Letters

Correspondance

The cost of maintaining adequate antidote supplies

David Juurlink and colleagues reported recently that most acute care hospitals in Ontario do not stock adequate amounts of antidotes.[1] We previously showed that the availability of 13 antidotes was also poor in Quebec (we used more stringent criteria to define adequate stocking).[2]

Although the situation is worrying, it is probably not as expensive to correct as it may seem. The antidote inventory would only have to be increased by 6 to 18% to correct the problem in Quebec,[3] because there is gross overstocking of some antidotes by some hospitals. Because we set our recommended minimal stock of 18 antidotes on the basis of levels of hospital care, we think that keeping an adequate antidote inventory should not be a problem even for smaller hospitals with limited pharmacy budgets; the annual costs in 2000 would have been $4697 for primary care hospitals, $7450 for secondary care hospitals and $14 273 for tertiary care hospitals. Our recommended minimal amount of stock was that which would provide an adequate amount of antidote to treat a 70-kg adult for 12 hours in a primary or secondary care hospital and 24 hours in a tertiary care hospital.[3] Most antidotes are used infrequently: the turnover of antidote inventory is 0.3 to 7.4 per year compared with an average of 8.9 per year for all medications in Canadian pharmacies.[3] If a hospital uses antidotes appropriately the cost of maintaining an adequate stock should not be a concern, considering that most antidotes can be credited if unused.

Benoit Bailey
Department of Pediatrics
Université de Montréal
Montreal, Que.
Jean-François Bussières
Faculty of Pharmacy
Université de Montréal
Montreal, Que.

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[Two of the authors respond:]

We thank Benoit Bailey and Jean-François Bussières for their thoughtful comments on the costs of maintaining appropriate supplies of antidotes. The actual cost of an adequate inventory is influenced by variables other than acquisition cost, including the drug's shelf life and the manufacturer's policy on issuance of credit for outdated product.[1] For example, a course of treatment with digoxin immune Fab antibody fragments may cost up to $8000. This sticker shock, coupled with the infrequency of use, may lead some hospitals to purposefully not stock the drug. Consider, however, that the manufacturer will credit hospitals for outdated product, and the cost becomes a justifiable one-time expense.

How much of each antidote should a hospital stock? There is no right answer, but suggestions have been published.[2–5] For some toxins, such as acetaminophen, methanol and ethylene glycol, a hospital should be prepared for the simultaneous treatment of more than one patient. Clearly, every hospital should keep at least enough of each antidote in the emergency department to be able to initiate treatment immediately.

Our survey[6] generated substantial media attention, and this may have helped to mitigate the problem of inadequate antidote stocking at some hospitals. In addition, the simple act of completing our questionnaire may also have led hospitals to recognize and address the deficiencies in their antidote supplies. We were pleased to receive calls from 4 different hospitals in the days after publication asking if they could announce that they were the one hospital in the province with all 10 antidotes on hand. Such corrective actions are encouraging.

David Juurlink
Department of Medicine
University of Toronto
Toronto, Ont.
Donald Redelmeier
Department of Medicine
University of Toronto
Toronto, Ont.

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Personalized medications

The article by Michelle Fischbach and colleagues on pill-splitting in a long-term care facility accurately described my experience at a pharmacy serving many nursing and retirement homes.[1]

There are at least 3 factors conspiring to defeat the "start low, go slow" strategy for administering medications in solid oral dosage form: pharmaceutical manufacturers, monographs in the *Compendium of Pharmaceuticals and Specialties* and the Ontario Drug Benefit Formulary.

Although pharmaceutical manufacturers produce drugs in discrete dosage

units that will be effective in approximately 90% of the population, these dosage units are excessive for many young patients and may be inappropriate for frail elderly people. Most monographs in the *Compendium of Pharmaceuticals and Specialties* list the number of fixed-strength tablets or capsules that may be given in a 24-hour period. If an elderly 50-kg woman and a 100-kg man each consume one capsule they are certainly not getting the same dose. The presentation of dosage should include a measure of body weight or body surface area.

