USE OF PHYSICIAN PROFILES TO INFLUENCE PRESCRIBING OF TOPICAL CORTICOSTEROIDS

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ABSTRACT

Background
Physician profiling is a tool used to attempt to affect changes in prescribing. The Drug Evaluation Alliance of Nova Scotia (DEANS) decided to implement a physician profiling project to determine if prescribing of topical corticosteroids could be altered.

Objectives
To evaluate a DEANS initiative utilizing physician prescribing profiles to shift prescribing of topical corticosteroids from higher to lower potency agents in beneficiaries of the Nova Scotia Seniors' Pharmacare Program.

Methods
Administrative claims from the Nova Scotia Seniors' Pharmacare program were used to identify prescriptions for topical corticosteroids. Prescriptions were summarized at the individual physician level, and aggregated by Anatomical Therapeutic Classification into weak, moderately potent, potent and very potent products. The number of prescriptions for topical corticosteroids was compared for the twelve-month period before and after mailing of the profiles. Overall results were aggregated by utilization and expenditures.

Results
The number of prescriptions for topical corticosteroids per physician profiled was 44.0 in 2000/2001 and 42.8 in 2001/2002 (p=NS) and the expenditures per physician profiled were $838.94 in 2000/2001 and $826.81 in 2001/2002 (p=NS). There was a small decrease in prescriptions dispensed for potent topical products over the profiling period (52.4% of prescriptions in 2000/2001 versus 51.5% of prescriptions in 2001/2002, p=0.03). Otherwise, changes in utilization or expenditures for topical corticosteroids were not statistically different between the profiling periods.

Conclusions
This project showed that mailing unsolicited individual-level profiles did not alter prescribing or expenditures for topical corticosteroids over a two-year period. Further work is needed to determine physician attitudes towards such projects.

***Key Words**: Topical corticosteroids; physician prescribing profiles; drug utilization*

Gaps between evidence and clinical practice, along with variations in health care utilization affect quality of care and health expenditures.[1-8] Inappropriate medication prescribing has been identified as one of the five most important quality of care issues in terms of preventable morbidity and mortality, especially in the elderly.[9,10]

One tool used to promote change in physician behaviour is physician profiling. Physician profiling is the process of providing a summary of a physician's past patient care activities in order to influence future clinical and administrative decisions.[9, 11-14] Information can be obtained from clinical or administrative databases, or from surveys. Performance is typically compared to peers or to clinically 'acceptable' levels.[5, 14-16]

Physician profiling has been used as a quality assessment tool to provide feedback on patient care.[13,15,17-19] It assumes that notifying individuals or groups about deviations from peer behaviour or accepted clinical criteria will lead to improved physician performance.[9,15,16,20] While physician profiling has been widely used to assess physician performance, evidence regarding whether it is effective in changing behaviour is conflicting.[1,2,8,12,13, 21-23] Overviews of systematic reviews on the effectiveness of methods to change physician behaviour indicate that profiling sometimes had a significant effect on utilization, but that the clinical importance of the changes was moderate and that the generalizability of the studies was uncertain.[1,12,23] These overviews also note that studies examining profiling often had methodological weaknesses and differed in design, content, data presentation, barriers to change, and study setting.

Topical Corticosteroid Profiling Initiative

Many topical corticosteroids are available on the market, varying by chemical entity, potency, formulation, combination, and price.[24-26]

The variety of products available makes it difficult for physicians to choose the most appropriate and cost-effective product for their patients. Topical corticosteroid products are classified by the World Health Organization (WHO) Anatomical Therapeutic Classification (ATC) system[27] as either weak, moderately potent, potent or very potent. For products within the same potency category, other than differences in formulation and cost, there is little evidence for any therapeutic advantage of one product over another.[28,29] Potent and very potent products are usually reserved for severe unresponsive skin conditions, are generally limited to 10-14 days of therapy due to the possibility of a higher incidence of adverse effects, such as tachyphylaxis, atrophy and thinning of the skin.[26,28,30-32] Low to moderate potency corticosteroids are usually preferred for mild-moderate inflammatory conditions, for long-term use, or for use in patients with thin or sensitive skin, including the elderly.[28,31,33]

One of the structures used to encourage appropriate drug use in Nova Scotia is the Drug Evaluation Alliance of Nova Scotia (DEANS), a program funded by the Nova Scotia Department of Health.[34] DEANS is comprised of a multi-disciplinary team, with expertise in family medicine, pharmacy, continuing pharmacy medical education, drug evaluation and epidemiology, with a mission to contribute to the health of Nova Scotians by encouraging appropriate and cost-effective drug use. The role of DEANS is to identify critical drug care issues; obtain and analyze information and data relevant to these issues; develop interventions to provide targeted, evidence-based information; and to evaluate the impact of initiatives on provider and consumer behaviours.

