

Carol Rees Parrish, R.D., M.S., Series Editor

## When What Comes Out Is Way More Than What Goes In: Perineal Skin Care



Marilu Dixon

**Painful diarrhea-associated perineal tissue injury affects many patients with GI diseases; however, treatment is sometimes slow in coming. Topical preparations are useful adjuncts to the clinician's treatment plan as medication, dietary and other therapeutic interventions are undertaken to resolve the diarrhea. However, skin care product selection among the many available can be confusing. This article provides the clinician with an introduction to cleansers, moisturizers and skin protectants and the role they play in ensuring an environment for healing damaged skin and preventing skin breakdown. Basic information about product selection and patient-related considerations are reviewed.**

*From the nutrition series editor: You might wonder what this article is doing in a nutrition series. I will tell you. For gut adaptation to take place in the setting of a short gut, luminal nutrients must be ingested. Furthermore, for the clinician to determine efficacy of interventions on stool output and the patient's ability to maintain weight and hydration, the patient must be assessed eating and drinking the volume of food and fluid necessary to achieve that end. If the patient will not eat and drink for fear of, or because of, a sore bum, we are going nowhere.*

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### CASE STUDY

**M**rs. D., a 72-year-old female, was admitted for evaluation and management of ongoing diarrhea, malnutrition, and overall failure to thrive; her medical record documented a history of "short gut syndrome." She had been diagnosed with colon cancer in the early 1990's for which she underwent a sigmoid resection followed by radiation and chemotherapy. Since that time she had a cholecystectomy, and multiple small bowel resections for obstructions and lysis of adhesions. Her most recent resection in February 2007 resulted in a jejunocolonic anastomosis. At the time of her evaluation, Mrs. D. reported a two month history of worsening diarrhea of up to 15 to 20 stools per day. She was continent, but her frequent diarrhea pre-

vented her from leaving her home and participating in her usual activities. The Wound Ostomy Continence nurse was consulted for the patient's complaint of painful perineal skin breakdown. On exam Mrs. D. had areas of erythematous denuded (loss of epidermal tissue) peri-anal skin.

### INTRODUCTION

Patients presenting with a complaint of painful diarrhea-associated perineal or perigenital skin injury is not an unusual finding among adults receiving care from GI services. What may be less well appreciated are the steps to take to prevent or treat this skin injury. Therapeutic options for preventing and managing perineal dermatitis include, in addition to treating the underlying cause of the diarrhea, routine hygiene and the use of topical preparations. The large number of preparations available can seem overwhelming and confusing. A cost-conscious approach is recommended since treatment may necessitate out-of-pocket expenses.

### ETIOLOGY

Perineal dermatitis is an acute inflammatory skin reaction resulting from repetitive contact with perspiration, urine and/or liquid feces. The resulting skin injury

ranges from redness to areas of epidermal or dermal tissue loss (eroded or denuded skin), with associated pain, itching or risk for bleeding. The tissue injury may extend to the buttocks, groin and upper thighs. While incontinence can increase the risk for impaired tissue integrity, skin breakdown or perineal dermatitis can also occur in continent patients with diarrhea. Perineal dermatitis can affect any age; in infants, it is commonly referred to as "diaper rash."

### EFFECT OF DIARRHEA ON THE SKIN

Diarrhea, characterized by increased stool volume and altered frequency of stool loss, is a symptom in a variety of disease states; it may even be therapeutically induced prior to surgery or GI procedures. As a result, the perineal skin may come in contact with water, electrolytes, digestive enzymes, bile salts, or enterotoxins such as *C. difficile*. In the case of Mrs. D., her diarrhea was attributed to a decrease in the absorptive surface of her GI tract following her recent jejunocolonic anastomosis, radiation injury, as well as small bowel bacterial overgrowth. This, in turn, exposed her peri-anal skin to irritants such as digestive enzymes, and possibly bile salts.

