

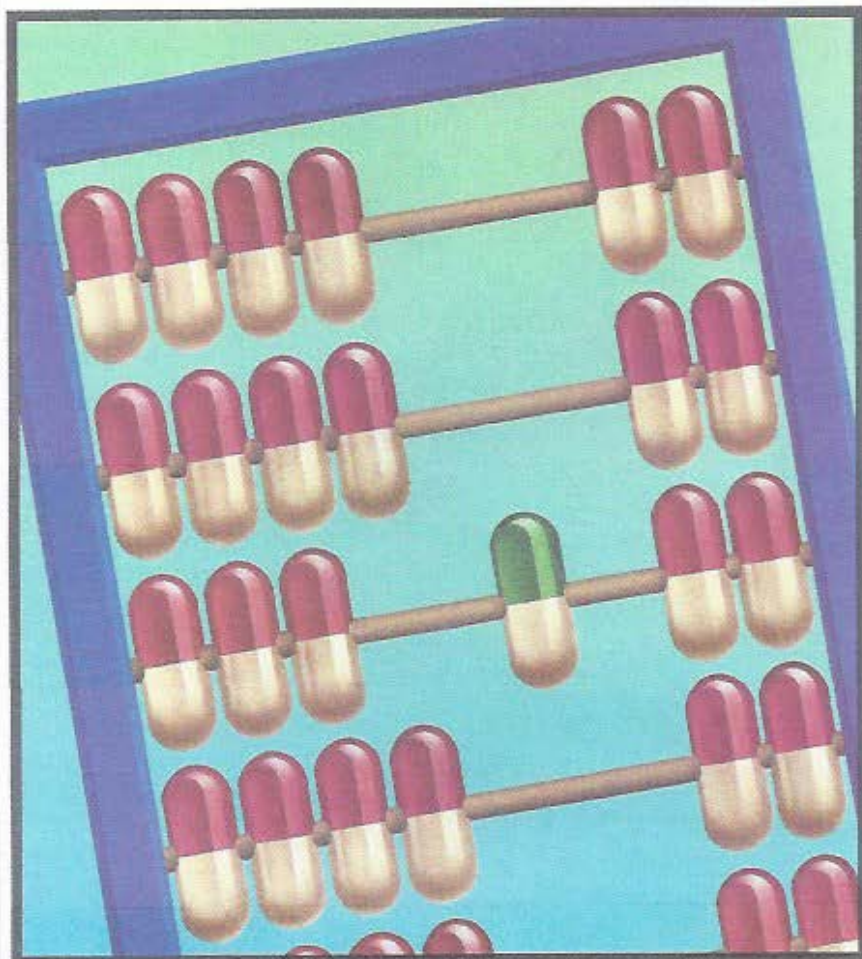
# HOSPITAL PHARMACY PRACTICE

*The professional journal for Canada's hospital pharmacists*

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PMS-LITHIUM**



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## COUNTING THE COST OF DRUG ERRORS

*What impact do shrinking pharmacy resources  
have on "drug misadventures"?*

*KAREN GRAHAM, B.Sc.Pharm.*

Recently the television documentary *Marketplace* examined medication errors and described a situation where a pediatric leukemia patient died as a result of an intrathecal rather than intravenous injection of vincristine.<sup>1</sup> Anyone watching that documentary would share the horror and incredulity

expressed by the child's mother that such an error might occur at all, and moreover that other children had already died as a result of similar misadventures. Many elements contributed to this tragedy, including inappropriate labelling, preparation and distribution of medications, as well as short-staffing,

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"Drug misadventure," a phrase coined in the 80s by Manasse in a series of articles in *AJHP*, is still highly relevant today.<sup>2,3</sup> Manasse contended that hospital pharmacists have a professional, institutional and societal responsibility to prevent adverse outcomes from medication use. He ascribed the risk of drug misadventure to more than simply drug delivery systems; risk is inherent in all stages of the drug use cycle in hospitals, from prescribing to administering. In an age of increasing cutbacks to hospital budgets, we need to look critically at the impact that shrinking resources have and will have on the risk of drug misadventure in hospitals.

The early 90s will be remembered for the emergence of myriad vocabulary mutations intended to mask the clear-cutting of health care resources: downsizing, rightsizing, outplacement, re-engineering, regionalization, partnering, restructuring, insourcing and outsourcing became part of our everyday language. A glance at any health conference brochure or table of contents from a health care journal published over the past five years reveals an obsession with "doing more with less" and finding ways to enhance quality while decreasing resource use.

In the health care sector, we need to ask whether staffing decreases will accomplish a budget surplus at the expense of quality of care. A hard-line focus only on the bottom line can cause us to overlook the human capital of health care workers, who should appear under "assets"—not "expenses"—on the balance sheet.

The question that has to be asked is not how much can we cut, but have we already cut too much? What can be done to decrease the risk for drug misadventures in an environment of shrinking health care resources?

