



## School of Medicine and Dentistry - Course and Clerkship Objectives

---

The curriculum is designed for students to acquire all the elements of a general medical education, providing them with strong foundations in the natural and social sciences basic to medicine, as well as professional attitudes and clinical skill - all with a focus on launching a lifetime of continued learning.

### Year 1

#### Mastering Medical Information

1. Gain foundational knowledge on population/public health concepts including measures of health status, points of prevention and measures of disease including their occurrence, transmission and control. (K-NSS-2, K-T-1, K-SC-1)
2. Develop skills in the knowledge, application and interpretation of principles of biostatistics, including basic statistics, distributions, variables, sampling. (K-T-1, S-CRM-1)
3. Understand Evidence Based Medicine, the search tools and available resources to answer a clinical question. (S-PE-2, S-CRM-1)
4. Apply knowledge from epidemiology and Evidence Based Medicine skills in reading the literature to critically evaluate the design, conduct and conclusions of observational and interventional research studies. (K-D-1)
5. Engage in Problem Based Learning sessions to become familiar with this learning method, fostering self-directed, active learning and collaborative team skills. (S-C-2, S-CRM-1, AB-PH-1, AB-IS-1)
6. Acquire foundational knowledge of health care costs as a component of the Health Systems Theme. (K-SC-1, K-SC-2)
7. Become familiar with introductory knowledge of translational medicine. (K-SC-2, S-CRM-1)
8. Become adept at use of iPad technology as a platform for curriculum content delivery. (S-CRM-1)

#### Human Structure and Function

1. Use appropriate anatomical-medical terminology.
2. Discuss how embryologic development contributes to formation of basic tissue types and major organ systems, and be familiar with defects that arise from abnormalities in embryologic development. (K-NSS-1)
3. Describe and integrate the general concept of segmentation in humans as encompassed in the development of embryonic somites and their derivatives, the distribution of cranial and spinal nerves, and dermatomes. (K-NSS-1)
4. Identify tissues from various organs using microscopic images, and understand how the four basic tissues, and their adaptations, contribute to organ structure and function. (K-NSS-1)
5. Discuss the important role of the cell membrane and its receptors, transporters, and channels in absorption, secretion, filtration and generation of electrical potentials. (K-NSS-1)

6. Describe the function of various cell types based on ultrastructural appearance. (K-NSS-1)
7. Describe the arterial supply, venous drainage and innervation of all major organ systems and musculo-skeletal regions of the body. (K-NSS-1)
8. Recognize the key features and names of the bones comprising the axial and appendicular skeleton, describe the fine structure of bone, and identify and discuss the general function of the skeletal muscles that act on major joints. (K-NSS-1)
9. Discuss the integrative nature of the nervous, endocrine and immune systems in the regulation of bodily functions and the maintenance of homeostasis. (K-NSS-1)
10. Describe the structure-function relationships of the cardiovascular system as they relate to ventricular function, the cardiac cycle, blood pressure regulation, and blood flow through the regional circulations. Discuss how oxygen supply is matched to oxygen demand, and appreciate the important role of neural, hormonal, and endothelial mechanisms in the regulation of blood pressure and blood flow. (K-NSS-1)
11. Describe the structure of the lungs and airways, and the mechanisms by which the respiratory system helps maintain blood homeostasis in terms of oxygen, carbon dioxide and pH. (K-NSS-1)
12. Describe the mechanisms and structure-function relationships of the gastrointestinal system as they relate to motility, digestion, and absorption and secretion, and appreciate the important role of neural and hormonal mechanisms in the regulation of these three components. (K-NSS-1)
13. Discuss how the mechanisms of ultrafiltration of plasma at the renal glomerulus, selective reabsorption of water and solutes, and selective tubular secretion of solutes in the kidney contribute to body fluid homeostasis and pH regulation. (K-NSS-1)
14. Describe the structures and understand the processes involved in human reproduction. (K-NSS-1)
15. Begin your study of medical pharmacology by describing the mechanism of physiological action of selected categories of drugs. (K-T-2)
16. Begin to develop a basic appreciation of diagnostic imaging approaches used to assess organ structure and function. (K-T-2)
17. Discuss the basic structure/function relationships that underlie the physical examination of a patient. (K-NSS-1)
18. Using the PBL process, develop problem-solving, communication, research, self-study, and life-long learning skills, and begin to practice constructive self and peer evaluation. (S-CRM-1; K-D-1)

### **Introduction to Clinical Medicine**

1. Understand the framework of a clinical interview using core communication skills (K-NSS-2; S-PE-1; S-C-1)
2. Understand and perform a screening physical examination and regional examinations using the tools of inspection, palpation, percussion, and auscultation (S-PE-1)
3. Understand the principles of human development, psychodynamics, and behavioral approaches to medicine (K-NSS-2)
4. Foster desired attitudes of professionalism, self-awareness, humanism, compassion, and honesty (AB-PH-1)

