L – EVALUATING PHARMACY SERVICES

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There is a common and widely attributed maxim that "If you can't measure it, you can't manage it".[1] Increasingly measurement is raised as an important issue in the areas of quality, safety and risk. The Institute of Medicine report in the US in 1999 [2], followed by the Baker/Norton report in Canada in 2004 [3], showed a pressing need for identifying and mitigating preventable adverse events in Canadian hospitals. Classen wrote:

As hospitals tackle medication safety more aggressively, measuring safety will prove to be an essential tool in both understanding the problem and tracking success in solving identified problems. [4]

Five years later, in a paper titled "Is Health Care Getting Safer", Charles Vincent stated,

The main problem is that measurement and evaluation have not been high on the agenda. We believe that the lack of reliable information on safety and quality of care is hindering improvement in safety across the world.[5]

He further stated that:

…unless serious efforts are made to develop reliable indices of safety and quality we will still be unable to answer the question posed by this paper in five years' time.

At the 2010 *Halifax* Conference, Ross Baker emphasized three problems:

1. There are growing numbers of patient safety and quality indicators but still limited understanding of what they measure and how they relate.
2. Few organizations have adopted a strategic focus on measurement that helps them determine what to measure.
3. The links between measurement, improvement goals and actions are poorly developed.

Evaluation of pharmacy services is an important tool for improving safety, quality, efficiency and accountability.

Clearly there is work to be done.

The rapidly increasing cost of health care has also put additional focus on efficiency and accountability. Our organizations are attempting to make changes to their organizational behavior through the adoption of LEAN and six sigma "high performance" strategies, balanced scorecards, and other measures.

Hospital pharmacy has a long history of tracking data related to drug distribution, drug compounding, and the preparation of sterile parenteral products. Although some hospital pharmacy departments do measure clinical activities, this is often done primarily from a workload measurement perspective. In hospital pharmacy, pharmacy technicians are assuming more and more of the day to day responsibility for drug distribution. The pharmacist is becoming primarily a clinical practitioner. In this revised practice model, not only is there a need to clearly define the value of the clinical pharmacist, but also to measure it through the use of appropriate indicators. In a healthcare world where limits to available funding are inevitable, the use of resources will need to be justified. Not only will hospital pharmacy managers need to provide data, they will also need to show that what they are measuring are the right things to measure. Indicators which clearly relate clinical activity to the core values of our organizations, such as improved patient outcomes, are what we have to establish, validate and refine.

This new chapter of the Hospital Pharmacy in Canada Report focuses on the audit and evaluation activities that are carried out in Canadian hospitals for the purpose of insuring the quality and safety of pharmacy services and other medication-related activities that occur in the hospital setting. The evaluation data that was captured and reported in various sections of the 2009/10 Hospital Pharmacy in Canada Survey is summarized in this chapter. The 2009/10 survey contained a number of questions, concerning the evaluation of pharmacy services, which had been asked in previous surveys. The results and trends in those areas are presented in this chapter. In addition a number of new service evaluation questions were included in this year's survey and the results of those questions are also presented and discussed.

EVALUATION OF CLINICAL PHARMACY SERVICES

As reported in the chapter on clinical pharmacy services, Bond and his colleagues, in the 1990s and early 2000s, 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 .[6,7,8,9,10,11,12,13]

In Table B-7 in the clinical chapter, the 2009/10 average level of service (comprehensiveness) was reported for 22 clinical pharmacy activities. Respondents were asked to select one of 4 rankings that best described the extent of implementation of the service within their hospital. A score of 1 on the rating scale represented a comprehensive service, a score of 2 represented a targeted service delivered to those who most need the service, a score of 3 represented a limited service, and a score of 4 indicated that the service was not offered at the respondent's hospital. Of the clinical pharmacy services identified by Bond et al. as having a positive effect on health outcomes, most were not offered on a comprehensive level by our survey respondents. For example:

- 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), and adverse drug reactions (ADR). However, despite this evidence, the respondents to the 2009/10 survey seemed to place a low priority on the provision of medication histories, with an average comprehensiveness rating of 2.6. In addition to the evidence from the Bond papers that supports the value of medication histories, Accreditation Canada now includes medication reconciliation as one of its Required Organizational Practices.

