the multidisciplinary approach to care which benefits the child and family when life-limiting illness is present. 11848 Recognize the components involved in care of a child with life-limiting illness from the time of diagnosis (including antenatal diagnosis), throughout the life of the child, the death of the child and the bereavement of the family. 11849 Identify the challenges (societal, professional and personal) which arise when caring for a dying child.
Managing dyspnea and the last hours in palliative care	11759 Describe the prevalence of dyspnea in terminally ill patients. 11760 List and categorize the causes of dyspnea in palliative care patients. 11761 Explain the clinical implications of dyspnea in palliative care patients. 11762 Describe the role of oxygen and opioids in the management of dyspnea in palliative care patients. 11763 Develop a management plan for dyspnea in a palliative care patient, including: a) identifying appropriate pharmacological agents and non-pharmacological agents; b) addressing the underlying causes; and c) identifying the need for appropriate communication with, and inclusion of, the patient, family and caregivers in the decision-making process. 11764 Describe four dying trajectories. 11765 Identify signs of approaching death. 11766 Describe common signs of the natural dying process. 11767 Describe how to prepare and educate the patient, family and caregivers when death approaches. 12758 List common medications used for symptomatic control of end-of-life symptoms. 14695 Describe chronic indwelling pleural/peritoneal catheters as a treatment option for refractory pleural effusions or ascites.

Clinical communication and advance care planning	11706 Describe an approach to exploring diverse cultural perspectives with regard to care with patients and their families at the end of life. 12232 Demonstrate an approach to issues in end-of-life care, including attitudes towards dying and death, communication, truth-telling and autonomy that is respectful of different cultures and religions. 12763 Outline an appropriate method of breaking bad news to patients and families (SPIKES framework). 12764 Describe an approach to discussing prognosis with patients facing a life-limiting illness and their families. 12765 Describe the role and structure of interprofessional/ interdisciplinary family meetings with palliative care patients and their families. 14691 Demonstrate how to initiate discussions about palliative and end-of-life care with patients and their families. 14692 Discuss an approach to establishing goals of care with a patient and their families when facing a life-limiting illness. 14693 Describe the role of advance care planning and its implications when caring for a patient. 14694 Explain the difference between advance care planning and goals of care discussions.
Unit 4 Week 5 CDMQ	Any of the above objectives may be tested.

Unit 4 Week 6: Pediatrics I & Dermatology

Lecture	Session Objectives
Fungal infection of the skin	758 Identify types of dematological fungal and yeast infections. 759 Describe fungal and yeast infections, including the structure of the organisms, differential diagnosis, treatment, and pathophysiology, with a focus on skin, hair, and nails.
Skin of Color	Describe the differing manifestations of dermatological conditions in patients with skin of colour List the most prevalent dermatological conditions affecting patients of colour. Discuss an approach to initial diagnosis and treatment for common dyspigmentation, inflammatory, nail and hair conditions presenting in patients with skin of colour. Identify when it is most appropriate to refer to a dermatologist
Common newborn issues	12236 Discuss components of the first newborn follow up visit, including umbilical cord care, sleep routine, maternal depression. à 12237 Describe normal newborn intake and elimination patterns and challenges. 12238 Recognize common neonatal rashes. 12239 Discuss modifiable factors and their relation to Sudden Infant Death Syndrome.
Failure to thrive	11911 Define “failure to thrive”. 11912 Outline an appropriate history in a child with “failure to thrive”. 11913 Discuss the differential diagnosis for “failure to thrive” in children. 11914 Recognize the role of the multidisciplinary team in the management of “failure to thrive” in children.
Baby Alia: is she feeding enough?	11094 Describe the important historical information, physical findings and laboratory data needed to help formulate the differential diagnosis and management of jaundice in the newborn.

