A Provincial Program in Nova Scotia to Decrease the Use of Wet Nebulization Respiratory Medications

By Ingrid Sketris and Pam McLean-Veysey

All Canadian citizens are eligible for health care services, including hospital care and physician services, under the Canada Health Act. Public funding accounts for approximately 69% of health care expenditures. Private insurance for publicly covered hospital care and physician services is not allowed. Some health care services (e.g., drugs provided outside the hospital setting, dental care, and outpatient rehabilitation services) are not covered under the Canada Health Act. Each Canadian province and territory has, over the years, introduced publicly funded drug insurance programs, but these vary with respect to the population covered, drugs covered as benefits, deductibles, and copayments. This system has some similarities to the vertically integrated systems of the United States.

Nova Scotia is a province of approximately 942,000 inhabitants. The Nova Scotia government funds two main drug insurance programs: one for seniors (Seniors' Pharmcare, with approximately 95,000 beneficiaries) and one for persons who receive social assistance through the Nova Scotia Department of Community Services (with approximately 65,000 beneficiaries), according to John Hoar, research and statistics officer, Nova Scotia Pharmcare Program. Disease-specific programs also exist (e.g., for patients with cystic fibrosis or multiple sclerosis). The Nova Scotia drug program promotes appropriate, cost-effective, affordable drug therapy. Among strategies used to manage drug therapy in Nova Scotia are the Provincial Formulary Management Committee, a committee of the Department of Health, and the Drug Evaluation Alliance of Nova Scotia (DEANS), a program funded by the Department of Health. The Provincial Formulary Management Committee maintains a benefit list of drugs reimbursed, including approximately 80 drugs with exception status.

The Nova Scotia Formulary Management Committee identified more than 5,000 beneficiaries in the Seniors' Pharmcare Program who were receiving inhalation therapy by wet nebulization. The issue of the greater-than-expected use of wet nebulization respiratory medications was referred to the DEANS Management Committee, which developed an initiative in cooperation with stakeholders to encourage the delivery of respiratory medications via metered-dose or dry-powder inhaler delivery systems rather than wet nebulization.

Drug Evaluation Alliance of Nova Scotia Initiative (DEANS)

In 1999, the province of Nova Scotia introduced DEANS to complement its drug program management structures and policies (e.g., formulary policies that restrict or delist—that is, remove from benefit status—drugs). DEANS does not make formulary decisions. The mission of DEANS is “to contribute to the health of Nova Scotians by encouraging appropriate drug use.” To accomplish this, DEANS:

- identifies critical drug care issues earmarked by any source;
- collects information, conducts preliminary analyses, and prioritizes critical drug care issues using specific criteria;
- develops implementation plans to address the drug care issues and identifies evaluation tools to measure the progress and outcome of drug use initiatives; and
- establishes and manages partnerships to implement and evaluate drug use initiatives.

DEANS is coordinated by a government representative and has a management committee with representation from academic pharmacy, continuing pharmacy education, research, and clinical pharmacists.

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hospital-based drug evaluation, and academic medicine (family medicine, epidemiology, and continuing medical education). DEANS is provided with drug-utilization and cost data by the Department of Health as appropriate.

**Pharmacists’ Involvement in DEANS**

Pharmacists are involved in DEANS in a number of ways. Drug-evaluation pharmacists at the Queen Elizabeth II (QEII) Health Sciences Centre in Halifax, Nova Scotia, provide documents that detail evidenced-based therapeutics, publish bulletins for health professionals, provide supporting information for continuing professional education and communicate details of DEANS initiatives to hospitals in Nova Scotia. Continuing pharmacy education offers educational programs on topics identified by DEANS in a timely manner in many locations across the province. The current continuing-pharmacy-education representative to DEANS is the Continuing Education Coordinator of the Nova Scotia Pharmaceutical Society.

The Pharmaeconomics Research Unit at the College of Pharmacy, Dalhousie University, provides support for analyzing the Nova Scotia Community Services and Seniors’ Pharmacare Program’s drug-claims database to determine targets for intervention and to evaluate the outcome of the intervention program. Dalhousie University’s Population Health Research Unit (which includes pharmacy researchers and pharmacists pursuing graduate studies) has access to hospital, physician service, and pharmacy claims data, which can be linked by unique encrypted patient identifiers to aid outcomes evaluation.

**Initiative to Decrease the Use of Wet Nebulization Respiratory Medications**

The goal of this DEANS initiative was to promote the conversion from wet to dry delivery methods for inhaled respiratory medications. More than 5,000 Nova Scotia Seniors’ Pharmacare beneficiaries were using wet nebulization medications at the time the initiative was launched. In the 1997/98 fiscal year, the drug cost to the Nova Scotia Seniors’ Pharmacare Program for inhaled bronchodilators was about $3 million, of which approximately $2.1 million was for the nebulized form. Inhaled corticosteroids contributed an additional $2 million in drug costs; nebulization solutions, however, only account for 6% of this cost, according to Hoar.

