Vermont Integrated Curriculum Summary

The educational program comprises three levels. **Level One** is the foundation of the educational program and features the acquisition of clinical skills, as well as the development of fundamental science knowledge in a clinically relevant context. Initial courses in the fundamentals of medical science are followed by a series of organ system-based courses. **Level Two** consists of core clerkships emphasizing the basic principles and practices of clinical medicine. This level comprises rotations in family medicine, pediatrics, outpatient medicine, inpatient internal medicine, surgery, obstetrics and gynecology, psychiatry, and neurology. Additional educational experiences that are of a clinical nature but not specific to any one discipline are also included. **Level Three** provides students with additional opportunities for the application of medical knowledge with increased responsibilities for the care of patients. This level includes several core requirements, completion of a teaching practicum or scholarly project, and elective rotations. Clinical correlations are prominent in the curriculum at all levels, beginning with meeting a patient on the first day of medical school.

Level 1 – Foundations

The purpose of Level One/Foundations is to help students develop a fundamental understanding of health and illness as framed by systems from single genes to entire populations.

Orientation

The week-long Orientation course prepares the entering medical student for a successful transition to the Larner College of Medicine. Through a series of social, curricular, and community-building activities, incoming students get to know leadership, staff, faculty, and fellow students. Over the course of the week, students also learn about financial and educational support resources, information technology, patient communication skills, and curriculum delivery methods. Through pre-work and session activities, students experience the college's commitment to professionalism and inclusive, safe learning environments. (1 credit hour)

Professionalism, Communication, and Reflection

Professionalism, Communication, and Reflection (PCR) is a year-long course that is composed of small, process-oriented discussion groups with a faculty preceptor once a week. Important themes of the course include: 1) facilitating professionalism in medicine, 2) developing self-awareness and personal wellness to promote the highest standards in clinical care, 3) cultivating the habit of communicating with peers and colleagues about difficult subjects, 4) developing a healthy approach to the emotional challenges of clinical work, 5) improving understanding of culture and diversity in the practice of medicine, 6) developing a willingness to examine and discuss social and economic forces in medicine and, 7) learning to attend to the narratives of patients and physicians. This course fosters self-awareness, emotional intelligence, mindfulness, and the capacity to care for self and colleagues. Each week, the groups focus on a topic that widens the lens on a current academic topic in their Foundations curriculum or relates to important issues in medical practice. PCR mentors will also serve as their students' Careers in Medicine (CIM) advisors for the first two years of medical school. Regular advising meetings and Careers in Medicine material is integrated into the PCR curriculum. (2 credit hours)

Foundations of Clinical Science

This course builds from fundamental concepts of anatomy, biochemistry, cellular metabolism,

and molecular genetics to understand cell biology, pharmacology, embryology, and human physiology. Through an integrated study of normal healthy structure and function, students examine microscopic and gross anatomy and understand basic principles, concepts, and methods that are foundational to the study and practice of medicine, drawing from disciplines including biochemistry, cell biology, epidemiology, ethics, genetics, pharmacology, and public health. Students learn to apply basic scientific principles and develop frameworks for clinical decision-making and the practice of evidence-based medicine during course activities that include team-based learning, small- and large-group discussions, interactive modules, lectures, and clinical skills practice with standardized patients. The integrated, interdisciplinary organization of the course highlights clinical, ethical, and public health implications of basic medical sciences. Interactive sessions also include guided practice with a variety of learning strategies to help students develop effective approaches that will prepare them for success in their ongoing studies. (18 credit hours)

Attacks and Defenses

Attacks and Defenses is the bridge course between Fundamentals and Systems Integration courses that addresses the vocabulary, principles, and pathophysiology of disciplines that are not necessarily organ-based. The course integrates studies in hematology, immunology, microbiology, toxicology, pathology, pharmacology, and neoplasia. Students are introduced to advanced history taking skills, clinical problem-solving skills, and application of evidenced-based medicine. Instructional methods include lectures, weekly laboratories, small group exercises, evidence-based medicine assignments, team-based learning, team-based problem solving, and standardized patient exercises. (6 credit hours)