	11589 Elicit an appropriate pediatric history including: growth, development (mental, behavioural and psychosocial), prenatal and birth, feeding/diet, immunizations, and HEADSS (Home, Education/Employment, Activity, Drugs, Sex, Suicidality) history. 11590 Identify important milestones in communication, social, gross and fine motor development. 12237 Describe normal newborn intake and elimination patterns and challenges. 12238 Recognize common neonatal rashes. 12348 Create a treatment plan that takes into account realistic time frames and resources as well as the behavioural and socioeconomic context of the patient. 12349 Explore the challenges and limitations of diagnosis and/or treatment of the patient. 14514 Recognize normal vital signs in pediatrics based on age. 14553 Identify normal and abnormal vital signs in paediatrics depending on the age group. 14554 Describe common neonatal rashes. 14555 Describe ways to provide culturally competent comprehensive care for children, youth, and their caregivers considering the social determinants affecting their health.
Anticipatory guidance	11918 Define “anticipatory guidance”. 11919 List five child and adolescent issues commonly discussed through anticipatory guidance. 11920 Discuss the impact of anticipatory guidance regarding injury prevention in children.
Introduction and morphology	12437 Appreciate the skin as the body's largest organ and its role in protection from the environment, temperature regulation and psychological well-being. 12438 Explain and demonstrate the proper techniques of examining the skin with regards to morphological type including: macule, papule, patch, plaque, vesicle, bulla, nodule,

	tumor, pustule, erosion, ulcer, wheal, telangiectasia, and scar. 12439 Appreciate the use of other descriptors used to delineate skin lesions such as: location or grouping, duration, time sequence and aggravating or relieving factors.
Acne vulgaris	14686 Describe the pathogenesis of acne vulgaris. 14687 Identify the factors that exacerbate acne vulgaris. 14688 Describe the clinical presentations of acne vulgaris and distinguish acne from other acne-like conditions. 14689 Describe the concepts of treating acne vulgaris. 14690 Discuss the psychological impact of acne.
Psoriasis	733 Describe skin conditions using descriptive morphological terms. 734 Describe the epidemiology, pathogenesis and pathology of psoriasis. 735 Recognize the clinical features and exacerbating factors of the different types of psoriasis. 736 Perceive the significance of the psychosocial impact that psoriasis has on an individual. 737 Explain the treatment approaches for psoriasis as they relate to localized vs generalized and mild vs severe disease.
Cancer of the skin	751 Describe a classification of, their cells of origin and the major histological features of the three most common skin cancers. 752 Describe different types of naevi and risk factors for development of skin cancer, and the major prognostic factors for melanoma. 753 Explain the concepts of markers, pre-cursors to skin cancers, in-situ cancers, preventive measures and therapeutic interventions for skin cancer.
Dermatitis	740 Classify eczema based on exogenous versus endogenous causes.

	741 Discuss the concept of atopy and atopic dermatitis based on clinical features, major and minor diagnostic criteria, and the roles played by different variables such as foods, irritants, infection, stress, dryness, genetics, and aeroallergens. 742 Define the immunological abnormalities implicated in the development of inflammation and the histopathology of acute and chronic dermatitis. 743 Develop an approach to the treatment of atopic dermatitis. 744 Identify the viruses that can affect the skin.
Histology and histopathology of the skin	12440 Summarize the functions of the skin. 12441 Define the components of the skin. 12442 Describe the histology of normal skin. 12443 Explain the histopathology of inflammatory conditions of the skin including psoriaispsoriasis and eczema. 12444 Explain the histopathology of neoplastic conditions of the skin including basal cell carcinoma, squamous cell carcinoma, malignant melanoma.
Bacterial skin disease	748 Classify the common bacteria that cause cutaneous infections by the mode of presentation and their cutaneous and systemic features. 749 Recognize various dermatological disorders that are caused by bacterial organisms. 750 Describe, in general terms, the management of bacterial skin diseases.
Viral infections of the skin	745 Classify the viruses affecting the skin by the type of virus (DNA, RNA) and the correlation to the specific morphology of the exanthema involved (e.g vesicle, papule, maculopapular). 746 Classify the Herpes viruses and their clinical presentations, and describe the dermatological conditions caused by Pox and Papilloma viruses.

