

B - CLINICAL PHARMACY SERVICES

JEAN-FRANCOIS BUSSIERES

INTRODUCTION

Since our last survey, the American College of Clinical Pharmacy (ACCP) has published a new strategic plan, developed a revised definition of clinical pharmacy, and proposed a new set of core competencies of a clinical pharmacist¹. ACCP defines clinical pharmacy as:

“A health science discipline in which pharmacists provide patient care that optimizes medication therapy and promotes health, wellness, and disease prevention. The practice of clinical pharmacy embraces the philosophy of pharmaceutical care; it blends a caring orientation with specialized therapeutic knowledge, experience, and judgment for the purpose of ensuring optimal patient outcomes. As a discipline, clinical pharmacy also has an obligation to contribute to the generation of new knowledge that advances health and quality of life. Clinical pharmacists care for patients in all health care settings. They possess in-depth knowledge of medications that is integrated with a foundational understanding of the biomedical, pharmaceutical, socio behavioral, and clinical sciences. To achieve desired therapeutic goals, the clinical pharmacist applies evidence-based therapeutic guidelines, evolving sciences, emerging technologies, and relevant legal, ethical, social, cultural, economic, and professional principles. In accordance, clinical pharmacists assume responsibility and accountability for managing medication therapy in direct patient care settings, whether practicing independently or in consultation or collaboration with other health care professionals. Clinical pharmacist researchers generate, disseminate, and apply new knowledge that contributes to improved health and quality of life. Within the system of health care, clinical pharmacists are experts in the therapeutic use of medications. They routinely provide medication therapy evaluations and recommendations to patients and health care professionals. Clinical pharmacists are a primary source of scientifically valid information and advice regarding the safe, appropriate, and cost-effective use of medications.”

The data reported in this chapter provides an indication of how well the practice of hospital pharmacy in Canada conforms to this definition.

Each year, the American Society of Health-System Pharmacists (ASHP) publishes a section of its 3-year cycle survey of hospital pharmacy practice in the United States. In 2007, the section on monitoring and patient education² was published and the section on prescribing and transcribing was published in 2008³. Readers are invited to consult these publications to benchmark their clinical pharmacy practice against that reported by US hospitals.

Since 1996, The Canadian Society of Hospital Pharmacists (CSHP) has published numerous documents on clinical pharmacy practice. In 2001, guidelines on the optimization of the practice of pharmaceutical care in the hospital setting were published⁴. In 2001 and 2004, CSHP published statements and information papers on pharmaceutical care⁵, seamless care⁶, continuing competency for hospital pharmacists⁷ and directing the pharmacist's practice toward health outcomes and pharmaceutical care⁸. In 2008, CSHP released a revised version of its 2015 vision, which contains six key goals and 38 objectives (http://www.cshp.ca/programs/cshp2015/index_e.asp). The objectives include measurable implementation targets that CSHP believes can be achieved by Canadian hospitals by the year 2015. The majority of these objectives will only be achieved by 2015 if hospital pharmacists succeed in establishing an appropriate set of clinical pharmacy programs and services within their institution. The last chapter of this report provides data on how hospital pharmacy practice in Canada in 2007/08 measures up against the targets that have been set in CSHP's Vision 2015 document⁹.

In Canada, the CSHP 2015 document includes an objective which states that, by 2015, 100% of new pharmacists entering practice in hospitals and related healthcare settings will have completed a residency program that has been accredited by the Canadian Hospital Pharmacy Residency Board (CHPRB). While some question the need for such a requirement, others argue that the development of optimal clinical pharmacy services in all hospitals and related health-care settings in Canada is most likely to be achieved if pharmacists entering practice have completed this additional training, following the completion of their undergraduate pharmacy degree^{10, 11}. The highest proportion of pharmacists' time in the hospital setting (45% ± 17% in the 2007/08 report) is already being spent in clinical activities vs. 42% ± 19% in drug distribution, 6% ± 4% in teaching, 6% ± 6% in other non-patient care activities, and 1% ± 2% in pharmacy research. This suggests that pharmacists practicing in hospitals and related health-care systems are likely to require more experiential training in the clinical setting than the limited amount of such training that is currently provided in undergraduate pharmacy programs. At the present time, it appears that CSHP has taken the position that completion of an accredited residency program is the best way to insure that new practitioners have the type of training that is required to practice optimally in the hospital setting. It is worth noting that in the United States, where the Doctor of Pharmacy degree has been the entry-to-practice degree offered by all Faculties of Pharmacy for the past decade, there is now a debate as to whether board-certified specialists are necessary for the delivery of high quality clinical services¹².

STRUCTURED PATIENT CARE PROGRAMS

During the 2005/06 Hospital Pharmacy in Canada survey, respondents provided feedback indicating that we needed to more clearly define what we meant by a "patient care program". To address this issue a definition of a "patient care program" was developed and included in the 2007/08 survey. A patient care program was defined as:

"a healthcare delivery system that is formally structured around a group of patients with similar healthcare needs (e.g. child health program, mental health program, critical care program, etc.). There is usually a physician and/or nurse leader/director for a formal patient care program."

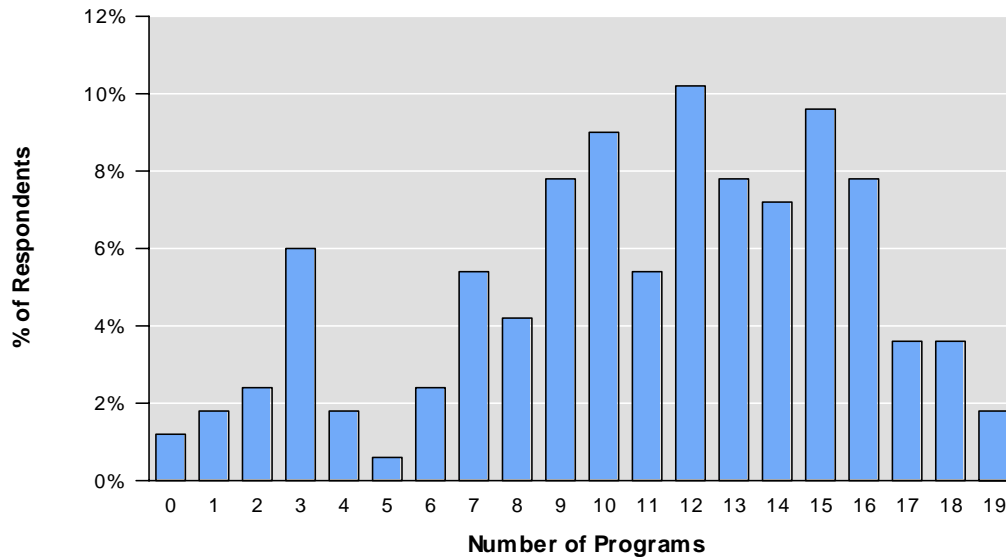
Respondents to this year's survey were asked to review this definition and then indicate if their facility had, or did not have, a formal patient care program for each of a number of patient groupings (e.g. general medicine patients, cardiology patients, dialysis patients, etc.). The inclusion of this definition was expected to reduce the number of respondents who reported that they had certain patient care programs, and the survey results suggest that this did in fact occur.

Because of this change in the way we structured the 2007/08 survey, caution is required when comparing the 2007/08 data, dealing with patient care programs and pharmacist involvement in these programs, with the results from the previous survey. There was also a change made in the qualifying criteria for the 2007/08 survey, which allowed a number of smaller hospitals to participate this year for the first time. This change also makes it more challenging to compare the results of this year's survey with the results reported from earlier surveys.

- Out of a total of 19 patient care programs, the average number of patient care programs that respondents reported having at their facility was 11.0 ± 4.6 programs [range – 0-19] with an average of 10.7 programs in BC, 9.8 programs in the Prairies, 12.2 programs in Ontario, 11.5 programs in Quebec and 8.6 programs in the Atlantic Provinces.

Figure B-1 summarizes the distribution of respondents providing formal patient care programs in 2007/08.

After respondents had indicated that they had a specific patient care program at their hospital, they were then asked to indicate if they had a pharmacist(s) assigned to that program for inpatient and/or outpatient services. Formal assignment of a pharmacist to a patient care program is felt to be a good indicator that a reasonable level of clinical pharmacy support is being provided to a patient care program.

Figure B-1. Respondents Providing Formal Patient Care Programs 2007/08

Base: All respondents (n=166)

PROFILE OF OUTPATIENT CLINICAL PHARMACY SERVICES

In this year's survey, 81% (134/166) of respondents indicated that they had a pharmacist assigned to at least one of the 17 outpatient practice areas included in this year's survey. This is lower than the 92% (130/142) reported in 2005/06. The new 50-bed inclusion criteria might have added small hospitals with no dedicated pharmacists assigned to structured patient care programs. It is probable that pharmacists in smaller hospitals do provide clinical pharmacy services, but in a less structured manner, without pharmacists being assigned to specific patient care programs. Also, some hospitals without formal programs may have indicated that they provided clinical services in 2005/06, before the clarifying definition of a formal program was provided.

- The average number of outpatient programs with an assigned pharmacist was reported by respondents to be 3.0 ± 2.6 programs [range – 0 to 14 programs] with an average of 2.6 programs in BC, 2.2 programs in the Prairies, 3.3 programs in Ontario, 3.5 programs in Quebec and 2.6 programs in the Atlantic Provinces.
- The percentage of hospitals that reported having a pharmacist assigned to a particular outpatient program ranged from a low of 6% for rehabilitation to 78% for haematology-oncology. As described earlier in this chapter, comparisons to earlier survey results must be interpreted cautiously. With that caution in mind, the percentage of respondents who reported that they had a pharmacist assigned to a particular outpatient care program increased from 2005/06 to 2007/08 in the following program areas: emergency increased from 54% (71/132) to 61% (77/126), haematology/anticoagulation increased from 52% (51/99) to 65% (51/78), infectious disease/AIDS increased from 40% (37/92) to 63% (31/49) and transplantation increased from 31% (16/51) to 48% (11/23).
- Among the respondents who reported that they had a pharmacist assigned to a particular outpatient care program, the percentage doing so was usually higher for respondents with teaching affiliation. This was particularly true for clinical pharmacy services to infectious disease/AIDS and emergency.
- Among the respondents who reported that they had a pharmacist assigned to the outpatient component of a patient care program, the percentage doing so was usually higher for respondents from larger bed-size hospitals. This was particularly true for the following outpatient programs: haematology/anticoagulation, infectious disease/AIDS, renal/dialysis, emergency, transplantation, diabetes, cardiovascular/lipid and mental health.
- Regional differences were noted for outpatient pharmacist assignment to particular outpatient care programs. Examples where there was a lower percentage of respondents in a particular region who reported having an outpatient pharmacist assigned to particular patient care programs included:

haematology/oncology - 31% of respondents in the Prairies and 47% of respondents in BC, vs. 78% nationally; renal/dialysis - 39% of respondents in the Prairies vs. 66% nationally; emergency - 40% of respondents in the Prairies, vs. 61% nationally; transplantation - 0% of respondents in the Atlantic provinces, vs. 48% nationally; and diabetes - 13% of respondents in the Prairies and 23% in BC, vs. 46% nationally.

