

HIV pharmacy specialty residency program in Canada

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Prescribing and managing anti-retroviral medications is becoming increasingly complex. Furthermore, patients may require agents for the prophylaxis or treatment of opportunistic infections, nutritional deficiencies, pain relief, sleep and mood disturbances, and gastrointestinal and lipid disorders. The median number of daily medications in people with HIV infection ranges from 2 to 5 but may be 24 or more.¹ Such factors as efficacy, toxicity, drug interactions, medication compliance, and drug acquisition need to be considered when selecting a treatment regimen.

In one study, 72 significant anti-retroviral prescribing errors were noted for 59 hospitalized HIV-infected patients over a 28-month period.² Almost half of the errors involved protease inhibitors. Seventy-eight percent of the errors were serious or severe, and 21% were clinically significant. The rate of prescribing errors increased from 2% in 1996 to 12% in the first four months of 1998, reflecting perhaps the increased complexity of the drug regimens. A recent Canadian study found that antiretroviral medications contributed to more than two thirds of adverse-drug-reaction-related

admissions of HIV-infected patients to a university-affiliated tertiary care hospital.³

Advanced knowledge and training are necessary for providing optimal pharmaceutical care of HIV-infected patients, and there is a growing demand for HIV pharmacotherapy specialists. Pharmacist intervention can have a favorable impact on patient outcomes, including drug compliance and viral suppression.⁴⁻⁸ One of the most effective methods of obtaining HIV pharmacotherapy expertise is to complete a specialized hospital residency. However, only a few institutions in the United States have offered residencies in HIV pharmacotherapy, and no such programs have existed in Canada. This article describes Canada's first postgraduate pharmacy specialty residency program in HIV pharmacotherapy. The goal of the residency program is to help pharmacists gain expertise in HIV infection and pharmacotherapy and to prepare them for challenging careers in clinical, academic, research, and industry settings.

Rationale. In Canada, all pharmacists must obtain a bachelor of science degree from a provincial faculty of pharmacy. Additional training

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may include a doctor of pharmacy degree, a master of science in pharmacy degree, or a general hospital pharmacy residency. General residency programs are usually completed after the bachelor's degree. There are very few specialty residencies for pharmacists with advanced training, and standards for specialty residencies do not exist.

By offering a specialty residency program to people with advanced degrees in pharmacy, we hoped to recruit highly experienced and qualified individuals who not only have an active interest in providing pharmaceutical care to patients with HIV infection but who will also be able to contribute to the health care system and the profession.

Development of the program.

The concept of the residency was developed by pharmacists specializing in pharmacotherapy for patients with HIV infection at two urban, university-affiliated hospitals. We believed that a residency program with the full participation of both institutions would offer the most advantages because the two HIV clinics encompassed different physician practices and patient populations. Therefore, a joint residency program was developed for the two institutions.

Support was obtained from administrators and clinicians at both institutions. A residency advisory committee was created consisting of both HIV pharmacists, the pharmacy directors at each institution, the director of the Pharm.D. program at the University of Toronto, an HIV clinic director and infectious diseases specialist, an HIV clinic coordinator and nurse, and a representative of the Canadian Hospital Pharmacy Residency Board (CHPRB). This group meets quarterly to provide feedback and support to residents, act as consultants for the residency program, suggest alternative and new rotation sites and discuss future directions for the program.

The program was based on a hospital pharmacy residency, modified to meet the goals of the specialty pro-

gram. Certain rotations, such as sterile products and hospital administration, were omitted and others were added to provide the resident with as much experience as possible in pharmacotherapy for HIV infection. In accordance with current general residency accreditation standards, we prepared a residency manual that included program goals, the roles and responsibilities of preceptors and coordinators, and the requirements for successful completion of the program. Policies and procedures were developed to conform as closely as possible to existing CHPRB accreditation standards. In some cases, goals and responsibilities were modified to better reflect the abilities and expectations of a resident with advanced training. Clinical activities, rotation assignments, and learning objectives were tailored to the resident's experience and personal goals.

Innovative and distinguished practice sites were identified, and potential preceptors for external rotations were contacted. Sites were considered if they involved or had the potential to involve HIV pharmacists. Close to 20 preceptors from across Ontario and the United States volunteered to offer rotations. Some of those who volunteered were physicians, community activists, and researchers interested in developing roles for pharmacists at their sites.

The average annual budget allotted for the residency program was approximately \$30,000 Canadian (\$25,000 U.S.). This included expenses for the resident's stipend, for conference attendance, and for recruiting and advertising. The pharmacy departments at the two hospitals agreed to fund the residency for the first few years with the understanding that external support would eventually be sought.

Description of the program. The residency program is designed to help the resident acquire a comprehensive base of knowledge on HIV infection and treatment and develop the critical thinking and advanced patient care skills needed to provide effective

pharmaceutical care. The resident is exposed to a variety of HIV practice sites and has the opportunity to work with different health care professionals, patients, and community organizations. This experience allows the resident to achieve the program's objectives in an independent, self-directed learning environment under the guidance of experts.

