G - MEDICATION SAFETY

PATRICIA LEFEBVRE

The Accreditation Canada Qmentum Program now includes standards for the safe use and effective management of medications (Standards for Managing Medications).[1] In addition, organizations seeking accreditation will be required to comply with 31 "Required Organizational Practices" related to patient safety, of which 6 are new requirements of the accreditation survey in 2009.[2,3] The Accreditation Canada document entitled *Evaluation of Implementation and Evidence of Compliance*, details how surveyors assess compliance with the Patient /Client Safety Goals and the Required Organizational Practices.

In 2007, Neil J. Mackinnon published the book "*Safe and Effective – The Eight Essential Elements of an Optimal Medication-Use System*". This book is another key reference for pharmacists and other healthcare providers to use when reviewing and evaluating their medication-use systems.

The results of the 2007/08 Hospital Pharmacy in Canada survey provide a snapshot of current practices related to medication safety in Canadian hospitals. The survey also helps identify initiatives that hospital pharmacists, in collaboration with other healthcare providers and the leaders of their organizations, will need to implement in order to comply with Accreditation Canada's Patient/Client Safety Goals and medication-related, Required Organizational Practices. Although compliance with these accreditation requirements is important to hospitals from an accreditation perspective, the most important objective should be the creation of safe and effective systems for managing medications in each of our hospitals.

MEDICATION INCIDENT REPORTING SYSTEM

Accreditation Canada's Required Organizational Practices, which fall under the culture domain of patient safety, include:

- having patient safety as a strategic priority/goal of the organization

- preparation and dissemination of quarterly reports on the progress the organization has made in advancing patient safety

- having a reporting system in place for adverse events, including appropriate follow-up

- having a policy and process in place for the disclosure of adverse events to the affected patient and/or family

- conducting prospective analysis of the safety risks associated with various processes of care.

- All respondents reported use of a medication incident reporting system within their facility (Table G-1). The presence of reporting systems, in all of the hospitals that participated in the 2007/08 survey, will hopefully facilitate future participation in the Canadian Medication Incident Reporting and Prevention System (CMIRPS), a national database of medication incidents which was developed through a collaborative partnership between the Institute for Safe Medication Practices-Canada (ISMP Canada), the Canadian Institute for Health Information, and Health Canada.[4] CMIRPS is part of the pan-Canadian reporting and learning system being developed to support the capture, analysis and dissemination of information about adverse events, with the goal of insuring that known risks are acted upon in a coordinated and timely manner.[5]

- Forty-seven percent (74/159) of respondents indicated that their hospital reported medication incidents to an external reporting program. Of the respondents who reported to external programs, the programs mentioned included a health region reporting program (54%, 38/71), ISMP Canada (40%, 28/71), a

provincial reporting program (34%, 24/71) and other programs (7%, 5/71). (Note: more than one program could be selected)

- The percentage of respondents who reported that medication incident reports can be used during an individual healthcare provider's performance assessment was 11%, compared to 12% in 2005/06, 21% in 2003/04 and 32% in 2001/02. Although progress was made in eliminating this deterrence to the reporting of medication incidents between 2001/02 and 2005/06, there was minimal improvement since the 2005/06 survey and the 2007/08 survey. The use of medication incident reports during individual performance assessments was more commonly reported by non-teaching hospital respondents (13%) than by teaching hospital respondents (5%). None of the respondents with more than 500 beds reported using medication incident reports during an individual healthcare provider's performance assessment.

- Thirty-nine percent of respondents reported that they broadly communicate information regarding the institution's medication incidents to hospital staff and physicians. There was minimal change since 2005/06, when 37% of respondents reported that they broadly communicated this information. This is an area where there is significant opportunity for improvement.

- Fifty-nine percent of respondents reported that they broadly communicate information regarding published medication incidents to their hospital staff and physicians, compared to 47% in 2005/06. The percentage of respondents reporting that they do so was highest in Ontario (89%, 41/46) followed by the Atlantic (73%, 11/15), the Prairies (68%, 19/28), British Columbia (41%, 9/22), and Quebec (31%, 15/49). A number of respondents reported that they post ISMP newsletters on the institution's intranet site.

Table G-1. Reporting System for Medication Incidents 2007/08

	All	Bed Size			Teaching Status	
		50 - 200	201- 500	>500	Teaching	Non-Teaching
Hospitals (n=)	(161)	(34)	(88)	(39)	(38)	(123)
A medication incident reporting system is in use	100%	100%	100%	100%	100%	100%
Medication incidents are reported to an external reporting program (n=159)	74 / 47%	13 / 38%	48 / 55%	13 / 34%	20 / 53%	54 / 45%
Medication incident reports can be used during an individual healthcare provider's performance assessment (n=160)	18 / 11%	7 / 21%	11 / 13%	0 / 0%	2 / 5%	16 / 13%
Information regarding the institution's medication incidents is broadly communicated to hospital staff and physicians (n=158)	61 / 39%	16 / 48%	29 / 33%	16 / 42%	16 / 42%	45 / 38%
Information regarding published medication incidents is broadly communicated to hospital staff and physicians (n=160)	95 / 59%	23 / 68%	47 / 54%	25 / 64%	24 / 63%	71 / 58%

MEDICATION INCIDENT REVIEW

- Ninety percent of respondents reported having a designated committee responsible for medication incident review (Table G-2), compared to 80% in 2005/06. All respondents (22/22) from BC reported the presence of a committee, compared to 50% (10/20) in 2005/06, while the situation remained largely unchanged in the other provinces.

