



Educational Goals And Objectives

Responsibilities of CCM Residents

The University Health Network Medical Surgical Intensive Care Unit

St. Michael's Critical Care Unit

Sunnybrook & Women's College Health Sciences Centre Critical Care Unit

Mount Sinai Hospital Critical Care Unit

The Hospital for Sick Children Paediatric Critical Care Unit

Elective Opportunities

The Critical Care Medicine (CCM) Programme at the University of Toronto is a multidisciplinary critical care training programme which strives to achieve the goals and objectives for specialty training in CCM as outlined by the *Royal College of Physicians and Surgeons of Canada* (appended and the web address is: <http://rcpsc.medical.org/english/residency/certification/index.php3> - awenote). There are 4 teaching centres affiliated with the University of Toronto where core rotations are completed. Hence a favourable component of this programme is the opportunity to be exposed to a wide variety of critically ill patients.

The programme consists of 2 years of training following the successful completion of at least 3 years of residency training in any of: Anaesthesia, Internal Medicine, Paediatrics, General Surgery, Thoracic Surgery or Emergency Medicine. During the 24 months that a resident is associated with this programme there is a minimum requirement of 12 months training in the core intensive care units affiliated with the programme. These units include: Mount Sinai Hospital, Sick Children's Hospital (1 month maximum towards core training), St. Michael's Hospital, Sunnybrook & Women's College Health Sciences Centre and the University Health Network (includes the General and Western Divisions). The specific goals and objectives for each of these core experiences can be found below. The other 12 months must be approved in advance by the Residency Programme Committee and includes rotations considered worthwhile towards Adult Critical Care Medicine Training. Such rotations may include: (1) further rotations in core ICUs, (2) research, and (3) electives (see below). The Residency Programme Committee reserves the right to mandate further core ICU training on an as needed basis based on the resident's individual needs, progress through the programme and evaluations. Ample opportunity to function in an administrative, research, supervisory, and consultative role is considered a primary objective. All CCM training must be undertaken at University of Toronto teaching centres, with the following exceptions: 1) with prior approval some electives may be taken outside the University of Toronto (see electives below) 2) in unique circumstances core ICU rotations may be done at Canadian centres with Adult CCM training programmes. All CCM training must be pre-approved by the CCM Programme Director, and there is absolutely no retroactive approval of CCM training.

To ensure these goals and objectives are being satisfactorily met, the resident will be subject to regular *In-Training Evaluation Reports* completed by the Director of Training at his or her hospital and reviewed at least

biannually with the CCM Programme Director.

At the conclusion of training at the University of Toronto the candidate will be expected to be competent to practice critical care medicine in both a consultative role and in a totally independent environment.

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This Committee's structure includes representatives from all centres which provide core ICU training, a trainee representative, Directors of Research, Education, Evaluation and Bioethics, and a representative from each of the 4 base specialty groups: (Anaesthesia, Medicine, Surgery, Paediatrics). This committee meets approximately every 2 months and communicates frequently by electronic mail. All meetings are minuted. Rotations, electives and all Critical Care Medicine aspects of the trainees' experience, including the evaluation process are reviewed. The CCM trainee sits on this committee and brings all concerns and comments of the trainees to the Faculty.

The *CCM Residency Programme Committee* examines all *In-Training Evaluation Reports* and *Programme Evaluation* forms completed by the trainees. The Programme Director or his representative attends all meetings of the *Royal College Nucleus Committee for Critical Care Medicine*, and the minutes of these meetings are reviewed by the CCM Committee. The Committee oversees the development of the core lecture series for Critical Care Medicine and ensures its compliance with the *Specialty Training Requirements*. The Committee is responsible for the overall programme for all trainees and deals with any difficulties and disputes the trainees may encounter.

Responsibilities of CCM Residents

CCM Lecture Series (See attached educational programme overview)

Briefly, the CCM Lecture Series is held every Tuesday 1400 to 1600 hrs. This series runs throughout the academic year. In the summer months seminars are held every Tuesday to address the needs the trainee with

regard to more practical clinical problems in the Critical Care Units.

Attendance at seminars and lectures is mandatory for CCM Trainees. Trainees are not to take call on Monday nights, if this will preclude their attendance at CCM lectures. Trainees must be relieved of all clinical responsibilities during this time. Any difficulty with being relieved of clinical duties must be reported to the Education Director. The residents are to complete evaluation forms for all educational sessions.

Call Schedule

At the beginning of CCM training, residents will be expected to undertake *in-house* call, not more than 1 in 4 nights, in accordance with the *PAIRO* agreement. Once the trainee has gained experience in managing critically ill patients, as assessed by the CCM RPC, then call may be taken from home, 1 in 3 nights. It is expected that, when the trainee is taking call from home, he/she will return to the hospital to assess all new ICU admissions. Additionally the trainee is expected to return to the hospital when indicated by the change in any patient's condition. As experience is gained by the trainee, the CCM RPC will evaluate the gradation of responsibility from in-house call to senior call from home.

Assessment of Technical Skills

All trainees will carry a Palm Pilot in which to document all technical procedures for the 2 years of training.

Evaluations (See attached evaluation overview)

Written Examinations

A written CCM examination is undertaken by all trainees in early Spring. This examination is administered by the *Society for Critical Care Medicine* in the United States and thus there is limited flexibility with timing. No vacations may be taken during this period.

Oral Examinations

University of Toronto based CCM Oral Examination is held twice per year. Examinations are then part of the evaluation process for CCM residents.

In-Training Evaluation Reports

In-Training Evaluation Reports (ITERS) will be provided to the Programme Director and CCM RPC for all clinical and non-clinical rotations. Trainees should meet with the Clinical Supervisor at the end of each rotation. During each meeting with the Programme Director these ITERS will be reviewed and the resident's progress discussed.

Vacation

Trainees are entitled to 4 weeks vacation per year and 1 week of conference leave. All requests for vacation are to be submitted in writing to the CCM Programme Director and to the Clinical Supervisor of the respective rotation at least 1 month in advance. No vacation or statutory days may be taken during 4 week rotations.

Conference Funding

Trainees must request conference leave and approval for funding a minimum of 4 weeks in advance. An Application/Authorization for Conference Leave Form must be completed and submitted to the Programme Director for approval at least 4 weeks in advance. Annual conference leave entitlement: 5 days conference leave; and, up to a maximum of \$1,500 per trainee/year. Funding is not cumulative from one year to the next. Funding is to support the attendance of CCM Residents at an approved Critical Care meeting held in continental North America. The approved meetings would include:

- ◆ Society of Critical Care Medicine
- ◆ American Thoracic Society
- ◆ World Congress of Intensive Care Medicine
- ◆ Any other symposium directed at Critical Care Medicine

Before reimbursement, all receipts (airfare, accommodation, and registration) should be submitted to the

Programme Director.

An additional week of conference leave is available if the resident is presenting a paper, generated during CCM training. This second week of conference leave requires a letter of support from participating faculty and must be pre-approved by the Programme Director.

All necessary forms may be obtained from the CCM Co-ordinator (416-586-8774).