### **The impact of reduced resources on drug delivery**

In traditional drug delivery systems, it's virtually impossible to quantify the

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*What impact do shrinking pharmacy resources have on "drug misadventures"? KAREN GRAHAM, B.Sc.Pharm.*

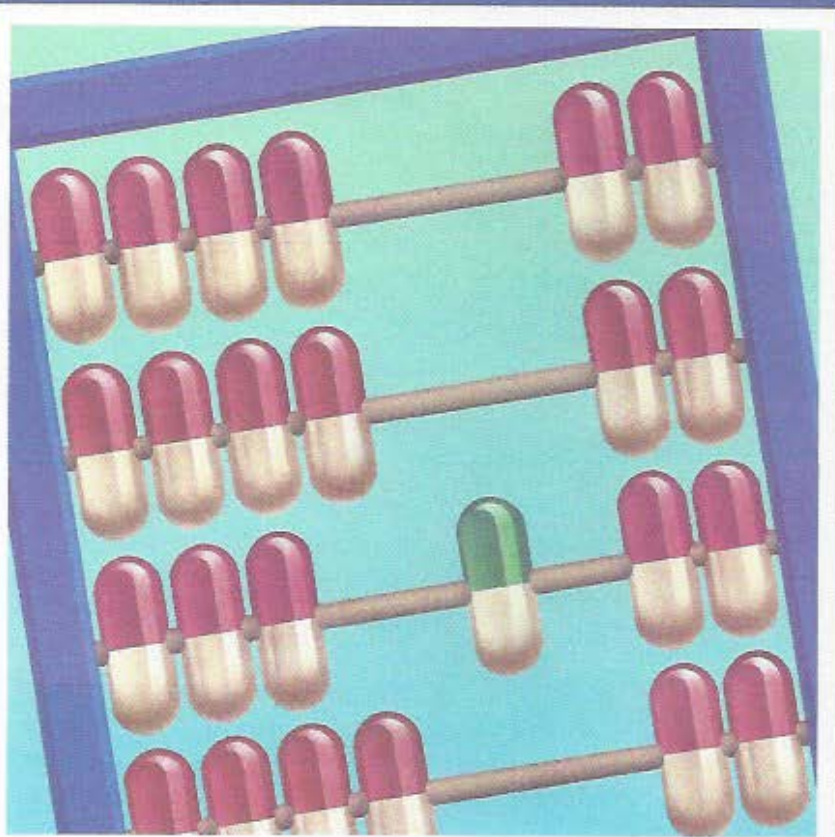
impact of reduced staffing, since errors are effectively buried by the system. Knowledge accumulated over several decades has shown that traditional drug delivery systems neither unearth nor prevent medication errors and that medication incident reporting represents only the tip of the iceberg. In spite of this, some health care workers, including some pharmacists, describe their drug delivery systems as "safe" simply because they don't have many medication incident reports.

Although decades of evidence demonstrates that the unit dose distribution system costs the same on a global basis as traditional systems and is far safer,<sup>4</sup> it appears that if a hospital is not already providing a unit dose service, it is unlikely to convert in the near future. There appears to be a trend toward abandoning the concept of unit dose as virtually impossible in 1997, because it

is perceived as simply too expensive.

Unit dose has been shown to significantly reduce the number of errors that occur through drug distribution. The error rate of 5.3-20.6 per cent in traditional systems falls to 0.6-3.5 per cent with unit dose.<sup>5</sup> However, we know that many unit dose systems in Canadian hospitals have been eroded over the years and the careful 24-hour scrutiny of what goes up in the bins and what is returned is not occurring in all unit dose hospitals all of the time. This may be due to competing priorities for technician and pharmacist time. If we are not performing that final step in a unit dose drug distribution system, will error identification and reduction continue to be a significant improvement over traditional drug distribution systems?

If the commitment to the unit dose system has been waning, it appears that the remaining drug distribution choice



is between the traditional system status quo or automation. The emerging pharmacy service model appears to make a clear distinction between clinical and distributive services, assigning the latter to be re-structured through automation to some degree. As Perini et al pointed out,<sup>6</sup> pharmacy directors faced with departmental restructuring are looking to automation to maximize human resources, but are hampered by the lack of objective, evaluative information about automated technology. We still need to study the effect of automated medication distribution systems on the quality of patient care, and must quantify their real impact on medication error rates. Hospital pharmacies that are considering automated drug delivery systems should consider negotiating with vendors to cover the costs of the post-implementation evaluation—perhaps in a partnership arrange-

ment—which might yield new information for the profession about the quantitative impact of automation on patient care.

What, then, should be done to reduce the risk of medication errors in hospitals with high-risk traditional drug distribution systems? A careful assessment of the cost-benefit of a pharmacy-based, centralized intravenous admixture (CIVA) service is the first place to start. It really doesn't make sense to invest in system upgrades for oral medications but continue to provide IVs through nursing-based IV admixture programs. Parenteral medications are the most risky and have been responsible for the most tragic medication errors, including the vincristine error profiled on the *Marketplace* program. Schneider summarized the risks associated with a nurse-based system including contamination, instabil-

ity, incompatibility, calculation error, wrong drug and wrong dose.<sup>7</sup> The literature reviewed in this article demonstrates clearly that pharmacy-based CIVA systems significantly reduce the risk of medication errors.