- Among the 143 respondents who identified one or more committees in their organization that are responsible for medication incident review, the committees named as being responsible for this function were the Medication Safety/Quality Committee (50%, 71/143), Risk Management Committee (48%, 69/143), Pharmacy and Therapeutics Committee (45%,64/143), Pharmacy & Nursing Committee (31%, 44/143), General Quality Committee (28%, 40/143), Medical Advisory Committee (14%, 20/143) and other committees (10%, 14/143). (Note: more than one committee could be selected) Half of the respondents indicated having designated a Medication Safety/Quality Committee to oversee the review of medication incidents.

- A Medication Safety Self-Assessment tool was reported to have been completed, within the previous two years, by 63% of respondents. Seventy-three percent of teaching hospitals, compared to 61% of non-teaching hospitals, reported completing a self-assessment tool within the previous two years. The completion of a self-assessment tool was highest in the Prairies (89%, 25/28), followed by Ontario (87%, 39/45), British Columbia (59%, 13/22), Atlantic Canada (40%, 6/15) and Quebec (35%, 16/30). Of the respondents who reported completing a self-assessment in the previous two years, 93% used the ISMP Hospital Medication Safety Self- Assessment™ tool (ISMP MSSA). With the implementation of the new Managing Medications Standards, surveyors from Accreditation Canada now frequently ask if you have conducted a Medication Safety Self-Assessment tool and if you wish to share the results at the time of the survey.

ISMP Canada has published a bulletin entitled *"Failure Mode and Effects Analysis (FMEA): Proactively Identifying Risk in Healthcare"* [6] to introduce new users to the purpose and goals of failure mode and effects analysis, a *prospective*, analytical process for identifying potential failure points in the delivery of healthcare services. ISMP Canada also provides tools to help conduct a failure mode and effects analysis. Although failure mode and effects analysis is not the only method of conducting a prospective, analytical review of medication management systems, it is probably the most widely used.

- Forty-six percent of respondents reported that they had conducted, in the previous year, at least one prospective, medication safety-related, analytical process, such as a failure mode and effects analysis. This percentage is higher in teaching hospitals (61%) than in non-teaching hospitals (41%). The completion of this process was more commonly reported by respondents from Atlantic Canada (67%, 10/15) and Ontario (63%, 29/46), followed by the Prairies (41%, 11/27), Quebec (34%, 16/47) and British Columbia (27%, 6/22). Nearly all of the respondents who had conducted a prospective analysis (94%, 66/70) reported that they had implemented improvements that were recommended as a result of the analysis.

Table G-2. Medication Safety Review and Assessment 2007/08

		Bed Size			Teaching Status	
	All	**50 - 200**	**201- 500**	**>500**	**Teaching**	**Non-Teaching**
Hospitals (n=)	(161)	(34)	(88)	(39)	(38)	(123)
Designated committee responsible for the review of medication incidents	145 / 90%	29 / 85%	82 / 93%	34 / 87%	35 / 92%	110 / 89%
Your facility has conducted at least one prospective, medication safety-related, analytical process in the last year (n= 157)	72 / 46%	19 / 58%	34 / 40%	19 / 50%	23 / 61%	49 / 41%
Your facility has conducted at least one retrospective, medication safety-related, Root Cause Analysis, in the last year (n=142)	90 / 63%	18 / 62%	49 / 66%	23 / 59%	22 / 58%	68 / 65%
A medication safety self-assessment has been completed (n=156)	99 / 63%	22 / 65%	52 / 62%	25 / 66%	27 / 73%	72 / 61%
Type of medication safety self-assessment (n=95)						
ISMP's Medication Safety Self-Assessment	93%	91%	92%	96%	96%	91%
Other	7%	9%	8%	4%	4%	9%

Root Cause Analysis (RCA) is another analytical tool that is used to *retrospectively* identify the underlying causes of incidents that have occurred within an organization. *"The Canadian Root Cause Analysis Framework – A Tool for Identifying and Addressing the Root Causes of Critical Incidents in Healthcare"* [7] was created by the Canadian Patient Safety Institute, the Institute for Safe Medication Practices Canada, and Saskatchewan Health. Workshops on root cause analysis have been provided across Canada by the Canadian Patient Safety Institute. ISMP Canada also conducts training workshops on both root cause analysis and failure mode and effects analysis.

- A medication safety-related root cause analysis was reported to have been completed, in the previous year, by 63% of respondents,. Ontario (74%, 32/43) and the Prairies (72%, 18/25) had the highest rate,

followed by Atlantic Canada (62%, 8/13), British Columbia (57%, 8/14) and Quebec (51%, 24/47). As with failure mode and effects analysis, almost all of the respondents (94%, 85/90) who had conducted a root cause analysis reported that they had implemented improvements that were recommended as a result of the root cause analysis.

Both types of analysis, either retrospective (root cause analysis) or prospective (failure mode and effects analysis), can assist organizations in the development of strategies to improve patient safety.

