Describing Canadian Hospital Pharmacy Residencies

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ABSTRACT

A survey of Canadian hospital pharmacy residency programs was designed to collect general information for prospective residents and to identify educational and evaluation methods used in each program for networking between program administrators. The survey was distributed nationally to 39 Canadian Hospital Pharmacy Residency Board-accredited programs.

Information collected in the survey indicated that most programs offer a general hospital pharmacy residency, accepting one to two residents per year. Generally, most residency programs which have been in existence for more than 15 years, were affiliated with a university, and were located in a hospital with more than 300 beds. All responding programs offered the Canadian Hospital Pharmacy Residency Board (CHPRB) required rotations in pharmacy administration, drug distribution, drug information, and IV admixtures/nutrition as well as requiring the completion of a residency project. In addition to the required rotations, the most commonly offered clinical rotations included general medicine, intensive care, oncology, and geriatrics.

Residents in responding programs were required to attend at least one professional conference, and submit one article for external publication each year. Pharmaceutical care (PC) education and/or PC-related activities were generally offered. Responding programs had similar evaluation processes and requirements of extra-rotational services and working hours.

The survey results have been published in a Directory of Canadian Hospital Pharmacy Residency Programs. A detailed reference of these programs has not previously been available. Planning is underway to make the directory available on the World Wide Web at Dalhousie's College of Pharmacy Home Page.

Key Words: networking, residency programs, structured learning, students, survey

RÉSUMÉ

Une enquête sur les programmes de résidence en pharmacie d'hôpital au Canada a été élaborée dans le but de recueillir de l'information générale pour les résidents éventuels et pour identifier les méthodes d'enseignement et d'évaluation utilisées dans chacun des programmes pour la mise sur pied d'un réseau d'échange entre administrateurs de programmes. L'enquête a porté sur 39 programmes accrédités par le Conseil canadien de résidence en pharmacie hospitalière (CCRPH), dans tout le Canada.

Les renseignements issus de l'enquête ont révélé que la plupart des programmes offrent une résidence générale en pharmacie d'hôpital, à raison de un à deux résidents par année. Dans l'ensemble, la plupart des programmes étaient en place depuis plus de 15 ans, et étaient dispensés en collaboration avec une université et dans des hôpitaux de plus de 300 lits. Tous les programmes qui ont fait l'objet de l'enquête offraient une rotation des activités pharmaceutiques, telle qu'exigée par le CCRPH, soit en administration pharmaceutique, en distribution de médicaments, en information sur les médicaments, et en additifs aux solutés/alimentation I.V., et demandaient aux résidents qu'ils terminent un projet de résidence. Outre la rotation des activités pharmaceutiques, la rotation des activités cliniques les plus courantes étaient offertes en médecine générale, en soins intensifs, en oncologie et en gériatrie.

Les résidents de ces programmes devaient participer à au moins une conférence professionnelle et soumettre un article pour publication externe à chaque année. L'enseignement des soins pharmaceutiques (SP) et (ou) les activités liées aux SP étaient généralement offert. Les méthodes d'évaluation et les exigences relatives aux heures de travail et aux services hors-rotation étaient semblables dans tous les programmes.

Les résultats de l'enquête ont été publiés dans le Directory of Canadian Hospital Pharmacy Residency Programs. Aucune référence détaillé à ces programmes n'a jamais été produite auparavant. On prévoit publier ce répertoire sur le Web, dans le site du Dalhousie's College of Pharmacy.

Mots clés : enquête, enseignement structuré, étudiants, programmes de résidence, réseau d'échange.

Can J Hosp Pharm 1997;50:109-114

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Acknowledgments: The authors gratefully acknowledge Dalhousie's Pharmacy Endowment Fund for their support of this project. The authors wish to thank the Canadian Hospital Pharmacy Residency Board for their comments and suggestions regarding the survey, as well as Andrew Wyllie, the Residency Directors Forum of Ontario and Apotex, Inc. for allowing the use and adaptation of questions from their survey: *Hospital pharmacy residency program survey: Sites, services and rotations.*

INTRODUCTION

Pharmacy students and pharmacists considering hospital pharmacy residency application may have difficulty obtaining information on the general structure of all programs available. Often, information about local programs is provided at affiliated schools of pharmacy, but information pertaining to other programs may be missing or out of date.

