Wound Care ADVISOR

Best *of the* Best 2014

Official journal of National Alliance of Wound Care and Ostomy®

PRACTICAL ISSUES IN WOUND, SKIN, AND OSTOMY MANAGEMENT

September/October 2014 • Volume 3 • Number 5
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Wound Care Advisor is written by skin and wound care experts and presented in a reader-friendly electronic format. Clinical content is peer reviewed.

The publication attempts to select authors who are knowledgeable in their fields; however, it does not warrant the expertise of any author, nor is it responsible for any statements made by any author. Certain statements about the use, dosage, efficacy, and characteristic of some drugs mentioned here reflect the opinions or investigational experience of the author. Any procedures, medications, or other courses of diagnosis or treatment discussed or suggested by authors should not be used by clinicians without evaluations of their patients' conditions and possible contraindications or danger in use, review of any applicable manufacturer's prescribing information, and comparison with the recommendations of other authorities.

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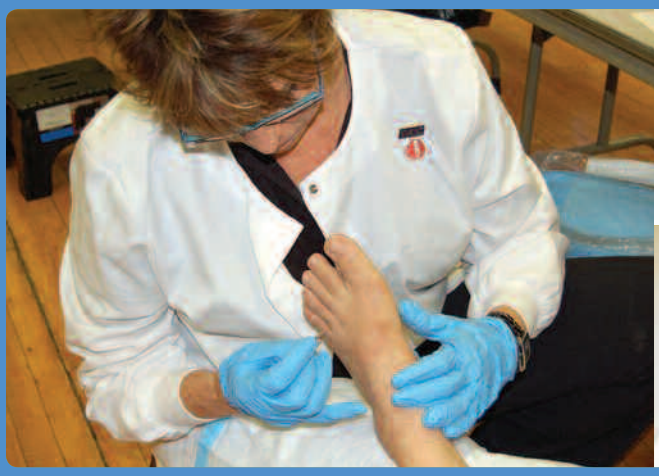

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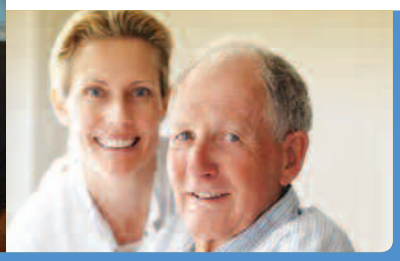

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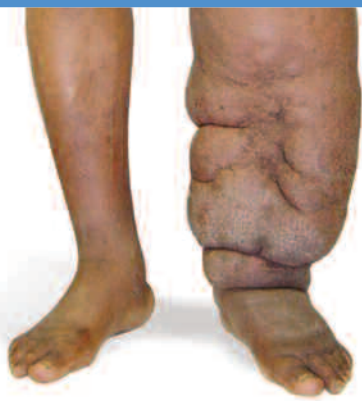

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DEPARTMENTS

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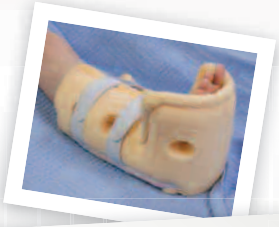

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From the EDITOR

Best of the best, the sequel

Welcome to our second annual "Best of the Best" issue of *Wound Care Advisor*, the official journal of the National Alliance of Wound Care and Ostomy (NAWCO). This may be the first time you have held *Wound Care Advisor* in your hands because normally we come to you via the Internet. Using a digital format for this peer-reviewed journal allows us to bring you practical information that you can access anytime, anywhere and gives you the ability to access videos and other links to valuable resources for you and your patients.

However, it's still nice sometimes to hold a print version of a journal, so last year we started our "Best of the Best" issue, which gives you a compendium of our most popular articles to create a resource you can turn to again and again.

If you are new to *Wound Care Advisor*, this is an opportunity for you to experience what you've been missing. If you are a regular reader, this print edition gives you the opportunity to revisit some of our best articles: We've chosen the ones readers have viewed most frequently online over the past 12 months.

Within these pages you'll find feature articles, best practices, step-by-step how-to's, clinical resources, and news. Along with wound-related topics, such as how dietary protein improves wound healing and managing venous stasis ulcers, you'll find a variety of other topics, ranging from safe use of negative-pressure wound therapy to understanding stoma complications. You'll also sharpen valuable skills you can apply in practice by reading articles on how to apply a spiral wrap, understanding the crusting procedure, how to assess wound exudate, and what you need to know about collagen wound dressings. And, you'll learn nonclinical skills that can make you a more effective clinician through a useful article on how to become a wound care diplomate.

Also included as part of this special edition is an exclusive directory of the *2014 Wild on Wounds Exhibitors Guide*. Wild on Wounds (aka WOW) is an annual, multidisciplinary national wound conference presented by the Wound Care Education Institute. The exhibitor guide features names, products, and contact information for many different manufacturers and companies that can offer solutions to assist in caring for your patients.

In keeping with our digital format, this compendium will also be available electronically at our website, **www.woundcareadvisor.com**, where you'll be able to download resources and access links to instructional and informational videos, clinical resources, and much more.

Thanks to our readers, *Wound Care Advisor* is already winging its way to its third anniversary. We appreciate your support and thank you for your passion for wound, ostomy, and skin care.

Donna Sardina

Donna Sardina, RN, MHA, WCC, CWCMS, DWC, OMS
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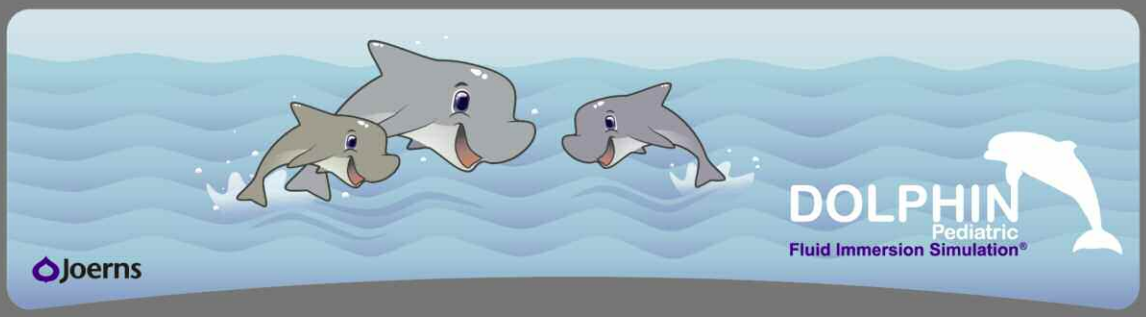

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Clinical NOTES

Wound photography may motivate patients

Having patients view photographs of their wounds can motivate them to become more involved in managing those wounds, according to a study in *International Wound Journal*, particularly when wounds are in difficult-to-see locations.

In the wound care clinic where the study took place, 86% of patients had difficult-to-see wounds and only 20% monitored their wounds for healing progress, relying instead on clinicians.

"**Patient perception of wound photography**[A]" notes that patients report a loss of autonomy when they can't view their wound, 81% said photographing the wound would help them track its progress, and 58% said photography would give them more involvement in their own care.

Lymphedema after surgery for endometrial cancer

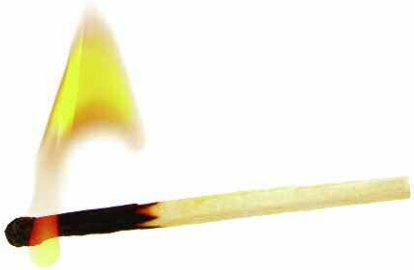
The risk of developing lower-extremity lymphedema is 23% for women with endometrial cancer who undergo lymphadenectomy compared with hysterectomy alone, with an overall prevalence of 47%, according to "**Lymphedema after surgery for endometrial cancer: Prevalence, risk factors, and quality of life**[B]."

The study in *Obstetrics and Gynecology*, which included 1,048 patients, also found that multiple quality-of-life scores were worse in women who developed lower-extremity lymphedema.

Diabetic sensorimotor neuropathy may explain GI complaints

A study in the *Journal of Diabetes and Its Complications* concludes that in patients with diabetes and sensorimotor neuropathy, there's "substantial evidence of concomitant cutaneous, cardiac and visceral autonomic neuropathies." The authors of the study add that diabetic sensorimotor neuropathy can reduce quality of life and may explain the higher prevalence of GI complaints.

"**Association between visceral, cardiac and sensorimotor polyneuropathies in diabetes mellitus**[C]" studied 20 patients with sensorimotor neuropathy and diabetes and 16 healthy control subjects.



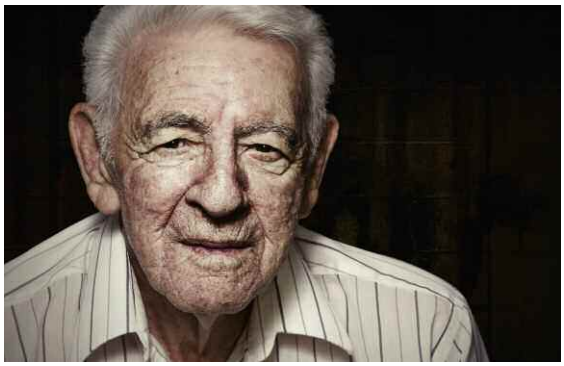
Growth factor therapy may improve healing time for partial-thickness burns

Topical application of growth factor (GF) therapy in patients with partial-thickness

burns reduces healing time compared with standard wound care alone, according to an analysis in *International Wound Journal*.

The authors of "**Growth factor therapy in patients with partial-thickness burns: A systematic review and meta-analysis[D]**" analyzed 13 studies comprising a total of 1,924 participants with 2,130 wounds to evaluate the effects of fibroblast growth factor (FGF), epidermal growth factor (EGF), and granulocyte macrophage-colony stimulating factor on partial-thickness burns. In addition to decreased healing time, scar improvement was noted with FGF and EGF.

Patients who received GFs had no significant increase in adverse events.



Factors associated with infection in patients with extremity lymphedema

"**Factors associated with reported infection and lymphedema symptoms among individuals with extremity lymphedema[E]**" found that the following factors are associated with infection: male gender, self-report of heaviness, and lower-extremity as opposed to upper-extremity involvement. Factors associated with symptoms include infection, lower knowledge level of self-care, and presence of secondary lower-extremity lymphedema.

Factors associated with both infection and symptoms include decreased annual household income and decreased self-care, according to the survey of 1,837 participants, which was published in *Rehabilitation Nursing*.

Fitzpatrick Skin Type Scale studied

"**The Fitzpatrick Skin Type Scale: A reliability and validity study in women undergoing radiation therapy for breast cancer[F]**," in the *Journal of Wound Care*, found that only the Sun Exposure subscale of the Fitzpatrick Skin Type Scale has good reliability and validity.

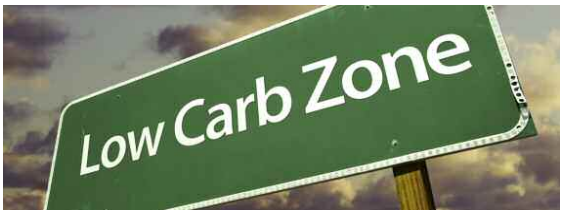
Analysis for other subscales, Genetic Disposition and Tanning Habits, found issues with both internal reliability and construct validity, yet the tool continues to be used in clinical practice.

Caffeine may hinder wound healing

A study in *International Wound Journal* reports that caffeine, which has antioxidant properties, restricts cell proliferation of keratinocytes and delays cell migration, which may inhibit wound healing and epithelialization. Both effects are dose dependent. The authors, who used primary human keratinocytes, HaCaT cell line, and

an ex vivo model of human skin for the study, noted that cell adhesion and differentiation weren't affected.

"**The effects of caffeine on wound healing**[G]" concludes that the findings "are more in support of a role for caffeine as adenosine-receptor antagonist that would negate the effect of adenosine in promoting wound healing."



Very low-carb, low saturated fat diet improves glycemic control and may reduce CVD risk in patients with diabetes

"**A very low carbohydrate, low saturated fat diet for type 2 diabetes management: A randomized trial**[H]," which compared this diet to a high–unrefined carbohydrate, low-fat diet, found that both diets resulted in "substantial" improvements for several clinical glycemic control and cardiovascular disease (CVD) risk markers, but the very low-carbohydrate diet resulted in greater benefit.

The authors of the study, which included 93 obese adults and was published in *Diabetes Care*, also reported that reductions in glycemic variability and antiglycemic medication requirements were greatest with the very low-carbohydrate diet. Both diets were hypocaloric.

Purse-string technique after ileostomy closure

"**Systematic review and meta-analysis of published randomized controlled trials comparing purse-string vs conventional linear closure of the wound following ileostomy (stoma) closure**[I]" concludes that purse-string closure is associated with a reduced risk of surgical-site infection without affecting duration of the operation and length of hospital stay.

The authors of the study in *Gastroenterology Report* analyzed three randomized, controlled trials for a total of 105 patients in the purse-string closure group and 101 patients in the conventional closure group.