MEDICATION INCIDENT REDUCTION STRATEGIES - PRESCRIBING, TRANSCRIBING AND ADMINISTRATION

The Canadian Society of Hospital Pharmacists and the American Society of Health System Pharmacists have both published guidelines on preventing medication errors in hospitals.[8,9]

Accreditation Canada has identified Required Organizational Practices for high risk care/service activities, including medication use. Required Organizational Practices that fall under the medication use domain of patient safety include:

- Remove concentrated electrolytes from patient/client care units

- Standardize and limit the number of drug concentrations available in the organization

- Provide training on the use of infusion pumps

- Evaluate and limit the availability of heparin products and remove high-dose formats from patient care areas (new 2009)

- Evaluate and limit the availability of narcotic products and remove high-dose, high-potency formats from patient care areas (new 2009).

Tables G-3 and G-4 provide data on a number of strategies that are recommended to prevent medication incidents.

- Thirty-six percent of respondents, compared to 38% in 2005/06, reported that they do not have a policy requiring checking of two patient identifiers before a medication is administered. The percentage without a policy was lower in teaching hospitals (29%) compared to non-teaching hospitals (38%). The use of at least two patient identifiers before administering medications is one of Accreditation Canada's Required Organizational Practices.

- Seventy-nine percent of respondents reported that the patient's allergy status is known 90% or more of the time before a medication order is dispensed, compared to 68% in 2005/06. This percentage was highest in hospitals with 201-500 beds (86%), followed by hospitals with 50-200 beds (74%) and hospitals with more than 500 beds (66%). Respondents from BC (96%, 21/22) and Ontario (89%, 41/46) reported the highest percentages, followed by respondents from Atlantic Canada (73%,11/15), the Prairies (71%, 20/28) and Quebec (67%, 33/49)

- Fifty-two percent of respondents reported that 90% or more of medication orders remain conditional until reviewed by a pharmacist. This percentage was higher in hospitals with more than 500 beds (62%), compared to hospitals with 201-500 beds (52%) and hospitals with 50-200 beds (38%). Medication order review by a pharmacist prior to the medication being administered, including the evaluation of the appropriateness of the order against the current medication profile for a specific patient, is a key element of safe medication practices.

- Almost all respondents (99%, 153/155) reported a formal process was in place to review and approve pre-printed medication orders, compared to 87% in 2005/06. Eighty-three percent (129/155) of respondents reported having a process in place to review and approve infusion charts and guidelines. This percentage was lowest in hospitals with 50-200 beds (60%). Sixty-three percent (97/155) of respondents reported that a formal process was in place to review and approve physician order sets, compared to 42% in 2005/06.

- Establishment of a designated list of dangerous abbreviations that are not accepted in the institution was reported by 73% of respondents, a notable increase from the 58% reported in 2005/06. Less than half of the respondents from Quebec (42%, 21/50) reported the presence of a list of prohibited abbreviations. The use of nonstandard or ambiguous abbreviations has lead to many medication incidents. ISMP has published a "do not use" list of abbreviations, symbols and dose designations to assist hospitals in establishing their lists.[10]

Table G-3. Medication Safety Strategies - Prescribing, Ordering, Transcribing 2007/08

	All	Bed Size			Teaching Status	
		50 - 200	201- 500	>500	Teaching	Non-Teaching
Hospitals (n=)	(161)	(34)	(88)	(39)	(38)	(123)
Policy requiring that <u>two patient identifiers</u> (neither to be the patient's room number) are checked before administering medications (n=155)	99 / 64%	22 / 69%	56 / 67%	21 / 54%	27 / 71%	72 / 62%
The patient's <u>allergy status</u> is know prior to a medication order being dispensed (n=160)						
yes, for >= 90% of all orders	126 / 79%	25 / 74%	76 / 86%	25 / 66%	30 / 79%	96 / 79%
yes, but for < 90% of all orders	32 / 20%	8 / 24%	11 / 13%	13 / 34%	8 / 21%	24 / 20%
A medication order <u>remains conditional</u> (i.e., no labels printed or drug dispensed, no update of profile or MARs, or access to automated dispensing units) until reviewed by a pharmacist (n=161)						
yes, for >= 90% of all orders	83 / 52%	13 / 38%	46 / 52%	24 / 62%	20 / 53%	63 / 51%
yes, but for < 90% of all orders	42 / 26%	11 / 32%	23 / 26%	8 / 21%	13 / 34%	29 / 24%
There is a <u>formal process</u> to review and approve (n=155)						
Pre-printed medication orders	153 / 99%	30 / 100%	85 / 99%	38 / 97%	38 / 100%	115 / 98%
Physician order sets	97 / 63%	18 / 60%	57 / 66%	22 / 56%	23 / 61%	74 / 63%
Infusion dosage charts and guidelines	129 / 83%	18 / 60%	78 / 91%	33 / 85%	34 / 89%	95 / 81%
There is a <u>list of dangerous abbreviations</u> that are not accepted in the institution (n=161)	117 / 73%	26 / 76%	60 / 68%	31 / 79%	33 / 87%	84 / 68%

- When asked if a policy was in place that describes the safety procedures for specific high-alert medications used within the organization, the presence of such a policy was reported by 89% (139/156) of respondents for concentrated potassium chloride for injection, 73% (111/152) for potassium phosphate injection, 69% (83/120) for intrathecal vincristine, 63% (97/154) for hypertonic sodium chloride, 58% (90/155) for hydromorphone, 56% (87/155) for intravenous unfractionated heparin, 53% (82/154) for intravenous insulin, 53% (81/154) for morphine, 44% (67/153) for subcutaneous insulin, 38% (58/152) for magnesium sulfate, 35% (54/153) for low molecular weight heparin, 34% (52/155) for neuromuscular blocking agents, and 27% (41/152) for warfarin.

