

Clinical Pharmacy Services

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Introduction

Pharmacists react strongly to those film clips intended to illustrate the practice of pharmacy, featuring a close-up of a hand counting out pills. After all, the emphasis in pharmacy shifted to the patient so very long ago! Clinical pharmacy services form one of the five major components of pharmaceutical practice, together with drug distribution services – or dispensing – education, research and management. While it is true that distributing medication continues to be an important component of the practice of pharmacy, it is disappointing that depicting the clinical role of the pharmacist remains a more difficult feat.

The importance of clinical pharmacy is no longer questioned. A number of studies, albeit mostly descriptive, have assessed the nature, variety, complexity, relevance and impact of clinical pharmacy services. Since our last report, Schumock et al.⁽¹⁾ have published their evaluation of economic studies from 1996 to 2000 on the impact of clinical pharmacy on both hospital and ambulatory care. In particular, they report a positive benefit/cost ratio (ranging from 1.7:1 to 17:1, with a mean of 4.68:1). An assessment by the same authors of studies published from 1988 to 1995 yielded similar results.⁽²⁾

It is worthwhile recalling some positions that have contributed to the promotion of clinical pharmacy. In 2000, the American College of Clinical Pharmacy (ACCP) published its white paper on the role of the pharmacist in the health care system.⁽³⁾ In 2003, the American Society of Health-System Pharmacists (ASHP) published its strategic plan entitled *ASHP 2015 initiative*.⁽⁴⁾ The six main goals and 31 associated objectives are designed in particular to enable pharmacists to help achieve the best use of medications through the safe use of evidence-based methods and available technology, not only in their own healthcare facilities but throughout the health-care network. Legislative amendments are also under consideration in the US that will extend Medicare coverage to clinical pharmacists' services.⁽⁵⁾ In Canada, the Canadian Society of Hospital Pharmacists has published professional standards⁽⁶⁾ for hospital pharmacists practising in health-care facilities, which will help point the way for the development of clinical pharmacy.

This section of the report accordingly profiles clinical pharmacy services in 2003/04 with respect to human resources, documentation of clinical activities, practice models, evaluation of services, the right to prescribe and the priority and service level of clinical pharmacy services.

Staffing for clinical pharmacy

For more than a decade, we have been asking pharmacists to assess what proportion of their time is devoted to each of the components of pharmaceutical practice. Despite the substantial increase in the average number of full-time equivalents (FTEs) of pharmacy staff in healthcare facilities, increasing automation and the development of distribution systems, there has been little change in the proportion of pharmacists' time devoted to clinical services. In 2003/04, respondents reported this proportion to be 38%, compared with 39% in 2001/02 and 38% in 1999/2000. Moreover, these figures are close to those reported in similar surveys conducted in the US.⁽⁷⁾⁽⁸⁾ However, data presented in this report illustrate the evolution of clinical pharmacy services throughout the years in terms of areas of practice and specialization, intensity, documentation, seamless care and prescribing rights.

Bond et al. evaluated the possible link between pharmacists' practices and medication errors.⁽⁹⁾ A key finding was that the number of medication errors per occupied bed per year was 3.15 in facilities in which the pharmacist is "centralized" – works mainly in the pharmacy – compared with 1.93 when the pharmacist is centralized but makes occasional floor visits, and 1.74 when the pharmacist is decentralized and is generally on the floor. In other words, decentralizing pharmacists can help reduce errors by 45%. Improving medication safety is a topical issue to which we have devoted a chapter of this year's report.