**University Health Network –
Toronto General Hospital, Toronto Western Hospital
Medical/Surgical Intensive Care Unit**

Description of the MSICU

The Medical/Surgical Intensive Care Unit (*MSICU*) consists of 2 separate units at the two sites of The University Health Network. At the Toronto General Hospital there are 20 MSICU beds and at the Toronto Western Hospital there are 9 MSICU beds, 11 Neurosurgical ICU beds and 4 Cardiology ICU beds. The MSICU team is responsible for all neurosurgical patients who are ventilated or critically ill. There are approximately 2,500 admissions to these units per annum. The MSICU attendings are as follows:

Administrative Director

Dr. Arnold Aberman Internal Medicine

Director of Research

John C. Marshall General Surgery

Director of Education

John T. Granton Respiratory Medicine

Associate Directors

Wilfred Demajo Anaesthesia/Internal Medicine

Neil M. Lazar Respiratory Medicine

Laura Hawryluck Internal Medicine

Margaret S. Herridge Respiratory Medicine

Joanne Meyer Internal Medicine

David Wong Anaesthesia

The most common reasons for admission are:

- ◆ Postoperative ventilated patients: Neurosurgery, Vascular surgery, Thoracic & General Surgery
- ◆ Transplantation
 - Single and Double Lung
 - Liver
 - Pancreas
- ◆ Respiratory Failure
 - Pneumonia
 - ARDS
 - Congestive heart failure
- ◆ Sepsis and septic shock
- ◆ Multiple System Organ Failure
- ◆ Multiple Organ Donors

House-staff structure and Critical Care Medicine Trainee Responsibilities

At the Toronto General Hospital, the resident staff is composed of a Clinical fellow or, 4-5 junior residents (medicine/anaesthesia/surgery). The CCM Trainee acts as the senior resident in the MSICU, is responsible for the day to day running of the unit, and is the first line backup for the junior resident staff. There is 1 junior resident on call at all times in the MSICU. At the Toronto Western Hospital, resident staff is composed of 1 clinical fellow or Critical Care Medicine Trainee, and 4 PGY 2's from Anaesthesia, General Internal Medicine, and Emergency Medicine. On call responsibilities consist of both in-house and second (at home) call. Call frequency follows the recent PAIRO agreement. In house call will be no more than 1 night in 4 and home call will be no more than 1 in every 3 nights rotating with the MSICU Director. When taking call from home it is expected that all new cases or clinically important changes in patient's health will be reviewed with the MSICU director of the week. Furthermore it is expected that the CCM trainee will be present to review all unstable patients with the junior resident.

The MSICU is a semi-open unit. In the case of surgical patients this means that patients are admitted under the name and the responsibility of the referring surgeon. The management of these patients is undertaken in conjunction with the referring surgeon by the attending in the ICU, the CCM trainee, and the junior resident staff. In the case of medical patients who are admitted to the intensive care unit, the primary care physician is the ICU attending.

Educational sessions

Daily bedside rounds and teaching occurs from 0900 to 1200. Discussion centres on patient and disease specific issues, and includes a review of relevant changes in patient's health. Input from a multidisciplinary team is made for each patient. A clear diagnostic and therapeutic plan is developed for each patient.

There are educational rounds each day in the ICU.

Monday

- ◆ 1300 to 1400 session by the MSICU director from
- ◆ 1600 to 1700 research seminar on alternate Mondays

Tuesday CCM teaching seminars from 1400 to 1600 at St Michael's Hospital.

Wednesday

- ◆ 1200 – 1300 physiology seminar by Dr. Aberman
- ◆ 1300 – 1400 lecture on a critical care topic by a local expert physician

Thursday

- ◆ Respiratory therapist or pharmacy session

Friday

- ◆ Alternating sessions (CCM trainee, Case presentation (by residents), ethics, journal club)

In addition to these sessions once per month there is a morbidity and mortality round, ICU audit, and quality assurance meeting. Minutes are taken in the later two meetings. The fellow, and critical care medicine trainee are expected to take an active role in each of these rounds.

Educational Objectives

Preamble

The educational objectives of the rotation in the ICU's at the University Health Network are reflective of the Royal College of Physicians and Surgeons of Canada CANMEDS 2000 recommendations for subspecialty training in critical care. As outlined by the goals of the CANMEDS project 7 physician roles have been developed to better define the tasks required of specialist physicians. These physician roles include the following: medical expert/clinical decision-maker, communicator, collaborator, manager, health advocate, scholar, and professional. The nature of each role is provided in table 1. We feel that these roles allow for more explicit expectations for residents who rotate through the ICU and allow for more precise evaluation and feedback to the CCM trainee.

Table 1: Essential Roles and Key Competencies of Critical Care Physicians	
Roles	Key Competencies The intensivist must be able to ...
Medical Expert	<ul style="list-style-type: none"> ◆ ◆ demonstrate diagnostic and therapeutic skills for ethical and effective patient care ◆ ◆ access and apply relevant information to clinical practice ◆ ◆ demonstrate effective consultation services with respect to patient care, education and legal opinions

Communicator	<ol style="list-style-type: none"> 1. ♦ establish therapeutic relationship with patients/families 2. ♦ obtain and synthesize relevant history from patients/families/communities 3. ♦ listen effectively 4. ♦ discuss appropriate information with patients/families and the health care team
Collaborator	<ol style="list-style-type: none"> 1. ♦ consult effectively with other physicians and health care professionals 2. ♦ contribute effectively to other interdisciplinary team activities
Manager	<ul style="list-style-type: none"> ♦ ♦ utilize resources effectively to balance patient care, learning needs, and outside activities ♦ ♦ allocate finite health care resources wisely ♦ ♦ work effectively and efficiently in a health care organization ♦ ♦ utilize information technology to optimize patient care, life-long learning and other activities
Health Advocate	<ul style="list-style-type: none"> ♦ ♦ identify the important determinants of health affecting patients ♦ ♦ contribute effectively to improved health of patients and communities ♦ ♦ recognize and respond to those issues where advocacy is appropriate
Scholar	<ul style="list-style-type: none"> ♦ ♦ develop, implement and monitor a personal continuing education strategy ♦ ♦ critically appraise sources of medical information ♦ ♦ facilitate learning of patients, housestaff/students and other health professionals ♦ ♦ contribute to development of new knowledge
Professional	<ul style="list-style-type: none"> ♦ ♦ deliver highest quality care with integrity, honesty and compassion ♦ ♦ exhibit appropriate personal and interpersonal professional behaviours ♦ ♦ practise medicine ethically consistent with obligations of a physician

ROLES

Medical Expert/Clinical Decision-Maker

Specific Objectives: Upon completion of the rotation, the resident will be able to:

- ♦ Elicit a history that is relevant, concise, accurate and appropriate to critically ill patients
- ♦ Perform physical examination that is relevant, sufficiently elaborate, and appropriate.
- ♦ Select appropriate investigations in a timely, cost-effective, ethical and useful manner.
- ♦ Demonstrate cognitive and process skills toward solving the individual patient's problem(s).
- ♦ Demonstrate effective consultation skills in presenting well-documented assessments and recommendations in written and/or verbal form.
- ♦ Apply knowledge and expertise to performance of technical skills relevant to critical care (see below)
- ♦ Demonstrate the attitudes and the skills necessary to retrieve and implement the information necessary to provide health care services to patients in meeting the needs and expectations of the community.
- ♦ Access, retrieve, assist and apply relevant information of all kinds to problem-solving and introduce new therapeutic options to clinical practice.
- ♦ Demonstrate medical expertise in situations other than those involving direct patient care (eg. Resident lead seminars, Morbidity and Mortality rounds, ICU audits and business rounds).
- ♦ Demonstrate insight into his/her own limitations of expertise by self-assessment.