Table G-4. Medication Incident Reduction Strategies - Preparing, Dispensing, Administration 2007/08

	All	Bed Size			Teaching Status	
		50 - 200	201- 500	>500	Teaching	Non-Teaching
The <u>hospital has a policy</u> that describes the safety procedures for specific high-alert medications						
Heparin, unfractionated IV (n=155)	87 / 56%	23 / 70%	46 / 54%	18 / 49%	23 / 61%	64 / 55%
Heparin, low molecular weight (n=153)	54 / 35%	13 / 41%	32 / 38%	9 / 24%	15 / 39%	39 / 34%
Hydromorphone (n=155)	90 / 58%	18 / 55%	49 / 58%	23 / 61%	24 / 63%	66 / 56%
Insulin, IV (n=154)	82 / 53%	20 / 63%	46 / 54%	16 / 43%	20 / 54%	62 / 53%
Insulin, subcutaneous (n=153)	67 / 44%	18 / 56%	37 / 44%	12 / 32%	18 / 47%	49 / 43%
Magnesium sulfate, injection (n=152)	58 / 38%	13 / 39%	35 / 43%	10 / 27%	19 / 50%	39 / 34%
Morphine (n=154)	81 / 53%	16 / 48%	46 / 55%	19 / 51%	23 / 61%	58 / 50%
Neuromuscular blocking agents (n+155)	52 / 34%	13 / 39%	25 / 29%	14 / 38%	15 / 39%	37 / 32%
Potassium chloride for injection, concentrate (n=156)	139 / 89%	29 / 88%	76 / 89%	34 / 89%	34 / 89%	105 / 89%
Potassium phosphate injection (n=152)	111 / 73%	21 / 68%	61 / 73%	29 / 78%	30 / 79%	81 / 71%
Sodium chloride, hypertonic (n=154)	97 / 63%	20 / 61%	53 / 63%	24 / 65%	29 / 76%	68 / 59%
Vincristine intrathecal (n=120)	83 / 69%	13 / 72%	44 / 64%	26 / 79%	26 / 81%	57 / 65%
Warfarin (n=152)	41 / 27%	10 / 32%	22 / 26%	9 / 24%	9 / 24%	32 / 28%
The <u>hospital has removed</u> one or more of the following concentrated medications from patient care units in at last 90% of cases						
Potassium Chloride (n=155)	149 / 96%	29 / 94%	84 / 98%	36 / 95%	38 / 100%	111 / 95%
Potassium Phosphate (n=150)	137 / 91%	26 / 90%	76 / 92%	35 / 92%	37 / 100%	100 / 88%
Concentrated Narcotics (n=154)	124 / 81%	21 / 70%	70 / 81%	33 / 87%	31 / 82%	93 / 80%
Sodium Chloride (3%, 23%, etc) (n=152)	139 / 91%	28 / 93%	75 / 89%	36 / 95%	36 / 97%	103 / 90%
The <u>hospital has standardized infusion concentrations</u> for the following high-alert medications, and these standardized concentrations are						
Heparin (n=158)	142 / 90%	32 / 97%	75 / 87%	35 / 90%	36 / 95%	106 / 88%
Insulin (n=157)	90 / 57%	16 / 48%	49 / 58%	25 / 64%	27 / 71%	63 / 53%
Morphine (n=158)	109 / 69%	20 / 61%	59 / 69%	30 / 77%	28 / 74%	81 / 68%
Hydromorphone (n=157)	99 / 63%	17 / 52%	55 / 64%	27 / 71%	24 / 63%	75 / 63%
The hospital uses <u>TALL man lettering</u> (n=159)	92 / 58%	21 / 64%	50 / 57%	21 / 54%	26 / 68%	66 / 55%
TALL man lettering is used:						
(n=)	(90)	(20)	(49)	(21)	(26)	(64)
In the Pharmacy Information System (PIS) (e.g., drop down drug selection menus)	65 / 72%	15 / 75%	34 / 69%	16 / 76%	20 / 77%	45 / 70%
On Pharmacy-generated labels	67 / 74%	14 / 70%	38 / 78%	15 / 71%	22 / 85%	45 / 70%
On Pharmacy unit dose packaging	66 / 73%	12 / 60%	38 / 78%	16 / 76%	23 / 88%	43 / 67%
On Pharmacy-generated Medication Administration Records (MARs)	45 / 50%	12 / 60%	22 / 45%	11 / 52%	14 / 54%	31 / 48%
In Pharmacy, on shelf labels	44 / 49%	7 / 35%	26 / 53%	11 / 52%	20 / 77%	24 / 38%
In the medication rooms on patient care units (e.g., shelf labels)	17 / 19%	5 / 25%	6 / 12%	6 / 29%	9 / 35%	8 / 13%

The Institute for Safe Medication Practices in the United States conducted a survey on high-alert medications in 2007[11] in which they asked respondents to:

1. identify, from a list of medications, those that they believed were high-alert medications

2. indicate, from that list, if their organization had special precautions in place for those high-alert medications.

