

Peristomal Skin Complications: Clinical Resource Guide



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Acknowledgments

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This document was developed and completed by the WOCN Society's Peristomal Skin Complications Task Force and submitted for review in November 2015.

Task Force Chair:

Cecilia Krusling, MS, ACNS-BC, CWOCN
Clinical Nurse Specialist
Lynchburg, Ohio

Task Force Members:

Debra Beauchaine, MN, AGPCNP-BC, CWOCN-AP
Nurse Practitioner
Cave Creek, Arizona

Ann Marie Nie, MSN, RN, CNP, FNP-BC, CWOCN
Wound Nurse Practitioner
Wound Specialists of Greater Cincinnati
Cincinnati, Ohio

Jo Ann Valent, BSN, RN, BC, CWOCN, COS-C
Chilton Medical Center
Pompton Plains, New Jersey

Susan Werchek, MSN, RN, ANP, APNP-BC, COCN, CWS
Nurse Practitioner
HSHS St. Vincent Hospital
Green Bay, Wisconsin

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Introduction and Purpose

Ideally, peristomal skin should appear healthy and intact. When an alteration in the condition of peristomal skin occurs, a thorough history and assessment of the clinical features of the peristomal skin offer clues to a clinician about the etiology of the skin problems. This document was originally developed by the WOCN® Society’s Clinical Practice Ostomy Subcommittee as a best practice guide for clinicians who care for patients with ostomies (Wound, Ostomy and Continence Nurses Society [WOCN, 2007]).

The purpose of this updated document is to facilitate the identification, assessment and management of selected peristomal skin complications. The peristomal complications discussed in this document include the following: allergic contact dermatitis, folliculitis, fungal infection/candidiasis, pseudoverrucous lesions/hyperplasia, mechanical trauma (i.e., medical device-related pressure ulcer; medical adhesive-related skin injury/skin stripping), psoriasis, pyoderma gangrenosum, varices/caput medusa, granulomas/hypergranulation, mucosal transplantation/seeding, peristomal moisture-associated skin damage, chemical skin injury, malignancy, and peristomal abscess. For each complication, this document provides an overview with a description and information about assessment and nursing intervention. The following information is provided for each complication: definition, etiology/contributive factors, identifying characteristics and assessment parameters; and nursing interventions for prevention, management, and patient/caregiver education. Please see the appendix (Figures 1–14) for images of selected complications.

Allergic Contact Dermatitis		
Description	Assessment	Nursing Intervention
<p>Definition (Figure 1)</p> <ul style="list-style-type: none"> • Allergic contact dermatitis is an inflammatory skin reaction due to hypersensitivity to chemical elements in contact with the peristomal skin (WOCN, 2010). • An initial exposure to an allergen causes an immune response and the release of antibodies, which results in an allergic reaction when the allergen is reintroduced (Alvey & Beck, 2008; Erwin-Toth, Stricker, & van Rijswijk, 2010). 	<p>Identifying Characteristics</p> <ul style="list-style-type: none"> • An allergic contact reaction may manifest itself as an area with erythema and edema, and/or with vesicles/blisters, papules, bullae, and erosions that bleed or weep serous fluid (Stelton et al., 2015; Szymanski et al., 2010). • The inflammation of the skin initially mirrors the size/shape of the allergen, enlarges as inflammation progresses, and is typically associated with intense pruritis (Salvadarena, 2016). 	<p>Prevention</p> <ul style="list-style-type: none"> • Avoid suspected or known allergens. • Consider using a nonadhesive pouching system until the dermatitis is resolved. • Use caution with accessory products such as adhesives, tapes, adhesive removers, skin cleansers, and antiperspirants or deodorants, which could be potential allergens.
<p>Etiology/Contributive Factors</p> <ul style="list-style-type: none"> • A common source of the allergen is the adhesive on pouching systems (Alvey & Beck, 2008; Stelton, Zulkowski, & Ayello, 2015). • Other allergens associated with contact allergies on peristomal skin include tapes, dyes, perfumes, preservatives, soaps, and lotions 	<p>Assessment Parameters</p> <ul style="list-style-type: none"> • Obtain a history of any known prior skin issues or allergies, specifically, those reactions related to tape, adhesives, or other topical products. • Identify the characteristics, distribution, exact pattern and onset of the erythema and rash, or other manifestations. • Determine if the dermatitis is associated with a new type pouching system, a new batch of products, or new skin 	<p>Management</p> <ul style="list-style-type: none"> • Identify and discontinue any suspected or known irritants or allergens. • Replace the current pouching system with an alternative system that has different chemical properties (Stelton et al., 2015). • Eliminate any unnecessary products. • If skin is denuded, apply a thin coat of skin barrier powder to the area, and cover the powder with a no-sting skin sealant/barrier film if the patient is not sensitive to

Allergic Contact Dermatitis		
Description	Assessment	Nursing Intervention
<p>(Salvadalena, 2016; Szymanski, St.-Cyr, Alam, & Kassouf, 2010).</p> <ul style="list-style-type: none"> Some of the allergy producing agents in common products used by patients with ostomies include: epoxy resins or colophony found in adhesives; lanolin; latex or rubber; formaldehyde in household products such as shampoo and cosmetics; neomycin; benzocaine; parabens found in sunscreens, topical creams, and antifungals; and nickel (Woo, Sibbald, Ayello, Coutts, & Garde, 2009). 	<p>care products, etc.</p> <ul style="list-style-type: none"> Determine what products/techniques are used for application/removal of the pouching system and skin cleansing. If the patient has persistent rashes that are not responsive to appropriate interventions, administer a patch test to determine what product(s) is/are causing the skin reaction and help guide the selection of an alternate pouching system or products (Al-Niामी et al., 2012; Alvey & Beck, 2008; Burch, 2014; Stelton et al., 2015). <ul style="list-style-type: none"> To perform the patch test, adhere a small piece of the skin barrier to the abdominal skin (on the opposite side from the current reaction) for several days; remove the patch and observe for any signs of inflammation (Burch, 2014). Additionally, patch testing might include a piece of the pouch, pouch cover material, adhesive strips/tapes, and/or a small amount of skin barrier paste (Al-Niामी et al., 2012). 	<p>sealants/barrier films. This technique is sometimes referred to as “crusting.” See the section on Peristomal Moisture-Associated Skin Damage for additional information about “crusting.”</p> <ul style="list-style-type: none"> In collaboration with the primary healthcare provider, consider use of a topical steroid to reduce the inflammation (Alvey & Beck, 2008; Salvadalena, 2016). Some steroid products such as creams can interfere with adhesion of the pouching system. Therefore, select a product such as a topical steroid spray, which generally will not interfere with adhesion of the pouching system (Salvadalena, 2016). <ul style="list-style-type: none"> Application of occlusive products over topical steroids can increase the absorption through the skin and affect the potency of the steroid (Oakley, 2016). Extended use (months) of topical steroids can lead to skin atrophy, easy bruising, and tearing of the skin (Oakley, 2016). Refer to a dermatologist if the condition persists or worsens.
		Patient/Caregiver Education
		<ul style="list-style-type: none"> Teach the patient/caregiver: <ul style="list-style-type: none"> To use only plain water to cleanse the skin when changing the pouching system, and avoid soap and other cleansing products. To avoid use of tapes, lotions, and products containing dyes, and perfumes.

Folliculitis		
Description	Assessment	Nursing Intervention
Definition (Figure 2)	Identifying Characteristics	Prevention
<ul style="list-style-type: none"> Folliculitis is an inflammation at the base of hair follicles on the peristomal skin (Salvadalena, 2016; Stelton et al., 2015; WOCN, 2010). 	<ul style="list-style-type: none"> The primary lesions are small dome-shaped papules surrounding a hair follicle, which may have a central pustule that is pierced by a hair; secondary lesions may develop with crusts and erythema (Bryant, 2012). Folliculitis is more commonly found in males than in females due to the increase in hair distribution on the male abdomen (Stelton et al., 2015). 	<ul style="list-style-type: none"> Remove peristomal hair by clipping or trimming on a weekly basis. Avoid straight-edge razors. Use an electric razor or hair clipper; shave in the direction of the hair growth. Avoid frequent, close shaving of the peristomal skin, and/or dry shaving.

Folliculitis		
Description	Assessment	Nursing Intervention
	<ul style="list-style-type: none"> • Patient may experience pain or pruritus (WOCN, 2010). 	<ul style="list-style-type: none"> • Wash, rinse, and completely dry the skin before applying a new pouching system. • Gently remove the pouching system and adhesive products. • Use a skin sealant to provide skin protection (Erwin-Toth, n.d.; Szymanski et al., 2010).
Etiology/Contributive Factors	Assessment Parameters	Management
<ul style="list-style-type: none"> • Folliculitis may be caused by mechanical factors and/or bacterial or fungal infection (Bryant, 2012). • Causative/contributive factors may include: occlusion of the skin and/or blockage of the follicle from occlusive ointments, oil or grease on the skin; tight clothing; trauma from rubbing/friction; multidirectional shaving or aggressive shaving; and/or chronic pulling of the hair during removal of an adhesive pouching system, followed by the secondary infection (Bryant, 2012; Meisner & Ballaby, 2008; Salvadalena, 2016; Stelton et al., 2015; U.S. National Library of Medicine [NLM], 2014; WOCN, 2010). • Bacterial folliculitis is most commonly caused by <i>Staphylococcus aureus</i>, but can also be due to <i>Streptococcus</i>, <i>pseudomonas aeruginosa</i>, or fungal/tinea infections (Bryant, 2012; Meisner & Ballaby, 2008; Salvadalena, 2016; Stelton et al., 2015; NLM, 2014; WOCN, 2010). • Diabetes, steroid use, immunosuppression, malnutrition, antibiotic use, chronic staphylococcal infection, and obesity are additional contributive factors (Salvadalena, 2016; WOCN, 2010). 	<ul style="list-style-type: none"> • Examine the skin surrounding the stoma for clinical signs of folliculitis. • Assess the patient/caregiver's technique for: <ul style="list-style-type: none"> ◦ Application/removal of the pouching system, tapes, and adhesive products. ◦ Hair removal, skin care, and cleansing of the peristomal skin. • Determine what products are used to cleanse the skin. • Obtain or refer for cultures to determine if the infection is bacterial or fungal in origin (Salvadalena, 2016). A potassium hydroxide examination can be used to determine if the infection is fungal in origin (Bryant, 2012). 	<ul style="list-style-type: none"> • Use antibacterial soap when changing the pouching system and cleansing the skin (Salvadalena, 2016; Stelton et al., 2015; Szymanski et al., 2010). • Consult with the primary healthcare provider regarding a prescription for a topical antibiotic powder, which can be applied to the inflamed area for severe cases (Erwin-Toth et al., 2010; WOCN, 2010). • If the condition does not improve or worsens, consider obtaining a culture/sensitivity to guide treatment with an appropriate oral antibiotic or antifungal (Bryant, 2012; Meisner & Balleby, 2008; Salvadalena, 2016). • Consult with a dermatologist or the primary healthcare provider for chronic issues.

Folliculitis		
Description	Assessment	Nursing Intervention
		Patient/Caregiver Education <ul style="list-style-type: none"> • Teach the patient/caregiver: <ul style="list-style-type: none"> ◦ Proper technique for removal of peristomal hair. ◦ To use an adhesive remover to prevent tearing hair from the hair follicle. • To cleanse the skin with an antibacterial soap at pouch changes until the skin is healed. • After skin is healed, use a skin sealant (Erwin-Toth, n.d.).