Table B-1 summarizes the profile of pharmacist assignment to outpatient care programs in 2007/08.

Figure B-2 illustrates the number of outpatient programs with pharmacists assigned to the program.

Figure B-2. Respondents Providing Outpatient Clinical Pharmacy Services 2007/08

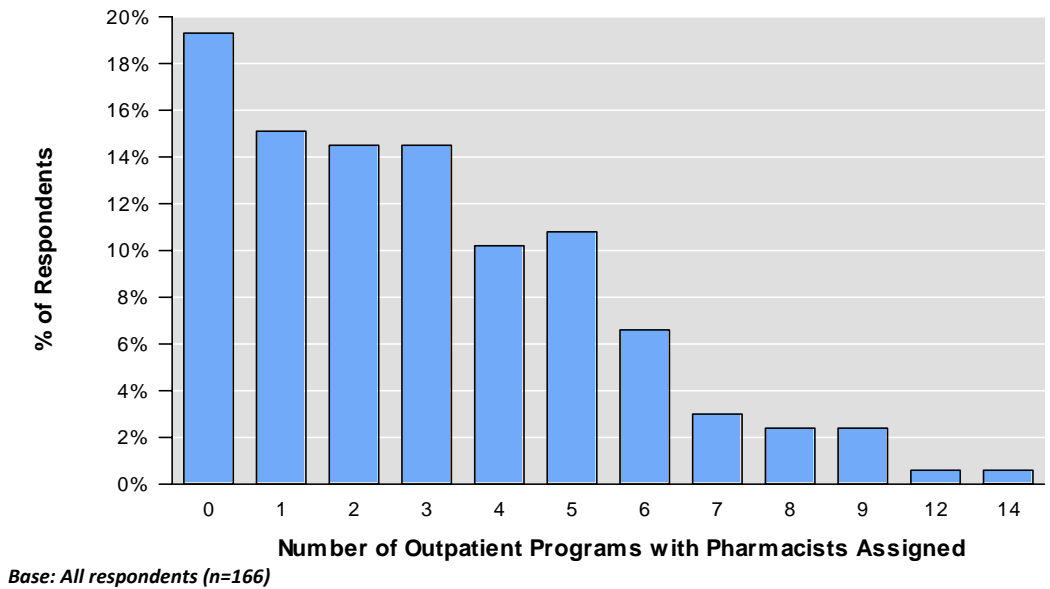


Table B-1 Profile of Pharmacist Assignment to Outpatient Programs 2007/08

| | Bed size | | | | Teaching | | Regions | | | | |
|-----------------------------------|----------|--------|---------|-------|----------|--------------|---------|------|------|------|------|
| | All | 50-200 | 201-500 | > 500 | Teaching | Non-Teaching | BC | Prai | ON | QC | Atl |
| Hospitals (n=) | (164) | (34) | (89) | (41) | (40) | (124) | (22) | (31) | (46) | (50) | (15) |
| Hematology-oncology | | | | | | | | | | | |
| program exists | 111 | 9 | 68 | 34 | 31 | 80 | 15 | 16 | 29 | 43 | 8 |
| pharmacists assigned | 87 | 1 | 58 | 28 | 24 | 63 | 7 | 5 | 26 | 41 | 8 |
| | 78% | 11% | 85% | 82% | 77% | 79% | 47% | 31% | 90% | 95% | 100% |
| Hematology/anticoagulation | | | | | | | | | | | |
| program exists | 78 | 9 | 45 | 24 | 25 | 53 | 11 | 11 | 18 | 34 | 4 |
| pharmacists assigned | 51 | 6 | 25 | 20 | 15 | 36 | 5 | 9 | 12 | 22 | 3 |
| | 65% | 67% | 56% | 83% | 60% | 68% | 46% | 81% | 67% | 65% | 75% |
| Infectious Disease / AIDS | | | | | | | | | | | |
| program exists | 49 | 3 | 25 | 21 | 28 | 21 | 7 | 7 | 21 | 11 | 3 |
| pharmacists assigned | 31 | 1 | 15 | 15 | 23 | 8 | 6 | 6 | 7 | 9 | 3 |
| | 63% | 33% | 60% | 71% | 82% | 38% | 86% | 86% | 33% | 82% | 100% |
| Renal / Dialysis | | | | | | | | | | | |
| program exists | 82 | 9 | 43 | 30 | 29 | 53 | 7 | 18 | 22 | 28 | 7 |
| pharmacists assigned | 54 | 4 | 28 | 22 | 19 | 35 | 7 | 7 | 16 | 20 | 4 |
| | 66% | 44% | 65% | 73% | 66% | 66% | 100% | 39% | 73% | 71% | 57% |
| Emergency | | | | | | | | | | | |
| program exists | 126 | 19 | 71 | 36 | 32 | 94 | 15 | 20 | 40 | 42 | 9 |
| pharmacists assigned | 77 | 6 | 39 | 32 | 23 | 54 | 10 | 8 | 26 | 26 | 7 |
| | 61% | 32% | 55% | 89% | 72% | 58% | 67% | 40% | 65% | 62% | 78% |
| Transplantation | | | | | | | | | | | |
| program exists | 23 | 2 | 8 | 13 | 22 | 1 | 2 | 5 | 6 | 8 | 2 |
| pharmacists assigned | 11 | 0 | 3 | 8 | 11 | 0 | 1 | 4 | 3 | 3 | 0 |
| | 48% | 0% | 38% | 62% | 50% | 0% | 50% | 80% | 50% | 38% | 0% |
| Diabetes | | | | | | | | | | | |
| program exists | 96 | 11 | 57 | 28 | 25 | 71 | 13 | 8 | 25 | 41 | 9 |
| pharmacists assigned | 44 | 2 | 24 | 18 | 10 | 34 | 3 | 1 | 12 | 23 | 4 |
| | 46% | 18% | 42% | 64% | 40% | 48% | 23% | 13% | 52% | 56% | 44% |
| Cardiovascular / lipid | | | | | | | | | | | |
| program exists | 81 | 2 | 48 | 31 | 29 | 52 | 11 | 12 | 30 | 23 | 5 |
| pharmacists assigned | 34 | 0 | 20 | 14 | 10 | 24 | 4 | 4 | 9 | 13 | 4 |
| | 42% | 0% | 42% | 45% | 35% | 46% | 36% | 33% | 30% | 57% | 80% |
| Geriatrics | | | | | | | | | | | |
| program exists | 99 | 9 | 56 | 34 | 27 | 72 | 12 | 14 | 24 | 44 | 5 |
| pharmacists assigned | 21 | 3 | 10 | 8 | 6 | 15 | 2 | 5 | 5 | 6 | 3 |
| | 21% | 33% | 18% | 23% | 22% | 21% | 17% | 36% | 21% | 14% | 60% |
| Asthma / Allergy | | | | | | | | | | | |
| program exists | 57 | 3 | 35 | 19 | 22 | 35 | 8 | 8 | 15 | 22 | 3 |
| pharmacists assigned | 12 | 1 | 6 | 5 | 5 | 7 | 1 | 3 | 3 | 4 | 1 |
| | 21% | 33% | 17% | 26% | 23% | 20% | 13% | 38% | 19% | 18% | 33% |
| Pain / palliative care | | | | | | | | | | | |
| program exists | 107 | 14 | 59 | 34 | 32 | 75 | 16 | 14 | 34 | 33 | 10 |
| pharmacists assigned | 19 | 3 | 9 | 7 | 6 | 13 | 4 | 3 | 5 | 6 | 1 |
| | 18% | 21% | 15% | 21% | 19% | 17% | 25% | 21% | 15% | 18% | 10% |
| Mental Health | | | | | | | | | | | |
| program exists | 120 | 12 | 73 | 35 | 33 | 87 | 15 | 19 | 38 | 39 | 9 |
| pharmacists assigned | 19 | 0 | 9 | 10 | 7 | 12 | 2 | 2 | 9 | 5 | 1 |
| | 16% | 0% | 12% | 29% | 21% | 14% | 13% | 11% | 24% | 13% | 11% |
| General Surgery | | | | | | | | | | | |
| program exists | 121 | 17 | 70 | 34 | 31 | 90 | 16 | 20 | 39 | 38 | 8 |
| pharmacists assigned | 14 | 2 | 7 | 5 | 2 | 12 | 2 | 3 | 7 | 1 | 1 |
| | 12% | 12% | 10% | 15% | 7% | 13% | 13% | 15% | 18% | 3% | 13% |
| Neurology | | | | | | | | | | | |
| program exists | 48 | 0 | 27 | 21 | 24 | 24 | 5 | 8 | 16 | 15 | 4 |
| pharmacists assigned | 4 | 0 | 3 | 1 | 3 | 1 | 0 | 2 | 1 | 1 | 0 |
| | 8% | 0% | 11% | 5% | 13% | 4% | 0% | 25% | 6% | 7% | 0% |
| General Medicine | | | | | | | | | | | |
| program exists | 123 | 17 | 72 | 34 | 33 | 90 | 17 | 20 | 39 | 39 | 8 |
| pharmacists assigned | 9 | 2 | 5 | 1 | 2 | 6 | 1 | 1 | 6 | 0 | 0 |
| | 7% | 12% | 7% | 3% | 6% | 7% | 6% | 5% | 15% | 0% | 0% |
| Gynecology / Obstetrics | | | | | | | | | | | |
| program exists provided | 105 | 11 | 64 | 30 | 27 | 78 | 14 | 13 | 35 | 36 | 7 |
| pharmacists assigned | 7 | 2 | 4 | 1 | 1 | 6 | 2 | 3 | 2 | 0 | 0 |
| | 7% | 18% | 6% | 3% | 4% | 8% | 14% | 23% | 6% | 0% | 0% |
| Rehabilitation | | | | | | | | | | | |
| program exists | 79 | 9 | 47 | 23 | 15 | 64 | 14 | 8 | 31 | 18 | 8 |
| pharmacists assigned | 5 | 0 | 4 | 1 | 2 | 3 | 1 | 1 | 2 | 0 | 1 |
| | 6% | 0% | 9% | 4% | 13% | 5% | 7% | 13% | 7% | 0% | 13% |