It is interesting to note that there are similarities between the results of our survey and the ISMP US survey for potassium chloride (89% vs. 86% ISMP US) potassium phosphate (73% vs. 77% ISMP US) and hypertonic sodium chloride (63% vs. 71% ISMP US).[12] When comparing the results, it is important to take into consideration that differences were noted between nursing and pharmacy in the ISMP US survey. Our survey is completed primarily by pharmacists.

- Ninety percent of respondents reported that they have standardized heparin infusion concentrations, compared to 75% in 2005/06. Standardization of infusion concentrations for morphine was reported by 69% of respondents, compared to 57% in 2005/06. For hydromorphone, 63% of respondents reported standardization of infusion concentrations, compared to 53% in 2005/06. Fifty-seven percent of respondents indicated that they had standardized insulin infusion concentrations, compared to 48% in 2005/06.

- All respondents in BC, the Prairies, Ontario and Atlantic Canada have removed concentrated potassium chloride from 90% or more of patient care units, compared to 87% in Québec (41/47). Ninety-one percent of respondents reported that they have removed potassium phosphate from 90% or more of patient care units. This practice has been implemented in all teaching hospitals for potassium chloride and potassium phosphate. Eighty-one percent of respondents reported that they have removed concentrated narcotics from 90% or more of patient care units. Ninety-one percent of respondents reported that they have removed hypertonic saline from 90% or more of patient care units.

- Fifty-eight percent of respondents reported using TALLman lettering to reduce errors caused by confusion between drug products with look-alike drug names. Only 6% of the Quebec respondents (3/50) reported the use of TALLman lettering, compared to 54% (7/13) in Atlantic Canada, 79% (22/28 in the Prairies, 86% (19/22) in BC, and 89% (41/46) in Ontario. Among the 92 respondents who reported using TALLman lettering, it was most often used on: pharmacy generated labels (74%), pharmacy unit dose packaging (73%), pharmacy information system drop down drug selection menus (72%), pharmacy generated medication administration records (50%), pharmacy shelf labels (49%), and in the medication rooms on patient care units (e.g: shelf labels) (19%). In the new Managing Medication Standards, organizations are expected to identify a list of look-alike/sound-alike drugs used in the organization. The US Food and Drug Administration's list and the Institute for Safe Medication Practices' list of "Look-Alike Drug Name Sets With Recommended TALLman Letters" are available at http://www.ismp.org/Tools/tallmanletters.pdf .[13]

MEDICATION RECONCILIATION

Medication reconciliation is a practice designed to prevent medication errors at transition points in care, such as admission to, or discharge from, a hospital. It has been identified as a key component of the seamless care process in the Canadian Society of Hospital Pharmacists/Canadian Pharmacists Association Joint Statement on Seamless Care.[14] Medication Reconciliation is also one of the ten interventions in the *Safer Healthcare Now Campaign* that is currently underway across Canada.[15]

Accreditation Canada has identified two Required Organizational Practices related to Medication Reconciliation. They are:

- reconcile the patient's/client's medications upon admission to the organization, with the involvement of the patient/client;

- reconcile medications with the patient/client at referral or transfer, and communicate the patient's/client's medications to the next provider of service at referral or transfer to another setting, service, service provider, or level of care within or outside the organization.

The Institute for Healthcare Improvement defines Medication Reconciliation as *"a formal process of obtaining a complete and accurate list of each patient's current home medications – including name, dosage, frequency and route - and comparing the physician's admission, transfer, and/or discharge orders to that list. Discrepancies are brought to the attention of the prescriber and, if appropriate, changes are made to the orders. Any resulting changes in orders are documented".[16]*

- Sixty-nine percent of respondents reported the presence of a formal process to obtain a complete medication history of a client's home medications when a patient visits the Emergency Department (Table G-5). This percentage is highest in hospitals with more than 500 beds (79%), followed by hospitals with 201-500 beds (67%) and hospitals with 50-200 beds (61%).   On average, a complete medication history is obtained for 62% of patients who visit the ER.

- Of the 109 respondents with a formal process in place to conduct complete medication histories in the ER, 91% reported that nurses conducted medication histories, 67% reported that physicians conducted medication histories, and 50% reported that pharmacists conducted medication histories. (Note: More than one health professional could be identified as being responsible for conducting medication histories) The conducting of a complete medication history in the Emergency Department was highest in Quebec (86%, 43/50) followed by Ontario (63%, 29/46), Atlantic Canada (60%, 9/15), the Prairies (59%, 16/27) and BC (55%, 12/22).

- Among those respondents who reported that a formal process was in place to obtain a complete medication history when a patient visits the Emergency Department, the medication history was created using information provided by the patient/family (98%), information contained on prescription containers (96%), information from a transferring facility (86%), information from a community pharmacy (83%), information obtained from an electronic database containing records of prescriptions dispensed by retail pharmacies (57%) and information obtained from the patient's primary care physician (50%). All respondents in BC who obtain a medication history in the ER (12/12), reported using the information obtained from an electronic database containing records of prescriptions dispensed by retail pharmacies, followed by Ontario (96%, 27/28), the Prairies (94%, 15/16), Atlantic Canada (22%, 2/9) and Quebec (12%, 5/43).