	747 Recognize childhood exanthemas associated with viral infections. 1299 Describe the cutaneous manifestation caused by HIV infection.
Other common dermatological conditions	14746 Recognize the four types of rosacea. 14747 Discuss topical and systemic treatments of rosacea. 14748 Review the management of drug hypersensitivity reaction. 14749 Recognize the morphological and histological features of vitiligo. 14750 Review systemic diseases associated with vitiligo.
School refusal and bullying	11915 Discuss the common causes for school refusal in children. 11916 Describe how new technologies play a role in childhood and teen bullying. 11917 Describe the impact of bullying on the physical, emotional and social health of a child and family. 12244 Discuss the aspects of online activity and social networking that may result in potentially adverse developmental outcomes.
Maternal / birth health from a Global perspective	11838 Explore issues related to maternal morbidity and mortality in the global context. 11839 Explore issues related to global perinatal mortality. 11840 Discuss the causes and prevention of mortality in the under five age group worldwide.
Unit 4 Week 6 CDMQ	Any of the above objectives may be tested.

Unit 4 Week 7: Pediatrics II

Lecture	Session Objectives
Otalgia	11852 List the nerves that provide sensation to the ear. 11853 Explain the concept of referred otalgia. 11854 List the major points in history taking and the pertinent physical examination findings in patients with otalgia. 11855 Recognize: a) that otalgia may be due to otological or non-otological causes; and b) the need to look at distant sites for an etiology if the ear examination is normal. 11856 Describe the symptoms and signs of the following otological causes of otalgia: otitis externa (reviewed from lecture "Diseases of External Ear"), otitis media (reviewed from lecture "Diseases of Middle Ear), barotraumas and herpes zoster. 11857 List the non-otological causes of otalgia.
Children with complex health needs	11831 Define "family centered care". 11832 Recognize the importance of coordinated, comprehensive and family centered care for children with complex health needs. 11833 Using cystic fibrosis and spina bifida as examples, explain how these medical conditions are multisystem and require management by a multidisciplinary team. 11834 Discuss the effects of caring for a child with complex health needs on the family.
Multidisciplinary team approach to a pediatric chronic illness	12240 Recognize the role of a multidisciplinary team in the assessment and management of a pediatric chronic illness, such as Tourette Syndrome. 12241 List the co morbidities often seen with Tourette Syndrome in children. 12242 Discuss the impact of a chronic illness on a child and family
A 6 year old with a cough	11595 Interpret the growth chart. 12348 Create a treatment plan that takes into account realistic time frames and resources as

	well as the behavioural and socioeconomic context of the patient. K 12349 Explore the challenges and limitations of diagnosis and/or treatment of the patient. 14508 Discuss the approach to a pediatric patient with failure to thrive including the history and physical exam, a prioritized differential diagnosis, appropriate investigations and a management plan. 14509 Discuss an approach to the pediatric patient with chronic cough including the history and physical exam, a prioritized differential diagnosis, appropriate investigations and a management plan. 14510 Discuss the benefits of vaccination. 14511 Describe a strategy for discussing vaccinations with families who are hesitant to vaccinate their child. 14555 Describe ways to provide culturally competent comprehensive care for children, youth, and their caregivers considering the social determinants affecting their health.
Approach to the acutely ill child	11060 Discuss effective communication techniques when breaking news of a serious illness to a parent. 11121 Discuss the etiology, pathophysiology, differential diagnosis, investigations, and management of sepsis / meningitis in a child. 11142 Discuss the etiology, pathophysiology, differential diagnosis, investigations, and management of shock in a child. 11179 Recognize the signs and symptoms of dehydration, and describe the investigation and management of a child with dehydration. 11186 Discuss the “ABCD” (Airway, breathing, circulation, disability) assessment in identifying patients in need of immediate medical attention and intervention. 11191 Recognize the ""well"" vs. ""unwell"" looking child. 14543 Recognize normal vs. abnormal vital signs in pediatrics based on age. 14544 Discuss the various descriptions used when assessing sick children including “toxic” and “lethargic”.