A review of the issue confirmed that inhaled respiratory medications (beta agonists, anticholinergics, corticosteroids, and sodium cromoglycate) delivered by wet nebulization are more costly, less efficient, less convenient, and have more possibility for bacterial contamination than dry delivery methods. The dry delivery methods, which include metered-dose inhalers and dry-powder inhalers, deliver effective doses faster than nebulization and are more portable. The 1998 Canadian Asthma Consensus Conference Report, the 1998 Canadian Chronic Obstructive Pulmonary Disease (COPD) Guidelines, and other international asthma guidelines support the preferential use of dry delivery methods over wet nebulization for most patients. However, some patients are not good candidates for dry delivery and still require wet nebulization therapy.

Studies evaluating the effect on patient outcomes and the costs of programs suggest that the conversion from wet nebulization to dry delivery has no adverse effect on efficacy when the dry delivery method is used appropriately. The studies examining outcomes have generally been in controlled environments (i.e., hospital or emergency room settings) and include adult and pediatric patients with asthma or COPD. The trials have been both double-blinded and open-label in design and were often of limited duration. The cost savings depend on the type of initiative (hospital community, labor costs, drug costs, etc.). Studies have reported up to a 30%–60% reduction in therapy costs in a hospital setting.

In a Canadian study, Turner et al. reported that cost savings are highest in patients who can self-administer metered-dose inhaler (MDI) therapy. They determined that labor-time allocation for wet nebulization versus self-administered MDI therapy significantly affected cost estimates, and suggested that the large cost differentials reported in other studies comparing wet nebulization to dry delivery methods were based on unrealistic labor estimates.

**Changing the Formulary Benefit Status**

Criteria for provincial drug plan reimbursement for wet nebulizations of respiratory medications using exception criteria were developed with input from physicians, pharmacists, and the Nova Scotia Lung Association. The Nova Scotia Formulary Management Committee discussed and subsequently ratified the criteria for recommendation to Nova Scotia drug programs. Effective August 1, 2000, wet nebulization respiratory agents became available only under exception status benefits for the Nova Scotia Community Services and Seniors’ Pharmacare Programs. For reimbursement of exception status drugs, physicians are required to provide written documentation that their patients meet the exception criteria. The exception criteria are listed in Table 1 (see page 460). Drugs involved are beta agonists (fenoterol, metoprolol, salbutamol), anticholinergics (ipratropium), corticosteroids (budesonide), and sodium cromoglycate. Recommendations for adding a spacer device to the Pharmacare benefit list were also approved.

Two other Canadian provinces, New Brunswick and British Columbia, have implemented similar policy changes that limited the benefit status of wet nebulization in their Pharmacare programs.

**Developing a New Professional Fee for Pharmacists**

Pharmacists receive a maximum professional fee of approximately $9.00 per prescription for dispensing prescriptions for Pharmacare beneficiaries. Negotiations between the Pharmacy Association of Nova Scotia and the Nova Scotia Department of Health resulted in a pilot template for a professional fee ($10.00) for pharmacists to counsel new patients on the spacer devices.

From February 1, 2000 to July 31, 2000

Continued on page 46k
TABLE 1

<table>
<thead>
<tr>
<th>Identifying Individuals Who Should Remain on Wet Nebulization Respiratory Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Individuals Meeting Any of the Following Criteria Should Not Be Required to Switch From Wet Nebulization</strong></td>
</tr>
<tr>
<td>• Adult patients with a vital capacity of 900 mL or less</td>
</tr>
<tr>
<td>• Adult patients with a respiratory rate greater than 25 breaths/minute</td>
</tr>
<tr>
<td>• Patients who have demonstrated that they cannot follow instructions, cannot hold the device, or cannot hold the device long enough to actuate it*</td>
</tr>
<tr>
<td>• Others as approved upon written request</td>
</tr>
</tbody>
</table>


*A metered-dose inhaler plus a spacer fitted with a mask may be needed to optimize the delivery of medication to certain individuals.

pharmacists were reimbursed the actual acquisition cost (AAC) of the Aerocam m Plus (Trudell Medical) (with or without mask) plus a cognitive fee of $10.00. The fee is intended to compensate pharmacists for reinforcing the effectiveness of this method of delivery, ensuring that the patient or the care giver understands the proper technique for using a spacer plus MDI, and providing relevant cleaning and replacement instructions. The $10.00 cognitive fee will continue to be reimbursed for patients who are either new to the program, are newly diagnosed with respiratory disease, or who are being switched from wet nebulization to dry-powder inhalation. Effective August 1, 2000, for prescription renewals, a cognitive fee of $4.00 plus the AAC of the Aerocam m Plus VHC will be reimbursed to pharmacies. This cognitive fee acknowledges the pharmacists' time to reinforce the use and care of the spacer device.