Cost effectiveness of NPWT

"**Evaluation of wound care and health-care use costs in patients with diabetic foot ulcers treated with negative pressure wound therapy (NPWT) versus advanced moist wound therapy (AMWT)**[J]" found that NPWT was more cost effective than AMWT in patients with "recalcitrant" wounds that didn't close during a 12-week period.

The study, published in the *Journal of the American Podiatric Medical Association*, included 169 patients who received NPWT and 166 who received AMWT. The researchers concluded that the lower expenditures on procedures and use of healthcare resources accounted for the lower costs associated with NPWT. ■

Online Resources

A. http://onlinelibrary.wiley.com/doi/10.1111/iwj.12293/abstract

B. http://www.ncbi.nlm.nih.gov/pubmed/25004343

C. http://www.sciencedirect.com/science/article/pii/S1056872713002754

D. http://onlinelibrary.wiley.com/doi/10.1111/iwj.12313/abstract

E. http://www.ncbi.nlm.nih.gov/pubmed/25042377

F. http://www.journalofwoundcare.com/cgi-bin/go.pl/library/abstract.html?uid=105647

G. http://onlinelibrary.wiley.com/doi/10.1111/iwj.12327/abstract

H. http://care.diabetesjournals.org/content/early/2014/07/29/dc14-0845.abstract

I. http://www.ncbi.nlm.nih.gov/pubmed/25011379

J. http://www.ncbi.nlm.nih.gov/pubmed/24725034

Guidelines for safe negative-pressure wound therapy

Rule of thumb: Assess twice, dress once

By Ron Rock, MSN, RN, ACNS-BC

Since its introduction almost 20 years ago, negative-pressure wound therapy (NPWT) has become a leading technology in the care and management of acute, chronic, dehisced, traumatic wounds; pressure ulcers; diabetic ulcers; orthopedic trauma; skin flaps; and grafts. NPWT applies controlled suction to a wound using a suction pump that delivers intermittent, continuous, or variable negative pressure evenly through a wound filler (foam or gauze). Drainage tubing adheres to an occlusive transparent dressing; drainage is removed through the tubing into a collection canister. NWPT increases local vascularity and oxygenation of the wound bed and reduces edema by removing wound fluid, exudate, and bacteria.

Every day, countless healthcare providers apply NPWT devices during patient care. More than 25 FDA Class II approved NPWT devices are available commercially. If used safely in conjunction with a comprehensive wound treatment program, NPWT supports wound healing. But improper use may cause harm to patients. (See *Risk factors and contraindications for NPWT.*)

Lawsuits involving NPWT are increasing. The chance of error rises when inexperienced caregivers use NPWT. Simply applying an NPWT dressing without critically thinking your way through the process or understanding contraindications for and potential complications of NPWT may put your patients at risk and increase your exposure to litigation.

Proper patient selection, appropriate dressing material, correct device settings, frequent patient monitoring, and closely managed care help minimize risks. So before you flip the switch to initiate NPWT, read on to learn how you can use NPWT safely.

Understand the equipment and its use

Consult your facility's NPWT protocols, policies, and procedures. If your facility lacks these, consult the device manufacturer's guidelines and review NPWT indications, contraindications, and how to recognize and manage potential complications. Ideally, facilities should establish training programs to evaluate clinicians' skills. Enhanced training should include comprehension of training materials, troubleshoot-

Risk factors and contraindications for NPWT

Since 2007, the Food and Drug Administration (FDA) has received 12 reports of death and 174 reports of injury related directly to negative-pressure wound therapy (NPWT). The deaths occurred in patients' homes and long-term care facilities. The most serious complications were bleeding and infection. Patients taking anticoagulants and those who had vascular grafts or infected wounds were most at risk. In 32 of the injuries, dressings had adhered to tissue and foam was embedded or retained in the wound; most of these patients had to be readmitted for surgical removal of foam, management of dehisced wounds, and antibiotic therapy. Infection from the original wound or retained foam was reported in 27 additional injury cases.

These reports compelled the FDA in 2011 to recommend that clinicians use extreme care when prescribing NPWT. The agency stressed that clinicians should know that NPWT is contraindicated for specific wound types and should thoroughly consider all patient risk factors before prescribing it. Once NPWT has been applied, clinicians must assess and monitor the patient in an appropriate setting. Monitoring frequency depends on the patient's condition, wound status, wound location, and comorbidities. Most importantly, clinicians must be vigilant in checking for potentially life-threatening complications and be prepared to respond appropriately.

The Pennsylvania Patient Safety Authority reported 419 adverse events linked to NPWT between January 2008 and December 2009. Assessment and monitoring deficiencies accounted for nearly half; delayed or incorrect dressing application accounted for another 21%.

Contraindications

Contraindications for NPWT include:

- inadequately debrided wounds
- necrotic tissue with eschar
- untreated osteomyelitis
- cancer in the wound
- untreated coagulopathy
- nonenteric and unexplored fistulas
- exposed vital organs.

Patient risk factors

Factors that increase the risk of harm from NPWT include:

- increased risk for bleeding and hemorrhage
- anticoagulant or platelet aggregation inhibitor therapy
- friable or infected blood vessels
- spinal cord injury
- enteric fistulas.

View: FDA information on NPWT adverse events[A]

ing, and correct operation of the device, as shown by return demonstration of the specific NPWT device used in the facility.

Assess the patient thoroughly

The prescribing provider is responsible for ensuring patients are assessed thoroughly to confirm they're appropriate NPWT candidates. Aspects to consider include comorbidities, contraindicated wound types, high-risk conditions, bleeding disorders, nutritional status, medications that prolong bleeding, and relevant laboratory values. The pain management plan also should be evaluated and addressed.

Assess the order

Before NPWT begins, make sure you have a proper written order. The order should specify:

- wound filling material (foam or gauze dressing and any wound adjunct, such as a protective nonadherent, petrolatum, or silver dressing)
- negative pressure setting (from -20 to -200 mm Hg)
- therapy setting (continuous, intermittent, or variable)
- frequency of dressing changes.

Follow all parts of the order as prescribed. Otherwise, you may be held responsible if a complication arises—for example, if you apply a nonadherent dressing when none is ordered and this dressing becomes retained, requiring sur-

Assessing with DIM

To assess your patient's wound, use the acronym *DIM*—**D**ebridement, **I**nfection and **I**nflammation control, and **M**oisture balance.

Debridement. This procedure reestablishes a viable wound base with a functional extracellular matrix. Necrotic or devitalized tissue harbors bacteria and cells, which impede wound healing. It also prevents NPWT from being distributed equally across the wound bed, which reduces NPWT efficacy and prevents effective exudate removal. In wound beds with more than 20% nonviable tissue consider debridement (surgical, mechanical, enzymatic, chemical, or autolytic) before initial NPWT application. The debridement method will vary depending on the patient's condition.

Infection and inflammation control. Infection and inflammation delay wound healing. Antimicrobial (silver) dressings are effective in localized infections and inflamed wounds due to their anti-inflammatory effects. Wound debridement also reduces bacterial burden, including biofilm. NPWT then can remove surface wound fluid–containing contaminants.

Moisture balance. Moisture balance allows cells within the wound to function effectively. If the wound is too moist, wound edges may become macerated, turning white. On the other hand, too little moisture may inhibit cellular growth and promote eschar formation. NPWT helps preserve a moist environment and reduces edema, contributing to improved tissue perfusion. Incremental increases or decreases in negative pressure may be needed to ensure a moist wound environment.

gery for removal; or if you set a default pressure when none is ordered and the patient suffers severe bleeding or fistula formation as a result.

Assess the wound

If you know what your patient's wound needs, you can take proactive measures. What is the wound "telling" you? With adept assessment, you can become a "wound whisperer"—a clinician who understands wound-healing dynamics and can interpret what the wound is "saying." This allows you to see the wound as a whole rather than just maintaining it as a "hole."

- If the wound tells you it's too wet, take steps to absorb fluid or consider increasing negative pressure, as ordered.
- If it's telling you it's dry, consider decreasing negative pressure, as ordered. If the wound bed remains dry, you might want to take a NPWT "time out". Apply a moisture dressing for several days and assess the patient's hydration status before restarting NPWT.
- If the wound says it's moist, maintain the negative pressure.
- If it tells you it's infected, treat the infection.
- If it tells you it's dirty, debride it.
- If it says it's malnourished, feed it.

The DIM approach

To establish a baseline evaluation, develop a systematic approach for assessing the wound before NPWT. This will help optimize wound-bed preparation, enhance NPWT efficacy, and prevent delayed wound healing. (See *Assessing with DIM.*)

Take a time-out

Before you apply the NPWT dressing, be a **STAR—S**top, **T**hink, **A**ct, and **R**eview your action. This time-out allows you to critically think your way through the application process and consider potential consequences of your actions.

Ongoing patient assessment and monitoring

Follow these guidelines to help ensure safe and effective NPWT:

- Follow the device manufacturer's instructions and your facility's NPWT pro-

tocol, policy, and procedures.
- Identify and eliminate factors that can impede wound healing (poor nutritional status, limited oxygen supply, poor circulation, diabetes, smoking, obesity, foreign bodies, infection, and low blood counts).
- Evaluate the patient's nutritional status to ensure protein stores are adequate for healing.
- Assess and manage the patient's pain accordingly.
- Protect the periwound from direct contact with foam or gauze.
- Prevent stretching or pulling of the transparent drape to secure the seal and avoid shear trauma to surrounding tissue.
- Prevent stripping of fragile skin by minimizing shear forces from repetitive or forceful removal of transparent drapes.

Don't overpack the wound too tightly with foam. Compressing the foam prevents negative pressure from reaching the wound bed.

- Use protective barriers, such as multiple layers of nonadherent or petrolatum gauze, to protect sutured blood vessels or organs near areas being treated with NPWT.
- Don't overpack the wound too tightly with foam. Compressing the foam prevents negative pressure from reaching the wound bed, causing exudate to accumulate.
- Position drainage tubing to avoid bony prominences, skinfolds, creases, and weight-bearing surfaces. Otherwise, a drainage tubing related pressure wound may develop.
- Bridge posterior wounds to the lateral or anterior surface to minimize drainage tubing related pressure wounds to the surrounding tissue.
- Count and document all pieces of foam, gauze, or adjunctive materials on the outer dressing and in the medical record, to help prevent retention of materials in the wound.
- Ensure the foam is collapsed and the NPWT device is maintaining the prescribed therapy and pressure at the time of initial patient assessment and when rounding.
- Address and resolve alarm issues. If you can't resolve these issues and the device needs to be turned off, don't let it stay off more than 2 hours. While the device is off, apply a moist-to-dry dressing.
- With a heavily colonized or infected wound, consider changing the dressing every 12 to 24 hours.
- Monitor the patient frequently for signs and symptoms of complications.

Evaluate patient comprehension of teaching

A proactive approach to education can ease the patient's anxiety about NPWT. Unfamiliar sounds and alarms may heighten anxiety and cause unwarranted concerns, so inform patients in advance that the device may make noise and cause some discomfort. An educated and empowered patient can participate actively in treatment. Improved communication may enhance outcomes and help identify errors in technique before they cause complications.

Be prepared to answer patients' questions, which may include:
- Am I using the device correctly?
- How long will I have to use it?
- What serious complications could occur?
- What should I do if a complication oc-

curs? Whom should I contact?
- How do I recognize bleeding?
- How do I recognize a serious infection?
- How do I tell if the wound's condition is worsening?
- Do I need to stop taking aspirin or other medicines that affect my bleeding system or platelet function? What are the possible risks of stopping or avoiding these medicines?
- Can you give me written patient instructions or tell me where I can find them?

View: Patient Education[B]

Be a STAR

To avoid patient harm and potential litigation, be a STAR and a wound whisperer. If you're in doubt about potential complications of NPWT or how to assess and monitor patients, stop the therapy and seek expert guidance. "Listen" to the wound and assess your patient. This may take a little time, but remember—monitoring NPWT, the wound, and the patient is an ongoing process. You can't rush it. Sometimes, to go fast, you need to go slowly.

Access more information about **NPWT[C]**. ■

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How to apply a spiral wrap

By Nancy Morgan, RN, BSN, MBA, WOC, WCC, DWC, OMS

Each issue, *Apple Bites* brings you a tool you can apply in your daily practice.

Description

The spiral wrap is a technique used for applying compression bandaging.

Procedure

Here's how to apply a spiral wrap to the lower leg. Please note that commercial compression wraps come with specific instructions for proper bandaging technique. Be sure to follow these instructions to provide safe and effective compression.

