Assessment of Risk in Medication-Use Systems: Learning from the Medication Safety Self-Assessment

Linda Hofman, Julie Greenall, John McBride, and Valentina Jelincic

Contributions to this column are prepared by the Institute for Safe Medication Practices Canada, a key partner in the Canadian Medication Incident Reporting and Prevention System.

INTRODUCTION

Interest in tools for enhancing patient safety has grown with the patient safety movement. The Medication Safety Self-Assessment (MSSA), a comprehensive assessment program originally developed by the Institute for Safe Medication Practices (ISMP) in the United States, is one such tool. The MSSA was adapted for use in Canada in 2001 and has been used by individual hospitals, regional health authorities, and provincial governments to identify and prioritize areas for improvement in medication-use systems.[1] The Canadian MSSA program is administered by ISMP Canada, independent of ISMP (US), and includes additional features not available with the US version.

The MSSA assists interdisciplinary hospital teams to evaluate the safety of medication practices in their institutions and to heighten awareness of the characteristics of a safe medication system. The MSSA consists of a series of safe medication practice characteristics, which are grouped into 10 key elements of medication-use systems (Table 1).

Each key element is defined by one or more core distinguishing characteristics. Several self-assessment items describing safe medication practices are then used to determine the level of success for each of the key elements. Some of the items purposely represent innovative practices and system enhancements that are not widely implemented in Canadian hospitals but that are grounded in scientific research and expert analysis of medication errors and their causes. When completing

Table 1. Key Elements of Medication-Use Systems

Key Element	Core Distinguishing Characteristics	Description
I	1	Patient information
II	2, 3	Drug information
III	4	Communication of drug orders and other drug information
IV	5, 6	Medication labelling, packaging, and nomenclature
V	7, 8, 9, 10	Medication standardization, storage, and labelling
VI	11	Medication delivery device acquisition, use, and monitoring
VII	12, 13	Environmental factors
VIII	14, 15	Staff competency and education
IX	16	Patient education
X	17, 18, 19, 20	Quality processes and risk management

the self-assessment, respondents must select 1 of 5 responses, ranging from no activity or discussion about a particular item to full implementation throughout the organization.

Although ISMP Canada is not itself a standards-setting organization, several items are under consideration for inclusion in the new standards of the Canadian Council on Health Services Accreditation.

The principal values of the MSSA are the ability of individual hospitals to identify opportunities for improvement and to track their improvement efforts over time. These values are enabled through a unique feature of the Canadian MSSA, whereby a Web-based program allows participants to immediately compare their current results to the aggregate national, provincial, and regional results, as well as to their own previous results in real time, as soon as responses have been electronically submitted. This functionality is not available for the US version.

At the time of writing, in late 2006, a total of 273 Canadian hospitals had completed at least one self-assessment. This article describes one hospital's experience with the MSSA program.

EXPERIENCE AT THE KINGSTON GENERAL HOSPITAL

The Kingston General Hospital (KGH) is a 456-bed regional referral centre that provides a full range of tertiary-level care for about 500 000 residents of southeastern Ontario. KGH is the primary inpatient teaching hospital affiliated with Queen's University.

The Pharmacy Department at KGH provides a comprehensive, centralized unit-dose and parenteral admixture service for all patient care areas except pediatrics and neonatology. Pharmacists are assigned to all patient care programs and are extensively involved in direct patient care, education, and research. Pharmacy technicians are responsible for all aspects of drug distribution services, including medication order entry.

An interdisciplinary Medication Safety Working Group (MSWG) was formed at KGH in January 2001. The MSWG is responsible for establishing strategic priorities and objectives for measuring and improving medication safety at KGH and the Cancer Centre of Southeastern Ontario. The MSWG reports directly to the hospital Pharmacy and Therapeutics Committee. The MSWG is also responsible for identifying areas for improvement, based on voluntary internal incident reports, incidents published in the literature, and internal self-assessments.

