

# Matching the Skin Barrier to the Skin Type

Hyacinth Thompson, RN  
Queens Hospital, Romford, UK

## 1. The Skin

The skin consists of two layers, the outer horny layer called the epidermis and a lower layer called the dermis.

The skin is normally an effective resilient barrier covering the body and protecting deeper tissue. The epidermis is non-vascular and consists of stratified epithelium. It has two zones, the horny zone and the germinative zone.

*The horny zone has three layers:*

### 1. The Stratum Corneum:

This is the outer layer—the cells are flat without a nucleus, and the protoplasm, having become keratine, is waterproof. The epidermal cells, which synthesize keratin are known as keratinocytes and they originate in the basal layer of the epidermis.

### 2. The Stratum Lucidum:

This is made up of cells with clear protoplasm. Some have nuclei, which are flat.

### 3. The Stratum Granulosum:

This consists of several layers of cells with nuclei and protoplasm that is granular.

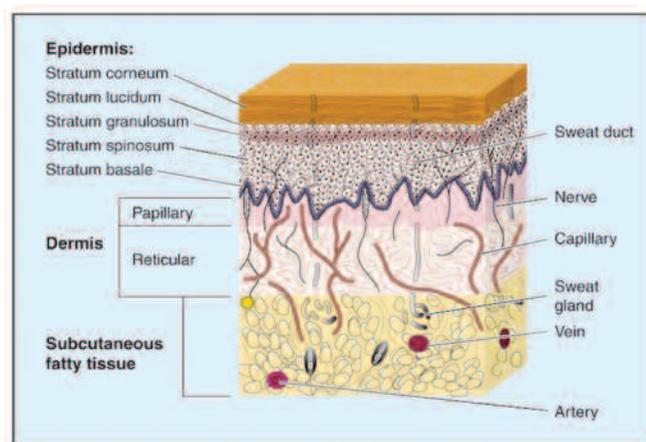
The thickness of this layer varies from 0.1 mm on the eyelid to 1 mm on the palms of the hands and the soles of the feet, thus illustrating the importance of its protective function<sup>1</sup>. This effect can occur anywhere on the skin that is exposed to persistent irritation and trauma.

*The deeper germinative zone has two layers:*

### 1. The Stratum Spinosum

### 2. The Stratum Basale

Cells originate in the stratum basale where they are known as basal cells, and they continually divide and migrate towards the skin surface. Initially they grow up into the stratum spinosum where they are known as prickle cells. When the cells reach the stratum granulosum they are known as granular cells, and are the



precursors to the keratinocytes in the outer stratum corneum, these are keratinized, squamous epithelial cells that have lost their nuclei. This ascent through the living layers of the skin takes about 60 days (Lyon and Smith, 2001). After losing their nucleus the cells then remain on the stratum corneum for about 15 days.

The dermis is a fibroelastic bed, which supports and nourishes the epidermis and its appendages. The stratum corneum is resistant to quite strong acids but is more vulnerable to alkaline substances. It can exclude harmful chemicals whilst allowing topical allergens and treatments to be admitted. The cells of the stratum corneum affect the rate at which molecules can pass through to the deeper layers. The speed of this movement is increased if the degree of humidity of the skin is raised.

### Implications for Stoma Patients

The skin around a stoma is very vulnerable and if it becomes damaged it can prove difficult to treat, particularly with the added problem of affixing an adhesive skin barrier. The rapid proliferation of skin cells means that superficial damage of the epidermis and upper dermis will usually heal without scarring, but deeper

#### FINANCIAL ASSISTANCE/DISCLOSURE

The support of Hollister Incorporated for this clinical presentation is gratefully acknowledged.

damage predisposes to scar formation. Exudate from an ileostomy is often strongly alkaline and may still contain the proteolytic enzymes of digestion. If allowed into contact with the skin, severe excoriation can quickly occur. Keratinocytes usually remain in the stratum corneum for about 15 days. However, removal of an adhesive skin barrier will pull off a layer of cells each time it is changed. If this changing is too frequent, damage to the skin will ensue.

As previously stated, the passage of molecules through the skin occurs at a faster rate if the temperature or humidity is increased. If the adhesive layer of a skin barrier prevents normal function of the skin, the temperature and humidity may rise and the speed at which irritant substances may be absorbed will be increased. This can result in skin irritation.

