

Survey of Canadian Oncology Pharmacy Services — The Emergence of a Specialty

Larry Broadfield

ABSTRACT

The provision of pharmacy services to oncology is a substantial component of hospital pharmacy practice at several Canadian hospitals. To determine the scope of such pharmacy services a survey was developed and distributed to 103 hospital pharmacies and 11 ambulatory oncology pharmacies in 1988. There were 72 responses (65%), although only 96 centres were known to offer oncology services (adjusted response = 72 of 96 = 75%). Surveys were distributed and returned in reasonable proportion across the country. Inpatient and outpatient services were reported separately, for size of service offered, and categories of work in which staff were employed. Twenty-four of fifty-seven centres report large inpatient pharmacist services, and 21 of 57 had large inpatient technician services. The ratio of pharmacists to technicians appeared to be about equal, but technicians were less likely than pharmacists to be permanently assigned (one-third vs. one-half permanently assigned). About one-half of both large and small services indicate a desire for increased time for both pharmacists and technicians. Outpatient services were reported by fewer respondents, and the job assignments in this setting were mostly permanent. Manpower usage in both settings is primarily dedicated to drug preparation and distribution, although two-thirds of centres report small clinical services (most centres desired increased clinical services).

Future planning topics ranked improved clinical services and standardization of practice highest. A 91% majority agree that there should be standards for pharmacy practice in oncology pharmacists in Canada. Many factors, including insufficient clinical services, impede specialty development and recognition, but are priority areas for future development.

Key Words: *oncology, clinical services, ambulatory care, manpower, certification, pharmacy practice*

RÉSUMÉ

Au sein de quelques hôpitaux canadiens, l'oncologie est un élément important de la pratique de la pharmacie d'hôpital. En 1988, un sondage fut distribué à 103 pharmacie d'hôpitaux et 11 pharmacie d'oncologie ambulatoire. Il y a eu 72 réponses (65 p.c.), quoique 96 centres seulement étaient reconnus pour offrir un service d'oncologie (réponse ajustée = 72/96 = 75 p.c.). À travers le pays, les sondages envoyés ont été retournés de façon proportionnelle. Les données, pour les services de consultation interne et externe ont été recueillies et analysées séparément; d'après les services offerts de la catégorie de travail des employés. Vingt quatre des cinquante sept centres rapporte un grand nombre de services de pharmacien en consultation interne, et vingt et un sur cinquante sept ont eu un grand nombre de services de technicien en consultation interne. La proportion pharmaciens versus techniciens était égale; cependant les techniciens étaient affectés de façon moins permanente à leur poste (un tiers versus une demi). Un besoin pour du temps supplémentaire, pour les pharmaciens et les techniciens est demandé pour la moitié des services soit grand ou petit. Moins de répondant ont rapportés les services de consultation externe et dans ce cadre les affectations étaient pour la plupart permanentes. Dans les deux cadres, l'utilisation de la main d'oeuvre est dédiée essentiellement à la préparation et la distribution de médicaments, quoique deux tiers des centres rapportent un peu de services cliniques (la plupart des centres désirent une augmentation des services en clinique).

D'après les sujets de la planification pour le futur, une amélioration des services en clinique et la pratique normalisée ont été échelonnés parmi les plus importants. Une majorité de 91 p.c. est en accord avec la mise sur pied de normes de pratique en pharmacie oncologie au Canada. Incluant l'insuffisance des services en clinique, plusieurs facteurs empêchent la reconnaissance et le développement spécialisé, cependant, l'expansion future de ces domaines est considérée prioritaire.

Mots clés: *pharmacie oncologique, services en clinique, soin ambulatoire, dotation, utilisation de la main d'oeuvre, planification, programmes de formation, certification*

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Larry Broadfield, BScPhm, MHSc, Chief Pharmacist, Hamilton Regional Cancer Centre, 711 Concession Street, Hamilton, Ontario L8V 1C3.

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Address correspondence to: Larry Broadfield at the above address.

INTRODUCTION

Oncology pharmacy practice is one component of hospital pharmacy practice at a substantial number of Canadian hospitals. In the 1988 survey of Canadian hospital pharmacies,¹ 166 of 264 respondents identified oncology (i.e. chemotherapy admixture) as a pharmacy service in their setting. Indeed, there are three hospitals and eleven ambulatory clinics in Canada dedicated exclusively to the treatment of cancer patients (Princess Margaret Hospital, Cross Cancer Institute, British Columbia Cancer Agency, Ontario Cancer Treatment and Research Foundation (OCTRF) [9], Tom Baker Cancer Centre and Victoria Cancer Clinic). With the rise of chemotherapy and, more recently, biological response modifier therapy, over the past two to three decades, pharmacy involvement has followed the growth of medical oncology as a fundamental health profession in the treatment of cancer. The information base in this area of health care is increasing at a rate unequalled by any other area.

