This document applies to those who begin training on or after July 1st, 2007.

(Please see also the “Policies and Procedures.”)

DEFINITION

Clinical Pharmacology and Toxicology is that branch of medicine with the ultimate goal of achieving optimal drug treatment. The subspecialty is based on in-depth knowledge of human pharmacology, therapeutics, and toxicology. The discipline of clinical pharmacology and toxicology includes rational therapeutics, clinical toxicology, population therapeutics and pharmacogenomics.

GOALS

Upon completion of training, a resident should possess a broad knowledge of the principles of pharmacotherapy, of diseases related to the primary specialty and be able to consult effectively on drug related problems.

Only candidates certificated by the Royal College of Physicians and Surgeons of Canada in Anesthesiology, Emergency Medicine, Internal Medicine, Pediatrics, or Psychiatry may be eligible to write the Royal College certification examination in Clinical Pharmacology and Toxicology.

Residents must demonstrate the requisite knowledge, skills, and attitudes for effective patient-centered care and service to a diverse population. In all aspects of specialist practice, the graduate must be able to address issues of gender, age, culture, ethnicity and ethics in a professional manner.

CLINICAL PHARMACOLOGY AND TOXICOLOGY COMPETENCIES

The nature of Clinical Pharmacology and Toxicology requires that the resident must become a consultant with a broad knowledge of human pharmacology and therapeutics, usually with special expertise in a specific area of pharmacotherapy or toxicology. Often this special expertise is developed by virtue of research conducted by the resident. The breadth of career possibilities requires the resident and supervisor to clearly identify the future career goals and setting of the resident. The appropriate training for individuals in community clinical practice, academic clinical practice, clinical research, regulatory institutions, administration or the pharmaceutical industry, will be quite different.
In keeping with the resident's background, it is assumed that an individual will have the broad knowledge of pathophysiology in their discipline. While the acquisition of knowledge and skills in areas of greatest relevance to a future career is appropriate, a sound understanding of the principles of Clinical Pharmacology and Toxicology as they affect different age groups (pediatric and adult) and patients with different diseases is essential.

Residents must demonstrate competence in the foundations of pharmacokinetics, pharmacodynamics, pharmacoeconomics, pharmacoepidemiology, drug development, clinical trial design and other aspects of evaluative sciences, critical appraisal, therapeutic drug monitoring, analytic methodology, applied statistics, drug regulation, drug utilization, education and teaching. In addition, residents are encouraged to undertake advanced level training in any of these or related areas.

During the course of training in Clinical Pharmacology and Toxicology, the resident must acquire clinical competence in the management of complex therapeutic problems together with an advanced background in basic and human pharmacology and relevant basic science (e.g. pharmacology, information technology, clinical epidemiology). Residents must learn to serve as consultants concerning Clinical Pharmacology and Toxicology and therapeutics in one or more domains: Anaesthesiology, Emergency Medicine, Internal Medicine, Pediatrics, and Psychiatry, as well as selected specialty services (e.g. Infectious Disease, Geriatrics, Obstetrics). The resident must become capable of critically evaluating scientific publications in this field and participate in research during training.

Finally, the resident must become an effective communicator and educator. Teaching and education of students, residents, colleagues, other health personnel and the general public is a major role for the clinical pharmacologist. Usually, these skills will be acquired in conjunction with structured clinical experience, research projects and supervised consultation related to pharmacotherapy in hospital, community, government and ambulatory care settings.

At the completion of training, the resident will have acquired the following competencies and will function effectively as a:

**Medical Expert**

**Definition:**

As Medical Experts, physicians integrate all of the CanMEDS Roles, applying medical knowledge, clinical skills, and professional attitudes in their provision of patient-centered care. Medical Expert is the central physician Role in the CanMEDS framework.

