



This document offers a brief description of the four-year course of study at Rochester encompassed in the Double Helix Curriculum and provides a curriculum overview across the four years.

## Year One

**Mastering Medical Information. MMI** provides opportunity for learners to develop and enhance their knowledge, skills and experience with finding, evaluating, integrating and communicating medical evidence into processes of patient and population level clinical reasoning. Content includes biostatistics, epidemiology, translational medicine, clinical testing & population/public health. The course is taught through lectures, problem based learning, and Technology and Resource sessions.

**Introduction to Clinical Medicine. ICM** takes place during the first 18 weeks of year one. Students learn to acquiring information in the clinical setting—the patient interview and physical exam. Applying principles of the biopsychosocial model, students learn how to interact with diverse patients, preparing them for the clinical courses that follow. The course is taught through lectures and small group instruction with standardized patients.

**Human Structure and Function HSF** is a 14-week course that follows MMI. It is an integrated course that teaches gross anatomy, histology, embryology, and physiology. During **HSF**, ICM is organized so that the physical examination and focused history for each body system are learned as that system is studied and dissected. The course is taught through lectures, large group interactive discussion sessions, problem-based learning cases, and laboratory experiences (gross anatomy, physiology and histology) and physiology problem set conferences.

**Molecules to Cells. MTC** starts the second semester of year one continuing with the basic science strand. **MTC** is a 10-week course that provides the foundations in biochemistry, genetics and cell biology curriculum. It is organized into seven theme blocks: biochemical basics and systems integration; intermediary metabolism; molecular genetics and cell biology; cell growth control, development, cancer and aging; medical genetics; genetic-environmental interactions; nutrition. The course is taught through lectures, problem-based learning cases and patient encounters. Theme content of the Double Helix Curriculum is also tightly woven into the course.

**Skills in Complete Patient Evaluation. SCOPE** begins the clinical strand in January of the first year by exposing students to patients across the lifespan from pediatrics to geriatrics and in a variety of care settings, while reinforcing skills learned in the ICM course during the fall. This includes evaluation of diverse patient populations including those with chronic illness and disability. This 10 week course is taught through lectures and small group sessions. Additionally, a major portion of the course is direct patient interactions. Students spend four half-days in pediatric settings, physical medicine and rehabilitation settings, the acute hospital and nursing homes.

**Host Defense. HD** is the final basic science course of year one. It is a 7-week course that introduces immunology, inflammation, microbiology, dermatology (skin is taught as a Host Defense organ). Within microbiology, bacteriology, virology, mycology and parasitology are key topics. The course is taught through lectures, problem-based learning cases and on-line independent virtual laboratory sessions.

**Addressing Disparities in Healthcare (ADH).** ADH is a one-day interprofessional (nursing and medical students) educational module that introduces students to the impact of community health and bioethics in addressing disparities in healthcare delivery. Within care teams, students explore how socio-economic disparities based on zip code, living conditions and access, impact health in families. Students will reflect on their own biases and knowledge of the principles of bioethics as they apply them to case scenarios with family members.

**Pharmacology. Pharm** is a two-week course that provides students with a solid foundation in pharmacokinetics, pharmacodynamics and receptor mechanisms. It also gives a broad background in autonomic pharmacology, cancer chemotherapy, antihypertensives, cardiac pharmacology, and anesthesia. The course is taught through lectures, small group problem sessions and a mannequin simulation. Many of the specific areas of pharmacology are integrated into other courses, particularly DPT. Assessment is through a written exam.



## Year One to Year Two

**Medical Humanities Seminars.** Students are required to select at least two **Medical Humanities Seminars (MHS)** during the first two years (one in the second semester of year one and one in the first semester of year two). Seminars are two hour session once a week for eight weeks. Topics have included bioethics and law, philosophy, medical history, visual arts, literature and narratives in medicine, disability, spirituality, social and environmental perspectives in healthcare, complementary and alternative medicine, national healthcare reform, Latino health, deaf health, and others.

**Primary Care Clerkship (PCC).** PCC forms the clinical strand from March of year 1 through May of year 2, meeting three afternoons per week. During the first year of PCC, learning objectives are focused primarily on prevention, screening and wellness. Students practice advanced interviewing competencies, with a focus on health behavior change. Year Two turns to Primary Care management of acute and chronic illnesses, organized around common outpatient conditions (e.g. chest pain) presented in the context of organ system pathophysiology being taught in DPT (e.g. cardiovascular system). Physical diagnosis sessions early in year 2 reinforce and add to earlier learning of the physical exam, with attention to identifying and interpreting abnormal findings. Clinical preceptorships in adult and pediatric primary care office settings begin in year 1. During the second year course, students have two longitudinal preceptorships: 28 weeks with an adult primary care physician, and 10 weeks with a primary care pediatrician. Assessment methods include preceptor evaluations, course exams, standardized patient encounters, graded clinical notes, and the NBME Family Medicine shelf exam.