In Canada, there has not yet been any consensual involvement towards the development of certified specialists within the Canadian Society of Hospital Pharmacists (although the Professional Specialty Groups [PSGs] of Ontario branch have acted as special interest groups for Toronto area-based hospital pharmacists). In the United States, however, the American Society of Hospital Pharmacists (ASHP) has recently begun a movement towards certification of specialists, including oncology pharmacy practitioners.^{2,3,4} On examination of the ASHP Special Interest Groups (roughly equivalent to the PSGs of CSHP — Ontario Branch), the Task Force³

identified an increasing need for specialists as institutional pharmacy practice shifts from a materials-management focus to a clinical focus. The Task Force³ also differentiates between the development of a specialty (e.g. when a sizable number of pharmacists concentrate upon a unique area of knowledge, and educational or training programs are offered in that area) and recognition of a specialty (e.g. when individuals are certified as specialists by demonstration of their qualifications to a credentialing body. A number of authors^{5,6,7} have included the emergence of pharmacy practice specialties as an integral component of future institutional pharmacy evolution. Despite substantial differences between Canadian and American health care systems, we have observed increasing parallelism in pharmacy practice evolution in each country. The need for practice specialties can be predicted in Canada, as well as the United States. It is timely to examine the current status of pharmacy involvement in oncology, and to outline areas for future development in Canada.

METHODS

In 1987, a pilot survey of oncology pharmacy services was distributed to the nine Centres of the OCTRF. Based upon this experience, and consultation with three other oncology pharmacists, a national survey was designed and distributed during the summer and fall of 1988. The survey was distributed to 103 hospital pharmacy departments and 11 ambulatory oncology clinic pharmacies. The survey consisted of, i) a covering letter; ii) an identification section; iii) an inpatient data section (descriptive demographics, total manpower, usage of manpower by category,

adult and pediatric clinical services, and educational and research activities); iv) an outpatient data section (same format as inpatient section); v) a future planning and priorities section; vi) planning of educational programs section; vii) two questions on oncology pharmacy standards; and viii) an application for the Oncology Pharmacy Research Network (to be published elsewhere⁸). The survey was distributed in both English and French versions (French versions to all Quebec centres and one hospital in New Brunswick), with a stamped, addressed return envelope included. Respondents were given a fairly short deadline, followed by one reminder letter to all non-respondents. A second reminder letter was sent to those centres known by the author to be major oncology centres. The survey was closed to response at the end of 1988.

The sample selected for distribution of the survey was compiled from a variety of sources. All major oncology centres, known to the author, or compiled for the author by pharmacist contacts in other provinces began the list. Centres known to be participants with the National Cancer Institute (Canada) as listed by the Clinical Trials Group, and centres who had sent participants to the National Oncology Pharmacy Symposium (1987) filled out the majority of the list (along with pharmacist contact names). Three other categories were included: all pediatric hospitals (as listed in the Canadian Medical Directory), all centres of the OCTRF and their host hospitals and outreach clinics, and all other major hospitals (>500 beds for larger provinces, >350-400 beds for smaller provinces) for those provinces not as well known by the author for oncology involvement.

Distribution by province of surveys sent and returned are illustrated in Figure 1.

Prior to analyzing the responses to survey questions, the pattern of responses was examined, to determine that they were suitably representative. It was intended that there should be respondents from ambulatory oncology centres, hospitals dedicated to oncology, teaching hospitals, pediatric hospitals and other community hospitals which offer substantial cancer treatment. Respondents should also be distributed proportionately across the country, to represent a truly national perspective. It was also hoped that there would be a high response rate, since only 110 surveys were distributed.

Questions on manpower levels and usage were rated by respondents on a six-point scale, provided at the beginning of the survey (Appendix 1). Many of the questions also asked respondents to rate if and how much desire there was to increase beyond the current level of service. Desired increases were also rated on a six-point scale (Appendix 1).