1. With the foot flexed at 90 degrees, start the bandage at the center of the ball of the foot, with the lower edge of the bandage at the base of the toes.
2. Wrap either laterally or medially, using two turns around the foot to anchor the bandage.
3. Once the bandage is secure, take it across the foot towards the heel. Keep the bandage low on the heel, just taking in a small area of the sole of the foot.
4. Complete the turn around the heel, coming back towards the foot.
5. Enclose the foot, sealing the gap at the base of the heel.
6. Bring the bandage across the top of the foot to the ankle.
7. Complete the turn around the ankle.
8. Stretch the bandage to 50% capacity and wrap up the leg in a circular fashion, with each turn overlapping the previous layer by 50%.
9. Avoid wrinkles and creases in the bandage as this may cause skin breakdown and uneven compression pressures.
10. Finish 1 inch below the knee.
11. Upon reaching the knee, cut off any excess bandage and secure the bandage with tape. *Note:* **Do not** wrap down the leg with any remaining bandage as this would result in a tourniquet effect, pushing the blood flow back toward the foot instead of toward the heart.
12. If another application of the wrap is desired, cut the bandage and begin reapplying from the base of the toes, moving up the leg as before. ■

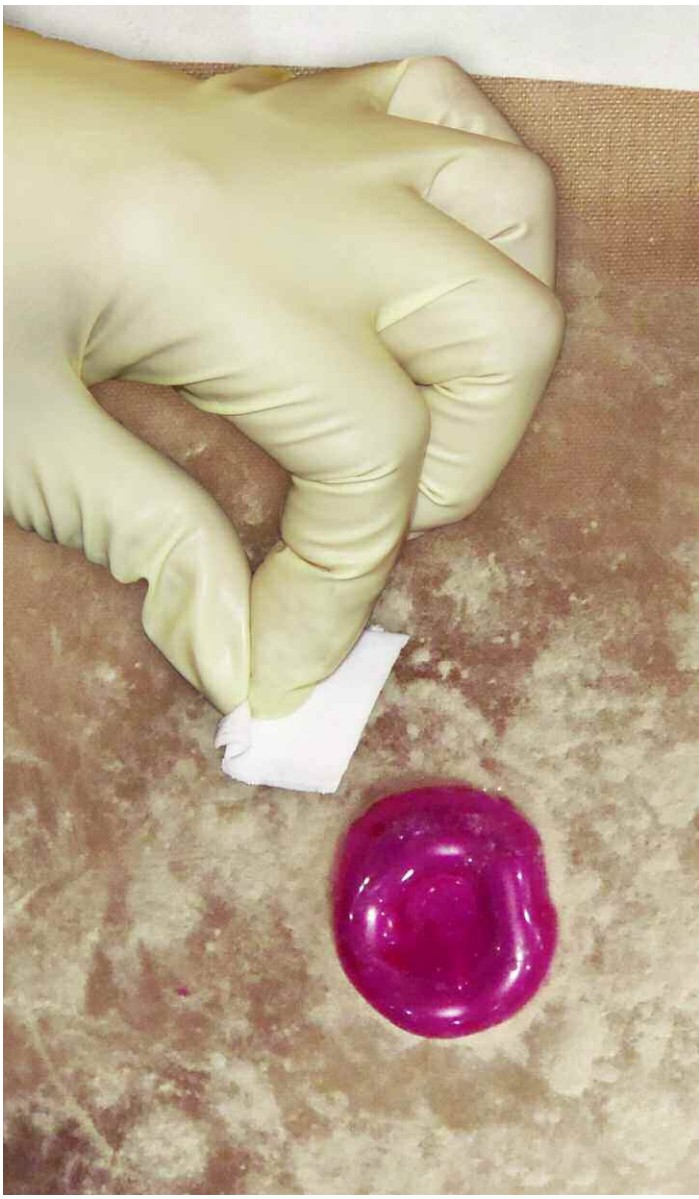
View: Spiral wrap application[A]

Online resource

A. http://www.youtube.com/watch?v=fTsrol9u1H8

Understanding the crusting procedure

By Nancy Morgan, RN, BSN, MBA, WOC, WCC, DWC, OMS



The crusting procedure produces a dry surface and absorbs moisture from broken skin through an artificial scab that's created by using skin barrier powder (stoma powder) and liquid polymer skin barrier. The crusting procedure is most frequently used on denuded peristomal skin to create a dry surface for adherence of an ostomy pouching system while protecting the peristomal skin from effluent and adhesives. Crusting can increase pouching-system wear time, resulting in fewer pouch changes and less disruption to irritated peristomal skin. The crusting procedure can also be used for other denuded partial-thickness weeping wounds caused by moisture.

Here's an overview of the procedure.

Indications

- Denuded or weeping peristomal skin
- Need for absorption of moisture from broken skin around the stoma

Contraindications

- Allergy to products used to create the artificial scab
- Not indicated for prevention of skin problems

Equipment

- Skin barrier powder (antifungal powder may be substituted)
- Alcohol-free polymer skin barrier wipes or spray
- Clean 4" × 4" gauze pads or tissue for dusting excess powder

Steps

1. Clean the peristomal skin with water (avoid soap) and pat the area dry.
2. Sprinkle skin barrier powder onto the denuded skin.
3. Allow the powder to adhere to the moist skin.

4 Dust excess powder from the skin using a gauze pad or soft tissue. The powder should stick only to the raw area and should be removed from dry, intact skin.

5 Using a blotting or dabbing motion, apply the polymer skin barrier over the powdered area, or lightly spray the area if you're using a polymer skin barrier spray.

6 Allow the area to dry for a few seconds; a whitish crust will appear. You can test for dryness of the crust by gently brushing your finger over it; it should feel rough but dry.

7 Repeat steps 2 through 6 two to four times to achieve a crust.

8 You may apply a pouching system over the crusted area.

9 Stop using the crusting procedure when the skin has healed and is no longer moist to the touch.

10 Watch a **video**[A] of the crusting procedure.

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Online resource

A. https://www.youtube.com/watch?v=v83hWZDMpgE

Nancy Morgan, cofounder of the Wound Care Education Institute, combines her expertise as a Certified Wound Care Nurse with an extensive background in wound care education and program development as a nurse entrepreneur.

The DIME approach to peristomal skin care

By Catherine R. Ratliff, PhD, APRN-BC, CWOCN, CFCN

It's estimated that about 70% of the 1 million ostomates in the United States and Canada will experience or have experienced stomal or peristomal complications. Peristomal complications are more common, although stomal complications (for example, retraction, stenosis, and mucocutaneous separation) can often contribute to peristomal problems by making it difficult to obtain a secure pouch seal. This article will help you differentiate types of peristomal complications, including how to prevent and manage them.

The basics

Peristomal (or *parastomal*) is the term used to describe the skin around a stoma. In the immediate postoperative period, the peristomal skin may be ecchymotic or erythematous as a result of trauma from the surgical creation of the stoma. However, after this immediate postoperative period, the peristomal skin should be free from erythema, ulcerations, blisters, or rashes.

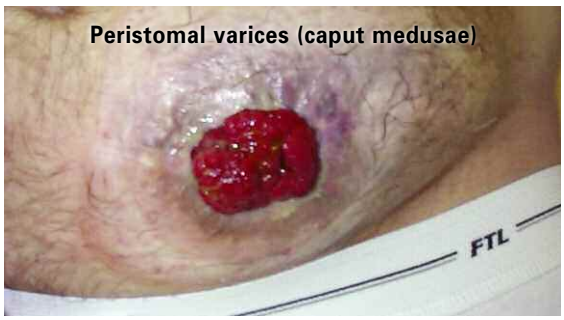
To more easily remember and educate others on the types of peristomal complications, you can divide them into four basic categories using the mnemonic **DIME**. **D** is disease-related complications, **I** is infection-related complications, **M** is mechanical-related complications, and **E** is exposure of the peristomal skin to effluent or chemical preparations. Here's a closer look at each category.

D: Disease-related complications

Disease-related peristomal complications include peristomal varices, pyoderma gangrenosum, and mucosal transplantation. *Peristomal varices* (caput medusae) are dilated veins due to portal hypertension that occur at the mucocutaneous junction on the peristomal skin. The peristomal skin appears as a purplish blue discoloration and, as the name "caput medusae" suggests, the dilated veins are similar in appearance to the snake-haired Medusa in Greek mythology. Peristomal varices are frequently associated with sclerosing cholangitis, liver cancer, and cirrhosis.

Gentle pouch removal and peristomal skin care are important since pulling and rubbing can increase the risk of traumatizing the skin, with resultant bleeding. Two-piece systems are generally avoided since the flange can rub against the varices, increasing the chance of bleeding.

Assessment of peristomal bleeding followed by such management techniques as applying pressure and cauterizing bleeding areas with silver nitrate can help con-



Peristomal varices (caput medusae)

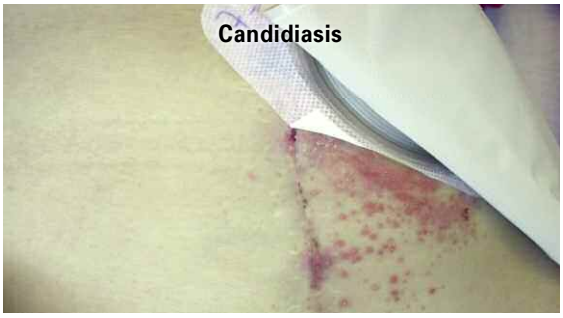
trol this peristomal complication; the mainstay of therapy is to treat the underlying systemic disease. Advise patients with portal hypertension that they are at increased risk for GI bleeding. If bleeding occurs, patients should use conservative measures, such as applying cold compresses and pressure to the peristomal area. If bleeding persists after pressure has been applied, patients should seek immediate medical attention.

Pyoderma gangrenosum (PG) is a rare inflammatory disease believed to start as one or more pustules that become indurated and form painful full-thickness ulcers on the peristomal skin. The ulcers may appear raised, with dusty red to purplish, irregularly shaped wound margins. Diseases associated with PG include ulcerative colitis and Crohn disease. Once the systemic disease improves, PG usually improves as well.

Peristomal management should include decreasing peristomal inflammation with topical preparations, such as steroids and absorptive powders and dressings, to avoid effluent coming in contact with PG peristomal ulcers.

Mucosal transplantation (also known as seeding) occurs when intestinal mucosa is transplanted to the peristomal skin during the formation of the stoma, usually by suturing the bowel to the epidermis instead of the dermis. Mucosal transformation may result in persistent mucus secretion and friable intestinal mucosa, and patients may experience a burning sensation when the mucosa comes in contact with some adhesive ostomy products. Conservative management includes the use of absorptive powders to maintain an effective pouch seal.

Other diseases that affect the peristomal skin include malignancy, herpes virus infections, psoriasis, and pemphigus.


Candidiasis

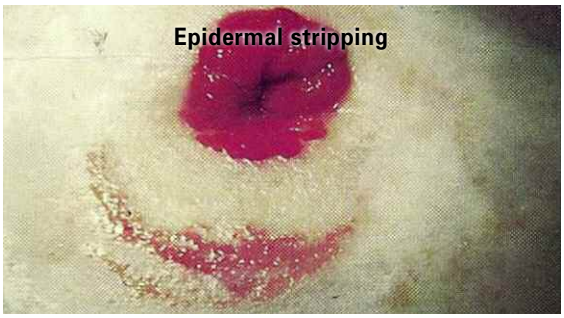
I: Infection-related complications

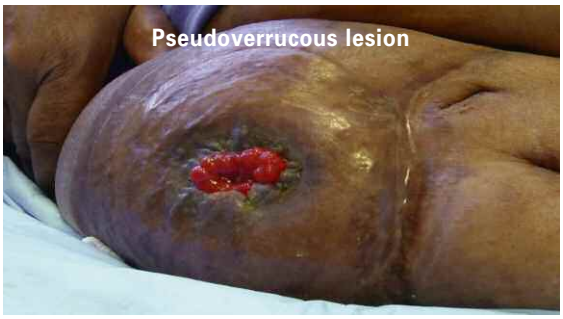
Infection-related peristomal complications include candidiasis and folliculitis. *Peristomal candidiasis* is an overgrowth of *Candida* organisms, with *Candida albicans* being the most common. Exposure to urine or fecal effluent provides a moist environment, which promotes the overgrowth of *Candida* organisms. The condition starts as pustules, which are abraded during pouch changes. Patients may complain of burning and itching. Treatment is aimed at keeping the peristomal skin dry and applying antifungal powder.

Folliculitis in the peristomal area is an inflammation of the hair follicles commonly due to shaving of the peristomal skin; it's usually caused by *Staphylococcus aureus*. Prevention is key and involves clipping rather than shaving the skin, using antibacterial soap to cleanse the peristomal skin, gently removing the pouch, and using adhesive pouch-removal products to decrease the pulling of peristomal skin hairs when the pouch is removed.

M: Mechanical-related complications

Mechanical peristomal injuries can be related to pressure, friction, and epidermal stripping caused by the pouching system





being too tight and rubbing against the peristomal skin. Other possible causes include traumatic removal of the pouch and too-aggressive cleansing of the peristomal skin during pouch changes. The peristomal skin may be erythematous or denuded or, in the case of pressure-related injuries, there may be a circumscribed ulcer.