PROFILE OF INPATIENT CLINICAL PHARMACY SERVICES

In this year's survey, 92% (152/166) of respondents indicated that they had a pharmacist assigned to at least one of the 18 inpatient programs included in this year's survey. In the 2005/06 report, 99% (140/142) reported having a pharmacist assigned to at least one inpatient program. The new 50-bed inclusion criteria might have added small hospitals with no dedicated pharmacists assigned to structured patient care programs. It is probable that pharmacists in smaller hospitals do provide clinical pharmacy services, but in a less structured manner, without pharmacists being assigned to specific patient care programs. Also, some hospitals without formal programs may have indicated that they provided clinical services in 2005/06, before the clarifying definition of a formal program was provided.

- The average number of inpatient care programs with an assigned pharmacist was reported by respondents to be 6.2 ± 4.2 programs [range of 0-17 programs] with an average of 6.2 in BC, 6.0 in the Prairies, 8.7 in Ontario, 4.4 in Quebec and 5.3 in the Atlantic Provinces.
- The proportion of hospitals that reported having a pharmacist assigned to a particular inpatient program (Table B-2) ranged from a low of 21% for diabetes, to 84% for geriatrics. Bearing in mind the earlier caution related to data comparisons between the 2005/06 and 2007/08 reports, the proportion of respondents that reported having a pharmacist assigned to a patient care program increased from 2005/06 to 2007/08 in the following programs: paediatric/neonatal critical care from 56% (51/91) to 70% (54/77), infectious disease/AIDS from 46% (49/106) to 66% (33/50) and transplantation from 45% (22/49) to 83% (19/23).
- Among the respondents who reported that they had a pharmacist assigned to particular patient care programs, the proportion offering this service was usually higher for respondents from teaching facilities. This was particularly true for the following clinical pharmacy services: adult critical care, general medicine, haematology-oncology, cardiovascular/lipid, paediatric/neonatal critical care, infectious disease/AIDS, mental health, renal / dialysis and asthma/allergy.
- Among the respondents who reported that they had a pharmacist assigned to particular patient care programs, the proportion offering this service was usually higher for respondents from larger bed-size hospitals. This was particularly true for the following clinical pharmacy services: adult critical care, general medicine, pediatric/neonatal critical care, mental health, neurology and renal / dialysis.
- Regional differences were noted, with no specific regional trend except a lower proportion of pharmacists assigned to most inpatient care programs in Quebec. That trend might be related to the higher vacancy rates for pharmacists in that province. In addition, there were regional differences in the percentage of respondents that reported having pharmacists assigned to certain inpatient programs: transplantation - 50% in BC and the Atlantic provinces vs. 83% nationally; haematology-oncology - 57% in BC vs. 72% nationally; and general surgery - 33% in the Atlantic provinces, vs. 63% nationally.

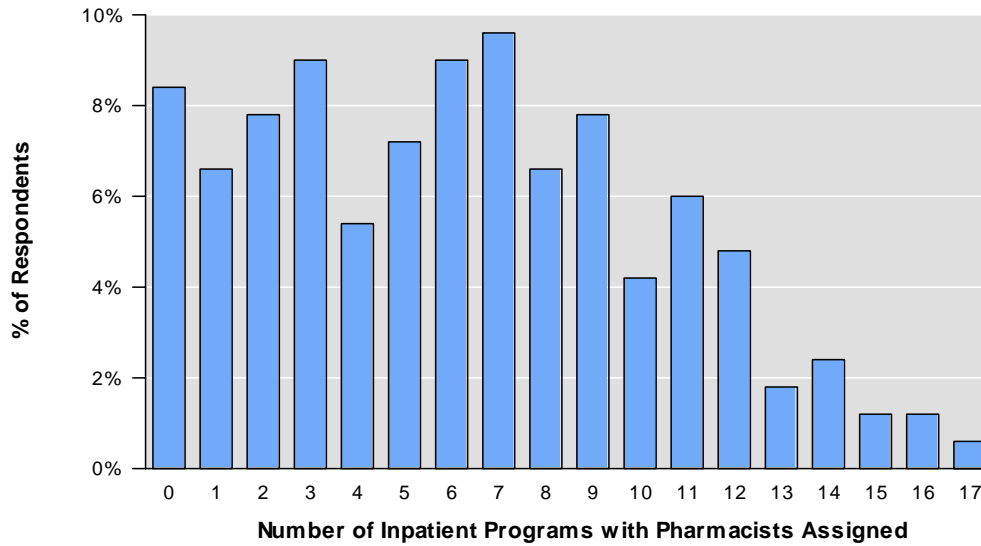
Table B-2 summarizes the profile of pharmacist assignment to inpatient programs in 2007/08.

Table B-2. Profile of Pharmacist assignment to Inpatient Programs 2007/08

| | All | Bed size | | | Teaching | | Regions | | | | |
|-----------------------------------|-------|----------|---------|-------|----------|--------------|---------|------|------|------|------|
| | | 50-200 | 201-500 | > 500 | Teaching | Non-Teaching | BC | Prai | ON | QC | Atl |
| Hospitals (n=) | (164) | (34) | (89) | (41) | (40) | (124) | (22) | (31) | (46) | (50) | (15) |
| Geriatrics | | | | | | | | | | | |
| program exists | 104 | 8 | 61 | 35 | 28 | 76 | 12 | 16 | 25 | 45 | 6 |
| pharmacists assigned | 87 | 3 | 53 | 31 | 25 | 62 | 9 | 13 | 22 | 37 | 6 |
| | 84% | 38% | 87% | 88% | 89% | 82% | 75% | 81% | 88% | 82% | 100% |
| Transplantation | | | | | | | | | | | |
| program exists | 23 | 2 | 8 | 13 | 22 | 1 | 2 | 5 | 6 | 8 | 2 |
| pharmacists assigned | 19 | 2 | 7 | 10 | 19 | 0 | 1 | 4 | 6 | 7 | 1 |
| | 83% | 100% | 88% | 77% | 86% | 0% | 50% | 80% | 100% | 88% | 50% |
| Geriatrics | | | | | | | | | | | |
| program exists | 104 | 8 | 61 | 35 | 28 | 76 | 12 | 16 | 25 | 45 | 6 |
| pharmacists assigned | 87 | 3 | 53 | 31 | 25 | 62 | 9 | 13 | 22 | 37 | 6 |
| | 84% | 38% | 87% | 88% | 89% | 82% | 75% | 81% | 88% | 82% | 100% |
| Adult Critical Care | | | | | | | | | | | |
| program exists | 133 | 22 | 72 | 39 | 31 | 102 | 16 | 24 | 42 | 42 | 9 |
| pharmacists assigned | 108 | 16 | 56 | 36 | 31 | 77 | 15 | 22 | 40 | 24 | 7 |
| | 81% | 73% | 78% | 92% | 100% | 76% | 94% | 92% | 95% | 57% | 78% |
| General Medicine | | | | | | | | | | | |
| program exists | 134 | 20 | 77 | 37 | 34 | 100 | 18 | 25 | 42 | 39 | 10 |
| pharmacists assigned | 103 | 14 | 56 | 33 | 32 | 71 | 15 | 22 | 39 | 19 | 8 |
| | 77% | 70% | 73% | 89% | 94% | 71% | 83% | 88% | 93% | 49% | 80% |
| Hematology-oncology | | | | | | | | | | | |
| program exists | 111 | 10 | 66 | 35 | 32 | 79 | 14 | 18 | 28 | 43 | 8 |
| pharmacists assigned | 80 | 6 | 47 | 27 | 28 | 52 | 8 | 12 | 23 | 29 | 8 |
| | 72% | 60% | 71% | 77% | 88% | 66% | 57% | 67% | 82% | 67% | 100% |
| Cardiovascular / lipid | | | | | | | | | | | |
| program exists | 89 | 3 | 50 | 36 | 31 | 58 | 13 | 13 | 32 | 24 | 7 |
| pharmacists assigned | 64 | 3 | 35 | 26 | 26 | 38 | 10 | 12 | 28 | 9 | 5 |
| | 72% | 100% | 70% | 72% | 84% | 66% | 77% | 92% | 88% | 38% | 71% |
| Ped/Neonatal Critical care | | | | | | | | | | | |
| program exists | 77 | 5 | 44 | 28 | 31 | 46 | 10 | 15 | 34 | 13 | 5 |
| pharmacists assigned | 54 | 3 | 29 | 22 | 26 | 28 | 8 | 9 | 28 | 7 | 2 |
| | 70% | 60% | 66% | 79% | 84% | 61% | 80% | 60% | 82% | 54% | 40% |
| Infectious disease / AIDS | | | | | | | | | | | |
| program exists | 50 | 3 | 25 | 22 | 28 | 22 | 8 | 7 | 21 | 11 | 3 |
| pharmacists assigned | 33 | 2 | 15 | 16 | 21 | 12 | 4 | 4 | 15 | 8 | 2 |
| | 66% | 67% | 60% | 73% | 75% | 55% | 50% | 57% | 71% | 73% | 67% |
| Pain / palliative care | | | | | | | | | | | |
| program exists | 116 | 18 | 62 | 36 | 34 | 82 | 17 | 17 | 35 | 35 | 12 |
| pharmacists assigned | 75 | 12 | 39 | 24 | 22 | 53 | 13 | 11 | 26 | 15 | 10 |
| | 65% | 67% | 63% | 67% | 65% | 65% | 77% | 65% | 74% | 43% | 83% |
| General Surgery | | | | | | | | | | | |
| program exists | 130 | 20 | 75 | 35 | 31 | 99 | 17 | 23 | 43 | 38 | 9 |
| Pharmacists assigned | 82 | 13 | 43 | 26 | 21 | 61 | 12 | 20 | 37 | 10 | 3 |
| | 63% | 65% | 57% | 74% | 68% | 62% | 71% | 87% | 86% | 26% | 33% |
| Mental Health | | | | | | | | | | | |
| program exists | 128 | 16 | 75 | 37 | 34 | 94 | 15 | 23 | 39 | 39 | 12 |
| pharmacists assigned | 77 | 5 | 41 | 31 | 29 | 48 | 9 | 14 | 30 | 15 | 9 |
| | 60% | 31% | 55% | 84% | 85% | 51% | 60% | 61% | 77% | 39% | 75% |
| Rehabilitation | | | | | | | | | | | |
| program exists | 85 | 10 | 52 | 23 | 15 | 70 | 14 | 12 | 33 | 18 | 8 |
| pharmacists assigned | 50 | 6 | 29 | 15 | 9 | 41 | 6 | 9 | 24 | 6 | 5 |
| | 59% | 60% | 56% | 65% | 60% | 59% | 43% | 75% | 73% | 33% | 63% |
| Neurology | | | | | | | | | | | |
| program exists | 49 | 0 | 27 | 22 | 25 | 24 | 7 | 8 | 16 | 14 | 4 |
| pharmacists assigned | 29 | 0 | 14 | 15 | 16 | 13 | 5 | 5 | 13 | 3 | 3 |
| | 59% | 0% | 52% | 68% | 64% | 54% | 71% | 63% | 81% | 21% | 75% |
| Renal / dialysis | | | | | | | | | | | |
| program exists | 86 | 11 | 44 | 31 | 29 | 57 | 8 | 20 | 23 | 28 | 7 |
| pharmacists assigned | 48 | 3 | 27 | 18 | 20 | 28 | 6 | 9 | 17 | 11 | 5 |
| | 56% | 27% | 61% | 58% | 69% | 49% | 75% | 45% | 74% | 39% | 71% |
| Gynecology / obstetrics | | | | | | | | | | | |
| program exists | 110 | 13 | 66 | 31 | 26 | 84 | 14 | 13 | 38 | 37 | 8 |
| pharmacists assigned | 52 | 5 | 31 | 16 | 15 | 37 | 8 | 7 | 29 | 5 | 3 |
| | 47% | 39% | 47% | 52% | 58% | 44% | 57% | 54% | 77% | 14% | 38% |
| Hematology/anticoagulation | | | | | | | | | | | |
| program exists | 76 | 9 | 43 | 24 | 24 | 52 | 10 | 11 | 19 | 32 | 4 |
| pharmacists assigned | 36 | 7 | 21 | 8 | 10 | 26 | 4 | 6 | 11 | 12 | 3 |
| | 47% | 78% | 49% | 33% | 42% | 50% | 40% | 55% | 58% | 38% | 75% |
| Asthma / allergy | | | | | | | | | | | |
| program exists | 57 | 2 | 36 | 19 | 22 | 35 | 8 | 7 | 16 | 23 | 3 |
| pharmacists assigned | 17 | 2 | 9 | 6 | 8 | 9 | 2 | 5 | 7 | 2 | 1 |
| | 30% | 100% | 25% | 32% | 36% | 26% | 25% | 71% | 44% | 9% | 33% |
| Diabetes | | | | | | | | | | | |
| program exists | 98 | 12 | 56 | 30 | 26 | 72 | 13 | 11 | 24 | 41 | 9 |
| pharmacists assigned | 21 | 2 | 11 | 8 | 5 | 16 | 2 | 3 | 6 | 7 | 3 |
| | 21% | 17% | 20% | 27% | 19% | 22% | 15% | 27% | 25% | 17% | 33% |