The Health of Inuit children	11940 Discuss social factors affecting the health of Inuit children, for example housing, poverty, mental health and addictions, education. 14525 Describe challenges in access and delivery of health care and the disparities in health indicators of Inuit children compared to the rest of the Canadian population, including life expectancy, infant mortality, food security, and child welfare. 14526 Recognize the legacy of traumatic historical events manifesting as both intergenerational trauma and systemic racism, and discuss ways to provide culturally safe health care. 14527 Describe the unique demographics of the Inuit population and the Inuit traditional values and cultural differences. 14528 Describe the Jordan's Principle and the importance of the United Nations Convention on the Rights of the Child in ensuring equal access to care regardless of ethnicity.
Adoption	11814 Describe the types of adoption available and the trends in these options. 11815 Recognize the issues around racial and cultural identity in transracial adoption and parenting. 11816 Discuss the unique medical and emotional needs of children adopted internationally due to institutionalization and abandonment and gender related factors. 11817 Outline the catch-up immunization schedule for adopted children.
A global approach to managing adolescents with complex needs	14549 Recognize key concepts in using a biopsychosocial approach in youth. 14550 Establish manageable and realistic treatment goals for the adolescent patient with numerous challenges. 14551 Develop an approach to the management of chronic illness in adolescence. 14552 Identify reliable electronic, web-based medical and mental health resources available for youth.

Approach to a child with speech difficulties	14539 Describe the different types of communication disorders seen in children. 14540 Describe how the characteristics of the communication difficulties may differ in children with Autism Spectrum disorder, Global Developmental Delay and Hearing Impairment. 14541 Describe medical etiologies for different types of communication disorders. 14542 Describe the approach to a child who presents with delayed or disordered communication skills.
Approach to a preschool and school-aged child with behavioural difficulties	14531 Describe how behavior in a young child can be deconstructed to understand why it happens and what to do about it. 14532 Recognize when behavior is pathological in terms of severity and functional impact. 14533 List both biologic and environmental influences on behavior in the young child. 14534 List recommended components (within history-taking and physical exam) of an appropriate evaluation of a preschool child presenting with behavioral problems. 14535 Describe how behavior in a school-aged child can be deconstructed to understand why it happens and what to do about it. 14536 Recognize when behavior is pathological in terms of severity, social and academic impact. 14537 List both biologic and environmental influences on behavior in the school-aged child. 14538 List recommended components (within history-taking and physical exam) of an appropriate evaluation of a school-aged child presenting with behavioral problems.
Approach to the child with seizures / paroxysmal event	14545 Recognize and list the key features of seizures including febrile and non-febrile seizures. 14546 Describe the management for a child with a seizure. 14547 Differentiate seizures from typical paroxysmal events in children including

	BRUE, syncope, arrhythmias and breath-holding spells 14548 Describe the presentation, differential diagnosis, investigations and management plans for non-epileptic/paroxysmal events including BRUE, syncope, breath-holding spells.
Practicing evidence based advocacy in pediatrics	11883 Recognize that physicians must serve as advocates for infants, children and adolescents because they are frequently unable to advocate for themselves in a variety of institutional and policy making settings. 11884 Identify specific issues where child advocacy by physicians has resulted in improvements in child health. 11885 Describe the current status of literacy in Canada. 11886 Identify the health consequences of low literacy. 11887 Recognize the role of physicians in childhood literacy promotion. 11888 Explain how housing and one's physical environment affects health. 11889 Describe the epidemiology of preventable head injury in children and adolescents. 11890 Recognize the importance of understanding child development in order to better understand risk and provide age appropriate injury prevention strategies. 11891 Recognize the impact of helmet use in the prevention of head injury
Practical calculations in pediatrics	14751 Estimate the degree of dehydration in a pediatric patient based on history and physical examination findings. 14752 Calculate total fluid intake (TFI) and daily caloric intake for infants based on oral intake of breastmilk or formula. 14753 Demonstrate how to write intravenous orders for an infant, child and adolescent including types of fluid and rate for maintenance and rehydration.