For each question in the survey, a count of responses was tallied. Not every respondent provided analyzable answers to all questions, so data are presented with total responses analyzed for each category. With six possible levels for the size of service, and six more possible levels for desired increase in each service size, there were 36 combinations of size of service and desire to increase. These data were collapsed for analysis into smaller groupings. Size of service is reported as large (one or more Full-Time Equivalent (FTE)), small (<1 FTE) or none currently available. Desired increases from current levels of service are also reported as large (>50% increase),

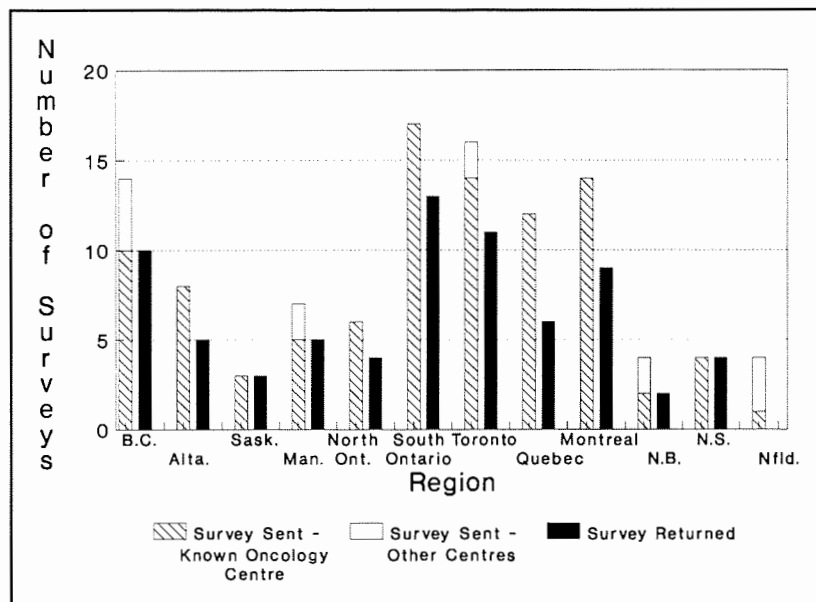


Figure 1: Survey Responses by Region

small (1-50% increase) or no increase (large and small increases are lumped together in the manpower usage figures). Data are collected and analyzed separately for inpatient and outpatient services.

The sections on future planning and priorities, and educational programs were opinion polls, open to additional respondents who wished to provide their thoughts. Responses were ranked and the ranks were weighted (as five down to one) for the five requested choices. For each poll, responses are tabulated by cumulative weighted ranks for each choice. Weighted rankings indicate the relative importance of each option to the group of respondents. Frequency of responses are also listed, to determine which options were chosen most often.

RESULTS

Survey Responses

There were 72 responses to 110 surveys sent for a response rate of 65%. Upon reexamination of the

sample, 14 centres were identified as almost certainly not involved in the provision of oncology services. Response rate to the subgroup of 96 centres known or strongly suspected to provide substantial oncology treatment in Canada was 75%. From this subgroup, there were 11 of 24 non-responders from Quebec, and 8 of 24 non-responders from Ontario. Almost all surveys were completed by the Director or Assistant Director of Pharmacy at each centre.

Four of the respondents provided responses with either confusing answers, substantial missing data or obvious misunderstanding of the questions. These are excluded from the analysis. All 11 of the oncology-dedicated ambulatory clinics responded, but only one of the three cancer hospitals responded. Six of eight Children's hospitals returned the survey (seven of ten, when including the two major Ontario hospitals which also incorporate pediatric oncology services). Excepting the oncology-dedicated hospitals and the lack of any respondents from

Newfoundland (there were no eligible centres in P.E.I.), the predetermined criteria for representativeness would appear to have been satisfied. The results may be considered as representative of oncology pharmacy services in Canada.

Inpatient Services

The descriptive demographics for inpatient respondents included the total number of beds and wards, and the number of beds/wards for adult and pediatric oncology/hematology patients, at each hospital. 42 of 58 respondents were from teaching hospitals, and 44 of 58 reported that they had beds/wards dedicated to oncology patients (one to 105 beds). The distribution of respondents by hospital size is shown in Table I, with most respondents in small-medium sized hospitals (200-600 beds).

Current manpower to inpatient oncology services is illustrated in Figure 2. Usage of that manpower (by category) is demonstrated in Figure 3. For each category of personnel or usage, respondents were also asked if they would change the current manpower, and by how much. Responses to manpower amounts and desired change were taken from standardized scales (given on the survey) and responses were collapsed for this report. A large service is arbitrarily defined as one requiring one or more FTE, a small service is less than one FTE and no service includes the response "part of normal pharmacy operation". A major desired change is defined as >50% increase of time or manpower, a minor increase is one to 50%, and no increase is the same as no change (or a decrease — but this was rarely indicated). Two items of particular interest are shown in Tables II and III. Table II correlates total pharmacist manpower with total pharmacy technician man-

Table I: Frequency by Hospital Size

Hospital Size (Number of Beds)	Number of Respondents
>1000	3
800-1000	7
600-800	9
400-600	17
200-400	20
<200	2
	58