- Ninety-three percent of the respondents who conducted medication histories in the Emergency Department reported using the complete medication history when writing medication orders at the time of admission.   This percentage was consistent across teaching status and bed size. This practice was systematically (100%) implemented in BC, the Prairies and the Atlantic.

- Seventy-two percent of respondents reported having a formal process to obtain a complete medication history of a client's home medications when a patient is admitted to the organization (Table G-6). Ontario led with 89% (41/46), followed by the Prairies (82%, 22/27), Atlantic Canada (73%, 11/15), Quebec (57%,28/49) and BC (55%, 12/22). Of the 114 respondents having a formal process to obtain a complete medication history when a patient is admitted, 95% reported that medication histories were carried out by nurses, 71% by pharmacists, and 68% by physicians. Physicians (86%) and pharmacists (90%) were more likely to conduct medication histories in teaching hospitals than in non-teaching hospitals (physicians 61% and pharmacists 65%). The same situation existed in hospitals with 500 or more beds (physicians 77% and pharmacists 87%).

- Among the 114 respondents who reported that a medication history was conducted upon admission to the hospital, the medication history was created using information provided by the patient/family (99%), information contained on prescription containers (97%), information from a transferring facility (94%), information from a community pharmacy (91%), information obtained from the patient's primary care physician (65%) and information obtained from an electronic database containing records of prescriptions dispensed by retail pharmacies (59%).

Table G-5. Medication Incident Reduction Strategies - Comprehensive Medication History 2007/08

	All	Bed Size			Teaching Status	
		50 - 200	201- 500	>500	Teaching	Non-Teaching
Hospitals (n=)	(159)	(33)	(87)	(39)	(37)	(122)
When a patient visits the Emergency Department						
<u>A formal process</u> is in place to obtain a complete list of the patient's current home medications, including name, dosage, frequency and route	109 / 69%	20 / 61%	58 / 67%	31 / 79%	26 / 70%	83 / 68%
The list is used when writing medication orders at the time of ER visit (n=109)	100 / 92%	18 / 90%	55 / 95%	27 / 87%	24 / 92%	76 / 92%
The list is used when writing medications orders at the time of admission (n=108)	100 / 93%	19 / 95%	54 / 95%	27 / 87%	24 / 92%	76 / 93%
Medication history is carried out by:						
(n=)	(109)	(20)	(58)	(31)	(26)	(83)
Pharmacist	54 / 50%	7 / 35%	30 / 52%	17 / 55%	12 / 46%	42 / 51%
Nurse	99 / 91%	18 / 90%	56 / 97%	25 / 81%	21 / 81%	78 / 94%
Physician	73 / 67%	14 / 70%	39 / 67%	20 / 65%	22 / 85%	51 / 61%
Other	14 / 13%	2 / 10%	7 / 12%	5 / 16%	5 / 19%	9 / 11%
Medication history is created using: (n=109)						
Information contained on prescription containers brought to the hospital by patient/family	96%	100%	95%	97%	100%	95%
Information provided by the patient/ family	98%	100%	97%	100%	100%	98%
Information obtained from the patient's primary care physician	50%	75%	50%	32%	46%	51%
Information obtained from an electronic database containing records of prescriptions dispensed by retail pharmacies	57%	55%	60%	52%	50%	59%
Information from a transferring facility (e.g., a nursing home)	86%	100%	86%	77%	85%	87%
Information from a community pharmacy	83%	95%	81%	77%	73%	86%

- Ninety-four percent of respondents, who conducted medication histories at the time of admission, reported having a formal process to use the list of the patient's current home medications to write medication orders at the time of admission. The use of the medication order form to reconcile medication has led to successful implementation of Medication Reconciliation. With this approach, the prescribing physician has access to the list of medications taken at home while writing the admission order. It also eliminates transcription errors, as well as streamlines the ordering process (i.e. the physician checks the appropriate box: continue, discontinue or modify).

- Forty-seven percent of respondents in 2007/08 compared to 38% in 2005/06, reported reconciling the patient's medications and communicating that information to the next provider of care when the patient is transferred between levels of care within the facility (Table G-7). This practice was more commonly reported by teaching hospital respondents (68%) than by non-teaching hospital respondents (40%). Respondents who conduct medication reconciliation when the patient is transferred reported that the physician was the health professional most frequently responsible (41%), followed by the pharmacist (30%) and the nurse (27%). The results of this survey are encouraging as they suggest that physicians are getting more involved in medication reconciliation (26% in 2005/06). Of the respondents who reported reconciling the patient's medication history when the patient is transferred, 26% had implemented the process throughout the hospital and another 74% had implemented the process for selected patient groups. It is worth noting that 38% of the non-teaching hospital respondents have implemented the practice throughout the hospital.