Normally the outermost layer of the skin, an intact stratum corneum (SC) of the epidermis with its unique bricks and mortar (keratinocytes/corneocytes and hydrophobic lipids, respectively) bilayer structure, maintains a protective physical barrier to the external environment while it prevents internal water loss (Figure 1). The epidermal surface's acid mantle with a pH between 5.0–5.9 provides further protection by preventing bacterial or fungal infection. Repeat exposure to the frequent liquid stools associated with diarrhea, however, predisposes the skin to breakdown—moisture and over hydration disrupts the SC, allowing irritants and micro-organisms to penetrate, increasing the skin's susceptibility to the disrupting mechanical effects of friction. Risk factors for skin breakdown include moisture, altered skin pH, colonization with micro-organisms and friction (1) (Table 1). In addition, age related skin changes pose a risk for tissue injury. Elderly skin is thinner and drier; if pruritis occurs, scratching may further disrupt the skin barrier. Damaged skin is replaced more slowly and the skin's immune function is diminished with aging (2).

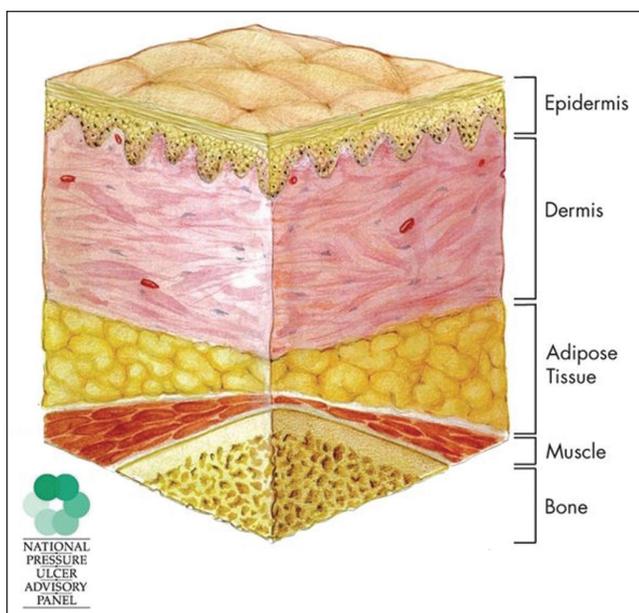


Figure 1. Normal Skin

**Table 1**  
**Factors Increasing the Risk of Skin Breakdown in Patients with Diarrhea**

- Contact with pancreatic enzymes or bile acid
- Moisture/overhydration resulting from urinary incontinence, perspiration and/or the use of plastic-backed containment briefs
  - Loss of the skin's acid mantle leads to an alkaline pH further interrupting the epidermal barrier and skin integrity
- Colonization/growth of micro-organisms such as staphylococcus or most commonly *Candida albicans*
- Friction as macerated skin comes in contact with clothing, pads/briefs or chairs and beds

## DIAGNOSIS AND MANAGEMENT

Identifying and treating the cause of the diarrhea is paramount to resolving the problem long term. The work up often begins by determining osmotic vs secretory diarrhea (Table 2). Diagnosing perineal dermatitis is a clinical diagnosis typically based on visual inspection. Identifying an associated fungal or bacterial component to the dermatitis is necessary for selecting the

**Table 2**  
**Osmotic vs. Secretory Diarrhea (11)**

### **Causes of osmotic diarrhea**

- Ingestion—antacids, laxatives
- Maldigestion—pancreatic insufficiency, disaccharidase deficiency
- Malabsorption—carbohydrate malabsorption, congenital chloridorrhea

### **Causes of secretory diarrhea**

- Bacterial enterotoxins—*Vibrio cholerae*, enterotoxigenic *E. coli*
- Circulating secretagogues—prostaglandins, VIP, serotonin, calcitonin
- Laxatives such as phenolphthalein, dioctyl sodium sulfosuccinate, ricinoleic acid, bisacodyl, oxyphenisatin, aloe, senna, danthron
- Bile salts
- Fatty acids
- Increased hydrostatic pressure and tissue pressure
- Pancreatic or gastric hypersecretion
- Intestinal obstruction
- Intestinal distention/ileus

appropriate topical preparation. This may be done by obtaining a skin scraping for laboratory study; frequently, however, diagnosis and treatment are initiated based on clinical observation. Decreasing, or eliminating diarrhea requires a systematic approach. Interventions might include: dietary modifications such as limiting concentrated sugars, fructose, fructans and poorly absorbed sugar alcohols such as sorbitol (3), and depending on the presence or absence of a colonic segment, adding or deleting fiber-rich foods or bulking agents such as bran or psyllium; initiating and titrating up antidiarrheal medications such as loperamide (Imodium), diphenoxylate/atropine (Lomotil), or narcotics such as Codeine to reduce colonic motility for non-infectious diarrhea; prescribing cholestyramine (Questran) for bile salt diarrhea, antibiotics for *C. difficile* infection, or antibiotics for bacterial overgrowth based on hydrogen breath test or strong clinical suspicion (4). Initiating a probiotic might also be considered (5). Remember when reviewing liquid medications for sorbitol content that sorbitol is not required to be listed on the label—call the manufacturer to determine whether it is present.