The MSWG completes the MSSA annually, and the score is tracked and reported as a corporate medication safety indicator. One goal of the MSWG's activities is to increase the hospital's MSSA score by 5% each year, and this was achieved in 2003 and 2004, with score increases of 8.8% and 6.7%, respectively. The 2005 assessment revealed an increase of only 0.9% from the previous year, but this was primarily attributed to a change in approach to the scoring system (in the years before 2005, some items had been assigned a score of "B" to reflect that the item had been discussed at some point but had not been implemented; in 2005, a decision was made to assign some of these same items a score of "A" if the item had not been discussed in the recent past). Despite this change in scoring, gains were achieved in 10 of 20 core characteristics. Comparative scores for individual core characteristics for the period 2002 to 2005 are shown in Figure 1.

In 2005, the MSWG identified the MSSA items with the greatest potential for improvement by evaluating the following features:

- the weight assigned to each item (items with greater weights were given higher priority)
- the percentage of the maximum score achieved (items with a lower percentage were given higher priority)
- a comparison of KGH results with those for "similar teaching hospitals in Canada", as identified through the MSSA Web program (key elements and core characteristics with scores below the peer hospital mean were given higher priority)

Using this process, 20 priority self-assessment items were identified (Table 2). The feasibility of achieving each of these items was considered in relation to availability of staff, technology, and financial resources. Wherever feasible, these items have been incorporated into the hospital's 5-year plan for strategic medication safety priorities and objectives.

KGH management and staff found this to be an effective method of translating the results of the MSSA into a manageable and meaningful action plan. Specific areas of improvement in the past year have included the following:

- further development of preprinted orders (KGH has 170 preprinted orders in use and another 44 in development)
- establishment and auditing of dispensing turnaround times
- modifications to formulary system policy to include safety information for new drug submissions

In addition, the Medical Advisory Committee has

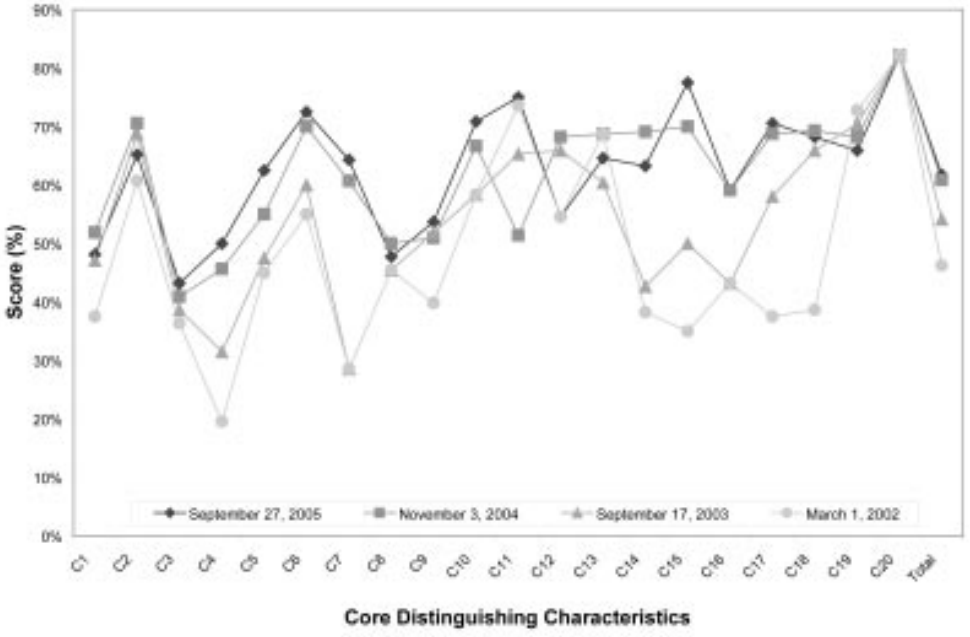

Figure 1. Scores for the 20 core characteristics of the Medication Safety Self-Assessment at Kingston General Hospital over a 4-year period. Each score represents the percent of the maximum weighted score for that characteristic. An example of a core characteristic is "essential patient information is obtained, is readily available in useful form, and is considered when prescribing, dispensing, and administering medications."

