

# I – Evaluating Pharmacy Services

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This chapter of the Hospital Pharmacy in Canada Report focuses on the structure, resources, processes and tools that have been developed for evaluating activities carried out by pharmacy personnel in Canadian hospitals. Performance measurement is key to enabling managers and staff to better understand work processes, clinical services and their outcomes. Quality improvement metrics are necessary for identifying areas of improvement, implementing positive change and monitoring progress toward established objective.<sup>1</sup>

Numerous frameworks for evaluating pharmacy services are available through regulatory authorities, professional associations (e.g.: CHSP, CPhA), and accreditation agencies. Each framework has its own set of important performance dimensions, performance indicators, and targets, based on standards and established norms. The most common measurement areas include the patient experience, accessibility to care, patient safety, and service quality, efficiency, effectiveness, and continuity.

**CSHP 2015 – Targeting excellence in Pharmacy Practice** - proposes six goals and thirty-six objectives, each with measurable targets, to ensure that medication use is effective, evidence-based, safe and contributing meaningfully to public health. Building from that framework, pharmacy departments can design their evaluation activities to ensure alignment with organizational goals and priorities.

Evaluating services cannot be viewed as an isolated task. It should be embedded in the fabric of providing care and services. It informs us on what we are doing well, what we should improve, and what we should stop doing because of evidence that it provides little or no added-value.

*Evaluation of pharmacy services is an important tool for improving patient experience, access to care, patient safety, and service quality, effectiveness, efficiency, and continuity.*

Most hospital pharmacy departments are collecting data related to structure and process, but not outcomes. Structure-related measurement activities examine structural aspects of a pharmacy department that are believed to be indicators of quality care, such as the number and type of staff, the organizational structure and reporting relationships, and the availability of equipment and technology, the pharmacist/technician ratio, and the proportion of time that pharmacists spend in drug distribution versus clinical activities. Process related measurement activities look at whether or not the expected processes, as defined by standards and professional norms are being followed in activities such as drug compounding, preparation of sterile parenteral products, and clinical practice expectations (e.g. insuring that post myocardial infarct patients are discharged on appropriate medications such as statins and beta-blockers), all of which measure how well certain activities are being performed. Some hospital pharmacy departments also measure a limited number of outcome measures such as adverse events related to medication use, wrong dose related to renal function, and percentage of palliative care patients with controlled pain). With the shift to the pharmaceutical care model, there is a need to capture more extensive outcome-related measures in order to document the added-value of providing direct patient-care services. Best practices call for a balanced set of key performance indicators that measure elements critical to the success of an organization. In healthcare, value should be defined from a patient-perspective and evaluated on the basis of the outcomes that were achieved.

The 2011/12 survey results provide information on the current evaluation practices conducted by the hospital pharmacy departments that participated in the Hospital Pharmacy in Canada Survey.

## *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 evaluation through their standards, accreditation processes and licensing requirements. The high response rate and participation in this Canadian hospital pharmacy survey shows the willingness of the majority of directors of pharmacy to document, benchmark, and evaluate the

level of their practice. The 2011/12 survey results provide information on the current evaluation practices that are being applied to clinical pharmacy services in Canadian hospitals.

The evaluation of pharmacy services, by pharmacy clinicians and their managers, insures that what is taking place in the practice setting is congruent with the best available evidence that has been generated through research studies. Research-based initiatives, using rigorous scientific methods, provide the evidence that specific therapies, interventions or services, including those provided by pharmacists, actually improve outcomes. Unfortunately, more research, of a higher quality, is needed to support the value of specific pharmacy interventions. Since our last report, Melchior et al. have conducted an analysis of the quality of systematic reviews that have been published on pharmacists' health interventions.<sup>2</sup> A total of 151 systematic reviews were found and 31 were included in the analysis. The authors stated that *"...in the past 20 years, many studies have evaluated the impact of pharmaceutical practices on clinical, humanistic and economic outcomes. However, few studies have critically analyzed the primary studies and published reviews regarding pharmaceutical practices. The quality of published reviews varies from moderate to poor."* A number of suggestions were made for improving the quality of practice-based research that aims to document the value of specific pharmacy interventions.