Topical skin care preparations play an integral role in resolving perineal dermatitis (Figure 2). Three broad categories of topical preparations exist: cleansers, moisturizers and skin protectants. In addition, topical preparations may be specially compounded by pharmacists for individual situations. Within each category are

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**Figure 2.** Incontinence-associated dermatitis in a patient with *C. difficile*.

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numerous products. Product selection and product application is generally based on clinical experience and clinician preference (2).

Current evidence supports a structured skin care regimen that utilizes: regular cleansing to remove stool from the perineal skin; use of a moisturizer and skin

protectant to prevent or limit skin contact with stool, avoiding contact with irritants and treating any infectious agents associated with liquid stool (1).

**Table 3**  
**Water and Surfactant Perineal Skin Cleansers**

**Cleansers**

- Designed to remove irritants and related material from skin's surface.
- When pH of cleanser approximates acidic surface of skin, likelihood of irritation, skin breakdown less

**Surfactants**

- Various lauryl sulfates (LS) such as sodium LS, triethanolamine LS or sodium stearate
- May contain antibacterial agents to reduce growth of bacteria and reduce odor: triclosan, para chloroxylenol, chlorhexidine gluconate
- Surfactant rated according to their relative irritancy to the skin: low, moderate, high.

**Use**

- No rinse formulations available
- Variety of product types: Liquid, emulsion, foam or in a soft towelette with the cleanser already in place

**Comments/Product Examples\***

- Cleanse at the time of soiling
- No rinse formulations preferred
- Examples:  
Aloe Vesta 3-n-1 Cleansing Foam by Convatec  
<http://www.Convatec.com/en/cvtus-skincareus>  
or (800) 422-8811  
Secura Personal Cleanser by Smith & Nephew  
[http://global.smith-nephew.com/us/SECURA\\_SKIN\\_CARE\\_SYS\\_17115.htm](http://global.smith-nephew.com/us/SECURA_SKIN_CARE_SYS_17115.htm)
- Products formulated for facial cleansing least irritating but expense may be prohibitive (example: Cetaphil by Galderma)  
<http://www.galdermaUSA.com/Products>
- Water alone removes 65% of oil & dirt from the skin (less effective at removing cosmetic related oils) (12)
- A peri-bottle or hand held shower spray may be used as a no-hands cleaning strategy

\*Does not indicate endorsement of listed products

**Cleansers**

Skin cleansing as soon as possible after stooling is critical to minimize the excoriating effects of fecal material. Characteristics of an "ideal" cleanser include the effective removal of skin contaminants with ingredients that will cause minimal injury and have a pH compatible to skin pH within a range of 4–7 (Table 3). The use of soft plain wipes, avoidance of rubbing or wiping (gently pat the area dry) and leaving as little residue as possible on the skin is optimal. Bar soap tends to dry the skin and create an alkaline pH on the epidermal surface, both of which can predispose to tissue injury. Vigorous cleaning can contribute to erosion of the epidermis with subsequent dermatitis or dermal infection. Products with known irritants such as fragrance and alcohol should be avoided (1). Both Dove Body Wash (<http://dove.us/#/Products/>) and Johnson's Baby Wash (<http://johnsonsbaby.com>; (866) 565-2229) are cited as examples of products with a skin compatible pH (6).

**Moisturizers and Skin Protectants**

Moisturizers and skin protectants are combinations of emollients, humectants and occlusives.

- Emollients are lipids and oils that form a film on the skin that inhibits water loss and prevents the evaporation of skin moisture
- Humectants attract and bind water to the stratum corneum from the underlying dermis and from the environment
- Occlusives reduce transepidermal water loss by creating a hydrophobic barrier over the skin.

