



*USUHS students gain significant clinical experience during their third and fourth years, although they begin clinical work in the first year.*

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## **Appendix B**

### Course and Clerkship Descriptions

#### **First-Year Courses**

##### **Biochemistry (BC01001)**

The molecular mechanisms of human biology are described and explained. Major areas covered are: (1) the structure and function of proteins, nucleic acids, carbohydrates, and lipids; (2) bioenergetics; (3) membranes and transport; (4) intermediary metabolism of biological fuels, vitamins, and minerals; and (5) signal transduction. Mendelian and population genetics are also presented as a foundation for understanding heritable metabolic disorders. Emphasis is placed on the biochemical basis of disease and nutrition throughout the course; however, clinical correlation lectures are included that are devoted to relating various aspects of biochemistry, molecular biology, and human genetics to specific human diseases. (Department of Biochemistry)

##### **Clinical Head, Neck, and Functional Neuroscience (AT01022)**

Module II of the Anatomy, Physiology, and Genetics MS-I curriculum consists of integrative learning of basic and applied anatomy of the head and neck region with functional neuroscience and histology and physiology of the special senses. This course stresses a core of basic science information of practical clinical value and emphasizes the development of skills in clinical reasoning by involving the students in problem-solving clinical case studies. (Department of Anatomy, Physiology, and Genetics)

## **Diagnostic Parasitology and Medical Zoology (PM01002)**

The major protozoan, helminth, and arthropod parasites of humans as well as their respective reservoir hosts and vectors are covered in a series of lectures, laboratories, and demonstrations. Emphasis is placed on diagnostic methods, geographic distribution, means of transmission, methods for prevention of disease, and control strategies. Venomous vertebrate and invertebrate animals likely to be encountered by the military are also discussed. (Department of Preventive and Biometrics)

## **Fundamentals of Epidemiology and Biometrics (PM01001)**

This course is designed to give the student a working knowledge of basic clinical biostatistics as well as fundamental epidemiological principles and concepts. Applications to evidence-based clinical decision-making, epidemiological study design, and disease outbreak investigation are covered in lectures, seminars and labs. The objective is to provide a solid foundation in the epidemiological approach to clinical and public health practice. (Department of Preventive Medicine and Biometrics)

## **Human Context in Health Care (FP01001)**

This course is designed to introduce the student to the clinical approach in health care through readings, panel presentations, and discussion groups. It examines the role of context—individual life experience, beliefs, and values—of both physician and patient in determining the quality of care provided, demonstrating how these factors influence care independently of the nature of the patient's illness and the specialty of the physician. Presentations emphasize the crucial role of the physician's self-awareness in facilitating effective patient care. (Department of Family Medicine)



## **Introduction to Clinical Medicine I (ID01101)**

Introduction to Clinical Medicine I is designed to provide an initial experience in clinical skills needed in the care of a patient. The course is conducted in the second half of the first year and includes the teaching of basic communication skills and interviewing techniques. Coursework includes conducting a history with standardized patients, videotape review with faculty, and a variety of interviews with inpatients and ambulatory patients with direct observation and feedback from experienced faculty. (Interdepartmental course managed by the Department of Medicine)

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## **Introduction to Structure and Function (AT01020)**

This module consists of three sections: Module 1a, 1b, and 1c. Module 1a teaches first year medical students the fundamental concepts of structure and function that are most important to their understanding. This curriculum combines: (1) topics on cell biology with relevant segments of basic physiology, (2) the study of human basic tissue structure and function (physiology), and (3) early embryogenesis and basic tissue formation. Modules 1b and 1c: (1) introduce the medical student to anatomical and medical terminology; (2) teach basic information on form, structure, and function by dissection of the body and normal radiology; and (3) correlate the development of organ systems and the etiology of congenital abnormalities. (Department of Anatomy and Cell Biology)

## **Medical History (MM01001)**

This course describes the historical development of Western medicine with emphasis on medical practice, patient care, and interactions between medicine and society. The development of military, naval, and aviation medicine is presented in the context of the social and military events of the period. Particular attention is given to the growth of medicine in America from colonial times to the present. (Department of Medical History)