Preventive measures include careful removal of the pouch, with gentle cleansing of the peristomal skin, or the use of a more flexible pouch if the pouching system rubs against the peristomal skin.

Once the injury has occurred, skin barrier powders may be applied over the denuded skin with a skin sealant. It's important to reevaluate the pouching system to prevent mechanical injury from recurring.

E: Exposure of the peristomal skin to effluent

Exposure to effluent on the peristomal skin such as from an ileostomy can cause the skin to become erythematous in less than an hour, with skin breakdown in several hours. Urine can also cause problems because of the irritating effects of alkaline urine containing ammonium phosphates. *Pseudoverrucous* wartlike lesions may appear around urostomies that are chronically exposed to urine effluent, leading to thickening of the epidermis.

Use of chemical preparations (such as cleansers, liquid skin barriers, soaps, and adhesives) can also break down the peristomal skin. This type of skin breakdown is referred to as an *irritant contact dermatitis*; for example, if the soap used to clean the peristomal skin hadn't been completely removed before the ostomy pouch was applied, the peristomal skin at the next pouch change may be erythematous due to the soap residue irritating the peristomal skin.

Some ostomates may develop an allergic *contact dermatitis* from hypersensitivity to certain chemicals in the ostomy products. Patch testing to determine which product

is causing the allergen, then discontinuing the product, usually resolves the allergic dermatitis.

Treatment of exposure problems is aimed at finding the cause of the problem and establishing a secure pouching system that protects the peristomal skin from contact with the effluent or chemical preparation.

Be proactive

Unfortunately, many ostomates will experience peristomal skin complications. To proactively treat the signs of peristomal skin complications, clinicians and patients must be able to recognize them. Accurately describing the peristomal skin complication is important to determining which treatment works best for the ostomate and benchmarking treatment interventions that can be applied globally. Mnemonics such as DIME will help ensure that complications are caught early and patients receive the treatment they need.

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It takes a village: Leading a wound team

By Jennifer Oakley, BS, RN, WCC, DWC, OMS

I used to think I could do it alone. I took the wound care certification course, passed the certification exam, and took all of my new knowledge—and my new WCC credential—back to the long-term care facility where I worked. I was ready to change the world.

It didn't take me long to figure out that I couldn't change the complex world of wound care alone. I needed a team of specialists who could manage my patient's troubles with nutrition, swallowing, activities of daily living, positioning, body image issues, and many other areas that required expertise I didn't have.

A team consists of a group of people who are working together toward a common goal. A team has members whose skills complement each other. A successful team maximizes individuals' strengths and establishes a strong sense of mutual commitment. That success begins with effective leaders. Here are tips that will help you become one of those effective leaders.

Recruit the right players for your team

As wound care clinicians, we must always treat the *whole* patient, not just the *hole* in the patient. Treating the patient holistically requires input from everyone on the healthcare team or, in essence, the "village." At a minimum, your village should include a certified wound care clinician, physical therapist, occupational therapist, dietician, nurse manager, nurse aide, social worker, speech language pathologist, minimum data set coordinator or utilization review specialist, the director of nursing for the facility, the patient's prescriber and, of course, the patient.

Understand leadership characteristics

Good leaders believe in themselves and are "authentic." Authentic leaders understand themselves and their strengths and weaknesses. They are honest, act with integrity, and can articulate the vision or goal of the team to its members. Effective leaders embrace the future and let go of the past; they understand that change

Take Action: Take a quiz to see how authentic a leader you are[A].

is an essential part of health care today. Leaders see possibilities, not just problems, and are able to communicate clearly.

Leaders depend on the goodwill of their team to get things done (rather than authority from the top down), use the word "We" instead of "I," ask for action, and say, "Lets go do this together." Leaders use their influence, supported by evidence-based practice, to change minds, shape opinions, and move others to act.

Remember that knowledge is power, so if you educate your team, amazing things will happen.

Whether you focus on preventing pressure ulcers, developing product formularies, or implementing ankle-brachial index testing, you'll find that combining a positive attitude with best practices and being authentic will help you lead the team in achieving its goals.

Keep the team motivated

Keeping your team motivated can be difficult. How do you inspire people every day? Most facilities don't have the budget for raises or bonuses; in reality, other ways are more effective for helping your team keep their workplace passion.

Here are some ideas to get you started. Offer positive praise for a job well done, say "thank you," give awards and certificates, catch members "doing the right thing" and post their pictures on bulletin boards, celebrate success with parties, or host a break-time brunch or pizza party lunch. The goal is to foster an environment that rewards positivity rather than one that focuses on negativity.

Remember that knowledge is power, so if you educate your team, amazing things will happen. Members will be able not only to identify when there is a problem but also solve that problem on their own without intervention from management, creating pride in a job well done.

We are social creatures, so get out from behind your desk and be "present" on the unit or in the clinic. Team members appreciate a leader who is visible and willing to answer questions.

Take time to get to know your staff and team members on a personal level, too. What we do for a living is much more than just a job for most of us. If you ask me to tell you about myself, I would start by saying, "I'm a wound care nurse"; many of us associate a large part of our identity with our careers. When you help your staff find camaraderie in teamwork and pride in the job they do, it's a win-win for all involved and promotes successful outcomes.

Plan how to manage conflict

As the leader, you will have to interact with all types of personalities on your team and maximize their strengths while minimizing their weakness. Keep in mind that few teams run smoothly all the time. Challenges the team might encounter in-

clude a lack of trust among members, passivity, lack of commitment or accountability, members who make excuses or cling to the past, negative attitudes, fear of conflict, and actual conflict.

You will need to address potential and actual conflicts to ensure the team's success. Two strategies are *compromising*, where each party gives in a little bit to meet in the middle, and *collaborating*, where each party works together to come up with a solution. These methods foster teamwork and better working relationships.

Whichever strategy you use, be sure you have all the facts, that everyone's emotions are in check, and that the timing is appropriate for discussing the conflict. Use effective communication, make eye contact, be sure your body language is "open," use "I feel" statements and open-ended questions, and thank each party when finished. Addressing—and solving—problems quickly will put your team back on track to the real problem at hand: healing those wounds!

Reap the benefits

An effective team leader chooses the right team members, understands leadership characteristics, encourages and motivates each team member, and addresses conflicts appropriately. If you accomplish all this, your reward will likely be better patient outcomes and personal satisfaction from working with your village of professionals. ■

Online resource

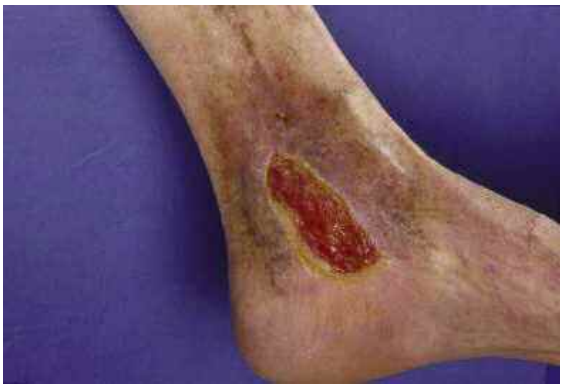
A. http://www.jblearning.com/samples/0763749761/ClarkAssessmentChecklist.pdf

Jennifer Oakley is a clinical instructor for the **Wound Care Education Institute** in Plainfield, Ill.

Managing venous stasis ulcers

Compression therapy, local wound care, dressings, antibiotics, surgery, and adjunctive methods play a role in management.

By Kulbir Dhillon, MSN, FNP, APNP, WCC



Venous disease, which encompasses all conditions caused by or related to diseased or abnormal veins, affects about 15% of adults. When mild, it rarely poses a problem, but as it worsens, it can become crippling and chronic.

Chronic venous disease often is overlooked by primary and cardiovascular care providers, who underestimate its magnitude and impact. Chronic venous insufficiency (CVI) causes hypertension in the venous system of the legs, leading to various pathologies that involve pain, swelling, edema, skin changes, stasis dermatitis, and ulcers. An estimated 1% of the U.S. population suffers from venous

stasis ulcers (VSUs). Causes of VSUs include inflammatory processes resulting in leukocyte activation, endothelial damage, platelet aggregation, and intracellular edema. Preventing VSUs is the most important aspect of CVI management.

Treatments for VSUs include compression therapy, local wound care (including debridement), dressings, topical or systemic antibiotics for infected wounds, other pharmacologic agents, surgery, and adjunctive therapy. Clinicians should be able to recognize early CVI manifestations and choose specific treatments based on disease severity and the patient's anatomic and pathophysiologic features. Management starts with a full history, physical examination, and risk-factor identification. Wound care clinicians should individualize therapy as appropriate to manage signs and symptoms.

Compression therapy

Treatment focuses on preventing new ulcers, controlling edema, and reducing venous hypertension through compression therapy. Compression therapy helps prevent reflux, decreases release of inflammatory cytokines, and reduces fluid leakage from capillaries, thereby controlling lower extremity edema and VSU recurrence. Goals of compression therapy are to reduce symptoms, prevent secondary complications, and slow disease progression.

In patients with severe cellulitis, compression therapy is delayed while infection is treated. Contraindications for compression therapy include heart failure, recent deep vein thrombosis (DVT), unstable medical status, and risk factors that can cause complications of compression therapy. Ultrasound screening should be done to rule out recent DVT. Arterial disease must be ruled out by measuring the ankle-brachial index (ABI). Compression is contraindicated if significant arterial disease is present, because this condition may cause necrosis or necessitate amputation.

High compression levels should be used only if the patient's ABI ranges from 0.6 to 1.0. With an ABI between 0.9 and 1.25, the patient likely can tolerate treatment with four-layer compression or a long-stretch compression wrap. For patients with an ABI between 0.75 and 0.9, use single-layer compression with cast padding and a Coban wrap in a spiral formation.

Keep in mind that use of a compression wrap depends on the patient's comfort level and degree of leg edema. In patients who have mixed venous and arterial insufficiency with an ABI between 0.5 and 0.8, monitor for complications of arterial disease. Don't apply sustained high levels of compression in patients

Comparing compression levels

Compression stockings should exert a pressure of at least 20 to 30 mm Hg at the ankle to be effective. Antiembolism stockings exert a pressure of 8 to 10 mm Hg at the ankle, making them inadequate and not recommended for treating venous insufficiency. Use of graduated compression stockings varies with patient factors, including signs and symptoms. For latex-sensitive patients, compression stockings without elastic are available.

Description of pressure	mm Hg (range)
Very light	7 to 15
Low	16 to 20
Moderate	20 to 30
High	30 and higher

Other drugs used to treat VSUs

Besides antibiotics, pharmacologic agents used to treat venous stasis ulcers (VSUs) include the following:

- *Pentoxifylline* is a useful adjunct to compression bandaging and may be effective even without compression. It works by reducing platelet aggregation and thrombus formation. The drug also can be used as monotherapy in patients who can't tolerate compression bandaging. However, it's not the preferred treatment for VSUs.
- *Calcium-channel blockers*, such as diltiazem, nifedipine, and verapamil, are particularly effective against large-vessel stiffness and venous hypertension.
- *Aspirin* combined with compression therapy speeds ulcer healing and reduces ulcer size, compared to compression therapy alone. Adding aspirin therapy to compression bandaging generally is recommended in patients with VSUs, unless contraindicated.
- *Dermatologic topical corticosteroids*, such as triamcinolone, fluocinolone, and betamethasone, may reduce erythema, inflammation, pruritus, and vesicle formation.

Be aware that oral zinc, a trace metal, has potential anti-inflammatory effects. But recent studies found it has no benefit in treating VSUs. Also, diuretics may be prescribed for patients with other medical conditions that exacerbate lower-extremity edema (such as heart failure).

with ABIs below 0.5. (See *Comparing compression levels*.)

Pneumatic compression

The benefits of intermittent pneumatic compression are less clear than those of standard continuous compression. Pneumatic compression generally is reserved for patients who can't tolerate continuous compression.

Local wound care

Wound debridement is essential in treating chronic VSUs. Removing necrotic tissue and bacterial burden through debridement enhances wound healing. Types of debridement include sharp (using a curette or scissors), enzymatic, mechanical, biologic (for instance, using larvae), and autolytic. Maintenance debridement helps stimulate conversion of a chronic static wound to an acute healing wound.

Dressings

Dressings are used under compression bandages to promote healing, control exudate, improve patient comfort, and prevent the wound from adhering to the bandage. Vacuum-assisted wound-closure therapy can be used with compression bandages.

A wide range of dressings are available, including:

- hydrofiber dressings
- acetic acid dressings
- silver-impregnated dressings, which have become more useful than topical silver sulfadiazine in treating VSUs
- calcium alginate dressings
- proteolytic enzyme agents
- synthetic occlusive dressings
- extracellular matrix dressing
- bioengineered skin substitutes. Several human-skin equivalents created from human epidermal keratinocytes, human dermal fibroblasts, and connective tissue proteins are available for VSU treatment. These grafts are applied in outpatient settings.