In order to determine the feasibility and impact of employing profiles to provide physicians with feedback on their prescribing practices for topical corticosteroids, DEANS initiated a physician profiling project in the Winter of 2001. The objective of the project was to determine if physician profiling could shift prescribing of topical corticosteroids from higher cost, higher potency products to lower cost, lower potency products. Topical corticosteroids were chosen for a number of reasons. The Nova Scotia Formulary Management Committee had completed a review of these products in 1999, had de-listed all but two topical combination corticosteroid products, and was currently considering adding several new products to the Nova Scotia Pharmacare Programs' benefit list. Although this delisting had decreased the number of agents available as insured benefits, there were still over 150 topical corticosteroid products listed as a benefit on the Nova Scotia Formulary. A drug

use evaluation[25] demonstrated that even after delisting specific topical corticosteroid combination products, approximately 50% of prescriptions dispensed to seniors were for potent topical corticosteroids, and drug expenditures for topical corticosteroids to the Senior Pharmacare Program were approximately $900,000 for the fiscal year April 1, 1999 to March 31, 2000 (including pharmacists professional fees, but after deducting patient co-payments). It was also felt that physicians might appreciate a tool to help in choosing the most appropriate product for their patients.

METHODS

Study Setting

Nova Scotia is a province in Canada with approximately 942,000 inhabitants. The Nova Scotia government funds two main drug insurance programs: one for seniors (The Nova Scotia Seniors' Pharmacare Program, with approximately 95,000 beneficiaries) and one for persons receiving social assistance through the Department of Community Services (with approximately 65,000 beneficiaries). The seniors' program provides drug benefits to residents aged 65 years and over, who have opted to participate by payment of the required insurance premium and co-payments. It does not include seniors who have drug insurance from Federal Programs (the Royal Canadian Mounted Police, Veterans Affairs Canada, eligible First Nations or Inuit, Correctional Services of Canada, Retired Federal Employees) or those who use solely private drug insurance. This study was approved by the Health Sciences Human Research Ethics Board, Dalhousie University, Halifax, Nova Scotia.

Data for Profiles

Administrative claims from the Nova Scotia Seniors' Pharmacare program were utilized. To ensure confidentiality, all individual (patient and physician) identifiers are encrypted and all computing for this study was conducted on secure Population Health Research Unit (PHRU)[35] Dalhousie University computing facilities by PHRU staff.

Topical corticosteroids were identified using Drug Identification Numbers (DINs), a Canadian system used to identify unique drug products. A DIN is assigned by Health Canada and uniquely identifies the drug product brand/trade name, manufacturer, name and strength of active ingredients, route of administration and pharmaceutical dosage form.[36] The completeness of the DIN list was ensured by using: the Health Canada Drug Product Database (DPD)[36] the Nova Scotia Formulary[37] the Anatomical Therapeutic Chemical Classifications (ATC) list[27] and the Compendium of Pharmaceuticals and Specialties (CPS)[38]for the study period. Prescriptions were summarized at the individual physician level, and were aggregated by DIN, according to the WHO ATC classification[27], into the number of weak (D07AA), moderately potent (D07AB), potent (D07AC) and very potent (D07AD) products prescribed.

Profile Development and Generation

The DEANS Management Committee developed the profile template. Profiles were designed to convey two main messages to prescribers:1) The potency of the products prescribed by the physician and, 2) the distribution of low, medium, and high cost products prescribed within potency classes. Individual-level physician profiles were generated by PHRU using encrypted patient and physician identifiers. The profiles were sent from the university to the Nova Scotia Department of Health where the identifier was unencrypted for mailing purposes to maintain physician confidentiality. Individual-level physician prescribing profiles were sent by mail in June 2001 to all general practitioners in Nova Scotia who wrote at least one prescription for a topical corticosteroid between April 1, 2000 and March 31, 2001. A letter explaining the profile and a cost comparison chart (see next section) were included in the mailing. This letter provided background for the initiative, information on how to interpret the profiles, basic therapeutic information regarding topical therapy, and it indicated that physicians would be re-profiled in the following year. Re-profiling at the individual physician level was completed and mailed in June 2002 describing prescribing for the fiscal year April 01, 2001 to March 31, 2002 (Figure 1) No comparison to other physicians was provided. The DEANS Management Committee agreed that a 'norm' for prescribing was not appropriate given that the patient case-mix was not available.