More specifically, information on structured learning opportunities in residencies is lacking. Most Canadian hospital pharmacy residencies devote significant time to developing the resident's clinical skills, usually through experiential rotations. However, the degree and format of structured learning opportunities may vary considerably between institutions, as each must develop its own specific objectives, learning activities, and evaluation processes.

The "Survey of Structured Learning in Canadian Hospital Pharmacy Residencies" was; therefore, designed with the following objectives: 1) to collect general information to characterize each Canadian Hospital Pharmacy Residency Board (CHPRB) program; 2) to identify structured learning components, educational methods, and evaluation methods used in the various programs; and 3) to facilitate information exchange for prospective residents and residency program administrators through resultant publications.

METHODS

The survey was divided into two sections. Section I collected information for prospective residents including: 1) general information (e.g., type of residency, associated university, program directors/coordinators); 2) hospital information (size and specialties); 3) compulsory and optional rotations; 4) extra-rotational services required of the resident; 5) working hours required; 6) required attendance at professional conferences; and 7) publication history of residents since June 1993.

Section II was developed with input received from the CHPRB, as well as the use or adaptation of several questions from the Residency Directors Forum of Ontario/ Apotex survey (adapted with permission, J. Mann, Apotex, Inc., 1995) conducted in Ontario. This section collected information of interest for networking between the programs including: 1) pharmaceutical care activities; 2) evaluation of residents (timing, type); and 3) additional learning activities (e.g., teaching at a university, unique programs).

The survey was mailed in November 1995 to the 45 CHPRB-accredited hospital residency programs. However, as it was later discovered that certain programs had merged, while others had been eliminated, only 39 responses were expected. Three sets of follow-up calls were completed to those institutions initially not responding.

RESULTS

Information for Prospective Residents

Thirty-four surveys were returned - a response rate of 87%. However, it should be noted that some respondents did not answer all questions. The number of responses for each question has; therefore, been identified in the tables. Table I characterizes the responding programs.

CHPRB mandatory rotations include pharmacy administration, drug distribution, drug information, intravenous admixtures/nutrition, and completion of a residency project. As expected, all residency programs offered these rotations. In addition to these mandatory rotations, the most commonly offered clinical rotations were general medicine, intensive care, oncology/hematology, geriatrics, and cardiology. Rotations varied in length, with an

Table I. General Information About Responding Programs[a]

Characteristic	Number of Respondents (%)
Type of Residency Program (n=34)[a]	
• general	26 (76.5)
• specialized	3 (8.8)
• question not answered	5 (14.7)
Number of Residents Accepted Each Year (n = 31)	
• 1	10 (32.3)
• 2	15 (48.4)
• 3	2 (6.5)
• 4	4 (12.9)
Age of Residency Program (n = 34)	
• < 1 year	1 (2.9)
• 4 - 7 years	3 (8.8)
• 8 - 10 years	5 (14.7)
• 10 - 15 years	5 (14.7)
• > 15 years	20 (58.8)
Number of Beds in Hospital (n = 33)	
• 100 - 300	3 (9.1)
• 300 - 500	12 (36.4)
• 500+	18 (54.5)
University Affiliation (n = 34)	
• yes	30 (88.2)
• no	4 (11.8)

a. The number of programs which responded to each question appears in parenthesis

average of approximately four weeks per rotation. Rotation information is summarized in Table II.

Seventy-one percent of responding hospital residency programs required drug distribution services of the resident outside of the distribution rotation. Other extra-rotational services (those above and beyond the resident's regular work week), such as drug information, were required less often (Table III). There was variation in extra working hours required with 72% of responding programs requiring residents to work some weekends. Time was often given back to residents who worked extra hours (Table IV).

All responding programs required residents to attend at least one professional conference, with an average of one local and one national conference each year. In most cases, full or partial funding was provided both for local conferences (16 of 22 respondents - 72.7%) and national conferences (27 of 32 respondents - 84.4%).