**Key and Enabling Competencies: Clinical Pharmacologists are able to...**

1. **Function effectively as consultants, integrating all of the CanMEDS Roles to provide optimal, ethical and patient-centered medical care**
   - 1.1. Effectively perform a consultation, including the presentation of well-documented assessments and recommendations in written and/or verbal form in response to a request from another health care professional
   - 1.2. Demonstrate effective use of all CanMEDS competencies relevant to their practice
1.3. Identify and appropriately respond to relevant ethical issues arising in patient care
1.4. Effectively and appropriately prioritize professional duties when faced with multiple patients and problems
1.5. Demonstrate compassionate and patient-centered care
1.6. Recognize and respond to the ethical dimensions in medical decision-making
1.7. Demonstrate medical expertise in situations other than patient care, such as providing expert legal testimony or advising governments, educational bodies, formulary management committees, drug development, therapeutics product licensing authorities, pharmaceutical manufacturers, and developers of drug regulations as needed

1.7.1. Contribute to evidence based, patient centered therapy as it relates to the broader context of populations within the health care system

2. Establish and maintain clinical knowledge, skills and attitudes appropriate to their practice

2.1. Apply knowledge of the clinical, socio-behavioural, and fundamental biomedical sciences relevant to the Clinical Pharmacology and Toxicology

2.2. Describe the RCPSC framework of competencies relevant to the Clinical Pharmacology and Toxicology

2.3. Apply lifelong learning skills of the Scholar Role to implement a personal program to keep up-to-date, and enhance areas of professional competence

2.4. Contribute to the enhancement of quality care and patient safety in their practice, integrating the available best evidence and best practices

3. Perform a complete and appropriate assessment of a patient

3.1. Effectively identify and explore issues to be addressed in a patient encounter, including the patient’s context and preferences

3.2. For the purposes of prevention and health promotion, diagnosis and or management, elicit a history that is relevant, concise, accurate and appropriate to the patient’s problem(s) as they relate to Clinical Pharmacology and Toxicology

3.2.1. Demonstrate the ability necessary to retrieve the required information related to Clinical Pharmacology and Toxicology issues, such as adverse drug reactions, drug development, toxicology, teratology, developmental pharmacology, substance-related disorders, substance dependence, therapeutics and principles important to understanding drug safety and adherence to recommendations

3.3. For the purposes of prevention and health promotion, diagnosis and/or management, perform a focused physical examination that is relevant and accurate and appropriate to the patient’s problem(s) as they relate to Clinical Pharmacology and Toxicology
3.4. Select medically appropriate investigative methods that are cost-effective, ethical, and appropriate to the management of Clinical Pharmacology and Toxicology problems

3.5. Demonstrate effective clinical problem solving and judgment to address patient problems, including interpreting available data and integrating information to generate differential diagnoses and management plans

4. Use preventive and therapeutic interventions effectively

4.1. Implement an effective management plan in collaboration with patients and their families

4.2. Demonstrate effective, appropriate, and timely application of preventive and therapeutic interventions relevant to Clinical Pharmacology and Toxicology

4.3. Ensure appropriate informed consent is obtained for therapies

4.4. Ensure patients receive appropriate end-of-life care

5. Demonstrate proficient and appropriate use of procedural skills, both diagnostic and therapeutic

5.1. Demonstrate knowledge and expertise in the performance of technical skills relevant to Clinical Pharmacology and Toxicology (e.g. measurement of drug effects in humans; appropriate choice of analytical technique for measurement of drug concentrations; application of pharmacokinetics in clinical settings including interpretation of drug concentration; measurement of pharmacologic, therapeutic and adverse drug effects by non-invasive and invasive techniques)

5.2. Demonstrate effective, appropriate, and timely performance of therapeutic procedures relevant to Clinical Pharmacology and Toxicology

5.3. Ensure appropriate informed consent is obtained for procedures

5.4. Appropriately document and disseminate information related to procedures performed and their outcomes

5.5. Ensure adequate follow-up is arranged for procedures performed

6. Seek appropriate consultation from other health professionals, recognizing the limits of their expertise

6.1. Demonstrate insight into their own limitations of expertise via self-assessment

6.2. Demonstrate effective, appropriate, and timely consultation of another health professional as needed for optimal patient care

6.3. Arrange appropriate follow-up care services for a patient and their family
Communicator

Definition:

As Communicators, physicians effectively facilitate the doctor-patient relationship and the dynamic exchanges that occur before, during, and after the medical encounter.

Key and Enabling Competencies: Clinical Pharmacologists are able to...