Table 2. Prioritization of Self-Assessment Items from the Medication Safety Self-Assessment by the Kingston General Hospital

Proposed Priority Rank	MSSA Item No.	Theme	Score (% of Maximum)*
11	12	Bar coding	0/16 (0)
	41b	Preprinted orders	4/16 (25)
2	15	CPOE with LIS interface	0/12 (0)
	87	High-alert medications from floor stock or automated cabinet: first-dose review by pharmacist	0/12 (0)
	48	e-MARs with pharmacy system interface	3/12 (25)
	79	Compliance with dispensing turnaround times	3/12 (25)
	35	Formulary: review of error potential before adding drugs	3/12 (25)
3	37	Formulary: at least a 6-month review of errors for drugs on market less than 6 months (i.e., for 6 months after adding to the hospital formulary)	0/8 (0)
	16	Weight designated as a required field for pharmacy order entry	0/16 (0)
	121	Distraction-free and noise-free transcription areas	0/8 (0)
	52	Ad hoc review process for urgent use of unusual drugs, doses, uses	0/8 (0)
	78	Established dispensing turnaround times	2/8 (25)
	8a	Allergy prompts on all pages of paper orders	2/8 (25)
4	80	Compliance with stat, emergency, and routine prescribing criteria	0/4 (0)
	38	Drug use evaluation after introduction of drugs with heightened error potential	0/4 (0)
	100	Formalin not stored or dispensed in Pharmacy	0/4 (0)
	123	Distraction-free and noise-free medication preparation areas	0/4 (0)
	46	Chemotherapy: no verbal or telephone orders	0/4 (0)
	9	Allergy prompts on all pages of MARs	1/4 (25)
	173	Medication safety front-line walkabouts	0/12 (0)

CPOE = computerized physician order entry, LIS = laboratory information system, MAR = medication administration record.

*The response for each characteristic is assigned a weighted score. The scores were developed by the Institute for Safe Medication Practices in the United States through an assessment of the impact on patient safety from a system perspective and the ability of the characteristic to ensure sustained improvement.[2]

formed an interdisciplinary working group to make recommendations for implementation of computerized physician order entry (CPOE), and the Pharmacy Department is now relocating medication order review and entry functions to a quiet area in the central pharmacy. The 2006 MSSA was completed in November 2006, and the results will be used to guide further medication safety initiatives.

MSSA AS A LEARNING AND PLANNING PROGRAM

The MSSA was developed to translate the learning gleaned from medication incidents into action. The majority of the items in the self-assessment represent safe practices recommended by ISMP and ISMP Canada in response to medication incidents or on-site hospital consultations. By conducting an MSSA, hospitals can learn about the shortcomings of their existing medication systems, identify key areas for improvement, and then take follow-up action to support their patient safety initiatives.

The recently released Medication Safety Self-Assessment for Hospitals Canadian Version II includes 41 additional items reflecting new safe practice recommendations. New MSSA programs are also available in Canada for community/ambulatory pharmacy and for complex continuing care and rehabilitation facilities; the long-term care version is in the pilot testing phase.

A great deal has been learned about the causes of medication errors and strategies for prevention. Pharmacists, as part of their role in ensuring the best possible pharmacotherapeutic outcomes, can participate in programs such as the MSSA to identify and resolve issues related to medication safety.

References

1. Greenall J, U D, Lam R. An effective tool to enhance a culture of patient safety and assess the risks of medication use systems. *Healthc Q* 2005;8 Spec No.:53-58.
2. Smetzer JL, Vaida AJ, Cohen MR, Tranum D, Pittman MA, Armstrong CW. Findings from the ISMP Medication Safety Self-Assessment for Hospitals. *Jt Comm J Qual Saf* 2003;29:586-597.

Linda Hofman, RN, BNSc, is Consultant, Professional Practice at Kingston General Hospital, Kingston, Ontario.

Julie Greenall, RPh, BScPhm, MHSc (Bioethics), is a Project Leader with the Institute for Safe Medication Practices Canada, Toronto, Ontario.

John McBride, RPh, BScPhm, MSc is Director of Pharmacy at Kingston General Hospital, Kingston, Ontario.

Valentina Jelincic, RPh, BScPhm, is a consultant to the Institute for Safe Medication Practices Canada, Toronto, Ontario.

e-mail: info@ismp-canada.org

ISMP Canada homepage: http://www.ismp-canada.org