- In the 2003/04 survey, 71% of respondents reported FTEs for outpatient clinical services, (Table B1) compared to 76% in 2001/02. The average number of services for which FTEs were reported was 3.9 in 2003/04, compared with 4.0 in 2001/02. This slight drop may be attributable to an increase in the response rate, and the inclusion of a greater number of smaller facilities.
- While 102 of the 144 respondents identified pharmacist FTEs for outpatient clinical services in general or by medical discipline, we based our analysis on 65 of the 102 respondents. The remaining responses were excluded due to inconsistencies in responses to different questions in the survey.
- Among respondents who reported FTE's for outpatient clinical services, the average of reported number of FTEs was 2.73 in 2003/04, and 2.32 in 2001/02. The reported number of FTEs varied with the size of the healthcare facility and teaching status. There were also regional variations: the average of reported FTEs was 3.4 in British Columbia, 1.9 on the Prairies, 2.3 in Ontario, 3.9 in Quebec and 1.5 in the Atlantic Provinces.
- There was generally little change in the average number of FTE's reported for each type of clinic compared with 2001/02. Table B-1 shows the average number of pharmacist FTEs and, in brackets, the absolute number of respondents reporting FTEs for clinical pharmacy services to each category of client. The 14 outpatient sectors for which data was collected are shown in descending order of the average of reported number of pharmacist FTEs per area.
- This year, for the second time, we calculated the ratio of the number of pharmacist FTEs per 10,000 outpatient visits for each clinic for which we had quantitative data on patient visits and FTEs. This type of ratio can be helpful in planning for the number of pharmacists required for a given patient volume. The results show a wide variation, possibly attributable to a number of factors that were discussed in the previous report. The median ratio of pharmacist FTEs per 10,000 patient visits for all outpatient clinics was 0.14 in 2003/04, compared with 0.11 in 2001/02. The median ratios, in descending order, for 2003/04 versus 2001/02, are as follows: DVT/anticoagulants (2.02 vs. 7.19), infectious disease/AIDS (2.00 vs. 3.40) cardiovascular/lipid (1.67 vs. 3.29), diabetes (1.16 vs. 0.38) hematology/oncology (1.06 vs. 1.21), asthma/allergies (0.84 vs. 1.39), geriatric day care (0.61 vs. 1.22), transplants (0.40 vs. 0.39), mental health (0.04 vs. 1.28) and the ER (0.01 vs. 0.03).

Table B-1. Number of Outpatient Clinical Pharmacy Services and Resources Allocated (FTE) 2003/04

Hospitals (n=)	All (144)	Bed Size			Teaching Status	
		100-200 (38)	201-500 (68)	>500 (38)	Yes (56)	No (88)
Respondents reporting FTE for Outpt Clinical Services	102 71%	19 50%	51 75%	32 84%	46 82%	56 64%
Total FTE (n=65)	2.73 (65)	0.86 (10)	1.89 (33)	4.83 (22)	4.23 (30)	1.44 (35)
Average # Diff Services (n=65)	3.9	2.6	3.5	5.0	4.7	3.2
Min	1	1	1	1	1	1
Max	10	6	7	10	10	6
Emergency room	0.65 (30)	0.20 (5)	0.54 (16)	1.10 (9)	1.02 (12)	0.41 (18)
Clinics (by frequency):						
Infectious Disease/AIDS	1.10 (21)	0.53 (2)	0.67 (5)	1.33 (14)	1.12 (19)	0.90 (2)
Haematology - oncology	1.07 (39)	0.55 (3)	0.82 (25)	1.79 (11)	1.57 (18)	0.65 (21)
Renal / dialysis	0.94 (30)	- (30)	0.71 (14)	1.14 (16)	0.82 (18)	1.11 (12)
DVT / anticoagulant	0.82 (23)	0.97 (3)	0.51 (11)	1.16 (9)	1.20 (12)	0.42 (11)
Transplantation	0.65 (6)	- (6)	0.20 (1)	0.74 (5)	0.65 (6)	- (-)
Geriatric Day Care	0.41 (7)	0.05 (1)	0.43 (2)	0.50 (4)	0.50 (4)	0.30 (3)
Cardiovascular / lipid	0.38 (15)	0.22 (3)	0.13 (3)	0.52 (9)	0.66 (7)	0.14 (8)
Diabetes	0.34 (26)	0.18 (3)	0.22 (14)	0.59 (9)	0.52 (12)	0.19 (14)
Neurology	0.30 (2)	- (2)	- (2)	0.30 (2)	0.30 (2)	- (-)
Asthma/Allergy	0.23 (6)	0.10 (1)	- (-)	0.25 (5)	0.25 (5)	0.10 (1)
Pain/Palliative Care	0.20 (10)	0.10 (1)	0.24 (6)	0.13 (3)	0.22 (5)	0.17 (5)
Mental Health	0.13 (13)	0.06 (3)	0.13 (6)	0.20 (4)	0.13 (4)	0.14 (9)
Other	0.66 (19)	0.40 (1)	0.61 (12)	0.78 (6)	0.90 (11)	0.33 (8)

0.00 = average number of FTE's dedicated to clinical services in that sector, consistent responses only