There is clearly a need for multiple safeguards inherent in a pharmacy-based CIVA admixture program, particularly for those drugs which are most prone to very serious or fatal errors. An inventory of those drugs which are most likely to be involved in serious error is a starting point. High-risk categories such as chemotherapies, drugs used in the OR, CCU and ICU, and all drugs with a narrow therapeutic range, should be subject to more intense scrutiny through double-checks and clear labelling practices. A checking system which helps to keep the person doing the checking (preferably a technician) focused on the task at hand should be implemented to increase accuracy. In the dispensing and order entry processes, particularly for the higher-risk drugs, items which have been verified on the label and order should be checked off.

Drug misadventure is also linked to poor prescriber handwriting. Michael Cohen, president of the U.S. Institute for Safe Medication Practices, estimated that 30 per cent of all physician prescriptions are illegible and necessitate a phone call for clarification.<sup>1</sup> The technological answer is to implement computerized physician order entry. Other options include highlighting the issue through the Pharmacy and Therapeutics Committee, and advocating tough policies relating to illegible physician orders. Perhaps linking legibility with admitting and prescribing privileges is warranted—these orders are not simply nuisances, they create unacceptable risks for patients.

### Patient-oriented services as a resource

It's no longer simply a suspicion that pharmacists save drug costs through interventions, or that they save global hospital costs through prevention of drug misadventures. We know, and have demonstrated, that our services in hospitals more than pay for themselves.<sup>8</sup>

As less acutely ill patients are more appropriately placed in long-term care institutions or cared for in the community, decreasing lengths of hospital stay and increasing acuity of care have become the norm. There are enormous challenges to administering increasingly complex drug regimens, and monitoring and tracking patients who are in hospital for only a few days. Assuring rational drug therapy is critical—we must strive to get it right the first time, in order to avoid medication errors, adverse drug reactions, prolonged stay and/or re-admission.

The cost of inappropriate drug therapy is high. We know that a significant percentage of hospital admissions can be attributed to drug misadventure,<sup>9</sup> and that some of this could be avoided by ensuring rational drug therapy from the outset. By decreasing pharmacist resources, we run the risk that drug-related problems will not be detected or resolved, and ultimately may save a few dollars at the front end while squandering significant resources and putting patients at risk at the other. It's important to note that pharmacist resources are wasted anyway, if all we do is "count, pour, lick and stick." The money spent on pharmacists is only appropriately spent if pharmacists are focused on patient-oriented activities, and ultimately pharmaceutical care.

It is unlikely that staff allocations to hospital pharmacies will grow in the foreseeable future; in fact they will probably decrease, if they haven't already. In the current environment, the most likely avenue for successfully increasing resources focused on appropriate drug therapy is through proven paybacks for specific services, in the same way that many Drug Utilization Evaluation positions have been justified over the past few years. Recent Canadian literature delineates a number of pharmacy services that pay for themselves and point the way to justification of these services even in times of severe financial constraint.<sup>8</sup> The other approach to enhancing the time available for direct patient care is to delegate responsibility for drug delivery to technicians.

## A national approach

We appear not to be learning collectively from our mistakes. Given that the same tragic error with vincristine described in the *Marketplace* program has been repeated several times across the country, we really haven't shared and haven't learned. Perhaps a central registry, similar to the U.S. program instituted by Michael Cohen, deserves support from the Canadian pharmacy profession.<sup>10</sup> Cohen's registry collects reports of medication errors on a voluntary basis from across the U.S. and makes these available to practitioners. Aggregate reports from a central registry could form a very important data source for continuous quality improvement in drug distribution systems. Where warranted, these centres would send out reports warning individual hospitals of dangerous occurrences and how to avoid them.

Industry labelling and packaging practices have certainly improved over the years, and the efforts of the Canadian Society of Hospital Pharmacists to work with the industry in this area should continue. A central registry could provide data to manufacturers to show where labels and packaging have contributed to a medication error.

## Conclusion

It is critical to evaluate and attempt to limit the impact of decreasing resources on the risk of drug misadventure. In hospitals where traditional drug delivery systems are employed, basic safeguards should be reviewed for high-risk drugs. A concerted effort to justify a pharmacy-based centralized intravenous additive program is warranted.

An evaluation of emerging drug delivery technologies and their impact on patient safety is necessary. Drug misadventure can be avoided by ensuring that emerging drug delivery systems are at least as safe as unit dose and that pharmacists are free to focus their energies on the identification, prevention and resolution of drug-related problems.

National, shared information on medication errors should be developed to help hospital pharmacists rigorously evaluate the potential for risk in their

individual institutions.

Canadian hospital pharmacists have decades of research and experience at their disposal to argue for pharmacy's role in assuring patient safety through decreased risk. In the context of the medication use cycle, which carries the inherent potential for harming every patient admitted to our hospitals, what is the real meaning of "too expensive"?

*Karen Graham, B.Sc.Pharm., is the president of Panacea Consulting Incorporated, based in Coldwater, Ont. It provides operational reviews, strategic issues and project management, education and facilitation toward group consensus for hospitals, industry, government, associations and academia.*

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