Fungal Infection/Candidiasis		
Description	Assessment	Nursing Intervention
Definition (Figure 3)	Identifying Characteristics	Prevention
<ul style="list-style-type: none"> • Peristomal candidiasis is an overgrowth of fungal organisms (<i>Candida</i>) that causes inflammation, infection, or disease of the peristomal skin in patients with fecal or urinary diversions (Alvey & Beck, 2008; WOCN, 2010). 	<ul style="list-style-type: none"> • Cutaneous candidiasis commonly occurs in moist, warm, and dark environments (Erwin-Toth et al., 2010; Stelton et al., 2015; Woo et al., 2009). • The infection may present with erythema, erosions, vesicles, papules, or pustules; or as areas of red, shiny skin that itches and burns (Morales-Mendoza et al., 2014; Stelton et al., 2015; Woo et al., 2009). • The borders of the lesions may be regular or irregular (Alvey & Beck, 2008). • Typically the papules/pustules have a speckled appearance on the skin and are accompanied by satellite lesions with an advancing border (Erwin-Toth et al., 2010; Morales-Mendoza et al., 2014; Stelton et al., 2015; Szymanski et al., 2010). • Except for the satellite lesions, the infection can resemble an allergic contact dermatitis (Morales-Mendoza et al., 2014). 	<ul style="list-style-type: none"> • Avoid excess moisture on the peristomal skin. • Consider using a skin sealant/barrier film or roll-on antiperspirant if excess moisture on the skin persists (Erwin-Toth et al., 2010). • Thoroughly dry the pouching system, including the tape, after bathing, swimming or other contact with steam or water. A hair dryer on the coolest setting may be used for drying. • Consider use of a pouch cover, or a pouch that has a cloth backing.
Etiology/Contributive Factors	Assessment Parameters	Management
<ul style="list-style-type: none"> • Candidiasis is most commonly due to <i>Candida albicans</i>, which is a common opportunistic pathogen that is part of the normal intestinal flora (Alvey & Beck, 2008; Morales-Mendoza et al., 2014; Salvadalena, 2016). 	<ul style="list-style-type: none"> • Obtain a detailed patient history: Inquire about recent use of antibiotics or immunosuppressant medications that increase the risk of fungal infections (Salvadalea, 2016). • Determine the onset/duration, characteristics, distribution and pattern of the rash/erythema, and satellite lesions. • Examine the fit of the pouching system; determine the patient's technique for application/removal of the pouching 	<ul style="list-style-type: none"> • Refit the pouching system as necessary to stop leaks and assure that the frequency for changes of the system is appropriate. • Cleanse and thoroughly dry the skin each time the pouching system is changed. • Apply a topical antifungal powder or cream (e.g., nystatin [requires a prescription]; or miconazole [over-the-counter

Fungal Infection/Candidiasis		
Description	Assessment	Nursing Intervention
<ul style="list-style-type: none"> Multiple factors/conditions can predispose patients to candidiasis: poorly controlled diabetes mellitus, immunosuppression, antibiotic therapy, corticosteroid therapy, chemotherapy, myelosuppression, anemia, obesity, leakage of the pouching system, backflow of pouch contents onto the skin causing irritation and altering the pH, continuous traction on the skin, increased perspiration, and denuded skin (Erwin-Toth et al., 2010; Morales-Mendoza et al., 2014; Salvadalena, 2016). Cleansing the skin with alkaline soaps can alter the pH, and routine/frequent use of antibacterial soaps can remove the normal skin flora, increasing the risk of fungal overgrowth (Stelton et al., 2015). 	<p>system, and skin care and cleansing.</p> <ul style="list-style-type: none"> Obtain cultures or refer for skin scrapings to confirm the fungal infection and/or isolate the <i>Candida</i> species (Morales-Mendoza et al., 2014; Woo et al., 2009). 	<p>drug]) to the affected area and rub it gently and thoroughly on to the skin to prevent interfering with adhesion of the pouching system (Stelton et al., 2015; Woo et al., 2009). <i>Note:</i> Note creams might interfere with pouch adhesion if applied to an affected area under the pouch adhesive.</p> <ul style="list-style-type: none"> Apply a no-sting skin sealant/barrier film over the antifungal, and allow it to dry prior to attaching the pouching system if needed to enhance adhesion (Alvey & Beck, 2008; Salvadalena, 2016; Woo et al., 2009). This technique is sometimes referred to as “crusting.” See the section on Peristomal Moisture-Associated Skin Damage for additional information about “crusting.” Apply the antifungal each time the pouching system is changed until the condition resolves and the skin appears dry and intact (Stelton et al., 2015).
		<p>Patient/Caregiver Education</p> <ul style="list-style-type: none"> Teach the patient/caregiver: <ul style="list-style-type: none"> Proper frequency for changing the pouching system. Proper sizing of the opening of the pouching system to prevent irritation from the effluent. Proper technique for emptying the pouch to prevent backflow of contents. Management of moisture on the peristomal skin and under the pouching system. Technique for application of an antifungal powder or cream, and/or skin sealant/barrier film to maintain a secure seal of the pouching system. Importance of tight blood sugar control for patients with diabetes mellitus.

Pseudoverrucous Lesions/Hyperplasia		
Description	Assessment	Nursing Intervention
<p>Definition (Figures 4, 5)</p> <ul style="list-style-type: none"> Peristomal pseudoverrucous lesions are hypertrophic “wart-like” lesions that develop on peristomal skin that is exposed to an irritating effluent over a long period of time (Erwin-Toth et al., 2010; Salvadalena, 2016; Stelton et al., 2015; Woo et al., 2009). The lesions have also been referred to as chronic papillomatous dermatitis, hyperkeratosis, and pseudoepitheliomatous hyperplasia (Erwin-Toth, n.d.; Salvadalena, 2016; Szymanski et al., 2010; Woo et al., 2009). 	<p>Identifying Characteristics</p> <ul style="list-style-type: none"> The lesions are benign areas of thickened epidermis with white, gray, brown, or reddish-brown, wart-like papules or nodules that develop at the mucocutaneous junction; spread over the skin exposed to effluent; and can become eroded, painful, and bleed easily (Erwin-Toth et al., 2010; Meisner & Balleby, 2008; Szymanski et al., 2010; WOCN, 2010; Woo et al., 2009). The lesions are most typically seen in patients with urostomies with skin that is chronically exposed to urine effluent (Ratliff, 2014). In patients with urostomies, pseudoverrucous lesions are often associated with encrustations around the stoma and on the skin from exposure to stagnant, alkaline urine, and infection (Salvadalena, 2016; Woo et al., 2009). The deposits may appear as a gray-colored, slimy film or coating on the skin adjacent to the stoma (Stelton et al., 2015). 	<p>Prevention</p> <ul style="list-style-type: none"> Correctly size the stomal opening in the pouching system to minimize exposure of the skin to the effluent (Colwell et al., 2011). If the effluent dissolves the current skin barrier, consider using an extended-wear skin barrier (Erwin-Toth et al., 2010). Use bedside drainage during hours of sleep for urinary stomas. Use a pouch with an antireflux valve for urinary stomas (Woo et al., 2009).
<p>Etiology/Contributive Factors</p> <ul style="list-style-type: none"> Chronic irritation over time leads to thickening of the epidermis and development of the lesions (Colwell et al., 2011; Erwin-Toth et al., 2010; Szymanski et al., 2010). The primary causative factor is prolonged/chronic exposure of the skin to an irritating effluent, most commonly urine, but the lesions can also result from exposure to liquid stool (Colwell et al., 2011; Salvadalena, 2016; Stelton et al., 2015; Szymanski et al., 2010; Woo et al., 2009). The condition is often due to an opening in the pouching system that is too large for the stoma, allowing effluent to contact the peristomal skin (Szymanski et al., 2010; Woo et al., 2009). 	<p>Assessment Parameters</p> <ul style="list-style-type: none"> Determine the pattern and distribution of the lesions; assess for eroded, bleeding areas. Assess the type/fit of the pouching system, size of the stomal opening, use of accessory products and antireflux pouch, wear time, frequency of emptying the pouch, use of a night drainage system, etc. Examine the skin barrier for erosion/melt-down and undermining and leakage. Check the urine pH. Assess the fluid intake. 	<p>Management</p> <ul style="list-style-type: none"> Measure and resize the stomal opening in the pouching system as needed (Szymanski et al., 2010; Woo et al., 2009). Change the pouching system more frequently (Szymanski et al., 2010; Woo et al., 2009). Manage leakage immediately. Cauterize the lesions with silver nitrate (may require an order/prescription from the primary healthcare provider); refer for surgical intervention if the lesions are chronic in nature (Erwin-Toth et al., 2010; Meisner & Balleby, 2008; Salvadalena, 2016; Stelton et al., 2015; WOCN, 2010). Several applications of silver nitrate might be required (Salvadalena, 2016). For encrustations: <ul style="list-style-type: none"> Consider an acidic type skin barrier (karaya; Colly-Seel, Torbot Group Inc., Cranston, RI) under the pouching system to maintain an acidic environment and decrease encrustations (Colwell et al., 2011; Woo et al., 2009). Apply soaks with an acetic acid solution to the skin for 20 minutes (i.e., dilute white vinegar and water solution; 30%

Pseudoverrucous Lesions/Hyperplasia		
Description	Assessment	Nursing Intervention
<ul style="list-style-type: none"> • Additionally, for patients with urostomies, alkaline urine increases encrustation and inflammation from deposits of phosphate and uric acid crystals, which increases the risk of pseudoverrucous verrucous lesions (Colwell et al., 2011; Erwin-Toth et al., 2010; Szymanski et al., 2010; Woo et al., 2009). 		<p>to 50% vinegar); rinse and gently clean the skin after the soaks (Colwell et al., 2011; Salvadalena, 2016; Stelton et al., 2015; Szymanski et al., 2010; Woo et al., 2009).</p> <ul style="list-style-type: none"> ○ Increase hydration to maintain the urine pH at approximately 6.0 (Colwell, 2004). ○ Acidify the urine if needed: Vitamin C or cranberry juice may be used (Colwell et al., 2011; Meisner & Balleby, 2008; Szymanski et al., 2010). <ul style="list-style-type: none"> - Do not exceed more than 1 gram per day of vitamin C, which could lead to kidney stones; avoid orange juice, which has a high alkaline ash residue (Woo et al., 2009). - Consider methanamine tablets to acidify the urine (Woo et al., 2009).
		Patient/Caregiver Education
		<ul style="list-style-type: none"> • Teach the patient/caregiver: <ul style="list-style-type: none"> ○ Selection and management of an appropriate pouching system. ○ How to measure and correctly size/fit the stomal opening in the pouching system. ○ Technique for application of vinegar and water soaks when changing the pouching system. ○ To maintain an adequate fluid intake; measures to acidity the urine.

Mechanical Trauma: Medical Device-Related Pressure Ulcer (Injury)		
Description	Assessment	Nursing Intervention
Definition	Identifying Characteristics	Prevention
<ul style="list-style-type: none"> • A medical device-related pressure ulcer is a mechanical injury to the peristomal skin and/or underlying tissue as result of pressure associated with use of an external medical device at the location of the ulcer (Pittman, Beeson, Kitterman, Lancaster, & Shelly, 2015). • A pressure ulcer (injury) can occur wherever external pressure impairs circulation to the skin (Pittman et al., 2015). 	<ul style="list-style-type: none"> • Skin manifestations vary in severity ranging from partial to full thickness tissue loss (Erwin-Toth et al., 2010; Salvadalena, 2016; Szymanski et al., 2010). • Denuded or ulcerated areas may be painful, and could lead to cellulitis (Erwin-Toth et al., 2010). • Drainage from the ulcers might interfere with adhesion of the pouching system (Salvadalea, 2016). 	<ul style="list-style-type: none"> • Prevention of pressure and/or shear is a key to avoiding injury. <ul style="list-style-type: none"> ○ Ensure proper fit of the pouching system. ○ Decrease or omit excess pressure that is being exerted upon the skin by the pouching system, convex flanges/ inserts, belts/binders, etc. (Szymanski et al., 2010). • Examine the skin for signs of pressure each time the pouching system is changed, and modify the pouching system as indicated. <ul style="list-style-type: none"> ○ If a belt/binder is used, ensure that it is snug but not too tight.