() = Number of respondents reporting FTE for clinical services in that sector

- Sixty-nine per cent of respondents reported FTEs for inpatient clinical services (Table B2) compared with 73% in 2001/02. The average number of services for which FTE's were reported was 5.9 in 2003/04 compared with 5.7 in 2001/02.
- While 100 of the 144 respondents identified pharmacist FTEs for inpatient clinical services in general or by medical discipline, we based our analysis on 70 of the 100 respondents. The remaining responses were excluded due to inconsistencies in responses to different questions in the survey.
- The average of reported number of pharmacist FTEs devoted to inpatient clinical services was 8.3 in 2003/04, and 6.6 in 2001/02. Thus, although a lower percentage of respondents reported FTE's for inpatient and outpatient clinical services compared to 2001/02, the average number of reported FTE's was greater both for inpatients and outpatients, with the greatest increase observed in the inpatient area. The number of FTEs varies with the size of the healthcare facility and its teaching status. There are also regional variations: an average of 7.2 FTEs in British Columbia, 9.1 on the Prairies, 10.9 in Ontario, 6.9 in Quebec and 2.4 in the Atlantic Provinces.
- The increase in the average number of pharmacist FTEs varied depending on the type of clientele. Table B-2 shows the average number of pharmacist FTEs and, in brackets, the absolute number of respondents reporting FTEs for clinical pharmacy services to each category of client. The sixteen inpatient sectors for which we collected data are shown in descending order of the number of pharmacist FTEs per care unit (adult and pediatric).
- This year, for the second time, we calculated the ratio of the number of pharmacist FTEs per 10,000 patient days for each department for which we had quantitative data on patient-days and FTEs. This type of ratio can be helpful in planning for the number of pharmacists required for a given patient volume. The results show a wide variation, possibly attributable to a number of factors that were discussed in the previous report. The median ratio of pharmacist FTEs per 10,000 patient-days was 0.53 in 2003/04, compared with 0.49 in 2001/02, for all hospital patients. The median ratios in descending order, for 2003/04 versus 2001/02, are as follows: pediatric haematology/oncology (2.35 vs. 2.56), pediatric intensive care (1.82 vs. 2.93), adult intensive care (1.53 vs. 1.57), pediatric general medical (1.27 vs. 0.83), adult hematology/oncology (1.24 vs. 1.29), pediatric surgical (0.96 vs. 1.4), pediatric mental health (0.81 vs. 0.99) adult general medical (0.65 vs. 0.53), adult rehabilitation (0.55 vs. 0.48), adult surgical (0.51 vs. 0.45), adult mental health (0.47 vs. 0.52), obstetrics/gynecology (0.42 vs. 0.25), and geriatrics/LTC (0.36 vs. 0.26).

Table B-2. Number of Inpatient Clinical Pharmacy Services and Resources Allocated (FTE) 2003/04

	All (144)	Bed Size			Teaching Status	
		100-200 (38)	201-500 (68)	>500 (38)	Yes (56)	No (88)
Hospitals (n=)						
Respondents reporting FTE for Inpt Clinical Services	100 69%	18 47%	49 72%	33 87%	49 87%	51 58%
Total FTE (n=70)	8.3	1.8	5.4	15.8	12.7	3.9
Average # Diff Services (n=70)	5.9	3.8	5.7	7.3	6.2	5.6
Min	1	2	1	3	1	1
Max	14	8	12	14	14	12
Adult Acute Care						
Adult General Medical units	3.2 (56)	0.8 (10)	1.9 (25)	5.8 (21)	5.0 (26)	1.6 (30)
Adult Surgical units	1.9 (50)	0.4 (7)	1.2 (23)	3.1 (20)	2.8 (26)	0.9 (24)
Adult Intensive Care units	1.4 (50)	0.3 (5)	0.6 (24)	2.5 (21)	2.0 (28)	0.6 (22)
Adult Haem-Oncology units	1.2 (22)	0.3 (1)	0.5 (9)	1.8 (12)	1.5 (14)	0.6 (8)
Adult Mental Health units	0.7 (46)	0.4 (6)	0.5 (22)	1.0 (18)	0.8 (24)	0.5 (22)
Obstetrics/ Gynaecology	0.4 (26)	0.1 (3)	0.5 (13)	0.4 (10)	0.6 (11)	0.3 (15)
Other Acute Care	2.4 (33)	0.6 (3)	1.5 (17)	4.0 (13)	3.9 (17)	0.9 (16)
Pediatrics						
Paediatric General Medical	0.8 (21)	0.4 (3)	1.1 (10)	0.5 (8)	1.3 (11)	0.2 (10)
Paediatric Surgical units	0.4 (7)	- (-)	0.3 (2)	0.4 (5)	0.5 (5)	0.2 (2)
Paediatric Intensive Care	1.1 (14)	1.1 (1)	1.5 (5)	0.8 (8)	1.2 (12)	0.2 (2)
Paediatric Haem-Oncology	1.1 (8)	0.9 (1)	1.7 (3)	0.8 (4)	1.3 (7)	0.3 (1)
Paediatric Mental Health	0.2 (5)	- (-)	0.2 (3)	0.4 (2)	0.4 (2)	0.1 (3)
Non-Acute Care						
Adult Rehabilitation units	0.5 (24)	0.2 (3)	0.5 (11)	0.7 (10)	0.8 (7)	0.4 (17)
Geriatrics / LTC units	0.6 (34)	0.2 (2)	0.5 (18)	0.8 (14)	0.6 (15)	0.5 (19)
Paediatric Rehabilitation	0.2 (2)	- (-)	0.2 (2)	- (-)	0.2 (2)	- (-)
Other Non Acute Care	0.5 (11)	- (-)	0.4 (7)	0.6 (4)	0.6 (6)	0.3 (5)