Are hospital pharmacists prepared to conduct the kind of quality research that is needed to demonstrate the value of pharmacy services? Perreault et al. surveyed critical care pharmacists in Canada and their interest in clinical and practice research.<sup>3</sup> Their survey showed that Canadian critical care pharmacists are involved to varying degrees in clinical research and are very interested in initiating and supporting research activities. Opportunities are present but significant barriers exist. The value of pharmacist-initiated research needs recognition as a priority within hospital pharmacy administration. CSHP published a statement and guidelines in 2011 that aims to promote research in pharmacy practice.<sup>4</sup> That research would, in many cases, provide the background evidence that is needed to support the evaluation of pharmacy services.

Respondents to the 2011/12 Hospital Pharmacy in Canada Survey answered questions that were intended to establish if and how pharmacy departments were evaluating the provision of direct patient care (clinical) services.

- Forty-seven percent of survey respondents reported using a structured approach to define and prioritize pharmacists' activities. This percentage was higher in teaching hospitals (66%) vs. 42% in non-teaching facilities. (Table I-1).
- Thirty percent of respondents reported that they evaluate the direct patient care services provided by pharmacists in their hospital by auditing a sample of clinical activities. The percentage of respondents who reported evaluating pharmacy services remained largely unchanged from 31% (51/163) in 2007/08 and 31% (50/160) in 2009/10.
- Of the survey respondents who reported that they evaluated their pharmacists performance by auditing a sample of clinical activities:
  - Seventy-three percent reported that the evaluation was conducted by pharmacy practice leaders, followed by 59% by pharmacy managers, 35% by the pharmacists themselves, and 27% by peers.
  - Evaluation was conducted using five methods: retrospective chart review (60%), direct observation (64%), and self-evaluation by pharmacists (48%) peer review (22%) and other (20%). Respondents from BC, the Prairies and the Atlantic provinces reported using all methods while QC reported the exclusive use of retrospective chart review.
- Survey respondents conducting evaluation of clinical practice reported assessing five aspects of clinical practice: documentation of clinical services provided by their pharmacists (80%), the development and monitoring of an individualized pharmaceutical care plan for their patients, (62%), answers to drug information questions (43%), medication/drug counseling and evaluation of compliance (42%). And other (23%). No comparison can be made with previous report, as the five aspects are different from those evaluated in 2009/10.
- Twenty-two percent of survey respondents reported that they have established mechanisms to measure medication-related patient outcomes. Of the respondents who reported having the mechanism in place, 17% use those outcome measures when evaluating the performance of individual pharmacists. The establishment of mechanisms to measure medication-related outcomes was reported more often by respondents in teaching hospitals than those in non-teaching hospitals (38% vs. 17%) and larger bed-size hospitals (29% in hospitals with more than 500 beds, 24% in hospitals with 201-500 beds, and 10% in hospitals with 50-200 beds).