The survey requested the publication history of residents for the past three years. Though the response rate to this question was poor (n=15), some information was gathered. The total number of articles submitted per resident per year ranged between 0.2 and 4. An average of 1.3 articles were submitted per resident per year to internal hospital publications, while an average of 1.1 articles per resident per year were submitted to external publications. The most common external publication to which manuscripts were submitted was the *Canadian Journal of Hospital Pharmacy* (60%).

Table II. Summary of Residency Rotation Information (n = 34)

Rotation	Number of Hospitals Offering (%)	Compulsory	Optional	Average Duration of Rotation in Weeks[b]
[a]Pharmacy Administration	34 (100)	34	0	3 (23)
[a]Drug Distribution	34 (100)	34	0	5.4 (25)
[a]Drug Information	34 (100)	34	0	3.9 (28)
[a]Intravenous Admixtures/ Nutrition	33 (97.1) 32 (94.1)	33 28	0 4	2 (20) 1.9 (14)
[a]Project	34 (100)	34	0	6.5 (23)
General Medicine	31 (91.2)	27	4	5.2 (24)
Intensive Care	30 (88.2)	14	16	3.9 (12)
Oncology/Hematology	28 (82.3)	14	14	4 (20)
Geriatrics	27 (79.4)	10	17	3.3 (19)
Cardiology	26 (76.5)	8	18	3.8 (15)
Infectious Disease	24 (70.6)	12	12	3.9 (19)
Pharmacokinetics	20 (58.8)	10	10	2.4 (13)
Psychiatry	19 (55.9)	1	18	3.5 (13)
Neonatal Intensive Care	18 (52.5)	6	12	3.6 (10)
Nephrology	16 (47.1)	4	12	3.7 (12)
Pediatrics	19[c] (48.7)	2	17	3.5 (11)
Gastroenterology	7 (20.6)	0	7	3.8 (5)
Rheumatology	7 (20.6)	1	6	3 (4)
Respirology	6 (17.6)	2	4	2.3 (7)
Other Clinical (e.g., drug use evaluation, surgery, ambulatory care)	22 (64.7)			
Other Nonclinical (e.g., journal club, staff meetings)	20 (58.8)			

a. Mandatory rotations for CHPRB accreditation
b. Although all institutions indicated which rotations were offered, several did not include the length of rotations, thus, sample size is given in parentheses with average duration.
c. There were two pediatric hospitals which did not indicate that they offered a "pediatric rotation", rather indicating specialized rotations instead (e.g., pediatric oncology).

Table III. Extra-Rotational Services Required of the Resident[a]

Service	Programs Responding		
	Required (%)	Not Required (%)	No Response
Drug Distribution	22 (71)	9 (29)	3
Drug Information	8 (29.6)	19 (70.4)	7
Drug Use Evaluation	4 (14.8)	23 (85.2)	7
Specialty Service (e.g., toxicology, cardiac arrest team, emergency room)	4 (18.2)	18 (81.8)	12

a. Extra rotational services were defined as responsibilities outside of a resident's rotations (i.e., service to the department)

Table IV. Residents' Working Hours

Time	Programs Responding (%)			
	Work Required (%)	Work Not Required (%)	No Response	Time Given Back (If Work Required) (%)
Holidays	11 (35.4)	20 (64.5)	3	8 of 11 (72.7)
Weekends	23 (71.9)	9 (28.1)	2	17 of 23 (73.9)
Evenings	13 (41.9)	18 (58.1)	3	5 of 13 (38.5)

Information for Program Networking

Seventy-five percent of responding residency programs offered formal pharmaceutical care (PC) education to residents. The number offering PC education for staff was lower (44%). Most residency programs had adopted the PC process as a teaching tool (84%), method of evaluation (81%), and basis for patient care (81%). In fact, several programs had incorporated PC-related activities into residency rotations, including intensive care, cardiology, and oncology (Table V). There were plans for further use of pharmaceutical care in many hospitals, in the areas of teaching (63%), evaluation (53%), and patient care (66%).