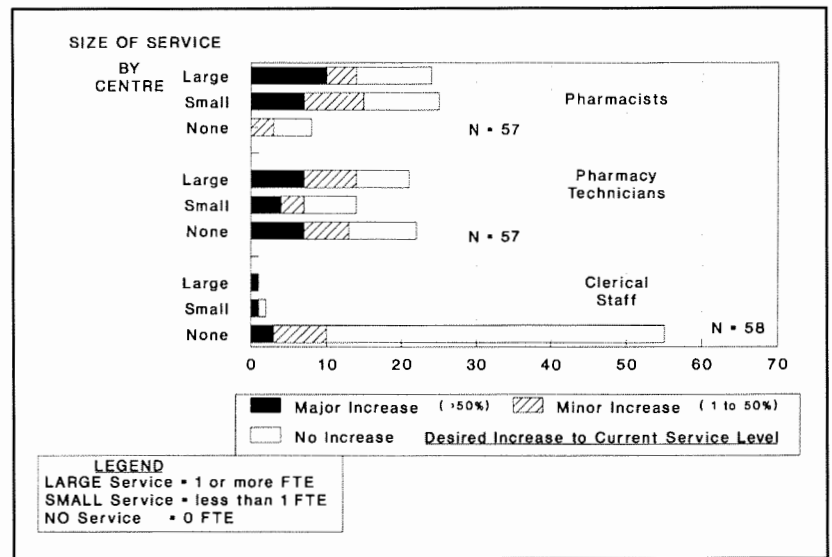


Figure 2: Inpatient Pharmacy Services by Current Size of Service

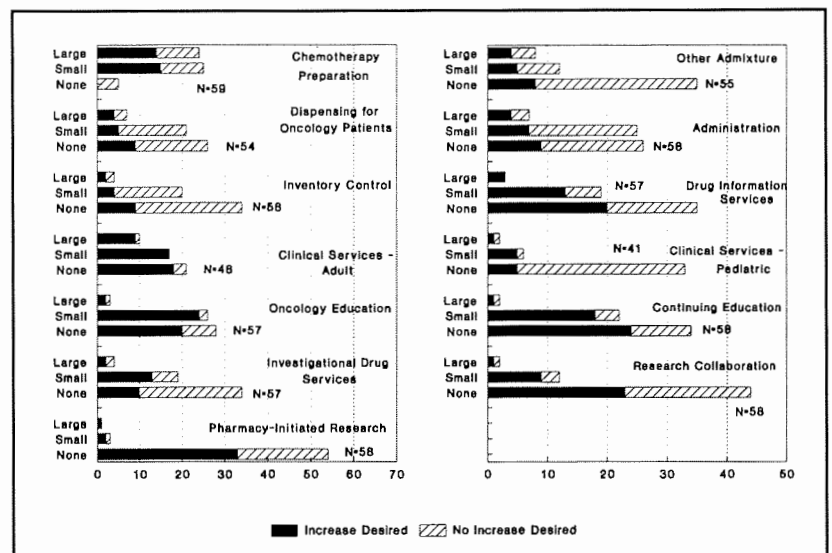


Figure 3: Inpatient Manpower Usage by Current Size of Service

power (to demonstrate staffing ratios in oncology). Table III lists the number of respondents who offer various types of clinical services.

Of 52 centres reporting pharmacist assignments, 21 centres reported permanent pharmacist assignment, 26 centres reported rotation of pharmacists to oncology and five centres reported both permanent and rotation assignments. Of 34 centres reporting technician assignments, 11 reported permanent assignments, 20 reported rotations of technicians and three reported both permanent and rotating staff.

Outpatient Services/Ambulatory Care Services

The section for outpatient (OP) services was identical to the inpatient (IP) services section, except for the descriptive demographic data. Results are in Figures 4 and 5. Numbers are smaller for IP services, since only 22 of 52 respondents indicated that OP pharmacy services are offered independently from the IP services. Most of those with combined IP/OP services (21) referred back to their responses to the IP section. Nevertheless, almost 30 evaluable survey returns are reported. Patient visits per month ranged from two to 4000 for adults and two to 1500 for pediatric patients. Chemotherapy preparation ranged from 100 to 1000 doses per month. 34 of 51 offered outpatient services for oncology only, but most outpatient settings operated with clinic days on four or five days per week (37 vs 11 for two or three days, and four for ≤ one day/week).