**Table I-1. Evaluation of Clinical Pharmacy Services 2011/12**

	---	Bed Size			Teaching Status		
		All	50 - 200	201- 500	>500	Teaching	Non-Teaching
<b>A structured approach is used to define and prioritize pharmacist activities</b>	(n=)	(168)	(41)	(84)	(43)	(38)	(130)
		79	14	39	26	25	54
		<b>47%</b>	<b>34%</b>	<b>46%</b>	<b>60%</b>	<b>66%</b>	<b>42%</b>
<b>The provision of direct patient care services is evaluated by auditing a sample of clinical activities</b>		51	6	30	15	19	32
		<b>30%</b>	<b>15%</b>	<b>36%</b>	<b>35%</b>	<b>50%</b>	<b>25%</b>
<i>Base: All respondents</i>							
<b>The evaluation is done by ...</b>	(n=)	(51)	(6)	(30)	(15)	(19)	(32)
.. pharmacy practice leaders		37	3	25	9	14	23
		<b>73%</b>	<b>50%</b>	<b>83%</b>	<b>60%</b>	<b>74%</b>	<b>72%</b>
.. the pharmacists themselves (self-evaluation)		18	2	10	6	10	8
		<b>35%</b>	<b>33%</b>	<b>33%</b>	<b>40%</b>	<b>53%</b>	<b>25%</b>
.. pharmacy managers		30	3	18	9	8	22
		<b>59%</b>	<b>50%</b>	<b>60%</b>	<b>60%</b>	<b>42%</b>	<b>69%</b>
.. peers (e.g., other pharmacists)		14	1	6	7	8	6
		<b>27%</b>	<b>17%</b>	<b>20%</b>	<b>47%</b>	<b>42%</b>	<b>19%</b>
.. physicians		3	0	1	2	2	1
		<b>6%</b>	<b>0%</b>	<b>3%</b>	<b>13%</b>	<b>11%</b>	<b>3%</b>
.. other		1	0	0	1	1	0
		<b>2%</b>	<b>0%</b>	<b>0%</b>	<b>7%</b>	<b>5%</b>	<b>0%</b>
<b>The method for evaluation used is ...</b>	(n=)	(50)	(6)	(29)	(15)	(19)	(31)
.. chart review - retrospective		30	2	17	11	14	16
		<b>60%</b>	<b>33%</b>	<b>59%</b>	<b>73%</b>	<b>74%</b>	<b>52%</b>
.. direct observation		32	4	21	7	14	18
		<b>64%</b>	<b>67%</b>	<b>72%</b>	<b>47%</b>	<b>74%</b>	<b>58%</b>
.. self-evaluation by pharmacists		24	3	15	6	11	13
		<b>48%</b>	<b>50%</b>	<b>52%</b>	<b>40%</b>	<b>58%</b>	<b>42%</b>
.. peer review		11	0	6	5	7	4
		<b>22%</b>	<b>0%</b>	<b>21%</b>	<b>33%</b>	<b>37%</b>	<b>13%</b>
.. other		10	1	4	5	3	7
		<b>20%</b>	<b>17%</b>	<b>14%</b>	<b>33%</b>	<b>16%</b>	<b>23%</b>
<i>Base: Respondents evaluating a sample of clinical activities; Note: multiple mentions permissible</i>							
<b>Aspects of clinical practice evaluated</b>	(n=)	(79)	(14)	(45)	(20)	(24)	(55)
Clinical documentation		63	11	34	18	22	41
		<b>80%</b>	<b>79%</b>	<b>76%</b>	<b>90%</b>	<b>92%</b>	<b>75%</b>
Medication counseling and evaluation of compliance		33	4	20	9	10	23
		<b>42%</b>	<b>29%</b>	<b>44%</b>	<b>45%</b>	<b>42%</b>	<b>42%</b>
Answers to drug information questions		34	6	20	8	11	23
		<b>43%</b>	<b>43%</b>	<b>44%</b>	<b>40%</b>	<b>46%</b>	<b>42%</b>
Development of an individualized pharmaceutical care plan, including its monitoring		49	6	29	14	17	32
		<b>62%</b>	<b>43%</b>	<b>64%</b>	<b>70%</b>	<b>71%</b>	<b>58%</b>
Other		18	3	10	5	5	13
		<b>23%</b>	<b>21%</b>	<b>22%</b>	<b>25%</b>	<b>21%</b>	<b>24%</b>
<i>Base: All respondents evaluating aspects of clinical practice; Note: multiple mentions permissible</i>							
<b>Mechanisms have been established to measure patients' medication-related outcomes</b>	(n=)	(164)	(40)	(82)	(42)	(37)	(127)
		36	4	20	12	14	22
		<b>22%</b>	<b>10%</b>	<b>24%</b>	<b>29%</b>	<b>38%</b>	<b>17%</b>
<i>Base: All respondents</i>							
<b>Patients' medication-related outcomes are used to evaluate the performance of individual pharmacists</b>	(n=)	(36)	(4)	(20)	(12)	(14)	(22)
		6	0	3	3	4	2
		<b>17%</b>	<b>0%</b>	<b>15%</b>	<b>25%</b>	<b>29%</b>	<b>9%</b>
<i>Base: Respondents with mechanisms to measure patients' medication-related outcomes</i>							
<b>Proportion of pharmacists evaluated in the last fiscal year</b>	(n=)	(6)	(0)	(3)	(3)	(4)	(2)
		43		35	50	39	50
<i>Base: Respondents where patients' medication-related outcomes are used to evaluate the performance of individual pharmacists</i>							

## Evaluation of Medication Safety

The results of a medication safety self-assessment (MSSA), such as the one developed by the Institute for Safe Medication Practices (ISMP), can facilitate the prioritization of improvement initiatives in the medication-use-system. Of note, it can be used as evidence of the institution having met the medication safety self-assessment

requirements, which are evaluated by Accreditation Canada surveyors when they pay their visit to a hospital.