Figure B-3 illustrates the number of inpatient patient care programs with pharmacists assigned to the program.

Figure B-3. Respondents Providing Inpatient Clinical Pharmacy Services 2007/08



Base: All respondents (n=166)

CLINICAL PRACTICE MODELS

In 2006, a Task Force on a Blueprint for Pharmacy was established to define a vision for pharmacy in Canada and to develop a strategic action plan, or blueprint, for achieving the vision for the profession. Although the Canadian Pharmacists Association played a leadership role in establishing the Task Force, many other pharmacy organizations have joined the effort. The final vision document was published in June 2008¹³, and five working groups are now in place to complete the strategic plan for implementing the vision.

A separate initiative, *Moving Forward: Pharmacy Human Resources for the Future* conducted a series of research studies to investigate and understand the pharmacy human resources challenges facing the Canadian healthcare system. A synthesis report was released in mid 2008 which contained the key findings, observations and conclusions arising from all of the individual research studies. In late 2008, the final report and recommendations of this 3 year study were released. The individual research study reports, the synthesis report, and the final report with recommendations can be accessed at <http://www.pharmacyhr.ca/AboutMovingForward.aspx>.

Among the research projects conducted by *Moving Forward*, one report identified and described innovative models of pharmacy practice that have been emerging in the Canadian health system and comparable jurisdictions.

The *Blueprint for Pharmacy* and *Moving Forward* documents, as well as regulatory changes and other provincial initiatives, are driving changes in the practice of pharmacy. In this section of the report, we examine some of the practice directions that are occurring in hospitals and related healthcare settings across Canada.

Pharmaceutical care refers to an organized model used to deliver comprehensive, patient-specific clinical pharmacy services that are intended to achieve well-defined therapeutic outcomes. Pharmaceutical care involves the design, application and management of a patient-specific care plan by the pharmacist.

- There was a small decrease in the total number of respondents reporting the use of the pharmaceutical care model for the delivery of patient-oriented pharmacy services to inpatients, from 82% (116/142) in 2005/06 to 78% (124/159) in 2007/08. The average reported percentage of inpatient beds serviced with the pharmaceutical care model was 25%. The percentage of hospitals reporting the use of the pharmaceutical care model is higher for teaching hospitals than non-teaching hospitals (97% vs. 72%) and

also higher in hospitals with more than 500 beds than in hospitals with 50-200 beds (95% vs. 59%). The proportion of respondents reporting use of the pharmaceutical care model was highest in Ontario (86%, 38/44) and BC (82%, 18/22).

Traditional clinical pharmacy services refers to the delivery of a range of pharmacy services that are primarily focused on: a) a particular medication (e.g. an anticoagulant management service) or b) a particular pharmaceutical function (e.g. a pharmacokinetic service) that is designed to optimize a given drug therapy result for the patient or c) a particular set of clinical activities (e.g. rounds, medication histories, chart review) designed to provide general pharmacotherapy monitoring and input to the care of all patients or of selected patients within a patient care program.

- The proportion of respondents reporting the use of the traditional clinical pharmacy services model for the delivery of patient-oriented pharmacy services to inpatients has increased from 89% (127/142) in 2005/06 to 94% (149/159) in 2007/08. The average reported percentage of inpatient beds serviced with this model was 44% in 2007/08.
- The proportion of respondents reporting that some patients do not receive any patient-oriented clinical pharmacy services remained essentially the same from the previous survey (80%, 114/142 in 2005/06 compared to 83%, 132/159 in 2007/08). The average reported percentage of inpatient beds not serviced with any clinical service was 31%. The region reporting the highest proportion of beds not serviced (45%) was in the Atlantic Provinces.

Table B-3 summarizes the types of clinical pharmacy services by clinical practice model.

Table B-3 Clinical Pharmacy Services – Clinical Practice Models 2007/08

| | All | Bed size | | | Teaching | |
|---|-------|----------|---------|------|----------|--------------|
| | | 50-200 | 201-500 | >500 | Teaching | Non-Teaching |
| Hospitals (n=) | (159) | (34) | (86) | (29) | (39) | (120) |
| Pharmaceutical Care model used | 124 | 20 | 67 | 37 | 38 | 86 |
| | 78% | 59% | 78% | 95% | 97% | 72% |
| % of beds serviced | 25% | 18% | 26% | 30% | 45% | 19% |
| Traditional clinical pharmacy services model used | 149 | 30 | 82 | 37 | 34 | 115 |
| | 94% | 88% | 95% | 95% | 87% | 96% |
| % of beds serviced | 44% | 50% | 42% | 46% | 35% | 48% |
| Some patients do not receive any clinical services | 132 | 26 | 72 | 34 | 32 | 100 |
| | 83% | 76% | 84% | 87% | 82% | 83% |
| % of beds not serviced with either model | 31% | 33% | 32% | 25% | 21% | 34% |

EVALUATION OF CLINICAL PHARMACY SERVICES

The evaluation of pharmacy services is increasingly being recognized as a necessary component of the practice of Pharmacy. Many external standard-setting organizations (e.g. Accreditation Canada, certification boards, regulatory authorities, professional associations, etc.) are driving this through their standards, accreditation processes and licensing requirements. The high response rate and participation in this Canadian hospital pharmacy survey shows the willingness of a majority of directors of pharmacy to document, benchmark, and evaluate the level of their practice. Although the evaluation of direct patient care pharmacy services continues to be limited, it is growing.

- There was an increase in the proportion of respondents reporting the evaluation of the provision of direct patient care pharmacy services from 20% (29/142) in 2005/06 to 31% (51/163) in 2007/08
- For hospitals reporting that they evaluate the provision of direct patient care pharmacy services in their facility, four aspects of clinical practice were evaluated by respondents: documentation (84%,41/51), implementation of objectives and development of a monitoring plan (71%,35/51), patient assessment

(51%, 25/51) and patient counselling and understanding (45%,22/51). The proportions were similar in 2005/06.