## Molecules to Cells

1. Biochemical Basics and Systems Integration - Learn the principles of how molecular structure determines chemical reactivity and macromolecular assembly. Also, learn the basics of cellular signaling and the biochemistry of signal transduction, including ligand-receptor interactions and post-receptor pathways. Apply this knowledge to understand hormone action in the regulation of intermediary metabolism, and the effect of growth factors on cell growth and differentiation. Understand the properties of biochemical and biological networks and integrate genetic, cell biological and biochemical processes to explain human chemical physiology and pathophysiology. (K-NSS-1, K-D-1)
2. Intermediary Metabolism - Learn the precursor-product relationships in the synthesis, degradation and inter-conversion of carbohydrates, proteins, fats, nucleic acids and other complex molecules. Apply this knowledge to understand human energy metabolism in the fed, starvation and various disease states, as well as the structure and function of human cells, tissues, organs and body. You will learn to infer the potential clinical consequences of genetic or biochemical imbalances, and interpret patient signs, symptoms and laboratory data in the development of a differential biochemical, genetic, and clinical diagnosis. (K-NSS-1, K-D-1, S-C-1, S-CRM-1, AB-PH-1, AB-IS-1)
3. Molecular Genetics and Cell Biology - Learn the structure of human genes and the molecules involved in their expression, with particular emphases on the qualitative and quantitative control of such expression at the transcription, translation and post-translation levels. In addition, learn the properties of subcellular structures, and apply this knowledge to understand the molecular mechanism of various human disorders. (K-NSS-1, K-D-1)
4. Cell Growth Control, Development, Cancer and Aging - Learn how growth and differentiation is controlled at the cellular, organ and organism levels, with emphasis on the genetic elements involved in positive and negative regulation of this process. Apply this knowledge to understand normal and abnormal development including cancer and aging. You will also learn about the genesis, progression and treatment of neoplasia, and generate hypotheses about rational drug design based on this molecular understanding. (K-NSS-1, K-NSS-2, K-D-1, K-T-1, K-T-2)
5. Medical Genetics - Learn the basic genetic principles governing patterns of inheritance and qualitative and quantitative approaches to pedigree analysis and genetic risk assessment. Also learn simple cytogenetic and molecular genetic techniques. Apply this knowledge to understand genetic counseling, molecular diagnostic testing, genetic profiling, gene mapping, genome research and genetic screening. Moreover, you will also learn the factors that affect gene frequencies in human population and gain some understanding of human diversity. Finally, you will appreciate the biopsychosocial aspects of human genetic diseases, the historical contexts of biochemical and genetic discoveries, and the ethical, legal and social implications of genetic discoveries and applications. (K-NSS-1, K-D-1, K-T-1, K-T-2, K-SC-1, S-PE-2, S-C-1, S-CRM-1, AB-PH-1, AB-IS-1)
6. Genetic-Environmental Interactions - Learn the many ways the human genome interact with the environment, including sensory genetics, teratology, pharmacogenetics and ecogenetics. Learn the basic pharmacokinetic and pharmacodynamic principles as well as genetic factors that affect each of these processes. Apply this knowledge to understand human pharmacogenetic disorders, and why many common diseases, such as diabetes mellitus, are examples of

aberrant genetic-environmental interactions. (K-NSS-1, K-NSS-2, K-D-1, K-T-1, K-T-2)

7. Nutrition - Learn the different macronutrient and micronutrient components of human diets, and how they play a role in health and disease. Apply this knowledge to understand the basic principle of dietary management of patients at different life stages, as well as those with inborn errors of metabolism and common diseases such as diabetes mellitus and hyperlipidemia. (K-NSS-2, K-T-1, K-T-2)

### Skills in Complete Patient Evaluation

1. To use the patient interview to build the doctor-patient alliance and to gather the complete history including an integration of patient information from multiple sources (patient, medical record, family, other caregivers or interdisciplinary team members) (K-NSS-2, SPE-1, AB-IS-1, S-CRM-1, S-C-1, S-C-2, S-C-3)
2. To acquire skill and confidence in performing the complete physical examination (SPE-1)
3. To develop proficiency with presenting the complete patient assessment in oral and written forms (SPE-1)
4. To apply human development and approaches to the mind principles learned in Introduction to Clinical Medicine to patient assessment and to interpretation of the information obtained from the assessment (K-D-1, K-D-2)
5. To gain comfort and foster a professional attitude towards evaluation of diverse populations and age groups, including those with chronic illness and disabilities (AB-PH-1, S-C-1, S-C-3, K-SC-1, K-SC-2, K-T-1, K-T-2)

### Host Defense

The following learning goals and objectives describe what is expected on the part of the student for each major topic area upon completion of the course. (K-NSS-1, K-D-1, K-T-1, K-T-2, K-SC-1, K-SC-2)

#### ***Microbiology and Infectious Diseases:***

1. Recognize a presentation of infectious disease and suggest approaches to identify the most likely causative agent.  
When presented with a patient history of respiratory, genitourinary, gastrointestinal, bone, skin, or neurological infection, be able to list the most likely etiologic agents among the bacteria, viruses, fungi, or parasites known to cause disease. Be able to suggest diagnostic tests to differentiate among the possibilities.
2. Describe the mechanisms used by infectious agents to cause pathology.  
When presented with a specific microorganism, be able to describe the specific aspects of the organism that allow it to cause disease in the host. In addition, describe how the host response to infection can contribute to pathology.
3. Describe the physical nature of microorganisms and how this determines the options for appropriate antimicrobial therapy.  
Describe the structural differences among bacteria, viruses, fungi & parasites, and how these differences dictate the selection of chemotherapy. List the major

classes of anti-infective agents and their respective modes of action. Describe the mechanisms used by infectious agents to thwart the efficacy of chemotherapy.

***Innate and Adaptive Immunity:***

1. Describe the cellular and acellular components associated with innate immunity and describe their function and action.

Be able to describe the physical and chemical barriers, cell types, the key receptor-ligand interactions, and the key effector molecules (complement, anti-microbial peptides and lipids, interferons) associated with innate immunity. Be able to explain how these components interact with microorganisms to control infection and stimulate the adaptive immune response.

2. Describe the series of events that results in the generation of humoral and cellular immunity.

Be able to explain the process of formation of specific antibody to its cognate antigen. This should include a consideration of antigen processing and presentation, T-cell stimulation of B-cell activation, the structure of immunoglobulin isotypes, antibody affinity versus avidity, and the function of the different domains of antibodies in antigen recognition, complement activation and phagocytosis. Understand the genetic mechanisms of antibody isotype switching and the generation of antibody diversity.

Similarly, be able to describe the mechanisms leading to the development of cell-mediated immunity (CMI) upon interaction of a pathogenic microorganism with an antigen-presenting cell, the role of cytokines and receptor-ligand interactions in T-cell activation, and how the effector cell types involved in CMI exert their function. Finally, describe the mechanisms involved in the generation of immunological memory.

3. Explain the concept of self and non-self as it relates to transplantation.

Be able to explain how the immune cells are educated to distinguish between self and non-self, including the concepts of thymic education, histocompatibility antigens, and cytotoxic T cells.

4. Identify, distinguish, and suggest treatment among the types of hypersensitivity.

When presented with a case of hypersensitivity, be able to distinguish among the 4 types by considering time to reaction, clinical presentation, and experiential history of patient. The student should be able to name the immune cells and molecules involved in the reaction, and propose possible treatments.

5. Explain the strategies for vaccine development.

Be able to determine the type of immunity required for protection against individual pathogens for each major class of infectious agent. Describe how to identify appropriate vaccine targets in a given infectious agent. Describe how to determine the predicted efficacy of a vaccine by evaluating the appropriate

correlates of protection in immunized individuals. Be able to describe the role of B and T cells in the development of a protective immune response to the vaccine target.