Nutrition, Metabolism, and Gastrointestinal Systems

This course utilizes both an organ and a disease-based approach to organize studies in nutrition and metabolism, the gastrointestinal and endocrine systems, and liver and biliary tree function. It is designed to integrate cell metabolism, normal and pathologic anatomy, pharmacology, physiology, pathophysiology, and the physical examination and related interviewing, diagnostic testing, and imaging. Students gain an understanding the metabolic and pathophysiologic consequences of public health problems including malnutrition, obesity and diabetes. Learning is facilitated through active learning sessions, assigned readings, small group case discussions, and workshops for problem-solving and skills development. Clinical correlations reinforce the lessons of the community preceptorships. (8 credit hours)

Medical Neuroscience

Students in this course learn about the nervous system through integrative study of behavior, cellular and systems neurobiology, neuroanatomy, neuroethics, neuropharmacology, neurophysiology, pathophysiology, and psychopathology. Students also learn the neurologic and mental status examinations, related interviewing, and diagnostic testing and imaging. Several instructional methods support learning in this course, including lecture, online independent study modules, readings from a variety of sources, laboratory sessions, physical examination and interviewing skills sessions, simulation, team-based learning, and case discussions prepared by students. (9 credit hours)

Public Health Projects

During the second year, Professionalism, Reflection, and Communication groups formed during the first year apply their group leadership, professional, and team skills to a public health project. Public health projects are designed to teach students about public health and the health issues that face our communities as they work side by side with the groups, organizations, and individuals in these settings. These projects begin to develop the background in population-based medicine and prevention a physician needs to fully address a range of health issues.

Public health projects are carried out in Vermont communities and enable students to apply the principles and science of public health to health needs in the community. (1 credit hour)

Connections

Students in Connections study skin, connective tissue, and the musculoskeletal system using appropriate aspects of cell metabolism, endocrinology, normal and pathologic anatomy, pharmacology, physiology, pathophysiology, and the physical examination and related interviewing, diagnostic testing, and imaging. It introduces students to the fields of orthopedics, rheumatology, and dermatology during the basic sciences. (3 credit hours)

Cardiovascular, Respiratory, and Renal Systems

The Cardiovascular, Respiratory, and Renal Systems (CRR) course uses multiple learning modalities to emphasize the pathophysiology of diseases that affect these 3 related organ systems. Students recognize life and organ threatening disease processes and study pharmacological and interventional management of diseases affecting the cardiovascular, respiratory, and renal systems. Basic biology and genetics are integrated with clinical data, including diagnostic testing and clinical imaging. The course also examines scientific and genetic evidence in the clinical management of sudden cardiac death, cystic fibrosis, asthma, autosomal dominant polycystic kidney disease, and hypertension. The final week of CRR emphasizes organ integration in diseases such as hypertension, shock, and acid-base disorders. Students also learn and apply clinical skills pertaining to the cardiovascular and respiratory systems. (8.5 credit hours)

Human Development and Reproductive Health

Human Development and Reproductive Health is a seven-week course that studies human life cycle development, the male and female reproductive system, age-related illnesses, disability, gender identity, sexual orientation, and social determinants of health. These areas are covered in tandem with one another, using a chronological approach beginning with the health of the fetus and continuing up through childhood, adolescence, the adult reproductive years, and the geriatric years. Students are introduced to the process of integrating life cycle factors into their consideration of differential diagnoses and their approach to therapeutic care. Lectures, Team-Based Learning, and pathology labs are supported by small group meetings and workshops. (6.5 credit hours)

Convergence

The Convergence course uses problem-based learning (PBL) to reinforce and integrate topics covered in previous courses and to apply clinical problem-solving skills in preparation for the students' transition into the clerkships. The PBL process requires that students recall knowledge and integrate with new knowledge in the context of solving a clinical problem. The students work through 6 clinical case problems with a clinical faculty facilitator. The course format includes the identification of student knowledge gaps (learning issues), peer teaching through brief presentations, and an opportunity for oral case summary presentations. (4 credit hours)