Of 28 centres reporting pharmacist staffing, 19 centres indicated permanent pharmacist assignments and nine reported rotation of pharmacists. Of 34 centres reporting technician staffing, eight centres indicated permanent staff,

Table II: Pharmacist/Pharmacy Technician Manpower

Pharmacy Technicians — Size of Service	Number of Respondent Centres			
	INPATIENT Size of Pharmacist Service		OUTPATIENT Size of Pharmacist Service	
	Large	Small	Large	Small
Large	18	3	10	0
Small	2	11	3	8
None	5	10	1	6

Table III: Clinical Services Currently Provided

Clinical Service	Number of Respondent Centres			
	INPATIENT		OUTPATIENT	
	Adult	Paeds	Adult	Paeds
Patient Medication Profiles	44	12	21	7
Ward Rounds	18	7	10	1
Therapeutic Drug Monitoring	29	10	9	4
Patient Counselling	29	5	20	6
Pharmacokinetics	3			
Drug Information	1		1	1
Antibiotic IV Additives	1			
Pain Management/Symptom Control	1		2	
Ambulatory Pump Program			2	
Research				1

(N.B. Paeds = Pediatric)

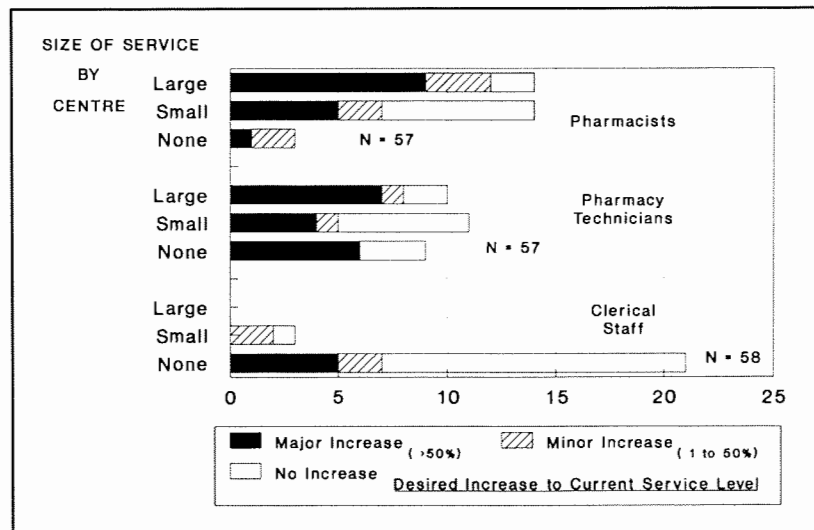


Figure 4: Outpatient Pharmacy Services by Size of Current Service

ten indicated rotations and one indicated both permanent and rotation staffing.

Future Planning and Priorities/Planning Educational Programs

In the section of future planning and educational programs, re-

spondents were asked to rank the five most important items for improvement of pharmacy practice and the five most important areas for future educational topics. Several items were suggested for each part and sufficient room was left for respondents to supply their own

items. This section, unlike the previous two sections was open to as many practitioners as wished to respond. Many centres sent several responses to this section. Also different from the previous sections, respondents were asked for their personal opinion in this section.

Responses to these two opinion polls are shown in Tables IV and V. Items are listed in descending order of weighted ranking, where each response in the highest rank is given a weight of five, second highest rank a weight of four, and so on down to one. Beside each item is the weighted rank and number of respondents who chose that item (at any rank). The third part of this section was two dichotomous questions, which are restated in Table VI. For each question, it can be seen that the majority favour a positive answer, but a much higher proportion favour standards than those who favour certification.

DISCUSSION

On examination of the manpower and usage results, it is obvious that there is a great variety of oncology pharmacy services offered in Canadian institutions. The size of service may correlate well to need, but the need for these services cannot be predicted by a single variable. Large inpatient oncology pharmacy services are found in larger hospitals and/or hospitals with a large number of oncology beds. A better measure might be the number of patient-days per month (or year), but these numbers (specific to oncology) were not attainable from all centres.

Pharmacy Staffing Trends

There were 24 centres reporting one or more FTE's pharmacists in inpatient settings and 21 centres reporting one or more technician staff. Fourteen centres reported

