

Cardiovascular Perfusion

PCCV110 – Patient Care and Professionalism

Course description under development.

HTCV111 - Hemotherapy

In this course, the students will examine the principles of hematology, immunohematology and transfusion science as they apply to cardiovascular perfusion. In addition, students will study hemostasis, homologous blood transfusions and component therapy, as well as blood conservation techniques such as auto transfusion and the use of blood substitutes. Students will also learn about adverse reactions to transfusions, and discuss clinical situations that apply to surgical patients.

PSCV110 - Physiological Science I

This course will introduce the learner to the physiological sciences that are important to the understanding of the effects of extracorporeal circulation. This is the first of two courses in the physiological sciences.

The course is 104 hours in length. There are 4 primary units to this course.

1. An introduction /review of organic chemistry and biochemistry.
2. Cellular physiology.
3. Anatomy and physiology of the respiratory and cardiovascular systems
 - a. The cardiac cycle
 - b. The embryological development of the heart linking the information to the ba
 - c. The renal, endocrine and nervous systems and their effect on the cardiovascular system.
4. Monitoring the cardiovascular patient.
 - a. The essentials of ECG monitoring
 - b. Interpretation and the principles of hemodynamic monitoring.

PTCV110 - Perfusion Theory I

This course introduces the learner to the fundamental theory and equipment associated with basic perfusion techniques. This course provides the necessary foundation for the Perfusion Theory II course (PTCV 120).

This course is 182 hours, composed of 2 main sections. The first 8 weeks (88 hours) is in a distance based format that provides the academic knowledge necessary to complete the laboratory portion of the course. This will use a distributed learning format where the learner will incorporate individual study from notes, textbooks, and websites with synchronous and non synchronous discussion with a facilitator and fellow learners. There will be numerous formative evaluations during this period to ensure the learner is maintaining a satisfactory standard. In addition, the students will prepare 1 group presentation for this course and some minor summative evaluations. The second half of the course (5 weeks) will comprise of a residential laboratory period. During this period, the learner will acquire hands on experience with perfusion equipment in a controlled learning environment. By the end of this period, they will be able to operate the heart lung machine in a rudimentary manner, be able to circuit the machine, and prime the circuit. The labs are structured in such a way as to provide continuity and progression from one lab to the next. During this course, hospital visits to the GTA sites will enable the students to observe open heart surgery and cardiopulmonary bypass

BAIP124 - Foundations of Interprofessional Collaboration II

Interprofessional practice has become a preferred mode of team based practice in health care nationally and internationally. This course provides an overview of the ethical, societal and personal factors that influence and impact health. The role of the health care provider and the dynamics of the provider/patient relationship will be examined from a critical perspective. This course will also address the historical perspective of the Canadian healthcare model and the move towards collaborative practice. The first step towards interprofessional practice is a solid foundation of your role and scope of practice, ethics, boundaries, patient advocacy and regulatory guidelines. A variety of instructional strategies are intended to help us learn with, from and about each other to advance our understanding of intra- and interprofessional practice.

RMCV120 - Research Methods

This course prepares future health care professionals to make contributions to knowledge through empirical inquiry. Students completing the course will have strong foundations in the Scientific Method and its application to answering questions in health care. Students are expected to integrate previous knowledge from research and statistical courses with the current course. In addition, students are expected to apply concepts in the current course in order to answer a research question.

PMCV121 - Applied Pharmacology

The course covers a broad range of general pharmacological principles for fundamental understanding and application to extracorporeal science. Coverage will include pharmacological effects on the nervous system, tissue responses, cardiovascular responses and renal/respiratory effects of various agents. Also included will be endocrine and microbial effects. Specific focus will be applied to hemostasis and the practical application and tools associated with the conduct of extracorporeal science by the cardiovascular perfusionist.

PPCV120 - Pathophysiology

This is a thirteen week course that provides the knowledge of pathological mechanisms essential for the understanding of relevant cardiovascular diseases. Identifying and applying these principles in a systematic and integrated manner is required for evidence-based clinical practice as a valuable member of the health care team. This course is offered in the classroom lecture format where each lecture focuses on the pathophysiology of a specific cardiovascular disease or syndrome. Students are expected to interpret the cases in clinical visit and observation with the knowledge acquired in the classroom and further broaden their learning by classroom discussion.

PTCV120 – Perfusion Theory II

PTCV120 builds on material mastered in PTCV110 including but not limited to fundamental perfusion theory and equipment required to perform basic perfusion techniques. The primary objective of this course is the mastery of the knowledge required to competently and safely conduct cardiovascular perfusion techniques in the laboratory and to demonstrate functional capacity leading to "readiness for clinical practice".

This course is 195 hours and is composed of three main sections. The first section consists of didactic learning in the classroom. This includes completion of a major case study. The second section is laboratory based learning where specific competencies are taught and demonstrated in a simulated environment. The third section incorporates one day clinical visits to local hospitals where students will observe clinical cases under the supervision of clinical perfusionists.

PTCV230 – Advanced Perfusion Theory

The primary objective of this course is the mastery of advanced perfusion related topics. The student will use acquired knowledge from PTCV 120 required to competently and safely conduct cardiovascular perfusion techniques in the laboratory and apply them to topics that may not be needed on a day to day basis during CPB.

This course is 126 hours and is run over 7 weeks. The student will learn in a number of distinct environments. The first consists of didactic learning in the classroom. The second section is laboratory based learning where specific competencies are demonstrated and performed in a simulated environment. The third section continues the one day clinical visits to local hospitals where students will observe clinical cases under the supervision of clinical perfusionists. The final environment is in a combined lecture/lab format where topics are learned via lecture and demonstrated immediately in an interactive lab.

Specific topics of the course include intra aortic balloon pumping (IABP), ventricular assist devices (VADS), anesthesia, hemodialysis, pediatric perfusion, plasma gel, mini circuits, and pump emergencies. The laboratory will build on basic circuit preparation, simulated case studies incorporating hemodialysis, pediatrics, and 2 pump emergencies. During this course practicing Perfusionists from the clinical sites will instruct the students in the laboratory. This will help the students make their transition to the clinical phase of the program.

CLCV132 – Simulation and Clinical Education I

CLCV 132 is the culmination of your training in the program. It is an intense 31 week course divided into 2 sections. The first is a 7 week simulated clinical phase where students will complete 6 different cases and complete a final assessment in a simulated clinical environment. This section takes place in the simulation center at TMI during semester 3. These cases recreate the actual clinical experience closely and allow the learner the opportunity to pump actual cases, make mistakes and do no harm to the patient. Cases range from simple coronary artery bypass grafts to complex deep hypothermic circulatory arrest.

The second section is 24 weeks of clinical education. The principle purpose of clinical education is to provide the student with the opportunity to apply his/her learning to acquire a satisfactory level of clinical competence and to gain confidence through supervised clinical experience. The clinical course is structured to allow the student to progress through a series of well-designed levels of graded responsibility. Graded levels of responsibility will be clearly defined by the respective program along with the methods of evaluating student success upon the completion of each phase. Specific professional competency profiles are references for didactic and clinical programs.

Each Phase will take place in a different training hospital. Students MUST be prepared to relocate to their training site. Locations range all across Canada. Students will be granted an opportunity to select their preferred locations but there is no guarantee they will be granted.