Mechanical Trauma: Medical Device-Related Pressure Ulcer (Injury)

Description	Assessment	Nursing Intervention
		<ul style="list-style-type: none"> ○ Consider use of a wider belt/binder. ○ Reevaluate the need for convexity; consider decreasing the amount or firmness of the convexity. ○ If a firm or rigid face plate or skin barrier/flange is used, consider changing to an alternative product.
Etiology/Contributive Factors	Assessment Parameters	Management
<ul style="list-style-type: none"> ● Skin injury occurs due to pressure, and/or shear due to improper technique or fit of the pouching system or accessory products (Szymanski et al., 2010; WOCN, 2010). ● Contributing factors include: <ul style="list-style-type: none"> ○ Friction might be a contributing factor (Erwin-Toth et al., 2010; Salvadalena, 2016). ○ Peristomal hernia, weight gain or a prolapsed stoma (Erwin-Toth et al., 2010; Salvadalena, 2016). ○ Tight belts or binders, a firm/hard face plate on the pouching system, and/or firm convex skin barriers/flanges (Alvey & Beck, 2008; Meisner & Balleby, 2008; Salvadalena, 2016). ○ Pressure ulcers (injuries) may occur in patients with peristomal hernias due to the use of convexity and belts/binders to hold products firmly in place (Alvey & Beck, 2008; Salvadalena, 2016). 	<ul style="list-style-type: none"> ● Determine the frequency for changing the pouching system. ● Assess the patient/caregiver’s technique for application/removal of the pouching system, belts, etc., and cleaning the skin. ● Assess the type/fit of the pouching system (i.e., belts, binders, convexity, etc.) with the patient in sitting, standing and reclining positions (Salvadalena, 2016). ● Inspect the abdominal contours for skin creases and folds, and for hernias. ● Examine the skin for changes in color and integrity. ● Assess for a relationship between the injury and specific components of the pouching system to identify the source of the pressure. ● Measure and describe the wound/periwound area. ● Assess for complications: pain, infection, etc. ● Assess for undermining/leakage of the pouching system due to wound exudate. 	<ul style="list-style-type: none"> ● Identify and remove the source of pressure. Modify the pouching system as appropriate. ● Manage the ulcer according to its size and characteristics (Erwin-Toth et al., 2010): <ul style="list-style-type: none"> ○ Superficial, partial-thickness ulcers: Apply a small amount of skin barrier powder to the ulcer each time the pouching system is changed until the ulcer is healed. Consider using the “crusting” technique. See the section on Peristomal Moisture-Associated Skin Damage for additional information about “crusting.” ○ Deeper, full-thickness ulcers: Select dressings (e.g., calcium alginate or hydrofiber with/without silver and a secondary dressing) to fill the wound, absorb exudate, and maintain a healing environment without interfering with the adhesion of the pouching system.
		Patient/Caregiver Education
		<ul style="list-style-type: none"> ● Teach the patient/caregiver: <ul style="list-style-type: none"> ○ Proper technique for fitting and management of the pouching system and any new supplies, application/removal of the pouching system, skin care, and wound care for the ulcer. ○ To monitor the peristomal skin for signs of pressure/injury when changing the pouching system, and to notify the ostomy care nurse and/or primary healthcare provider of any problems.

Mechanical Trauma: Medical Adhesive-Related Skin Injury/Skin Stripping

Description	Assessment	Nursing Intervention
<p>Definition (Figure 6)</p> <ul style="list-style-type: none"> • A medical adhesive-related skin injury is a type of peristomal trauma or mechanical injury in which epidermal cells (i.e., 1 or more layers of the stratum corneum) are stripped away, and/or the epidermis separates from the dermis when the adhesive portion of the pouching system or tape is removed from the skin (McNichol, Lund, Rosen, & Gray, 2013; Stelton et al., 2015; Woo et al., 2009). 	<p>Identifying Characteristics</p> <ul style="list-style-type: none"> • The skin injury appears beneath the adhesive portion of the pouching system or tape (Salvadalena, 2016). • Erythema, edema, blisters, and skin tears may occur (McNichol et al., 2013; Salvadalena, 2016; Woo et al., 2009). • Lesions usually have irregular borders. 	<p>Prevention</p> <ul style="list-style-type: none"> • Prevention of improper application/removal of tapes and adhesive products is a key to avoiding injury. • Ensure proper fit of the pouching system to prevent unnecessary, frequent changes. • Consider use of a skin sealant/barrier film to protect the skin from tapes and adhesive products: <ul style="list-style-type: none"> ◦ Apply a no-sting skin sealant/barrier film (wipe or spray) to the peristomal skin and allow it to dry, prior to application of the pouching system (Alvey & Beck, 2008; Salvadalena, 2016; Woo et al., 2009). ◦ Check the manufacturer’s guidelines to determine if the skin sealant/barrier film is compatible with other products (i.e., pouching system). • Avoid use of additional tapes and adhesives, such as skin cement, silicone-based adhesive sprays, etc. • Gently remove the pouching system, and/or tape from the skin. <ul style="list-style-type: none"> ◦ Consider use of an adhesive remover without an oil base. ◦ Remove the adhesive product in the direction of hair growth. ◦ Loosen the edges of the adhesive product; push the skin down and away from the adhesive product; and remove it low and slow, back over itself (McNichol et al., 2013). • Gently cleanse the skin; avoid scrubbing or manually removing residual skin barriers, pastes, and other adhesives.
<p>Etiology/Contributive Factors</p> <ul style="list-style-type: none"> • Causative factors include: <ul style="list-style-type: none"> ◦ Abrasive skin cleansing techniques. ◦ Repeated application and removal of adhesive products in a short period of time (McNichol et al., 2013; Salvadalena, 2016; Woo et al., 2009). ◦ Improper application and removal of the pouching system/tape (McNichol et al., 2013; Salvadalena, 2016; Woo et al., 2009). 	<p>Assessment Parameters</p> <ul style="list-style-type: none"> • Assess the extent, location, appearance of the skin damage. • Identify all products that are used: pouching system, tapes, adhesives/bonding agents or tackifiers, skin sealants/barrier films, soaps, cleansers, adhesive removers, other skin care products, etc. • Assess the patient/caregiver’s technique for application/removal of the pouching system, and cleaning the skin. • Determine the frequency of changing the pouching system. • Assess for a relationship between the injury and the products/components of the pouching system, or techniques used in application/removal of the pouching system and skin care. 	<p>Management</p> <ul style="list-style-type: none"> • Treat denuded skin: <ul style="list-style-type: none"> ◦ Apply a small amount of skin barrier powder to the lesion each time the pouching system is changed until the injury is healed. ◦ Consider using the “crusting” technique for severe skin stripping. See the section on Peristomal Moisture-Associated Skin Damage for additional information about “crusting.” • Use proper technique for application/removal of any adhesive products (McNichol et al., 2013): <ul style="list-style-type: none"> ◦ Apply a no-sting skin sealant/barrier film prior to an adhesive product. ◦ Apply all tapes without tension.

Mechanical Trauma: Medical Adhesive-Related Skin Injury/Skin Stripping

Description	Assessment	Nursing Intervention
<ul style="list-style-type: none"> ○ Use of tape with aggressive adhesive (McNichol et al., 2013; Salvadalena, 2016). ○ Overuse of adhesive/bonding products or skin tackifiers (McNichol et al., 2013; Salvadalena, 2016). ● Contributive factors include (McNichol et al., 2013; Salvadalena, 2016): <ul style="list-style-type: none"> ○ Very young age (i.e., neonate/premature infant) or advanced age. ○ Other diseases/comorbid conditions (e.g., dermatologic disease, diabetes mellitus, immunosuppression, malnutrition, dehydration, etc.). 		<ul style="list-style-type: none"> ○ Carefully select products to minimize skin trauma. ○ Use adhesive removers. ○ Maintain adequate hydration/nutrition status. ○ Consult a skin/wound care specialist if the skin injury does not respond to conservative management within 7 days or deteriorates.
		Patient/Caregiver Education
		<ul style="list-style-type: none"> ● Teach the patient/caregiver: <ul style="list-style-type: none"> ○ Proper techniques for application/removal of the pouching system, tapes, and any adhesive products. ○ Skin care and management of any open lesions (e.g., crusting technique, etc.).

Psoriasis

Description	Assessment	Nursing Intervention
<p>Definition</p> <ul style="list-style-type: none"> ● Psoriasis is a chronic inflammatory skin disorder and autoimmune disease with multiple clinical variations (Salvadalena, 2016; Villaseñor-Park, Wheeler, & Grandinetti, 2012). ● Chronic inflammation leads to proliferation of keratinocytes and angiogenesis in the psoriatic plaque (Hsu et al., 2012; Villaseñor-Park et al., 2012). 	<p>Identifying Characteristics</p> <ul style="list-style-type: none"> ● Plaque psoriasis is the most common form, accounting for more than 80% of cases and is characterized by well-demarcated pink-to-red plaques (Villaseñor-Park et al., 2012). The plaques may be covered by thick, silvery-white scales (Erwin-Toth et al., 2010; Limaye, 2015; Salvadalena, 2016). ● Disease severity varies: An estimated 80% of patients have mild to moderate disease; 20% have moderate to severe disease (Villaseñor-Park et al., 2012). 	<p>Prevention</p> <ul style="list-style-type: none"> ● Avoid known triggers. ● Encourage smoking cessation. ● Ensure the pouching system is properly sized and fitted to prevent leakage and irritation from stomal effluent (Salvadalena, 2016). ● Gently remove adhesive products.

Psoriasis		
Description	Assessment	Nursing Intervention
	<ul style="list-style-type: none"> • The severity of disease is gauged according to the extent of psoriasis (Limaye 2015): <ul style="list-style-type: none"> ◦ Mild disease (< 5% of total body surface area [BSA]). ◦ Moderate disease (5% to 10% BSA). ◦ Severe disease (> 10% BSA). • Psoriasis is most common in individuals 20 to 30 and 50 to 60 years of age (Villaseñor-Park et al., 2012), and in individuals of European and Scandinavian descent (Limaye, 2015). • Patients with severe psoriasis are at a higher risk of cardiovascular disease and metabolic syndrome (Hsu et al., 2012; Limaye, 2015; Villaseñor-Park et al., 2012). • Other diseases involving the immune system occur more frequently in patients with psoriasis such as Crohn’s disease, ulcerative colitis, lymphoma, and type 2 diabetes Villaseñor-Park et al., 2012). 	
Etiology/Contributive Factors	Assessment Parameters	Management
<ul style="list-style-type: none"> • Cause remains unknown; believed to have a genetic component; and symptoms may intensify in individuals who are immunosuppressed (Erwin-Toth et al., 2010; Limaye, 2015; Villaseñor-Park, et al., 2012). • Triggering factors include: <ul style="list-style-type: none"> ◦ Trauma of removing an adhesive pouching system, which is known as the Koebner phenomenon, whereby a localized trauma provokes the occurrence of a pre-existing condition at the site of the trauma (Salvadaleña, 2016). ◦ Stool on the skin. ◦ A moist environment caused by the pouching system (Sakai, Yoshimatsu, Yokomizo, & Osawa, 2010). ◦ Stress, hypocalcemia, pregnancy, infection, viral or drug induced reactions/rashes, alcohol, smoking, and obesity (Villaseñor-Park et al., 2012). Smoking is a risk factor 	<ul style="list-style-type: none"> • Determine if there is a history of psoriasis, eczema, etc., elsewhere on the body; assess the history of medications and previous treatments (Salvadaleña, 2016). • Examine the color, texture, distribution of the lesions, and integrity of the skin (Salvadaleña, 2016). • Assess for secondary infections. 	<ul style="list-style-type: none"> • Consider a nonadherent pouching system during treatment with topical therapy/medications (Erwin-Toth et al., 2010). • Collaborate with the primary healthcare provider regarding medical therapy (Erwin-Toth et al., 2010). • Topical steroids and phototherapy are mainstays of treatment along with biological agents for severe conditions (Villaseñor-Park et al., 2012). <ul style="list-style-type: none"> ◦ Reduce the inflammation by topical or intralesional corticosteroids (Salvadaleña, 2016; Woo et al., 2009). ◦ Products with low alcohol content are preferred for topical application; corticosteroid lotions/sprays may be more compatible for use under the pouching system (Salvadaleña, 2016). ◦ Treatment for mild disease (Limaye, 2015): <ul style="list-style-type: none"> - Class I or II topical corticosteroids. - Class I or II topical corticosteroids combined with steroid sparing agents such as vitamin D analogues, tacrolimus, and retinoids (i.e., tazarotene). ◦ Treatment for moderate to severe disease (Hsu et al.,