Antibiotics

Common in patients with VSUs, bacterial colonization and infection contribute to poor wound healing. Oral antibiotics are recommended only in cases of suspected

wound-bed infection and cellulitis. I.V. antibiotics are indicated for patients with one or more of the following signs and symptoms of infection:

- increased erythema of surrounding skin
- increased pain, local heat, tenderness, and leg swelling
- rapid increase in wound size
- lymphangitis
- fever.

Progressive signs and symptoms of infection associated with fever and other toxicity symptoms warrant broad-spectrum I.V. antibiotics. Suspected osteomyelitis requires an evaluation for arterial disease and consideration of oral or I.V. antibiotics to treat the underlying infection.

Other pharmacologic agents

A wide range of other drugs also can be used to treat VSUs. (See *Other drugs used to treat VSUs*.)

Surgery

Surgery can reduce venous reflux, hasten healing, and prevent ulcer recurrence. Surgical options for treatment of venous insufficiency include saphenous-vein ablation, interruption of perforating veins with subfascial endoscopic surgery, and treatment of iliac-vein obstruction with stenting and removal of incompetent superficial veins by phlebectomy, stripping, sclerotherapy, or laser therapy.

Patients should be evaluated early for possible surgery. An algorithm based on a review of literature indicates that patients whose wounds don't close at 4 weeks are unlikely to achieve complete wound healing and may benefit from surgery or other therapy.

To help determine if surgery may be warranted, assess venous reflux using duplex ultrasonography, which can reveal CVI, assess physiologic dysfunction, and identify abnormal venous dilation. Consider a vascular consult for surgical management of patients with superficial venous reflux disease or perforator reflux disease.

Surgery aims to correct valve incompetence leading to increased intraluminal pressures. (Venous valve injury or dysfunction may contribute to CVI development and progression.) Surgical reconstruction of deep vein valves may be offered to selected patients with advanced severe and disabling CVI who have recurrent VSUs.

The literature shows that surgical vein stripping isn't superior to medical management. Endovenous laser ablation (EVLA), a minimally invasive procedure, yields greater benefits than vein stripping and other types of surgery.

Skin grafting

Skin grafting may be done in patients with large or refractory venous ulcers. It may involve an autograft (skin or cells taken from another site on the same patient), an allograft (skin or cells taken from another person), or artificial skin (a human skin equivalent). Skin grafting generally isn't effective if the patient has

Skin care for CVI patients

Adequate skin care with emollients or barrier preparations (such as petroleum jelly or zinc oxide cream, ointment, or paste) helps avoid skin irritation and maintain intact skin. Teach patients to apply moisturizer to the affected skin once or twice daily. However, caution them not to use lanolin-based moisturizers. Be aware that stasis dermatitis, an intense manifestation of advanced chronic venous insufficiency (CVI), can cause blistering and skin irritation with oozing.

persistent edema (common with venous insufficiency) unless the underlying venous disease is addressed.

Adjunctive therapies

Adjunctive therapies, such as ultrasound, pulsed electromagnetic fields, and electrical stimulation, can aid in treating VSUs that fail to close despite good conventional wound care and compression therapy.

Patient education

Be sure to teach patients with VSUs about treatment and prevention to promote successful management. Advise them to:

- elevate their legs above heart level for 30 minutes three to four times daily (unless medically contraindicated), to minimize edema and reduce intra-abdominal pressure. Increased intra-abdominal pressure in severely and morbidly obese patients can increase iliofemoral venous pressure, which transmits via incompetent femoral veins, causing venous stasis in the legs.
- perform leg exercises regularly to improve calf muscle function
- use graduated compression stockings as ordered to prevent dilation of lower-extremity veins, pain, and a heavy sensation in the legs that typically worsen as the day progresses
- minimize stationary standing as much as possible
- treat dry skin, itching, and eczematous changes with moisturizers and topical corticosteroids as prescribed. (See *Skin care for CVI patients*.)

Also help patients identify risk factors for CVI (such as smoking and overweight), which can affect management. Teach them about therapeutic compression stockings, including their use, benefits, and care instructions. Remind them to wear stockings every day to prevent venous edema and VSU recurrence. Finally, urge them to adhere to the plan of care and get regular follow-up care. ■

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Apple BITES

Dose from WCEI

WOUND CARE EDUCATION INSTITUTE®

How to assess wound exudate

By Nancy Morgan, RN, BSN, MBA, WOC, WCC, DWC, OMS

Each issue, *Apple Bites* brings you a tool you can apply in your daily practice.

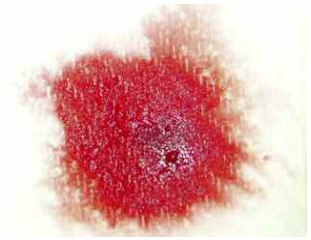
Exudate (drainage), a liquid produced by the body in response to tissue damage, is present in wounds as they heal. It consists of fluid that has leaked out of blood vessels and closely resembles blood plasma. Exudate can result also from conditions that cause edema, such as inflammation, immobility, limb dependence, and venous and lymphatic insufficiency.

Accurate assessment of exudate is important throughout the healing process because the color, consistency, odor, and amount change as a result of various physiologic processes and underlying complications.

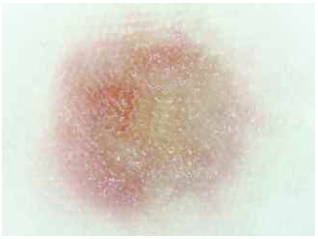
Consistent terminology is crucial to ensure accurate communication among clinicians. Here are terms you should keep in mind when observing the wound and documenting your findings.

Type

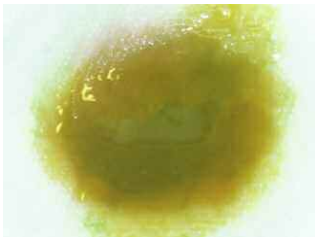
- Serous—thin, clear, watery plasma, seen in partial-thickness wounds and venous ulceration. A moderate to heavy amount may indicate heavy bio-burden or chronicity from a subclinical infection. Serous exudate in the acute inflammatory stage is normal.



- Sanguineous—bloody drainage (fresh bleeding) seen in deep partial-thickness and full-thickness wounds during angiogenesis. A small amount is normal in the acute inflammatory stage.



- Serosanguineous—thin, watery, pale red to pink plasma with red blood cells. Small amounts may be seen in the acute inflammatory or acute proliferative healing phases.



- Purulent—thick, opaque drainage that is tan, yellow, green, or brown. Purulent exudate is never normal and is often associated with infection or high bacteria levels.

Amount

- None—Wound tissues are dry.
- Scant—Wound tissues are moist, but

there is no measurable drainage.
- Small/minimal—Wound tissues are very moist or wet; the drainage covers less than 25% of the dressing.
- Moderate—Wound tissues are wet; the drainage involves more than 25% to 75% of the dressing.
- Large or copious—Wound tissues are filled with fluid that involves more than 75% of the dressing.

Consistency
- Low viscosity—thin, runny
- High viscosity—thick or sticky; doesn't flow easily

Odor
- No odor noted
- Strong, foul, pungent, fecal, musty, or sweet

Use the following terms to describe the condition of primary and secondary wound dressings:
- Dry—The primary dressing is unmarked by exudate; the dressing may adhere to the wound.
- Moist—Small amounts of exudate are visible when the dressing is removed; the primary dressing may be lightly marked.
- Saturated—The primary dressing is wet and strikethrough occurs.
- Leaking—The dressings are saturated, and exudate is leaking from primary and secondary dressings onto the patient's clothes.

A useful resource to help you with your assessment is the **Bates-Jensen Wound Assessment Tool**[A]. ■

Online resource

A. http://www.geronet.med.ucla.edu/centers/borun/modules/Pressure_ulcer_prevention/puBWAT.pdf

What you need to know about collagen wound dressings

By Nancy Morgan, RN, BSN, MBA, WOC, WCC, DWC, OMS

Description

Collagen, the protein that gives the skin its tensile strength, plays a key role in each phase of wound healing. It attracts cells, such as fibroblasts and keratinocytes, to the wound, which encourages debridement, angiogenesis, and reepithelialization. In addition, collagen provides a natural scaffold or substrate for new tissue growth.

Collagen dressings stimulate new tissue growth and encourage the deposition and organization of newly formed collagen fibers and granulation tissue in the wound bed. These dressings chemically bind to matrix metalloproteinases (MMPs) found in the extracellular fluid of wounds. MMPs normally attack and break down collagen, so it's thought that wound dressings containing collagen give MMPs an alternative collagen source, leaving the body's natural collagen available for normal wound healing.

Indications

Examples of wounds that may benefit from a collagen dressing include:

- partial- and full-thickness wounds
- wounds with minimal to heavy exudate
- skin grafts and skin donation sites
- second-degree burns
- granulating or necrotic wounds
- chronic nonhealing wounds (to jump-start wounds that are stalled in the inflammatory phase by reducing mediators of inflammation).

Contraindications

Don't use collagen dressings in the following circumstances:

- third-degree burns
- patient sensitivity to bovine (cattle), porcine (swine), or avian (bird) products
- wounds covered in dry eschar.

Collagen provides a natural scaffold or substrate for new tissue growth.

How to apply

Some collagen products will require a secondary cover dressing. Application technique varies based upon manufacturer recommendations.

Frequency of dressing changes

The frequency of dressing changes varies depending on the brand, but ranges from daily to every 7 days.

Collagen, the protein that gives the skin its tensile strength, plays a key role in each phase of wound healing.

Formulations

A variety of topical formulations of collagen are available, such as freeze-dried sheets, pastes, pads, powder, and gels. Some dressings include alginates or even antimicrobial additives. The collagen source varies—bovine, porcine, or avian.

Examples

BGC Matrix®; BIOSTEP◇ Collagen Matrix; Catrix® Wound Dressing; CellerateRX® Gel or Powder; ColActive® Plus; Excellagen®; FIBRACOL® Plus; Promogran Prisma® Matrix; Puracol® Plus; Stimulen™ Collagen Gel, Lotion, Powder, or Sheets; Triple Helix Collagen Dressing

The HCPCS (Healthcare Common Procedure Coding System) codes for collagen dressings are A6021-A6024. ■

Nancy Morgan, cofounder of the Wound Care Education Institute, combines her expertise as a Certified Wound Care Nurse with an extensive background in wound care education and program development as a nurse entrepreneur.

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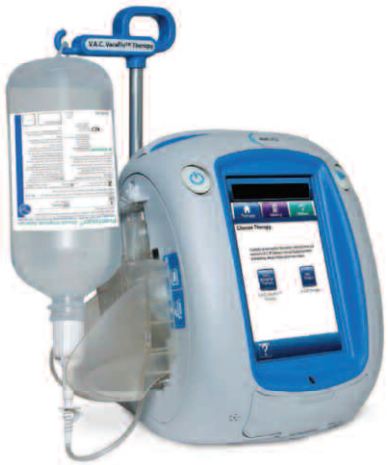

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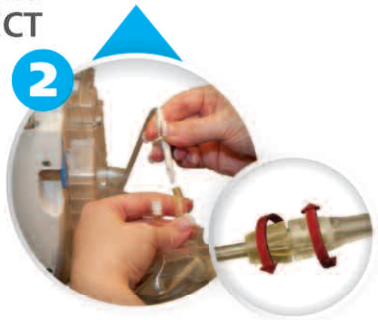

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*Kim PJ, Attinger CE, Steinberg JS, et al. The impact of Negative-Pressure Wound Therapy with Instillation Compared with Standard Negative-Pressure Wound Therapy: A Retrospective, Historical, Cohort, Controlled Study. Plast. Reconstr. Surg.2014; 133: 709-716.

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Why I became a certified DWC®

I obtained Diabetic Wound Certification (DWC) in February 2014. In addition to WCC® and OMS certifications that I currently hold, I felt this was an important next step in advancing my knowledge of wound care and treatment options.

Diabetes is becoming more prevalent. Currently, 246 million people in the world have diabetes, and by 2030, it is expected that 438 million will have the disease. Of Americans, 8.3% have diabetes and 27% do not even know they have the disease.

As the number of patients with diabetes increases, so does the number of patients with diabetes-related wounds. One in every six people in the United States who has diabetes will develop a wound, and a staggering 85% of those will go on to require amputation. Of those amputations, the vast majority could have been prevented with proper wound care and treatment.

The numbers are eye opening, and the drain on the healthcare system and insurance industry is great. Having a chronic nonhealing diabetic wound is life altering for a patient and his or her family. Prevention of the wound is best and includes proper education on diet, pressure relief, checking feet daily, weight management, maintaining a healthy blood glucose level, regular checkups with the appropriate care provider, and shoes custom-molded to the patient's irregularly shaped foot. If a wound should develop, knowledge of how to best treat this wound is paramount in preventing an amputation and lifelong disability. In summary, diabetic lesions require specialized care.

