Assessing Leakage and Peristomal Skin Conditions in Ostomy Patients Following Surgery and Prior to Discharge

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Introduction

Leakage is one of the top concerns for people living with an ostomy.

One of the main challenges of ostomy management is finding the right pouching system that will help a person living with an ostomy avoid leakage.[1] In a recent survey of people who had been living with an ostomy for a minimum of three months, 91% of respondents reported that they worried about leakage, and 76% reported that they experience leakage.[2,3] According to the literature, the impact of leakage for persons living with an ostomy often include increased incidents of peristomal skin complications (PSC), as well as self-imposed social and physical limitations for fear of leakage[3] and an overall reduction in health-related quality of life (HR-QoL).[4] In addition, the experience most often described in the literature for a person living with an ostomy in the community, is different from the experience of a person with a newly created ostomy while admitted in the hospital recovering from surgery.

Finding a pouching system that fits well is important to help mitigate barrier leakage and maintain peristomal skin health. Understanding the impact of pouch system choices and action taken by the wound, ostomy, continence (WOC) nurse is important so that evidence-based decisions can be made by WOC nurses. Unfortunately, there is a lack of real-world data on the performance of barriers in practice, especially in the acute setting.

The purpose of this study was to explore the performance of pouching systems with respect to barrier leakage and the development of PSCs in the hospital setting immediately following ostomy creation.

Methods

A retrospective chart review was performed at two affiliated university hospitals. Patient charts were included in the study if they were in the hospital and underwent stoma-creation surgery between February 2022 and June 2023.

214 charts met the inclusion criteria and were reviewed by WOC nurses from each hospital. Demographic, surgical and stoma details were collected. Leakage and PSCs were documented (if present) along with product selection at each pouch change, from the pouch placed in the operating room through discharge; data were reviewed for up to 5 pouch changes or 2 weeks post-surgery. The presence of leakage and PSCs were documented as yes or no.

Statistical analysis was performed using a generalized linear mixed model to determine the predicted probability of key outcomes.
A generalized linear mixed model was used because patients had different numbers of observations *(see Figure 1)* and a patient could switch from one barrier and/or accessory to another at different pouch change observations. The model also controlled for differences between the hospitals, including chronic/acute conditions, elective/emergent surgeries, surgery duration, end/loop stoma formation, and steroid use. Other variables considered were not significantly different and thus were not controlled.

Results

Subject characteristics

Table 1. Demographics, surgical and stoma characteristics of patients whose charts were reviewed.

Table 1. Demographics (N = 214)	
Mean Age (SD; years)	63.9 (0.9)
Gender	
Female	106 (49.53%)
Male	107 (50.00%)
Transgender	1 (0.47%
BMI (SD)	27.9 (0.5)
Race	
African American	27 (12.62%)
Asian	2 (0.93%)
Non-specified	7 (3.27%)
White	178 (83.18%)
Surgical characteristics	**N (%)**
Reason for surgery	
Chronic*	108 (50.47%)
Acute**	106 (49.53%)
Elective or emergent surgery	
Elective	163 (76.17%)
Emergent	51 (23.83%
Surgery duration (min)	252 (11.6)
Stoma characteristics	**N (%)**
Ostomy type	
Colostomy	82 (38.33)
Ileostomy	97 (45.33%)
Jejunostomy	1 (0.47%)
Urostomy	34 (15.89%)
Loop or end stoma	
End	143 (66.82%)
Loop	71 (33.18%)

*Cancer, Crohn's disease, Diversion for wound management, Ulcerative colitis, other
**Bowel perforation, Diverticulitis, Fecal diversion, Ischemia, Other, Trauma

Barrier changes

Table 2. Characteristics of barrier change patterns and the length of stay for patients in the study.

Table 2. Barrier changes and length of stay	**N (SD)**
Time (in days) to first pouch change	1.49 (0.07)
Mean number of pouch changes	3.9 (0.1)
Number of patients discharged 14 days or later	72
Average length of stay (in days) of patients discharged prior to 14 days	7.33 (0.24)

Barrier & barrier ring characteristics

Table 3. Barriers and barrier rings from three different manufacturers were used, although the majority were from two.