- Sixty-two percent of respondents (Table I-2) reported that they had completed a MSSA, using a recognized tool, compared to 76% (121/159) in 2009/10. There were considerable regional variances in the percentages of respondents who had completed a MSSA. Ontario led with 92% (45/49) followed by BC (68%, 17/25), the Prairies (61%, 19/31), the Atlantic Provinces (50%, 9/18) and QC (32%, 14/44).
- Of the respondents who indicated that they had completed MSSA, 49% had completed the assessment more than 2 years ago, 27% had completed one between 1 and 2 years ago, and 24% had completed one in the last fiscal year. Considering that significant changes take time to implement and accreditation is now on a 4 year cycle, it is likely that MSSAs will be carried out less frequently, perhaps on the same 4 year cycle as Accreditation Canada now uses.

**Table I-2. Evaluation of Medication Safety 2011/12**

	---	Bed Size			Teaching Status		
		All	50 - 200	201- 500	>500	Teaching	Non-Teaching
<b>Hospital completed a Medication Safety Self-Assessment, using a recognized assessment tool.</b>	(n=)	(167)	(41)	(83)	(43)	(38)	(129)
		104	26	51	27	24	80
		<b>62%</b>	<b>63%</b>	<b>61%</b>	<b>63%</b>	<b>63%</b>	<b>62%</b>
<b>Assessment was last performed</b>	(n=)	(104)	(26)	(51)	(27)	(24)	(80)
more than 2 years ago		51	17	23	11	9	42
		<b>49%</b>	<b>65%</b>	<b>45%</b>	<b>41%</b>	<b>38%</b>	<b>53%</b>
between 1 and 2 years ago		28	6	14	8	8	20
		<b>27%</b>	<b>23%</b>	<b>27%</b>	<b>30%</b>	<b>33%</b>	<b>25%</b>
in the last fiscal year		25	3	14	8	7	18
		<b>24%</b>	<b>12%</b>	<b>27%</b>	<b>30%</b>	<b>29%</b>	<b>23%</b>
<i>Base: All respondents</i>							
<b>When reviewing physician / clinical order sets, the content evidence such as published clinical studies or guidelines and expert consensus advice</b>	(n=)	(165)	(41)	(81)	(43)	(38)	(127)
		162	40	80	42	36	126
		<b>98%</b>	<b>98%</b>	<b>99%</b>	<b>98%</b>	<b>95%</b>	<b>99%</b>
patient safety checklist		156	40	77	39	36	120
		<b>95%</b>	<b>98%</b>	<b>95%</b>	<b>91%</b>	<b>95%</b>	<b>94%</b>
<i>Base: All respondents; Note: multiple mentions permissible</i>							
<b>Physician / clinical orders sets are approved by an appropriate multidisciplinary group</b>	(n=)	(167)	(41)	(83)	(43)	(38)	(129)
		155	37	78	40	34	121
		<b>93%</b>	<b>90%</b>	<b>94%</b>	<b>93%</b>	<b>89%</b>	<b>94%</b>

*Base: All respondents*

- Almost all respondents (98%) reported using evidence, such as published clinical studies, clinical guidelines and expert consensus recommendations, when reviewing and approving physician / clinical order sets. Ninety-five percent of respondents reported using patient safety checklists when reviewing and approving physician / clinical order sets. These results were similar, regardless of the bed size, teaching status or the region in which the hospital was located.
- Ninety-three percent of respondents reported having a multidisciplinary committee responsible for approving physician / clinical order sets. All respondents from BC (25/25) and QC (44/44) reported the presence of a committee, compared to only 50% (10/20) and 42% (60/142) respectively in 2005/06, while the situation remained largely unchanged in the other provinces.