- Three methods for conducting the evaluation were reported by respondents: retrospective chart review (78%, 40/51), direct observation (57%, 29/51) and self-evaluation by pharmacists (53%, 27/51).
- For hospitals reporting the evaluation of the provision of direct patient care pharmacy services, the proportion of pharmacists who were evaluated was 61% in 2005/06 vs. 63% in 2007/08.
- The evaluation of direct patient care pharmacy services was reported more often by respondents in teaching hospitals than non-teaching hospitals (48% vs. 26%) and larger bed-size hospitals (39% in hospitals with more than 500 beds vs. 32% in hospitals with 201-500 beds, vs. 21% in hospitals with 50-200 beds).

Table B-4 summarizes the evaluation of clinical pharmacy services.

Table B-4. Evaluation of Clinical Pharmacy Services 2007/08

| | All | Bed size | | | Teaching | |
|---|-----------|----------|-----------|-----------|-----------|--------------|
| | | 50-200 | 201-500 | >500 | Teaching | Non-Teaching |
| Hospitals (n=) | (163) | (34) | (88) | (41) | (40) | (123) |
| Evaluation of direct care services by auditing sample of clinical activities | 51 31% | 7 21% | 28 32% | 16 39% | 19 48% | 32 26% |
| Evaluation is done by: (n=) | (50) | (7) | (27) | (16) | (19) | (31) |
| Pharmacy managers | 23 46% | 4 57% | 15 56% | 4 25% | 9 47% | 14 45% |
| Pharmacy practice leaders | 26 52% | 3 43% | 15 56% | 8 50% | 13 68% | 13 42% |
| Peers (e.g. other pharmacists) | 26 52% | 4 57% | 15 56% | 7 44% | 13 68% | 13 42% |
| Physicians | 7 14% | 2 29% | 4 15% | 1 6% | 5 26% | 2 7% |
| The pharmacists themselves | 20 40% | 3 43% | 12 44% | 5 31% | 8 42% | 12 39% |
| Others | 9 18% | 2 29% | 3 11% | 4 25% | 4 21% | 5 16% |
| Method for evaluation : (n=) | (51) | (7) | (28) | (16) | (19) | (32) |
| Chart review – retrospective | 40 78% | 6 86% | 21 75% | 13 81% | 15 79% | 25 78% |
| Direct observation | 29 57% | | 17 61% | 8 50% | 9 47% | 20 63% |
| Self-evaluation by pharmacists | 27 53% | 5 71% | 13 47% | 9 56% | 9 47% | 18 56% |
| Other | 11 22% | 0 0% | 7 25% | 4 25% | 2 11% | 9 28% |
| Evaluated aspects of clinical practice: (n=) | (49) | (7) | (28) | (14) | (17) | (32) |
| Patient assessment | 25 51% | 4 57% | 13 46% | 8 57% | 10 59% | 15 47% |
| Implementation of objectives and monitoring plan | 35 71% | 6 86% | 18 64% | 11 79% | 14 82% | 21 66% |
| Patient counselling and understanding | 22 45% | 3 43% | 11 39% | 8 57% | 8 47% | 14 44% |
| Documentation | 41 84% | 5 71% | 23 82% | 13 93% | 16 94% | 25 78% |
| Other | 6 12% | 0 0% | 4 14% | 2 14% | 2 12% | 4 13% |
| Proportion of pharmacists evaluated | 63% | 55% | 68% | 55% | 59% | 65% |

CLINICAL PHARMACY COMPETENCIES

In 2008, The American College of Clinical Pharmacy (ACCP) published a strategic plan that summarizes their core ideology, envisioned future, core purpose and mission, and critical issues for the organization and the profession¹⁴. One of the key goals identified by ACCP is the appropriate education of the clinical pharmacy workforce. To attain that goal, the College has established five key competencies for clinical pharmacists that are consistent with their revised definition of clinical pharmacy. An ACCP task force has developed a complete set of competency statements for the clinical pharmacist. This section of the chapter addresses the clinical competencies of pharmacists.

In Canada, the Canadian Council for Accreditation of Pharmacy Programs (CCAPP) has the responsibility for evaluating the quality of pharmacy professional degree programs in Canadian universities and for promoting the continued improvement of such programs. CCAPP has developed accreditation standards for the first professional degree in pharmacy, awarded as either the baccalaureate or doctor of pharmacy degree¹⁵. In Quebec, the Faculty of Pharmacy at l'Université de Montréal started its new doctor of pharmacy program (Pharm.D.) in August 2007. This new program is based on six overarching competencies - professionalism, communication, team work/interdisciplinary collaboration, scientific reasoning/critical thinking, autonomous learning, and leadership) and three specific competencies (e.g. pharmaceutical care, health promotion and prevention and operational/practice management). While knowledge and skills are important to educate a competent pharmacist, universities now also embrace the teaching and evaluation of a pharmacist's competencies.

In 2003, CSHP adopted and published its professional standards for hospital pharmacists.

"Hospital Pharmacy is a unique practice environment for pharmacists. Pharmacy practice in health systems is distinguished by the complexity of the medication-use process, intensity of medication use, close collaboration of pharmacists with other healthcare professionals, focus on improving patient outcomes, pharmacist access to patient information, compliance with professional standards of practice, and specialization. Five standards have been developed: 1) professional accountability and continued competence, 2) provision of quality services, 3) evaluation, application and provision of unique knowledge, 4) patient advocate and 5) educator".

Again, these competencies should be considered in planning and evaluating clinical pharmacy services.

Based upon the clinical pharmacist competencies proposed by ACCP, respondents to this year's survey were asked, for the first time, to rank in descending order (with 1 being the highest priority and 5 being the lowest priority) the importance that their pharmacy department attaches to each of the clinical pharmacist competencies.

- The 31% (37/163) of respondents who evaluate the provision of pharmacy direct patient care services by auditing a sample of clinical activities, provided a complete ranking of competencies.
- Respondents reported a higher priority (lower average) for clinical problem solving, judgment and decision making (average 1.4 ± 0.7), therapeutic knowledge (2.4 ± 1.9) and communication and education (3.2 ± 1.2), three competencies that are relevant to direct patient care activities. Respondents reported a lower priority (higher average) for the management of patient populations (3.9 ± 1.3) and for medical information evaluation and management (4.1 ± 0.9), two competencies that relate more to indirect patient care activities.
- Regional differences were noted with different scores from Quebec where respondents reported more emphasis on the management of patient populations (2.6 ± 1.5 in Quebec vs. 3.9 ± 1.3 nationally) and therapeutic knowledge (1.9 ± 1.0 in Quebec vs. 2.4 ± 1.9 nationally).
- No major differences were observed between hospitals of different bed size or teaching vs. non-teaching status.

Table B-5 summarizes the ranking of clinical pharmacist competencies.

Table B-5. Ranking of Clinical Pharmacy Competencies 2007/08

| | All | Bed size | | | Teaching | |
|--|-----------|-----------|-----------|-----------|-----------|--------------|
| | | 50-200 | 201-500 | >500 | Teaching | Non-Teaching |
| Hospitals (n=) | 37 | 7 | 17 | 13 | 16 | 21 |
| Clinical problem solving, judgment and decision making | 1.4 ± 0.7 | 1.0 ± 1.6 | 1.0 ± 1.3 | 1.0 ± 1.3 | 1.0 ± 1.3 | 1.0 ± 1.4 |
| Therapeutic knowledge | 2.4 ± 1.9 | 2.4 ± 1.0 | 2.5 ± 0.7 | 2.3 ± 1.0 | 2.6 ± 0.8 | 2.3 ± 0.9 |
| Communication and education | 3.2 ± 1.2 | 3.3 ± 1.3 | 3.2 ± 1.3 | 3.2 ± 1.1 | 3.3 ± 1.3 | 3.2 ± 1.2 |
| Management of patient populations | 3.9 ± 1.3 | 3.9 ± 1.7 | 4.0 ± 1.4 | 3.8 ± 1.0 | 3.7 ± 1.6 | 4.1 ± 1.0 |
| Medical information evaluation and management | 4.1 ± 0.9 | 3.9 ± 0.7 | 3.9 ± 0.8 | 4.4 ± 1.0 | 4.1 ± 0.8 | 4.1 ± 0.9 |

Base: Respondents who evaluate the provision of pharmacy direct patient care services by auditing a sample of clinical activities and provide complete rankings of competencies [scoring: top rank = 1, lowest rank = 5]

PRESCRIBING RIGHTS

In Canada, the *Food and Drug Act* and provincial pharmacy acts define the licensed practitioners that can prescribe drugs. Pharmacists are drug experts and their right to prescribe independently or dependently has changed and evolved in the last decade. According to the *Food and Drug Act*, drugs can either be dispensed following a prescription of a licensed practitioner (e.g. depending on provincial legislation- physician, dentist, midwives, podiatrists, optometrists, nurse practitioners, extended-practice nurses, veterinary practitioners) when included in Schedule F of the *Food and Drug Regulations*, or without a prescription when listed in certain other schedules. CSHP's most recent publication on pharmacist prescribing rights within a healthcare facility was published in 2001. This section describes the evolution of prescribing rights for hospital pharmacists in Canada.

Independent prescribing rights refer to prescribing rights that are granted to a healthcare provider by the legislation governing their own profession, with or without restrictions on the extent of those prescribing rights (i.e. the legislated right for a pharmacist to prescribe, often involving a set of requirements that a pharmacist must meet in order to be able to do so). Generally speaking, independent prescribing rights for pharmacists cover drugs contained in Schedule F of the *Food and Drug Act*.

Dependent prescribing rights refer to prescribing rights that are delegated by a legally recognized prescriber to another class of health professional that does not have the legal right to independently prescribe (e.g. delegation of a physician's prescribing rights to a pharmacist, usually based on a well-defined protocol to which the pharmacist must conform). Pharmacist dependent prescribing generally refers to prescribing that occurs within the context of a collaborative relationship between a pharmacist and a physician.