Communicator

Specific Objectives: Upon completion of the rotation the resident will be able to:

- ♦ Establish relationships with the patient and his / her family that are characterized by understanding, trust, respect, empathy and confidentiality.
- ♦ Gather information not only about the disease but also about the patient's / family's beliefs, concerns and expectations about the illness, while considering the influence of factors such as the patient's age, gender, ethnic, cultural and socio-economic background, and spiritual values on that illness.

- ◆ Deliver information to the patient and family in a humane manner and in such a way that it is understandable, encourages discussion and promotes participation in decision-making to the degree that they wish.
- ◆ The resident will demonstrate competence in effectively coordinating the ICU team, including residents, nurses, allied health professionals and consulting medical services to optimize patient care.
- ◆ Understand and demonstrate the importance of cooperation and communication among health professionals involved in the care of individual patients such that the roles of these professionals are delineated and consistent messages are delivered to patients and their families.
- ◆ Demonstrate skills in working with others who present communication challenges such as anger or confusion, or an ethno-cultural background or expectations about health care delivery / capabilities that may be different from the physician's own.

Collaborator

Specific Objectives: Upon completion of the rotation, the resident will be able to:

- ◆ Identify and describe the role, expertise and limitations of all members of an interdisciplinary team required to optimally achieve a goal related to patient care, a research problem, an educational task, or an administrative responsibility.
- ◆ Develop a care plan for a patient they have assessed, including investigation, treatment and continuing care, in collaboration with the members of the interdisciplinary team.
- ◆ Participate in an interdisciplinary team meeting, demonstrating the ability to accept, consider and respect the opinions of other team members, while contributing critical care specific expertise him/herself.
- ◆ Effectively communicate with the members of an interdisciplinary team in the resolution of conflicts, provision of feedback, and where appropriate, be able to assume a leadership role.

Manager

Specific Objectives: Upon completion of the rotation, the resident will be able to:

- ◆ Better understand how to function effectively in health care organizations, such as the base hospital, referring institutions, and deal with other stake holder organizations such as patient interest groups, MORE, and the critical care access programme.
- ◆ Begin to appreciate the complexity of making clinical decisions and judgements based on sound evidence for the benefit of individual patients and the population served. In this manner the trainee should develop an advocacy role primarily for the individual but in the context of societal needs when monitoring and allocating needed resources.
- ◆ Work effectively as a member of a team to accomplish tasks.
- ◆ Understand population-based approaches to health care services and their implication for medical practice.
- ◆ Participate in planning, budgeting, evaluation and outcome of a patient care program.

Health Advocate

Specific Objectives: Upon completion of the rotation, the resident will be able to:

- ◆ Demonstrate an understanding of the following:
 - Determinants of health by identifying the most important determinants of health (i.e., poverty, unemployment, social support systems), being familiar with the underlying research evidence, and applying this understanding to common problems and conditions in critical care.
 - Public policy for health by describing how public policy is developed; identifying current policies that affect health, either positively or negatively (i.e., communicable diseases, substance abuse)
- ◆ Begin to demonstrate an understanding of these concepts as applied to the following three levels:
 - In the management of individual patients by identifying the patient's status with respect to one or more of the determinants of health (i.e., unemployment); adapting the assessment and management accordingly (i.e., the medical history to the patient's social circumstances).

- In the analysis of the population of critically ill patients, work with specialty societies and other associations in identifying current "at risk" groups within a critical care and apply the available knowledge about prevention to "at risk" groups within the practice; and contributing "group data" for better understanding of health problems within the population.
- In relation to the general population by describing, in broad terms, the key issues currently under debate regarding changes in the Canadian health care system, indicating how these changes might affect societal health outcomes and advocating to decrease the burden of illness (at a community or societal level) of a condition or problem relevant to critical care through specialty societies, community-based advocacy groups, other public education bodies, or private organizations.

Scholar

Specific Objectives: Upon completion of the rotation, the resident will be able in each of the following areas to:

Clinical:

- ◆ pose a clinical question;
- ◆ recognize and identify gaps in knowledge and expertise around the clinical question;
- ◆ formulate a plan to fill in gaps in knowledge and technical skills:
 - conduct an appropriate literature search based on the clinical question;
 - assimilate and appraise the literature;
 - develop a system to store and retrieve relevant literature;
 - consult others (physicians and other health professionals) in a collegial manner;
- ◆ propose a solution to the clinical question;
- ◆ implement the solution in practice. Evaluate the outcome and reassess the solution (re-enter the loop at c i) or c ii);
- ◆ identify practice areas for research.

Research

During the rotation, residents are encouraged to develop a research question that arose either as a result of an observation, clinical question, or developing area of interest. Or to work with the faculty in an area of research. In this regard the resident will be expected to be able to:

- ◆ pose a research question (clinical, basic or population health);
- ◆ develop a proposal to solve the research question:
 - conduct an appropriate literature search based on the research question;
 - identify, consult and collaborate with appropriate content experts to conduct the research;
 - propose a methodological approach to solve the question;
- ◆ carry out the research outlined in the proposal;
- ◆ defend and disseminate the results of the research;
- ◆ identify areas for further research that flow from the results.

Education:

- ◆ demonstrate an understanding of, and the ability to apply, the principles of adult learning, with respect to oneself and others;
- ◆ demonstrate an understanding of preferred learning methods in dealing with students, residents, and colleagues.
- ◆ demonstrate the ability to effectively teach junior residents, nurses and other allied health professionals.
- ◆ prepare one teaching session per month for the junior residents.

Professional

Specific Objectives: Upon completion of the rotation the resident will be able in each of the following objectives to:

- ◆ Discipline-Based Objectives:

- display attitudes commonly accepted as essential to professionalism;
- use appropriate strategies to maintain and advance professional competence;
- continually evaluate one's abilities, knowledge and skills and know one's limitations of professional competence.
- ◆ Personal/Professional Boundary Objectives:
 - adopt specific strategies to heighten personal and professional awareness and explore and resolve interpersonal difficulties in professional relationships;
 - consciously strive to balance personal and professional roles and responsibilities and to demonstrate ways of attempting to resolve conflicts and role strain.
- ◆ Objectives Related to Ethics and Professional Bodies:
 - know and understand the professional, legal and ethical codes to which physicians are bound;
 - recognize, analyse and attempt to resolve in clinical practice ethical issues such as truth-telling, consent, advanced directives, confidentiality, end-of-life care,
 - conflict of interest, resource allocation, research ethics, etc.;
 - understand and be able to apply relevant legislation that relates to the health care system in order to guide one's clinical practice; e.g. codes of conduct,
 - patient representatives (surrogate decision makers, ministry appointed guardians)
 - recognize, analyse and know how to deal with unprofessional behaviours in clinical practice.

During the rotation the CCM trainee will be exposed to a variety of disease states, clinical and ethical problems. As an expert / clinical decision maker the CCM trainee will be expected to develop knowledge and demonstrated acceptable competence and understanding of the following systems /disease states, and have demonstrated proficiency in the following technical skills.