	14754 Calculate urine output for an infant, child and adolescent and interpret urine output results
Understanding adolescent development	11953 Outline the normal developmental tasks for an adolescent. 11954 Using youth homelessness as an example, discuss how difficulties attaining adolescent developmental milestones can lead to maladaptive coping skills. 12243 Recognize how the internet can promote healthy youth development. 12246 Identify harm reduction strategies concerning internet situations involving risk. 14529 Describe how adolescent brain development affects behavior, including risk taking.
Adolescent sexual health	3874 Review the health and social implications of teen pregnancy. 3875 Illustrate youth friendly community resources available for adolescent sexual health. 11958 Describe the current trends in teen STI rates, pregnancy and contraception use in Canada. 11960 Recognize the impact of teenage pregnancy on adolescent development
Unit 4 Week 7 CDMQ	Any of the above objectives may be tested.

Unit 4 Week 8 Pediatrics III & Integrative Medicine

Lecture	Session Objectives
The health of street involved youth	11949 Outline risk factors for youth homelessness. 11950 Discuss the barriers in accessing health care for homeless youth. 11951 Recognize the extent of substance use and abuse and sexual health risks on the streets. 11956 Discuss the medical and psychiatric illnesses homeless youth are at increased risk for.
Engaging youth in health care	11955 Identify the community resources available that focus on youth mental health. 11957 Recognize the principle of "harm reduction" in treating an adolescent. 14530 Discuss the importance of youth engagement in the healthcare setting, and its effect on health outcomes
Vanessa: the tired teenager -	11595 Interpret the growth chart. 12347 Generate a prioritized differential diagnosis. 12348 Create a treatment plan that takes into account realistic time frames and resources as well as the behavioural and socioeconomic context of the patient. K 13012 Elicit an adolescent history using the HEADSS mnemonic as a template. 13015 List the indications for breaking confidentiality when conducting an adolescent interview. 13018 Recognize the importance of a confidentiality declaration with an adolescent patient. 14512 Initiate an appropriate work-up to rule out organic causes of fatigue in youth. 14513 Describe an approach to the management of fatigue in adolescents, including counseling around sleep hygiene. 14555 Describe ways to provide culturally competent comprehensive care for children,

	youth, and their caregivers considering the social determinants affecting their health.
Natural health products	12730 Describe key aspects of how natural health products are regulated in Canada. 12988 Develop an evidence-based medical approach and a rational prescribing approach to choosing CAM therapies and apply them to clinical practice. 12990 Explain the concerns for herb-drug and herb-herb interactions when dealing with CAM therapies.
Medical cannabis	14771 Explain the pharmacology of cannabis and cannabinoids. 14772 Describe the current Canadian laws and regulations for cannabis. 14773 Apply your knowledge of cannabis and cannabinoids to a clinical case.
Introduction to integrative medicine: concepts and controversies	12985 Define integrative medicine and complementary and alternative medicine (CAM). 12986 Describe the major challenges in designing research studies on CAM. 12987 Assess your knowledge of CAM and any biases you may have regarding specific CAM therapies. 14556 Describe 5 integrative medicine treatment modalities that can be incorporated into patient care. 14558 Explain the role of the gut microbiome and list 3 evidence-based indications for the use of probiotics
Food as medicine	12991 Describe the main features of Canada's Food Guide and the Mediterranean diet. 12992 Name four (4) food choices associated with a reduced risk of chronic disease. 14557 Articulate the health effects of the modern high-glycemic diet and it’s effects on insulin resistance and obesity. 14679 Describe the health effects of diets that are rich versus poor in vegetables and fruits. 14680 Describe the health effects from consumption of different types of dietary fats (trans, saturated, unsaturated, omega-3).

	14681 Describe the health effects of diets rich in different sources of protein (plant-based proteins, animal-based protein, processed meats).
Integrative Medicine Case Study	11651 Recognize where to find online resources for evidence-based integrative medicine. 14685 Explain the role of a naturopath and recognize how they can contribute to chronic disease management through educating patients on lifestyle changes.
Unit 4 Week 8 CDMQ	Any of the above objectives may be tested.