The residency survey included two questions about residents' learning activities. The first asked if residents were required to teach at a university. Of 33 programs responding, ten required university teaching. The second question requested a description of any "unique" learning activities in which residents participate for clinical skill-building. Sixteen programs responded to this question, listing a variety of learning activities including: PC case presentations, personal development sessions (e.g., communication, team building, time management), precepting pharmacy students on rotation, nursing inservices, arrhythmia and EKG workshops, clinical toxicology service, ambulatory rotation (home visits to patients), staying on call overnight with emergency department medical team, bone marrow biopsy, and prescribing total parenteral nutrition.

The evaluation of residents was very similar. All responding institutions performed evaluations at the end of each rotation, as required by the CHPRB. Additional formal evaluations of residents were performed at varying intervals, depending on the program (Table VI). Residents at most responding institutions were evaluated by oral exam on clinical knowledge and skills (61%), however, most were not examined orally in other instances. For example, only 36% of residents at responding institutions were evaluated by oral exam on drug distribution, 33% on drug information, and 39% on pharmacy administration (Table VII).

Table V. Residency Rotations Involving Pharmaceutical Care Activities (n=31)

	Programs Responding (%)	
Rotation	Number of Hospitals Offering Rotation	Number of Hospitals Offering Rotation with PC Activities (%)
Intensive Care	30	21 (70)
Cardiology	26	19 (73.1)
Oncology	28	18 (64.3)
General Medicine/Internal Medicine	31	18 (58.1)
Infectious Disease	24	17 (70.1)
Geriatrics	27	16 (59.3)
Pediatrics	19	10 (52.6)
Neonatology	18	12 (66.7)
Nephrology	16	6 (37.5)
Psychiatry	19	5 (26.3)
Respirology	6	4 (66.7)
Ambulatory Care	4	4 (100)
Other (e.g., rheumatology, surgery, emergency medicine, palliative care)	22	18 (81.8)

Table VI. Formal Evaluation of Residents (n = 34)

Time Interval	Number of Responding Institutions Performing Evaluations (%)	Evaluation Type		
		verbal (%)	written (%)	self (%)
end of rotation	34 (100)	23 (58.8)	32 (94.1)	34[a] (100)
mid-rotation	24 (70.6)	21 (61.8)	10 (41.7)	13 (54.2)
at a specified interval:	14 (41.1)	13 (92.9)	12 (85.7)	5 (35.7)
• 1 month • 3 months • 3-4 months • 4-6 months • 6 months	• 1 • 3 • 1 • 1 • 8			
end of the year	26 (76.5)	24 (92.3)	16 (61.5)	15 (57.7)
other (e.g., provincial oral assessment, resident weekly diaries)	8 (23.5)	7 (87.5)	7 (87.5)	4 (50)

a. Required by CHPRB

Table VII. Evaluation of Residents By Oral Exam (n = 33)

Rotation	Number of Responding Institutions Evaluating Residents by Oral Exam (%)
Drug Distribution	12 (36.4)
Drug Information	11 (33.3)
Administration	13 (39.4)
Clinical Knowledge/ Skills	20 (60.6)

DISCUSSION

When analyzing the data included in this report, the reader should note certain limitations. First, the survey did not achieve a 100% response rate, thus, information on some Canadian programs is missing. Responses were not received from five CHPRB-accredited programs plus there are six residency programs affiliated with Laval University that were not accredited by the CHPRB at the time of survey distribution (Note: These programs are applying for CHPRB-accreditation in 1996-97). In addition, many institutions did not provide answers to all questions in the survey, which makes analysis somewhat complicated. In recognition of these problems, the number of responding programs has been included in tables where appropriate. Despite these limitations, the survey has fulfilled a number of needs.

This survey was completed with the intent to gather and distribute information to two distinct groups: potential residency applicants and hospital pharmacy residency administrators. As mentioned previously, detailed information on hospital residency programs across Canada is not consistently available. The CHPRB publishes a program directory on an annual basis; however, this publication only includes the name of each program's Director and Coordinator, department telephone and fax numbers, the program's current residents, university affiliation, hospital classification, and a short program description. While more detailed information on local or affiliated programs is often available at the respective schools of pharmacy, a consistent method of sharing program information between geographic regions is lacking. This would not be problematic if it could be assumed that: 1) all potential candidates for residency programs are pharmacy students; and 2) potential applicants choose a program primarily based on locality. While data regarding the number of non-pharmacy student residency applicants are not available, it is acknowledged that this group represents only a small percentage of the applicant pool.