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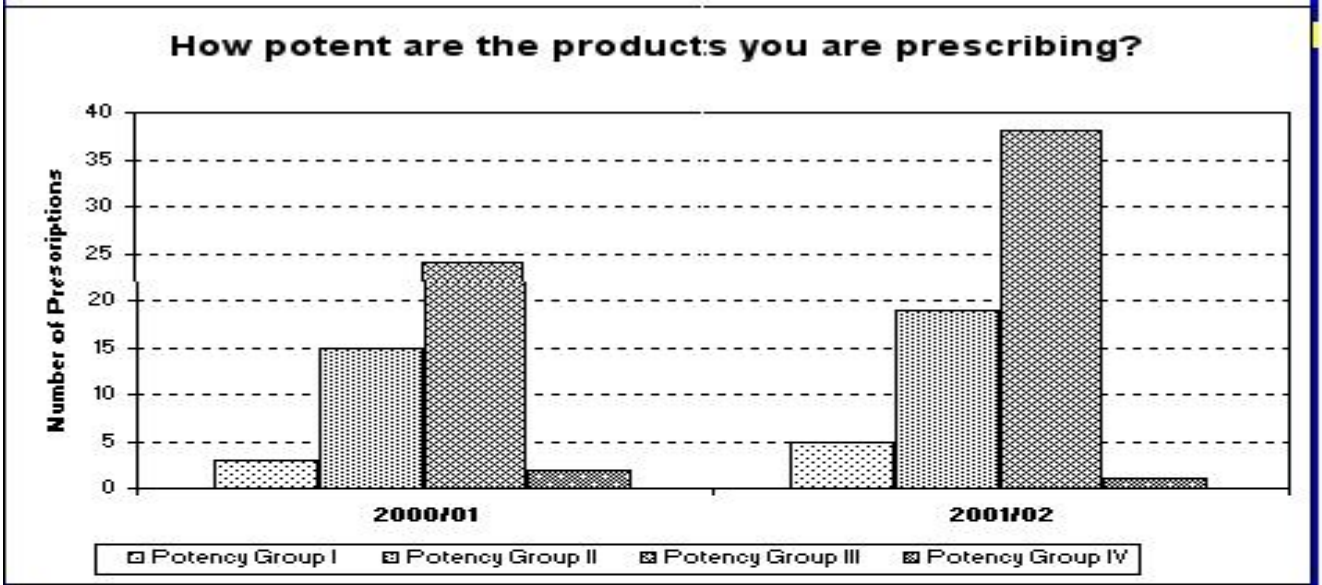
FIGURE 1 Topical Corticosteroid Prescribing Profile for Seniors Pharmacare Beneficiaries

Physician ID xxxx 2000/01 - 2001/02

Figure 1

In June of 2001, you were sent your prescribing profile for the topical corticosteroid products that are benefits under the Seniors' Pharmacare Program. We promised to re-profile you this year to enable you to compare your prescribing over a two-year period. Your profile is provided in a graphical format in the box below. Please note that this profile summarizes your prescribing to only Seniors' Pharmacare beneficiaries



Enclosed is an updated cost comparison chart, which lists the most commonly prescribed topical corticosteroids in each Potency Group and provides some general information about different potencies and bases. *The purpose of providing this information is to assist you in choosing the most appropriate products for your patients.*

Has there been any change in the potency of products prescribed since profiles were sent out last year?

Although you may note changes in your own prescribing profile shown above, there has been no significant change in the overall prescribing of topical corticosteroids to Seniors' Pharmacare beneficiaries. Potency Group III products remain the most commonly prescribed products. Lotriderm™ (a Potency Group III combination of betamethasone and clotrimazole) remains a popular product, despite the fact that the compounded product of hydrocortisone (1 to 2.5%) in clotrimazole cream (a Potency Group I product) is now insured by the Pharmacare Programs.