Emollients, humectants and occlusives are formulated with other ingredients in varying proportions for delivery as lotions, creams, ointments and pastes according to their intended purpose and the manufacturer's proprietary recipes:

- **Lotions:** oil in a primarily water-based preparation with a thinner consistency compared to other preparations, preferred for daytime facial use. Typical

ingredients are: propylene glycol, mineral oil and water

- **Cream:** water in oil emulsion usually lanolin or some other heavier lipid: 50% oil/50% water
- **Ointment:** an occlusive, oil based preparation usually petrolatum based with longer-lasting effects: 80% oil/20% water
- **Pastes:** ointment with a powder added for a longer lasting more durable effect; contains a high proportion (usually >10%) of a fine powder such as zinc oxide, titanium dioxide or methylcellulose; powder in paste acts to absorb excessive drainage associated with eroded/denuded tissue while blocking exposure to irritants (1)

Moisturizers promote the skin's function as a moisture barrier by hydrating the stratum corneum and restoring the lipid barrier. By replacing oils in the skin, moisturizers reduce skin friction and prevent tissue injury (7) (Table 4).

**Table 4**  
**Moisturizers**

**Moisturizers**

- Replace oils in skin
- Promote skin's effectiveness as a barrier to moisture

**Active Ingredients**

- Humectants such as glycerin (glycerol), methyl glucose esters, honey, hyaluronic acid, propylene glycol—attract water from dermis and environment
- Emollients such as cetyl or stearyl alcohol contribute smooth supple skin
- Occlusives such as petroleum jelly/petrolatum, lanolin, mineral oil, dimethicone (a silicone)

**Use**

- May be applied as a separate step in perineal skin care or combined with cleansers to save time and expense of separate product application. For example cetyl or stearyl alcohol used as emollients in cleansing products

**Product Examples\***

Aquaphor – petrolatum, mineral oil  
Eucerin – petrolatum, mineral oil, wax  
<http://eucerinus.com/products.html> or (800) 227-4703

\*Does not indicate endorsement of listed products

Moisture barriers, also known as skin protectants or skin barriers, are formulated to provide a physical shield on the skin to limit exposure to irritants or moisture. FDA approval for such a designation requires the use of specified percentages of a particular identified active ingredient(s) in the product (Table 5).

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**Table 5**  
**Moisture Barriers or Skin Protectants**

**Moisture Barriers or Skin Protectants**

- Ointment or paste formulation
- Pastes are the most hardy and desirable barriers followed by ointments (ointments are superior to creams and lotions)

**Selected FDA approved Active Ingredients**

- Petrolatum 30–100%
- Zinc oxide 1–25%
- Dimethicone 1–30%
- Lanolin 12.5–50%
- Calamine 1–25%
- Allantoin 0.5–2%

**Use**

- May be applied as a separate step in perineal skin care or incorporated with a cleanser
- Oil-based preparations longer lasting effect due to their occlusive nature
- Gentle cleaning is recommended to remove stool on barrier surface leaving protective shield in place. Reapply more barrier ointment

**Product Examples\***

- Comfort Shield Barrier Cloth by Sage Products—no rinse, all in one cleanser, moisturizer and skin barrier (3% dimethicone)  
<http://sageproducts.com/products/incontinence-care/> or (800) 323-2220
- Critic-aid Clear by Coloplast—contains petrolatum, dimethicone, cellulose gum  
<http://www.us.coloplast.com> or (800) 788-0293 ext 7800 or order on-line <http://www.sweenstore.com/skincare.html>
- Sensi-Care protective barrier (Convatec)—active ingredients petrolatum, zinc oxide (See Convatec under Cleansers)
- Calmoseptine ointment (Calmoseptine, Inc)—active ingredients : zinc oxide, menthol  
Inactive ingredients :  
Calamine, glycerin, lanolin  
<http://www.calmoseptineointment.com/> or (800) 800-3405 (Pacific Standard Time)

\*Does not indicate endorsement of listed products

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**Table 6**  
**Pharmacist Compounded Products\***