Developing Continuing Pharmacy Education Programs

The Nova Scotia Department of Health evaluated a number of spacer devices and a specific device was chosen: the Aerocam m Plus. Pharmacists both developed and conducted pharmacy continuing education programs for community pharmacists on decreasing the use of wet nebulized respiratory medications and teaching patients about spacer devices. Education programs for pharmacists, health professionals, and the public were implemented between February and March 2000. These education programs focused on providing documentation of the comparative efficacy of wet and dry delivery methods, and instruction regarding patient teaching techniques related to the use of the dry delivery method with the spacer. The total number of education program attendees across Nova Scotia was 147 pharmacists. Obstacles (e.g., patient preference, unfamiliarity with other methods, difficulty in using other methods) were addressed. Numerous studies document instances of poor inhaler technique.41-40 The importance of reinforcement and follow-up was stressed. Long-term patient education is critical.41,42 Pharmacists must be reinforced.43 The education programs included “hands on” workshops, with pharmacists getting a chance to practice with the devices under supervision. In addition, the Drug Evaluation Unit of the Drug Information Center, QEII Health Sciences Center (the largest tertiary care referral center in the province), provided written information to pharmacy directors and regional pharmacy managers, who, in turn, distributed the information to smaller hospitals across the province (n=57). This information assisted with the implementation of programs that encouraged the conversion from wet nebulization to dry delivery methods for inhaled respiratory medications. At the QEII Health Sciences Center, multifaceted educational programs targeted hospital staff, patients, physicians, pharmacists, and respiratory therapists. Information on the administration time for the inhaled respiratory medications (i.e., time to administer dry delivery is less than the time to administer wet nebulization) and the cost and efficacy of the medications were provided.

Working with Other Partners

Pharmacists at the Nova Scotia Department of Health facilitated linkage with the Nova Scotia Lung Association, which provided access to a 24-hour support line for patients with questions about their respiratory medications. The Nova Scotia Lung Association also developed a poster to communicate the message to stop using wet nebulization respiratory medications. The poster was sent to all Nova Scotia pharmacists, physician offices, hospitals, asthma clinics, and long-term care facilities (3,500 posters were distributed). Approximately 16 asthma clinics across the province were contacted about the initiative. DEANS presented its plan to the Asthma Advisory Group to the Minister of Health, which acts as a steering committee for the development of a provincial strategy for the management of asthma. The Medical Society of Nova Scotia sent seven notices to its members explaining and supporting this initiative. The Pharmacy Association of Nova Scotia’s newsletter discussed the comparable effectiveness of wet nebulization and dry delivery, the cost differences, and the exception criteria. The Respiratory Association of Nova Scotia at Home Care Nova Scotia were contacts about the initiative. All manufacturers affected respiratory drug products we contacted and asked to have their representatives provide information to support the initiative to health professionals. On November 25, 1999, 15 representatives from each of the major manufacturers met with a DEANS staff member. The public was involved by having posters displayed in pharmacies, phy:
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The Nova Scotia Lung Association in conjunction with National Asthma Week coordinated a media strategy, including a television interview with a physician.

Future Work
An evaluation of this DEANS program is being planned. Issues that could be explored include examining the utilization and costs of both wet nebulization and dry delivery methods within the Pharmacare program after the formulary policy was implemented; the number of patients who paid for wet nebulization therapy privately, once it was put on exception status; the number of times pharmacists receive the cognitive fee; and a qualitative study of physicians to determine their evaluation of the program and barriers they faced when attempting to convert patients to dry delivery methods for respiratory medications. Studies need to continue to evaluate patient and physician preferences for various formulations of respiratory medications, health outcomes, and economic evaluations.

Lessons for Managed Care Pharmacy in the United States
The Nova Scotia Department of Health’s drug programs provide drug benefits to all eligible Seniors’ Pharmacare beneficiaries and is integrated with all hospital departments in the province. However, the DEANS approach described could be applied in other jurisdictions both in Canada and, in managed care settings in the United States. This program brought together many stakeholders in a pharmacy benefit management project. The stakeholders have expertise in both delivery of education programs (continuing pharmacy education programs and medical education) and evaluation (epidemiology and family medicine). The project successfully brought together physicians (including the Nova Scotia Medical Society), pharmacists (including the Pharmacy Association of Nova Scotia), continuing professional education providers, drug/device suppliers, and the Nova Scotia Lung Association to use multiple methods to try to increase conversion from wet nebulization to dry delivery methods, where appropriate. The special professional fee to compensate pharmacists for educating patients on the spacer devices provided an additional incentive to pharmacists to provide the necessary instruction on the proper use of the inhaler.

Summary and Conclusions
Provinces in Canada have the ability to implement and monitor changes in drug prescribing because of their universal health care system and public drug insurance programs for specific segments of the population. This was one of the first initiatives to be implemented by the Drug Evaluation Alliance of Nova Scotia and this paper documents the process used to change the use of wet nebulization respiratory medications in Nova Scotia. Studies are needed to evaluate the impact of this initiative.

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