In May 2008, Marie Berry¹⁶ published an update on prescribing authority in Canada in her Canadian Pharmacy Law book. Based on her analysis of the legislation across Canada, she reported that pharmacists can prescribe, once trained and certified, in British Columbia, Alberta, Saskatchewan and Quebec. No details are provided regarding whether this refers to dependent or independent prescribing authority. In November 2008, Sumeet Sidhu published a similar update in the Pharmacist Letter¹⁷. According to that report, independent prescribing rights were granted to Alberta pharmacists in April 2007. In British Columbia, a new legislative change will allow pharmacists to modify prescriptions starting in January 2009. In Saskatchewan, the College of Pharmacists has drafted a position statement for pharmacist prescribing authority. In Manitoba, legislation has been passed, but not yet proclaimed, that would allow extended-practice pharmacists to prescribe certain drugs independently. In Ontario, an expanded scope of practice for pharmacists is being discussed. In Quebec, pharmacists may prescribe if a physician has written a prescription directing that the pharmacist may do so. In Nova Scotia, pharmacists can prescribe certain drugs independently. Discussions continue in other provinces. These updates show that there are important provincial differences in terms of the prescribing rights that have been granted to pharmacists. In the United States, the most recent survey of pharmacist prescribing practices was published in 2006 by Thomas et al¹⁸.

The 2007/08 survey included a number of questions related to pharmacist prescribing rights.

- There was an increase in the number of respondents reporting that pharmacists have prescribing rights approved within their hospital, from 46 % (66/142) in 2005/2006 to 61% (99/163) in 2007/08.
- Regional differences were noted. Overall, the total number of pharmacists having prescribing rights approved within their hospital was lower in the Atlantic Provinces (38%, 6/16) and Prairies (43%, 13/31) and above average in Ontario (63%, 29/46), Quebec (67%, 33/51) and BC (82%, 18/22) in 2007/08. For hospitals reporting prescribing rights approved for pharmacists within their hospitals (61%, 99/163), there was no change or only small variations in the different types of prescribing rights approved for pharmacists. Dependent prescribing for dosage adjustment is by far the most common prescribing right granted to pharmacists and was reported by 79% (78/99) of respondents in 2007/08 and 79% (52/56) of respondents in 2005/2006. Dependent prescribing for lab tests was reported by 68% (67/99) in 2007/08, but was not included in the survey in 2005/06. Dependent prescribing for new therapy was reported by 49% (48/99) in 2007/08, up from 42% (28/66) in 2005/06.
- Independent prescribing rights for lab tests was reported by 33% (33/99) in 2007/08, down from 41% (27/66) in 2005/06. Independent prescribing rights for dosage adjustment was reported by 24% (24/99) in 2007/08, down from 30% (20/66) in 2005/06. Independent prescribing rights for new therapy was reported by 6% (6/99) in 2007/008 and 6% (4/66) in 2005/06. The scope of pharmacist prescribing rights appears to be slowly expanding or consolidating across the country.
- Regional differences were noted for dependent pharmacist prescribing rights with the highest percentage reported by respondents in Ontario.
- Regional differences were noted for independent pharmacist prescribing rights with the highest percentage reported by respondents in BC.
- Among the respondents who reported prescribing rights approved for pharmacists, the proportion of respondents with different types of prescribing rights was higher in teaching hospitals and in larger hospitals.
- For hospitals reporting dependent prescribing rights approved for pharmacists, the average number of arrangements/protocols for pharmacists was 3.7 ± 2.8 (range 0-15, median 3.0) per respondent
- For hospitals reporting prescribing rights approved for pharmacists, the respondents were asked to check each American Hospital Formulary System class where at least one drug in that class has been included in one or more of the arrangements/protocols governing dependent pharmacist prescribing. The most frequently reported AHFS classes in which this occurred were: anti-infective agents (76%,69/91), blood formation, coagulation and thrombosis (66%,60/91), electrolytic, caloric and water balance (45%,41/91), gastrointestinal drugs (43%,39/91), cardiovascular drugs (31%,28/91), and central nervous system agents (28%, 25/91). Regional differences were noted with higher percentages in BC for most drug classes.

Table B-6 summarizes the prescribing rights for pharmacists.

Table B-6. Prescribing rights for pharmacists 2007/08

| | All | Bed size | | | Teaching | |
|--|----------------------|---------------------|----------------------|----------------------|----------------------|----------------------|
| | | 50-200 | 201-500 | >500 | Teaching | Non-Teaching |
| Hospitals (n=) | (163) | (34) | (88) | (41) | (40) | (123) |
| Prescribing rights have been approved for pharmacists within the hospital | 99 61% | 10 29% | 56 64% | 33 81% | 29 73% | 70 57% |
| Type of prescribing rights approved for pharmacist : (n=) | (163) | (34) | (88) | (41) | (40) | (123) |
| Independent, for lab tests | 33 33% | 3 30% | 19 34% | 11 33% | 12 41% | 21 30% |
| Independent, for dosage adjustment | 24 24% | 1 10% | 14 25% | 9 27% | 6 21% | 18 26% |
| Independent, for new therapy | 6 6% | 1 10% | 1 2% | 4 12% | 3 10% | 3 4% |
| Dependent, for lab tests | 67 68% | 6 90% | 39 70% | 19 58% | 16 55% | 51 73% |
| Dependent, for dosage adjustment | 78 79% | 10 100% | 47 84% | 21 64% | 22 76% | 56 80% |
| Dependent, for new therapy | 48 49% | 4 40% | 24 43% | 20 61% | 21 72% | 27 39% |
| Average number of arrangements/protocols for pharmacists approved within the hospital (n=) (avg ± sd) | (80) 3.7 ± 2.8 | (9) 5.0 ± 3.0 | (45) 3.6 ± 3.2 | (26) 3.2 ± 1.9 | (26) 4.8 ± 3.3 | (54) 3.1 ± 2.4 |
| American Hospital Formulary System class with dependent pharmacist prescribing (n=) | (91) | (10) | (51) | (30) | (27) | (64) |
| Anti-infective agents | 69 76% | 9 90% | 40 78% | 20 67% | 19 70% | 50 78% |
| Blood formation, coagulation and thrombosis | 60 66% | 7 70% | 34 67% | 19 63% | 19 70% | 41 64% |
| Electrolytic, caloric and water balance | 41 45% | 4 40% | 24 47% | 13 43% | 15 56% | 26 41% |
| Gastrointestinal drugs | 39 43% | 6 60% | 20 39% | 13 43% | 10 44% | 12 42% |
| Cardiovascular drugs | 28 31% | 4 40% | 15 29% | 9 30% | 8 30% | 20 31% |
| Central nervous system agents | 25 28% | 2 20% | 15 29% | 8 27% | 6 22% | 19 30% |
| Vitamins | 20 22% | 3 30% | 11 22% | 6 20% | 6 22% | 14 22% |
| Antihistamine drugs | 19 21% | 3 30% | 11 22% | 5 17% | 9 33% | 10 16% |
| Respiratory tract agents | 19 21% | 2 20% | 8 16% | 9 30% | 8 30% | 11 17% |
| Eye, ear, nose and throat preparations | 17 19% | 2 20% | 9 18% | 6 20% | 6 22% | 11 17% |
| Skin and mucous membrane agents | 17 19% | 2 20% | 10 20% | 5 17% | 6 22% | 11 17% |
| Serum, toxoids and vaccines | 14 15% | 2 20% | 8 16% | 4 13% | 7 26% | 7 11% |
| Hormones and synthetic substitutes | 14 15% | 1 10% | 7 14% | 6 20% | 5 19% | 9 14% |
| Antineoplastic agents | 11 12% | 2 20% | 8 16% | 1 3% | 5 19% | 6 9% |
| Autonomic drugs | 11 12% | 1 10% | 4 8% | 6 20% | 7 26% | 4 6% |
| Others | 7 8% | 1 10% | 3 6% | 3 10% | 5 19% | 2 3% |
| Enzymes | 6 7% | 1 10% | 2 4% | 3 10% | 5 19% | 1 2% |
| Smooth muscle relaxants | 3 3% | 0 0% | 2 4% | 1 3% | 2 7% | 1 2% |
| Local anesthetics | 2 2% | 1 10% | 1 2% | 0 0% | 2 7% | 0 0% |

SUPPORT FROM PHARMACY TECHNICIANS FOR CLINICAL PHARMACY SERVICES

The Blueprint for pharmacy and the synthesis report of the Moving Forward initiative both recognized the need to enhance and expand the role of pharmacy technicians. While there are barriers to improving the use of pharmacy technicians in pharmacy practice (e.g. legislative restrictions, lack of standards for technician training programs, the need for process reengineering, the need for revised technician to pharmacist ratios, etc.), hospital pharmacists do already rely on pharmacy technicians to support their clinical activities.

In the United States, a white paper on pharmacy technicians was published in 2003¹⁹. In Canada, CSHP published a revised version of its guidelines for the delegation of functions to pharmacy technicians in 2006, but those guidelines do not address the role of technicians in supporting the clinical activities of the pharmacist²⁰.

- In this year's survey, 66% of respondents reported that pharmacy technicians carried out tasks that directly support pharmacists in carrying out their clinical activities. Regional differences were noted with 46% (10/22) in BC, 57% (17/31) in the Prairies, 71% (35/51) in Quebec, 72% (33/46) in Ontario and 75% (12/16) in the Atlantic Provinces reporting that this occurs.
- Among the respondents who reported that pharmacy technicians carried out tasks that directly support pharmacists in carrying out their clinical activities, respondents reported that the supportive tasks performed by technicians were drug distribution (88%), support to the medication safety committee (45%), admission drug histories (29%), support to the drug use evaluation program (25%), drug therapy evaluation/monitoring (24%), medication counselling (21%), and support to the P&T committee (13%). All these support functions must be interpreted by taking into account the narrow task descriptions provided in the survey (see Table B-7).
- Among the respondents who reported that pharmacy technicians carried out tasks that directly support pharmacists in carrying out their clinical activities, respondents reported that pharmacy technicians doing so work mainly in the central pharmacy (90%) and satellite pharmacies (29%). Interestingly, pharmacy technicians who support clinical pharmacists were reported to be located on the patient care units by 51% of respondents and to be located in clinics by 19% of respondents.

Table B-7 summarizes the roles that pharmacy technicians fulfill in support of clinical pharmacy services.