1. Develop rapport, trust, and ethical therapeutic relationships with patients and families
   1.1. Recognize that being a good communicator is a core clinical skill for physicians, and that effective physician-patient communication can foster patient satisfaction, physician satisfaction, adherence and improved clinical outcomes
   1.2. Establish positive therapeutic relationships with patients and their families that are characterized by understanding, trust, respect, honesty and empathy and confidentiality
   1.3. Respect patient confidentiality, privacy and autonomy
   1.4. Listen effectively
   1.5. Be aware and responsive to nonverbal cues
   1.6. Effectively facilitate a structured clinical encounter

2. Accurately elicit and synthesize relevant information and perspectives of patients and families, colleagues, and other professionals
   2.1. Gather information about a disease, but also about a patient’s beliefs, concerns, expectations and illness experience while considering the influence of factors such as the patient’s age, gender, ethnic, cultural and socio-economic background, and spiritual values regarding that illness
   2.2. Seek out and synthesize relevant information from other sources, such as a patient’s family, caregivers and other professionals

3. Accurately convey relevant information and explanations to patients and families, colleagues and other professionals
   3.1. Deliver information to patients and their families in a humane manner and in such a way that it is understandable, encourages discussion and participation in decision-making to the degree that they wish
   3.2. Deliver information to colleagues and other professionals in such a way that it is understandable, encourages discussion and promotes participation in decision-making

4. Develop a common understanding on issues, problems and plans with patients, families, and other professionals to develop a shared plan of care
   4.1. Effectively identify and explore problems to be addressed from a patient encounter, including the patient’s context, responses, concerns, and preferences
4.2. Respect diversity and difference, including but not limited to the impact of gender, religion and cultural beliefs on decision-making

4.3. Encourage discussion, questions, and interaction in the encounter

4.4. Engage patients, families, and relevant health professionals in shared decision-making to develop a plan of care

4.5. Effectively address challenging communication issues such as obtaining informed consent, delivering bad news, and addressing anger, confusion and misunderstanding
   4.5.1. Demonstrate skills in working with others who present significant communication challenges an ethno-cultural background different from the physician's own

4.6. 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 thereby enabling the delivery of consistent messages to patients and their families

5. Convey effective oral and written information about a medical encounter
   5.1. Maintain clear, accurate, and appropriate records (e.g., written or electronic) of clinical encounters and plans
   5.2. Effectively present verbal reports of clinical encounters and plans
   5.3. When appropriate, effectively and discretely provide understandable information to others (i.e. the general public, media, administrators, regulators) about areas of Clinical Pharmacology and Toxicology

**Collaborator**

**Definition:**

As Collaborators, physicians effectively work within a healthcare team to achieve optimal patient care.

**Key and Enabling Competencies: Clinical Pharmacologists are able to...**

1. **Participate effectively and appropriately in an interprofessional healthcare team**
   1.1. Clearly describe their roles and responsibilities to other professionals
   1.2. Identify and describe the role, expertise and limitations of all members of an interdisciplinary team required to optimally achieve goals related to patient care, a research problem, an educational task, or an administrative responsibility within the subspecialty of Clinical Pharmacology and Toxicology
   1.3. Recognize and respect the diversity of roles, responsibilities and competences of other professionals in relation to their own
1.4. Work with others to assess, plan, provide and integrate care for individual patients (or groups of patients)

1.5. Where appropriate, work with others to assess, plan, provide and review other tasks, such as research problems, educational work, program review or administrative responsibilities

1.6. Participate effectively in interprofessional team meetings, by demonstrating the ability to accept, consider and respect the opinions of other team members, while contributing Clinical Pharmacology and Toxicology expertise

1.7. Describe the principles of team dynamics

1.8. Respect team ethics, including confidentiality, resource allocation and professionalism

1.9. Work effectively and communicate as a member of a team and where appropriate, be able to assume a leadership role

2. Effectively work with other health professionals to prevent, negotiate, and resolve interprofessional conflict

2.1. Demonstrate a respectful attitude towards other colleagues and members of an interprofessional team

2.2. Work with other professionals to prevent conflicts

2.3. Employ collaborative negotiation to resolve conflicts

2.4. Respect differences, misunderstandings and limitations in other professionals

2.5. Recognize one’s own differences, misunderstanding and limitations that may contribute to interprofessional tension

2.6. Reflect on interprofessional team function

Manager

Definition:

As Managers, physicians are integral participants in healthcare organizations, organizing sustainable practices, making decisions about allocating resources, and contributing to the effectiveness of the healthcare system.

Key and Enabling Competencies: Clinical Pharmacologists are able to...