## **Medical Psychology (MP01001)**

Medical psychology is the study of mind and behavior as they relate to physical and mental health. This course presents important topics in medical psychology, including tobacco use, stress, eating disorders, pain, psychological assessment, behavioral cardiology, substance abuse, sexual assessment, medical decision-making, and compliance. Presentations integrate basic psychological and behavioral principles with modern life sciences and relevant treatment strategies. (Department of Medical and Clinical Psychology)

## **Military Studies (MM01001)**

Military Studies (MS-I) is composed of five sub-courses over the freshman year of medical school. Listed in chronological order, these include Introduction to Military Medicine (IMM), Military Medical History [taught by the Department of Medical History], Combat Medical Skills (CMS), Military Applied Physiology (MAP), and Military Medical Field Studies (MMFS) (see below). IMM serves as a basic introduction to military medicine: it introduces basic concepts that form the foundation for everything that follows, both during medical school and afterward, enabling students to appreciate and understand the complexities of military medicine; and it answers the question, “What can I expect in my role as a physician in the U.S. military at the beginning of the twenty-first century?” CMS teaches combat-/field-oriented, basic and advanced, out-of-hospital, first-aid skills and an algorithmic approach to multiple patient incidents. MAP adds military specific issues to the traditional physiology course (taught concurrently) focusing on the unique military occupational environments. (Department of Military and Emergency Medicine)

## **Military Medical Field Studies—Summer (MM01002)**

Students receive training in military field and leadership skills, including weapons familiarization skills, land navigation, small-unit leadership and team problem solving, field sanitation, and basic field medical skills while deployed during one week of Field Training Exercise Kerkesner at the Marine Corps Base in Quantico, Virginia. Immediately following this week in the field, students spend four weeks with an operational unit of their parent service to enrich their understanding of the working environment and people for which they will have future medical responsibility. (Department of Military and Emergency Medicine)



## **Structure and Function of Organ Systems (AT01024)**

This course examines the anatomy and physiology of the organs of the human body, beginning at the level of cellular and subcellular structures comprising organ systems. Students learn how these cellular components form the anatomical organs and study the function and physiology of whole organs. The course approaches the material by dividing organs into six organ systems: cardiovascular, immune, renal, gastrointestinal, respiratory, and endocrine. Material is presented both in lecture format and as laboratory/small group exercises designed to strengthen student understanding of major concepts in this field. Clinical correlations and pathology cases emphasize the practical aspects of this material. (Department of Anatomy, Physiology, and Genetics)

## **Second-Year Courses**

### **Introduction to Clinical Reasoning (ID02001)**

This course introduces students to principles of diagnostic reasoning and clinical problem solving. A series of common, primary-care topics germane to the disciplines of medicine, pediatrics, obstetrics/gynecology, and surgery are introduced through clinical-oriented lecture followed by small group case studies, in which students are expected to lead discussions under the guidance of a faculty preceptor. Students learn the vocabulary of clinicians and appropriate terms that are understood by patients, as well as gain a broadened ability to relate patient symptoms and signs to pathophysiologic principles. (Interdepartmental course managed by the Department of Medicine)

### **Ethical, Legal, and Social Aspects of Medical Care (ID02102)**

The course provides a framework for using diverse perspectives in analyzing current ethical problems in medicine at both institutional and individual levels. Current issues are discussed from legal, ethical, sociological, and economic perspectives and include neonatal care, military medicine, informed consent, experimentation, active and passive euthanasia, reproductive choices, genetic screening and counseling, and macro and micro allocations. (Interdepartmental)

### **Human Behavior (PS02001)**

The format for this course involves lectures and small group discussions (attendance mandatory) on normal human development and psychopathology. The first segment of the course focuses on psychological growth and development from infancy to late adulthood. The second segment introduces major psychiatric disorders and emphasizes biological, psychosocial, and social factors in diagnosing and treating these disorders. Six small, group sessions held throughout the course emphasize learning objectives through case discussions and are intended to provide clinical correlations to lecture materials. (Department of Psychiatry)