Thank you for taking a few minutes to review your profile and the information provided.

FIGURE 2 Comparison of topical corticosteroids covered in the Nova Scotia Pharmacare Programs

Group I- Least Potent

Corticosteroid and strength	Brand examples	Cost per gm or mL
Hydrocortisone USP 0.5% or 1%	Cortate Cortoderm Emo-Cort	2 - 20¢
Hydrocortisone acetate 1%	Cortacet Dermaflex Hyderm	2 - 20¢
Hydrocortisone 1% with urea 10%	Calmurid or Uremol HC	10 - 18¢
Hydrocortisone 1% or 2.5% with camphor / menthol	Sarna HC	10 - 19¢
Hydrocortisone 1% to 2.5% in clotrimazole	Pharmacy compound	10 - 21¢
Hydrocortisone 1% with a local anesthetic	Pramox HC	12 - 22¢
Hydrocortisone acetate 0.5%	Cortacet Hyderm	17 - 21¢
Hydrocortisone 2.5% *	Emo-Cort	21 - 25¢
Hydrocortisone 1% with silicone-type barrier	Barriere-HC Prevex HC	28 - 38¢

The Cost Ranges

The cost ranges are broad because they include <u>all</u> package sizes and <u>all</u> formulations (cream, ointment, lotion, solution, gel and oil).

Application Frequency

Because the skin acts as a reservoir, most topical corticosteroids are efficacious when applied once or twice daily.

Group II – Moderate Potency

Corticosteroid and strength	Brand examples	Cost per gm or mL
Triamcinolone acetonide 0.025%	Triaderm	6 - 21¢
Triamcinolone acetonide 0.1%	Aristocort R Triaderm	6 - 21¢
Hydrocortisone valerate 0.2%	Westcort Hydroval	12 - 17¢
Triamcinolone acetonide 0.5%	Aristocort C	14 - 21¢
Desonide 0.05%	Desocort Tridesilon	17 - 39¢
Clobetasone 0.05%	Eumovate	38 - 40¢

Choosing a Potency

In general, the least potent topical corticosteroid to control symptoms should be used.

Low and moderate potency products effectively treat acute, inflammatory skin lesions. These products are preferred for areas of the body where the skin is thin (such as the groin and axilla) and for use on infants and the elderly.

Potent and very potent products are often required for treating chronic, hyperkeratotic or lichenified lesions, such as psoriasis. They may also be required for areas where the skin is thick, such as the palms and soles.

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FIGURE 2 - Cont'd

Group III – Potent			Group IV – Very Potent		
Corticosteroid and strength	**Brand examples**	**Cost per gm or mL**	**Corticosteroid and strength**	**Brand examples**	**Cost per gm or mL**
Betamethasone valerate 0.05%	CelestodermV/2	2 - 10¢	Halcinonide 0.1% *	Halog	39 - 49¢
Betamethasone valerate 0.1%	Celestoderm V Valisone	2 - 29¢	Clobetasol 17-propionate 0.05%	Dermasone Dermovate	41 - 49¢
Fluocinolone acetonide 0.025%	Synalar	8 - 41¢	Halobetasol propionate 0.05%	Ultravate	65 - 75¢
Fluocinolone 0.01% * and ***	Derma-Smoothe Synalar	12 - 47¢			
Betamethasone dipropionate 0.05%	Diprosone Topisone	20 - 22¢			
Fluocinonide 0.05% **	Lidemol Lidex,Topsyn Lyderm	25 - 65¢			
Betamethasone dipropionate 0.05% glycol	Diprolene Topilene	27 - 56¢			
Desoximetasone 0.05%**	Topicort gel & mild cream	28 - 34¢			
Desoximetasone 0.25%	Topicort	28 - 64¢			
Amcinonide 0.1%	Cyclocort	35 - 59¢			
Betamethasone valerate 0.1% with silicone Barrier	Prevex B	36 - 42¢			
Beclomethasone dipropionate 0.25%	Propaderm	39 - 68¢			
Mometasone furoate 0.1%	Elocom	40 - 56¢			
Diflucortolone valerate 0.1%	Nerisone	42 - 45¢			
Betamethasone dipropionate 0.05% with clotrimazole 1%	Lotriderm	55 - 62¢			

Choosing a Base

Ointments are occlusive and are generally more potent than creams and lotions. They are preferred for areas where the skin is thicker (palms or soles) or is dry, fissured or scaly.