With respect to locality, it is possible that some applicants may limit their applications to local programs because information on non-local programs is not available and the applicants are unfamiliar with other programs. However, a 1990 US study[1] examined the factors which influenced a residency applicant's selection of a specific program and found that proximity to the applicant's current residence was not a significant factor in choosing a program. Seventy-two percent of respondents indicated they would have been willing to move to another city, and 67% stated they would have been willing to move to another state for a residency position. Reputation, accreditation, medical services provided by the institution, and university teaching affiliation were factors given greatest importance by residents. Certainly a significant difference exists between the residency applicant pool in the US compared to Canada; yet, these findings add support for the development of a national reference on hospital residency programs in Canada.

A number of references on residency programs are available in the US and some include Canadian programs. Ohri and Pincus[2] have provided guidance for gathering residency and fellowship information. They refer potential applicants to the American Society of Hospital Pharmacists (ASHP) Residency Directory, the Directory of Residencies and Fellowships published by the American College of Clinical Pharmacy (ACCP), and RESFILE. The ASHP Residency Directory includes information on pharmacy practice and specialized residency programs accredited by the organization. The Directory of Residencies and Fellowships only provides information on programs offered by members of ACCP. RESFILE is a computerized database which allows potential applicants to access and compare pharmacy residencies and fellowships[3] and is available on the Internet.[4] While Canadian residency programs are included in this database, it does not provide descriptive information about the content of these programs.[5] Therefore, there has been no comprehensive reference of Canadian hospital pharmacy residency programs available to potential applicants.

A *Directory of Canadian Hospital Pharmacy Residency Programs* was compiled using the survey results discussed in this paper. The *Directory* contains an entry for each responding program giving general hospital and program information, extra-rotational services and working hours required of the resident, publication history of residents since 1993, required professional conference attendance, and rotation information. There currently are no plans to distribute "hard" copies of the *Directory*. Instead, support is being sought to make the *Directory* available on the World Wide Web at Dalhousie's College of Pharmacy home page. In order to update *Directory* entries and include programs not currently listed in the *Directory*, each hospital residency program will be contacted prior to initiating this Internet resource.

In addition to responding to the needs of potential applicants, data collected through this survey will also allow residency program administrators to compare specific aspects of their programs against others. Points for comparison might include the number of articles written by residents, provision of funding for local and national conference attendance, and requirement of extra rotational services. Administrators may also wish to compare their complement of available rotations to that of other programs. Although this survey did not collect information on each rotation's learning objectives or activities, administrators could contact programs offering rotations-of-interest and request this information.

It is acknowledged that residency stipend and benefits are items of considerable interest when comparing programs; however, these data were not requested because it may have had a negative effect on the response rate. Therefore, while current Canadian benefit information is not available, at least two summaries have been published in the last ten years.[6,7]

The CHPRB, the accrediting body for Canadian hospital pharmacy residency programs, has outlined program standards in the areas of pharmacy practice, administration, and education and research. While the accreditation standards describe certain learning objectives for residents in each of the aforementioned areas, the methods for meeting these objectives are designed by the individual programs and, thus, may vary significantly. Because of this variability, networking between programs is important for sharing of experiences and ideas. A national directory could help facilitate this interchange.

In conclusion, after reviewing the data presented, it appears that much variability exists between hospital residency programs, despite the fact that each of the responding programs is bound to the same standards for accreditation. This variability is understandable and desirable considering each institution has different specialties and employs staff with different strengths. This variance is also likely due to differences in the vision and educational philosophies of individual program administrators. Appropriately, it is the final product of the program that is the focus of CHPRB accreditation standards and not the path in which the product is achieved. But while accreditation standards ensure core skills and experiences, it is recognized that residents will be influenced by the specific activities in which they engage during their program. It is, thus, important to provide information regarding these activities to potential applicants. It is also desirable for programs to share ideas and experiences to improve the overall quality of Canadian hospital residency programs. Presentation of the results of this survey begins to address both of these issues.

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