## 2. Skin Structure and Function

| Skin Structure                               | Function   |
|--|--|
| <b>Stratum corneum (horny layer)</b>         | Protection against trauma, either physical, chemical, heat, or ultraviolet light.  |
| <b>Keratinocytes</b>                         | Vitamin D synthesis necessary for normal calcium metabolism.   |
| <b>Melanocytes</b>                           | Protection of the keratinocyte nuclei from ultraviolet light damage. Skin pigmentation.  |
| <b>Langerhans' cells</b>                     | Bone marrow-derived cells involved in immunological surveillance.  |
| <b>Sensory nerves</b>                        | Sensory communication providing an awareness of pain, temperature, vibration, itch, and touch.   |
| <b>Motor nerves</b>                          | Involved in controlling blood flow, sweat gland function, and the hair movements when cold or scared (piloerection or 'goose-bumps').  |
| <b>Blood vessels (under nervous control)</b> | Temperature regulation by increasing or decreasing the flow of blood through the skin. Communication via flushing or pallor of the skin as in embarrassment or fear, respectively.                         |
| <b>Sweat glands</b>                          | Temperature regulation via evaporation of sweat. Protection against infection: sweat contains urea and ammonia so that it is acidic (pH 4-6.8) and discourages the overgrowth of some pathogenic bacteria. |

### Skin Structure

#### Pilosebaceous units

### Function

Protection against infection: the sebaceous glands produce greasy secretions that limit the proliferation of certain bacteria and fungi.

Protection by waterproofing the skin.

#### Hair follicle plus

At certain moist body sites where waterproofing is needed, sebaceous glands occur without an associated hair follicle; these areas include around the eyes, mouth, anus, and genitalia where the glands may be abundant.

The waterproofing role of these glands is demonstrated by the fact that they are absent from the palms and soles, allowing these surfaces to absorb water and become wrinkled, e.g., in a warm bath. The hair provides warmth and adornment, and denotes sexual differentiation and maturity.

## 3. The Skin Types

| Skin Type                 | Description   |
|---------------------------|---|
| <b>Oily</b>               | Tends to be shiny with enlarged pores. (Prone to blackhead and blemishes.)  |
| <b>Normal</b>             | Has medium pores, smooth even texture, good circulation, healthy colour.  |
| <b>Sensitive, fragile</b> | Tends to be thin, delicate with fine pores flushes easily. Frequently allergic and can be rashy.                                |
| <b>Dry</b>                | Feels tight. Tendency towards fine wrinkles, flaking, red patches. In dark-skinned patients their skin may appear ashy or dull. |

## 4. Skin Barrier Range

### SoftFlex

The SoftFlex Skin Barrier provides ultra flexibility without compromising security.

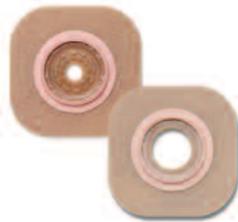
- This skin friendly barrier with dimples allows frequent pouch changes
- The shape and depth of the barrier are designed for optimal flexibility without compromising security
- The low profile offers both discretion and comfort



### FlexWear

The FlexWear Skin Barrier provides extended wear time for patients using the Conform 2 Two-Piece System.

- The addition of an adhesive border that does not irritate the skin provides a high level of skin tolerance
- Provides maximum security against leakages
- FlexWear Skin Barrier has a cross-linked structure for high resistance to liquid or aggressive output
- Maintains high discretion under clothing due to the exceptionally low profile



### Flextend

The Flextend Skin Barrier can be found on the Adapt Convex Rings and the Adapt Barrier Strips.

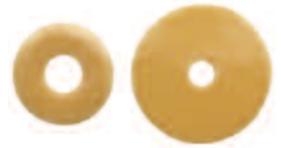
- Flextend is a durable skin barrier, combining high resistance to erosion with proven skin friendliness
- Flextend can be cut, bent, stretched, and moulded to create custom shapes



### Flextend M

The Flextend M Skin Barrier is a unique formulation offering extended wear time due to its unique fluid handling for perspiration, and stoma effluent.

- Flextend M has improved adhesive and cohesive properties that adhere well to skin and skin barriers even when wet
- In addition, it retains good cohesive strength when wet to prevent barrier disintegration
- Like Flextend, Flextend M provides flexibility, and matches the skin's natural pH balance, helping maintain skin integrity



## 5. Assessment

1. Identify skin type
2. Patient expectation in relation to wear time
3. Stomal output



## 6. Case Studies

---

### Normal - SoftFlex

#### Abstract

ND was initially admitted to the hospital medical ward with exacerbation of ulcerative colitis and was under the care of a gastroenterologist.

She had managed conservatively since then without medication, and this was her first admission to the hospital since diagnosis two years earlier.

ND was fully counseled preoperatively, and the stoma site marked. Siting her stoma proved difficult due to her petite frame and small abdomen. ND was particularly fashion conscious, preferring to wear very low waisted trousers. ND's ileostomy was well spouted, however postoperatively a mucocutaneous separation occurred. This was managed extremely effectively by moulding an Adapt Barrier Ring to protect the separation, whilst treating with Orahesive Powder and Orabase Paste.