Respiratory

Theoretical

- ◆ Anatomy of the pulmonary system
- ◆ Physiology of the respiratory system (lung mechanics, pulmonary vasculature)
- ◆ Arterial blood gases and acid/base physiology
- ◆ Pathophysiology of acute respiratory failure
- ◆ Principles of intubation
- ◆ Principles of mechanical ventilation,
- ◆ Weaning from mechanical ventilation
- ◆ ARDS, pneumonia, pneumonitis, pulmonary embolus, COPD, Asthma (status asthmaticus), ventilator induced lung injury
- ◆ Pharmacology of antibiotics, bronchodilators, vasoactive medication,
- ◆ Lung Transplantation and pharmacology of immunosuppression
- ◆ Postoperative thoracic (pneumonectomy/esophageal surgery)

Practical

- ◆ Masks, application
- ◆ Non-invasive mechanical ventilation
- ◆
- ◆ Endotracheal intubation –
 - single / double lumen tubes
 - laryngoscopic, bronchoscopic,
- ◆ Conventional and non-conventional mechanical ventilation
- ◆ Fiberoptic Bronchoscopy)
- ◆ Acquisition of samples via bronchoscopy
 - BAL
 - Protected brush
 - Transbronchial biopsy

- ◆ Tracheostomy & management of complications
- ◆ Chest tube insertion & management
- ◆ Thoracocentesis
- ◆ Interpretation of chest radiographs and CT Scans
- ◆ Measurement of respiratory mechanics (resistance, compliance, muscle strength)

Cardiovascular System

Theoretical

- ◆ Anatomy & Physiology of cardiovascular system
- ◆ Management of Arrhythmias (atrial, ventricular, brady and tachyarrhythmias)
- ◆ Pathophysiology and treatment of:
 - myocardial infarction
 - cardiogenic shock
 - septic shock
- ◆ Pharmacology of:
 - inotropic agents
 - vasopressor agents
 - antiarrhythmic agents
 - Thrombolytics
 - Antiplatelet agents
- ◆ Oxygen delivery & tissue oxygenation
- ◆ Postoperative peripheral vascular surgery (ABF/AAA/Carotid Endarterectomy)

Practical

- ◆ Pulmonary artery catheter insertion, management & interpretation
- ◆ Insertion / management of arterial lines
- ◆ Central line insertion & management
- ◆ Gastric tonometry
- ◆ Electrical cardioversion
- ◆ Pericardiocentesis
- ◆ 2D & transesophageal ECHO
- ◆ ECG and its interpretation
- ◆ Temporary pacemaker insertion
- ◆ Advanced cardiac life support

GI System

Theoretical

- ◆ Pathophysiology
 - GI tract
 - GI Bleeding
 - Abnormalities of motility
 - Intra-abdominal infections
 - Toxic enterocolitis
 - Acalculous cholecystitis & cholangitis
 - Pancreatitis
 - Bowel ischemia

Nutrition

- ◆ Assessment of nutritional status
- ◆ Methods of nutritional support
- ◆ Pharmacology of various enteral solutions and the concept of immuno-nutrition

- ◆ Pharmacology of:
 - H₂ receptor blockers
 - GI motility drugs
 - Antibiotics pertaining to GI sepsis
- ◆ Pathophysiology of Acute & Chronic liver disease
- ◆ Liver Transplantation & Pharmacology of Immunosuppression

Practical

- ◆ Insertion of nasogastric feeding tubes
- ◆ Interpretation of conventional and CT radiographs
- ◆ Prescription of appropriate nutritional supplementation, (enteral & parenteral)
- ◆ Insertion & management of Linton tubes
- ◆ Paracentesis

Nephrology

Theoretical

- ◆ Physiology of fluids & electrolytes
- ◆ Acid – base handling
- ◆ Disorders of sodium, potassium, calcium, magnesium, water, and solute.
- ◆ Pathophysiology acute renal failure
- ◆ Principles of renal replacement therapy
- ◆ Principles of renal protection
- ◆ Pharmacology of
 - Diuretic agents

Practical

- ◆ Bladder catheter insertion & management
- ◆ Insertion of catheters for ultrafiltration, hemodialysis, or CVVHD, including membranes
- ◆ Urinalysis
- ◆ Management of peritoneal dialysis

Endocrine

Theoretical

- ◆ Pathophysiology of:
 - Diabetes
 - Adrenal Disease
 - Thyroid Disease
 - Pituitary Disease
- ◆ Pharmacology of:
 - Insulin
 - Mineralocorticoids

Practical

- ◆ Ordering & interpretation of test relating to specific endocrine function
- ◆ Glycemic control

Organ Donors

Theoretical

- ◆ Pathophysiology of:
 - Brain death
 - Diabetes insipidus

- ◆ Organ donation in Ontario, Canada, and current barriers to organ donation
- ◆ Pharmacology of:
 - Inotropic & vasoactive agents for organ donors
 - DDAVP

Practical

- ◆ Declaration of brain death (using various modalities)
- ◆ Speaking to families re obtaining permission for organ donation (perfused and non-perfused)
- ◆ Liasing with MORE (Multiple Organ Retrieval and Exchange Programme)

Neurological System

Theoretical

- ◆ Pathophysiology of:
 - Coma
 - Stroke
 - Seizures
 - Intracerebral hemorrhage
 - Subarachnoid hemorrhage
 - vasospasm
- ◆ Pharmacology of:
 - Sedative drugs & analgesics
 - Specific drug antagonists
 - Anticonvulsants
 - Muscle relaxant drugs
 - Methods to lower intracerebral pressure

Practical

- ◆ Lumbar puncture and analysis of CSF
- ◆ Fundoscopy
- ◆ Neurological assessment
- ◆ Management of lumbar CSF drainage system

Vascular

Theoretical

- ◆ Pathophysiology of:
 - Deep vein thrombosis
 - Limb ischaemia & compartment syndrome
 - Ischemia-reperfusion injury
 - Aortic dissection and aneurysms
- ◆ Pharmacology of:
 - Heparin & Warfarin
- ◆ Fibrinolytic therapy

Practical

- ◆ IPG, contrast angiography, and Doppler
- ◆ Fasciotomies & their management
- ◆ Monitoring limb perfusion
- ◆ Managing post-operative vascular surgery patients
- ◆ Prescription of anticoagulants

Toxicology

Theoretical

- ◆ Recognition of:
 - Toxidromes
- ◆ Knowledge of:
 - Common poisonings
- ◆ Management of:
 - Overdosed patients
 - Antidotes
- ◆ Clearance of:
 - Metabolism of therapeutic agents and toxins

Practical

- ◆ Hemodialysis
- ◆ Charcoal hemoperfusion
- ◆ Supportive care
- ◆ Hyperbaric oxygen therapy

Administrative Director:

David Mazer Anaesthesia

Associate Directors:

Simon Abrahamson Anaesthesia
Andrew Baker Anaesthesia
Robert Chen Anaesthesia
William Darrah Anaesthesia
Patrick Hanly Medicine
Patricia Houston Anaesthesia
Lisa Hutchinson Anaesthesia/Internal Medicine
Stephane Lambert Anaesthesia
Richard Levene Anaesthesia/Internal Medicine
Robert Mustard Surgery
William Noble Anaesthesia
Claude Tousignant Anaesthesia
Michael Ward Medicine
Jeff Wassermann Anaesthesia/Emergency Medicine