Creams are preferred for oozing lesions, acute and subacute dermatosis and intertriginous areas.

Lotions are the least occlusive. They spread easily and are useful for large areas.

Solutions and **gels** are non-greasy and are favoured for use on the scalp or hairy areas. Solutions and gels should be used cautiously on the face. Corticosteroids available in a solution format are indicated by *. Those available as gels are indicated by **.

Oils are useful for dry, fissured or scaly scalp lesions. The only corticosteroid available as an oil is indicated by ***.

Community Pharmacy Education

In April 2001, all pharmacists in Nova Scotia were mailed the topical corticosteroid cost comparison chart, and a summary of the profiling project in order to assist in providing information to physicians. The summary information was published in the provincial Pharmacy Association bulletin.[40] As well, all pharmacies received a copy of the cost comparison chart and an outline of the initiative, published in the Pharmacare Bulletin.[41]

Data Analysis

The number of prescriptions for topical corticosteroids issued to Nova Scotia seniors covered by the Pharmacare Program was compared for the twelve-month period before and after mailing of the profiles. The claims submitted during the fiscal years April 1, 2000 to March 31, 2001 and April 1, 2001 to March 31, 2002 were examined to identify all topical corticosteroids dispensed to senior beneficiaries covered by the Pharmacare Program.

Overall results were aggregated by utilization and expenditures into the four key potency categories by ATC classification. The data were normally distributed and of equal variance, so the student's t-test was used to test the statistical significance of differences between overall usage and potency categories for both utilization and expenditures.

A modified Laspeyres index[42] was also used to decompose any changes in topical corticosteroid prescribing into its component factors: price, volume, new drugs, exiting drugs and interaction effects by potency category. It is a forward-looking index that expresses prices and quantities in terms of the previous (base) period. The Laspeyres Index[43,44] has been validated in similar types of evaluations. All calculations were done using SAS 8.1.[45]

RESULTS

A total of 814 profiles were generated for all general practitioners in Nova Scotia who wrote at least one prescription for a topical corticosteroid between April 1, 2000 and March 31, 2001 for a senior covered by the Nova Scotia Seniors' Pharmacare Program. This represents approximately 85% of licensed/registered general practitioners in the province.[46] For the 2001/2002 fiscal year, re-profiles were sent to the 814 general practitioners who received the profiles in 2000/2001.

The number of prescriptions for topical corticosteroids per physician profiled was 44.0 in 2000/2001 and 42.8 in 2001/2002 (p=0.10), while the expenditures per physician profiled were $838.94 in 2000/2001 and $826.81 in 2001/2002 (p=0.44) (Table 1).

TABLE 1 Topical corticosteroid prescriptions dispensed to Nova Scotia Seniors' Pharmacare Beneficiaries by Year

Fiscal Year	#Prescriptions[1]	#Prescriptions/ Physician[1]	Total Expenditures[2]	Expenditures/ Physician[2]	Expenditures/ Prescription[2]
2000-01	35,798	44.0	$682,897.16	$838.94	$19.08
2001-02	34,873	42.8	$673,023.34	$826.81	$19.30

[1] Number of prescriptions written by the 814 physicians profiled in both 2000-01 and 2001-02
[2]Expenditures include the pharmacists' professional fees and patient co-payments

As seen in Figure 3, there was a small, but statistically significant, decrease in prescriptions for potent topical products over the profiling period (52.4% of prescriptions in 2000/2001 versus 51.5% of prescriptions in 2001/2002, p=0.03). This translates into an average decrease of one prescription for a potent product per physician (23.1 prescriptions/physician in 2000/2001 versus 22.1 prescriptions/physician in 2001/2002), or 817 fewer prescriptions for potent products over the profiling period. Otherwise, changes in utilization or in expenditures for topical corticosteroids were not statistically different within potency categories from the initial profiles to the re-profiles for general practitioners. When examining changes in prescribing and expenditures using the Laspeyres