<i>Skin Protectants</i>	<i>Ingredients</i>	<i>Use</i>	<i>Comments</i>
Nystatin/ Hydrocortisone-1%/ Zinc Oxide	<ul style="list-style-type: none"> <li>• 2 tabs Nystatin</li> <li>• 1 ounce Hydrocortisone-1%</li> <li>• 1 ounce Zinc Oxide</li> </ul>	<ul style="list-style-type: none"> <li>• Cutaneous candidiasis with itching, discomfort</li> <li>• Apply 2–3 times a day</li> </ul>	<p>Liquid stool tends to wash off protective barrier of zinc oxide so this product is less effective as a shield for denuded eroded skin.</p> <p>May be preferable to treat with an OTC barrier product that contains an antifungal (for example, Critic-aid Clear Antifungal (AF) with 2% Miconazole Nitrate <b>OR</b> prescribe Nystatin cream to be applied twice a day and cover with a skin protectant such as Critic-aid Clear by Coloplast. Continue to apply skin protectant as needed after stools. (See Coloplast under Moisture Barriers or Skin Protectants)</p> <p>A mild corticosteroid such as Hydrocortisone 1% may soothe inflammation &amp; discomfort but can cause tissue atrophy with prolonged use</p> <p>Do not use a mid-to-high potency corticosteroid on perineal dermatitis</p>
Lidocaine2%/ Nystatin/ Zinc oxide	<ul style="list-style-type: none"> <li>• Lidocaine use 6 mL of the 20% injection</li> <li>• Nystatin ointment 20 grams</li> <li>• Zinc oxide ointment add quantity sufficient to make 60 grams</li> </ul>	<ul style="list-style-type: none"> <li>• Painful denuded skin with candidiasis</li> <li>• Apply twice a day</li> </ul>	<p>Provides temporary pain relief</p> <p>Use with caution in individuals with skin loss and cardiac arrhythmias</p> <p>Zinc oxide barrier not sturdy enough to withstand liquid stool and provide environment for healing; need another skin protectant</p>

\*University of Virginia Health System Formulary

**Table 7**  
**Other Pharmacist Compounded Skin Protectants for Conditions Affecting Fecal Composition**

<i>Other Skin Protectants</i>	<i>Ingredients</i>	<i>Use</i>	<i>Comments</i>
Cholestyramine (Questran) and A&D ointment*	<ul style="list-style-type: none"> <li>• Cholestyramine 1 packet</li> <li>• A&amp;D ointment 1 tube</li> </ul>	<p>Prescribed for young pediatric patients with bile salt diarrhea</p> <p>Apply 2 to 4 times a day and reapply after cleaning</p>	<p>Liquid stool tends to wash off A&amp;D ointment protective barrier</p> <p>Evidence supporting use and effectiveness of cholestyramine skin barrier is anecdotal. It is thought to act by neutralizing bile salts on the skin surface</p>
Sucralfate 4% (10)	<ul style="list-style-type: none"> <li>• Four, 1 gram Sucralfate tabs crushed &amp; diluted to 4% in an aqueous cream</li> </ul>	<p>Apply 2 to 4 times a day and reapply after cleaning</p>	<p>According to literature, useful for dermatitis refractory to effects of other skin barrier products, hypothesized that it treats tissue injury from gastric secretions</p>

\*University of Virginia Health System Formulary

**Other Barrier Options**

1. A skin sealant or liquid barrier film product composed of polymers and a solvent may be another barrier option. After application, the solvent evaporates leaving the polymers to dry and form a protective film on the skin. In a study of incontinent nursing home residents free of perineal skin damage, a liquid barrier film applied three times a week was found to be a cost effective, preventive option to ointment based skin barriers (2). The solvent is usually alcohol so the skin sealant is best suited for intact skin. Alcohol-free liquid barriers can be substituted for use with injured perineal skin. The use of a barrier paste or ointment with a barrier film is not recommended due to possible incompatibility.
2. Powders are formulated to absorb moisture upon application and in turn reduce friction between opposing skin surfaces that can lead to tissue injury. Cornstarch has long been used in this regard. However, the potential to act as an irritant and allergen has limited its use. Talc should not be used in the perineal area since it may increase the risk of invasive serous ovarian cancer (1).
3. Products that are specially compounded by a pharmacist are another option depending on the institutional practices and the patient’s dermatitis (Table 6). Cost can be a limiting factor in prescribing this type of product, especially if the patient has no medical insurance (8).
4. Patients with conditions that affect fecal composition may benefit from formulations designed to mitigate the specific irritants (Table 7). Cholestyramine and sucralfate (Carafate) have been used in this regard (9,10).