0.0 = average number of FTE's dedicated to clinical services in that sector, consistent responses only

() = Number of respondents reporting FTE for clinical services in that sector

In 2002, the National Association of Pharmacy Regulatory Authorities (NAPRA) published a bulletin stating that it supported the recognition of specialties in pharmacy. In at least three provinces – British Columbia, Alberta and Quebec – working groups have been set up by the professional associations to consider the advisability of recognizing specialties in pharmacy, in particular to assist in the exercise of the right to prescribe, and in the more efficient organization of health care. Recognition of pharmaceutical specialization will doubtless promote optimum use of pharmacists' services.

Documentation of clinical activities

In 1993, the Canadian Society of Hospital Pharmacists proposed guidelines for the documentation of pharmacists' activities.⁽¹⁰⁾

- Most respondents (79% in 2003/04 compared with 80% in 2001/02) reported that pharmaceutical interventions were documented and recorded (Table B-3). There was little difference in the percentage reporting documentation, regardless of the size of the healthcare facility or its teaching status.
- Surprisingly, almost 20% of respondents who document interventions still do not document their activities in the patient record, which no doubt impairs continuity of care and the multidisciplinary approach.
- Respondents reported an average of 10,815 pharmacokinetic and therapeutic interventions in 2003/04. These have been on the rise for several years: the reported average was 4,195 in 1997/98, 7,505 in 2000/01 and 8,973 in 2001/02. The average number of interventions is greatly affected by the size of the healthcare facility and its teaching status.
- While mergers increased the size of facilities, and thus potentially the total number of interventions per respondent, two ratios dependent on the volume of activity and of pharmaceutical resources also progressed. The number of interventions per admission rose from 0.19 in 1993/94 to 0.64 in 2003/04, while the number of interventions per pharmacist FTE rose from 418 in 1999/00 to 645 in 2003/04.
- Regional differences were also found: an average of 0.51 interventions was reported per admission in British Columbia, 0.61 on the Prairies, 0.81 in Ontario, 0.52 in Quebec and 0.42 in the Atlantic Provinces. The ratio of the reported number of interventions/pharmacist FTE also varies: an average of 356 in British Columbia, 669 on the Prairies, 817 in Ontario, 664 in Quebec and 346 in the Atlantic Provinces. The Society's guidelines notwithstanding, there is no common yardstick recognized by the provincial bodies for measuring pharmacists' clinical activities, and this is true of all the provinces. Despite the absence of such standards, the quantity and quality of descriptive data on the clinical practices of pharmacists in Canada are remarkable.

Table B-3. Clinical Pharmacy Activities - Documentation 2003/04

	All Hospitals (n=)	Bed Size			Teaching Status	
		100-200 (38)	201-500 (68)	>500 (38)	Yes (56)	No (88)
Interventions						
Documented Interventions	114	30	52	32	45	69
	79%	79%	76%	84%	80%	78%
By % of those who document interventions						
In Manual Pharmacy records	57	13	26	18	31	26
	50%	43%	50%	56%	69%	38%
In Computerized Pharmacy records	66	18	29	19	27	39
	58%	60%	56%	59%	60%	57%
Document in Medical Record	90	22	43	25	38	52
	79%	73%	83%	78%	84%	75%
Total Interventions						
# Therapeutic and Pharmacokinetic Interventions Made/ Year (n=67)	10,815	2,747	9,672	21,102	17,147	6,800
Ratios						
# Interventions per Admission (n=58)	0.64	0.44	0.69	0.73	0.82	0.51
# Interventions per Pharmacist FTE (n=63)	645	726	719	439	569	695

Clinical practice models

Most pharmacy departments have a range of distribution systems and clinical practice models. “Pharmaceutical care” means the organized delivery of pharmacotherapeutic services to achieve well-defined therapeutic results. In particular, it means designing, applying and managing a therapeutic care plan of monitoring, prevention and solution of pharmacotherapeutic problems, potential or real. “Traditional clinical pharmacy services” can refer to a range of services based on a medication or a particular pharmaceutical function designed to optimize a given result for the patient; for example pharmacokinetic services, total parenteral nutrition (TPN) monitoring services and so on.