As healthcare professionals with a passion for healing, we are responsible for knowing the latest information. Not only are we educating patients and families but on many occasions we are also educating physicians, physician assistants, and nurse practitioners who order wound care. Substandard care still happens too often and is not acceptable.

I encourage everyone who has the privilege of being a certified wound care clinician to consider the DWC program. You will gain valuable knowledge in the prevention and care of diabetic wounds, and will be an asset to your patients, coworkers, community, and the wound care world. You will also have the backing and strength of the National Alliance of Wound Care and Ostomy. I am proud to represent them.

— Janie Hollenbach, RN, WCC, OMS, DWC, DAPWCA, FACCWS,
Wound and Ostomy Nurse Consultant,
West Penn Allegheny Health Network

NAWCO Certifications

WCC® Wound Care Certified

When considering wound care certification, choose the credential that aligns best with your lifestyle. The WCC certification is the number one wound care credential in the United States. There are thousands of multidiscipline WCC clinicians making a difference in the lives of their patients and improving the quality of wound care every day.

The WCC clinician provides direct patient wound and skin care in acute-care, long-term care, and home-care settings. The WCC clinician plays an important role as a direct care provider, educator, and resource for optimum

patient outcomes in wound and skin care management. The WCC clinician's scope of practice is performed in accordance with scope of practice as determined by each respective professional state regulatory board. **Learn more here[A]**.

DWC® Diabetic Wound Certified

The role of the DWC clinician is based upon expert evidence-based clinical knowledge and skills that are practiced in acute-care, outpatient, long-term care, and home-care settings. The focus of the DWC clinician is on high-quality care to achieve optimum patient outcomes and cost control in diabetic wound management and prevention of complications. To ensure appropriate and thorough diabetic wound management, a holistic comprehensive approach is used. All factors affecting healing, including consideration of systemic, psychosocial, and local factors, are reviewed. **Learn more here[B]**.

LLE® Lymphedema Lower Extremity

Lymphedema lower-extremity, edema, and wound management is a specialized area that focuses on overall skin care and promotion of an optimal wound environment through reduction of edema and lymphedema. This therapeutic approach includes intensive rehabilitative interventions followed by education in self-care measures to prevent disease progression.

Lymphedema lower-extremity and edema management requires the skills of the interdisciplinary team, which includes the physician, nurse, LLE-certified clinician, dietitian, physical therapist, occupational therapist, social worker, and other healthcare disciplines or providers depending on each patient assessment. **Learn more here[C]**.

OMS Ostomy Management Specialist

The National Alliance of Wound Care and Ostomy is proud to offer the first multidisciplinary Ostomy Management Specialist (OMS) certification in the United States. We believe our thousands of WCCs and other certificants who work with ostomy patients or are considering ostomy as a career direction will greatly benefit from the new OMS program. The role of the OMS clinician is based on expert, evidence-based clinical knowledge and skills that are practiced in acute-care, outpatient, long-term care, and home-care settings.

The focus of the OMS clinician is on high-quality care to achieve optimum patient outcomes and cost control in ostomy management and prevention of complications. To ensure appropriate and thorough ostomy management, a holistic comprehensive approach is used. All factors affecting healing, including considerations of systemic, psychosocial, and local factors, are reviewed. **Learn more here[D]**.

Online Resources

A. http://www.nawccb.org/library/documents/Handbooks/CandidateHandbook%201.25.10-FINALPRINTER.pdf

B. http://www.nawccb.org/library/documents/Handbooks/DWC%20handbook%20MAIN%202012.pdf

C. http://www.nawccb.org/library/documents/Handbooks/LLE%20Candidate%20handbook.pdf

D. http://www.nawccb.org/library/documents/Handbooks/OMS%20Candidate%20handbook.pdf

How dietary protein intake promotes wound healing

Careful assessment and adequate intake ensure patients' protein needs are met.

By Nancy Collins, PhD, RD, LD/N, FAPWCA, and Allison Schnitzer

Nutrition is a critical factor in the wound healing process, with adequate protein intake essential to the successful healing of a wound. Patients with both chronic and acute wounds, such as postsurgical wounds or pressure ulcers, require an increased amount of protein to ensure complete and timely healing of their wounds.

Elderly patients with wounds pose a special challenge because of their decreased lean body mass and the likelihood of chronic illnesses and insufficient dietary protein intake. To promote a full recovery, wound care clinicians must address the increased protein needs of wound patients, especially elderly patients.

Understanding protein structure and function

Protein comes from the Greek word *protos*, which means "first" or "primary," reflecting the body's fundamental need for this nutrient. Amino acids, the basic constituents of protein, are required for many wide-ranging body functions. Proteins function as enzymes for chemical reactions; hormones for chemical messaging; buffers to regulate acid-base balance; antibodies for the immune system; transporters, such as albumin, hemoglobin, transferrin, and retinol-binding protein, of substances in the blood; and acute-phase responders that guide the body's response during acute critical illness.

Proteins also play structural roles, as the contractile proteins actin and myosin found in cardiac, skeletal, and smooth muscle and as the fibrous proteins collagen, elastin, and keratin. During the proliferative phase of wound repair, collagen deposition is crucial to increase the wound's tensile strength. Forty percent of the body's protein occurs in skeletal muscle—the major component of lean body mass, the metabolically active tissues of the body. Lean body mass declines with age and critical illness, significantly compromising the body's ability to carry out all the necessary functions of protein.

Amino acids

All of the body's 20 amino acids have the same basic structure—a central carbon, at least one amino group (-NH_2), at least one carboxylic acid group (-COOH), and a side chain group that makes each amino acid unique and determines its functional role in the body.

Sometimes classified by their properties, such as net charge and polarity, amino acids commonly are classified as either *essential* (or indispensable) or *nonessential* (or dispensable).

The nine *essential* amino acids are histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan, and valine. Because the body can't synthesize essential amino acids, it's necessary to obtain them from the diet.

The 11 remaining amino acids are *nonessential* because the body can synthesize them using existing carbon skeletons and free amino groups. However, some nonessential amino acids are considered conditionally essential when a specific condition prevents the body from synthesizing a particular amino acid, including genetic conditions, such as phenylketonuria, and immature organ function during infancy and adulthood. In some individuals, demand for these amino acids rises during times of metabolic stress (as when a patient has a chronic wound) and the body's production may not keep up with increased demands. Requirements for the nonessential amino acids glutamine and arginine increase during wound healing, although specific recommendations for dietary intake amounts are not yet established. Glutamine acts as a precursor for nucleotide synthesis, which is essential for rapidly proliferating cells during wound healing. Arginine promotes wound healing by increasing collagen deposition and improving both nitric oxide production and nitrogen retention and immune function.

Assessing patients' protein needs

The recommended amount of 0.8 g protein/kg body weight is based on the needs of healthy adults. Elderly patients may require a higher baseline protein intake of 1 g/kg. However, many patients, including those with wounds, don't fall into the "healthy adult" category and have even higher protein needs.

It's known that adequate protein is crucial for proper wound healing, but the precise amount isn't established. Postsurgically, 1 to 1.5 g protein/kg is recommended, but this may vary with the extent of the surgical wound. For patients with pressure ulcers, the recommendation is also 1 to 1.5 g/kg; those with deep ulcers or multiple pressure-ulcer sites may need 1.5 to 2 g/kg. For patients with large burn wounds, protein requirements sometimes reach 1.5 to 3 g/kg to offset extensive protein loss through urine and burn-wound exudate.

It's known that adequate protein is crucial for proper wound healing.

When determining the protein needs of a wound patient, it's necessary to consider additional factors, such as preexisting protein-energy malnutrition, renal impairment, or other critical illnesses. The best strategy is to evaluate the patient as a whole and use clinical judgment based on:

- a physical examination for signs of catabolism
- a dietary history to determine typical protein intake
- a weight history to find out if unintended weight loss has occurred
- laboratory values, such as serum albumin, to identify catabolism and inflammation.

It's also necessary to consider the depth

Protein content of food groups

This table shows the amount of protein per serving for each of the six food groups.

Protein source	Protein content (g)
Meat, poultry, eggs, fish (1 oz)	7 g
Milk (8 fl oz)	8 g
Breads and starches*	3 g
Vegetables (½ C)*	0 to 2 g (legumes have highest content)
Fruits (½ C)*	Trace amounts
Fats	0

*Incomplete protein

and total body surface areas of the patient's wounds.

Helping patients meet their protein needs

Patients who aren't eating a well-balanced diet probably aren't consuming enough protein to heal their wounds. Getting enough protein is particularly problematic in elderly patients for a variety of reasons—the higher cost of high-protein foods, strong food preferences and intolerances, difficulty chewing or swallowing fibrous foods, and fear of consuming high-fat and high-cholesterol protein. Also, loneliness, fatigue, depression, polypharmacy, dental problems, and other problems can interfere with meal preparation and oral intake.

To promote adequate protein intake, clinicians should give patients flexibility in their diet and encourage them to consume foods they enjoy that are easy to prepare and economically feasible. A diet that's too restrictive may seem unappealing and could lead to decreased intake and unintended weight loss. Keep in mind that adequate calories are also important for wound healing; otherwise, the body uses protein calories to provide glucose for energy production instead of tissue repair.

Complete vs. incomplete proteins

Animal products are complete proteins because they contain all the essential amino acids. Whole eggs, with their full amino-acid profile, are the gold-standard protein against which all other protein sources are compared. Eggs generally are cheaper than other high-protein foods, making them a convenient and easy-to-prepare choice for elderly patients. Other complete proteins include beef, poultry, fish, milk, cheese, and yogurt.

Soy products are unique among plant foods in that they're complete protein sources. Most plant proteins are considered incomplete because they contain too little of one or more of the essential amino acids, which are termed the "limiting" amino acids. Combining foods with different limiting amino acids can improve the quality of plant protein sources, such as combining grains with legumes or legumes with seeds. It isn't necessary to combine incomplete proteins at each meal, but it's important to eat them the same day at other meals. (See *Protein content of food groups*.)

Strategies to boost protein intake

The best way to increase protein intake is to treat your patients as individuals and find out what foods they would accept and prefer. Tips for increasing protein include:

- adding diced meat to soups, salads, and casseroles
- using milk powder in hot cereals, scrambled eggs, and mashed potatoes
- choosing desserts that contain eggs, such as sponge cake, custard, and bread pudding.

To consume the higher protein amounts needed for wound healing, some patients may require supplementation. The most common way to supplement protein is to use an oral nutritional supplement bever-

Comparison of oral nutritional supplements

This chart can help clinicians determine protein intake for patients using nutritional supplements, but the product label always contains the most accurate information.

Supplement*	Kilocalories	Protein (g)	Serving size
Boost®	240	10	8 fl oz
Boost® High Protein	240	15	8 fl oz
Boost Plus®	360	14	8 fl oz
Carnation® Breakfast Essentials™ Drink	250	14	10 fl oz
Ensure®	250	9	8 fl oz
Ensure Clear™	180	10	9 fl oz
Ensure® High Protein	210	25	14 fl oz
Ensure® Muscle Health	250	13	8 fl oz
Ensure Plus®	350	13	8 fl oz
Pro-Stat® Sugar Free	90	15	30 mL
Pro-Stat® Sugar Free AWC	100	17	30 mL

*The information in this table was obtained from these product websites:
- www.boost.com/nutritional-drinks/boost-original?gclid=COi9_uKDj7gCFegWMgodfWIA1Q
- www.carnationbreakfastessentials.com
- www.ensure.com
- www.pro-stat.com

age or protein module, such as protein powder or liquid protein. (See *Comparison of oral nutritional supplements*.)

When evaluating these products for cost-effectiveness, keep in mind that 8 fl oz of whole milk has 150 calories and 8 g protein. Variety in supplementation is key, because most patients tire quickly of the same supplement day after day. Many different protein supplement products are available, including high-protein cookies, gelatins, and nutrition bars. Adding protein powder to soups, sauces, and milk shakes is an easy way to increase protein intake.

Patient education that emphasizes the importance of protein intake can help patients achieve the highest level of dietary compliance and the best clinical outcomes. ■

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Becoming a wound care diplomat

By Bill Richlen, PT, WCC, CWS, DWC, and Denise Stetter, PT, WCC, DCCT

The Rolling Stones may have said it best when they sang, "You can't always get what you want," a sentiment that also applies to wound care. A common frustration among certified wound care clinicians is working with other clinicians who have limited current wound care education and knowledge. This situation worsens when these clinicians are making treatment recommendations or writing treatment orders not based on current wound-healing principles or standards of care.

Frequently, these same clinicians seem uninterested in listening to what you say and aren't receptive to treatment suggestions. This is where your skills of diplomacy will make all the difference. Rarely is it a simple matter of sharing your expertise to change a person's mind. Lack of training and knowledge of current best practices may be part of the reason for resistance. "We've always done it that way" or "The rep told me" are common statements you might hear. Other factors include ego, self-image, politics, and the need to be in control. Sadly, human nature gets in the way more often than we think.