General Objectives

To provide the trainee with the following:

- ◆ a broadly based exposure to all aspects of adult critical care
- ◆ a working knowledge of applied clinical physiology and homeostasis as well as the ability to recognize and treat single or multiple organ failure
- ◆ an understanding of clinical pharmacology as it applies to the critically-ill
- ◆ the knowledge to design strategies to prevent organ failure in the high-risk patient
- ◆ the knowledge to design strategies to prevent other complications in various systems in the high-risk patient.
- ◆ an understanding of the organization of critical care delivery in an acute care hospital
- ◆ an opportunity to participate in ICU research
- ◆ an understanding of ICU ethics and their impact on day-to-day activity in the ICU
- ◆ an opportunity to develop communication skills by interacting both with patients and their relatives
- ◆ an opportunity to develop teaching skills by giving formal teaching sessions to ICU housestaff

Specific Objectives

Knowledge:

In the setting of critical illness, to be able to recognize, to determine the severity of, and to formulate both a differential diagnosis of and a plan of action to investigate and manage conditions including but not limited to the following:

Respiratory system:

- ◆ Ventilatory failure including difficulty with weaning from ventilation
- ◆ Hypoxemia

Cardiovascular system:

- ◆ Chest pain, myocardial infarction, dysrhythmia, pulmonary and hemodynamic instability
- ◆ Post cardiac surgery

Genitourinary system:

- ◆ Oliguria, renal insufficiency, and renal failure requiring dialysis

Neurological and neuromuscular systems:

- ◆ Coma, other CNS crises, major generalized derangement of peripheral neuromuscular function
- ◆ Post neurological surgery

Gastrointestinal/digestive system:

- ◆ Acute bowel disturbance including obstruction, haemorrhage, & ischemia
- ◆ Hepatic abnormalities and frank hepatic failure
- ◆ Pancreatic disease including fulminant pancreatitis

Nutrition:

- ◆ Nutritional deficiencies

Metabolic/Endocrine system:

- ◆ Major endocrine abnormalities
- ◆ Fluid and electrolyte disturbances
- ◆ Acid/base disorders

Haematopoietic system:

- ◆ Abnormalities of red blood cells, white blood cells, and platelets
- ◆ Coagulation disorders

Immunological system:

- ◆ Conditions associated with AIDS
- ◆ Major infections
- ◆ Septic illness

Multisystem trauma:

- ◆ All systems including major trauma in the pregnant patient

Infectious diseases

Oncology

Poisoning

Technical Skills:

To gain an understanding of techniques, indications, limitations, contraindications, and complications of various procedures, diagnostic tests, and therapeutic strategies.

To be able to interpret measurements from or perform procedures including but not limited to the following:

- ◆ Advanced and basic cardiopulmonary resuscitation (open and closed chest)
- ◆ Airway management including airway access by all routes
- ◆ Management of and weaning from, mechanical ventilation
- ◆ Oxygen therapy
- ◆ Securing venous access by all routes
- ◆ Securing arterial access
- ◆ Pulmonary flow-directed arterial catheterization
- ◆ Cardiac output by thermodilution
- ◆ Mixed venous oxygen saturation
- ◆ Peritoneal tap
- ◆ Tube thoracostomy

- ◆ Thoracocentesis, Pericardiocentesis
- ◆ Temporary pacemaker insertion
- ◆ Lumbar puncture
- ◆ Intra-aortic balloon counterpulsation
- ◆ Diagnostic and therapeutic bronchoscopy
- ◆ Placement of gastric tubes for suction and nutrition
- ◆ Urinary bladder access
- ◆ Urinalysis

To have exposure to the following (in conjunction with specific consulting services):

- ◆ Haemodialysis
- ◆ Peritoneal dialysis
- ◆ Continuous renal replacement therapy
- ◆ Plasmapheresis

To participate in simulator based education related to critical care.

Sunnybrook & Women's College Health Sciences Centre Critical Care Unit

Administrative Director (Acting)

Dr. Patricia Murphy Anaesthesia

Education Director

Dr. Cameron Guest Anaesthesia

Associate Directors

Dr. Frederick Brenneman General Surgery

Dr. Andrew Cooper Anaesthesia

Dr. Terry Smith Anaesthesia

Dr. William Sibbald Medicine

The Critical Care Unit (CrCU) at Sunnybrook and Women's College Health Sciences Centre is a closed multidisciplinary ICU made up of two subunits – Medical-Surgical and Cardiovascular. There are approximately 1,100 admissions to the Medical-Surgical ICU annually, roughly 1/3 each for trauma, other surgical, and medical patients. The CVICU admits approximately 1,300 postoperative cardiac and major vascular surgery patients. CCM Trainees are exposed to both the Medical-Surgical ICU and the CVICU during their rotation at SWCHSC.

The critical care trainee is an integral member of the medical team, consisting of staff intensivists with critical care fellowship training and subspecialty interests, clinical fellows / Critical Care Medicine residents, residents from several postgraduate training programs, and elective medical students. Professional support personnel including a pharmacist, respiratory therapists and a physiotherapist present on Med-Surg rounds and provide a non-medical perspective to care in addition to medical and nursing staff. In particular, our pharmacist provides drug information and is a superb educational resource to supplement the intensivists' bedside teaching.

Weekly bedside Infectious Diseases rounds are held with consultants in this specialty area. Several other educational activities are routinely scheduled, including weekly continuing education / literature appraisal grand rounds, monthly multidisciplinary ethics rounds, bimonthly Morbidity and Mortality rounds, weekly Trauma rounds, and daily interdisciplinary resident seminars.

Role of the CCM Trainee

Clinical

The CCM trainee is responsible for the day to day functioning of the Critical Care Unit, under the supervision of the attending intensivists. The trainee directs service rounds in the morning, and is responsible for assigning and supervising junior housestaff patient care duties. All consults and admissions to the Critical Care Unit are seen and reviewed by the trainee before discussion with attending staff. The CCM trainee takes 1 in 4 in house call, as backup for the junior resident staff.

Administrative

The CCM trainee coordinates and presents Morbidity and Mortality rounds, as well as the service's involvement in hospital-wide Trauma rounds (presentations every 6 to 7 weeks). The CCM trainee is routinely involved in evaluation of junior residents.

Teaching

A daily seminar series is offered for residents; CCM residents are welcome to attend these sessions, and are occasionally asked to present at them. The CCM resident is routinely released from clinical duties on Tuesday afternoons to permit attendance at the University of Toronto Critical Care lecture series.

Research

A variety of opportunities for involvement in academic pursuits are available for interested senior trainees.

Respiratory

Our case mix allows for regular exposure to patients with impending or established respiratory failure from a broad range of causes. Patients are regularly assessed in the Emergency Department, on the ward and in the ICUs with respect to the need for mechanical ventilation. The CCM resident is responsible for initial evaluation and formulation of a management plan.

With our large trauma population, there is ample opportunity for airway management in the presence of a known or suspected C-spine injury or raised intracranial pressure. In addition, patients with difficult airways are routinely assessed for extubation after complex maxillofacial surgery. Diagnostic and therapeutic bronchoscopy are frequent during the rotation at this centre.