### **Introduction to Clinical Medicine II (ID02103)**

ICM II, taught at the beginning of the second year, concentrates on learning the essentials of a complete physical examination. Mastering the mechanics and sequence of examination for a normal, healthy subject is achieved through sessions devoted to individual sections of the body and the cumulative performance of a complete physical examination. Specific, sensitive portions of examination techniques are taught by using standardized patients and teaching associates. (Interdepartmental course managed by the Department of Medicine)

## Introduction to Clinical Medicine III (ID02111)

Taught in the spring semester, ICM-III prepares students for MS3 clerkships by consolidating basic clinic skills learned in ICM-I (Medical Interviewing) and ICM-II (Physical Examination). After successfully completing ICM-III, students are able to perform a comprehensive history and physical exam. Key course components include the following:

- Seven comprehensive history and physical examinations performed on standardized patients at the NCA Simulation Center (6) and hospitalized inpatients (1)
- Didactic and practical instruction in subspecialty examinations (e.g., dermatology, neurology, etc.) with three interactive cardiac auscultation sessions
- Practical sessions in the gynecological exam (taught by instructor/models) and the pediatric exam
- Introduction to oral and written medical case presentation
- Introduction to medical record-keeping and chart organization
- Introduction to professionalism in the patient care environment
- Pre-clerkship evaluation of clinical skills including an observed history and physical and an Objective Structured Clinical Examination (OSCE)

(Interdepartmental course managed by the Department of Medicine)



## Microbiology and Infectious Diseases (MC02001)

The course objective is to provide an understanding of the scientific basis for prevention, pathogenesis, diagnosis, and treatment of infectious human diseases. The course surveys the immunobiology of human hosts and the biology of pathogenic bacteria, viruses, fungi, and parasites. It presents a broad introduction to immunology, general and pathogenic microbiology, and host responses to infectious agents. Students develop an understanding of the biological characteristics of pathogenic microorganisms, the course of their infections, the functions of the immune system, and the actions of antibiotics against these pathogens. Students learn techniques for collecting and inoculating specimens from patients and the common laboratory tests used to diagnose infectious and immunological diseases. Upon completion of the course, students should be able to answer the following questions about each infectious agent:

1. **How is the pathogen identified?** What are its specific growth characteristics or distinguishing biochemical tests? What are its morphological and/or staining characteristics? What immunological or nucleic acid-based tests are used to identify the pathogen?
2. **What diseases does the pathogen cause?** What are the most common symptoms?
3. **Which epidemiological risk factors** (e.g., age, sex, ethnicity, race, immune status, geographic, or occupational exposure) **make an individual susceptible to infection/disease?**
4. **How is the pathogen transmitted to a human host?** How is it maintained in nature?
5. **What are the virulence factors of the pathogen?**
6. **How does the host defend itself against the pathogen?** Does the host response contribute to the pathogenesis of the disease?
7. **How is infection by the pathogen treated?**
8. **How is infection/disease prevented?** Does a vaccine exist to protect susceptible hosts? If so, what is its composition? (Department of Microbiology and Immunology)

## Military Studies II (MM02002)

The second year course in military studies, conducted by the Department of Military and Emergency Medicine, focuses on two general areas, casualty care and medical planning. Introduction to Combat Casualty Care (ICCC) builds on the principles of physiological responses to abnormal environments, learned in Military Applied Physiology (MAP), and the mechanics of wounding, learned in Introduction to Military Medicine (IMM), to educate second-year medical students about the pathophysiology of injuries sustained in the combat environment (e.g., ballistic, blast, burn, chemicals). Introduction to Joint Medical Planning (IJMP) focuses on the command and staff functions of military medicine in joint commands (e.g., medical planning, medical logistics, medical evacuation systems, and blood programs) to help students understand the complex relationship between medical planning and military missions. (Department of Military and Emergency Medicine)

## **Pathology (PA02001)**

This course initiates study of human disease. Part I, introductory and basic pathology, illuminates some of the major primary disease processes and mechanisms of cell and tissue damage by means of gross and microscopic correlations. Part II, organ system pathology, expands upon the effects of disease in major tissue systems and emphasizes specifics of causation, pathophysiology, biochemical alterations, progression, and complications. Throughout the course, integration of pathology and clinical medicine is accomplished through studies of multisystem diseases and case analysis with emphasis upon clinicopathologic correlations and differential diagnosis from the perspectives of both pathologic anatomy and clinical pathology. (Department of Pathology)