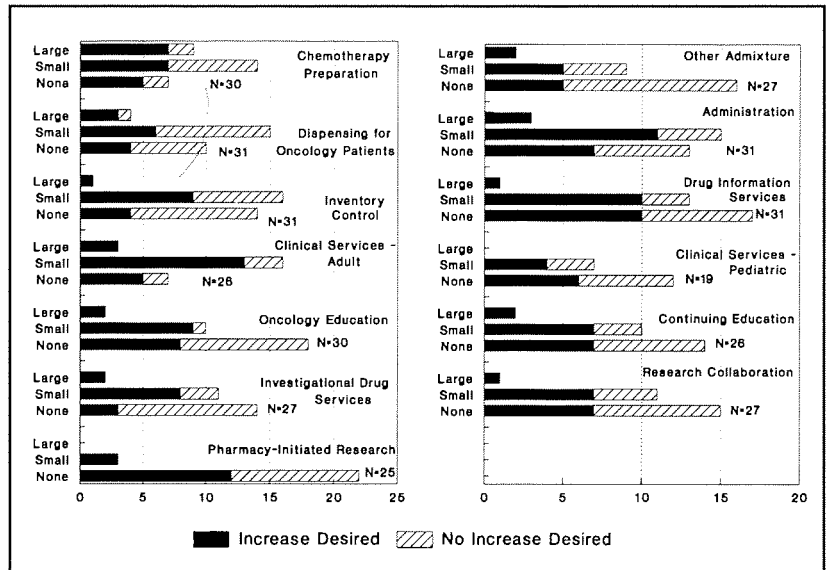


Figure 5: Outpatient Manpower Usage by Current Size of Service

Table IV: Future Planning and Priorities — Ranked Opinions

Item	Weighted Rank	Freq. of Response
* Improved clinical pharmacy services in oncology	262	70
* Standardization of oncology pharmacy practice & procedures	210	56
* Improved oncology drug info services	170	57
* Increased staffing/pharmacist time for oncology	155	43
* Improved staff education/oncology rounds/written materials	148	54
* Patient medication counselling/patient education programs	147	56
* Standardization of pharmacist/technician training for oncology	133	41
* Improved communications/networking among oncology pharmacists	130	48
* Computer data management/oncology patient medication profiling	108	41
* Increased involvement/collaboration in oncology research	63	23
* Improved investigational drug services	44	17
* Standardization of oncology workload measurement system	8	2
* Improved detection of secondary effects of chemotherapy	7	2
* Improved communication with medical/nursing staff	5	2
* Increased emphasis on outpatient services	5	2
* Unit dose preparation to wards	5	1
* IV compatibility information	4	1
* Improved procedures for chemo preparation	4	1
* Increased technician time in oncology	4	1

one or more FTE pharmacists in the outpatient setting and 10 centres reported one or more FTE technicians (Figures 2 and 4). As one might expect, most services large enough to employ \geq one FTE pharmacist also employ \geq one FTE pharmacist technician (18 of 25 inpatients, 10 of 14 outpatients — see Table II). Conversely, small services usually employ little pharmacist time and little or no pharmacy technician time (21 of 24 inpatient and 14 of 14 outpatient). Only five inpatient centres and one outpatient centre report large pharmacist requirements but no technicians. It would appear that most centres maintain approximately even ratios of pharmacists to technicians, with a few employing slightly more pharmacist time for clinical or other professional services (see Table II).

About half of the inpatient pharmacists and two-thirds of the outpatient pharmacists are assigned permanently to the oncology service. Some centres report both permanent and rotating positions, either for complete coverage or variable functions (eg. clinical pharmacists are permanent, but other pharmacists rotate through chemotherapy preparation function). Pharmacy technicians were permanently assigned in fewer centres (about 40% for inpatient and 50% for outpatient services). Although some respondents were from pharmacy departments devoted exclusively to oncology practice, almost all were from departments which offered oncology as part of the pharmacy services. There were too few oncology-dedicated services to significantly skew the numbers of permanent staff.

On the issue of expansion from current services, it appears that respondents from large outpatient

Table V: Planning Educational Programs in Oncology Pharmacy — Ranked Opinions

Item	Rank	Freq.
* Pharmacology/pharmacokinetics of antineoplastic agents (review)	247	73
* Comparative evaluation of new antineoplastic agents	245	76
* Toxicities of anticancer agents & treatment	237	69
* Control of symptoms in cancer patients	205	68
* Review of different types of cancer	173	55
* New modalities in cancer treatment	166	60
* Biological response modifiers — new info	95	41
* Review of treatment protocols	18	6
* Development of quality assurance programs	10	2
* Antibiotics and infectious diseases in cancer	9	2
* New methods of drug delivery	8	3
* IV compatibilities and stabilities of antineoplastic agents	7	2
* Cost control programs	7	2
* Chronopharmacology of antineoplastics	6	2
* Treatment of various cancers	3	1
* Qualitative evaluation of secondary drug effects	2	1
* Unorthodox treatments	1	1