Barriers placed in OR	**N (%)**
Manufacturer	
Manufacturer A	129 (61.18%)
Manufacturer B	85 (39.72%)
Border	
Tape-border	85 (39.72%)
Tapeless	129 (61.18%)
Shape	
Flat	214 (100%)
Convex	0 (0%)
System type	
One-piece	85 (39.72%)
Two-piece	129 (61.18%)
Total barrier use across all observations	**N (%)**
Manufacturer	
Manufacturer A	558 (67.15%)
Manufacturer B	258 (31.05%)
Manufacturer C	15 (1.81%)
Border	
Tape-border	267 (32.25%)
Tapeless	563 (67.75%)
Shape	
Flat	587 (70.64%)
Convex	243 (29.36%)
System type	
One-piece	293 (35.26%)
Two-piece	537 (64.74%)
Combination of barrier brand + barrier ring (any brand)	**N (%)**
Manufacturer	
Manufacturer A	270 (48.39%)
Manufacturer B	225 (90.04%)
Manufacturer C	8 (72.72%)
Total barrier ring use across all observations	**N (%)**
Manufacturer	
Manufacturer A	399 (77.78%)
Manufacturer B	105 (20.47%)
Manufacturer C	9 (1.75%)
Barrier used at discharge (or 5th pouch change)	**N (%)**
Manufacturer	
Manufacturer A	143 (66.82%)
Manufacturer B	65 (30.37%)
Manufacturer C	6 (2.80%)
Border	
Tape-border	70 (32.71%)
Tapeless	144 (67.29%)
Shape	
Flat	134 (62.62%)
Convex	80 (37.38%)
System type	
One-piece	59 (27.57%)
Two-piece	155 (72.43%)

Leakage and Peristomal Skin Complications – Subject experience by pouch change

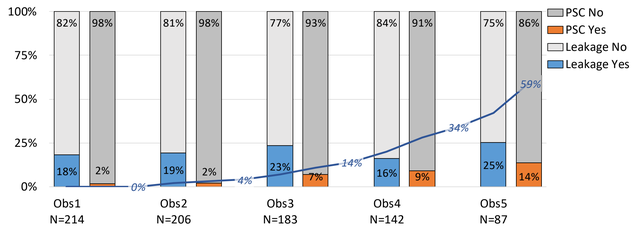

Figure 1. All 214 subjects had at least one pouch change. Because subjects were discharged (dark blue line), each subsequent pouch change or observation had fewer subjects.

The percentage of subjects who experienced PSCs at a given observation ranged from 2% to 14%. A PSC was only counted once. If, e.g., a subject was experiencing a PSC at observations 3 through 5, it would only be counted at observation 3. PSCs increased as more observations were reported.

The percentage of subjects who experienced barrier leakage at a given observation ranged from 16% to 25%. Leakage incidence was relatively consistent among the patients reported per observation. However, as more patients were discharged, the patients that remained hospitalized represented a group that experienced additional barrier leakage.

Leakage by barrier type

Figure 2.

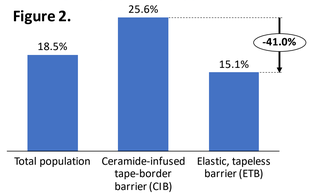

Figure 2. Risk of leakage – total population
The two most prevalent brands were compared to the total population. A significantly (p=0.011) lower risk of leakage was observed with the elastic tapeless barrier (ETB) – representing a 41% reduced risk in leakage compared to the ceramide-infused tape-border (CIB) barrier.

Figure 3.

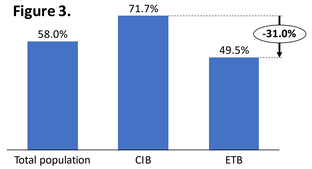

Figure 3. Risk of leakage – patients who leaked 2+ times
When the performance of these barriers was evaluated in those 36 patients who experienced leakage two or more times, as with the total population, the ETB leaked significantly less (p=0.043). This resulted in a 31% reduction in the risk of leakage for patients using an ETB compared to patients using a CIB.

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Discussion

Based on a review of the literature, this is the first description of this size observing leakage and PSCs for patients with newly formed ostomies still in the hospital. The review provides valuable data regarding product usage and outcomes.

Leakage consistently occurred across pouch changes during the observation period, with a risk of barrier leakage for all pouches. The two most frequently used brands, an elastic tapeless barrier (ETB) and a ceramide-infused barrier (CIB). When examined, the risk of barrier leakage for the CIB was 26% while the risk of barrier leakage for the ETB was only 15%, which corresponds to a 41% reduction in the risk of leakage (p=0.011). This pattern held true even for patients who experienced persistent leakage; in the sub analysis of this difficult to manage group, the CIB had a risk of leakage of 72% compared to a risk of barrier leakage with the ETB of 50% (p=0.043). These data demonstrate that while barrier leakage occurs during the immediate postoperative period, the risk of leakage can be reduced by choosing the optimal barrier based on patient needs.

Conclusion

Nurses may view barrier leakage as inevitable and therefore they may consider leakage just a frustration to be dealt with. The results from this study demonstrate that the choice in barrier type matters. Each episode of barrier leakage takes time to address and replacement products; a reduction in leakage could reduce product and nursing time costs, or perhaps free up time for other patient care. Many hospitals, including UPMC, have standards to ensure patients who are experiencing barrier leakage are not discharged without a plan in place. Thus, a reduction in leakage – provided there are no other complications – could result in decreased length of stay, improved patient satisfaction, and improved HR-QoL. Altogether, reducing leakage during admission in the post-operative period will benefit patients, nurses and hospitals.

References:

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