ND chose a Moderma Flex Pouch out of a variety of different pouches. The rationale for her choice was the fact that the Moderma Flex Pouch was light, flexible, and discreet enabling her to wear her usual clothes without any problems. The SoftFlex Skin Barrier allows for ultra flexibility without compromising security. Once the mucocutaneous separation had healed, ND continued to use Moderma Flex Pouches without the need for an Adapt Barrier Ring.

### Fragile - Flexend M

#### Abstract

Mrs. S.C is a 66-year-old lady with rheumatoid arthritis mainly affecting her hands. She lives alone. She had a mesh repair of an abdominal hernia and within six months of her surgery, the mesh had broken through her skin. This led to a small bowel fistula and the fistula site evolved into a stoma.

She required district nurses for wound management due to her rheumatoid arthritis. The position of the fistula on her abdomen was difficult for her to manage herself.

They were in attendance to her every 3 days until Mrs. S.C. began suffering with leakages due to the changes in the shape and contours of her abdomen. This required more frequent pouch changes (3-4 times a day).

Due to these factors, the district nurses were finding it difficult to achieve a solution involving a wound management system that would remain in situ for more than 24 hours without leaks.

Mrs. S.C. was admitted into hospital with dehydration and had to go back to theatre for removal of the mesh and laying open of her wound.

On assessment, her peristomal skin was very sore due to her fragile skin type and frequent pouch changes. The stoma was retracted sitting within skin creases with the lumen located on the underside of stoma. The fistula output was liquid, high in volume and corrosive in nature. Using the Hollister skin barrier selection tool the **Flexend M** Skin Barrier was identified because it is a unique formulation offering extended wear time due to its unique fluid handling.

Mrs. S.C. has now been discharged home and the pouch remained in situ for up to 3-4 days.

#### Aim

To find a secure wound management system that could cope with the high liquid and corrosive output of her fistula.

#### Overview

Mrs. S.C. is a 66-year-old lady with a fistula which developed following a mesh repair of an abdominal hernia. She suffers from rheumatoid arthritis of the hands.

#### Setting

Mrs. S.C is an inpatient at present due to dehydration and management of her high output fistula

#### Intervention

Mrs. S.C. was admitted for surgery and management of a high output fistula. Due to the leakages and change in the shape and contour of her abdomen, she required frequent pouch changes which was not possible with the district nurse in attendance at home. On assessment her peristomal skin was very sore due to her fragile skin type and frequent pouch changes. The stoma was retracted sitting within skin creases with the lumen located

on the underside of stoma. The fistula output was liquid, high in volume, and corrosive in nature.

Using the Hollister skin barrier selection tool the **Adapt Barrier Ring** formulation uses the Flexend M Skin Barrier which was identified for its unique fluid handling, protection by matching the skin pH balance, and its enhanced mouldable properties.

It helped maintain a secure pouch seal and improved pouch adherence while protecting her fragile peristomal skin and achieving an extended wear time. The large Adapt Barrier Ring was chosen as it covered the sore area of the peristomal skin and was moulded to fit.



### Outcome

The Adapt Barrier Ring, due to its Flexend M Skin Barrier properties, proved to be successful in maintaining a secure pouch seal which improved adherence while protecting the fragile peristomal skin. There were no further leakages, and wear time was extended up to 3 days. Mrs. S.C. was discharged home and she felt more confident to socialize out of her home with her family.

### Conclusion

The Flexend M Skin Barrier with the Adapt Barrier Ring proved to resolve this difficult wound management issue. Wear time was extended. The Flexend M Skin Barrier was durable and could withstand the erosive liquid fistula output.

### Dry - Flexend

#### Aim

To find a stoma pouching system that would cope with a liquid and corrosive output and conform to her many abdominal contours.

#### Overview

Mrs. S.D. is a 67-year-old. She had an ileal conduit fashioned for chronic urinary incontinence. However, she suffered with recurrent UTI and bilateral hydronephrosis. This was discovered to be due to stagnation of urine collecting in a pocket of the ileum situated just behind the stoma opening.

#### Setting

Mrs. S.D. also has chronic congested cardiac failure (CCF). This restricts her mobility and she is reliant on her husband to assist her with her practical stoma care.

### Intervention

Mrs. S.D. was referred to the community stoma care clinical nurse specialist (SCN), by the hospital team. Unfortunately, a successful stoma pouching system had not been identified at this time. Her current stoma pouching system was being changed twice a day due to leakages.

On assessment, the peristomal skin was dry and flaky, the output was liquid and corrosive. The patient was also reliant on her husband to assist her in managing her stoma care and so they both wanted a pouching system that did not need to be changed daily.