1. Participate in activities that contribute to the effectiveness of their healthcare organizations and systems

1.1. Work collaboratively with others in their organizations

1.1.1. Participate in institutional processes that relate to the discipline of Clinical Pharmacology and Toxicology and toxicology such as Pharmacy and Therapeutics Committees and Research Ethics Boards
1.2. Participate in systemic quality process evaluation and improvement, such as patient safety initiatives

1.3. Describe the structure and function of the healthcare system as it relates to Clinical Pharmacology and Toxicology

1.4. Describe the structure, financing, and operation of the drug related aspects of the Canadian health system, function effectively within it and be capable of playing an active role in its improvement

2. **Manage their practice and career effectively**

2.1. Set priorities and manage time to balance patient care, practice requirements, outside activities and personal life

2.2. Manage a practice including finances and human resources

2.3. Implement processes to ensure personal practice improvement

2.4. Employ information technology appropriately for patient care

2.5. Understand how to function effectively in health care organizations, ranging from an individual clinical practice to organizations at the local, regional, national, and international levels

2.6. Understand population-based approaches to Clinical Pharmacology and Toxicology services and their implication for medical practice

3. **Allocate finite healthcare resources appropriately**

3.1. Recognize the importance of just allocation of healthcare resources, balancing effectiveness, efficiency and access with optimal patient care

3.2. Apply evidence and management processes for cost-appropriate care

4. **Serve in administration and leadership roles, as appropriate**

4.1. Chair or participate effectively in committees and meetings

4.2. Lead or implement a change in health care

4.3. Plan relevant elements of health care delivery (e.g., work schedules)

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**Health Advocate**

**Definition:**

As *Health Advocates*, physicians responsibly use their expertise and influence to advance the health and well-being of individual patients, communities, and populations.
**Key and Enabling Competencies: Clinical Pharmacologists are able to...**

1. **Respond to individual patient health needs and issues as part of patient care**
   1.1. Identify the health needs of an individual patient
   1.2. Identify opportunities for advocacy, health promotion and disease prevention with individuals to whom they provide care

2. **Respond to the health needs of the communities that they serve**
   2.1. Describe the practice communities that they serve
   2.2. Identify opportunities for advocacy, health promotion and disease prevention in the communities that they serve, and respond appropriately
   2.3. Appreciate the possibility of competing interests between the communities served and other populations

3. **Identify the determinants of health for the populations that they serve**
   3.1. Identify the determinants of health of the populations, including barriers to access to care and resources
      3.1.1. Identify the most important determinants of health (i.e. poverty, unemployment, early childhood education, social support systems), being familiar with the underlying research evidence, and applying this understanding to common problems and conditions in the resident's Clinical Pharmacology and Toxicology experience (i.e. maternal-fetal health; vaccinations; medication costs and coverage; adherence; overdose)
      3.1.2. 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); and assessing the patient's ability to access various services in the health and social system
      3.1.3. Describe, in broad terms, the key issues currently under debate regarding changes in health care systems, 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 Clinical Pharmacology and Toxicology through a relevant specialty society (i.e. Canadian Society for Clinical Pharmacology and Toxicology, Canadian Association for Population Therapeutics), community-based advocacy group, other public education bodies, or private organizations
   3.2. Identify vulnerable or marginalized populations within those served and respond appropriately
      3.2.1. Identify at risk groups within a given population and applying the available knowledge about prevention to the at risk groups, and contributing group data for better understanding of health problems within that population
4. **Promote the health of individual patients, communities, and populations**

4.1. Describe an approach to implementing a change in a determinant of health of the populations they serve

4.2. Describe how public policy related to Clinical Pharmacology and Toxicology impacts on the health of the populations served. For example, describe how public policy is developed; identifying current policies that affect health, either positively or negatively (i.e. communicable diseases, tobacco, substance abuse); and citing examples of how policy was changed as a result of actions by physicians

4.3. Identify points of influence in the healthcare system and its structure

4.4. Describe the ethical and professional issues inherent in health advocacy, including altruism, social justice, autonomy, integrity and idealism

4.5. Appreciate the possibility of conflict inherent in their role as a health advocate for a patient or community with that of manager or gatekeeper

4.6. Describe the role of the medical profession in advocating collectively for health and patient safety

**Scholar**

**Definition:**

As *Scholars*, physicians demonstrate a lifelong commitment to reflective learning, as well as the creation, dissemination, application and translation of medical knowledge.