Table G-6. Medication Incident Reduction Strategies - Comprehensive Medication History 2007/08

2007/08 Hospital Pharmacy in Canada Report		Bed Size			Teaching Status	
	All	**50 - 200**	**201- 500**	**>500**	**Teaching**	**Non-Teaching**
Hospitals (n=)	(159)	(33)	(87)	(39)	(38)	(121)
When a patient is admitted to the hospital						
A formal process is in place to obtain a complete list of the patient's current home medications, including name, dosage, frequency and route (i.e., a complete medication history)	114 72%	24 73%	60 69%	30 77%	29 76%	85 70%
The list is used when writing medications orders at the time of admission (n=114)	107 94%	21 88%	57 95%	29 97%	29 100%	78 92%
Medication history is carried out by: (n=114)						
Pharmacist	81 71%	11 46%	44 73%	26 87%	26 90%	55 65%
Nurse	108 95%	24 100%	56 93%	28 93%	27 93%	81 95%
Physician	77 68%	14 58%	40 67%	23 77%	25 86%	52 61%
Other	22 19%	7 29%	10 17%	5 17%	10 34%	12 14%
Medication history is created using: (n=114)						
Information contained on prescription containers brought to the hospital by patient/family	111 97%	24 100%	58 97%	29 97%	29 100%	82 96%
Information provided by the patient/ family	113 99%	24 100%	59 98%	30 100%	29 100%	84 99%
Information obtained from the patient's primary care physician	74 65%	14 58%	43 72%	17 57%	20 69%	54 64%
Information obtained from an electronic database containing records of prescriptions dispensed by retail pharmacies	67 59%	14 58%	36 60%	17 57%	15 52%	52 61%
Information from a transferring facility (e.g., a nursing home)	107 94%	24 100%	55 92%	28 93%	29 100%	78 92%
Information from a community pharmacy	104 91%	22 92%	55 92%	27 90%	27 93%	77 91%

Table G-7. Medication Incident Reduction Strategies - Comprehensive Medication History 2007/08

		Bed Size			Teaching Status	
	All	**50 - 200**	**201- 500**	**>500**	**Teaching**	**Non-Teaching**
Hospitals (n=)	(158)	(33)	(86)	(39)	(37)	(121)
When the patient is transferred between levels of care within the facility:						
The facility reconciles the patient's medications and communicates that information to the next provider of care	74 47%	15 45%	42 49%	17 44%	25 68%	49 40%
Health professional most frequently responsible for this medication reconciliation: (n=73)						
Pharmacist	22 30%	4 27%	13 32%	5 29%	8 32%	14 29%
Nurse	20 27%	6 40%	11 27%	3 18%	6 24%	14 29%
Physician	30 41%	5 33%	16 39%	9 53%	11 44%	19 40%
Other	1	0	1	0	0	1
The facility has implemented the process of reconciliation: (n=73)						
Throughout the hospital	19 26%	2 13%	13 32%	4 24%	1 4%	18 38%
For selected patient groups only	54 74%	13 87%	28 68%	13 76%	24 96%	30 63%

- At discharge time, 42% of respondents reported that they provide a printed, reconciled list of the patient's medications to the next provider, while another 1% of respondents were providing an electronic copy of the reconciled medication list (Table G-8). When medication reconciliation occurred at discharge time, the service was most frequently provided by a pharmacist (54%, 37/69), followed by a nurse (23%, 16/69) and by a physician (22%, 15/69). Of the 69 respondents who reported communicating a reconciled medication list at the time of discharge, 84% were providing the service for selected patient groups only.

Table G-8. Medication Incident Reduction Strategies - Comprehensive Medication History 2007/08

	All	Bed Size			Teaching Status	
		50 - 200	201- 500	>500	Teaching	Non-Teaching
Hospitals (n=)	160	34	87	39	37	123
When patient is discharged from the facility:						
The facility communicates a reconciled list of the patient's medications to the next provider with:						
A printed copy of the reconciled medication list	67	11	36	20	24	43
	42%	32%	41%	51%	65%	35%
An electronic copy of the reconciled medication list	2	0	1	1	1	1
	1%	0%	1%	3%	3%	1%
Health professional most frequently responsible for this medication reconciliation: (n=69)						
Pharmacist	37	9	22	6	16	21
	54%	82%	59%	29%	64%	48%
Nurse	16	0	8	8	3	13
	23%	0%	22%	38%	12%	30%
Physician	15	2	6	7	6	9
	22%	18%	16%	33%	24%	20%
Other	1	0	1	0	0	1
	1%	0%	3%	0%	0%	2%
The facility implemented the process of medication reconciliation for: (n=69)						
All discharged patients	11	2	5	4	2	9
	16%	18%	14%	19%	8%	20%
Selected patient groups only	58	9	32	17	23	35
	84%	82%	86%	81%	92%	80%
The facility has implemented the process of medication reconciliation in all 4 steps (when patients visit the ER, are admitted, are transferred between levels of care, and are discharged) (n=160)						
yes...	35	5	20	10	16	19
	22%	15%	23%	26%	43%	15%
no...	125	29	67	29	21	104
	78%	85%	77%	74%	57%	85%
...If no, the most significant barriers to provide a reconciled list of the patient's medication in all 4 steps are: (n=117)						
The facility has examined the desirability and feasibility.., but .. additional .. resources would be required	55	10	31	14	9	46
	47%	36%	51%	50%	43%	48%
The facility has examined the desirability and feasibility.., but .. there are not enough other supports to implement it	13	2	8	3	1	12
	11%	7%	13%	11%	5%	13%
The facility has not yet examined the desirability and feasibility of implementing medication reconciliation	17	4	11	2	1	16
	15%	14%	18%	7%	5%	17%
Implementation of medication reconciliation is planned or underway	86	21	41	24	19	67
	74%	75%	67%	86%	90%	70%
The hospital is registered as a participating facility in the 'Safer Healthcare Now!' medication reconciliation initiative (n=158)	112	24	57	31	29	83
	71%	75%	66%	79%	76%	69%

- It is worth noting that medication reconciliation was performed in all four situations (ER visit, admission, and transfers within the facility and at discharge) by only 22% (35/160) of respondents. Medication reconciliation in all four situations was more commonly reported by teaching hospital respondents (43%, 16/37) than by non-teaching hospital respondents (15%, 19/123).