How evidence-based are our decisions concerning the allocation of resources to programs and services?

- The service level rating of 1.9 for pharmacokinetic consultations/monitoring suggests that this service is delivered on a more comprehensive basis than admission histories, which received an average service level score of 2.6. However none of the Bond papers, or other similar studies, have reported that this service is associated with an improvement in patient outcomes.

The question that the profession must ask itself is why this discrepancy exists between the services to which we give a high priority and the evidence that supports those decisions. We place a high value on evidence-based decisions when it comes to drug therapy, but the decisions we make about the pharmacy services that we offer in our facilities do not seem to be entirely evidence-based.

The clinical services chapter also reported the results of other questions that looked at quality evaluation activities within the pharmacy department.

- Pharmacist participation in drug use evaluation, where drug use patterns are analyzed and reported to a hospital committee for follow up, received a comprehensiveness rating of 2.9. In the 2007/08 survey, the comprehensiveness rating for drug use evaluation was reported to be 2.6. These results suggest that drug use evaluation is not given a high priority by the facilities that participate in this survey, and that the comprehensiveness of this service has actually decreased since the last survey.
- Evaluation of formulary compliance was rated at 2.9, indicating that this activity is carried out at a very limited level of service, in most of the responding hospitals. In the 2007/08 survey, the comprehensiveness rating was 2.4, which again suggests that the service level for this pharmacy activity has actually declined since the last survey.
- Adverse drug reaction (ADR) evaluation and reporting, with a comprehensive rating of 2.2 was very similar to the 2007/08 result of 2.3.
- Medication incident analysis, and the development of corrective actions, was rated at 1.7, again very similar to the 2007/08 result of 1.8. These ratings indicate that these two activities are conducted as a "targeted service" (rating scale = 2), delivered on an as needed basis, presumably dependent on the level of severity of the ADR or the medication incident.

- Thirty-one percent (50/160) of the 2009/10 survey respondents reported that they evaluate the direct patient care services provided by pharmacists in their hospital by auditing a sample of clinical activities. Evaluation was conducted through the use of retrospective chart review, direct observation and self-evaluation by pharmacists.
- Of the respondents who reported that they evaluated clinical services:
    - Eighty-two percent (40/49) evaluated the documentation of clinical services that had been provided by their pharmacists,
    - Sixty-seven percent (33/49) evaluated the patient assessment performed by their pharmacists,
    - Sixty-one percent (30/49) evaluated the development of objectives and the implementation of a monitoring plan,
    - Forty-one percent (20/49) evaluated the medication/drug counselling provided by their pharmacists.

EVALUATION OF DRUG DISTRIBUTION

In the Drug Distribution chapter, several questions dealt with whether or not a pharmacist reviewed all medication orders for therapeutic appropriateness, prior to administration to the patient. The Accreditation Canada Qmentum Program for 2010 includes a set of Managing Medications Standards, in which the need for a pharmacist review of medication orders prior to dispensing is addressed.[14] The review is to include the appropriateness of the medication, dose, frequency, and route of administration; any therapeutic duplication; actual or potential allergies or sensitivities; actual or potential interactions; variations from the medication's intended use; and other medication related issues or concerns. In emergency situations or when there is no pharmacist available, the organization is to establish and follow a process to ensure a review occurs as soon as a pharmacist is available to do so.

The responses to the questions dealing with the review of medication orders, before the patient receives the medication, indicated that during the hours that the pharmacy is open most orders are appropriately reviewed by a pharmacist before the medication can be accessed by nursing staff for administration to the patient. However, when the pharmacy is closed, the situation is quite different.