Table VI: Standards and Certification for Oncology Pharmacy Practitioners

Question	Yes	No	Percentage
			Yes
Do you believe that there should be standards specific for oncology pharmacy practitioners (eg. minimum level of skills or knowledge, competency in handling antineoplastics, etc.)?	71	7	91%
Do you believe that there should be a (voluntary) certification for oncology pharmacists, perhaps similar to a mini-residency program?	49	27	65%

services were more inclined to desire further expansion than those from small services (12 of 14 vs. 7 of 14 for pharmacist increases, 8 of 10 vs. 5 of 11 for pharmacy technician increases). Over half of those who wished for expansion to large services were looking for major increases ($>50\%$). Among the smaller services, the split was about one-quarter for major expansion, one-quarter for minor expansion, and one-half for no change. Major increases in pharmacy technician time, where no services are currently available, were called for in 7 of 22 inpatient services and six of nine outpatient services (there were 15 inpatient and seven outpatient services with

some level of pharmacist time, but no pharmacy technician time — Table IV). This trend indicates that most oncology pharmacy services would ideally include at least some support from pharmacy technicians.

Manpower Usage Trends

As expected, the traditional product-oriented distributive role for pharmacy is predominant in oncology services. Chemotherapy preparation was the most common usage of large amounts of manpower for both inpatient and outpatient services (Figures 3 and 5). Likewise, preparation of other parenteral admixtures and dispensing to oncology patients consumed a

great deal of the manpower in both settings. Administration and inventory control combine to form the next largest category of manpower usage, with half the respondents from both inpatient and outpatient services reporting small or large services (one might have expected a higher proportion to answer "part of normal pharmacy operation" in each of these categories).

Clinical services employ pharmacy manpower in about two-thirds of both inpatient and outpatient services. Large clinical services are reported by about one-quarter of the inpatient respondents, and only three outpatient respondents, but a higher proportion of outpatient respondents report small clinical services (<one FTE). The most common clinical activities (Table III) are monitoring patient medication profiles, patient counselling and therapeutic drug monitoring (TDM). Patient counselling is much more common than TDM in outpatient settings, whereas the reverse is true for inpatient centres, (especially pediatric inpatient settings where close monitoring of induction-consolidation regimens is more crucial to patient care).

Drug information services, oncology education, continuing education and investigational drug services are each offered in less than one-half of inpatient and outpatient services, and most respondents report small services for each category. However, the majority of respondents from centres where these services are offered wish to see increases in each category. Research collaboration and pharmacy-initiated research employ the least manpower of any category, but rank about the highest for desired increase (36 of 58 and 15 of 25 for increases respectively to inpatient and outpatient phar-

macy-initiated research, mostly from non-existent current service levels).

Trends in Future Planning and Educational Program Planning

Improved clinical services and standardization of practice and procedures were ranked as the top two priorities for future planning (by a large margin, Table IV). Increases in manpower/time for clinical services were noted by several respondents to the inpatient and outpatient services sections (Figure 3 and 5). Since there were no restrictions to the number of respondents from any centre for the future planning section, the high ranking and large number of respondents favouring improved clinical services may be more representative of the opinions of all pharmacists practising in oncology. Of course, improved clinical services will require additional staffing, and this is ranked as the fourth highest priority for planning. The top ranked priorities appear to match the most popular priorities for other areas of pharmacy practice, including clinical services, standardization of procedures, drug information, continuing education and patient education programs.

Planning of educational programs was added to this section at the request of one consultant to the survey design, since this affords an opportunity to poll for the educational needs of practising oncology pharmacists. Top ranked choices were the drug review topics, namely pharmacology/pharmacokinetics, evaluation of new agents, and drug toxicities. Knowledge-based topics on drug products were ranked substantially higher than non-drug product topics (eg. review of types of cancer, new modalities) or research-ori-

ented topics (eg. biological response modifiers). It would appear that respondents would prefer to learn more about the agents used routinely, than to build upon that base with other new knowledge or applications. Perhaps this is reflective of the fairly low priority given to cancer therapy in most undergraduate programs.

The final part of this section is reported in Table VI. On the issue of standards for pharmacy practice, including level of knowledge/skills and competency at handling the drugs, a convincing majority of respondents (91%) agree that there should be standards. However, a much smaller majority (65%) agree that there should be some form of certification for oncology pharmacy practitioners. Perhaps some of the negative responders feared a return to academia in order to continue their current practice, or perhaps some department heads would prefer not to have specialist staff members in one area but not others. Regardless of the reasons for reduced support, two-thirds of respondents agreed to certification (in principle). These final two questions point the way to the future. If oncology pharmacy is to become a bona fide specialty, practice standards and certification are recognized prerequisites. It is reassuring that these prerequisites are acknowledged by a majority of the 78 respondents to this section.