- Seventy per cent of respondents, compared with 66% in 2001/02, reported that pharmacists utilized a pharmaceutical care model within their organization; the average reported percentage of inpatient beds serviced was 30 (Table B-4).
- Eighty eight per cent of respondents, compared with 89% in 2001/02, reported that pharmacists utilized a traditional clinical pharmacy services model within their organization; 53% of inpatient beds were serviced.
- A source of concern is the fact that 81% of respondents, compared with 83% in 2001/02, reported that clinical pharmacy services were not offered to some inpatient clientele; this affected 33% of inpatient beds. Bond et al. have identified key factors in implementing evidence-based clinical pharmacy services. Their model indicates a need to plan a net addition of 14,508 FTEs in the US market, on the current basis of 17,235 FTEs devoted to clinical pharmacy activities, in order to be able by 2020 to offer the five clinical pharmacy services that have the most impact to 100% of inpatients. ^{(11) (12)} In other words, the clinical services workforce must be more than doubled in order to reduce to zero the proportion of inpatients with no access to clinical pharmacy services.
- It appears that continuity of care, or “seamless care”, has lost ground since our last report, with only 28% of respondents reporting an established policy on seamless care, compared to 32% in 2001/02. However, among respondents who reported an established policy for seamless care, the average reported proportion of patients whose information was forwarded to healthcare workers in the community rose from 15% in 2001/02 to 21% in 2003/04. The descriptive data on types of information and types of healthcare providers to which information is provided were not collected in the same way in the last two reports, and thus are not comparable.

Table B-4. Clinical Practice Models and Seamless Care 2003/04

	Hospitals (n=)	All (144)	Bed Size			Teaching Status	
			100-200 (38)	201-500 (68)	>500 (38)	Yes (56)	No (88)
Clinical Practice Model							
Pharmaceutical care		101	21	47	33	50	51
		70%	55%	69%	87%	89%	58%
% of beds serviced (n=101)		30%	30%	27%	33%	35%	24%
Traditional clinical services		126	31	60	35	48	78
		88%	82%	88%	92%	86%	89%
% of beds serviced (n= 126)		53%	56%	55%	46%	49%	55%
Some patients do not receive any clinical services		117	31	53	33	48	69
		81%	82%	78%	87%	86%	78%
% of beds not serviced (n=117)		33%	35%	36%	26%	28%	36%
Seamless Care							
Established Policy for Seamless Care		41	13	13	15	22	19
		28%	34%	19%	39%	39%	22%
% of patients with information transferred to community (n= 41)		21%	31%	18%	14%	16%	26%
Information is provided to (n= 41)							
• community pharmacists		93%	92%	92%	93%	100%	84%
• family physicians		73%	85%	69%	67%	68%	79%
• care centres		39%	15%	62%	40%	50%	26%
• home care providers		54%	69%	54%	40%	45%	63%
• others		15%	8%	23%	13%	18%	11%
Information includes (n=41)							
• medications at discharge		95%	92%	100%	93%	100%	89%
• medications discontinued during stay		68%	77%	54%	73%	86%	47%
• care plan information		56%	54%	69%	47%	55%	58%
• relevant drug / monitoring parameter and lab values		59%	54%	54%	67%	68%	47%
• diagnosis		46%	46%	38%	53%	55%	37%
• other		15%	15%	8%	20%	18%	11%

Evaluation of clinical services

Plan, organize, direct and monitor: traditional schools of management still teach these four key aspects of management. However, given the limited administrative resources in pharmacy – 1.9 FTEs in management, or about 5% of all the FTEs reported – many organizations hesitate or fail to put in place a recurrent, structured, collegial process for evaluating pharmaceutical practice.

- Only 17% of respondents, compared with 20% in 2001/02, reported that pharmacy’s direct patient care services were evaluated by auditing a sample of clinical activities (Table B-5). This proportion is affected by the size of the healthcare facility and its teaching status: a higher percentage of larger facilities and teaching hospitals report that evaluation is done. There were also regional variations; the percentage reporting that evaluation was done was higher in Ontario (24%) and the West (17-19%) than in the East (11-13%).
- Note that respondents reporting that evaluation was conducted indicated that evaluation is most commonly conducted by peers, and is more often retrospective (64%) than prospective (direct observation – 48%, self-evaluation of pharmacists – 36%), with little change from the 2001/02 data.