## **Pharmacology (PH02101)**

This course covers the principles of drug action and the properties of the major drug groups used in the treatment of disease. The course begins with a review of the basic principles of drug action and a survey of drug-delivery methods followed by discussion of drug absorption, distribution, and metabolism and an overview of toxicology. Students are given a systematic review of drug effects and pharmacotherapeutic approaches to disease states in major physiological systems, including the central and peripheral nervous systems (including drug abuse) and the immune, cardiovascular, renal, and endocrine systems. A review of drug applications in cancer chemotherapy and in the treatment of viral, bacterial, and parasitic infections follows. The final section of the course offers an introduction to the use of drugs in specific clinical populations, including surveys of neonatal, developmental, and geriatric pharmacology. The course objective is to provide a solid basis for understanding the therapeutic application of drugs, to be studied in the third and fourth years of medical school. (Department of Pharmacology)

## **Preventive Medicine (PM02001)**

This course reviews the principles of disease and injury prevention applicable to both military and community public health environments. Fundamental skills learned in epidemiology, biostatistics, and other basic science courses are used to examine specific disease and injury risk patterns. Emphasis is on identifying preventive medicine interventions that contribute to the health and fitness of military personnel and their families. The course also provides students with the fundamentals of health policy in general and the military system in particular. Approaches to primary prevention and health promotion are introduced in lectures, seminar discussions, and laboratory sessions. Students develop the necessary skills to recognize common public health problems, to formulate practical solutions, and to make recommendations for implementing those solutions during laboratory exercises. (Department of Preventive Medicine and Biometrics)

## **Radiographic Interpretation (RD02001)**

This course is a basic introduction to radiology. The course is taught by using didactic lectures supplemented with CD-ROM and web-based materials and through “open-book” quizzes. Module I (Fall) stresses the systematic evaluation of the chest film and culminates in an oral examination. Instruction also emphasizes the utility and evaluation of the following topics:

- Mammography
- The Acute Abdomen
- CNS Trauma including Cervical Spine
- Skeletal Trauma
- Pediatric Emergencies

This course helps students prepare for effective use of radiology services during the clerkship years and in the development of modest skills for evaluating acute and emergent imaging studies. (Department of Radiology)

## **Third-Year Clerkships**

### **Family Practice (FP03001)**

The family practice clerkship is designed to acquaint all medical students with the knowledge, attitudes, and skills fundamental to the specialty of family medicine. Students are exposed to a model of comprehensive primary health care with particular emphasis on the family unit, where the physician’s continuing responsibility is not limited by the patient’s age or sex nor by a particular organ system or disease entity. The six-week rotation is predominantly ambulatory, with time divided between the family practice clinic, hospital in-patient service, and on-call experiences, during which students have direct contact with patients and provide supervised primary care. Supervision is provided by family practice departmental preceptors and other staff and resident members of the health care team. Lectures, clinical case discussions, clinical and ward rounds, behavioral science seminars, required readings, and assigned family interviews enrich this in-depth exposure to family medicine. (Department of Family Practice)

### **Medicine (MD03001)**

The medical clerkship focuses on the care of adult patients. It fosters clinical problem solving for and with patients as they experience a wide variety of problems, allowing students to become clinicians who embrace complexity, yet act with simplicity. Students spend six weeks at two of the following hospitals: National Naval Medical Center, Bethesda (Maryland); Walter Reed Army Medical Center (Washington, D.C.); Wilford

Hall Air Force Medical Center (Texas); Wright-Patterson Air Force Medical Center (Ohio); Naval Medical Center, Portsmouth (Virginia); Malcolm Grow Air Force Hospital (Maryland); and Tripler Army Medical Center (Hawaii). One rotation is in an outpatient setting, the other is on inpatient service.

