Use of a Cost-effectiveness model to capture ostomy-related cost of care and outcomes among people with an ostomy in Canada using a ceramide infused skin barrier

• Kimberly LeBlanc • Deanna C. Eaves, BS • George Skountrianos

Introduction:

It is estimated that there are 70,000 individuals living with an ostomy in Canada, with 13,000 new ostomy surgeries performed annually. Living with an ostomy impacts Canadians financial well-being, and the geographical location of the individual with an ostomy has a significant impact on the availability of resources. There are considerable differences in funding among provinces such as flat rate funding, funding based on a percentage of costs, income-based funding, and no funding. Despite different funding bundles, out-of-pocket expenses are the same across the provinces. A recent cross-sectional study reported that accessibility to Nurses Specialized in Wound, Ostomy and Continence (NSWOC) can potentially reduce ostomy complications and aid in cost containment.[1] With the frequency of postoperative complications and the high number of those seeking NSWOC support, further research should focus on accessibility and geographic discrepancies relating to NSWOC access.

Given the financial impact living with an ostomy has on Canadians, there is an increased demand for NSWOCs to be aware of cost-effective health care solutions and services and to ensure this knowledge is transferred to patients, care givers and other healthcare professionals.

Objective:

Ostomy-related costs of care and outcomes were captured using a hypothetical cost-effectiveness model for people with a new ostomy in the provinces of Alberta and Ontario. Half of the hypothetical ostomy supply users were assumed to use a ceramide-infused barrier (CIB) versus the other half using a standard of care barrier (SOC).

Methods:

A cost-effectiveness model was adapted from the ADVOCATE[2] study to capture the ostomy-related costs of care and outcomes among persons with a new ostomy assumed to use a ceramide-infused barrier (CIB) versus standard of care barrier (SOC). The model estimates incidence and cost of peristomal skin complications including supply cost as well as expected quality-adjusted life days (QALD's) over a one-year period of time. The provinces of Ontario and Alberta were chosen to be included in the analysis as cost data was readily available and both provinces combined account for 50% of Canada's population.[3]

A health economic model was run separately for both provinces using inputs specific to each province to simulate costs over a one-year period. Outcomes of interest included costs of care, peristomal skin complications (PSCs) and quality-adjusted life days (QALDs). Individuals are assigned QALDs on a daily basis, with the value of the QALD on any given day based on whether the individual experiences a PSC and the severity level of the PSC. The incremental cost-effectiveness of CIB versus standard of care was estimated as the incremental cost per PSC averted and QALD gained, respectively. Each model incorporates sensitivity analyses to assess the uncertainty of input parameters and their consequence on decision-making.

The analyses were run using the perspective of an ostomy end-user/patient in Ontario, Canada and the Alberta Health Service – Alberta Aids to Daily Living (AADL) in Alberta, Canada. The model was populated with inputs from a hypothetical cohort of 1000 individuals in Ontario and 4000 in Alberta. The mix of users on each type of pouching system is based on historic database information from Hollister Incorporated.

Individuals in Ontario are assumed to access their pouching supplies through a recognized retailer in the province thus the model is used to demonstrate that the consumer can potentially manage their healthcare spend more wisely through the use of a CIB barrier. Individuals in Alberta are assumed to access their supplies through the AADL. Pouch changes and supply costs are determined by the benchmark set by the AADL. The objective of the model is to quantify the economic impact to the Alberta Health Services.

Results:

For each cohort, the model calculates the following outcomes:
- Number of individuals experiencing PSCs
- Quality Adjusted Life Days (QALD)
- Healthcare resource costs of ostomy supplies (ostomy barriers, pouches, and accessories) and PSC-related care

ONTARIO	SOC	CIB
Patients on barrier	500	500
Skin Complications (PSCs)		
Total PSC events	297	215
Quality-Adjusted Life Days (QALD)		
Total QALD (cohort)	135,189	135,363
Healthcare Costs (CAD)		
Usual Ostomy Supply Costs	$ 781,956	$ 581,540
PSC-related Care and Ostomy Supply Costs	$ 39,955	$ 18,805
Average Per-Patient Cost	$ 1,644	$ 1,201
Incremental Per Patient Per Year Savings		**$ 443**
Incremental Cost Savings per PSC averted		**$ 2702 / PSC**
Incremental Cost Savings per QALD gained		**$ 1266 / QALD**

ALBERTA	SOC	CIB
Patients on barrier	2031	2031
Skin Complications (PSCs)		
Total PSC events	1,208	875
Quality-Adjusted Life Days (QALD)		
Total QALD (cohort)	549,138	549,843
Healthcare Costs (CAD)		
Usual Ostomy Supply Costs	$ 7,010,184	$ 6,636,489
PSC-related Care and Ostomy Supply Costs	$ 278,213	$ 156,775
Average Per-Patient Cost	$ 3,589	$ 3,345
Incremental Per Patient Per Year Savings		**$ 244**
Incremental Cost Savings per PSC averted		**$ 1487 / PSC**
Incremental Cost Savings per QALD gained		**$ 697 / QALD**

Conclusion:

Finding suggest that a ceramide infused barrier may be cost-effective for people with an ostomy in Alberta and Ontario. Potential ostomy-related cost savings of approximately $443 and $244 per user per year for those using a ceramide-infused skin barrier vs. a non-infused skin barrier in Ontario and Alberta, respectively. Costs related to living with an ostomy include both direct and indirect burdens. Direct costs include those of managing the ostomy such as purchasing supplies (ostomy pouches and accessories). Indirect costs include time away from work and hospital admissions.

NSWOCs play a pivotal role in cost containment for individuals living with an ostomy. NSWOCs may consider using health economic models to justify their recommendations for products for individuals living with and ostomy.

References:

1. LeBlanc K, Heerschap C, Martins L, Butt B, Wiesenfeld S, Woo K. The Financial Impact of Living in Canada With an Ostomy: A Cross-sectional Survey. J Wound Ostomy Continence Nurs. 2019 Nov/Dec;46(6):505-512.
2. Berger, A., et al. Cost-effectiveness of a Ceramide-Infused Skin Barrier Versus a Standard Barrier: Findings From a Long-Term Cost-effectiveness Analysis, J Wound Ostomy Continence Nurs, 2018. 45(2):p. 146-155
3. Statistics Canada. Table 17-10-0009-01, Population estimates, quarterly [Internet]. 2020 [updated 2020 Feb 20;cited 2020 Feb 26]. Available from: https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000901

Authors:
Kimberly LeBlanc,
Deanna Eaves, BS, Director, Market Access – Americas, Hollister Incorporated, Libertyville, IL, USA
George Skountrianos, Hollister Incorporated, Libertyville, IL, USA

Acknowledgements:
The authors gratefully acknowledge Hollister Incorporated, Libertyville, Illinois, for their support of this study.