- Among respondents reporting that evaluation was conducted within their pharmacy departments, we find that the average reported proportion of pharmacists evaluated is 42% in 2003/04, compared with 41% in 2001/02.

A key element of professionalism is the capacity for periodic evaluation of the skills and abilities of the professionals, and the quality and risks of the actions they take. Given the rapid evolution of pharmaceutical practice, it seems necessary to invest in the short term in the evaluation of its various components. In 2003, the Canadian Society of Hospital Pharmacists published its *Professional Standards for Hospital Pharmacy Practice*.⁽¹³⁾ In the Society's view, its standards are established to describe a suitable and desirable level of quality in the practice of pharmacy and in the services provided in a health care facility. The Standards are applicable to any pharmaceutical department that contributes to the efficient, safe and cost-effective delivery of care, and the monitoring of the use of medications. Standards should reflect the professional consensus on what constitutes satisfactory quality in a given department or practice environment. The standards specify in particular the level of quality expected with respect to competence, quality of pharmaceutical services, and evaluation.

Table B-5. Evaluation of Clinical Pharmacy Services 2003/04

Hospitals (n=)	All (144)	Bed Size			Teaching Status	
		100-200 (38)	201-500 (68)	>500 (38)	Yes (56)	No (88)
Evaluation of direct care services by auditing sample of clinical activities	25	4	9	12	17	8
	17%	11%	13%	32%	30%	9%
• peers, e.g., other pharmacists	18	3	6	9	13	5
	72%	75%	67%	75%	76%	63%
• physicians	1	-	-	1	1	-
	4%			8%	6%	
• others	8	1	3	4	4	4
	32%	25%	33%	33%	24%	50%
Method for evaluation (n=25)						
• chart review - retrospective	16	4	5	7	12	4
	64%	100%	56%	58%	71%	50%
• direct observation	12	3	2	7	9	3
	48%	75%	22%	58%	53%	38%
• self-evaluation by pharmacists	9	2	-	7	8	1
	36%	50%		58%	47%	13%
• other	8	1	3	4	3	5
	32%	25%	33%	33%	18%	63%
Evaluated aspects of clinical practice (n=25)						
• patient assessment	15	3	5	7	10	5
	60%	75%	56%	58%	59%	63%
• implementation of objectives and monitoring plan	15	1	6	8	12	3
	60%	25%	67%	67%	71%	38%
• patient counselling and understanding	8	2	1	5	7	1
	32%	50%	11%	42%	41%	13%
• documentation	20	4	4	12	15	5
	80%	100%	44%	100%	88%	63%
• other	2	-	1	1	1	1
	8%		11%	8%	6%	13%
Proportion of pharmacists evaluated (n= 25)	42%	68%	36%	38%	39%	48%

The right to prescribe

It is no longer surprising to hear Canadian hospital pharmacists claiming the right to prescribe medication, either in collaboration with the physician (dependent – with a collaboration agreement and protocol) or independently (in which case the pharmacist is solely responsible in law for the results experienced by the patient). Among the reasons for this interest and the desire to contribute more proactively to pharmacotherapy, we note the following: the dynamics of the drug market (with approximately twenty new active drug substances approved each year in Canada), increasing costs (medication now ranks second among health care costs, after hospital costs), the need to make evidence-based choices, the training required in order to practise pharmacy in a healthcare facility (generally, a 4-year bachelor's degree plus a hospital residency or a master's degree), and the specialization of most pharmacists working in healthcare facilities (whereby many pharmacists who work in facilities choose one or more sectors on which to focus their continuing education and their day-to-day practice).

A number of papers addressing the right to prescribe have appeared since the publication of our last report. In 2003, the American College of Clinical Pharmacy published an updated position statement which provides information on the recognition profile for collaborative drug therapy management in the US context, where the pharmacist's contribution is now widely recognized.⁽¹⁴⁾ The American Society of Health-System Pharmacists published a similar tract in 2004.⁽¹⁵⁾ Kuo et al. published an interesting discussion of the application of collaborative agreements between physicians and pharmacists in group family practices.⁽¹⁶⁾ In Canada, the Canadian Society of Hospital Pharmacists published an information paper⁽¹⁷⁾ and a statement⁽¹⁸⁾ in 2001 on prescribing by pharmacists in healthcare facilities. These publications make it clear that a growing number of pharmacists have access to a dependent or independent right to prescribe.