## Medication Safety

The creation of safe, effective and efficient systems for managing medications in each hospital should be one of the priority objectives. A good place to start is by assessing compliance of the medication use system against the standards for Managing Medications and the medication-related Required Organizational Practices (ROPs) of the Accreditation Canada Qmentum Program.<sup>5</sup> In addition, comparing your facility to the results of medication safety-related questions that appear throughout this report would be a useful exercise. To facilitate that exercise, we have prepared a summary of the responses to medication safety-related questions which appeared in the past 3 Hospital Pharmacy in Canada Reports. (Table I-3)

**Table I-3. Medication Safety Indicators 2011/12**

Indicator	2011/12	2009/10	2007/08
<b>Improving prescribing:</b>			
Computerized Prescriber Order Entry is operational (CPOE) (n =) all respondents	8%	8%	5%
CPOE has a bidirectional interface to PIS (n =) respondents with CPOE	69%	46%	33%
Order entry is performed by prescribers through an interfaced CPOE	7%	7%	-
CPOE is integrated with a clinical decision support system that guides : <ul style="list-style-type: none"> <li>through established protocols and clinical pathways</li> </ul>	75%	58%	-
<ul style="list-style-type: none"> <li>the use of weight-based or surface area base dosing for selected drugs</li> </ul>	67%	75%	-
<ul style="list-style-type: none"> <li>the dosing of medications in special populations (e.g: renal, pediatrics)</li> </ul>	67%	42%	-
<b>Improving medication order review</b>			
Order review by a pharmacist, when the pharmacy is closed, of at least 95% of routine medication orders , before: (n =) all respondents <ul style="list-style-type: none"> <li>Medications are accessed from a night cupboard</li> </ul>	5%	8%	6%
<ul style="list-style-type: none"> <li>Medications are accessed from automated dispensing cabinets on patient care units</li> </ul>	1%	8%	3%
<ul style="list-style-type: none"> <li>Medications are accessed from wardstock</li> </ul>	1%	7%	3%
100% of medication orders in a hospital's emergency department are reviewed by hospital pharmacists within 24 hours of the order being written (n =) all respondents	29%	27%	-
<b>Improving dispensing of medications</b> (n =) all respondents			
Hospital utilizes a unit-dose system for drug distribution for 90% or more of their total beds	75%	76%	62%
95% or more of oral unit-dose packaged medications are dispensed in a ready-to-administer form, i.e. no further dose manipulation required by nursing staff	46%	58%	-
<b>Improving administration of medications</b> (n =) all respondents			
At least 95% of routine medication orders are reviewed by a pharmacist, when the pharmacy is closed, before medications appear on the MAR	16%	14%	-
MARs are electronic and documentation is online	10%	10%	7%
Policy is in place which requires that two (2) patient identifiers (neither to be the patient's room number) are checked before administering medications	97%	91%	64%
TALLman lettering is used to reduce errors caused by confusion between drug products with look-alike drugs	82%	70%	58%
Wireless network is used to upload or download data to smart pumps (n =) respondents using smart pumps	24%	30%	9%
Libraries of smart pumps are updated annually (n =) respondents using smart pumps	58%	62%	43%
Barcoding is used to: (n =) all respondents <ul style="list-style-type: none"> <li>Verify drug selection prior to patient administration</li> </ul>	3%	8%	2%
<ul style="list-style-type: none"> <li>Identify patient during medication administration</li> </ul>	4%	6%	3%
<ul style="list-style-type: none"> <li>Identify staff member during medication administration</li> </ul>	2%	4%	-
Pharmacists are provided with access to laboratory results through an interface with lab system (n =) all respondents	49%	43%	35%
Patients receiving antibiotics as prophylaxis for surgical infections have their prophylactic antibiotic therapy discontinued within 24 hours after the surgery (n =) all respondents	48%	45%	39%

### Evaluation of the Use of Technology

Evaluation of the use of technology primarily addressed how pharmacy departments deal with the clinical decision support alerts that are built into their Pharmacy Information Systems (PIS) and medication-related equipment.