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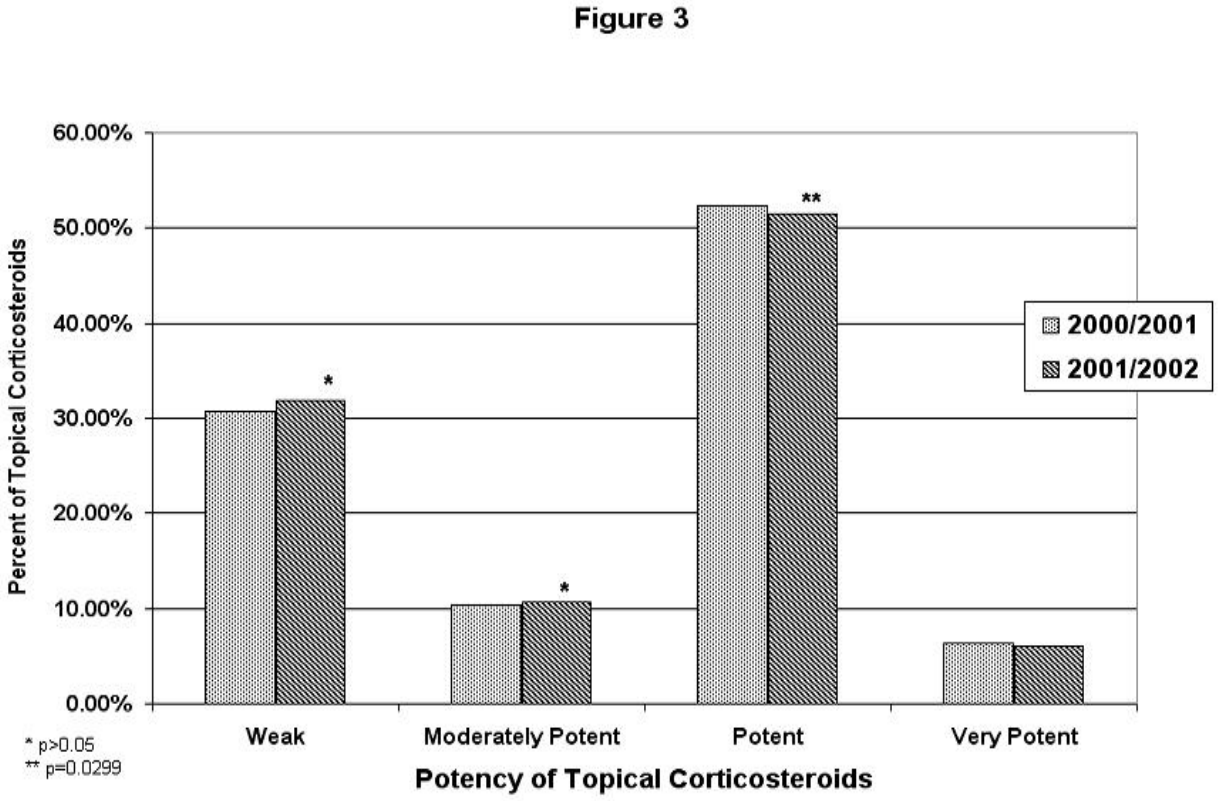
Index, there was a seven percent increase in expenditures for weak potency agents driven primarily by an increase in prescribing volume, accompanied by declines in volume for moderately potent agents, potent agents and very potent agents. Declines in the price of prescribed agents within potency categories also contributed to reducing total expenditures for topical corticosteroids over the profiling period. However, the Laspeyres Index showed that the overall reduction in total expenditures for topical corticosteroids was only $8,922 (2.4 percent).

FIGURE 3 Topical Corticosteroid Utilization, Nova Scotia Seniors Pharmacare Program, 2000-2002



DISCUSSION

The form of physician profiling used in this study - mailed, unsolicited, centralized, government-sponsored, and involving aggregate data - did not substantially alter the potency or expenditures for topical corticosteroids dispensed to seniors in Nova Scotia. Although mild to moderate potency agents are recommended for the elderly[31, 33], 52% of topical corticosteroids dispensed in 2000/2001 contained a potent agent; after mailing of the profiles, 51% of topical corticosteroids dispensed in 2001/2002 still contained a potent agent. This decrease, although statistically significant, may not be clinically relevant. The Lasperyes Index did show trends in changes in prescribing that were consistent with the message of the profiling project, with expenditures for weak potency agents trending upward, while expenditures for more potent agents trending downward, driven primarily by volume changes. However, these changes were small overall.