**Key and Enabling Competencies: Clinical Pharmacologists are able to...**

1. **Maintain and enhance professional activities through ongoing learning.**

   1.1. Describe the principles of maintenance of competence

   1.2. Describe the principles and strategies for implementing a personal knowledge management system

       1.2.1. Use appropriate strategies to maintain and advance professional competence

   1.3. Recognize and reflect learning issues in practice

   1.4. Conduct a personal practice audit

   1.5. Pose an appropriate learning question

   1.6. Access and interpret the relevant evidence

   1.7. Integrate new learning into practice

   1.8. Evaluate the impact of any change in practice

   1.9. Document the learning process
2. Critically evaluate medical information and its sources, and apply this appropriately to practice decisions
2.1. Identify gaps in knowledge and expertise around the Clinical Pharmacology and Toxicology question
2.2. Describe the principles of critical appraisal
2.3. Critically appraise retrieved evidence in order to address a clinical question
2.4. Integrate critical appraisal conclusions into clinical care

3. Facilitate the learning of patients, families, students, residents, other health professionals, the public and others, as appropriate
3.1. Describe principles of learning relevant to medical education
3.2. Collaboratively identify the learning needs and desired learning outcomes of others
3.3. Select effective teaching strategies and content to facilitate others’ learning of topics in Clinical Pharmacology and Toxicology
3.4. Demonstrate an effective lecture or presentation
3.5. Assess and reflect on a teaching encounter
3.6. Provide effective feedback
3.7. Describe the principles of ethics with respect to teaching

4. Contribute to the development, dissemination, and translation of new knowledge and practices
4.1. Describe the principles of research and scholarly inquiry
4.2. Compare and contrast the objectives and requirements of drug development studies from Phase 1 to Phase 4 inclusively
4.3. Describe the principles of research ethics as formulated in the Tri-Council Policy Statement on the conduct of research involving human subjects
4.4. Pose a scholarly question (e.g. clinical, basic, population health, or regulatory)
4.5. Conduct a systematic search for evidence
   4.5.1. Identify, consult and collaborate with appropriate content experts to conduct the research
4.6. Select and apply appropriate methods to address the question
4.7. Demonstrate a basic understanding of the principles of carrying out the research outlined in the proposal, disseminating the findings, defending the results and identifying areas for further research
Professional

**Definition:**

As **Professionals**, physicians are committed to the health and well-being of individuals and society through ethical practice, profession-led regulation, and high personal standards of behaviour.

**Key and Enabling Competencies: Clinical Pharmacologists are able to...**

1. **Demonstrate a commitment to their patients, profession, and society through ethical practice**
   1.1. Exhibit appropriate professional behaviors in practice, including honesty, integrity, commitment, compassion, respect and altruism
   1.2. Demonstrate a commitment to delivering the highest quality care and maintenance of competence
   1.3. Recognize and appropriately respond to ethical issues in clinical practice such as truth-telling, consent, advanced directives, confidentiality, end-of-life care, conflict of interest, resource allocation, cultural differences and research issues
   1.4. Appropriately manage conflicts of interest
   1.5. Recognize the principles and limits of patient confidentiality as defined by professional practice standards and the law
   1.6. Maintain appropriate relations with patients

2. **Demonstrate a commitment to their patients, profession and society through participation in profession-led regulation**
   2.1. Appreciate the professional, legal and ethical codes of practice
      2.1.1. Understand the professional, legal and ethical codes to which physicians are bound, and how these differ from codes followed by industry
   2.2. Fulfill the regulatory and legal obligations required of current practice
   2.3. Demonstrate accountability to professional regulatory bodies
   2.4. Recognize and respond to others’ unprofessional behaviours in practice
   2.5. Participate in peer review

3. **Demonstrate a commitment to physician health and sustainable practice**
   3.1. Balance personal and professional priorities to ensure personal health and a sustainable practice
   3.2. Strive to heighten personal and professional awareness and insight
      3.2.1. Continually evaluate one's abilities, knowledge and skills and know one's limitations of professional competence
3.2.2. Be an exemplary role model and an advocate of optimal therapy with drugs and other therapeutic manoeuvres

3.2.3. Adopt specific strategies to heighten personal and professional awareness and explore and resolve interpersonal difficulties in professional relationships

3.3. Recognize other professionals in need and respond appropriately