Practicing our diplomacy skills will help us bridge the gap between resistance and openness to learning. Here's what makes a good diplomat.

Communication skills

The words you choose and your tone can make a huge difference in how the information you give is received. Avoid using "you" in your statements because this generally makes the other person feel defensive. Instead use "I" or "we" statements beginning with "I think" or "I feel." For example, "Dr. Smith, I see that the treatment for Jane Doe is currently wet to dry b.i.d. When we assessed the wound today, we noted she had a fair amount of drainage and some slough. I think that an absorptive dressing like an alginate would handle the drainage better and help promote debridement of the slough. It might be a better choice for Jane. Would you consider trying that for a couple of weeks and see what happens?"

When discussing opposing viewpoints, work to get agreement on smaller or more general issues before addressing the main concern: "Can we agree that using current evidence-based practice is what's best for Mrs. Jones?"

Knowledge

Be prepared to defend your position with evidence-based practices and, if necessary, provide resources to support your position. When clinicians refuse to listen or acknowledge facts, it can be a sign that their position is more about ego and power than what's right for the patient.

Use open-ended questions to help create dialogue and the sharing of ideas. Questions such as, "Do you have experience with this product? What were your results?" or "This product may not be on your for-

mulary, but if I got a sample, would you consider trying it?" put you on a collegial level with the clinician. It becomes a collaboration rather than a power struggle. When interacting with clinicians who aren't certified in wound care, it's not a good idea to play your "certification" trump card. This strategy only makes you appear arrogant, causing the perception that you think you're superior to the other person, putting your colleague on the defensive and seriously compromising the potential for further debate and reaching a solution.

Emotional control

We're all passionate about caring for our patients, so it's easy to take criticism and conflict personally. When emotions run high, logical thinking is impaired. We can lose grasp of our objectivity and say things we may regret, potentially undermining our integrity and damaging lines of communication. Consider scripting communication points or responses to help maintain professionalism. Use such phrases as "Have you considered...", "I know we both have the patient's best interest at heart…" or, when making a request, finishing with "… does that seem reasonable?"

Ability to compromise

Compromise doesn't mean compromising on principles or standards of care. However, we may not get the exact treatment we want. It's the old saying, "You aim for the eagle, you bag the pheasant, and you don't eat crow." We need to be creative and think outside the box to offer treatment options that will promote healing as best as possible and ultimately win the approval of the person with whom we are compromising. Sometimes we just have to accept the lesser of two evils. Our willingness to compromise can set the stage for future dialogue and less conflict.

Integrity

Become an ambassador for wound care. Be the same person in public as you are in private. Always promote best practice and not personal gain. It's no surprise that news travels fast, especially bad news. If people figure out that you're manipulative, dishonest, or egotistical, it won't be long before your reputation will precede you and you'll lose the confidence of your colleagues. Perception is reality in the minds of others. How are you representing wound care clinicians?

Sincere appreciation

Kill them with kindness. Drawing battle lines and creating conflict over differing opinions doesn't help our patients. We can catch more flies with honey than vinegar. But no one wants to hear insincere flattery or thank-you's. Take the time to tell others how much you appreciate their cooperation.

In the end, we need to remember that the patient has to be our focus. Our own personal issues need to be put aside. It's not ever about winning; it's about doing what's best for the patient.

As the Rolling Stones sang, "You can't always get what you want, but if you try sometimes, well you might find, you get what you need." ■

Want to improve your communication skills? Sign up for the free Crucial Skills Newsletter[A].

Online resource

A. http://www.vitalsmarts.com/resource-center/newsletter/

Bill Richlen is CEO of Infinitus, LLC in Ferdinand, Indiana. Denise Stetter is area manager for southern Indiana for Paragon Rehabilitation in Louisville, Kentucky.

How to set up an effective wound care formulary and guideline

By Jeri Lundgren, BSN, RN, PHN, CWS, CWCN

Navigating through the thousands of wound care products can be overwhelming and confusing. I suspect that if you checked your supply rooms and treatment carts today, you would find stacks of unused products. You also would probably find that many products were past their expiration dates and that you have duplicate products in the same category, but with different brand names. Many clinicians order a product by brand name, not realizing that plenty of the product is already in stock under a different brand name.

A solution to this problem is to set up a wound care formulary and guideline. This intervention can help clinicians become comfortable and clinically competent on what products to use when, which promotes better outcomes with less product waste.

Setting up a wound care formulary can seem overwhelming. It must be done tactfully or your clinicians may not have "buy in" for the products you decide to use. Here are some tips that may help you streamline the process. Keep in mind that you can involve staff to help you as you work through these tips.

Review current supplies

Start the process by going through all your current supplies. Label bins with the category of the product, for example, calcium alginate, hydrogel, and foams. Organize the brand-name products within the same category by placing them into the appropriate bin. As you check the supplies, put all expired products into an expired bin. You can always use them for teaching and demonstration purposes.

Evaluate the products

Evaluate the products you have on hand with the appropriate clinicians to determine which products have good performance and outcomes within each category. You may want to work with your medical-supply distributor to obtain pricing on the products, especially if you have multiple brand names within a category that perform well.

Set up a guideline

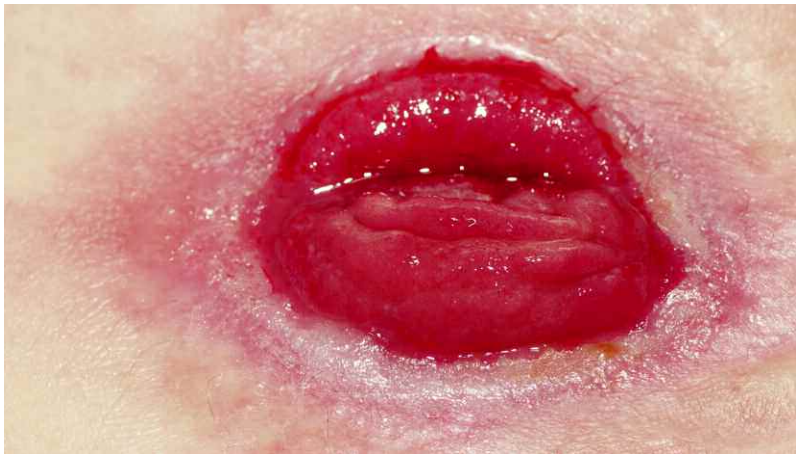
Once you determine what products you'll use within each category, set up a guideline on when and how to use them. Specify that nurses should write the prescriber's order by category instead of brand name (for example, "apply adhesive foam dressing") and have prescribers do the same. Then have the guideline indicate which brand-name product the clinician should

(continued on page 49)

Understanding stoma complications

Learn how to identify and manage stoma hernias, trauma, mucocutaneous separation, necrosis, prolapse, retraction, and stenosis.

By Rosalyn S. Jordan, RN, BSN, MSc, CWOCN, WCC, OMS; and Judith LaDonna Burns, LPN, WCC, DFC



About 1 million people in the United States have either temporary or permanent stomas. A stoma is created surgically to divert fecal material or urine in patients with GI or urinary tract diseases or disorders.

A stoma has no sensory nerve endings and is insensitive to pain. Yet several complications can affect it, making accurate assessment crucial. These complications may occur during the immediate postoperative period, within 30 days after surgery, or later. Lifelong assessment by a healthcare provider with knowledge of ostomy surgeries and complications is important.

Immediately after surgery, a healthy GI stoma appears red, moist, and shiny. Edema of the stoma is expected for the first 6 to 8 weeks. A healthy urinary stoma is pale or pink, edematous, moist, and shiny. Usually, it shrinks to about one-third the initial size after the first 6 to 8 weeks as edema subsides. The stoma warrants close observation as pouching types and sizes may need to be changed during this time. Teach the patient and family caregivers to report changes or signs and symptoms of stoma complications to a healthcare provider. If complications are recognized early, the problem may be resolved without surgical intervention.

Stoma complications range from a simple, unsightly protrusion to conditions that require emergency treatment and possible surgery. Clinicians must be able to recognize complications and provide necessary treatment and therapy early. Complications include parastomal hernias, stoma trauma, mucocutaneous separation, necrosis, prolapse, retraction, and stenosis. Although one complication can lead to and even promote others, all require attention and treatment.

Parastomal hernia

A parastomal hernia involves an ostomy in the area where the stoma exits the abdominal cavity. The intestine or bowel extends beyond the abdominal cavity or abdominal muscles; the area around the stoma appears as a swelling or protuberance. Parastomal hernias are incisional hernias in the area of the abdominal musculature that was incised to bring the intestine through the abdominal wall to form the stoma. They may completely surround the stoma (called circumferential hernias) or may in-

vade only part of the stoma.

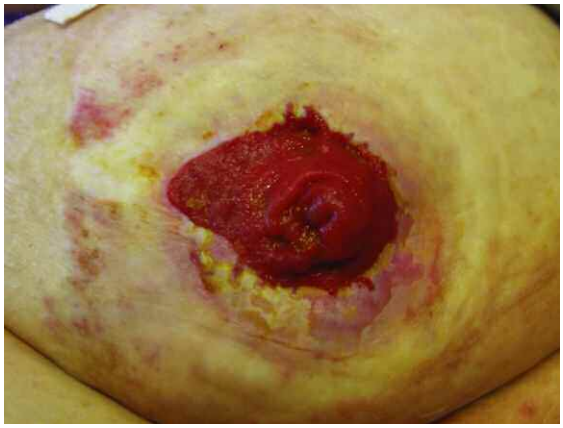
Parastomal hernias can occur any time after the surgical procedure but usually happen within the first 2 years. Recurrences are common if the hernia needs to be repaired surgically. Risk factors may be patient related or technical. Patient-related risk factors include obesity, poor nutritional status at the time of surgery, presurgical steroid therapy, wound sepsis, and chronic cough. Risk factors related to technical issues include size of the surgical opening and whether surgery was done on an emergency or elective basis.

Parastomal hernias occur in four types. (See *Types of parastomal hernias*.) Initially, a parastomal hernia begins as an unsightly distention in the area surrounding the stoma; the hernia enlarges, causing pain, discomfort, and pouching problems resulting in peristomal skin complications that require frequent assessment. Conservative therapy is the usual initial treatment. Adjustments to the pouching system typically are required so changes in the shape of the pouching surface can be accommodated. Also, a hernia support binder or pouch support belt may be helpful. Avoid convex pouching systems; if this isn't possible, use these systems with extreme caution. If the patient irrigates the colostomy, an ostomy management specialist should advise the patient to discontinue irrigation until the parastomal hernia resolves.

Types of parastomal hernias

The four types of parastomal hernias are based on hernia location within the abdominal tissue:

- *intestinal interstitial*, in which the hernia lies within the layers of the abdominal wall
- *subcutaneous*, in which the hernia is contained within subcutaneous tissue
- *intrastomal*, in which the herniated intestine penetrates the stoma (usually confined to an ileostomy)
- *peristomal*, in which the hernia is located within a stoma that has prolapsed.



The image shows stoma injury caused by a poor fitting appliance. Photo by Connie Johnson. Used with permission.

Stoma trauma

Stoma trauma occurs when the stoma is injured, typically from a laceration. Lacerations usually result from the pouch appliance or clothing. Belt-line stomas are easily traumatized and injury may occur from both clothing belts and pouch support belts. Stoma lacerations commonly result from a small opening in the flange or a misaligned pouch opening. Other causes include parastomal or stomal prolapse with possible stoma enlargement or edema.

Signs and symptoms of stoma trauma include bright red bleeding, a visible cut, and a yellowish-white linear discoloration. Lacerations may heal spontaneously. If the culprit is the pouching system, make sure nothing within the system comes in contact with the stoma. Usually direct pressure controls bleeding, but if bleeding continues, refer the patient to a physician for treatment.

Mucocutaneous separation

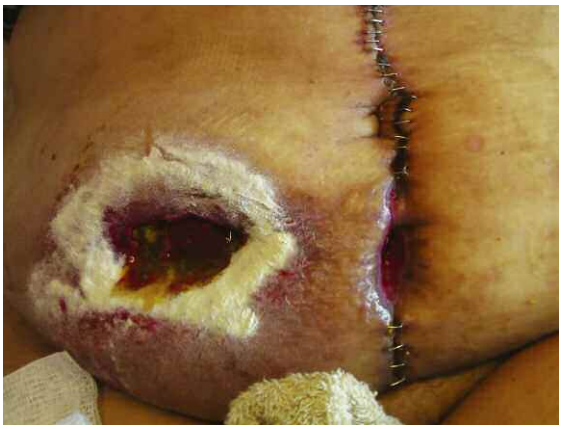
Mucocutaneous separation occurs when the stoma separates from the skin at the junction between the skin and the intestine used to form the stoma. Causes are related to poor wound-healing capacity, such as malnutrition, steroid therapy, diabetes, infection, or radiation of the abdominal area. Tension or tautness of the suture line also

can cause mucocutaneous separation.