CONCLUSION

The Survey of Canadian Oncology Pharmacy Services was conducted over the summer and fall of 1988. The purpose of the survey was to describe the state of practice in oncology, and to look at future directions. The respondents appear to be representative, with good levels of response from all regions

of the country and from all types of practice settings (large hospitals, children's hospitals, ambulatory clinics). Response rate from known oncology centres was 75%. There were good numbers of both large and small services among responders. The ratio of pharmacists to pharmacy technicians appeared about equal. Technicians were less likely to be permanently assigned to oncology practice than pharmacists, but one-third to one-half of positions continue to be filled on rotation. Consistent clinical services in oncology, the most highly rated priority for future planning, are difficult to offer when personnel are rotated. About one-half of both large and small services report a desire for increase of both pharmacists and pharmacy technician time.

Usage of manpower is greatest in the area of drug preparation and distribution. Clinical services are offered in two-thirds of responding centres, but are small services at most of these (especially in the outpatient settings). Almost all respondents indicated a desire to increase manpower for clinical services, many of these looking for major expansion. This desire is consistent with the trend for all areas of institutional pharmacy practice to shift towards a patient-care (clinical) focus. The most common clinical activities were medication profile monitoring, patient counselling and therapeutic drug monitoring. Administration and inventory control are small services in most centres, and small drug information, education and research services were offered in less than half of responding centres.

Future planning topics ranked improved clinical services and standardization of practice as the most important priorities for development. Oncology drug topics

were ranked highest among the topics for educational program planning. These rankings again highlight the attributes needed for a clinical focus of pharmacy practice built upon the base of a unique body of knowledge. There is positive consensus that practice should move in this direction.

The final questions act as opinion polls, linking the current state of practice to future directions. A 91% majority agree that there should be standards for pharmacy practice in oncology, and 65% also agree that there should be voluntary certification of oncology pharmacists. These are both prerequisites to be met before oncology practice becomes a recognizable specialty in Pharmacy. Various factors, especially the lack of sufficient clinical services, continue to stand in the road of specialty development and recognition, but these deficiencies are identified at many centres as priority areas for future development. ☒

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Appendix I: Part I — Inpatient (Hospital) Services

For Yes/No questions asked in this survey, circle Y or N for answer. For responses marked Scale A or Scale B, use the following rating scales and enter the appropriate number in the blank space.

Rating Scales**SCALE A (Manpower Requirements)**

1. Major service requiring 2 or more FTE (pharmacists, techs)
2. Large service requiring 1 to 1.9 FTE
3. Small service requiring 0.5 to 0.9 FTE
4. Minor service requiring <0.5 FTE
5. Very minor service (part of normal Pharmacy operation)
6. Service not offered (FTE = Full Time Equivalent)

SCALE B (Desired Change)

1. Increase time/manpower by more than 100%
2. Increase time/manpower by 51 to 100%
3. Increase time/manpower by 1 to 50%
4. No change
5. Decrease time/manpower by 1 to 50%
6. Decrease time/manpower by 50 to 100%

Current and desired services offered — Use ratings scales where noted

1. *How much manpower (total) is devoted to inpatient oncology services?*
(Do not include positions permanently allocated to outpatient services)
 - Pharmacist(s) Current (Scale A) _____; Ideal (Scale B) _____
Are these positions permanently assigned? Y/N; on rotation? Y/N
 - Pharmacy Technicians Current (Scale A) _____; Ideal (Scale B) _____
Are these positions permanently assigned? Y/N; on rotation? Y/N
 - Clerks/Other Current (Scale A) _____; Ideal (Scale B) _____
2. *Of the total manpower, approximately how much is dedicated to each of the following components, and what would you consider to be ideal at present?*
 - Chemotherapy Reconstitution:
Current (Scale A) _____; Ideal (Scale B) _____
(Approximately how many doses per month? _____; or Don't Know _____)
 - Other Parenteral Admixture (for oncology patients — eg. antibiotics, TPN):
Current (Scale A) _____; Ideal (Scale B) _____
(Approximately how many doses per month? _____; or Don't Know _____)
 - Dispensing for Oncology Patients (excluding chemotherapy and parenterals):
Current (Scale A) _____; Ideal (Scale B) _____
(Approximately how many doses per month? _____; or Don't Know _____)
 - Administrative Responsibilities (committee work, upkeep of dispensary statistics, department budgeting, etc.):
Current (Scale A) _____; Ideal (Scale B) _____
 - Inventory Control (including drug acquisition):
Current (Scale A) _____; Ideal (Scale B) _____
 - Drug Information Services: Oncology-Related (total DI service multiplied by proportion of service devoted to oncology);
Current (Scale A) _____; Ideal (Scale B) _____