Psoriasis		
Description	Assessment	Nursing Intervention
<p>for the onset and exacerbation of psoriasis, and increases its severity (Hsu et al., 2012).</p> <ul style="list-style-type: none"> ○ Drugs such as beta-blockers, interferon, antimalarials, and lithium (Limaye, 2015; Villaseñor-Park et al., 2012). 		<p>2012; Limaye, 2015):</p> <ul style="list-style-type: none"> - Ultraviolet light therapy: narrow-band ultraviolet-B (UVB) light, or UVB in combination with other treatments; oral or topical psoralen combined with ultraviolet A if UVB light therapy fails. - Oral therapies: methotrexate, cyclosporine, and acitretin. - Biologicals: ustekinumab, infliximab, etanercept, and adalimumab (Hsu et al., 2012; Reich, Burden, Eaton, & Hawkins, 2012). ● Refer to the primary healthcare provider to screen for metabolic syndrome and cardiovascular risks factors (Limaye, 2015; Villaseñor-Park et al., 2012).
		<p>Patient/Caregiver Education</p> <ul style="list-style-type: none"> ● Teach the patient/caregiver: <ul style="list-style-type: none"> ○ To avoid known triggers. ○ The importance of a properly sized/fitted pouching system to prevent leakage (Salvadarena, 2016). ○ Topical treatment regimens/strategies. ○ Gentle skin care and proper techniques for application/removal of adhesive products.

Pyoderma Gangrenosum (PG)		
Description	Assessment	Nursing Intervention
<p>Definition (Figure 7)</p> <ul style="list-style-type: none"> ● Peristomal PG is an ulcerative skin condition of unknown etiology occurring around a stoma (Beitz & Colwell, 2014). ● There are four major types of PG based on clinical and histological features (i.e., ulcerative/classical, pustular, bullous, and vegetative); peristomal PG is most commonly the ulcerative type (Dabade & Davis, 2011; Wu & Shen, 2013). 	<p>Identifying Characteristics</p> <ul style="list-style-type: none"> ● PG most commonly occurs in young to middle-aged adults with a slight predominance in women (Dabade & Davis, 2011; Wu & Shen, 2013). Half of cases are associated with systemic disease such as inflammatory bowel disease (IBD), arthritis, and hematological cancers (Ahronowitz et al., 2012; Dabade & Davis, 2011; Hanley, 2011; Meisner & Balleby, 2008; Wu & Shen, 2013). ● PG may present as nodules, plaques, or sterile pustules that rapidly enlarge and erode to form open red ulcers with irregular borders that are rolled/undermined; lesions are dusky red or purple; and extreme pain is a characteristic feature of PG (Ahronowitz et al., 2012; Erwin-Toth et al., 	<p>Prevention</p> <ul style="list-style-type: none"> ● Prevention of PG lesions may not be possible because they are a manifestation of an underlying systemic disease; however, early identification of the lesions and prompt intervention is necessary to prevent further trauma/exacerbation of the lesions (Stelton et al., 2015; WOCN, 2010). ● Avoid hard, rigid convex products, belts etc., which might create pressure, or utilize soft convex products (Salvadarena, 2016). ● Maintain a reliable pouch seal to prevent effluent from leaking onto the ulcers (Erwin-Toth et al., 2010). ● Use a gentle technique for changing the pouching system and cleansing of peristomal area.

Pyoderma Gangrenosum (PG)		
Description	Assessment	Nursing Intervention
	<p>2010; Salvadalena, 2016; Stelton et al., 2015; Woo et al., 2009; Wu & Shen, 2013).</p> <ul style="list-style-type: none"> • Lesions may progress to necrotic ulcers with purulent exudate (Ahronowitz et al., 2012; Erwin-Toth et al., 2010; Hanley, 2011; Salvadalena, 2016). • Multiple sites of PG ulcers may occur (Dabade & Davis, 2011; Wu & Shen, 2013). • Primary PG lesions are not due to infection, but secondary infection can occur (Wu & Shen, 2013). • Healing results in cribriform (sieve-like) atrophic scarring (Ahronowitz et al., 2012; Hanley, 2011). • Lesions are often refractory to treatment (Ahronowitz et al., 2012). • PG may recur, and some patients have multiple episodes (Dabade & Davis, 2011; Hughs, Jackson, & Callen, 2000; Uchino et al., 2012; Wu & Shen, 2013). • Drainage from the ulcerations and their painful nature present challenges for maintaining an effective seal of the pouching system (Alvey & Beck, 2008; Salvadalena, 2016). 	<ul style="list-style-type: none"> • Consider adhesive removers and a no-sting skin sealant/barrier film to protect intact, fragile peristomal skin (Salvadlena, 2016).
Etiology/Contributive Factors	Assessment Parameters	Management
<ul style="list-style-type: none"> • The exact etiology of PG is uncertain (Meisner & Balleby, 2008; Salvadalena, 2016). PG is a rare, neutrophilic dermatosis thought to be an autoimmune disease (Ahronowitz, Harp, & Shinkai, 2012; Salvadalena, 2016; WOCN, 2010). • PG is associated with pathergy (a phenomenon where minor trauma initiates/aggravates the lesions) such as pressure from convexity or removal of adhesive products and/or the pouching system (Hanley, 2011; Salvadalena, 2016; Woo et al., 2009). 	<ul style="list-style-type: none"> • Obtain a complete history and physical examination. • Inspect the peristomal skin and ulcers: Determine the size, shape, type tissue, pain, exudate, etc. • Diagnosis of PG is one of exclusion of other causes of the ulcerations; there is no absolute diagnostic test (Ahronowitz et al., 2012; Dabade & Davis, 2011; Wu & Shen, 2013). <ul style="list-style-type: none"> ◦ Differential diagnosis includes, but is not limited to, conditions such as infectious diseases, malignancy, vasculitis, insect bites, and a variety of other dermatoses (Ahronowitz et al., 2012; Dabade & Davis, 2011; Wu & Shen, 2013). It is important to exclude infection and malignancy, especially if the patient will be treated with immunosuppression therapy (Ahronowitz et al., 2012). ◦ Request a consult to obtain a biopsy: A deep elliptical incisional biopsy that includes tissue from the edge of the lesion and subcutaneous tissue is preferred over a punch biopsy (Ahronowitz et al., 2012; Dabade & Davis, 2011). Histology results can help exclude other causes of ulcers. 	<ul style="list-style-type: none"> • A key to successful management of PG is treatment of the underlying disease (Erwin-Toth et al., 2010; Stelton et al., 2015). Goals are to reduce inflammation and pain, optimize wound healing, and minimize exacerbating factors (Ahronowitz et al., 2012). • Initiate medical management to reduce the inflammatory process and infection. Treatment is based on the size and number of lesions, location, type, and presence of underlying disease (Ahronowitz et al., 2012). <ul style="list-style-type: none"> ◦ Topical and intralesional treatments are generally the initial approach for mild PG with few, small or slowly progressing lesions (Dabade & Davis, 2011; Wu & Shen, 2013). <ul style="list-style-type: none"> - Topical agents include: corticosteroids (i.e., clobetasol propionate 0.05%), tacrolimus 0.3%, or an ophthalmic preparation of cyclosporine (Ahronowitz et al., 2012; Dabade & Davis, 2011). - Intralesional injections of triamcinolone or cyclosporine may also be useful for smaller lesions (Ahronowitz et al.,

Pyoderma Gangrenosum (PG)

Description	Assessment	Nursing Intervention
	<p>Massive neutrophil infiltration confined to the dermis is a feature of PG (Dabade & Davis, 2011; Hughes et al., 2000; Wu & Shen, 2013).</p> <ul style="list-style-type: none"> ○ Obtain laboratory tests to help rule out other conditions: complete blood count, comprehensive metabolic panel, liver function tests, antinuclear antibody, coagulopathy panel (i.e., antiphospholipid antibody, cryoglobulins, rheumatoid factor, circulating antineutrophil cytoplasmic antibodies), fecal occult blood, chest x-ray, and colonoscopy to evaluate for IBD (Ahronowitz et al., 2012; Dabade & Davis, 2011). ○ Assess for signs of infection; culture if indicated (Salvadaleña, 2016; Wu & Shen, 2013). ● Determine if indicators of PG are present. While there are no formally accepted criteria for diagnosing PG, the following criteria are proposed indicators of the ulcerative/classic form of PG (Ahronowitz et al., 2012; Dabade & Davis, 2011; Wu & Shen, 2013): <ul style="list-style-type: none"> ○ Major criteria: <ul style="list-style-type: none"> - Rapid progression of a painful, necrotic, cutaneous ulcer, with irregular, violaceous, and undermined borders. - Exclusion of other causes of cutaneous ulcers. ○ Minor criteria: <ul style="list-style-type: none"> - History indicating pathergy or presence of cribiform scarring. - Systemic diseases associated with PG. - Histopathology results: sterile dermal neutrophilia with or without mixed inflammation or lymphocytic vasculitis. - Rapid response to systemic steroid treatment. ● Evaluate the fit of the pouching system, use of accessory products, wear time, and for undermining/leakage of the seal. 	<p>2012; Dabade & Davis, 2011; Hughes et al., 2000; Wu & Shen, 2013).</p> <ul style="list-style-type: none"> ○ Multiple, large, and/or rapidly progressing ulcers that do not respond to topical treatment require systemic therapy (Ahronowitz et al., 2012; Wu & Shen, 2013). <ul style="list-style-type: none"> - First-line systemic agents include (Ahronowitz et al., 2012; Wu & Shen, 2013): <ul style="list-style-type: none"> ■ Oral corticosteroids (prednisone 0.5 to 1mg/kg/day; methylprednisolone up to 0.8 to 1 mg/kg/day) are common first-line therapies that are effective in many cases; pulsed dose therapy may be used for rapidly progressive disease. ■ Drugs that exhibit anti-inflammatory effects such as minocycline, clofazimine, and cyclosporine may be useful for rapidly progressive disease. ■ Infliximab, a tumor necrosing factor inhibitor, is the only biologic with level 1 evidence for treatment of PG. - Other systemic biologic agents (i.e., etanercept, adalimumab, ustekinumab) may be used as treatment options for patients with PG and other associated inflammatory conditions such as Crohn’s disease (Ahronowitz et al., 2012; Wu & Shen, 2013). - The following adjunct treatments are typically used in conjunction with other treatments, because they may not be effective by themselves for severe PG (Ahronowitz et al., 2012; Wu & Shen, 2013): <ul style="list-style-type: none"> ■ Anti-neutrophilic agents (dapson). ■ Antimicrobials (minocycline, cyclosporine). ■ Mycophenolate mofetil, azathioprine, and methotrexate. ○ Options for treatment of recalcitrant lesions: <ul style="list-style-type: none"> - Adjust the dosage of first-line medications or change medications: High-dose steroids may be needed in severe cases (Ahronowitz et al., 2012; Dabade & Davis, 2011; Woo et al., 2009). - Consider adding intravenous immunoglobulin or alkylating agents (Ahronowitz et al., 2012; Dabade & Davis, 2011; Wu & Shen, 2013).