Doctoring in Vermont

The Doctoring in Vermont course spans the first and second year of Foundations. Students spend 8 sessions in the office of a primary care physician within a one-hour drive of Burlington. Students travel to their preceptor's office, observe direct patient care, and practice interviewing and examination skills. In the second half of this course, students perform a complete history and physical examination using standardized patients, in preparation for Clerkship years. (2 credit hours)

Level 2 – Clerkship

The Clerkship Year is designed to build on competencies acquired in Foundations to develop the knowledge, skills, and attitudes needed for clinical care and decision-making in a variety of medical settings.

The year is composed of 8 clerkships that are departmentally-based and provide clinical experiences supported by structured educational programs, as well as a four-week longitudinal Bridge Clerkship. All clerkships must be completed under the supervision of Larner College of Medicine faculty at an approved clinical site. Upon completion of this level, students complete a summative clinical skills exam (total = 49 weeks of required clerkships and 3 weeks of vacation.) UVM students gain clinical experience during clerkship and advanced integration at a variety of inpatient and outpatient settings and locations at various UVM Health Network sites, including UVM Medical Center in Burlington, as well as the Norwalk Hospital and Danbury Hospital in the Nuvance Health Network.

Family Medicine Clerkship

This clerkship emphasizes the acquisition of skills and knowledge related to the care of patients in the outpatient setting. Family Medicine physicians care for a diverse group of patients of all ages on a longitudinal basis, providing acute care, chronic disease management, prevention, health maintenance and education. They also coordinate care when subspecialty consultation is required. Students will examine the role of the Family Physician, both in leading the patient-centered medical home and within the complex health care system as a whole. The clerkship begins with small group, hands-on instruction utilizing the Simulation Center and Standardized Patients and other diverse teaching tools to learn skills and procedures for the office setting. Students then spend five weeks in a continuity clinical practice site, mostly based in rural New England. Along with working one-on-one with a preceptor in their outpatient clinic, many community faculty involve the students in their hospital work, nursing home care and home visits. Some physicians include obstetrics or other special focus in their work such as sports medicine. Students complete a community project and study from a national on-line curriculum designed by the Society of Teachers of Family Medicine. (6 credit hours)

Internal Medicine Clerkship

The inpatient medicine clerkship integrates medical knowledge acquired in the Foundations level with bedside clinical knowledge in the management of acute medical problems and chronic illness. Students expand their medical knowledge, develop their clinical skills, including history taking and physical examination, interpret clinical information, including laboratory and imaging data, learn differential diagnoses, practice diagnostic and therapeutic decision making, and develop proficiency in how to effectively communicate this information in both oral and written formats. Students are integral members of the ward team, which includes a faculty attending physician and usually a 2nd or 3rd year medical resident, intern and acting intern. Students participate in experiential learning supported by structured learning activities and didactic sessions throughout the clerkship. (6 credit hours)

Neurology Clerkship

The Neurology Clerkship is a combined inpatient-outpatient experience. Students spend most of the rotation working with inpatients, learning to care for neurological patients in an acute care setting. Students take an active role in following and managing those patients assigned to them. An emphasis is placed on properly performing and interpreting the neurological examination. There is ample exposure to testing of the nervous system, including neuroimaging. Students are encouraged to go to the literature to gather information about their patients' problems and, toward the end of the rotation, will give a brief clinical talk to the team. Didactics include interactive group case discussions using clinical cases to discuss important concepts related to clinical neurology. Evaluation of the students comes from feedback from their clinical

instructors, scores on an NBME subject examination, performance on clinical skills exam, evaluation of a submitted H&P, and evaluation of their topic presentation. (3.5 credit hours)