The Ontario Drug Benefit Formulary has taken on the role of paymaster for the pharmaceutical industry. Pharmacists are discouraged from finding creative ways to tailor medications to the specific needs of patients.

Recent advances in pharmacogenomics have produced much excitement concerning the future of personalized medicine. However, customized doses for elderly patients are needed today. The technology to deliver personalized medications is available now, but unfortunately it is seldom used by pharmacists or requested by physicians.

Véronique Koo
Pharmacy Manager
Pharmacy.ca
Toronto, Ont.

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[Two of the authors respond:]

In an ideal world and using existing technology, every hospital, pharmacy and physician's office would be equipped with a database capable of computing suitable starting and maintenance doses for each patient's medications on the basis of the patient's age, body weight, surface area and creatinine clearance rate. The doses could subsequently be modified on the basis of therapeutic effect. This would allow physicians to prescribe and pharmacists to dispense essential therapies in a truly personalized and standardized manner. Effective disease management would thereby be maximized and adverse events would be curtailed. Pharmacogenomics may promise even further advances, but its practical applications will likely not be implemented in the near future.

Until the pharmaceutical industry manufactures medicines in formulations that allow for such customized dosing (especially very small doses); until hospitals, pharmacies and physicians' offices invest in the infrastructure and information systems required to implement such an undertaking; and until hospital and provincial drug formularies and funding guidelines are revamped to account for variations in dosing, pill-splitting will remain an unfortunate reality.[1] This is particularly true among community-dwelling and institutionalized elderly people who so often require the "start low, go slow" strategy.

Michelle Litner (née Fischbach)
Baycrest Centre for Geriatric Care
Toronto, Ont.
Jennifer Gold
Baycrest Centre for Geriatric Care
Toronto, Ont.

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Give us clear, not convoluted, clinical practice guidelines

The recent article on chemoprevention of breast cancer has left me a confused general practitioner.[1] The authors refer to assessment of a woman's risk of breast cancer using the Gail index and make recommendations regarding the prescription of tamoxifen to women who have a Gail index that is greater than or equal to 1.66% over 5 years. But they point out that the Gail index has not been validated and has not been evaluated for use as a routine screening or case-finding instrument. Nowhere in the article can I find satisfactory reconciliation of these conflicting notions.

Because the Gail index has not been evaluated and validated it does not seem to me that there are sufficient grounds for publication of a high-profile article setting out official guidelines for all Canadian physicians.

As a result of the publication of this article many patients will no doubt visit their physician's office to discuss chemoprevention of breast cancer with tamoxifen. When I am faced with such patients I will be at a loss as to how to proceed, not knowing whether the advice given in the article is valid or not.

Michael R. Lawrence
Physician and surgeon
Vancouver, BC

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1. Levine M, Moutquin J-M, Walton R, Feightner J. Chemoprevention of breast cancer. *CMAJ* 2001;164(12):1681-90.

After reading the guideline on chemoprevention of breast cancer,[1] I feel compelled to vent my frustration at the publication of yet another verbose, convoluted and impractical guideline for those of us in clinical practice to follow. The appendix entitled "Questions and answers on chemoprevention and breast cancer: a guide for women and their physicians" also seems totally impractical. The woman and her physician are advised to obtain the Gail index from a Web site but told that it will only be useful in determining "whether to further discuss the benefits and harms of taking tamoxifen." A woman is supposed to decide whether she feels "a tamoxifen-induced stroke would be far worse than breast cancer" or "breast cancer would be far worse than a stroke." She is then advised, "You will have to determine the value you place on the possible consequences of taking or not taking tamoxifen after a full discussion with your doctor." Like so many other *CMAJ* guidelines, this provides little assistance in the decision-making process for the physician or the patient. Am I supposed to ask my patients if they would prefer to die of