Pyoderma Gangrenosum (PG)

Description	Assessment	Nursing Intervention
		<ul style="list-style-type: none"> - Other modalities might include: plasmapheresis, or granulocyte apheresis (Ahronowitz et al., 2012; Dabade & Davis, 2011). o For patients on long-term systemic corticosteroids, consider prophylaxis for osteoporosis (i.e., calcium, vitamin D, bisphosphonates), and pneumocystis pneumonia (Ahronowitz et al., 2012; Dabade & Davis, 2011; Wu & Shen, 2013). o Monitor the patient for side effects of the therapy and their response to treatment (Dabade & Davis, 2011). • Provide appropriate wound care. <ul style="list-style-type: none"> o Gentle wound cleansing. o Select dressings to optimize wound healing according to the wound characteristics: a moisture retentive dressing (e.g., film, hydrogel), collagen, hydrocolloid, alginate, hydrofiber, foam, and/or cadexomer iodine (Ahronowitz et al., 2012). <ul style="list-style-type: none"> - Choose dressings that absorb moisture and allow for adhesion of the pouching system (Alvey & Beck, 2008). - Absorptive products covered/secured by a transparent film dressing or hydrocolloid can absorb wound exudate and provide a dry pouching surface (Salvadaleña, 2016). • Modify the pouching system to remove any sources of pressure and friction to prevent trauma to the peristomal skin and wounds; consider a nonadhesive pouching system (Salvadaleña, 2016). • Adjust the frequency for changing the pouching system as necessary to ensure an adequate seal and access to monitor/treat the lesions. • Avoid interventions that may lead to pathergy such as the following: relocation of the stoma, which has been associated with ulceration at the new site (Hughes et al., 2000); debridement of the lesions; use of a convex pouching system and/or tape around the pouching system (Dabade & Davis, 2011; Hanley, 2011; Wu & Shen, 2013). • Monitor and manage the patient’s ulcer pain. Analgesics (e.g., judicious use of NSAIDs, opioids) in addition to a topical anesthetic may be needed, and a referral to a pain specialist might be needed to control the pain (Ahronowitz et al., 2012).

Pyoderma Gangrenosum (PG)		
Description	Assessment	Nursing Intervention
		<p>Patient/Caregiver Education</p> <ul style="list-style-type: none"> • Teach the patient/caregiver: <ul style="list-style-type: none"> ○ The importance of smoking cessation, optimal glycemic control for patients with diabetes, nutrition, and minimizing edema (e.g., venous disease) to promote wound healing (Ahronowitz et al., 2012). ○ Techniques for skin and wound care; necessity of gentle wound and skin care. ○ Any changes/modifications made to the pouching system; frequency for changing the pouching system, etc. ○ To continue to monitor for recurrence of the ulcers after the lesions are healed, and report any new or recurrent ulcers to the ostomy care nurse and/or primary healthcare provider.

Varices/Caput Medusae		
Description	Assessment	Nursing Intervention
<p>Definition (Figure 8)</p> <ul style="list-style-type: none"> • Varices, also referred to as caput medusae, are large portosystemic venous collateral blood vessels, which occur at the site of a stoma (Beitz & Colwell, 2014; WOCN, 2010). 	<p>Identifying Characteristics</p> <ul style="list-style-type: none"> • Dilated, tortuous veins occur around the stoma with a characteristic bluish, purple hue in a sunburst/caput medusae pattern (Kabir et al., 2014; Naidu, Castle, Kriegshauser, & Huettl, 2010; Stelton et al., 2015; WOCN, 2010). • Varices bleed easily from minimal trauma or erosion (Erwin-Toth et al., 2010; Kabir et al., 2014; Stelton et al., 2015). Bleeding is painless, but can be profound causing anemia (Kabir et al., 2014; Pabon-Ramos, Niemeyer, & Dasika, 2013; Pennick & Artioukh, 2013; Sarin & Kumar, 2012). • Varices can also present as episodes of spontaneous bleeding from the stoma or mucocutaneous junction without the characteristic skin changes (Salvadaleña, 2016). • Esophageal varices are also common in patients with peristomal varices (Kabir et al., 2014). 	<p>Prevention</p> <ul style="list-style-type: none"> • Varices cannot be prevented by proper fitting of the pouching system (Stelton et al., 2015). However, recognition of the condition is vital to adjust the pouching system and techniques for application/removal of the pouching system to prevent trauma to the varices, which could precipitate bleeding (Stelton et al., 2015). • To reduce the risk of bleeding from trauma and pressure on the stoma and peristomal area: <ul style="list-style-type: none"> ○ Remove the pouching system gently and less frequently to avoid trauma (Beitz & Colwell, 2014; Stelton et al., 2015). ○ Ensure proper fit of the pouching system to protect the skin (Stelton et al., 2015). ○ Avoid skin barriers with an aggressive seal (Erwin-Toth et al., 2010), convex products, and belts (Salvadaleña, 2016). ○ Consider using the following: a skin sealant/barrier film to protect the skin, a standard-wear skin barrier instead of an extended-wear skin barrier, and a one-piece pouching system (Salvadaleña, 2016).

Varices/Caput Medusae		
Description	Assessment	Nursing Intervention
Etiology/Contributive Factors	Assessment Parameters	Management
<ul style="list-style-type: none"> Varices develop from portal hypertension that is associated with liver cirrhosis, which is often alcohol-related, or with primary sclerosing cholangitis (Dell’Era, Iannuzzi, & de Franchis, 2015; Kabir, Kabir, Pillai, & Chakrabarti, 2014; Pennick & Artioukh, 2013; Sarin & Kumar, 2012). Creation of an abdominal stoma provides the anatomical location for an abnormal communication to develop between the high pressure portal system (via the mesenteric vessels) and the relatively low pressure in the systemic circulation involving the veins in the abdominal wall (Pennick & Artioukh, 2013). 	<ul style="list-style-type: none"> Obtain a thorough history and physical examination, inspect the peristomal skin for integrity, examine the pattern and distribution of the varices, and assess for pain, bleeding, and erosions. Assess the pouching system: fit, frequency of change, and patient/caregiver’s technique for application/removal of the pouching system, skin cleansing, undermining/leakage, etc. Refer for Doppler ultrasound, angiography/venography, and computerized tomography to confirm the diagnosis and guide ablation procedures, as indicated (Kabir et al., 2014; Pennick & Artioukh, 2013; Sarin & Kumar, 2012; Teo, Sabri, Turba, Saad, & Angle, 2011; Tsynman et al., 2014). 	<ul style="list-style-type: none"> Initiate immediate local measures to control the bleeding: <ul style="list-style-type: none"> Apply firm pressure (Erwin-Toth et al., 2010; Pennick & Artioukh, 2013; Stelton et al., 2015). Use hemostatic agents: gelfoam, silver nitrate cauterization (may require order/prescription from the primary healthcare provider), and epinephrine soaked gauze (Beitz & Colwell, 2014; Erwin-Toth et al., 2010; Kabir et al., 2014; Stelton et al., 2015; WOCN, 2010). Apply cool packs for minor bleeding (Stelton et al., 2015; Szymanski et al., 2010). Refer for additional treatment if local measures are insufficient: <ul style="list-style-type: none"> Injection sclerotherapy (Sarin & Kumar, 2012; WOCN, 2010). Glue embolization (Dell’Era et al., 2015; Naidu et al., 2010; Sarin & Kumar, 2012). Suture ligation (Dell’Era et al., 2015; Kabir et al., 2014; Pabon-Ramos et al., 2013; Pennick & Artioukh, 2013). Vasoactive drugs in combination with endoscopic therapy to enhance control of hemorrhage (Dell’Era et al., 2015; Sarin & Kumar, 2012). Antibiotic prophylaxis (Dell’Era et al., 2015; Sarin & Kumar, 2012). Blood volume restitution with crystalloids and packed red cells to achieve hemoglobin level 7 to 8 g/dL (Dell’Era et al., 2015; Sarin & Kumar, 2012). Minimally invasive interventional radiological techniques: <ul style="list-style-type: none"> Transjugular intrahepatic portosystemic shunt/TIPS (Pennick & Artioukh, 2013; Salvadalena, 2016; WOCN, 2010). TIPS has a high rate of success in preventing recurrent hemorrhage, reducing the risk of re-bleeding by 75.8% (Pennick & Artioukh, 2013). TIPS is preferred for patients who are not surgical candidates (Kabir et al., 2014). TIPS is contraindicated in patients with metastatic liver disease, heart failure, valvular heart disease, and pulmonary hypertension (Kabir et al., 2014; Pennick & Artioukh, 2013).

Varices/Caput Medusae		
Description	Assessment	Nursing Intervention
		<ul style="list-style-type: none"> - Percutaneous peristomal embolization (Kabir et al., 2014; Naidu et al., 2010; Pabon-Ramos et al., 2013). - Percutaneous transhepatic embolization (Kabir et al., 2014; Naidu et al., 2010; Sarin & Kumar, 2012). - Balloon occluded retrograde trans-venous obliteration (Kabir et al., 2014; Naidu et al., 2010; Pabon-Ramos et al., 2013; Sarin & Kumar, 2012; Teo et al., 2011). • If other measures fail, refer for surgical interventions. <ul style="list-style-type: none"> ◦ Surgical portosystemic shunts may be considered, recognizing that surgical risks are high in patients with cirrhosis and portal hypertension (Naidu et al., 2010; Pennick & Artioukh, 2011; Sarin & Kumar, 2012). ◦ A liver transplant is the gold standard treatment of the underlying disease (Beitz & Colwell, 2014; Pennick & Artioukh, 2013). ◦ Stoma relocation is <u>not</u> recommended as varices will develop at the new site in almost all cases, unless the underlying liver disease is treated (Erwin-Toth et al., 2010; Kabir et al., 2014; Pennick & Artioukh, 2013).
		Patient/Caregiver Education
		<ul style="list-style-type: none"> • Teach the patient/caregiver: <ul style="list-style-type: none"> ◦ To remove the pouching system gently and less frequently to avoid trauma (Beitz & Colwell, 2014; Stelton et al., 2015). ◦ Technique for gentle skin cleansing, and how to apply pressure, hemostatic dressings, etc., if bleeding occurs (WOCN, 2010). ◦ Uncontrolled bleeding requires immediate medical/surgical attention (Szymanski et al., 2010).

Granulomas/Hypergranulation		
Description	Assessment	Nursing Intervention
Definition (Figures 9, 10)	Identifying Characteristics	Prevention
<ul style="list-style-type: none"> • A granuloma is a mass of hypergranulation tissue that forms due to inflammation when the immune system reacts to/or attempts to contain foreign substances such 	<ul style="list-style-type: none"> • Granulomas are friable, tender papules, or nodules that bleed easily; occur primarily at the mucocutaneous junction; but may also occur on the stoma (Dukes et al., 2010; Johnson, 2010; WOCN, 2010). 	<ul style="list-style-type: none"> • Decrease friction and trauma to prevent bleeding (Johnson, 2010): <ul style="list-style-type: none"> ◦ Ensure proper fit of the pouching system; resize the stomal opening for the pouching system as needed.