The residency applicant must have a master's degree or doctorate from a pharmacy school whose curriculum has been approved by the Association of Faculties of Pharmacy of Canada. Ideally, the applicant should already have completed a one-year accredited general pharmacy residency.

The program consists of 10 months of rotations and 2 months of research. In keeping with the trend toward outpatient services, 24 weeks are allotted to mandatory rotations in ambulatory care at the two primary institutions. Twelve weeks are spent in the Immunodeficiency Clinic at Toronto General Hospital, a tertiary care facility. The clinic serves over 1500 patients a year. The medical staff comprises infectious diseases specialists and internists with expertise in HIV infection. A comprehensive interdisciplinary approach is used to provide specialized care. The clinic is also a leading center for research. The other 12 weeks of mandatory rotations in ambulatory care are spent at the Health Centre, St. Michael's Hospital, which is a joint primary care and specialty care facility in Toronto. Each year the Health Centre serves approximately 1200 HIV-positive patients, including people who have traditionally been marginalized by the health care system, such as gays and lesbians, native peoples, former prisoners, the homeless, and people with major health disabilities and substance dependencies.

The resident also receives training in inpatient services (four weeks), community pharmacy (two weeks), and drug information and the pharmaceutical industry (four weeks). Two elective rotations of four weeks

each are chosen by the resident from among pediatric services, family practice clinic services, independent consulting, community AIDS services, infectious diseases consulting services, palliative care, and government services.

During clinical rotations, the resident is expected to interview patients; participate in consultations about complex pharmacotherapy issues; identify and resolve drug-related problems; assess patient compliance with and tolerance of antiretroviral therapies; provide drug information and educational support to clinic staff, patients, and other interested parties; and participate in subspecialty rounds and team meetings.

The resident is formally evaluated during and after each rotation and at the midpoint of the residency year. The resident prepares a written progress report at the end of each rotation and discusses it with the preceptor before advancing to the next rotation. The program coordinators are informed of the resident's progress after each rotation and when any significant problems arise. At any time, the resident may air concerns or provide feedback about specific rotations, preceptors, and the program with an external advisor.

The resident is expected to conduct a research project in HIV pharmacotherapy. The project is guided by the program coordinators and the project preceptor. The project should be relevant to clinical practice, since the results will be presented at a national or international meeting. The resident also has teaching responsibilities for hospital pharmacy residents with bachelor's degrees and Pharm.D. degree candidates doing elective rotations in HIV ambulatory care.

The resident is expected to complete all rotations. If the resident fails to complete a rotation, the resident must successfully complete a similar rotation at his or her own expense at the end of the scheduled rotations. If two or more rotations are failed, the resident's participation in the pro-

gram may be terminated by the program coordinators in consultation with both hospital pharmacy directors. The resident must complete all assigned responsibilities for the research project, and a bound version of the project manuscript must be filed in the faculty of pharmacy library within two months after the end of the residency. Finally, the resident must pass midpoint and final oral examinations that include rapid assessment of cases. At the final meeting of the residency advisory committee, the program coordinators ensure that the resident has met all the requirements.

Experience and future directions. Two residents have now successfully completed the residency program, and a new candidate has been recruited for the 2000–01 cycle. Feedback about the program from the residents and the supporting organizations has been very positive. Some of the rotations have been slightly modified to better meet the objectives. The duration of the ambulatory care component was increased from four months to six months to help the resident become more familiar with the two main practice sites and to increase teaching opportunities. New rotation sites are being considered.

In 1999, external support for the residency program was secured through an unrestricted educational grant from Glaxo Wellcome Canada. A five-year financial commitment was tentatively agreed upon and is renewed annually. The funds are used to provide the resident's annual stipend and to meet minor program costs (primarily for program promotion and recruitment). No member of the residency advisory committee receives monetary compensation from Glaxo Wellcome Canada for contributing to the residency program.

The first resident conducted a pilot study of nelfinavir therapeutic drug monitoring in HIV-infected ambulatory care patients.⁹ The results contributed to the development of a randomized, controlled, multi-

center study of the benefits of therapeutic drug monitoring in HIV infection. The second resident studied physician prescribing patterns for patients who had not previously received antiretrovirals. This information will allow local physicians to compare their current practices with international standards. Awareness of local prescribing patterns will enable health care professionals, including pharmacists, to appropriately counsel newly diagnosed patients about available therapies and will help researchers develop optimal second-line or salvage antiretroviral protocols.

The first graduate of the residency program was offered a newly created HIV clinical pharmacist position in a major teaching hospital. He agreed to offer future elective rotations for the residency program at his new practice site. The second graduate is also pursuing a clinical practice career in HIV infection.

The success of this program led to the development of an infectious diseases specialty pharmacy residency at Toronto General Hospital. Pharmacy colleagues across the country have begun to develop postgraduate residencies in other therapeutic areas. Presentation and discussion of the residency program at the 13th International AIDS Conference have led to interest in creating similar programs in other countries.¹⁰ Finally, the Pharm.D. program at the University of Toronto is exploring the possibility of additional specialty residencies to support professional development.

Conclusion. A pharmacy specialty residency program was developed in Canada to meet the growing need for HIV pharmacotherapy specialists.

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