6. Apply the fundamentals of immunology to new strategies for the prevention and treatment of disease.

Connect basic principles in immunology to new developments in immunotherapy; including the use of monoclonal antibodies for the treatment of cancer and allergy, the development of viral vectors for gene therapy, and immunological approaches to limit the impact of bioterrorism.

## Addressing Disparities in Healthcare

### Population/Public Health

1. Understand the impact of race, SES, education, environment as critical pieces for health. (K-NSS-2; K-SC-1; K-SC-2)
2. Explore why place matters -discover socio-economic disparities based on address alone can impact health (K-NSS-2)
3. Compare and contrast through a video of a walk around the neighborhood, how food, safety, housing stock, social aspects, traffic, etc. impact health. (K-NSS-2)
4. Integrate geographical location with patterns of poverty and disease prevalence through examining maps of greater Rochester. (K-NSS-2)

### Bioethics

1. Reflect on their own knowledge, skills and emotional responses to cases involving various patients (AB-PH-1)
2. Understand the principles of bioethics and application of those principles in clinical cases (K-SC-2; AB-PH-1)
3. Demonstrate the skills necessary to communicate effectively and appropriately with health professions, patients, and families about ethically challenging topics. (S-C-1; S-C-2; S-C-3)
4. Engage other health professionals--appropriate to the specific care situation--in shared patient-centered problem solving. (S-C-2)

### Collaborative Care Delivery

1. Identify benefits of collaborative care planning and delivery (S-C-1; S-C-2; S-C-3)
2. Understand common and different approaches of medicine, nursing and social work to care of families (S-C-1; S-C-2; S-C-3)
3. Identify roles and responsibilities for medicine, nursing and social work (S-C-2)

## Pharmacology

1. Apply basic understanding of pharmacokinetics and pharmacodynamics, including receptor mechanisms, to estimate drug concentrations, develop dosing regimens, and predict drug interactions. (K-NSS-1, K-T-2)

2. Describe the basic actions of various receptor systems in the autonomic nervous system and the major classes of drugs that act there. (K-NSS-1, K-T-2)
3. Describe the pathophysiology and treatment of movement disorders. (K-NSS-1, K-T-2)
4. Describe the mechanism of action of the major classes of antihypertensives. (K-NSS-1, K-T-2)
5. Describe the major classes of drugs used in cancer chemotherapy and the principles underlying chemotherapy regimens. (K-NSS-1, K-T-2)
6. Describe the mechanism of action of major classes of local and general anesthetics and know when these are used. (K-NSS-1, K-T-2)
7. Review the pharmacology of antibiotics and antivirals. (K-NSS-1, K-T-2)
8. Describe the mechanisms of action of antihistamines and NSAIDs. (K-NSS-1, K-T-2)
9. Understand the pharmacology of diabetic drugs. (K-NSS-1, K-T-2)

### Medical Humanities Seminars, Year 1 and Year 2

1. Consider the broader human contexts for healthcare with a focus on the patient as person with unique personal socio-cultural experiences, values and beliefs that shape his/her knowledge, behaviors and attitudes about illness and treatment (AB-PH-1; K-NSS-2; S-C-1; S-C-2; S-C-3; AB-IS-1)
2. Reflect on their own personal experiences, values and beliefs about providing care for diverse patients (AB-PH-1; K-NSS-2; S-C-1; S-C-2; S-C-3; AB-IS-1)
3. Reflect on how their experiences with patients have shaped their knowledge, behaviors and attitudes about disease and treatment (K-NSS-2; AB-PH-1, AB-IS-1)
4. Apply knowledge (personal and professional), skills and reflective behaviors to clinical work with patients, families and colleagues in healthcare teams (AB-PH-1; K-NSS-2; S-C-1; S-C-2; S-C-3; AB-IS-1)

### Primary Care Clerkship, Year 1 and Year 2

#### Primary Care Concepts (K-NSS-2, S-C-2, K-SC-2, AB-IS-1, S-CRM-1)

- Describe the benefits of longitudinal, comprehensive, integrated care for patients with chronic medical problems
- Use appropriate scientific technology to provide point of care, evidence-based answers to clinical questions
- Understand how physicians use practice-based improvement methodology to analyze an area of the practice that needs improvement and develop and implement a plan for changes
- Recognize barriers to health care and the development of patient-centered medical home, including health literacy and psychosocial factors, under-insurance or lack of insurance, and the effect that health insurance has on quality of care and health outcomes.

#### Clinical objectives

- Clinical assessment of common **acute presentations** in primary care (K-NSS-2, K-D-1, K-T-1, K-T-2, S-PE-1, S-PE-2, S-CRM-1, AB-PH-1)
  - Differentiate among common etiologies that present with that symptom
  - Recognize dangerous conditions that may present with that symptom
  - Perform an appropriate focused history and physical examination
  - Appreciate the importance of a cost-effective approach to the diagnostic work-up
  - Describe the initial management of common and dangerous diagnoses that present with that symptom

- Primary care management of common **chronic diseases** (K-NSS-2, K-D-1, K-T-1, K-T-2, S-PE-1, S-PE-2, S-CRM-1, AB-PH-1)
  - Find and apply diagnostic criteria
  - Find and apply surveillance strategies
  - Describe the prevalence and natural history of common illnesses across the family life cycle and for an individual.
  - Elicit a focused history that includes information about adherence, self-management and barriers to care
  - Perform a focused physical exam that includes identification of complications
  - Assess improvement or progression of the chronic disease
  - Describe major treatment modalities
  - Document a chronic care visit
  - Partner with the patient, patient's family and other members of the health care team to develop a chronic disease management plan that enhances functional outcome and quality of life
  - Propose an evidence-based management plan that includes pharmacologic and non-pharmacologic treatments, and appropriate surveillance and tertiary prevention
  
- Well child and adult prevention visits (K-NSS-2, K-D-1, K-T-1, K-T-2, S-PE-1, S-PE-2, S-CRM-1, AB-PH-1)
  - General**
    - Define wellness as a concept that is more than “not sick”
    - Define primary, secondary and tertiary prevention
    - Identify risks for specific illnesses that affect screening and treatment strategies

**Child**

**PCC 1**

- Describe the core components of child preventive care—health history, PE, immunizations, screening/diagnostic tests, and anticipatory guidance