Clinic students work directly with faculty in the care of patients. Students on wards are junior members of teams consisting of attending physicians, residents, interns, and students. Under supervision, they participate actively in patient care, including nighttime and weekend call. All students attend teaching conferences and work directly with teaching preceptors in the analysis and synthesis of clinical information. Professional growth of students is the core goal of this clerkship. In both settings, students are expected to become reliable “reporters” who are making a transition to active “interpreters” for their patients; some students may progress to the “manager/educator” level. Formal evaluation and feedback occur mid-way at each clerkship site. (Department of Medicine)

## **Obstetrics and Gynecology (OB03001)**

The clinical clerkship in obstetrics and gynecology is designed to fulfill the dual objectives of providing all students with the core knowledge and skills required to address the health needs of women in primary care settings as well as to stimulate in some students a long-term interest in the clinical and academic excitement and challenges of this surgical and primary-care specialty. During the six weeks, students are members of the health care team through the traditional inpatient and outpatient services of obstetrics, gynecology, reproductive endocrinology, and gynecologic oncology.

Additionally, at all five clerkship sites (National Naval Medical Center; Walter Reed Army Medical Center; Brooke Army Medical Center; Wilford Hall, USAF Medical Center; Tripler Army Medical Center; DeWitt Army Hospital; and Washington Hospital Center), students have ample opportunity to evaluate patients and develop management skills in the ambulatory care setting. Core lecture series, case discussions on rounds, and independent study assignments assure exposure to the knowledge and principles of the specialty. The on-site clerkship coordinators are responsible for the cognitive and noncognitive assessments of students' performance. A final standardized National Board subject examination is administered on the last day of the clerkship. The on-site coordinators and the department chairperson are readily available to provide career counseling to further stimulate the interest of students in the numerous professional challenges in obstetrics and gynecology. (Department of Obstetrics and Gynecology)

## **Pediatrics (PD03001)**

The pediatric clerkship addresses issues unique to childhood and adolescence by focusing on human developmental biology and by emphasizing the impact of family, community, and society on child health and well being. Additionally, the clerkship focuses on the impact of disease and its treatment on the developing human and

emphasizes growth and development, principles of health supervision, and recognition of common health problems. The experience emphasizes those aspects of general pediatrics important for all medical students and provides a foundation for those students who elect further study in the health care of infants, children, and adolescents. Students have an opportunity to participate in clinical activities of both general and subspecialty pediatric services, but the emphasis in all services is placed on basic problems and common issues. The six-week rotation occurs at one to three of the teaching hospitals representing three of the uniformed services (U.S. Army, U.S. Air Force, and U.S. Navy) and is divided into three weeks of primarily outpatient general pediatrics with some exposure to subspecialty care, two weeks of inpatient ward, and one-week of newborn medicine. The Department of Pediatrics utilizes a nationally accepted curriculum that guides students through knowledge acquisition concerning the diverse areas of pediatric medicine. Throughout the clerkship, the essentials of pediatric history taking and physical examination are stressed. Additionally, the department places a heavy emphasis on clinical problem solving and provides students with structured learning in problem solving through clinical teaching by highly motivated preceptors as well as through computer-simulated case studies. The educational goal of the department is to provide each student with a comprehensive learning experience and the self-directed learning skills necessary to provide a lifetime of current, compassionate, and committed health care. (Department of Pediatrics)

### **Psychiatry (PS03001)**

Students participate in practical clinical work, individual supervision, and seminars and case conferences. In their daily work on inpatient, partial hospital, consultation-liaison, and/or outpatient services, students are supervised by psychiatry residents and staff. The department strongly emphasizes the biopsychosocial model, integrating biological, psychological, and socio-cultural knowledge in understanding behavior and disease. The development of clinical interviewing, diagnostic, and treatment planning skills are central to the clerkship. Particular attention is given to disorders often seen in the international focus of military medicine. Each student meets weekly with a senior clinician preceptor for review and discussion of case histories. Mandatory seminars and case conferences consider both practical and theoretical aspects of emotional disorders. (Department of Psychiatry)