A "Clinical Decision Support System" (CDSS) is defined as:

*"A computer program feature that provides automatic reminders, advice, or interpretation as data is entered for a specific patient and/or a specific medication order. A clinical decision support system (CDSS) uses patient specific data and evidence based practice guidelines to generate an alert and/or a suggested course of action."*

- Pharmacy information systems with built-in clinical decision support functionality are in place in most hospital pharmacy departments. Eighty-eight percent of respondents reported that their PIS included clinical decision support functionality. The reported availability of a PIS with clinical decision support functionality was higher in ON (98%, 48/49), BC (96%, 24/25) and the Atlantic Provinces (89%, 16/18), than in the Prairies (81%, 26/32) and Qc (77%, 34/44). (Table 1-4)

**Only 48% of respondents reported fully utilizing the functionality of the clinical decision support, despite the evidence that these systems improve the safety of the medication use system.**

**Table I-4. Clinical Decision Support Technology 2011/12**

	All	Bed Size			Teaching Status		
		50 - 200	201- 500	>500	Teaching	Non-Teaching	
<b>Facility uses a Pharmacy Information System (PIS) that has built-in clinical decision support functionality</b>	(n=) (168) 148 <b>88%</b>	(41) 35 <b>85%</b>	(84) 75 <b>89%</b>	(43) 38 <b>88%</b>	(38) 33 <b>87%</b>	(130) 115 <b>88%</b>	
<i>Base: All respondents</i>							
<b>Clinical decision support functionality is being fully utilized</b>	(n=) (148) 71 <b>48%</b>	(35) 17 <b>49%</b>	(75) 35 <b>47%</b>	(38) 19 <b>50%</b>	(33) 20 <b>61%</b>	(115) 51 <b>44%</b>	
<i>Base: Respondents where facility uses PIS with clinical decision support functionality</i>							
<b>Reasons why the decision support functionality is not in use</b>	(n=)	(85)	(21)	(42)	(22)	(18)	(67)
The clinical significance of many of the alerts is questionable	54 <b>64%</b>	13 <b>62%</b>	28 <b>67%</b>	13 <b>59%</b>	9 <b>50%</b>	45 <b>67%</b>	
There is insufficient time to deal with all the alerts	37 <b>44%</b>	11 <b>52%</b>	16 <b>38%</b>	10 <b>45%</b>	8 <b>44%</b>	29 <b>43%</b>	
The database that drives the alerts is out of date	15 <b>18%</b>	2 <b>10%</b>	8 <b>19%</b>	5 <b>23%</b>	3 <b>17%</b>	12 <b>18%</b>	
Physicians rarely make changes to the order when contacted regarding the alert	4 <b>5%</b>	2 <b>10%</b>	1 <b>2%</b>	1 <b>5%</b>	0 <b>0%</b>	4 <b>6%</b>	
Other	32 <b>38%</b>	10 <b>48%</b>	11 <b>26%</b>	11 <b>50%</b>	8 <b>44%</b>	24 <b>36%</b>	
<i>Base: Respondents where decision support functionality is not being fully utilized Note: multiple mentions permissible</i>							
<b>Hospital has a policy dealing with the overriding of alerts</b>	(n=) (167) 28 <b>17%</b>	(41) 5 <b>12%</b>	(83) 19 <b>23%</b>	(43) 4 <b>9%</b>	(38) 4 <b>11%</b>	(129) 24 <b>19%</b>	
<b>Facility reviews override data from smart pumps</b>	(n=) (164) 40 <b>24%</b>	(41) 5 <b>12%</b>	(81) 23 <b>28%</b>	(42) 12 <b>29%</b>	(37) 12 <b>32%</b>	(127) 28 <b>22%</b>	
<i>Base: All respondents</i>							
<b>Facility has made changes following the review of the pumps' override data</b>	(n=) (40) 31 <b>78%</b>	(5) 4 <b>80%</b>	(23) 17 <b>74%</b>	(12) 10 <b>83%</b>	(12) 12 <b>100%</b>	(28) 19 <b>68%</b>	

*Base: Respondents where facilities overrode data from smart pumps*

- Respondents from teaching hospitals (61%) were more likely than non-teaching hospitals (44%) to fully use the functionality.

The survey attempted to identify the reasons why facilities did not fully utilize the built-in- clinical decision support functionality that was present in their PIS. Eighty-five respondents provided reasons.