Granulomas/Hypergranulation		
Description	Assessment	Nursing Intervention
<p>as suture material (Beitz & Colwell, 2014; Johnson, 2010; Salvadalena, 2016; WOCN, 2010).</p>	<ul style="list-style-type: none"> • Suture granulomas appear as small, round, red, friable lesions at the skin-stoma base in areas of retained or reactive suture material (Beitz & Colwell, 2014; WOCN, 2010). • Moisture from the lesions may impair adhesion of the pouching system (Johnson, 2010; Salvadalena, 2016). 	<ul style="list-style-type: none"> ◦ Apply stoma barrier paste to the mucocutaneous junction. ◦ Avoid tight fitting clothing/belts over the peristomal/stomal area.
Etiology/Contributive Factors	Assessment Parameters	Management
<ul style="list-style-type: none"> • The definitive cause of granulomas is often unknown (Johnson, 2010). • Causative/contributive factors associated with formation of granulomas include: <ul style="list-style-type: none"> ◦ Sutures: retained fragments or reaction to suture material (Beitz & Colwell, 2014; Johnson, 2010; WOCN, 2010). ◦ Repeated trauma from the stomal opening in the pouching system and/or technique in application/removal of the pouching system (Dukes, Lowther, Martin, & Osborne, 2010; Johnson, 2010). ◦ Chronic irritation from exposure to fecal effluent (Burch, 2014; Dukes et al., 2010; Johnson, 2010; Lyon & Beck, 2012). ◦ Tight clothing or belts that create friction on the mucocutaneous/stomal area (Johnson, 2010). ◦ Allergic reaction to pouch material (Dukes et al., 2010). ◦ Some granulomas may result from seeding of mucosa at the time of surgery, active Crohn’s disease, or recurrent cancer; but most are due to other causes such as persistent irritation from feces (Dukes et al., 2010; Johnson, 2010; Lyon & Beck, 2012). See the next section for more information about Mucosal Transplantation/Seeding. 	<ul style="list-style-type: none"> • Obtain a history and physical examination. Check for a history of /or indications of other underlying conditions that might lead to granulomas such as Crohn’s disease (Dukes et al., 2010; Johnson, 2010). <ul style="list-style-type: none"> ◦ Examine the granulomas for pain and active bleeding (Dukes et al., 2010). ◦ Assess for presence of any foreign substance such as retained suture material that can be visualized and removed. • Refer to an appropriate healthcare provider for a biopsy to rule out malignancy (Dukes et al., 2010; Johnson, 2010; Lyon & Beck, 2012). • Assess the fit of the pouching system, use of accessory products, leakage or undermining, and the patient/caregiver’s technique for changing the pouching system to help identify the source of trauma (Dukes et al., 2010; Johnson, 2010). 	<ul style="list-style-type: none"> • Asymptomatic lesions may not require treatment (Lyon & Beck, 2012). • Consider treatment options for lesions that are painful, bleeding, and/or interfere with adhesion of the pouching system, which may include: <ul style="list-style-type: none"> ◦ Cauterization with silver nitrate (may require an order/prescription from a primary healthcare provider) one to three times a week for 4 weeks (Beitz & Colwell, 2014; Dukes et al., 2010; Johnson, 2010). ◦ Referral to a qualified healthcare provider for: <ul style="list-style-type: none"> - Electric cauterization to remove the excess tissue (Beitz & Colwell, 2014; Lyon & Beck, 2012). - Cryotherapy using liquid nitrogen spray (Dukes et al., 2010; Lyon & Beck, 2012). - Laser ablation (Lyon & Beck, 2012). - Surgical removal of visible suture material (Beitz & Colwell, 2014; WOCN, 2010), and/or excision of large or multiple granulomas that persist after conservative interventions (Johnson, 2010; Lyon & Beck, 2012). • If the area covered with lesions is large with excessive moisture, consider use of a foam dressing with a convex skin barrier to provide gentle pressure to the area, which might decrease the growth of new lesions (Salvadalena, 2016).

Granulomas/Hypergranulation		
Description	Assessment	Nursing Intervention
		Patient/Caregiver Education <ul style="list-style-type: none"> • Teach the patient/caregiver: <ul style="list-style-type: none"> ○ To check the size of the stomal opening/fit of the pouching system with each change, and adjust the size as needed to eliminate irritation/friction (Johnson, 2010). ○ Proper techniques for gentle skin cleansing, application/removal of the pouching system, and use of accessory products such as skin barrier powder, and/or no- stinging skin sealant/ barrier film to protect the skin during healing (Salvadalena, 2016). ○ To monitor the skin/stoma for changes, and notify the ostomy care nurse and/or primary healthcare provider of problems. • Advise to discuss treatment options with the primary healthcare provider.

Mucosal Transplantation/Seeding		
Description	Assessment	Nursing Intervention
Definition	Identifying Characteristics	Prevention
<ul style="list-style-type: none"> • Mucosal transplantation (also known as seeding) occurs when intestinal mucosa is transplanted to the peristomal skin during the formation of the stoma (Erwin-Toth et al., 2010; Ratliff, 2014; WOCN, 2010). 	<ul style="list-style-type: none"> • The transplanted tissues appears as small patches of moist, red mucosal tissue scattered on the peristomal area (Erwin-Toth et al., 2010), which may result in friable intestinal mucosa with persistent mucus secretion (Ratliff, 2014). • Patients may have a burning sensation when the mucosa comes in contact with adhesive ostomy products (Ratliff, 2014). • The excessively moist tissue may interfere with adhesion of the pouching system (WOCN, 2010). 	<ul style="list-style-type: none"> • Transplantation of the bowel tissue can be avoided by suturing the bowel mucosa to the subcuticular layer of the skin (Erwin-Toth et al., 2010).
Etiology/Contributive Factors	Assessment Parameters	Management
<ul style="list-style-type: none"> • Mucosal transplantation occurs when the bowel is sutured to the epidermis instead of the dermis, and seeds the intestinal mucosal tissue on to the peristomal skin (Beitz & Colwell, 2014; Erwin-Toth et al., 2010; Ratliff, 2014). 	<ul style="list-style-type: none"> • Examine the skin and stoma for excess bleeding. • Assess the type, fit of the pouching system, technique for application/ removal, use of accessories, skin care and cleansing regimen, and undermining/leakage of the seal. • Rule out other factors such as underlying disease processes that might cause stomal bleeding. 	<ul style="list-style-type: none"> • Consider options for conservative treatment, including: <ul style="list-style-type: none"> ○ Absorptive, skin barrier powder to maintain an effective seal of the pouching system (Erwin-Toth et al., 2010; Ratliff, 2014). ○ Application of silver nitrate to cauterize the tissue, which may require an order/prescription from a primary healthcare provider (Beitz & Colwell, 2014; Erwin-Toth et al., 2010; WOCN, 2010). ○ Referral for electric cautery (Erwin-Toth et al., 2010).

Mucosal Transplantation/Seeding		
Description	Assessment	Nursing Intervention
		<ul style="list-style-type: none"> • Refit the pouching system as needed to ensure an effective seal; more frequent changes of the pouching system may be required. • If the stomal opening of the pouching system is enlarged to accommodate the lesions, protect the exposed skin with an appropriate skin barrier product (Erwin-Toth et al., 2010). • Refer for surgical excision of transplanted mucosa and/or relocation of the stoma if conservative measures are not effective (Beitz & Colwell, 2014).
		Patient/Caregiver Education
		<ul style="list-style-type: none"> • Teach the patient caregiver: <ul style="list-style-type: none"> ◦ Techniques for skin care, skin protection, and proper sizing/fitting of the pouching system to protect the skin. ◦ To monitor the skin/stoma for changes, and notify the ostomy care nurse and/or primary healthcare provider of problems. • Advise to discuss treatment options with the primary health care provider.

Peristomal Moisture-Associated Skin Damage (MASD)		
Description	Assessment	Nursing Intervention
Definition (Figure 11)	Identifying Characteristics	Prevention
<ul style="list-style-type: none"> • Peristomal MASD is inflammation and erosion/denudation of the skin that begins at the stoma/skin junction and can extend outward due to prolonged exposure to urine or stool (Colwell et al., 2011; Gray et al., 2011; Salvadalena, 2016). • MASD is an umbrella term for skin damage caused by prolonged exposure to various sources of moisture, including urine, stool, perspiration, and wound exudate (Gray et al., 2011, 2013). Peristomal MASD is a complication within the broad category of conditions known as MASD (Salvadalea, 2016). • Peristomal MASD has also been referred to as contact irritant dermatitis, irritant dermatitis, and peristomal dermatitis; and is reported to be the most common peristomal complication (Alvey & Beck, 2008; Burch, 2014; Gray et al, 2013; Salvadalena, 2016). 	<ul style="list-style-type: none"> • Skin damage is characterized by erythema (with or without denudation), serous exudate; might include edema, blisters, moist skin, or maceration (Gray et al., 2013). • Skin loss may be superficial, uniform or patchy; can be well-defined or irregular, corresponding to the area that is exposed to the stomal effluent (Salvadalea, 2016). • May be associated with a secondary fungal infection from Candida, which proliferates in moist environments (Colwell et al., 2011). • Area may be painful when touched or contacted by effluent (Salvadalea, 2016). • Peristomal MASD is often associated with difficulty in maintaining a seal of the pouching system due to the skin damage and moisture. 	<ul style="list-style-type: none"> • Optimal placement and creation of the stoma (Szymanski et al., 2010), and proper selection of a pouching system to achieve a reliable wear time and protect the skin are necessary to prevent skin complications (Colwell, 2011). • Select, size/fit an appropriate pouching system initially after surgery, and make adjustments as the stoma shrinks and the contour of the abdomen changes in the weeks after surgery (Gray et al., 2013; Stelton et al., 2015). • Use a skin sealant/barrier film to protect the skin (Burch, 2014; Salvadalena, 2016). • Avoid using soap to clean the skin, which can alter the pH (normally 4 to 6.5), and disturb the protective acid mantle of the skin (Stelton et al., 2015). <i>Note:</i> Routine use of antibacterial soaps and recent treatment with broad spectrum antibiotics can remove the normal skin flora leading to an overgrowth of fungus and peristomal irritation/rashes (Stelton et al., 2015).

Peristomal Moisture-Associated Skin Damage (MASD)		
Description	Assessment	Nursing Intervention
Etiology/Contributive Factors	Assessment Parameters	Management
<ul style="list-style-type: none"> Peristomal MASD is primarily caused by prolonged exposure to stool or urine occluded under the pouching system due to an inadequate seal between the peristomal skin and pouching system (Gray et al., 2011). The inadequate seal can be due to poor stoma construction or location, poor fit, poor technique, and/or an inappropriate pouching system (WOCN, 2010). Multiple contributive factors influence the nature and extent of the skin damage (Gray et al., 2011, 2013): <ul style="list-style-type: none"> The stomal opening in the skin barrier may be too large, exposing the skin to urine or stool (Burch, 2014). Pouching system: trauma from application/removal techniques (skin stripping); wear time beyond 7 days may increase risk of undermining/leakage resulting in skin damage. Type stoma/effluent: enzymatic nature and chemical irritants in the effluent (e.g., mucus and urine pH from a urostomy; pH/enzymes of effluent from large versus small intestine); and/or amount/consistency of fecal effluent. Exposure to ileostomy effluent is likely to cause skin damage more quickly than colostomy output. Time since surgery: Typically more problems occur in the early postoperative period versus the later postoperative period. Excess perspiration exposing skin to moisture. Body mass index: Obesity is associated with alterations in sweat production and the moisture barrier function of the skin, resulting in increased moisture on the skin. Failure of the seal in the pouching system exposing the skin to stool or urine (Colwell et al., 2011): <ul style="list-style-type: none"> External water sources (bathing, swimming) may loosen the seal of the pouching system and 	<ul style="list-style-type: none"> Examine the peristomal skin, stoma, and care and management of the pouching system (Colwell et al., 2011; Gray et al., 2013): <ul style="list-style-type: none"> Peristomal skin: color, erythema, integrity (i.e., edema, blisters, denudation, moist skin, maceration); pain or itching; shape, size and distribution of the skin damage; duration of the skin damage. Type pouching system: one or two piece; size, type, fit of the skin barrier; accessory products (e.g., skin barrier paste or powder, skin sealant/barrier film); frequency of change; undermining/leakage; and activities (e.g., exercise, swimming, sports). Patient/caregiver's skill/technique for application/removal of the pouching system, skin care, and cleansing. Abdominal contours: Assess for hernias; examine the patient standing, sitting, and lying to determine if skin folds/creases are present. Stoma: type, shape, location, length/protrusion, type/character of effluent, etc. Identify other factors that might contribute to leakage/undermining of the seal of the pouching system, such as mucocutaneous separation, granuloma, fistula, wounds, etc. (Gray et al., 2013). Determine the time since surgery, age, medications, other medical conditions, weight gain/loss, functional limitations, and lifestyle activities such as sports/recreational activities (Gray et al., 2013). 	<ul style="list-style-type: none"> Provide topical treatment for the damaged skin. <ul style="list-style-type: none"> Crusting technique: <ul style="list-style-type: none"> Each time the pouching system is changed, apply a small amount of skin barrier powder to the damaged skin to absorb moisture and provide protection until the skin is healed (Beitz & Colwell, 2014; Colwell et al., 2011; Gray et al., 2013; Stelton et al., 2015). Gently rub the powder on to the skin, and brush off the excess. Apply a no-sting skin sealant/barrier film over the powder and allow it to dry to "seal" the powder in place prior to application of the pouching system (Gray et al., 2013; Salvadalena, 2016). The technique can be repeated to make several layers of the "crust," if the skin is severely denuded and moist. The "crusting" technique can also be used with nystatin powder if a fungal infection is present. Check the manufacturer's guidelines to determine if the skin sealant/barrier film is compatible with other products (i.e., pouching system). Consider applying a hydrocolloid sheet dressing prior to applying the pouching system if the skin damage is large and/or highly exudative (Salvadalena, 2016). Consult the primary healthcare provider regarding use of a steroid spray to decrease inflammation in severe cases (Colwell et al., 2011; Gray et al., 2013). Modify the pouching system and/or use accessory products to prevent further damage (Colwell et al., 2011). <ul style="list-style-type: none"> Resize the stomal opening in the pouching system to protect the surrounding skin. If skin stripping occurs from frequent changes of a one-piece pouching system, consider using a two-piece system so the pouch can be changed without removing the skin barrier, and the skin barrier can remain in place for several days (Burch, 2014).