**PCC 1 and 2**

- Identify health risks, including accidental and non-accidental injuries and abuse or neglect
- Perform physical examinations on children
- Identify developmental stages and detect deviations from anticipated growth and developmental levels
- Recognize normal and abnormal physical findings in the various age groups
- Find and apply the current guidelines for immunizations and be able to order them as indicated, including protocols to “catch-up” a patient with incomplete prior immunization
- Identify and perform recommended age-appropriate screenings

**Adult**

**PCC 1**

- For women: Elicit a full menstrual, gynecological and obstetric history
- For men: identify issues and risks related to sexual function and prostate health
- Apply the 5 As model and use motivational interviewing to encourage lifestyle changes to support wellness (weight loss, smoking, safe sex, exercise/activity/nutrition/diet)
- Provide counseling related to health promotion and disease prevention

- Discuss an evidence-based, stepwise approach to counseling for tobacco cessation
- Find and apply the current guidelines for adult immunizations

### **PCC 1 and 2**

- For each core health maintenance condition (table), discuss who should be screened and methods of screening
- Develop a health maintenance plan for a patient of any age or either gender that addresses the core health maintenance conditions

### **Communication and Professionalism (K-NSS-2, S-C-1, S-C-2, S-C-3, AB-PH-1, AB-IS-1)**

- Communicate laboratory, diagnostic testing and results, diagnoses or disease process in clear language patients can understand, regardless of health literacy level
- Communicate respectfully with patients who do not fully adhere to their treatment plan.
- Educate a patient about an aspect of his/her disease respectfully, using language the patient understands
- Use a patient-centered, culturally sensitive approach to overcome communication barriers including both language and cultural differences and to create a therapeutic relationship with patients of all ages and their families
- Recognize how cultural diversity, illiteracy, health literacy and other factors affect health promotion and disease prevention in individuals and communities
- Develop skills in mindful practice and self-reflection to support continual growth as a practitioner and enhance understanding of patients concerns and use of non-directive counseling
- Demonstrate respect for patient confidentiality and privacy
- Develop skills writing SOAP notes and delivering oral presentations
- Communicate appropriately with other health professionals

## **Year 2**

### **Mind Brain and Behavior**

1. To provide the medical student with a sufficient background in neurosciences, neuropathology, neuropharmacology, psychopathology and psychopharmacology to permit knowledgeable participation in the diagnosis and care of patients with neurological and psychiatric problems. (K-NSS-1)
2. To learn the anatomical, physiological, and neurochemical basis for normal neural function and for neurological and psychiatric disease. (K-NSS-1)
3. To learn the basic principles of general pathology, including cell injury, infarction, inflammation and neoplasia, and to learn the pathological basis for nervous system disease. (K-D-1)
4. To familiarize the student with psychopathology, including the nosology and phenomenology of psychiatric disorders, and the complex interplay of the biological, psychological and social factors in their genesis and maintenance. (K-NSS-2), (K-T-2)
5. To learn the pharmacological basis for rational drug therapy in diseases of the central and peripheral nervous system, and in psychiatric disorders.(K-T-2)
6. To learn the pathological basis for neuromuscular diseases, including anterior horn cell disorders, peripheral neuropathies, neuromuscular junction disorders and myopathies. (K-D-1)

## Disease Processes and Therapeutics

1. To develop an understanding of the pathology and pathophysiology that underlies human disease. (K-D-1)
2. To begin to understand the complex relationship between medical therapeutics, diagnosis, and disease. (K-T-2)
3. To continue to mature professionally, working with other students, residents, fellows, and faculty in small group exercises. (S-C-2)

## Women's Health

1. Explain normal sexual development, puberty, menstrual cycle physiology, fertility, pregnancy physiology and menopause. (K-NSS-1)
2. Demonstrate knowledge of disorders of sexual development, pubertal disorders, menstrual disorders, infertility, common obstetrical complications and common benign breast and gynecologic conditions. (K-D-1)
3. Describe breast and gynecologic malignancies including risk factors, signs and symptoms and the initial evaluation. (K-D-1)

## 2<sup>nd</sup> Year Comprehensive Assessment

1. To reflect on your ability to apply basic knowledge to specific situations (K-D-1)
2. To reflect on your ability to effectively communicate your thinking to colleagues and patients (S-C-2)
3. To assess gaps in your baseline level of knowledge (AB-IS-1)
4. To develop your skills as a self-directed learner (AB-IS-1)

## Quality, Safety and Inter-professional Communication

### Mini-Safety Course: (K-SC-2)

1. To introduce the science of errors and safety
2. To discuss the role of human factors in medical error and how human factors engineering can reduce this risk
3. To describe a culture of safety and how an institution can achieve it

### Event Reporting: (K-SC-1, S-C-3)

1. To discuss what types of adverse events should be reported at the institution and New York State level
2. To describe the institutional process that occurs once a report is made.
3. To demonstrate the process of reporting an event via our electronic reporting system, Quantros

### Disclosing Adverse Events Workshop: (S-C-1, AB-PH-1)

1. To discuss and demonstrate the process of disclosing an adverse outcome to a patient/family
2. To recognize the need for clear communication and to dispel myths regarding expressions of regret

### TeamSTEPS: (K-SC-2, S-C-2, AB-PH-1, AB-IS-1)

1. To identify the roles and responsibilities of an effective team leader
2. To discuss the barriers, tools, strategies, and outcomes of leadership
3. To recognize the connection between communication and medical error
4. To describe strategies for incorporation of team briefs, huddles, and debriefs
5. To define and discuss Situation Monitoring and Cross-Monitoring
6. To understand when to use SBAR, Call Out and Checkback