### **Surgery (SU03001)**

The clerkship begins with a three-day orientation to the fine art and science of surgery. This includes didactic and hands-on experience in the lab using surgical instruments, suturing, knot tying, manipulating tissue, and exposure to emerging surgical technologies such as videoendoscopic surgery and ultrasound. Students then become members of surgical teams of interns, residents, supervising surgical staff, and other health care providers at one of the participating military medical centers. They work in clinics,

make ward rounds, assist in the operating room, take night call, and attend departmental conferences related to all aspects of care of the surgical patient. Students do independent histories and physical examinations, which are reviewed and discussed. Lectures on disease and injuries managed surgically are given using a departmental handbook as a reading guide. Distinguished professor lectures (bimonthly) and quarterly one-day surgical seminars are provided at USUHS. Each student prepares a topic or case-based formal presentation. Clinical performance is evaluated by the teaching staff and final written and oral examinations are given. (Department of Surgery)

## Fourth-Year Courses and Clerkships

### Elective/Selective Clerkships

With the assistance of a faculty advisor, the student selects 28 weeks of elective/selective experiences from a wide variety of clinical and research areas. (All departments)

### Military Contingency Medicine (MM04001)

The capstone course for the four-year integrated military medicine curriculum, Military Contingency Medicine (MCM) is four weeks long and features both classroom didactic teaching and the field training exercise “Operation Bushmaster.” The course utilizes lectures, labs, small-group discussions, and clinical encounters to build upon topics introduced in first- and second-year courses. In MCM, the approach is at the clinical level, focusing on clinical management, decision-making, and problem solving. As in both medicine and war, students are often faced with situations for which there are no perfect, textbook answers. Lecturers from the Department of Military and Emergency Medicine teach core lectures. Within the course, the Advance Trauma Life Support (ATLS) course is given under the guidance of the Department of Surgery. Many distinguished guest speakers outside the department also contribute, and information from recent or ongoing conflicts is integrated whenever possible. The final grade is

based upon the written examination, ATLS written test score, and the performance evaluation received during the field training exercise. Students must pass each component of MCM to pass the course, and they must pass the course to graduate. USUHS graduates are exempt from the Combat Casualty Care Course (C4) on the basis of having completed MCM. (Department of Military and Emergency Medicine)



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## **Military Emergency Medicine (MM04002)**

This required course provides senior medical students with an opportunity to learn unique aspects of the specialty of emergency medicine. The four-week clinical rotation is completed at one of a number of participating military and civilian emergency departments in the national capital region and across the country. Students learn the initial approach to patients of all ages for whom a diagnosis is not already established or narrowed down to a short list of possibilities. Under the on-site supervision of practicing emergency physicians, students evaluate acute presentations of common injuries and illnesses, devise management plans, and formulate disposition decisions within a variety of health care systems. Basic and advanced life support skills are reinforced and technical abilities performing common procedures are augmented. Students are provided with core reading materials prior to the course. Small group discussions covering important clinical presentations and led by residency-trained emergency physicians further prepare students for their clinical rotation. Grades are based on clinical performance in the emergency department, completion of a logbook of patient encounters, presentation of an interesting case to a small group, active participation in all didactic sessions, score on a written examination, and submission of a course evaluation.

## **Military Preventive Medicine (PM04001)**

The course is a problem-solving exercise based on a scenario cast in a combat zone in a tropical third-world nation. Based on relevant lectures and laboratory sessions, students must evaluate medical intelligence, identify disease threats, determine practical countermeasures, and brief senior officers on problem solutions. The course prepares students for the field preventive medicine exercises in “Operation Bushmaster.” (Department of Preventive Medicine and Biometrics)

## **Neurology (NE04001)**

Students select assignments by lottery number. Rotation sites are available in adult neurology on an inpatient service (Walter Reed Army Medical Center), a consultation service (Walter Reed Army Medical Center or National Naval Medical Center), or an outpatient service (Kaiser/Permanente). Rotations are also available in child neurology, neurosurgery, or neuro-rehabilitation. A few students are allowed to select sites outside of the national capitol area. Students evaluate and participate in the management of patients as part of a team consisting of other medical students, residents, and attending staff. Depending on the rotation site, students participate in teaching rounds, conferences, and lectures/seminars; the latter are specifically designed to cover critical areas of neurological knowledge. To ensure adequate exposure to a breadth of neurological topics, a student objective list and other educational material are provided to guide independent study. At the end of the four-week clerkship, a formal written examination is given based on these materials. The exam counts for half of the grade. Students must achieve a minimum of 70 points to pass. (Department of Neurology)