Exposure to a wide variety of supportive and experimental respiratory support techniques is offered, including (recently) noninvasive ventilation, nitric oxide, prone positioning, high frequency oscillation, surfactant, and partial liquid ventilation.

Cardiovascular

A large portion of our medical population is admitted with a diagnosis of congestive heart failure or myocardial ischemia. In addition, the CVICU has a large volume of cases which provide ample exposure to the management of pacing, pump failure, valvular disease, adult congenital disease, dysrhythmias, and intra-aortic balloon counterpulsation. The hospital has an active transesophageal echocardiography service (covered in part by Critical Care staff), which permits familiarity with indications and diagnostic utility of this modality.

Renal

Pre-renal, intrinsic and obstructive causes of renal dysfunction are all relatively common in our patient population. The CCM resident will be exposed on a regular basis to patients with oliguria and/or progressive renal impairment, including fairly frequent initiation and monitoring of continuous hemodialysis. Intermittent hemodialysis and peritoneal dialysis are unusual in our population.

Neurologic

We see a large population of patients with neurologic dysfunction, including those with head injury, spinal cord injury, subarachnoid hemorrhage, thromboembolic stroke (for thrombolysis), post cardiac arrest and postcardiopulmonary bypass dysfunction. The CCM resident gains experience in the use of (recently) intracranial pressure monitoring / cerebral perfusion pressure management, therapeutic hypothermia, spinal drainage post vascular surgery, interventional neuroradiology, HHH therapy for cerebral vasospasm, brain death declaration / organ donor management; investigations such as computerized tomography, magnetic resonance imaging, cerebral angiography, nuclear medicine cerebral blood flow studies, and electroencephalography are involved.

Gastrointestinal

These issues are encountered frequently in the context of the surgical or trauma patient population. Complications of abdominal surgery and trauma are managed in concert with the surgical service. Significant GI bleeding is infrequent in our unit, but endoscopy is usual when this occurs. Hepatic dysfunction /jaundice is a frequent finding in our patient population. We see a moderate volume of patients with cirrhotic disease; TIPSS procedures are available in the institution.

Haematological

The CCM resident will gain experience in the management of massive transfusion in the trauma and post cardiac surgery populations, the assessment of coagulopathies, the proper use of component therapy in the management of these patients, and prophylaxis and treatment of thromboembolic disease. We are a cancer referral centre, and do see a moderate volume of patients with hematologic malignancies, including those with immunosuppressive and toxic complications of chemotherapy.

Nutrition

With a large number of patients with multisystem injury or failure at our centre, the CCM resident gains experience in managing the nutritional needs of these patients. There is active bedside teaching as well as regular didactic teaching regarding the various forms of enteral and parenteral nutrition, their indications, and their advantages and disadvantages. Indirect calorimetry is used frequently in planning nutritional support;

the ICU team is responsible for managing TPN therapy in this institution.

Neuromuscular

The most common neuromuscular problem at Sunnybrook is quadriplegia secondary to trauma. We have approximately 10-15 patients per year with C-spine injuries and quadriplegia developing respiratory failure. The CCM resident gains experience in the management of respiratory failure and spinal shock in these patients. Investigations such as evoked potentials, electromyography, nerve conduction velocities are common for investigation of ICU polyneuropathy / myopathy, head injury / hypoxia-ischemia prognostication, and post-trauma peripheral nerve injuries. We also see a small volume of patients with chronic neuromuscular disease such as amyotrophic lateral sclerosis.

Trauma

Sunnybrook is a level 1 Trauma Center. The ATLS protocol is used in the initial resuscitation and management of these patients. This philosophy carries on in the ICU. The CCM resident gains extensive experience in the assessment and management of patients with multisystem injury in the ICU setting. The opportunity to attend at trauma resuscitation is available if desired. Trainees receive extensive experience to airway management, venous access of all types, and chest tube placement.

The initial assessment and resuscitation of these patients occurs in the trauma room under the direction of a trauma team leader. In patients admitted to the CrCU, the Critical Care Team is responsible for the day to day management. All trauma patients requiring ventilatory support are admitted to the Critical Care Unit. Thus the CCM resident is exposed to patients with all forms of injury involving multiple organ systems.

Exposure to patients with thermal, chemical and exfoliative injuries is available through an elective rotation in the Ross Tilley Burn Centre at Sunnybrook, which handles the largest volume of adult burn patients in Canada (approximately 200 admissions annually).

Sepsis

The centre's patient population provides a regular supply of patients with fever and suspected sepsis. Extensive experience in the assessment of these patients and the diagnostic work-up for infection is provided.

Close liaison with the Division of Infectious Disease and the Division of General Surgery exists, facilitating assistance and guidance with complex antibiotic therapy, the management of unusual organisms, and with the surgical management of infection.

Toxicology

Approximately 15 - 20 patients per year are admitted for the treatment of overdoses. The CCM resident gains exposure to the initial diagnosis of the problem, the various techniques available to minimize absorption from the GI tract, the treatment of side effects, and the facilitation of clearance from the body.

Continuous Quality Improvement

The CCM Resident is responsible for organizing and presenting bimonthly Morbidity & Mortality rounds, which involve review of controversial, complex or interesting recent cases. This activity provides the resident with followup and an introduction to management and quality improvement. The CrCU is a member of the Canadian CCRNet (Critical Care Research Network), a database linkage with other units, for ongoing tracking of outcomes and comparison with benchmark quality indicators.

Administrative Director

Dr. Thomas Stewart Respiratory Medicine

Associate Directors

Dr. Stephen Lapinsky Respiratory Medicine

Dr. Gail Darling Thoracic Surgery

Dr. Sangeeta Mehta Respiratory Medicine

Dr. Randy Wax Internal Medicine

Nursing Unit Administrator

Angie Jeffs

Administrative Assistants

Farida Hasin-Shakoor

Teresa Mullins

Background

The Medical Surgical Intensive Care Unit at Mount Sinai Hospital is a 14 bed “closed” intensive care unit. There are approximately 950 admissions annually. The distribution is approximately 50:50 between medical and surgical patients. The ICU is responsible for the management of critically ill patients in our own institution and at the Princess Margaret Hospital which is physically attached to Mount Sinai Hospital. In addition we receive many outside referrals directly or through CritiCall. In general we manage all types of critically ill patients excluding cardiovascular surgery, neurosurgery, trauma and burn patients. Our surgery referrals are generally related to the large surgical programs of our hospital which includes an emphasis on sarcomas, liver resections and other large intra-abdominal procedures. In addition orthopaedic oncology and large ENT/dental procedures frequently send patients to our unit. The medical patients cover the spectrum of complex medical cases common to a tertiary care centre. Given our connection with Princess Margaret Hospital we see a large number of immunocompromised patients with solid and haematological malignancies. In addition to surgical & medical patients, given the consolidation of high-risk pregnancy in our institution we have a large experience with critical illness surrounding pregnancy. Finally as a result of our research and experience with acute lung injury and ARDS we receive many referrals for such patients from surrounding areas. Currently our 14 bed unit also functions as a “step-down”/progressive care unit for medicine and surgery. However, two 4-bed step-down units will be opening in the spring of 2001 to relieve us of this responsibility. At any one time the medical team is composed of an attending physician, 1-2 senior residents/fellows, 4 housestaff PGY 2-4, possibly one PGY 1 and at times 1-2 students. Only PGY 2 or greater do in-house call alone. The senior residents/fellow act at the “junior-staff” level and in general do not carry their own patients. All call duty is in accordance with PAIRO guidelines (www.pairo.org). Our paramedical team includes all the personnel typical of a tertiary care closed ICU. This includes dedicated nurses, pharmacist, nutritionist, social worker, chaplain, physiotherapist, respiratory therapists, research co-ordinators etc. The ICU team is the cardiac arrest team for Mount Sinai Hospital and Princess Margaret Hospital during weekdays, 8:00-6:00 pm.