7. To define mutual support
8. To describe assertion, CUS and the Two-Challenge Rule

### **Disorders of Childhood**

1. To increase knowledge of diseases that are specific to childhood, including their epidemiology, pathology, and treatment. (K-D-1, K-T-2)
2. To increase knowledge of disorders of embryologic development and the progression of anomalies, as well as their recognition and management. (K-D-1, K-T-2)
3. To increase knowledge of disorders that manifest during periods of growth and pubertal development and treatment approaches to these disorders. (K-D-1, K-T-2)
4. To develop an understanding of how physiology specific to infants, children, and adolescents alters their response to illness and treatment decisions. (K-D-1, K-T-2)
5. To develop an understanding of the long-term outcomes and late effects of disease and treatment during childhood and the needs of patients as they transition to adulthood. (K-T-1, K-T-2)
6. To increase knowledge of the inter-professional health care teams which are necessary to provide optimal treatment for many childhood disorders. (K-SC-1)
7. To utilize lifelong learning skills while working individually and in teams to access information and evidence to develop differential diagnoses, diagnostic evaluations, and management plans for patients via case presentations. (S-CRM-1, AB-IS-1)
8. To gain a perspective on the impact, across the biopsychosocial spectrum, of childhood disorders on the patient and family. (AB-PH-1)

### **Adaptation and Clinical Transitions**

1. Be able to calculate maintenance fluids for all patients and understand the basis of this calculation and how it may be altered in basic pathophysiologic states. (S-PE-1, K-T-2, S-CRM-1)
2. Be able to write clear and complete admission order sets using ERecord for patients with simple diseases. (S-PE-1, S-PE-2, S-C-2, S-CRM-1)
3. Continue to refine your understanding of the multidisciplinary aspects of patient care with a focus on the expertise and roles associated with an inpatient care model. (S-PE-1, S-CRM-1, S-C-2)
4. Understand the diagnostic uses of imaging techniques. (S-PE-1, S-PE-2, S-CRM-1)

## **Year 3**

### **Adult Medicine Basic Science Block**

1. To understand the basic and clinical principles of critical care medicine (K-NSS-2, K-T-2)
2. To continue to learn and be accountable in a pass/fail course (AB-IS-1)
3. To gain beginner skills with intensive care unit procedures in a simulated and laboratory environment (K-SC-2)
4. To become more adept at presenting knowledge and opinion of ethical issues (S-C-2)
5. To understand the pathologic underpinnings of end stage organ failure (K-D-1)

## Mind, Brain, Behavior Basic Science Block

1. To familiarize the medical student with current research, including genetic, cellular and systems approaches, that impact on the diagnosis and treatment of neurologic and psychiatric disorders (K-NSS-1, K-D-1, K-T-2).
2. To revisit and enhance student understanding of neuroanatomy, neuropathology, and advances in neuroimaging technology (K-NSS-1, K-D-1).
3. To examine the scientific bases of therapeutics in neurology and psychiatry (K-T-1, K-T-2, K-SC-2).
4. To reinforce perspectives about brain-behavior and behavior-brain relationships (K-NSS-1, K-NSS-2, K-D-1, K-SC-2).
5. To promote dialog with scientists (S-C-2, S-C-3).
6. To obtain evidence by searching the primary medical literature (S-CRM-1).

## Women & Children Basic Science Block

1. Describe evolutionary principles and characteristics of human life history. (K-NSS-2)
2. Describe epigenetic mechanisms responsible for gene expression during reproduction, embryogenesis, morphogenesis, fetal growth and development. (K-NSS-1)
3. Recognize that environmental factors (nutrition, toxins, socioeconomic status etc) influence short term and long term health through epigenetic mechanisms and that the epigenome is heritable, accounting for transgenerational effects of metabolic perturbation and endocrine disruptor chemicals. (K-NSS-1)
4. Examine how our cultural evolution impacts our biological evolution. (K-NSS-2), (AB-PH-1)
5. Apply an evolutionary perspective to understand human diseases that impact women and children. (K-D-1)
6. Answer the question, "Are humans still evolving?" (K-NSS-2)

## Internal Medicine Clerkship

### Knowledge

1. Demonstrate knowledge of the clinical presentation and underlying pathophysiology of common internal medicine problems. (KB) K-D-1)
2. Demonstrate an in-depth understanding your patients' symptoms, diseases, and treatments, and the underlying pathophysiology. (KB, PC) (K-D-1, K-T-2)
3. Demonstrate an understanding of how psychological, interpersonal, family, cultural, and environmental factors contribute to acute illness. (KB, PC;D,HS) (K-NSS-2)
4. Generate an appropriately detailed differential diagnosis for common medical problems. (KB); (S-CRM-1)
5. Describe the initial steps to evaluating a hospitalized patient's complaint, problem or diagnosis in a manner that balances benefits with harms and costs of diagnostic tests. (KB, PC); (S-CRM-1; K-SC-2)
6. Describe the general approach to managing common inpatient internal medicine problems in a manner that balances benefits with harms and costs of treatments. (KB, PC) (K-T-2; S-CRM-1; K-SC-2)
7. Identify the appropriate use of consultants. (SBP; HS) (K-SC-1)
8. Understand the role of systems in providing safe patient care and preventing errors. (SBP; HS) (K-SC-2)

### Skills

1. Independently obtain a complete history and physical and a focused follow-up history and physical. (KB, PC, CS); (S-PE-1)

2. Document comprehensive initial evaluations and focused follow-up evaluations in a standardized note format. (KB, PC, CS); (S-C-2)
3. Verbally present a complete history and physical and a focused, follow-up history and physical with minimal written cues in an appropriately succinct timeframe. (CS); (S-C-2)
4. Select and interpret basic diagnostic tests, including electrocardiograms and chest x-rays. (KB, PC); (SPE-2)
5. Utilize evidence-based medicine skills in the care of individual patients. (KB, PC, PBLI); (S-CRM-1); (S-CRM-1)
6. Demonstrate refined communication skills with patients, families, colleagues, and other members of the interprofessional team. (CS) (S-C-1; S-C-2)

### **Attitudes**

1. Utilize the biopsychosocial approach to the care of medical inpatients. (P, PC, CS) (K-NSS-2)
2. Appreciate the empathetic role of the physician. (P) (S-C-1); (AB-PH-1)
3. Appreciate issues of diversity in healthcare. (P; **D**) (K-NSS-2)
4. Appreciate ethical questions and issues involving the care of inpatients. (P; **BE**); (AB-PH-1)
5. Convey professionalism in words, actions and appearance. (P); (AB-PH-1)
6. Convey respect for the role of the various members of the health care team. (SBP; **HS**) (K-SC-2)

\*Domains of Excellence and Curricular Themes are identified in parentheses after each objective, where appropriate. The abbreviation for domains of excellence is separated from the abbreviation for the curricular theme by a semicolon.