Randomized controlled studies[47-54] have examined changes in drug prescribing behavior using mailed physician profiles with or without the addition of mailed guidelines or prescribing information. Some studies[47-50] reported no change in drug prescribing, while others[51-54] reported a positive change in drug prescribing. Our study was similar to three other studies that showed no change in drug prescribing when utilizing unsolicited mailing of

profiles to all physicians in a wide geographic area.[51-53] Studies that did report changes in prescribing focused primarily on benzodiazepine and sedative/hypnotics prescribing,[47-49] or enrolled physicians who volunteered for the intervention.[47,50] Nonetheless, physician profiling may produce small to moderate improvements in professional practice that may be important on a population level.[23]

Behavioural theories suggest that the provision of information in isolation does not typically result in translating evidence into changes in prescribing practices.[6,15,55] These theories also indicate that unsolicited prescriber feedback does not motivate physicians to change, nor does it address barriers to change.[13,14,17,22,55] Strategies to alter prescribing, therefore, need to address these barriers, incorporating approaches targeting the individual, approaches utilizing social influences, and approaches focusing on the health care delivery system.[1,2,14,15] A variety of these strategies may be needed to effect change, probably because each strategy affects a different part of the learning process.[12,13,15,16,21]

Recent evidence indicates that multifaceted interventions may not have a benefit over single interventions. [2,23] Nevertheless, systematic reviews of profiling initiatives do provide some guidance.[1,2,14,23] The profiling intervention studied here, although easy to implement on a large scale, may have lacked some features that may be helpful in eliciting behaviour change. The profiles were non-solicited, and passive approaches to change behaviour have not generally been largely effective. A once-yearly message may not be frequent enough to alter prescribing, especially for a group of medications not frequently prescribed as in our physician population (less than four prescriptions for topical corticosteroids per month, on average). Profiles were aggregated at the physician level, so information on an individual patient was not available to physicians, nor was a specific actionable message related to an individual patient included in the intervention. Finally, behaviour change strategies, including physician profiling, may be more successful if incorporated into educational outreach programs where individual approaches and relational capital may assist in influencing behaviour changes.[56,57] These may be important messages for other groups that plan to conduct large-scale profiling initiatives. As a result of this and other profiling initiatives at DEANS, future initiatives will focus on using individual targeted patient profiles for educational endeavours when requested by the individual physician.

Strengths and Limitations of the Project

This profiling project used various intervention strategies. The profiles were not designed for use as a single tool, but were combined with written educational information on the therapeutics and costs of topical corticosteroids. A local dermatologist provided feedback on how to present the therapeutic and cost information on the comparison chart in a user-friendly manner and endorsed the information on the chart, along with specific recommendations on the use of less potent products in the elderly.

The multidisciplinary (pharmacy, medicine, epidemiology) and multisectoral (university, hospital, government, professional society) involvement brought in many skills and perspectives. The profiles used in our study also reflect a population-based approach as the Pharmacare Program covers most seniors and Canadian pharmacy administrative claims databases have been found to have good validity.[58, 59]

The profiles may not reflect overall prescribing patterns for topical corticosteroids as the Nova Scotia Seniors' Pharmacare database contains information only on those over 65 years, has no information on prescriptions written but not dispensed, physician samples, or prescriptions dispensed using private insurance. No adjustments were made for patient characteristics, such as age, sex or case-mix. Clinical outcomes were not measured, as the indication for prescriptions is not available in our database. Patients' previous failure with less potent therapy, or the use of potent agents for short bursts rather than for long-term therapy, was not documented. Therefore, it was not possible to determine the appropriateness of therapy. Although this project involved a local opinion leader, and aimed to promote appropriate therapy, the project's highlighting of cost differences in the profile and cost comparison chart design may have been seen primarily as a cost-containment measure. Administrative costs associated with implementing the profiling project were not assessed, nor were physician attitudes. Quasi-experimental designs, such as those employing time-series analysis, may aid in further evaluation of this project.

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CONCLUSION

A multi-disciplinary team (DEANS) developed and implemented a profiling initiative focusing on prescribing of topical corticosteroids by Nova Scotia practitioners. An evaluation of the project showed that mailing of unsolicited individual-level profiles, along with a comparison chart, did not impact overall prescribing or expenditures for topical corticosteroids over a two-year period. Further work is needed to determine physician attitudes towards such projects, to examine individual-level changes in prescribing, and to examine prescribing on a monthly basis using a time series analysis.

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