Table B-7. Support roles from pharmacy technicians for clinical pharmacy services 2007/08

| | Bed size | | | Teaching | | |
|--|------------|-----------|-----------|-----------|-----------|--------------|
| | All | 50-200 | 201-500 | >500 | Teaching | Non-teaching |
| Hospitals (n=) | (163) | (34) | (88) | (41) | (40) | (123) |
| Pharmacy technicians carry out tasks that directly support pharmacists in carrying out their clinical activities | 107 66% | 22 65% | 57 65% | 28 68% | 31 78% | 76 62% |
| Tasks performed by pharmacy technicians (n=) | (107) | (22) | (57) | (28) | (31) | (76) |
| Drug distribution - serve as the initial Pharmacy liaison for solving drug distribution problems on patient care units | 94 88% | 21 96% | 49 86% | 24 86% | 26 84% | 68 90% |
| Admission drug histories - collection and collation of information concerning the patient's pre-admission drug therapy | 31 29% | 5 23% | 15 26% | 11 39% | 8 26% | 23 30% |
| Drug therapy evaluation - collection of laboratory test results | 26 24% | 4 18% | 13 23% | 9 32% | 10 32% | 16 21% |
| Drug dosage adjustment – use of nomograms and equations to carry out preliminary calculation of appropriate drug dosages (e.g. drug dosage calculations for patients with impaired renal function) | 6 6% | 1 5% | 4 7% | 1 4% | 0 0% | 6 8% |
| Medication counseling – assembly of pamphlets and documentation to be given to the patient by the pharmacist | 22 21% | 5 23% | 12 21% | 5 18% | 9 29% | 13 17% |
| Seamless care services – initial creation of inpatient drug therapy documentation and discharge drug therapy plan | 9 8% | 1 5% | 5 9% | 3 11% | 3 10% | 6 8% |
| Total parenteral nutrition team participation – using established protocols and lab values to calculate changes to parenteral nutrition therapy | 9 8% | 3 14% | 6 11% | 0 0% | 1 3% | 8 11% |
| Support to P & T Committee – gather and collate information used in the preparation of drug formulary submissions, gather and collate information on non-compliance to formulary rules, etc | 14 13% | 4 18% | 6 11% | 4 14% | 2 7% | 12 16% |
| Support to Medication Safety Committee – assist in collection of data for presentation to the committee (e.g. identification and collection of prescriptions containing banned abbreviations) | 48 45% | 14 64% | 21 37% | 13 47% | 16 52% | 32 42% |
| Support to drug use evaluation program - data collection for drug utilization review | 27 25% | 7 32% | 13 23% | 7 25% | 11 36% | 16 21% |
| Others | 11 10% | 3 14% | 7 12% | 1 4% | 2 7% | 9 12% |
| Pharmacy technicians work place when supporting pharmacists in carrying out their clinical activities (n=) | (106) | (21) | (57) | (28) | (31) | (75) |
| Central pharmacy | 95 90% | 20 95% | 51 90% | 24 86% | 27 87% | 68 91% |
| Wards | 54 51% | 12 57% | 28 49% | 14 50% | 17 55% | 37 49% |
| Satellite pharmacies | 31 29% | 4 19% | 15 26% | 12 43% | 20 65% | 11 15% |
| Clinics | 20 19% | 3 14% | 9 16% | 8 29% | 9 29% | 11 15% |
| Other | 10 9% | 1 5% | 5 9% | 4 14% | 2 7% | 8 11% |

PRIORITY AND SERVICE LEVEL OF CLINICAL SERVICES

In the 1990s and early 2000s, Bond and his colleagues published a number of studies concerning clinical pharmacy services and their impact on mortality, morbidity, length of stay, drug costs, medication errors and adverse drug reactions. These studies contributed to the emergence of evidence-based data on clinical pharmacy practice and can be used to help prioritize clinical services^{21, 22, 23, 24, 25, 26}. In 2008, Bond published a survey of 15 hospital-based clinical pharmacy services, 51 different drugs managed under protocol by pharmacists, medication errors, and pharmacy technology in United States hospitals. The study provides continuing evidence of the growth and value of clinical pharmacy services and clinical pharmacists in the USA²¹. Numerous other studies have been

published in the last 40 years that describe and document the impact of clinical pharmacy services. This chapter section focuses on the priority that the respondents place on different pharmacy services, and the level of service provided for those same pharmacy services.

In Canada, hospital pharmacists represent a workforce of about 4100 individuals (Note: This survey encompasses approximately 2800 full-time equivalent pharmacists who work at the 166 facilities that participated in the 2007/08 survey)²⁷. In contrast, nurses represent a workforce of more than 250,000 individuals, according to the latest Canadian Institute of Healthcare Information (CIHI) publication. While both professions have a distinct scope of practice, there are potential overlaps in some patient care activities (e.g. medication reconciliation, patient counselling), especially with nurse practitioners. Hospital pharmacists and hospital pharmacy managers will have to make choices with respect to the areas where they focus their available pharmacist resources, based on considerations related to the limited number of pharmacy practitioners, the persistent shortage of pharmacists, the growing demand for clinical pharmacy services and the published evidence that documents the relative impact of different clinical pharmacy services on patient outcomes and healthcare costs.

In this survey, and the previous one conducted in 2005/06, we asked respondents to indicate whether pharmacists participated in ten direct patient care activities (P.C.), three committee participation activities (C.P.), four drug information/drug use management activities (D.I.), three clinical research activities (C.R.), and two patient safety/quality improvement activities (P.S.). The respondents' responses provide a profile of the level of clinical pharmacy services provided in Canadian hospitals. Definitions were provided to respondents and are included in this year's report, in order to help readers to better understand the level of service and the priority ranking. The ten direct patient care activities are defined below.

- **Admission drug histories** – Pharmacists provide admission histories including documentation of allergy / intolerance status.
- **Rapid response (Cardiopulmonary resuscitation) team/ participation** – Pharmacists are an active member of the CPR team.
- **Drug therapy evaluation/monitoring** – Pharmacists periodically review patients' health records with verbal or written follow-up. (Does not apply if only drug orders are reviewed).
- **Lab test ordering/Drug dosage adjustment** - Pharmacists request laboratory tests as necessary and initiate or adjust drug dosage to obtain the desired therapeutic outcome (e.g. aminoglycoside or heparin dosing).
- **Medication/drug counselling** - Pharmacists provide counselling on drugs either during hospitalization or at discharge. (Does not apply if counselling solely involves review of label directions).
- **Medical rounds participation** - Pharmacists round actively and regularly (e.g. minimum of 3 days/week in acute care - minimum of 3 days/month in long term care) with the medical team, providing patient specific input.
- **Patient education program** - Pharmacists participate actively in education programs for specific clients.
- **Pharmacokinetic consultations/monitoring** - Pharmacists review drug regimen, serum levels and patient's medical record, with verbal or written follow-up when required.
- **Seamless care services** - Pharmacists provide a pharmaceutical care plan to the patient at time of discharge; the care plan is transmitted to the patient's community pharmacist and physician.
- **Total parenteral nutrition (TPN) team participation** - Pharmacists review patient's medical record and evaluate nutritional needs, with verbal or written follow-up when required.

The three committee participation activities and four drug information/drug use management activities are defined below.

- **Participation on the Pharmacy and Therapeutics (P&T) Committee** - Pharmacists are involved in drug evaluation and addition/deletion of drugs to/from the hospital formulary.
- **Participation on the infection control committee** - Pharmacists are involved in the analysis of nosocomial infections, antibiotic use and resistance patterns.
- **Participation on the Medication Safety Committee** - Pharmacists are involved in a multidisciplinary committee that focuses its activities on improving medication safety in the facility.
- **Drug information** - A formal drug information service, staffed by trained pharmacists, is provided by the facility.

- **In-service education to other health professionals** – Pharmacists provide continuing education on a regular basis.
- **Drug use evaluation program** - Pharmacists are assigned to the analysis of drug use patterns which are reported to a hospital committee.
- **Formulary compliance program** – Pharmacists evaluate compliance to hospital formulary and analyse non-formulary use.

The three clinical research activities and the two patient safety/quality improvement activities are defined below.

- **Clinical research** - Pharmacists are involved as a principal investigator or co-investigator and/or author or co-author.
- **Support for Clinical Trials** - Pharmacists are involved in drug distribution and record keeping.
- **Participation on the ethical review committee /institutional review board** - Pharmacists are involved in the review of research protocols including ethical and/or scientific aspects.
- **Medication incident reporting and prevention program** - Pharmacists are involved in the coordination of the program, analysis of medication incidents and development of corrective measures.
- **Adverse drug reaction (ADR) monitoring** - Pharmacists evaluate potential ADRs with follow-up to patient, physician, manufacturer and Health Canada.

Respondents were asked to rate the level of each clinical service as follows:

- a score of 1 for a comprehensive service, delivered consistently to all patients requiring the service;
- a score of 2 for a targeted service, delivered to those who most need the service;
- a score of 3 for a limited service, provided only when time and resources permit;
- a score of 4 if the service is not offered.

The lower the average of the level of service results, the more comprehensive the level of service that the respondents currently reported at their sites. Almost all respondents (98-100%, from 162 to 166/166) were able to indicate the level of clinical pharmacy service provided.

Table B-8 summarizes the 2007/08 average level of service of 22 clinical pharmacy activities, in descending order, broken down by bed size and teaching status. Some of the clinical pharmacy services provided at a comprehensive level may be given pharmacy attention and resources in response to a regulatory obligation (e.g. P & T committee, medication safety committee, medication incident reporting and prevention program, and infection control committee).

- The mean score reported by respondents was lower (i.e. a more comprehensive level of service offered), by at least 0.5 points or more in favor of teaching vs. non-teaching respondents, for the following clinical services : drug information (difference of 1.7), clinical trials support (difference of 1.5), medical rounds participation (difference of 1.1), clinical research (difference of 1.1), ethics review committee participation (difference of 1.0), drug use evaluation (difference of 0.8), seamless care services (difference of 0.7), inservice education (difference of 0.6), and formulary compliance (difference of 0.6).
- The mean score reported by respondents was lower (i.e. a more comprehensive level of service offered), by at least 0.5 points or more in favour of larger bed size hospitals (e.g. > 500 beds vs. 50-200 beds), for the following clinical services: clinical trial supports (difference of 1.2), drug use evaluation (difference of 1.0), ethics review committee participation (difference of 1.0), clinical research (difference of 0.8), drug information (difference of 0.7), patient education program (difference of 0.6), infection control committee (difference of 0.6), and medical rounds participation (difference of 0.5).