### **Domains of Excellence**

**KB:** Knowledge Base

**PC:** Patient Care

**CS:** Communication Skills

**P:** Professionalism

**SBP:** Systems-Based Practice

**PBLI:** Practice-Based Learning and Improvement

### **Double Helix Curriculum Themes**

**A:** Aging

**D:** Diversity

**BE:** Bioethics

**HS:** Health Systems

**N:** Nutrition

### **Neurology Clerkship**

1. To elicit an accurate neurological history, and to perform and interpret a neurological examination. (S-PE-1)
2. To appropriately order laboratory studies in neurology: EEG, EMG, nerve conduction studies, evoked potentials, lumbar puncture, CT and MR imaging of the brain and spinal cord. (S-PE-2)

3. To appropriately evaluate and treat common neurological problems: • Neurological Emergencies: Coma and mental status changes, stroke, seizures. • Common outpatient neurological problems: Headache, dizziness, back and neck pain, peripheral neuropathies. (K-D-1, K-T-2, S-CRM-1)
4. To appropriately evaluate less common neurological problems, including multiple sclerosis, Parkinson's disease and other movement disorders, neuromuscular diseases, dementia, central nervous system infections, and tumors of the nervous system. (K-D-1, K-T-2, S-CRM-1)
5. To acquire the many personal attributes necessary for becoming an effective physician, including honesty, compassion, reliability, and effective communication skills. The American Academy of Neurology Core Curriculum Guidelines for the Neurology clerkship are included in this syllabus for your information as Appendix I. (S-C-1, S-C-2, AB-PH-1)

## **Obstetrics & Gynecology Clerkship**

### **Gynecology Objectives**

1. Be able to take and appropriately record a complete gynecologic history. (S-PE-1, S-C-1)
2. Learn and be able to perform and appropriately record the essentials of a breast, abdominal and pelvic examination (including speculum and bi-manual portions of the pelvic exam). (K-T-1, S-PE-1)
3. Know how to obtain a PAP smear, perform cervical cultures and interpret KOH and wet smears of vaginal secretions. (S-PE-1, S-PE-2)
4. Consider the possibility of pregnancy occurring in any woman within the reproductive age range who presents for medical evaluation and care. Understand that pregnancy, both intrauterine and extrauterine can present in many ways and must be considered in terms of differential diagnosis and treatment decisions. (K-NSS-1, K-D-1, K-T-2, K-SC-2, S-PE-1, S-PE-2)
5. Understand the hormonal relationships of the menstrual cycle and how they relate to normal and abnormal uterine bleeding. (K-NSS-1, K-D-1)
6. Develop an appreciation for the differing gynecologic issues and problems encountered in the different stages of a woman's life. (K-NSS-1, K-D-1)
7. Become familiar with the anatomy of the external genitalia and pelvic viscera of women. (K-NSS-1)
8. Become familiar with the common gynecologic neoplasms, including the presentation, diagnosis and treatment; understand the general principles of staging. (K-D-1, K-T-1, K-T-2, S-PE-2)
9. Be able to construct appropriate differential diagnoses for patients presenting with (1) abnormal bleeding and/or (2) pelvic pain and/or (3) vaginal discharge and/or (4) menopausal symptoms and/or (5) acute abdomen. (K-D-1, K-SC-2, S-PE-1, S-PE-2, S-CRM-1)
10. Be able to outline appropriate measures of prevention and/or early detection of cervical dysplasia and sexually transmitted diseases. (K-D-1, K-T-1, S-PE-1, S-C-1)
11. Be able to outline the different contraceptive techniques with their advantages/disadvantages, risks and benefits. (K-NSS-1, K-D-1, K-T-1, K-SC-1, K-SC-2, S-C-1, AB-PH-1)
12. Assess a patient for possible perimenopausal symptoms and be able to construct a differential diagnosis, evaluation and management plan for those women. In addition, the student should be able to counsel women regarding hormone

replacement therapy. (K-NSS-1, K-D-1, K-T-1, K-T-2, S-PE-1, S-PE-2, S-C-1, S-CRM-1)

### **Obstetric Objectives**

1. Be able to diagnose pregnancy by history, physical exam, and laboratory tests. (K-NSS-1, K-D-2, K-T-2, K-SC-2, S-PE-1, S-PE-2, S-CRM-1)
2. Be able to obtain and appropriately record a complete obstetrical history. (S-PE-1, S-C-1, S-C-2)
3. Be able to explain the multi-system physiologic changes that occur in the pregnant woman. (K-NSS-1, K-D-1)
4. Become familiar with the basic concepts of fetal-placental physiology and function. (K-NSS-1, K-D-1)
5. Become familiar with and manage routine antepartum and postpartum care in an uncomplicated pregnancy. (K-NSS-1, K-NSS-2, K-D-1, K-T-1, K-T-2, K-SC-2, S-PE-1, S-PE-2, S-C-1, S-CRM-1, AB-PH-1)
6. Demonstrate how to clinically monitor the three stages of labor and manage a normal vaginal delivery. (K-NSS-1, K-D-1, K-T-2, K-SC-2, S-PE-1, S-PE-2, S-C-1, S-C-2, AB-PH-1)
7. Distinguish between the various techniques of antepartum fetal assessment and their indications based on maternal/fetal risk factors. (K-NSS-1, K-D-1, K-T-1, K-T-2, K-SC-2, S-PE-2)
8. Be able to identify high-risk circumstances in pregnancy based on history, examination or laboratory studies. (K-NSS-1, K-NSS-2, K-D-1, K-T-1, K-T-2, S-PE-1, S-PE-2, S-C-1)
9. Discuss the implications of the following conditions for the mother and fetus: a) chronic hypertension, b) multiple gestation, c) preeclampsia/eclampsia, d) Rh isoimmunization, e) diabetes mellitus, f) substance abuse. (K-NSS-1, K-D-1, K-T-2, S-PE-1, S-PE-2, S-C-1)
10. Be able to construct appropriate differential diagnoses for patients presenting with a) first trimester bleeding, b) third trimester bleeding, c) postpartum hemorrhage. (K-NSS-1, K-D-1, K-T-2, S-PE-1, S-PE-2)
11. Be able to identify and manage premature labor and premature rupture of membranes; possible etiologies. (K-D-1, K-T-2, S-PE-1, S-PE-2, S-C-1)
12. Be able to identify and initiate management of fetal intolerance of labor with regard to possible etiologies and risk factors. (K-NSS-1, K-D-1, K-T-2, S-PE-1, S-PE-2, S-C-1)
13. Translate the effects of chronic diseases, genetic disorders and commonly used medications into risks for the developing fetus. (K-NSS-1, K-D-1, S-PE-2, S-CRM-1)
14. Realize and demonstrate the principles of teamwork in a critical care setting. (K-SC-2, S-C-1, S-C-2, AB-PH-1, AB-IS-1)
15. Be able to perform ongoing bedside assessment of a pregnant patient and basic bedside procedures (e.g. Foley placement). (K-T-2, S-PE-1, S-PE-2, S-CRM-1)