Teaching

We have formal teaching most days of the week. The topics cover a wide-range of critical care issues. Frequently these are presented by the attending staff however, we incorporate our multidisciplinary team (e.g. pharmacy, respiratory therapy, nutrition etc) in didactic sessions. We hold a morbidity and mortality round monthly in addition to a monthly journal club. We also take advantage of our surgical skills laboratory to provide hands on sessions regarding insertion of central lines, chest tubes and tracheotomies. Recently we have purchased a critical care simulator to enhance the educational experience. Finally, we offer opportunities to enhance airway management in the operating room.

Educational Goals & Objectives for Adult Critical Care Residents

Our goal is to provide adult critical care trainees with an environment that allows them to obtain the goals and objectives outlined by the Royal College of Physicians and Surgeons of Ontario. These will not be reiterated

here, however, the specific guidelines are outlined at the following web-site (<http://rcpsc.medical.org>). The only goals and objectives that we are unable to fulfill are those that refer to critically ill neurosurgical, trauma, cardiovascular and burn patients. The following will outline some of the unique experiences of this rotation and the areas of excellence.

Clinical/Technical Skills and Cognitive Knowledge

- ◆ Management of severe hypoxemic respiratory failure with an emphasis on less conventional approaches including: lung protection, high frequency oscillation, recruitment maneuvers, nitric oxide, prone position or any combination.
- ◆ Pathogenesis and epidemiology of severe respiratory failure
- ◆ Lung physiology assessment techniques
- ◆ Continuous renal replacement therapy
- ◆ Weaning from mechanical ventilation
- ◆ Extubation practices
- ◆ Protocolized approaches to common critical care practices
- ◆ New approaches to sepsis
- ◆ Management of critically ill obstetric patients
- ◆ Management of immunocompromised patients with malignancies
- ◆ Incorporation of technology into patient management
- ◆ Critical care organization models
- ◆ Latest trends in resuscitation
- ◆ Hospital wide communication skills
- ◆ Palliation of the critically ill dying patient
- ◆ Interactions with families and friends of critically ill patients
- ◆ Advising referring physicians
- ◆ The value of the multidisciplinary team
- ◆ Managing a closed intensive care unit
- ◆ Leadership of more junior trainees
- ◆ Knowledge of the major ethical issues facing a critical care unit
- ◆ Sensitivity to the moral, cultural and religious diversity of patients and families we serve.

Research

Research is a major emphasis of our ICU team. Our projects cover a variety of areas including: new approaches to mechanical ventilation, protocolized approaches to patient management, technology, simulator training, fluid therapy, sedation etc. In addition, not only do we participate in multi-centre trials but we lead them. Trainees working with us will be exposed to “cutting-edge” research. We frequently provide opportunities for participation in projects as well. There is ample opportunity for trainees to be exposed to the conduct of quality research from the development of an idea right through to the presentation and publication of a manuscript. In addition, exposure to ethical and moral principles behind conducting research will be provided. On a day to day basis several of our patients may be enrolled in research projects, hence there will be opportunities to be part of conducting rigid research protocols.

Trainee Support

Critical care can be a very stressful environment which has the potential to take a toll on the trainees’ physical, psychological and spiritual well-being. We encourage discussions in this regard and all of our attendings have had a great deal of experience dealing with such issues. We encourage trainees to seek us out for help at the earliest sign of any turmoil. If the attendings are not the suitable person any member of our multi-disciplinary team is available to help (e.g. chaplaincy, social work). In addition, we usually have a “debriefing round” with our multi-disciplinary team during each rotation.

Critical Care Medicine Staff

Chief (Acting)

Dr. Sam Shemie Paediatrics

Associate Directors

Dr. Ian Adatia	Cardiology
Dr. Desmond Bohn	Anaesthesia
Dr. Peter Cox	Anaesthesia
Dr. John Edmonds	Anaesthesia
Dr. Brian Kavanagh	Anaesthesia

Objectives for Adult CCM Trainees

Critical Care Medicine is a multidisciplinary specialty concerned with caring for patients who have developed, or are at risk of developing single or multiple organ system failure due to either disease or injury. Critical Care Medicine seeks to provide for the needs of these patients through immediate and continued observation and intervention, so as to restore health and prevent complications.

While recognizing that Rotating Critical Care Residents are not Paediatric Intensivists in training, at the end of their rotation they would be expected:

- ◆ to recognize early single or multiple organ failure in the paediatric patients
- ◆ to promptly institute appropriate resuscitation measures
- ◆ to stabilize a clinically unstable paediatric patient

They would also be expected to:

- ◆ apply and expand their knowledge of physiology and pathophysiology in the paediatric patient in an environment where the effects of physiological manipulation are intensively monitored. From this they should understand the differences between critically ill adults and children
- ◆ have a working knowledge of basic pharmacology as applied to paediatric critical care and in particular, drugs acting on the Cardiovascular and Respiratory system
- ◆ gain some experience in skills particular to resuscitation and critical care of the paediatric patient:
 - Airway management including ventilation & intubation
 - Vascular access, including arterial and central venous access
 - Renal replacement therapy
- ◆ obtain a conceptual understanding of the technology used in the Critical Care Unit and its limitations in the care of critically ill patients as a whole
- ◆ recognize the multidisciplinary nature of critical care medicine and the importance of communication between services in caring for the patient as a whole

- ◆ have a basic understanding of the moral and ethical issues as applied to Paediatric Critical Care Medicine:
 - Death and Dying
 - Foregoing life sustaining therapy
 - Rights of patients and families
 - Consent in children

Paediatric and Adult CCM combined education series provide didactic learning for the trainees. The structure of the rotation is such as to allow the resident maximal integration and hands on practical experience with optimal bedside teaching from both fellows and attending physicians. Residents are always welcome to attend any of the teaching sessions or rounds irrespective of their current rotation.