Obstetrics and Gynecology Clerkship

The Obstetrics and Gynecology clerkship is a combined inpatient and outpatient experience. Ob/Gyn physicians care for a diverse group of patients of all ages on a longitudinal basis providing acute care, chronic disease management, prevention, health maintenance, and education. This clerkship emphasizes the acquisition of skills and knowledge related to the care of women through the spectrum of normal reproductive transitions, which include puberty, pregnancy, and menopause. In addition, the student is taught to recognize and understand the pathophysiology and approach to the management of common and threatening problems related to reproduction. During the clerkship, students will experience and explore the unique field of Obstetrics and Gynecology, from primary care to a surgical subspecialty; they will learn in three settings, including the clinic, the operating room, and labor and delivery; and they will participate in longitudinal relationships with patients across their lifespan. The clerkship consists of only experiential and active learning. There are no lectures; rather, there are daily interactions with patients, residents, fellows, and faculty that facilitate students' learning. Students expand their medical knowledge and develop clinical skills, such as recognition of the clinical signs and symptoms of common obstetrical and gynecologic disorders, completing histories and physical exams, developing differential diagnoses, and using evidence-based medicine and critical thinking skills to practice diagnostic and therapeutic decision making. Students will also develop proficiency in how to effectively communicate this information in both oral and written formats. Evaluation of medical knowledge is done using an NBME subject examination. Clinical knowledge, skills, and behaviors are assessed by faculty observations and evaluations and by a clinical skills examination (CSE). (6 credit hours)

Outpatient Internal Medicine Clerkship

The outpatient clerkship provides learners with the foundation of skills, experience and knowledge to care for adults in an ambulatory setting. Students will manage both acute and chronic medical problems. In addition to learning prevention and health maintenance, students experience the breadth of disease management. The clerkship consists primarily of experiential learning. It provides an opportunity for daily interaction with patients, as well as one-on-one mentoring with a physician preceptor. Students continue to develop problem-solving skills, oral and written communication skills, and lifelong learning skills. They will gain an understanding of the role of a primary care physician in the management of patients and populations. The clerkship focuses on Basic Generalist Competencies and specific Clerkship Directors of Internal Medicine Learning Objectives/Training Problems. (3.5 credit hours)

Pediatrics Clerkship

The pediatric clerkship consists of ambulatory and inpatient components. The goals are for students to acquire the basic knowledge, clinical aptitude and communication skills necessary to care for children from birth through adolescence. Students will develop skills necessary for the diagnosis and treatment of acute and chronic medical conditions, as well as develop health promotion strategies. Students will refine universal problem solving, oral and written communication, and lifelong learning skills. Working with primary care physicians, hospitalists, sub-specialists, and allied health professionals, students will have broad exposure to the field of pediatrics, the role of the pediatrician in caring for patients, and the influence of family, community, and society on the health of children of all ages. The clerkship is experiential in nature with weekly interdisciplinary active learning sessions to help students meet the course objectives. (7 credit hours)

Psychiatry Clerkship

The Psychiatry Clerkship provides students the opportunity to improve their knowledge of psychiatric illnesses and substance use disorders that occur across the lifespan, with a focus on prevention, management, and health promotion. Students recognize the signs and symptoms of psychiatric disorders, and the acute phase of response to pharmacological and psychotherapeutic interventions in largely inpatient, and some outpatient, settings. Through didactics and clinical teaching, students will develop knowledge of the etiology and pathogenesis of emotional-behavioral problems and gain an understanding of the indications for, mechanisms of action of, and potential adverse effects of a variety of treatments for such disorders. Students will develop empathy for those suffering with mental illnesses and knowledge of the role that psychiatric conditions play in clinical practices across all specialties. (6 credit hours)

Surgery Clerkship

Students become part of the surgical team and experience the unique relationship surgeons have with their patients. All students will have exposure to general surgery as well as a surgical sub-specialty. Clinical experiences occur in the outpatient and inpatient setting and students will have exposure to acute presentations of disease. Students will develop skills in recognizing the clinical presentation of common surgical disease, in completing histories and physicals, developing differential diagnoses, and developing assessments and plans for common surgical problems. They will develop their communication skills and learn to apply principles of evidence-based medicine to the care of surgical patients. Students will be involved in the preoperative and post-operative management of patients, and will display professionalism and ethics in the care of patients. This clerkship will provide the opportunity for students to develop technical skills in selected procedures. (7 credit hours)