## Pediatrics Clerkship

### KNOWLEDGE

1. Demonstrate knowledge of the clinical presentation and underlying pathophysiology of common pediatric problems. (K-D-1)
2. Generate an appropriately detailed differential diagnosis for common pediatric problems. (S-CRM-1)
3. Understand the general approach to managing common inpatient pediatric problems. (K-T-2; S-CRM-1; K-SC-2)
4. Understand the importance of and strategies for health promotion and disease and accident prevention among pediatric patients. (K-T-1)
5. Demonstrate basic knowledge of physical and psychosocial growth and know how to assess motor, language, and social development. (K-NSS-1, S-PE-1)

### SKILLS

1. Demonstrate communication/history-taking, physical examination and clinical problem-solving skills required to properly evaluate the health status of a pediatric patient. (S-PE-1, S-PE-2, P-C-1, S-CRM-1, K-T-2)
2. Use communication skills, including techniques to establish rapport with children of various ages, to properly evaluate a child's health status. (S-C-1)
3. Demonstrate the appropriate use of observation and the limited/focused examination as a method of obtaining data in the assessment of the child. (S-PE-1)
4. Observe and demonstrate physical exam findings unique to the pediatric age group, and understand how findings have different clinical significance depending on the age of the child. (S-PE-1)
5. Diagnose and manage common acute and chronic illnesses that occur in children and adolescents. (K-T-2, S-PE-2, S-CRM-1)
6. Assess severity of illness in children and know how behaviors of children reflect this severity. (S-C-1)
7. Document comprehensive initial evaluations and focused follow-up evaluations in a standardized note format. (S-C-2)
8. Verbally present a complete history and physical and a focused, follow-up history and physical in an appropriately succinct timeframe. (S-C-2)
9. Demonstrate effective communication skills with families, colleagues, and other members of the inter-professional team. (S-C-1; S-C-2)

### ATTITUDES

1. Understand the influence of the family, community, and society on the pediatric patient during health and illness. (K-NSS-2, K-SC-1)
2. Utilize the biopsychosocial approach to the care of pediatric inpatients. (K-NSS-2)
3. Appreciate issues of diversity in healthcare. (K-NSS-2)
4. Convey professionalism in words, actions and appearance. (AB-PH-1)
5. Convey respect for the role of the various members of the health care team. (K-SC-2)
6. Gain exposure to the varied aspects of pediatric practice to assist in career selection. (AB-IS-1)

## Psychiatry Clerkship

*Modified from the Learning Goals recommended by the Association of Directors of Medical Student Education in Psychiatry*

## **1. Medical Knowledge**

- 1.1 Understand how psychological development relates to the underlying processes of psychiatric disorders [K-NSS--1]
- 1.2 Describe the psychobiological-behavioral theories for psychiatric disorders and substance use disorders [K-NSS-2]
- 1.3 Describe the psychopharmacological treatments and psychotherapies for psychiatric disorders [K-T-2]
- 1.4 Demonstrate knowledge of psychiatric concepts, components of the psychiatric mental status exam and cognitive screening [S-PE-2]

## **2. Patient Care (clinical skills)**

- 2.1 Conduct patient interviews skillfully [S-PE-1], [S-C-1]
- 2.2 Diagnose psychiatric disorders in patients [S-CRM-1]
- 2.3 Propose evidence-based therapeutic options [S-C-1], [K-T-2]
- 2.4 Assess risk factors for suicidality and dangerousness in patients [S-CRM-1]

## **3. Systems-Based Practice**

- 3.1 Apply the biopsychosocial model in psychiatric assessments [K-NSS-1], [K-NSS-2]
- 3.2 Advocate for the humane, just, safe and prudent care of patients with psychiatric disorders [AB-PH-1], [K-SC-2], [AB-PH-1]
- 3.3 Describe the basic framework for mental health care in this country [K-SC-1]

## **4. Interpersonal Skills and Communication**

- 4.1 Deliver effective patient presentations, including a psychiatric examination [S-C-2]
- 4.2 Document accurately in the medical record, including a mental status examination [S-CRM-1]
- 4.3 Communicate and work effectively with others, with attention to appropriate boundaries [S-C-1], [S-C-2], [S-C-3]

## **5. Professionalism**

- 5.1 Demonstrate respect, empathy and concern for all patients, regardless of the patient's problems, personal characteristics or cultural background [AB-PH-1]
- 5.2 Be courteous to patients, families, staff, colleagues and other health professionals [S-C-1], [AB-PH-1]
- 5.3 Value and behave in a manner consistent with the highest ethical standards of the profession, including confidentiality and truthfulness [AB-PH-1]

## **6 Practice-Based Learning**

- 6.1 Advance knowledge through intellectual curiosity [AB-IS-1]
- 6.2 Appropriately utilize evidence-based resources to address uncertainty in medicine and gaps in knowledge/skills [S-CRM-1], [AB-IS-1]

## **Surgery Clerkship**

### **PATIENT CARE**

1. Demonstrate the ability to gather essential and accurate patient information. (S-C-1)
2. Exhibit the skills necessary to gather patient medical history and conduct physical examination. (S-PE-1)

### **MEDICAL KNOWLEDGE**

Demonstrate investigatory and analytical clinical thinking (S-CRM-1)

1. Understands pathophysiology of basic surgical disease, preoperative and postoperative care. (K-D-1)
2. Exhibit knowledge of the structure and function of the body (as an intact organism) and its major organ systems and of the molecular, cellular, and biochemical mechanisms. (K-NSS-1)
3. Demonstrate an understanding of the scientific basis of medicine and be able to apply that understanding to the practice of medicine. (K-D-1)