**CASE STUDY OUTCOME/CONCLUSION**

Even before dietary and medication interventions decreased the frequency of Mrs. D.’s diarrhea and improved the stool consistency, she reported pain relief and peri-anal tissue healing with the use of the following products:

1. Comfort Shield Barrier Cloths by Sage Products to cleanse after each stool
2. Application of Critic-aid Clear by Coloplast after each stool

**Table 8**

**Summary of Perineal Dermatitis Practice Pearls**

- Manage moisture—reduce tissue hydration:
  - Cleanse and pat dry or use a hairdryer on a *cool setting*
  - Recommend cotton underwear
  - If pads or briefs are used, avoid plastic backed products
- Select a product that is easy to apply, stays on the skin and is easy to remove
- Adopt a consistent approach to product use—*allow a minimum of 3 to 5 days* to adequately assess for product effectiveness before changing products
- Avoid products with known irritants such as fragrance and alcohol
- Avoid “mixing” products at the bedside
  - Although a mixture of a zinc oxide ointment and petrolatum could provide a quick fix while the patient is waiting for other skin protectant order
- Individual variations and responses to products occur; a patient focused approach to product selection is necessary. Assess product ingredients not just manufacturer’s “marketing claims” (1)
- Product ingredients are listed on package. Material Safety Data Sheets (MSDS) can be requested from the manufacturer or found on their websites for product ingredient review
- Products designed for infants may not “work” for adults. For example, a clear product may be more aesthetically acceptable to an adult than the zinc oxide ointments used for pediatric populations. For example, zinc oxide preparations are more completely removed using mineral oil
- Cost—most topical skin care products are for over-the-counter (OTC) purchase; however, if insurance coverage is possible, a prescription will be necessary. Local pharmacies may carry certain products in their stores, and if not, may be able to order. Another option is to obtain products from medical supply companies or over the internet
- For patients who pay out of pocket, the cost of certain products may seem high. It is important to discuss the benefits of skin healing with patients as numerous over-the-counter products may have been purchased unnecessarily while the patient searches for relief
- Rule out yeast rash or bacterial infection. Consider a dermatologist consult if dermatitis does not respond to barrier products within several days. Orally administered antifungal agents are rarely needed
- Identify care resources available in your practice site—products, individuals such as wound ostomy nurses, and dermatologists

3. Twice daily application of Zinc oxide/Lidocaine/Nystatin cream provided immediate pain relief during the first 2 days of treatment. Critic-aid Clear was used to cover this compounded cream product to prevent “washing” off with the diarrhea stool. This compounded product was discontinued once the pain resolved and tissue healing commenced as there was no associated Candida infection
4. A supplemental oral pain medication or anti-pruritic should also be considered to alleviate discomfort while healing occurs.

Management of diarrhea-associated perineal dermatitis can be challenging. Addressing the underlying cause of the diarrhea and the judicious use of topical preparations to facilitate tissue healing and prevent breakdown are basic to the patient’s plan of care. Clinical experience contributes to this care as well (Table 8). ■

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#### BRIEF MEETING REPORTS

#### HIGHLIGHTS FROM DIGESTIVE DISEASE WEEK, CHICAGO, 2009

##### Ireland Showcases Innovation Advances in Gastroenterology and Immunology With Symposium at Digestive Disease Week (DDW) 2009

In a demonstration of Ireland’s emergence as a leading center in gastroenterology and immunology research and innovation, Enterprise Ireland, the Irish government trade agency, gathered key Irish opinion leaders from the global medical and research communities. They presented a symposium on “The Host Microbe

Interface—Translating Science To Real And Emerging Therapeutic Opportunities” at Digestive Disease Week 2009. This was the first instance where a country has been permitted to present a symposium and is seen as a recognition of Ireland’s contribution to the science of gastroenterology and immunology.

The Ireland-hosted symposium featured presentations and remarks from recognized world leaders in their fields including Program Co-Chair, Dr. Joseph A. Murray, M.D., Program Co-Chair Ciaran P. Kelly, M.D., M.B., Professor Luke O’Neill, Dr. Laurence Egan, M.D., Professor Dermot Kelleher, Dr. Eamonn M.M. Quigley, M.D., and Dr. Fergus Shanahan, M.D. ■