Preamble

In the 24 months that a trainee is associated with the adult critical care medicine Programme at the University of Toronto they have to do a minimum of 12 months training in one of the core intensive care units (University Health Network, St. Michael's Hospital, Sunnybrook & Women's College Health Sciences Centre, Mount Sinai Hospital and Hospital for Sick Children). Although we encourage further rotations in core units there is opportunity for elective experiences including electives outside of the University of Toronto teaching hospitals (see training guidelines). Since critical care touches a variety of clinical arenas the elective opportunities are endless. All electives must be approved well in advance by the Programme director in conjunction with the residency Programme committee. We reserve the right to change rotations and mandate further core ICU training based on a resident's individual needs, progression through the program and evaluations. All electives must include a contact individual who will meet with the resident, do their evaluation and ensure the goals and objectives are met. The Programme director will communicate the timing of the rotation, the goals and objectives and the evaluation material to the contact individual. Examples of some of the more popular electives are listed below:

Burn Unit

Dr. Joel Fish – Sunnybrook & Women's College Health Sciences Centre

- ◆ Classification of burn injury
- ◆ Burn resuscitation
- ◆ Thermal and chemical inhalational injuries
- ◆ Burn wounds – general aspects, chemical and biological dressings
- ◆ Infections and infection control in burn care
- ◆ Acute and chronic airway management in burn injury
- ◆ Bronchoscopy in halational injury
- ◆ Vascular access in burn injury
- ◆ Prophylactic escharotomy in burn injury
- ◆ Anaesthesia/analgesia for burn wound debridement and dressing changes

Community ICU

North York General – Director: Dr. Donna McRitchie

- ◆ To gain clinical experience with a 27 bed combined medical/surgical/coronary care unit.
- ◆ To gain experience with a unit in transition from an “open” concept model of patient care to a “closed” intensivist run model of patient care.
- ◆ To learn more about administrative issues in running a multi-disciplinary unit
- ◆ To gain experience in co-ordinating an allied health teaching programme

St. Joseph's Health Centre – Director: Dr. Ted Rogovein

- ◆ To gain clinical experience leading a critical care team in the community.
- ◆ To understand the organizational structures of a community based “closed” ICU and to appreciate the unique challenges facing care-givers.
- ◆ To learn more about administrative issues in running a multi-disciplinary unit in a community setting

Anaesthesia

Dr. Alison McGee – Sunnybrook & Women's College Health Sciences Centre

- ◆ Preoperative anaesthesia assessment
- ◆ Pharmacotherapy of anaesthesia, analgesia and neuromuscular blockade with specific emphasis on the cardiovascular and hemodynamic considerations
- ◆ Airway assessment and acute airway management
- ◆ Mechanical ventilation with specific interest in selective regional ventilation
- ◆ Principles of post operative acute pain management.

Coronary Care Unit (CCU)

- ◆ To develop an in-depth understanding of current management of acute coronary syndromes.

- ◆ To gain experience with invasive procedures common to the CCU and less common to medical-surgical intensive care units (eg. pacemakers and intra-aortic balloon pumps).
- ◆ To manage complex arrhythmias.
- ◆ To gain an appreciation for the critical care challenges facing cardiac patients.
- ◆ To gain an appreciation for the differences in organization structures between coronary care units and intensive care units.

Bioethics

Residents interested in exploring bioethical issues in critical care medicine in greater depth are encouraged to consider a professional masters degree such as the MHSc in Bioethics offered at the University of Toronto, Joint Centre for Bioethics.

<<http://www.utoronto.ca/jcb/Education/mhsc.htm>>

Shorter, more focused electives can be arranged through discussion with Dr. Neil M. Lazar, bioethics coordinator, critical care medicine Programme, University of Toronto.

<<mailto:neil.lazar@uhn.on.ca>>

Goals and Objectives:

- ◆ To be able to integrate what has been learned in the critical care medicine bioethics seminars in the preparation, presentation and writing up of a case study.
- ◆ To be able to prepare a clinical case study from a multi-disciplinary perspective (including bioethics, health care science, law, religion, and culture).
- ◆ To be able to present a clinical case study and direct the discussion in a class of one's bioethical peers.

Thoracic Surgery

- ◆ To understand the unique critical care needs of thoracic surgical patients.
- ◆ To improve procedural skills related to thoracic surgery including chest tubes, bronchoscopy, lung / pleural biopsies.
- ◆ To understand the indications, contra-indications and complications of common thoracic surgical procedures.
- ◆ To gain appreciation of being a member of a consultative team into a "closed" ICU.

Toxicology – Hospital for Sick Children

- ◆ To develop in depth understanding of the latest management of a variety of poisonings and overdoses.
- ◆ To develop skills at guiding care givers in the management of poisonings and overdoses over the phone.
- ◆ To gain an appreciation for the services available to deal with poisonings/overdoses and the administration of such a program.
- ◆ To understand the epidemiology and pathophysiology of poisonings/overdoses and the impact on Critical Care Medicine.

Echocardiography

Dr. S. Hutchison – St. Michael's Hospital

- ◆ To gain an understanding for the indications, contraindications and complications associated with the various types of echocardiography in the critical care setting.
- ◆ To improve your assessment of the emergent ECHO findings in critically ill patients (ie cardiogenic vs non-cardiogenic shock, acute valvular dysfunction, tamponade)
- ◆ To improve your understanding of how ECHO findings can augment prognostication and clinical decision making.
- ◆ To acquire the technical skills necessary to perform ECHO in an intensive care setting.

Respirology

Dr. M. Hutcheon – UHN – Toronto General Hospital

- ◆ To gain experience with bronchoscopy in non-intubated patients.
- ◆ To appreciate the indications, contraindications and complications associated with non-intubated bronchoscopy.

- ◆ To review important respiratory issues in critically ill patients.

Infectious Disease

To have an indepth understanding of the following issues as they related to the Intensive Care Unit, to understand diagnosis and treatment and to be familiar with the latest literature related to the following topics:

- ◆ Approach to fever in the ICU
- ◆ Bacterial meningitis
- ◆ Infective endocarditis
- ◆ Infections associated with vascular catheters
- ◆ Post operative infections (i.e. wound, sternotomy etc)
- ◆ Urinary tract infections in the ICU
- ◆ Toxic shock syndrome
- ◆ Acute infections in the immunocompromised host
- ◆ Community acquired pneumonia
- ◆ Hospital acquired pneumonia
- ◆ Ventilator associated pneumonia
- ◆ Fungal infections
- ◆ Steroids in sepsis
- ◆ To increase overall knowledge about the use of antimicrobials in the treatment of infection in the critically ill patient
- ◆ To know how to perform and interpret Gram stains
- ◆ PCP and steroids
- ◆ Candidal infections in the ICU

Radiology

Dr. G. Olscamp – UHN – Toronto General Hospital

- ◆ To gain experience reading CT scans of chest, abdomens and heads in regards to issues pertinent to critically ill patients.
- ◆ To review indications, contraindication and complications of transportation and radiological procedures in critically ill patients.

Hematology

Dr. Kevin Imrie – Sunnybrook & Women's College Health Sciences Centre

- ◆ approach to cytopenias
- ◆ hematologic malignancies
- ◆ complications of chemotherapy
- ◆ diagnosis and treatment of thromboembolic disorders
- ◆ thromboprophylaxis
- ◆ anticoagulants
- ◆ management of the bleeding patient - hemostasis and coagulopathie
- ◆ hypercoagulable states
- ◆ blood conservation techniques
- ◆ indications for blood and blood components
- ◆ blood bank testing
- ◆ blood grouping
- ◆ crossmatching
- ◆ antibody identification
- ◆ component processing
- ◆ transfusion reactions

Procedures

- ◆ bone marrow aspiration
- ◆ lumbar puncture

- ◆ paracentesis
- ◆ blood grouping / antibody screening
- ◆ review of a peripheral blood film