The Bridge Clerkship

This longitudinal multidisciplinary curriculum is designed to support professional growth and to focus on topics that are important in all disciplines of medicine. This course includes topics of global health, palliative care, anesthesia, nutrition, patient safety, healthcare delivery and the economics of health care, complementary medicine, pain management, genetics, communication skills, and evidence-based medicine. In the Professionalism, Communication, and Reflection Sessions 2 (PCR 2), students continue to explore the concepts learned in the Professionalism, Communication and Reflection 1 (PCR 1) course, with emphasis on application in the clinical setting. (3 credit hours).

Level 3 – Advanced Integration

The Advanced Integration level comprises required activities that enhance the student's clinical skills and knowledge of basic and clinical science, and elective activities that allow the student to shape his or her own professional development. All students are required to include in their schedules:

- Two acting internships (AI). One of the AIs must be in Internal Medicine and the other is a discipline selected by the student.
- One month of surgical specialty training.
- The Emergency Medicine Selective
- A teaching practicum/scholarly project

Acting Internship in Internal Medicine

The Acting Internship in Internal Medicine consolidates and refines the student's Internal Medicine medical knowledge and clinical skills at a level of competency necessary to deliver comprehensive care to medical inpatients. Through increased responsibility in the evaluation

and management of patients and through closely supervised direct patient care experiences, students attain a level of competence and self-confidence sufficient to be prepared for entering their first year of residency. This Acting Internship must be completed at either the University of Vermont Medical Center in Burlington or Danbury Hospital or Norwalk Hospital in the Western Connecticut Health Network. (4 credit hours)

Acting Internship

Each student completes at least one month of Acting Internship in addition to the Acting Internship in Internal Medicine. This Acting Internship is in a specialty of the student's choosing and consolidates and refines the student's medical knowledge and clinical skills at a level of competency necessary to deliver comprehensive care to inpatients. Through increased responsibility in the evaluation and management of patients and through closely supervised direct patient care experiences, students attain a level of competence and self-confidence sufficient to be prepared for entering their first year of residency. This Acting Internship may be in any inpatient service that fulfills the requirements and be completed at the University of Vermont Medical Center, or at an approved affiliate site. (4 credit hours)

Surgery Specialty/Subspecialty

This rotation is designed to provide the student with further knowledge of surgical subspecialty areas of interest to them. Students can select either two separate two-week (2 credit hours) surgical specialty/subspecialty rotations or one full month (4 credit hours). If taken as an acting internship, this requirement can also satisfy the second Acting Internship Requirement.

Emergency Medicine

This required rotation integrates the practice of medicine in a situation where the student is the first provider to see the patient, develops differential diagnosis and treatment plan, and presents each patient to the supervising attending. The Student will spend 2 weeks at UVMMC and 2 weeks at an affiliated private hospital. Online modules developed by the Larner College of Medicine support the clinical experience and ensure consistent development of core competencies for all students. Didactic lectures and simulations are completed while at UVMMC. All students must pass the NBME Subject Examination in Emergency Medicine at the end of the rotation. (4 credit hours)

Teaching Requirement/Scholarly Project

The Teaching Practicum/Scholarly Project reinforces foundational sciences through teaching or scholarly activity and strengthens longitudinal integration in the VIC by revisiting foundational sciences with clinical perspective. Students may fulfill the practicum experience in one of two ways: the Teaching Practicum or a Scholarly Project. In the **Teaching Practicum**, students act as a teaching assistant in the VIC. Duties could include small group facilitation, laboratory teaching, tutoring, leading review sessions, developing on-line teaching materials, and preparing assessment and other teaching materials. Students attend two teaching workshops during the month, the first providing specific instruction tailored to their teaching duties, the second on assessment and feedback. The **Scholarly Project** encourages the development of students as physician-scholars by engaging in scientific inquiry. The scholarly project enhances inquiry, analytical, and communication skills. It solidifies the foundation for lifelong learning through critical evaluation of data. The research project may be in the basic or clinical sciences.