As we discussed in the 2005/2006 report, of the clinical pharmacy services identified by Bond et al. as having a positive effect on health outcomes, most of them, on average, were not offered on a comprehensive level according to our survey respondents. Bond et al. suggested that admission histories were associated with a significant improvement in six outcomes (total costs of care (TCC), drug costs (DC), mortality rates (MR), length of stay (LOS), medication errors (ME), adverse drug reactions (ADR) but, despite this, our respondents seemed to place a low priority on these service. In addition to the evidence to support the value of medication histories,

medication reconciliation/seamless care processes, which encompass medication histories, are now included in the Accreditation Canada Required Organizational Practices.

Table B-8. Average Level of Service 2007/08

| [Types**] Clinical activities (base for 2007/08) | 2005/06 | 2007/08 | | | | | | Expected favorable outcomes of clinical pharmacy services on different indicators according to Bond's studies * | | | | | |
|---|----------------------|-------------------------------|----------|---------|------|----------|--------------|---|-----|-----|-------|-----|-------|
| | All Average \pm SD | All Average \pm SD | Bedsizes | | | Teaching | | T C C | D C | M R | L O S | M E | A D R |
| | | | 50-200 | 201-500 | >500 | Teaching | Non-Teaching | | | | | | |
| [C.P.] P&T Committee (n = 163) | 1.2 \pm 0.7 | 1.2 \pm 0.6 | 1.1 | 1.2 | 1.1 | 1.1 | 1.2 | | | | | | |
| [C.P.] Medication Safety Committee (n = 163) | 1.8 \pm 1.1 | 1.6 \pm 0.9 | 1.6 | 1.6 | 1.4 | 1.4 | 1.6 | | | | | | |
| [P.S.] Med Incident Reporting/ prevention (n = 166) | 1.8 \pm 0.9 | 1.7 \pm 0.9 | 1.8 | 1.8 | 1.7 | 1.5 | 1.8 | | | | | | |
| [P.C.] Pharmacokinetic consultations / monitoring (n = 165) | 1.8 \pm 0.7 | 1.9 \pm 0.7 | 2.1 | 1.8 | 1.8 | 1.8 | 1.9 | | | | | | |
| [P.C.] Lab test ordering / Drug dosage adjustment (n = 164) | 2.0 \pm 0.8 | 2.0 \pm 0.7 | 2.2 | 2.0 | 2.0 | 1.9 | 2.1 | | | | | | |
| [C.P.] Infection Control Committee (n= 163) | 2.2 \pm 1.1 | 2.0 \pm 1.1 | 2.3 | 2.1 | 1.7 | 1.7 | 2.1 | | | | | | |
| [P.C.] Drug therapy evaluation / monitoring (n = 162) | 2.2 \pm 0.8 | 2.2 \pm 0.8 | 2.4 | 2.2 | 2.1 | 2.0 | 2.0 | | | | | | |
| [C.R.] Ethics Review Cte participation (n= 165) | 2.2 \pm 1.4 | 2.4 \pm 1.4 | 3.0 | 2.3 | 2.0 | 1.6 | 2.6 | | | | | | |
| [C.R.] Clinical trials support (n= 166) | 2.3 \pm 1.2 | 2.5 \pm 1.3 | 3.1 | 2.5 | 1.9 | 1.3 | 2.8 | | | | | | |
| [P.S.] ADR monitoring (n = 166) | 2.3 \pm 0.8 | 2.3 \pm 0.8 | 2.4 | 2.3 | 2.1 | 2.1 | 2.3 | + | | | | | + |
| [P.C.] Medication counselling (n = 164) | 2.4 \pm 0.6 | 2.4 \pm 0.6 | 2,5 | 2,4 | 2,2 | 2,1 | 2,5 | | | | | | |
| [P.C.] Patient education program (n= 165) | 2.4 \pm 0.6 | 2.5 \pm 0.7 | 2,8 | 2,5 | 2,2 | 2,2 | 2,6 | | | | | | |
| [P.C.] TPN team participation (n = 164) | 2.5 \pm 1.2 | 2.5 \pm 1.2 | 2.5 | 2.6 | 2.4 | 2.3 | 2.6 | | | | | | + |
| [P.C.] Medical rounds participation (n= 164) | 2.6 \pm 0.9 | 2.6 \pm 1.0 | 2.9 | 2.6 | 2.4 | 1.8 | 2.9 | + | | + | | | + |
| [P.C.] Admission drug histories (n = 165) | 2.7 \pm 0.8 | 2.6 \pm 0.8 | 2.8 | 2.6 | 2.4 | 2.4 | 2.7 | + | + | + | + | | + |
| [D.I.] Inservice education (n = 163) | 2.6 \pm 0.9 | 2.5 \pm 0.7 | 2.6 | 2.5 | 2.4 | 2.1 | 2.7 | + | + | + | + | | + |
| [D.I.] Formulary compliance (n= 162) | 2.4 \pm 1.1 | 2.6 \pm 1,0 | 2.8 | 2.7 | 2.4 | 2.2 | 2.8 | | | | | | |
| [D.I.] Drug Use Evaluation (n = 163) | 2.6 \pm 1.0 | 2.8 \pm 0.9 | 3.2 | 2.8 | 2.2 | 2.1 | 2.9 | + | | | | | |
| [P.C.] Seamless care services (n = 164) | 3.0 \pm 0.8 | 2.9 \pm 0.8 | 3.0 | 3.0 | 2.7 | 2.4 | 3.1 | | | | | | |
| [D.I.] Drug information (n = 163) | 3.0 \pm 1.2 | 3.0 \pm 1.2 | 3.3 | 3.1 | 2.6 | 1.7 | 3.4 | + | + | + | | | + |
| [C.R.] Clinical Research (n = 166) | 3.3 \pm 0.9 | 3.4 \pm 0.8 | 3.8 | 3.5 | 3.0 | 2.6 | 3.7 | + | | + | | | |
| [P.C.] Cardiopulmonary resuscitation (CPR) team participation (RCR) (n = 165) | 3.8 \pm 0.6 | 3.8 \pm 0.6 | 3.9 | 3.8 | 3.7 | 3.6 | 3.9 | | | + | | | + |
| Drug protocol management | | not applicable to this survey | | | | | | + | + | | + | | + |
| Increased pharmacy staffing/occupied beds | | not applicable to this survey | | | | | | + | + | | + | | + |
| Affiliation with a teaching program | | not applicable to this survey | | | | | | | | | | + | |
| Decentralized pharmacists | | not applicable to this survey | | | | | | | | | | + | |

* Total costs of care (TCC), drug costs (DC), mortality rates (MR), length of stay (LOS), medication errors (ME), adverse drug reactions (ADR)
 **Committee participation (C.P.), clinical research (C.R.), patient safety/quality improvement activities (P.S.), drug information/drug use management activities (D.I.), patient care activities (P.C.)

While almost all respondents provided data on the level of clinical pharmacy service provided by their facility, a smaller number (77%, 127/166) chose to provide a ranking of direct patient care services in the 2007/08 survey (1 being the highest priority and 10 being the lowest priority). Only small differences were observed between the average level of services scores and the average priority ranking scores between 2005/06 and 2007/08 for most direct patient care pharmacy services. However, the relative position of certain clinical services has changed, especially for seamless care (moved up from 9 to 7 on the priority ranking) and admission histories

(moved up from 5 to 4 for priority ranking). These changes may have occurred because of the inclusion of medication reconciliation in the required organisational practices of Accreditation Canada.

Table B-9 summarizes the average level of service and the average ranking priority of 10 direct patient care pharmacy services.

Table B-9. Comparison of Average Level of Service and the Average Ranking Priority of 10 Direct Patient Care Pharmacy Services 2007/08

| Direct Patient Care Pharmacy Services are sorted by priority ranking | Average level of services (score 1, 2, 3 or 4) | | Average priority ranking (score 1 to 10) | |
|--|--|-----------------------------|--|-----------------------------|
| | Avg ± SD | Rank 2007/08 (Rank 2005/06) | Avg ± SD | Rank 2007/08 (Rank 2005/06) |
| [P.C.] Drug therapy evaluation (DTM)/monitoring | 2.1 ± 0.6 | 1 (2) | 2.8 ± 2.2 | 1 (1) |
| [P.C.] Pharmacokinetic consultations /monitoring | 1.9 ± 0.7 | 3 (1) | 4.1 ± 2.3 | 2 (2) |
| [P.C.] Lab test ordering / drug dosage adjustment | 2.0 ± 0.7 | 2 (3) | 4.2 ± 2.3 | 3 (3) |
| [P.C.] Admission drug histories | 2.6 ± 0.7 | 8 (8) | 4.5 ± 2.6 | 4 (5) |
| [P.C.] Medical rounds participation | 2.5 ± 0.9 | 6 (7) | 4.8 ± 2.4 | 5 (6) |
| [P.C.] Medication / drug counselling | 2.3 ± 0.6 | 4 (4) | 4.8 ± 1.9 | 6 (4) |
| [P.C.] Seamless care services | 2.8 ± 0.8 | 9 (9) | 6.5 ± 2.1 | 7 (9) |
| [P.C.] Patient education program | 2.5 ± 0.7 | 5 (6) | 6.7 ± 1.9 | 8 (8) |
| [P.C.] TPN team participation | 2.6 ± 1.2 | 7 (5) | 7.3 ± 2.6 | 9 (7) |
| [P.C.] Cardiopulmonary resuscitation (CPR) team participation | 3.8 ± 0.6 | 10 (10) | 9.5 ± 1.3 | 10 (10) |

(Base =127: who provided both level of service and priority ranking) SD = standard deviation

For almost every service there were respondents who ranked a service number 1 and others who ranked it number 10. Given the discrepancy between the evidence of effectiveness (e.g Bond's papers and others) and the average levels of service, combined with the wide variability in the priority rankings attached to various services by our respondents, we believe that there is a need to develop a profession-wide, evidence-based consensus on the services we should be prioritizing and investing our limited resources in.

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