- During the hours that the pharmacy is closed, only 8% of respondents reported that a pharmacist, either on call or working off site, reviews at least 95% of all routine medication orders for therapeutic appropriateness before a medication is accessed from a night cupboard or similar after hours medication supply; only 7% reported this review occurs before medication is accessed from wardstock; and only 8% of respondents using automated cabinets on the patient care units reported that a pharmacist reviews at least 95% of all routine medication orders for therapeutic appropriateness before medication is accessed from an automated cabinet.

How important is the pharmacist's review of medication orders?

- During the hours that the pharmacy is closed, 14% of respondents reported that a pharmacist reviews at least 95% of all routine medication orders for therapeutic appropriateness before a medication order appears on the MAR.

This pattern suggests that the pharmacist's role in reviewing medication orders is considered to be vital for insuring the safety and appropriateness of drug therapy… but only during the pharmacy's regular work hours. When the pharmacy is closed, nurses, physicians and patients are on their own. It may be time for Canadian hospital pharmacy managers to question the limited review of medication orders by pharmacists during certain hours of the 24 hour day.

In the drug distribution chapter, the section on parenteral admixture services also includes several questions related to evaluation.

- A sterile products gap analysis to evaluate the hospital's procedures, equipment and facilities, based on accepted standards for compounding parenteral admixtures, had been completed by only 49% (72/147) of respondents.

- Fifty-eight percent (85/146) of respondents indicated that they audit the preparation of parenteral admixtures by observing employees for validation of aseptic technique, at least once a year. Of these, 41% (35/85) indicated that validation includes verification of product sterility by laboratory testing. Twenty-six percent (38/146) of respondents conduct surface sampling in sterile product preparation areas on a regular basis.

These results suggest that only about 50% of hospital pharmacy departments have implemented these quality assurance activities within their sterile product services. Given the serious outcomes that have been reported when a breakdown in process has led to contamination of parenteral products, all hospital pharmacy departments should review their quality assurance practices, with the aim of bringing them in line with current guidelines for insuring the safety of compounded sterile products.

EVALUATION OF MEDICATION SAFETY

The Medication Safety chapter also included a number of questions related to the evaluation of patient safety initiatives within the hospital.

- Forty-eight percent (76/158) of respondents reported that they had conducted a prospective, medication safety assessment process, such as a failure mode and effects analysis (FMEA), within the past year.
- A retrospective medication safety assessment, like root cause analysis (RCA), was completed in the last year by 61% (96/158) of respondents.
- Forty-two percent (51/121) of respondents reported that they had completed a Medication Safety Self-Assessment tool, like the one that has been developed by The Institute for Safe Medication Practices (ISMP), within the last two years

The pattern here is similar to that reported in the sections above, with only about 50% of respondents indicating that they have implemented these important medication safety evaluation processes, despite the heightened emphasis on medication safety over the past decade.

EVALUATION OF THE USE OF TECHNOLOGY

Evaluation and measurement issues addressed in the Technology chapter primarily addressed how pharmacy departments deal with the clinical decision support alerts that are built into their Pharmacy Information Systems.

Are we defeating the purpose of computerized clinical decision support systems?

- Only 21% (26/125) 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.
- Of those 26 respondents, 73% (19/26) have an override policy requiring documentation of the reason for high-risk overrides and 58% (15/26) have a requirement for electronic tracking of overrides.
- Thirty-one percent (8/26) of respondents reported that their override policy includes a requirement for a regular audit, review and follow up of overrides, usually by a medication safety committee or by a group within pharmacy.

There is a widely held belief that computerized clinical decision support systems will make health care safer and more effective. These systems have the ability to process large amounts of data and provide practitioners with alerts when potential problems are identified. However, the data suggest that many alerts are overridden and there is little in the way of follow-up done to determine if those overrides are appropriate or not.

In future surveys, additional attention will be paid to what we measure, with a view to developing and applying improved performance indicators.

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