- Sixty-four percent of respondents reported that the clinical significance of many of the alerts is questionable.
- Forty-four percent of respondents reported that there is insufficient staff time available to deal with all the alerts.
- Eighteen percent of respondents reported that the database that drives the alerts is out of date.
- Five percent of respondents reported that physicians rarely make changes to the order when contacted regarding the alert.
- Thirty-eight percent of respondents reported they had other reasons why the functionality was not being fully utilized.

Only 17% of respondents reported that their hospital has a policy dealing with the overriding of clinical decision support alerts that are generated by their pharmacy information system.

When properly programmed, set up, and used, smart pumps have the potential to significantly reduce the risk of adverse events associated with the administration of medications via the parenteral route. According to the literature, approximately 39% of medication errors occur during drug administration and this is typically the phase of the medication system where errors are least likely to be intercepted before reaching the patient.

- Twenty-four percent of respondents reported that they review override data from smart pumps at least annually, an increase from the 36% (35/98) of respondents in the previous survey who reported doing so. There were regional differences, ON led at 38% (18/48), followed by the Prairies at 28% (9/32), BC at

20% (5/25), QC at 14% (6/43) and the Atlantic Provinces at 13% (2/16).

- Seventy-eight percent of these respondents reported that they had made changes to policies, procedures, or pump programming following the review of the pumps' override data.

### ***Evaluation of the Process Related to Sterile Product Preparation***

Hospital pharmacy departments have reported slow progress in implementing new quality assurance practices for ensuring the safety of compounded sterile products.

- Fifty-eight percent of respondents indicated that they audit the preparation of parenteral admixtures by observing employees for validation of aseptic technique, at least once a year. (Table 1-5) This is the same percentage reported in the 2009/10 survey.
- Twenty-three percent of respondents indicated that they routinely verify product sterility by laboratory testing of samples from prepared products.
- Twenty-nine percent of respondents conduct sterility testing on samples collected from surfaces in sterile product preparation areas, on a regular basis.

**Table 1-5. Evaluation of the Process Related to Sterile Product Preparation**

	---	Bed Size			Teaching Status		
		All	50 - 200	201- 500	>500	Teaching	Non-Teaching
	(n=)	(167)	(40)	(84)	(43)	(38)	(129)
Employees preparing parenteral admixtures are observed for validation of aseptic technique at least once a year		97 58%	17 43%	48 57%	32 74%	35 92%	62 48%
Product sterility is routinely verified by laboratory testing on a sample of products prepared		49 29%	9 23%	26 31%	14 33%	18 47%	31 24%
Surface sampling is conducted in sterile product preparation areas of the parenteral admixture service		39 23%	4 10%	21 25%	14 33%	16 42%	23 18%

*Base: All respondents*

These results suggest that only about half of hospital pharmacy departments have implemented these quality assurance activities within their sterile product services area. Self-assessment tools are available to identify the gap in practices related to sterile product preparation. Considering the risk of contamination of parenteral products, additional efforts are required to put in place processes to ensure the safety of parenteral products.

In summary, evaluating pharmacy services can guide our efforts, making sure we are doing the right things, the right way, with the desired results, at the right cost. Key performance indicators are useful to inform hospital pharmacy departments on areas that warrant attention and improvement; to monitor performance over time, and to prioritize improvement activities.

<sup>1</sup> Coutts, J. By the Numbers: Measuring for Quality Care. *Healthcare Quarterly* 2010;13(4):24-6.

<sup>2</sup> Melchior AC, Correr CJ, Venson R, Pontarolo R. An analysis of quality of systematic reviews on pharmacist health interventions. *Int J Clin Pharm* 2012;34(1):32-42.

<sup>3</sup> Perreault MM, Thiboutot Z, Burry LD, Rose L, Kanji S, LeBlanc JM, Carr RR, Williamson DR. Canadian survey of critical care pharmacists' views and involvement in clinical research. *Ann Pharmacother* 2012;46(9):1167-73.

<sup>4</sup> Canadian Society of Hospital Pharmacists. Guidelines for conducting pharmacy practice research. [online] [http://www.cshp.ca/productsServices/officialPublications/type\\_e.asp](http://www.cshp.ca/productsServices/officialPublications/type_e.asp) (Accessed on Feb 2nd, 2013).

<sup>5</sup> *Managing Medications Standards. QMentum Program 2012. Accreditation Canada. Available for purchase at* <http://www.accreditation.ca>