- Sixty-seven per cent of respondents reported that professionals other than physicians and dentists were authorized to prescribe medication within their organizations, an increase from 57% in 2001/02. (Table B-6). In contrast to the previous report, the percentage varies little with facility size or teaching status. There were wide regional variations: 75% in British Columbia, 81% on the Prairies, 87% in Ontario, 42% in Quebec and 61% in the Atlantic provinces.
- Respondents who indicated that professionals other than physicians and dentists are authorized to prescribe reported that these included pharmacists (66% – an absolute increase from 42 to 63 respondents since the last report), nurse practitioners (47%), midwives (45%) and other professionals (20%). There were also regional variations, doubtless related to the legislation in force in each area. Since professional practice is a provincial jurisdiction, regional differences are to be expected. It should be understood, moreover, that the pharmacy act in a given province does not necessarily apply to pharmacy practised in a hospital setting, which may explain disparities in the right to prescribe within specific regions.
- Lastly, of the respondents who reported the granting of the right to prescribe to professionals other than physicians and dentists, a small proportion (5%) reported that pharmacists were given an independent right to prescribe, but a much larger proportion reported a dependent right (from 13% to 46%, depending on the type of prescription). There was little change reported for most types of prescribing by pharmacists in these healthcare facilities between 2001/02 and 2003/04: dependent, for new therapy (reduced from 20% to 13%); dependent, for dosage adjustments (reduced from 56% to 46%); independent, for new therapy (reduced from 6% to 5%); independent, for dosage adjustments (increased from 15% to 23%); and independent, for lab tests (increased from 20% to 21%). Developments in pharmacists' right to prescribe depend on developments in the regulatory framework, the shortage of pharmacists in the healthcare network, and multiple pressures within organizations.

Table B-6. Prescribing Privileges 2003/04

Hospitals (n=)	All (144)	Bed Size			Teaching Status	
		100-200 (38)	201-500 (68)	>500 (38)	Yes (56)	No (88)
Other professionals prescribe drugs (besides physicians and dentists)	96 67%	23 61%	45 66%	28 74%	41 73%	55 63%
Prescribing rights of other professionals (n=96)						
• Nurse practitioners	45 47%	8 38%	19 42%	18 62%	22 52%	23 43%
• Midwives	43 45%	5 22%	22 49%	16 57%	16 39%	27 49%
• Pharmacists	63 66%	17 74%	27 60%	19 68%	30 73%	33 60%
• Other	19 20%	4 17%	10 22%	5 18%	8 20%	11 20%
Prescribing rights approved for pharmacists (n=96)						
• Independent, for lab tests	20 21%	6 26%	9 20%	5 18%	10 24%	10 18%
• Independent, for dosage adjustments	22 23%	6 26%	8 18%	8 29%	13 32%	9 16%
• Independent, for new therapy	5 5%	1 4%	3 7%	1 4%	3 7%	2 4%
• Dependent, for dosage adjustments	44 46%	12 52%	17 38%	15 54%	19 46%	25 45%
• Dependent, for new therapy	12 13%	3 13%	5 11%	4 14%	6 15%	6 11%

Priority and service level of clinical services

Given limited resources, most pharmacy departments cannot offer the full range of clinical pharmacy services. Since this report first appeared, we have been asking respondents to identify the clinical pharmacy services available within their organizations. There has been remarkable progress in some clinical services- for example: the reporting of drug histories upon admission increased, from 6% in 1985/86 to 64% in 2001/02, and the reporting of pharmacist participation in medical rounds increased from 25% in 1985/86 to 61% in 2001/02. There has been limited progress in other areas- for example, reporting of a program of adverse drug reaction (ADR) monitoring increased from 74% in 1985/86 to 84% in 2001/02. In the absence of recognized definitions for such activities and uniform data collection tools, we have never asked respondents for quantitative data on which to assess the scope of individual categories of clinical activities.

In order to get a more accurate picture of the scope of services available, this year we asked respondents to characterize activities by the extent to which they are offered. A service may be offered systematically (meaning a comprehensive service provided uniformly to all patients who require it), in a targeted way (meaning a service that is targeted to those who need it most), in a limited way (meaning a limited service provided as time and resources allow), or not at all. We took the opportunity to add some services, and restate some others in clearer terms. Respondents were asked to identify the level of service offered for a selection of 21 clinical activities, 10 centrally-delivered and 11 patient-specific. We also asked respondents to rank in descending order (1 for the service with the highest priority and 10 for the one with the lowest) the 10 clinical pharmacy services to which they attach the most importance.