Elective Courses

Students are required to take an additional 28 credit hours of elective courses. Students choose from an array of elective offerings from all departments of the Larner College of Medicine. These electives are designed to expand clinical skills and knowledge and to assist students in exploring career choices. During Advanced Integration, students may also choose extramural rotations. They must have educational benefit and be approved by students' advisors at least one month before the rotation begins.

Additional Curricular Requirements

In addition to the graded courses and clerkships, each student must satisfy the following graduation requirements:

- All students complete Foundations Capstone Course (MD 580) following the foundations level.
- All students must pass observed structured clinical skills examinations after completion of the foundations level and after completion of the clerkship level.
- All students must pass Step 1 and Step 2 of the United States Medical Licensing Examination (USMLE) prior to graduation.

Assessment of Student Performance

Students are assessed in cognitive, affective, and psychomotor domains in all courses with an emphasis on formative evaluation throughout each course, providing frequent feedback to the student. Examinations and quizzes are coordinated in all components. Pass/Fail grading is used in Foundations courses, a Pass/Fail system is used for clerkships, and a Pass/Fail/Honors system is used for required Advanced Integration courses. Generally, electives shorter than 4 weeks are graded as Pass/Fail, whereas 4 week electives are generally graded as Pass/Fail/Honors. A written and narrative assessment of student performance is provided where appropriate in all courses and clerkships. Students are assessed individually based on curriculum standards and are not ranked against each other. Standardized examinations of clinical skills are administered frequently.

Evaluation of the Curriculum

Ongoing evaluation of all elements of the curriculum is essential to maintain continuous improvement. Evaluation of the curriculum is performed by students, faculty and staff. The process is directed by the Teaching Academy. The Teaching Academy, in collaboration with other staff, ensures adherence to evaluation policy and procedure. The Medical Curriculum Committee (MCC) has overall responsibility for management and evaluation of the curriculum. The Teaching Academy is responsible for conducting the evaluation of the curriculum across all four years, including planning, day-to-day management, implementation, and reporting aspects of evaluation.

For each course and clerkship, all students complete evaluations of faculty teaching and the course/clerkship overall. These data, in part or full, are provided to course faculty, course/clerkship directors, and department chairs after completion of the course. The course and clerkship directors use these and other data to prepare a Quality Assurance Report (QAR). The QAR is reviewed by the appropriate curriculum level Assistant Dean. Annually, course directors present their QAR to the MCC curriculum level subcommittee and the Student Education Committee present a summary of and reflections on the evaluation data, as well as recommendations to the appropriate curriculum level subcommittee.

The Quality Assurance Report is distributed by the appropriate assistant curriculum dean to the MCC at a regular monthly meeting. The level assistant dean presents a Strengths/Weaknesses/Opportunities/Challenges (SWOC) presentation to the MCC which considers the finding and recommendation of the subcommittees and may ask for further clarification or follow-up. The committee considers the findings and will then consider actions for improvement and and may mandate changes in the objectives/competencies, course content, methods of instruction and assessment, gaps and redundancies in the curriculum, timing of content, etc. Course SWOCs approved by the MCC are sent to the course director for implementation of the mandated changes.

The MCC Evaluation Subcommittee reviews each required course and clerkship every 2 or 3 years. This committee utilizes data about the course, such as the QAR, evaluations, national and

internal surveys, and information from stakeholders (e.g., student leadership groups, the Office of Diversity, Equity, and Inclusion). The subcommittee meets monthly and provides a formal, independent review of the required courses and helps facilitate a review of the horizontal and vertical integration of the curriculum. The subcommittee generates a summary evaluation report with recommendations for each course/clerkship that is presented to MCC monthly. This report guides recommendations made by MCC to the course and clerkship directors, and complements the annual review of the QAR.

The MCC monitors the curriculum by examining course, clerkship and component assessments. The MCC monitors the medical education program using outcome data from various sources, including internal assessments, USMLE Step 1 and 2 scores and results of other standardized examinations, data from the AAMC Graduation Questionnaire and surveys of first year residency program directors.