## Year Two

**Mind/Brain/Behavior.** MBB is a ten-week course that introduces the principles of neuroscience, neuropathology, neuropharmacology, psychopathology and psychopharmacology. Nine PBL cases integrate these basic sciences with the clinical disciplines of neurology and psychiatry. In addition, fourteen laboratory sessions reinforce neuroanatomy, neuroradiology and neuropathology through gross brain dissections and a review of neuroimages and gross and microscopic pathologic specimens.

**Disease Processes & Therapeutics.** DPT spans 17 weeks and is taught in a block model utilizing lectures, problem based learning, laboratory, team based learning and other methods. Content covers the relevant pathology, pathophysiology, pharmacology and other therapeutics of disease. The two semesters cover the fields of Gastroenterology, Infectious Diseases, Endocrinology, Renal/Urology, Pulmonary/ENT, Cardiology, Hematology and Rheumatology. Assessment is through written examinations, an oral exam, and performance in small group/PBL activities.

**Women's Health Course.** WH is a two-week course that follows DPT and provides a foundation for understanding women's reproductive disorders across the life stages. Each topic will be approached by reviewing the normal state before exploring the disorders. Topics covered will include sexual development, puberty, menstruation, reproduction, pregnancy, gynecologic disorders, breast disorders and menopause. Topics will be explored using flipped classroom exercises, lectures, pathology labs, team based learning exercises and a simulation experience for labor and delivery. Students will perform self-assessment through multiple choice questions provided on each topic and will complete a comprehensive multiple choice exam.

**Comprehensive Assessment.** At the conclusion of DPT, students spend two weeks in the Comprehensive Assessment (CA), a one and a half week formative assessment of knowledge, skills, and attitudes using multiple formats, including OSCEs, multi-source feedback, small and large group discussions, peer- and self-assessments, tests of basic and clinical science knowledge, and a 4 hour mock-NBME Step 1 exam. The Comprehensive Assessment guides students to discover their strengths and weaknesses in the domains of information gathering, interpersonal communication, medical knowledge, and professionalism. They come away from



these ten days with a well-developed preliminary "Individualized Learning Plan", naming realistic and meaningful goals and both the means and time frames to their achievement.

**Quality, Safety, and Inter-professional Communication Module.** QSICM begins a longitudinal experience bringing medical and nursing students together to learn the science of safety and the importance of teamwork in providing safe and high quality patient care. The module begins with a two day experience of didactic lectures and workshops exploring the root causes of medical errors, the role for human factors engineering and safety culture in preventing medical errors, and several team communication strategies. The following year, students meet again and participate in a facilitated debriefing of real life safety concerns from their clinical rotations.

**Disorders of Childhood.** DOC is a 2 week course focusing on illnesses and anomalies that specifically present in or are confined to childhood. Using a systematic approach and illustrative examples, the course will focus on developing knowledge and understanding of key concepts regarding how growth and development, embryonal through adolescence, relate to the occurrence of disorders, treatment decisions, and long term outcomes. Team based and individual learning exercises will complement the lectures and labs.

**Adaptation and Clinical Transitions.** ACT is the final basic science course in Year 2. This course aims to prepare students for their upcoming clerkships and introduces them to using the electronic medical record in inpatient settings. The course is organized around five basic patient scenarios that students (in small groups) manage while using the hospital information system to enter orders and retrieve data. This is supplemented by limited large group sessions, an Ultrasound Lab, a joint integrative simulation exercise along with students from the Graduate School of Nursing, and a 3rd year Clerkship Shadowing Experience.

### Year Three

There are three clinical clerkship blocks that together have six required experiences in the third year. These blocks and their components are:

1. Mind Brain Behavior: Neurology and Psychiatry
2. Women and Children's Health: Obstetrics and Gynecology and Pediatrics
3. Adult Inpatient Medicine: Medicine and Surgery

There are also three Basic Science Blocks, each two weeks in length, which follow clerkships.

The **Basic Science Blocks (BSB)** include PBL sessions, case conferences, lectures, basic science laboratories such as dissections, histology, and pathology, and self-study to teach advanced basic science topics related to both corresponding clinical specialties.

### **Adult Inpatient Clerkship: Medicine and Surgery**

**Internal Medicine.** This clerkship consists of a total of eight weeks of inpatient internal medicine divided into two four week blocks. The goal is to give a broad experience in the evaluation, diagnosis and management of hospitalized adults. During the first half, students meet in groups of 3 or 4 with a faculty preceptor three times a week to present and discuss cases, and have student focused bedside teaching with hospitalized patients. During the second half students rotate onto a different site or service and work closely with an inpatient team.



**Surgery Clerkship.** This is a 6-week rotation which consists of 3 weeks on “general surgery” and 3 weeks on a “sub-specialty.” The 6-week surgery clerkship is one component of the adult inpatient experience. The surgery clerkship, in the double helix curriculum, will achieve established goals and objectives by conducting a series of conferences and presentations, which address the core curriculum. At the same time it is important to maintain the apprenticeship type-learning environment, which is essential for the achievement of clinical competence. Students will also be expected to attend both the team’s clinics and operative procedures. This experience provides students an overview of the diagnosis, treatment and management of surgical conditions.