Peristomal Moisture-Associated Skin Damage (MASD)

Description	Assessment	Nursing Intervention
<p>necessitate frequent changes, which can result in mechanical stripping of the overhydrated skin.</p> <ul style="list-style-type: none"> ○ Exudate from eroded skin can cause the seal of the pouching system to detach allowing effluent to contact the skin causing further damage. ○ Occlusion can trap moisture under the pouching system and compromise the seal. ○ Creases/folds in the peristomal skin may result in undermining of the seal and leakage of effluent onto the skin (Burch, 2014). ● Age of the patient may increase the risk of skin damage due to thinner and more vulnerable skin in older patients (Colwell et al., 2011; Gray et al., 2013). 		<ul style="list-style-type: none"> ○ Use accessory products to enhance the seal: <ul style="list-style-type: none"> - An extended-wear skin barrier instead of a standard-wear barrier if there is a high volume of liquid effluent (Betiz & Colwell, 2014; Colwell et al., 2011; Stelton et al., 2015). - A convex skin barrier if the stoma is flush or retracted below skin level, and/or skin creases/folds are interfering with the seal of the pouching system (Colwell et al., 2011). - Skin barrier paste or strips to fill/level skin creases/folds under the pouching system (Burch 2014).
		<p>Patient/Caregiver Education</p> <ul style="list-style-type: none"> ● Teach the patient/caregiver (Gray et al., 2013): <ul style="list-style-type: none"> ○ Proper technique for application/removal of the pouching system, frequency for routine changes, and how to empty the pouch. ○ How to measure and fit the size of the stomal opening in the pouching system; how to cut the stomal opening in cut-to-fit skin barriers. ○ The importance of measuring and resizing the opening in the pouching system on an ongoing basis, as the stoma typically changes in size/shape for 4 to 6 weeks postoperatively, and can be affected by changes in the contours of the abdomen due to weight gains or losses. ○ To inspect the pouching system each time it is removed to check for undermining/leakage; inspect the peristomal skin for irritation/damage; and report persistent damage, undermining, or leakage to the ostomy care nurse and/or primary healthcare provider. ○ Proper use of accessory supplies: Avoid oily products on the skin that interfere with adhesion of the pouching system. ○ Skin cleansing technique (gentle) and choice of products.

Peristomal Moisture-Associated Skin Damage (MASD)		
Description	Assessment	Nursing Intervention
		<ul style="list-style-type: none"> ○ Change a leaking pouching system as soon as possible versus reinforcing the seal and leaving the pouching system in place (Szymanski et al., 2010). ● Discuss activities that might weaken or loosen the seal of the pouching system such as wetting the skin barrier before application (except for Colly-Seels), prolonged immersion in water such as soaking in hot tubs or swimming, allowing the pouch to overfill, or wearing constrictive clothing over the pouch.

Chemical Skin Injury		
Description	Assessment	Nursing Intervention
Definition	Identifying Characteristics	Prevention
<ul style="list-style-type: none"> ● Chemical skin injury is a form of irritant contact dermatitis/eczema, which is a nonallergic reaction or inflammation of the skin caused by chemical compounds/topical products (Erwin-Toth, n.d.; Meisner & Balleby, 2008; WOCN, 2007). ● It can be an acute or chronic condition (Meisner & Balleby, 2008). 	<ul style="list-style-type: none"> ● Chemical skin injuries may present as well-defined areas of erythema and edema, and/or as erosions with loss of the epidermis that are moist and painful (Erwin-Toth, n.d.; WOCN, 2007). ● Papules or vesicles with pruritis may also develop (WOCN, 2007). 	<ul style="list-style-type: none"> ● Limit the use of chemical products on the skin (WOCN, 2007). ● Avoid products that are known skin irritants; eliminate any unnecessary products (WOCN, 2007). ● Avoid soaps and antibacterial cleansers; use warm water to clean the peristomal skin (Woo et al., 2009).
Etiology/Contributive Factors	Assessment Parameters	Management
<ul style="list-style-type: none"> ● Common causative factors include exposure to soaps, abrasive agents, cleansers, solvents, and adhesives (Erwin-Toth et al., 2010; WOCN, 2007; Woo et al., 2009). ● Soaps and detergents can change the pH of the skin; detergents contain surfactants, which are irritants that can remove the protective layer of the skin and damage the skin barrier function causing the skin to be vulnerable to injury (Meisner & Balleby, 2008; Woo et al., 2009). 	<ul style="list-style-type: none"> ● Obtain a history and physical examination. <ul style="list-style-type: none"> ○ The diagnosis of a chemically induced irritant skin injury versus allergic contact dermatitis is often one of exclusion based on the patient's history, and/or patch testing, because the reactions can be similar in appearance (Meisner & Balleby, 2008). ○ Determine the characteristics, distribution, and onset of the skin reaction; and if there are any areas of dermatitis/eczema elsewhere on the body. ○ Identify if there is a history of known allergies or irritant reactions to topical products. ● Examine the pouching system for undermining/leakage to rule out peristomal MASD. 	<ul style="list-style-type: none"> ● Identify and remove the causative factor(s). ● Provide appropriate topical treatment to the denuded skin: <ul style="list-style-type: none"> ○ Apply skin barrier powder to the damaged skin to absorb moisture and provide protection. ○ Select appropriate dressings depending on the extent of skin damage and exudate. Nonadherent or absorptive dressings may be needed. ○ Topical steroids may be used if the irritation is unresolved in 1 to 2 weeks with other conservative measures (Meisner & Balleby, 2008) ● Refer to a dermatologist if the condition does not resolve in 4 weeks or worsens (Meisner & Balleby, 2008).

Chemical Skin Injury		
Description	Assessment	Nursing Intervention
<ul style="list-style-type: none"> Other causative factors include exposure to chemical compounds such as ether, alcohol, and perfumes (Meisner & Balleby, 2008). 	<ul style="list-style-type: none"> Determine if any new accessory or skin care products (e.g., soaps, detergents, etc.) have been introduced, or if changes were made in the pouching system that preceded the onset of the skin reaction (Meisner & Balleby, 2008). Assess the patient/caregiver's technique for application/removal of the pouching system, tape, or adhesive products; and skin care and cleansing to identify other potential causative/contributive factors such as skin stripping. 	
		Patient/Caregiver Education
		<ul style="list-style-type: none"> Teach the patient/caregiver: <ul style="list-style-type: none"> Proper technique for application/removal of the pouching system, skin care and cleansing (i.e., avoid soaps and detergents; clean skin with plain warm water). Regimen for topical treatment, dressings etc., until the skin is healed. Importance of avoiding products that are known irritants. To monitor the skin each time the pouching system is changed and report to the ostomy care nurse and/or primary healthcare provider if the condition does not improve or worsens.

Malignancy		
Description	Assessment	Nursing Intervention
Definition (Figure 12)	Identifying characteristics	Prevention
<ul style="list-style-type: none"> A malignancy is a term for diseases in which abnormal cells divide and proliferate without control and can invade nearby tissues (National Cancer Institute [NCI], n.d.): <ul style="list-style-type: none"> Carcinoma is malignancy that originates in the skin or in tissues that line or cover internal organs. Cutaneous cancer may present as the original lesion (i.e., primary cancer), or can result from spread of cancer cells from the primary lesion to other parts of the body (i.e., secondary cancer). 	<ul style="list-style-type: none"> Malignancy often presents as a polyp, nodule, lesion or wound in the peristomal area that does not heal with usual therapy (Salvadalea, 2016). <ul style="list-style-type: none"> Patients with adenocarcinomas have presented with peristomal ulceration and bleeding, and with areas that appeared similar to granulomas/excess granulation tissue (Al-Niami, et al., 2010; Wild et al., 2011). A patient with lymphoma presented with a persistent rash and skin irritation, stoma friability, and a peristomal mass that caused stenosis of the ileostomy (Chang et al., 2014). 	<ul style="list-style-type: none"> General prevention for cutaneous cancer: <ul style="list-style-type: none"> Avoid sun exposure and indoor tanning booths. Routinely use sunscreen with a high protection factor. Wear clothing to protect the skin from sun exposure.

Malignancy		
Description	Assessment	Nursing Intervention
<ul style="list-style-type: none"> • Metastatic carcinoma is the spread of malignant cells from the site of origin to another part of the body (NCI, 2013). • Peristomal malignancy is rare; cases reported in the literature include: <ul style="list-style-type: none"> ◦ Adenocarcinoma (Al-Niami & Lyon, 2010; Campana et al., 2013; Varma, 2011; Wild, Garner, & Skinner, 2011). ◦ Lymphoma (Chang et al., 2014). ◦ Squamous cell (Chang et al., 2014). ◦ Basal cell (Sewell & Marks, 2008). • Types of malignant lesions: <ul style="list-style-type: none"> ◦ Basal cell carcinoma (BCC): most common form of skin cancer; slow-growing; originates in the basal or deepest layer of the epidermis; metastasis rare; rarely fatal (Longo et al., 2013, Oakley, 2015a). ◦ Squamous cell carcinoma (SCC): originates in the squamous cells in the upper layer of the epidermis that make keratin; less common than BCC but more likely to metastasize; can be fatal (Longo et al., 2013, Oakley, 2015b). ◦ Malignant melanoma: most dangerous cutaneous malignancy; originates in melanocytes; high potential for metastasis (Longo et al., 2013, Oakley, 2015c). ◦ Adenocarcinoma: cancer that begins in glandular/secretory cells that line internal organs such as the colon, stomach, etc., which secrete mucus, digestive juice and other fluids (NCI, n.d.). ◦ Lymphoma: cancer that begins in cells of the immune system (NCI, n.d.). 	<ul style="list-style-type: none"> • BCC may appear as a shiny, pearly, and smooth papule or nodule with rolled edges; skin color may be normal, pink or pigmented; bleeding or ulceration may be present; dilated blood vessels (telangiectasia) may be visible; and some lesions may appear as scaly, irregular plaques (Longo et al., 2013, Oakley, 2015a). In a case reported by Sewell and Marks (2008), a peristomal BCC presented as an ulcerated, elevated plaque with a smooth, translucent, and rolled border. • SCC may present as erythematous, enlarging crusted or scaly papules, nodules, or plaques; which may ulcerate and are often tender or painful (Longo et al., 2013, Oakley, 2015b). Chang et al. (2014) described a patient with SCC who presented with a gray-tan lesion and chronic skin irritation in the peristomal area. • Malignant melanomas usually occur on sun exposed areas, but may occur anywhere on the body, including on the abdomen, and have the following characteristics (Longo et al., 2013; Oakley, 2015c): <ul style="list-style-type: none"> ◦ Asymmetry. ◦ Border irregularity. ◦ Color variation: Lesions may include a variety of colors including red, white, and blue; and/or brown, black, gray, or tan. ◦ Diameter enlarged: 6 mm or greater. • Metastatic carcinoma: If a patient's original surgery was for a carcinoma, a nonhealing lesion in the peristomal area adjacent to/or on the stoma may represent a metastatic lesion, a seeding of the tumor at surgery, or a possible residual tumor (Lyon & Smith, 2010). • Pain, exudate, and bleeding from tumors can interfere with the seal and management of the pouching system (Campana et al., 2013). 	
Etiology/Contributive Factors	Assessment Parameters	Management
<ul style="list-style-type: none"> • Most skin cancer is related to sun exposure. • Causes of BCC include DNA mutations triggered by exposure to ultraviolet radiation, or might be due to genetic, inherited factors (Longo et al., 	<ul style="list-style-type: none"> • Obtain a history and physical examination, including a history of previous/current cancers, treatments, and results of the therapy. • Determine the location, appearance, size, shape, color 	<ul style="list-style-type: none"> • Refer for treatment, which depends on the type of malignancy and stage of disease. <ul style="list-style-type: none"> ◦ BCC (Longo et al., 2013, Oakley, 2015a): <ul style="list-style-type: none"> - Surgical excision to remove lesion.