Bond et al. ⁽¹⁹⁾ assessed the possible links between pharmaceutical activities and the results achieved by a healthcare facility, based on a sample of 1,016 hospitals. They found that six clinical pharmacy services were associated with a lower total cost of care: drug use evaluation, drug information, adverse drug reaction monitoring, drug protocol management, medical rounds participation and admission drug histories. According to the abstract, “The results of this study suggest that increased staffing levels of clinical pharmacists and pharmacy administrators, as well as some clinical pharmacy services, were associated with reduced total cost of care in United States hospitals.” Other publications by this author reviewed effects on error rates, impact on mortality and costs. ⁽²⁰⁾⁽²¹⁾

- Respondents chose among their 10 priority clinical services: drug therapy monitoring and evaluation (possible including management by protocol – 68%), medical rounds participation (49%), admission drug histories (46%), drug use evaluation programs (33%), drug information (30%) and drug monitoring (3%). These results may suggest that pharmacists should be reviewing their priorities.
- Interestingly, of the six clinical services identified by Bond et. al. as having a positive effect on results (such as a reduced error rate, reduced mortality, reduction in the cost of medication, reduced overall costs per care event or reduced length of stay), none was reported by more than 70% of respondents as being among the top 10 priorities (Table B-7).
- We have indicated the average ranking assigned to each service; however, this value should be interpreted in conjunction with the number (n) of respondents that attached a priority to the service in question. For example, drug information was ranked at 5.8, but was ranked within the top 10 priorities by only 35 respondents, compared with medication incident reporting and prevention, which had an average ranking of 5.6, but was among the top 10 priorities for 73 respondents.
- The only service reported to be offered comprehensively by at least 50% of respondents was participation in the pharmacy and therapeutics committee (82%). The only targeted service reported to be offered in a proportion of at least 50% was participation in medication counselling (51%). Lastly, two limited services were reported as offered in a proportion of at least 50%: inservice education for other professionals, and ADR monitoring.

Readers interested in comparing the Canadian situation with the prevalence of clinical activities in the US. may be interested in referring to additional publications by Pedersen, Schneider et. al. ⁽²²⁾ and Bond et.al. ⁽²³⁾

Table B-7. Priority and Service Level of Clinical Pharmacy Services 2003/04

Service Description	Service Level				Service Priority		
	Not offered	Compre- hensive	Targeted	Limited	Rank	n*	% in top ten (n=116)
Centrally Delivered							
Clinical Research	60 %	3%	10%	27%	9.1	8	9%
Drug Information	52 %	18%	14%	16%	5.8	35	30%
Drug Use Evaluation	32 %	8%	24%	36%	7.4	37	33%
Formulary Compliance	28 %	14%	22%	36%	7.3	37	34%
Inservice education	10 %	4%	35%	51%	7.9	43	43%
Med Incident reporting/prevention	7 %	34%	25%	34%	5.6	73	69%
P&T participation	2 %	82%	12%	4%	5.9	89	88%
Ethics Review Ctee participation	34 %	46%	7%	13%	8.2	18	20%
Infection Control Ctee participation	23 %	24%	24%	29%	7.8	24	24%
Clinical Trials support	20 %	38%	21%	21%	8.0	38	36%
Patient Specific							
Admission drug histories	71 %	6%	29%	36%	5.0	50	47%
ADR monitoring	10 %	7%	25%	58%	6.5	44	46%
CPR team	85 %	3%	2%	10%	8.3	4	3%
Drug Interaction assessment	2 %	48%	34%	16%	3.8	86	84%
Drug therapy monitoring/evaluation	23 %	17%	42%	18%	2.6	85	76%
Medication Counselling	15 %	6%	51%	28%	4.9	74	68%
Medication rounds	30 %	15%	39%	16%	4.5	64	57%
Patient Education	13 %	6%	48%	33%	6.0	50	49%
Pharmacokinetic monitoring	4 %	32%	49%	15%	4.0	87	83%
Seamless Care	48 %	1%	27%	34%	6.5	32	28%
TPN team participation	36 %	24%	21%	19%	6.3	42	42%
Base: Respondents who provided rating of service level (n=137 to 141)							

*n= number of respondents who ranked 10 services and included this one

Conclusion

On the whole, the 2003/04 data in this report confirm the continuing development of clinical pharmacy in Canada with respect to staffing, for both inpatients and outpatients. By comparison with the 2001/02 data, we see less change with respect to the documentation of activities, practice models, evaluation of services, and the right to prescribe. Lastly, we took a different approach to describing clinical activities this year, in order to document the relative importance assigned to such activities by our respondents.

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