**Adult Inpatient Basic Science Block.**

The Adult Inpatient Basic Science Course is an integrated approach to teaching the material that bridges the medical sciences and clinical medicine, which are the foundations of medicine and surgery. Critical Care Medicine is the core topic used to develop the above principles.

**Mind Brain Behavior: Neurology and Psychiatry**

**Psychiatry Clerkship.** Psychiatry is a four-week experience that provides broad teaching on the subject of clinical psychiatry with focused clinical experiences in a particular area. The student works with a preceptor, and the clinical site placement may be inpatient psychiatry in the areas of adult, child and adolescent, forensic and geriatric; child and adolescent partial hospitalization; or consultation/liaison psychiatry in adult or pediatric services.

**Neurology Clerkship.** This clerkship is a four-week introduction to clinical neurology that builds upon the second year Mind, Brain and Behavior course. The clerkship consists of two 2-week experiences on the various inpatient adult and child neurology services at Strong Memorial Hospital and Highland Hospital. Students work as integral members of the patient care teams and are closely supervised by neurology residents, fellows and attending physicians.

There is an integrated seminar series offered to all students on both psychiatry and neurology across the eight weeks.

**Mind, Brain and Behavior Basic Science Block.**

The Mind, Brain and Behavior II Basic Science Course provides an advanced perspective of how basic science research contributes to the practice of clinical neurology and psychiatry. The overriding theme is “Development, Degeneration, and Dysfunction: A Life-Long Balance Influencing Brain Function”.

**Women and Children's Health: Obstetrics and Gynecology and Pediatrics**

**Obstetrics and Gynecology.** This is a five-week experience that provides intense clinical experience in obstetrics and gynecology while providing knowledge about specialty areas in this field. Students rotate through labor and delivery, gynecologic surgery and ambulatory settings.

**Pediatrics Clerkship.** This is a five--week experience that provides students a breadth and depth of exposure to pediatric medicine. The students spend the majority of time on the clerkship as members of an inpatient ward team, with the balance of time devoted to either a sub-specialty, newborn, or acute ambulatory experience.

**Women & Children’s Basic Science Block.**

Evolutionary biology provides the basis of our understanding of both the function an organism and its relationship with its physical, social and biotic environment. Thus an effective comprehension of human biology, health and disease requires knowledge of evolutionary principles and an appreciation of how they have shaped biological and biomedical processes at both an individual and a population level. During Sex to Selection, we will explore evolutionary principles,



such as epigenetic mechanisms, life history theory and evolutionary-developmental biology and apply these principles to our understanding of reproduction, nutrition and metabolism and cancer. In addition, we will explore how our cultural evolution in ethics, law, public policy and technology impacts our biological evolution.

**Comprehensive Assessment.** Modeled after the Year 2 Comprehensive Assessment (CA), the Year 3 CA is one week at the end of the 3rd year, and focuses on more complex clinical problems and more advanced basic science and clinical knowledge. Students revisit their ILP from the Year 2 CA, and reflect and make revisions for the final year of medical school.

#### **Year Four**

Students are required to complete:

**Surgical Subspecialty** – two weeks, can be done in year 3 or 4. This selective is focused on understanding and participating in one aspect of the team that cares for the surgical patient (general or subspecialty surgery, anesthesia, surgical pathology).

**Sub-Internship** – The required four-week experience in either Medicine, Surgery, Pediatrics, Obstetrics and Gynecology or Neurology as well as intensive care settings allows the student greater responsibility in the care of hospitalized patients that replicates what an inter would be doing.

**Emergency Medicine.** This 4-week experience will give students an opportunity to work up undifferentiated adult and pediatric patients in a high volume ED with exposure to stabilization of adult/pediatric emergent conditions, pre-hospital care of patients, and procedures related to care of these patients.

**Community Health Improvement Course. CHIC** is a required 4-week project-oriented course with a didactic component for 4th Year students. The course focuses on the role of the physician in population health and includes learning how to create and evaluate sustainable community health improvement projects. In addition, students will gain an appreciation of the social determinants of health, health disparity, barriers to care and the psychosocial aspects of health through hands-on learning in the community.

**Process of Discovery.** POD is a four-week required basic science course that presents, through a series of lectures, how new basic science knowledge changes clinical care. The relationships between work in basic, translational or clinical research to clinical care is explored and multiple examples are presented. The students also work in groups, by their planned medical specialty, to develop and present a research plan that addresses how a clinical problem could be addressed through additional research.

**Successful Interning.** SI is a one-week capstone program of study for fourth year medical students offered prior to graduation. There are whole class sessions on topics relevant to all students and students select from numerous small group sessions designed to review specific topics and skills that students will need for internships in various fields of medicine. Most sessions are case-based and highly interactive to promote active, learner-centered learning.

#### **Additional Information:**

**Themes:** The Double Helix Curriculum has several themes the topics of which are interwoven throughout the curriculum. The current themes are; Diversity, Aging, Nutrition, Bioethics, Health Systems. Each theme has a designated director or co-directors.

**Pathways:** Students can apply to participate in one of several elective pathways that are fulfilled through specific electives, humanities seminars, and/or other requirements. The current pathways are: Deaf Health, Latino Health, Global Health, Medical Education, Medical Humanities and Bioethics.