#### **PRACTICE BASED LEARNING**

1. Develop a personal program of self-study and professional growth, consistent with the teachings of the Double-Helix Program, with guidance from the teaching staff and faculty advisor. (AB-PH-1, AB-IS-1)
2. Participate in teaching conferences. (AB-PH-1)

#### **PROFESSIONALISM**

1. Demonstrate compassion and empathy in patient care, maintaining the highest moral and ethical values with a professional attitude. (S-C-1)
2. Demonstrate sensitivity to culture, age, gender and disabilities in patients and colleagues. (K-NSS-2, S-C-1)

#### **INTERPERSONAL RELATIONSHIPS AND COMMUNICATION**

1. Establish effective professional relationships with other members of the medical team including allied health care personnel (nurses, clerical staff, etc.), residents, and fellow medical students. (S-C-2, AB-PH-1)
2. Maintain professional interactions with other health care providers and hospital staff. (S-C-2, AB-PH-1)

#### **SYSTEMS BASED PRACTICE**

1. Demonstrate an understanding of the relationships among various aspects of health care delivery. (K-SC-1, K-SC-2)

### **3<sup>rd</sup> Year Comprehensive Assessment**

1. Standardized Patient Exercise (K-NSS-1, K-NSS-2, K-D-1, K-T-2, S-PE-1, S-PE-2, S-C-1, S-C-2, S-CRM-1, AB-PH-1)
2. Self-Assessment (AB-IS-1)
3. Peer Assessment (AB-IS-1)
4. Computer exercises (K-NSS-2, K-D-1, K-T-2, S-PE-2 S-CRM-1)
5. Video Recording Review (Individual and Group Sessions) (AB-IS-1)
6. Individualized Learning Plan (ILP) (AB-IS-1)

## **Year 4**

### **Community Health Improvement Course**

1. Describe community health and why it is important in medicine (K-SC-1, AB-PH 1)
2. Articulate the difference between volunteer health service and community health improvement projects
3. List social, economic, and behavioral determinants of health and how they relate to health outcomes (K-NSS-2, AB-PH-1)
4. Design a sustainable and evidence-based community health project (K-T-1)
5. Locate and interpret accurate and timely community health surveillance data (S-CRM-1)

6. Identify the principles of effective community engagement and partnership (S-C-3)
7. Formulate a basic evaluation plan for a community health project
8. Describe an effective health education process including identifying target population and using appropriate health literacy levels (K-T-1, S-C-1)
9. Recognize health disparity and the underlying upstream potential causes of health inequity (K-NSS-2, AB-PH-1)
10. Understand several functions of the local public health department including emergency preparedness, environmental health and surveillance (K-SC-1)
11. Recommend policy changes to address barriers to community health and suggest an advocacy strategy for the policy (K-SC-1)
12. Critique strategies to promote behavior change for effectiveness based on evidence base and self-determination theory (K-NSS-2)
13. Identify and prioritize the most relevant health issues based on local data and community input. (K-NSS-2, S-CRM-1)

### Emergency Medicine Clerkship

1. Assess and manage the undifferentiated patient. (K-D-1, S-PE-1, S-PE-2, S-CRM-1)
  1. Create a focused patient H&P
  2. Create and refine a differential diagnosis
    - Based on patient's presentation
    - Prevalence and epidemiology of disease
    - Evaluating for life threatening conditions
    - Proper utilization of diagnostic testing to assist in narrowing differential
2. Create a patient assessment and formulate a treatment plan (K-SC-1, K-SC-2, S-PE-1, S-PE-2, K-NSS-2, S-CRM-1, K-T-1, K-T-2, S-C-2)
  1. Accurately paint a picture of the acute issues of the patient
    - See Communication below for presentation template
  2. Formulate a treatment plan that includes...
    - Supportive care including analgesia, etc.
    - Therapeutics (ie. Aspirin in chest pain, proper antibiotics, etc.) (see educational supplements)
    - Appropriate diagnostic tools used in the ED (see education supplements)
    - Apply knowledge of physical exam skills as a diagnostic screening tool
    - Use of consultants (see educational supplements)
    - Implications of cost to patient and issues with the larger health care system as it relates to patient care
    - Disposition-Admission/Discharge
      - Level of Care patient needs (see educational supplements)
3. Clearly communicate clinical encounters with other medical providers and communication with patients to help them better understand their care. (S-C-1, S-C-2, K-NSS-2, AB-PH-1)
  1. Goal is keep presentations less than 3 minutes
  2. Further information during orientation
  3. Communicate with patients creating therapeutic relationship
    - Should demonstrate patient empathy, cultural competency, and ability to navigate "the difficult patient"
4. Learn how to assess and manage the acutely ill patient. (S-CRM-1, K-T-1, K-T-2)

1. Recognize emergent patient presentations
  2. Become familiar with emergent treatment modalities
- 
5. Learn about the diverse fields of Emergency Medicine (S-C-2, K-SC-1, AB-IS-1)
    1. Gain understanding of Emergency Medical Services (EMS) in pre hospital care and larger health care system
    2. POC Ultrasound-FAST scan
  6. Obtain experience in minor procedures (K-T-2)
  7. Continue to expand interprofessional skills (S-C-2, S-C-3, K-SC-2)
    1. Social work experience
      - Understand role of social work in the hospital setting
      - Review domestic violence/sexual assault/child abuse
      - Discuss the best way to approach delivering unexpected bad news
      - Understand role of social work in preventing “bounce backs” and cost control
      - Appreciate cost implications of health care reform

### Process of Discovery

#### **Course Goals (S-CRM-1, AB-IS-1):**

1. Describe the key elements of the process by which a key research discovery changes clinical practice, and ways in which research might be incorporated into practice
2. Provide an overview of several of the current research activities at the University of Rochester

### Successful Interning

#### **To prepare students entering residency for their intern role and responsibilities by:**

1. Reviewing common topics, skills and procedures specific to their specialty (K-D-1; K-T-2; S-PE-1; S-PE-2; S-CRM-1)
2. Enhancing confidence and skills pertaining to the handling of emergent situations (S-CRM-1; S-C-2); teaching medical students (AB-PH-1; AB-IS-1); and dealing with requests for advice and care from others (S-C-2; AB-PH-1)
3. Providing an opportunity to discuss business aspects of medicine (K-SC-1; S-CRM-1)