Malignancy		
Description	Assessment	Nursing Intervention
<p>2013, Oakley, 2015a). Contributive or predisposing factors for BCC include: fair skin; exposure to sun, sunburn, inorganic arsenic, or ionizing radiation; previous BCC, SCC or melanoma; older age; and male gender (Longo et al., 2013, Oakley, 2015a).</p> <ul style="list-style-type: none"> • SCC: DNA mutations are associated with more than 90% of SCC; human papillomaviruses may play a role in immune suppressed individuals (Oakley, 2015b). Contributive or predisposing factors for SCC include: fair complexion; chronic sun exposure; previous cutaneous injury or scars from burns or other disease; exposure to inorganic arsenic or ionizing radiation; actinic keratosis (a premalignant lesion); age; male gender; previous SCC, BCC or melanoma; smoking; and immune suppression (Longo et al., 2013; Oakley, 2015b). • Malignant melanoma is thought to be due to uncontrolled proliferation of melanocytes due to genetic transformation (Longo et al., 2013; Oakley, 2015c). Contributive or predisposing factors for melanoma include: sun exposure/sunburn; increasing age (> 24 years); personal or family history of melanoma; previous BCC or SCC; fair skin; poor tanning ability; and multiple, large nevi (Longo et al., 2013; Oakley, 2015c). 	<p>and onset of the lesion (s), pain, bleeding, etc. Maintain a high suspicion for hypergranulated or nonhealing, ulcerated areas that are on/or very near the stoma; and/or evidence of friable tissue with intermittent and/or persistent bleeding (Varma, 2011).</p> <ul style="list-style-type: none"> • Refer for biopsy any suspicious, persistent lesions that are unresponsive to therapy (Chang et al., 2014). 	<ul style="list-style-type: none"> - Cryotherapy might be used for small superficial lesions. - Locally advanced or metastatic disease may be treated using drug therapy such as with vismodegib, which is an inhibitor of the signaling pathway that is activated in BCC. ○ SCC: <ul style="list-style-type: none"> - Surgical excision and removal of wide margins of normal tissue; flap or skin graft might be needed to repair the defect; or - Cryotherapy for small thin, low-risk tumors; or - Radiotherapy for inoperable tumors, patients who are unsuitable for surgery, or as adjunctive therapy (Longo et al., 2013; Oakley, 2015b). - Relocation or reconstruction of the stoma may be necessary (Chang et al., 2014). ○ Malignant melanoma: <ul style="list-style-type: none"> - Surgical removal of the lesion and possible relocation of the stoma; extent of surgery depends on the thickness and site of the melanoma (Oakley, 2015c). - Metastatic melanoma may be treated with chemotherapy or immunotherapy (Longo et al., 2013; Oakley, 2015c). ○ Metastatic carcinoma: <ul style="list-style-type: none"> - Surgical removal of the lesion and possible relocation of the stoma; or - Electrochemotherapy (Campana et al., 2013; Salvadalena, 2016). ○ Re-evaluate the pouching system and skin care needs; refit as needed. ○ Provide appropriate wound care, as needed, based on the characteristics of the wound. ○ Provide appropriate pain management.

Malignancy		
Description	Assessment	Nursing Intervention
		Patient/Caregiver Education <ul style="list-style-type: none"> • Teach the patient/caregiver: <ul style="list-style-type: none"> ◦ To conduct routine skin examinations. ◦ To continue regular follow-up and surveillance by a healthcare provider (Oakley, 2015a, 2015b, 2015c). ◦ Measures to protect the skin and avoid sun exposure. ◦ Appropriate care and management of the pouching system, peristomal skin, and wound care as needed.

Peristomal Abscess		
Description	Assessment	Nursing Intervention
Definition (Figures 13, 14)	Identifying characteristics	Prevention
<ul style="list-style-type: none"> • A peristomal abscess is an enclosed, localized collection of purulent material beneath the skin near the stoma (Beitz & Colwell, 2007; Salvadalena, 2016). 	<ul style="list-style-type: none"> • An abscess usually appears as one or two areas of localized erythema that is raised, tender or painful, and may have systemic signs of infection (Erwin-Toth, n.d.; Salvadalena, 2016). 	<ul style="list-style-type: none"> • Prevention may not be possible, because many instances are due to underlying disease processes. • Early identification with prompt intervention is important to prevent additional complications.
Etiology/Contributive Factors	Assessment Parameters	Management
<ul style="list-style-type: none"> • The abscess is typically associated with a foreign body such as a suture fragment or disease process such as IBD, PG, or a fistula (Colwell & Beitz, 2007; Salvadalena, 2016). • Abscesses may occur more commonly in patients with active Crohn’s disease in the distal bowel (Erwin-Toth, n.d.). 	<ul style="list-style-type: none"> • Determine the onset, location, appearance, size, shape, color, and condition of the surrounding skin. • Examine/palpate the lesion and surrounding tissue for texture, consistency, warmth, and tenderness/pain. • Assess for signs/symptoms of systemic infection. • Examine the pouching system for undermining/leakage. 	<ul style="list-style-type: none"> • Refer the patient for definitive treatment, which may include the following interventions: <ul style="list-style-type: none"> ◦ Localized incision and drainage with culture and sensitivity (C & S) testing, and might include placement of a temporary drain (Salvadalena, 2016). ◦ Systemic antibiotic therapy (Salvadalena, 2016), as indicated by C & S results. ◦ Surgical consult for a wide surgical excision of the abscess, if the abscess cannot be completely drained with a localized procedure. • Provide appropriate local wound care with absorbent dressings such as a hydrogel, calcium alginate, hydrofiber, or hydrocolloid wafer (Erwin-Toth, n.d.). Nonadherent dressings may be needed. • Adjust the pouching system, frequency of changes, etc. to provide frequent access to observe the wound and change the dressings (Salvadalena, 2016). A nonadherent pouching system might be needed (Erwin-Toth, n.d.).

Peristomal Abscess		
Description	Assessment	Nursing Intervention
		Patient/Caregiver Education
		<ul style="list-style-type: none"> • Teach the patient/caregiver: <ul style="list-style-type: none"> ◦ Techniques for wound care and skin care, any modifications needed in the pouching system, and frequency of changing the system, etc. ◦ Signs/symptoms to report to the ostomy care nurse and/or primary healthcare provider.

Glossary

Denuded: Loss of epidermis; skin surface is moist and may bleed.

Nodule: A palpable, solid, round lesion more than 1 cm to 2 cm in diameter; may extend deeper into the dermis than a papule.

Papule: An elevated solid lesion less than 0.5 cm to 1 cm in diameter; color varies. Papules may merge together and form plaques.

Pathergy: A term used to describe the formation of an ulcer or lesion at a site of minimal trauma in an individual who is predisposed due to another disease process. Disorders that are subject to pathergy include psoriasis and pyoderma gangrenosum.

Plaque: A lesion that is slightly elevated from the skin, has a flattened surface, is larger than 1 cm, and may result from coalescence of papules.

Pouching system: A pouching system is comprised of two components: a flat or convex skin barrier (cut-to-fit or precut) that attaches to the skin, and a pouch (open or closed-end) that collects the effluent from the stoma. There are several types of pouching systems: adherent or non-adherent and one or two piece. In a one-piece system the skin barrier and pouch are manufactured as a single unit. In a two-piece system, the skin barrier and pouch are separate units, and the pouch can be removed while leaving the skin barrier in place.

Pustule: A superficial cavity in the skin that has well-defined edges; contains purulent fluid; varies in shape and size.

Scales: Small, visible flakes of skin.

Skin barrier film: Contains a polymer and plasticizer that form a breathable, clear coating on the skin; protects the skin from body fluids, adhesives, and friction; is alcohol free (no-sting product), noncytotoxic and hypoallergenic; can be used on intact or damaged skin.

Skin barrier powder: A hydrocolloid/pectin-based powder that is used to absorb moisture and protect the skin; can be used on denuded peristomal skin.

Skin sealant: A type of plasticizing agent that provides a thin protective film to the skin; acts as a moisture barrier; protects from ostomy effluent, incontinence, tape stripping and friction; available with or without alcohol (no-sting products), and as a wipe, spray, gel, liquid or roll-on product.

Vesicle (blister): A superficial, elevated lesion with well-defined edges; less than 1 cm in diameter and contains fluid.

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<http://dx.doi.org/10.1093/gastro/got013>

Appendix Peristomal Images



Figure 1. Allergic Contact Dermatitis (WOCN, n.d.). Reprinted with permission.



Figure 2. Folliculitis (WOCN, n.d.). Reprinted with permission.



Figure 3. Fungal Infection. Contributed by Ann Marie Nie. Reprinted with permission.

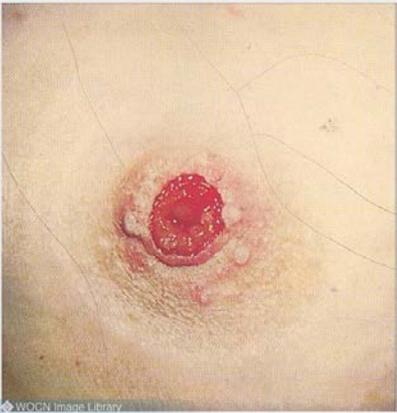


Figure 4. Pseudoverrucous Lesion/Hyperplasia (WOCN, n.d.). Reprinted with permission.



Figure 5. Pseudoverrucous Lesion/Hyperplasia. Contributed by Malou DeOcompo. Reprinted with permission.



Figure 6. Mechanical Trauma/Skin Stripping (WOCN, n.d.). Reprinted with permission.



Figure 7. Pyoderma Gangrenosum. Contributed by Sue Werchek. Reprinted with permission.



Figure 8. Peristomal Varices/Caput Medusae (WOCN, n.d.). Reprinted with permission.



Figure 9. Granulomas. Contributed by Jan Colwell. Reprinted with permission.



Figure 10. Granulomas. Contributed by Jan Colwell. Reprinted with permission.



Figure 11. Irritant Dermatitis (WOCN, n.d.). Reprinted with permission.



Figure 12. Malignancy. Contributed by Jan Colwell. Reprinted with permission.



Figure 13. Peristomal Abscess. Contributed by Jan Colwell. Reprinted with permission.



Figure 14. Peristomal Abscess. Contributed by Jan Colwell. Reprinted with permission.