- Respondents who did not carry out medication reconciliation in all four situations were asked to identify the most significant barriers to doing so;

  - Seventy-four percent of respondents in 2007/08, compared to 43% in 2005/06, reported that implementation of medication reconciliation is planned or underway

  - Forty-seven percent of respondents in 2007/08 vs. 34% in 2005/06 indicated that their facility had examined the desirability and feasibility of implementing medication reconciliation, but additional resources would be required

  - Fifteen percent of respondents in 2007/08 vs. 22% in 2005/06 have not yet examined the desirability and feasibility of implementing medication reconciliation

  - Eleven percent of respondents in 2007/08 vs. 13% in 2005/06 have examined the desirability and feasibility but there are not enough other supports to implement it (e.g. access to inpatient and outpatient electronic prescription records).

- Seventy-one percent of respondents reported that their facility was participating in the "Safer Healthcare Now!" medication reconciliation initiative. This percentage is consistent across teaching status and bed size. Noticeable differences exist between regions: participation was reported by 100% (15/15) of the respondents in Atlantic Canada, 93% (25/27) of respondents in the Prairies, 89% (41/46) of respondents in Ontario, 55% (12/22) of respondents in BC and 40% (19/48) of respondents in Quebec. The participation in this campaign may partly explain the larger percentages of respondents in 2007/08 who reported that they had implemented medication reconciliation, compared to the 2005/06 survey results   A "Getting-started Kit: Medication Reconciliation - How-to-Guide" has been published as part of the Safer Healthcare Now Campaign to support organizations in their   implementation of the medication reconciliation process [15].

INFORM AND EDUCATE PATIENTS/CLIENTS AND OR FAMILY

Patients play an important role in patient safety. There is proven value in teaching patients about their medication therapy to allow them to partner with healthcare providers to help improve the safety of the medication-use system. Accreditation Canada has identified Required Organizational Practices related to informing and educating patients/clients and/or family about their role in patient safety. The section on safely administering medications to clients lists the criteria related to educating clients about their medications.

- Thirty-five percent of respondents to the 2007/08 survey reported that they provide a copy of a medication record (e.g. a copy of the medication administration record) to selected patient groups, as part of their patient education program (Table G-9). Only 6% of respondents, all non-teaching hospitals, reported providing this service for all patients.

- Viewing of the medication record by the patient/patient's family was reported to be allowed, for selected patient groups, by 15% of respondents and for all patients by 11% of respondents.   This practice, for all patients, was more commonly reported by non-teaching hospitals (13%) than by teaching hospitals (5%).

- A pharmacist's consultation at the time of admission, for selected patients groups, was reported to be provided by 62% of respondents. A further 3% of respondents reported that this was provided for all patients.

- A pharmacist's consultation during the hospital stay was reported to be provided for selected patient groups by 76% of respondents. A further 5% of respondents reported providing a pharmacist's consultation for all patients.

- A pharmacist's consultation at the time of discharge was reported to be provided for selected patient groups by 75% of respondents. This practice was more common in teaching hospitals, compared to non-teaching hospitals (95% vs. 68%).

Table G-9. Medication Incident Reduction Strategies - Patient Education Program 2007/08

	All	Bed Size			Teaching Status	
		50 - 200	201- 500	>500	Teaching	Non-Teaching
Hospitals (n=)	158	33	86	39	38	120
Implementation of process to facilitate patient teaching with regards to their medication therapy:						
Provide the patient with a copy of the MAR or a similar medication record						
For all patients	9	3	6	0	0	9
	6%	9%	7%	0%	0%	8%
For selected patient groups only	56	16	30	10	16	40
	35%	48%	35%	26%	42%	33%
Allow viewing of the MAR by the patient / patient's family						
For all patients	17	2	13	2	2	15
	11%	6%	15%	5%	5%	13%
For selected patient groups only	23	9	10	4	2	21
	15%	27%	12%	10%	5%	18%
Provide a pharmacist's consultation at the time of admission						
For all patients	4	2	2	0	0	4
	3%	6%	2%	0%	0%	3%
For selected patient groups only	98	15	53	30	30	68
	62%	45%	62%	77%	79%	57%
Provide a pharmacist's consultation during their hospital stay						
For all patients	8	2	3	3	3	5
	5%	6%	3%	8%	8%	4%
For selected patient groups only	120	22	66	32	29	91
	76%	67%	77%	82%	76%	76%
Provide a pharmacist's consultation at the time of discharge						
For all patients	3	2	1	0	0	3
	2%	6%	1%	0%	0%	3%
For selected patient groups only	118	22	63	33	36	82
	75%	67%	73%	85%	95%	68%

In summary, improvements in medication safety practices have occurred since the last survey in 2005/06. The biggest changes were reported for medication reconciliation, which many hospitals have implemented more extensively since the last survey. The inclusion of medication reconciliation in the Accreditation Canada standards may have provided the impetus for more facilities to implement this practice.

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