The stoma itself was slightly retracted and sitting within several skin creases and scars. (Picture 1 & 2)

Using the Hollister skin barrier selection tool the **Flexend** Skin Barrier was selected. The Flexend Skin Barrier has an enhanced resistance to fluid erosion and is ideal for all skin types when infrequent changes are required.

Using the product guide, the urostomy one-piece pouch with Flexend Skin Barrier with adhesive border was identified for its durability and flexibility.

Firstly a convex conformable ring was applied to help secure a good seal, then paste was used to fill the peristomal creases (Picture 3). Finally, the urostomy pouch was applied using a belt for additional security. (Picture 4)

### Outcome

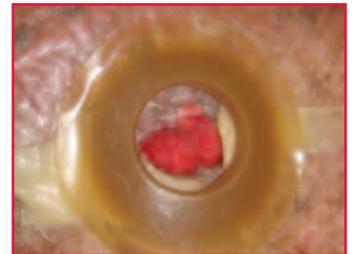
The pouching system stayed in place for 36 hours and this was an acceptable wear time for both the SCN and Mrs. S.D.

### Conclusion

The Flexend Skin Barrier and the convex ring helped provide solutions to a complicated stoma management problem. The Flexend was durable and withstood the liquid output, and the tape border also conformed to her abdominal contours.



**Picture 1:** Side view of slightly retracted stoma sat amongst skin creases and scars.



**Picture 2:** Stoma viewed from the front



**Picture 3:** Convex ring applied and paste applied to peristomal creases.



**Picture 4:** Belt applied to pouch for added security.

## Oily - FlexWear

### Abstract

Patients who experience stoma-related symptoms upon discharge from the hospital are more likely to experience psychological symptoms. Sometimes they feel quite isolated and dealing with early stoma management problems can result in them losing their confidence which leads to increased anxiety.

This case study shows the importance of an ongoing assessment following discharge from the hospital.

### Aim

To demonstrate the importance of ongoing assessment the patient's;

- Skin type
- Stomal output
- Patient expectation in relation to wear time

Then secondly, selecting a skin barrier.

### Overview

Mrs. P. N. was admitted to the hospital as an elective surgical case for a low anterior resection and defunctioning loop ileostomy.

### Setting

Mrs. P. N. is a 57-year-old general practitioner. She was originally from India, but has lived alone in the UK since she qualified as a doctor. She follows a vegetarian diet.

### Intervention

Mrs. P. N. made an uneventful postoperative recovery and was discharged from the hospital using a Hollister Moderma Flex drainable pouch. She was referred to the community stoma care nurse (SCN) for follow-up. At the first visit by the the SCN, Mrs. P. N. was very distressed as she had been suffering with leakages up to 3 times daily and her peristomal skin was very sore. When the pouch was removed, it was evident that the skin barrier had



**Picture 1:** Sore skin at the base of the stoma



**Picture 2:** Skin barrier has eroded away



**Picture 3:** FlexWear Convex Skin Barrier with tape in situ

eroded away and therefore caused leakages and had led to the skin breaking down (Pictures 1 & 2). Her stoma had retracted slightly.

### The SCN assessed the following;

Stoma output = watery, due to vegetarian diet

Skin type = oily

Patient expectation of wear time = 2–3 days as patient disliked changing her stoma pouch

Using the Hollister skin barrier selection tool, the **FlexWear** Skin Barrier was selected. FlexWear is a more durable skin barrier that is suitable for a more liquid output and can be changed infrequently. The Hollister two-piece convex pouching system with an adhesive border was selected. (Picture 3)

### Outcome

The SCN visited Mrs. P.N. 3 days later to review her skin and assess the new pouching system as well as offer her support as she was still very unconfident.

The pouching was changed and the skin had improved. Mrs. P.N. seemed a lot happier. The SCN visited the following week and the pouching system was removed and the skin assessed. There were no further leakages and the skin had healed. Mrs. P.N. was independently changing her pouch every third day and was confident with her stoma care.

### Conclusion

The FlexWear Skin Barrier proved to be durable and could withstand the liquid stomal output. By maintaining a good seal around her stoma, there were no further leakages and this allowed her skin to heal.

As presented at

## 11th ECET Congress

June 12-15, 2011

Bologna, Italy



**Hollister Incorporated**  
2000 Hollister Drive  
Libertyville, Illinois, 60048 USA  
**1.888.740.8999**

Distributed in Canada by  
**Hollister Limited**  
95 Mary Street  
Aurora, Ontario L4G 1G3  
**1.800.263.7400**

[www.hollister.com](http://www.hollister.com)

### References

1. Lyon, C.C. and Smith, A. J. (eds) (2001) Abdominal stomas and their skin disorders: an atlas of diagnosis and management. London: Martin Dunitz.