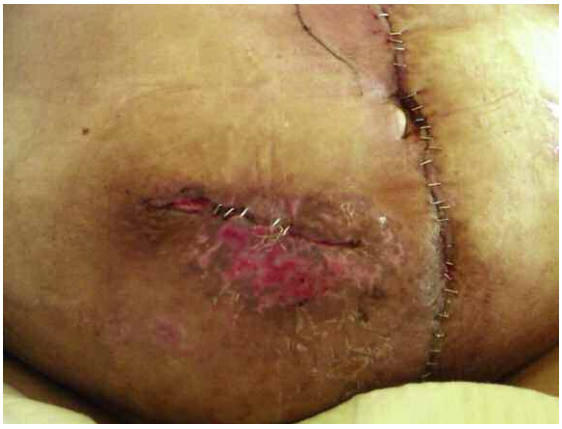
This complication usually arises early and can lead to other serious conditions, such as infection, peritonitis, and stomal stenosis. The area of the separation may completely surround the stoma (known as a circumferential separation), or the separation may affect only certain areas of the stoma/skin junction. The separation may be superficial or deep.

The first sign of mucocutaneous separation may be induration. Treat the separation as a wound, and apply wound-healing principles: Absorb drainage, reduce dead space, use the proper dressing, and promote wound healing. The proper dressing depends on wound depth and amount of wound drainage. Be sure to assess the wound, using the "clock method" to describe location; measure the wound area in centimeters; and describe the type of tissue in the wound bed. Be aware that slough may be present.

Treatment of the wound dictates how often the pouch is changed. A two-piece pouching system commonly is used to reduce the number of pouch changes. Cover the wound dressing with the pouching system unless the wound is infected. If infection is present, let the wound drain into the pouch and heal by secondary intention. Don't use a convex pouching system, because this may cause additional injury to the mucocutaneous junction.



This temporary ileostomy secondary to colon cancer has been treated for mucocutaneous separation.



Closure of the temporary ileostomy.

Photos by Connie Johnson. Used with permission.

Stoma necrosis

Blood flow and tissue perfusion are essential to stoma health. Deficient blood flow causes stoma necrosis. A stoma may be affected by both arterial and venous blood compromise. The cause of necrosis usually relates to the surgical procedure, such as tension or too much trimming of the mesentery, or the vascular system that provides blood flow to the intestine. Other causes of vascular compromise include hypovolemia, embolus, and excessive edema.

Stoma necrosis usually occurs within the first 5 postoperative days. The stoma appears discolored rather than red, moist, and shiny. Discoloration may be cyanotic, black, dark red, dusky bluish purple, or brown. The stoma mucosa

Blood flow and tissue perfusion are essential to stoma health.

Unless the patient complains of pain, has a circulatory problem, or has signs or symptoms of bowel obstruction, conservative treatment is used for uncomplicated stoma prolapse.

may be hard and dry or flaccid. Also, the stoma has a foul odor. Associated complications may include stoma retraction, mucocutaneous separation, stoma stenosis, and peritonitis.

Report signs and symptoms to the primary care provider immediately. Superficial necrosis may resolve with necrotic tissue simply sloughing away. But if tissue below the fascial level is involved, surgery is necessary. A transparent two-piece pouching system is recommended for frequent stoma assessment. The pouch may need to be resized often.

Stoma prolapse

A stoma prolapse occurs when the stoma moves or becomes displaced from its proper position. The proximal segment of the bowel intussuscepts and slides through the orifice of the stoma, appearing to telescope. This occurs more often in loop transverse colostomies. A prolapsed stoma increases in both length and size. Prolapse may be associated with stoma retraction and parastomal hernias.

Causes of stoma prolapse include large abdominal-wall openings, inadequate bowel fixation to the abdominal wall during surgery, increased abdominal pressure, lack of fascial support, obesity, pregnancy, and poor muscle tone.

Unless the patient complains of pain, has a circulatory problem, or has signs or symptoms of bowel obstruction, conservative treatment is used for uncomplicated stoma prolapse. The prolapse usually can be reduced with the patient in a supine position. After reduction, applying a hernia support binder often helps. Also, a stoma shield can be used to protect the stoma. A prolapsed stoma may require a larger pouch to accommodate the larger stoma. Some clinicians use cold compresses and sprinkle table sugar on the stoma; the sugar provides osmotic therapy or causes a fluid shift across the stoma mucosa and reduces edema.

Stoma retraction

The best-formed stoma protrudes about 2.5 cm, with the lumen located at the top center or apex of the stoma to guide the effluent flow directly into the pouch. In stoma retraction, the stoma has receded about 0.5 cm below the skin surface. Retraction may be circumferential or may occur in only one section of the stoma.

The usual causes of stoma retraction are tension of the intestine or obesity. Stoma retraction during the immediate postoperative period relates to poor blood flow, obesity, poor nutritional status, stenosis, early removal of a supporting device with loop stomas, stoma placement in a deep skinfold, or thick abdominal walls. Late complications usually result from weight gain or adhesions. Stoma retraction is most common in patients with ileostomies.

A retracted stoma has a concave, bowl-shaped appearance. Retraction causes a poor pouching surface, leading to frequent peristomal skin complications. Typical therapy is use of a convex pouching system and a stoma belt. If obtaining a pouch seal is a problem and the patient has recurrent peristomal skin problems from leakage, stoma revision should be considered.

Most stoma complications are preventable.

Stoma stenosis

Stoma stenosis is narrowing or constriction of the stoma or its lumen. This condition may occur at the skin or fascial level of the stoma. Causes include hyperplasia, adhesions, sepsis, radiation of the intestine before stoma surgery, local inflammation, hyperkeratosis, and surgical technique.

Stoma stenosis frequently is associated with Crohn's disease. You may notice a reduction or other change in effluent output with both urinary and GI ostomies. With GI stoma stenosis, bowel obstruction frequently occurs; signs and symptoms are abdominal cramps, diarrhea, increased flatus, explosive stool, and narrow-caliber stool. The initial sign is increased flatus. With urinary stoma stenosis, signs and symptoms include decreased urinary output, flank pain, high residual urine in conduit, forceful urine output, and recurrent urinary tract infections.

Partial or complete bowel obstruction and stoma stenosis at the fascial level require surgical intervention. Conservative therapy includes a low-residue diet, increased fluid intake, and correct use of stool softeners or laxatives for colostomies.

Most stoma complications are preventable and result from poor stoma placement. Up to 20% of patients with stoma complications require surgical revision of the stoma. All patients with ostomies require ongoing, accurate assessment and, if needed, early intervention by trained clinicians. ■

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Clinician RESOURCES

Here are a variety of resources you might want to explore.

Considering opioid-prescribing practices

Healthcare providers' prescribing patterns for opioids vary considerably by state, according to a report in *Vital Signs* from the Centers for Disease Control and Prevention (CDC). Here are some facts from the report:

- Each day, 46 people die from an overdose of prescription painkillers in the United States.*
- Healthcare providers wrote 259 million prescriptions for painkillers in 2012, enough for every American adult to have a bottle of pills.
- Ten of the highest prescribing states for painkillers are in the South.

Prescribing clinicians may want to consider their own patterns. Nonprescribing clinicians should be alert to possible inappropriate prescribing and use of opioids in their patients.

Learn more at **www.cdc.gov/vitalsigns** and read the **full report**[A].

Translating diabetes research

A good resource for you and your patients with diabetes is "**Diabetes Public Health Resource**[B]" from the CDC Division of Diabetes Translation.

The division translates diabetes research

into daily practice to help you and your patients understand the impact of the disease, influence health outcomes, and improve access to quality health care. Topics include:

- Diabetes & me, which includes frequently asked questions and basic information
- Data & trends, which includes statistics and surveillance data
- Publications, which includes fact sheets and reports
- Education resources, which includes intervention tools
- News & resources, which includes diabetes issues and conferences.

How to prevent pressure ulcers

Access "**How-to Guide: Prevent Pressure Ulcers**[C]," from the Institute for Healthcare Improvement.

The guide describes key evidence-based care components for preventing pressure ulcers, discusses how to implement these interventions, and recommends measures to assess improvement.

You will need to create a free account to access the guide. ■

Online Resources

A. www.cdc.gov/mmwr/preview/mmwrhtml/mm6326a2.htm?s_cid=mm6326a2_w

B. www.cdc.gov/diabetes/

C. www.ihi.org/resources/Pages/Tools/HowtoGuidePreventPressureUlcers.aspx

(continued from page 42)
use in that category. This way, if you do change the brand-name product within that category, you don't have to obtain a new order.

Educate staff

Schedule inservices for all licensed staff, physicians, nurse practitioners, and other prescribers to explain the formulary and guideline. Hold a product fair on how to use and apply the various dressings, so clinicians become familiar with the options and don't order something not on formulary.

Establish an approval system for products not on formulary

Work with your medical-supply distributor to set up an approval system if someone tries to order a product not on formulary. The distributor should also be able to run reports for you of the products being ordered so you can track them.

Achieving your goals

Once you have your wound care product formulary and guideline up and running, you should see those piles of expired and unused products disappear and your current products used appropriately. And you'll be on your way to achieving the goal of providing good clinical outcomes in a cost-effective manner. ■

Jeri Lundgren is director of clinical services at Pathway Health in Minnesota. She has been specializing in wound prevention and management since 1990.

Call for Manuscripts

Wound Care Advisor invites you to consider submitting articles for publication in the new voice for wound, skin, and ostomy management specialists.

As the official journal of WCC®s, DWC®s, LLE℠s, and OMS℠s, the journal is dedicated to delivering succinct insights and pertinent, up-to-date information that multidisciplinary wound team members can immediately apply in their practice and use to advance their professional growth.

We are currently seeking submissions for these departments:

- ***Best Practices***, which includes case studies, clinical tips from wound care specialists, and other resources for clinical practice
- ***Business Consult***, which is designed to help wound care specialists manage their careers and stay current in relevant healthcare issues that affect skin and wound care.

If you're considering writing for us, please **click here** or visit www.WoundCareAdvisor.com to review our Author Guidelines. The Guidelines will help you identify an appropriate topic and learn how to prepare and submit your manuscript. Following these guidelines will increase the chance that we'll accept your manuscript for publication.

If you haven't written before, please consider doing so now. Our Editorial Team will be happy to work with you to develop your article so that your colleagues can benefit from your experience.

For more information email the Managing Editor at, csaver@woundcareadvisor.com.

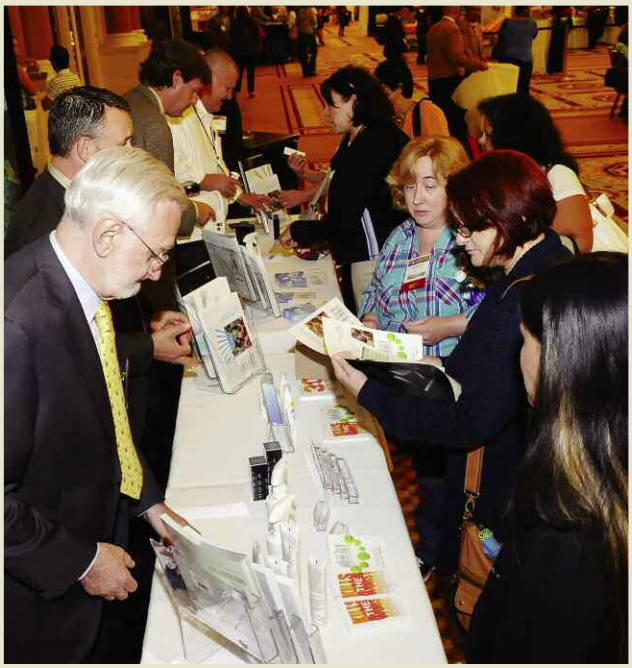
EXHIBITORS GUIDE

Skin is In™

WOW

WILD ON WOUNDS℠

2014



NATIONAL CONFERENCE

Rio Hotel, Las Vegas • September 17-20

Wild on Wounds WELCOME

Dear Colleagues,

We're thrilled to have you at this year's "WOW" WILD ON WOUNDS℠ national conference!

Being wound care clinicians ourselves, we understand the challenges you face at a time when reimbursement policies require you to provide quality care with fewer resources. We designed WOW to enhance your knowledge and skills in skin, wound, and ostomy care, which will help you in overcoming these challenges and in providing your patients with the quality care that they deserve.

We're committed to bringing you current standards of care, new prevention and treatment ideas, and tools to help you spread your knowledge and to make a difference in your patients' lives.

One significant component of being current with wound care is being familiar with new technologies and devices that heal wounds faster. Our exhibitors are here to provide you with hands-on training and education about their products so you can make a measurable impact on wound care outcomes.

Wound Care Advisor created this useful Exhibitor Guide for you to carry with you during exhibit times. We also suggest that you keep it in your wound care library for future reference.

We hope you enjoy this Exhibitor Guide and we'll see you at the exhibitors' showcase!

Nancy Morgan & Donna Sardina
Wound Care Education Institute

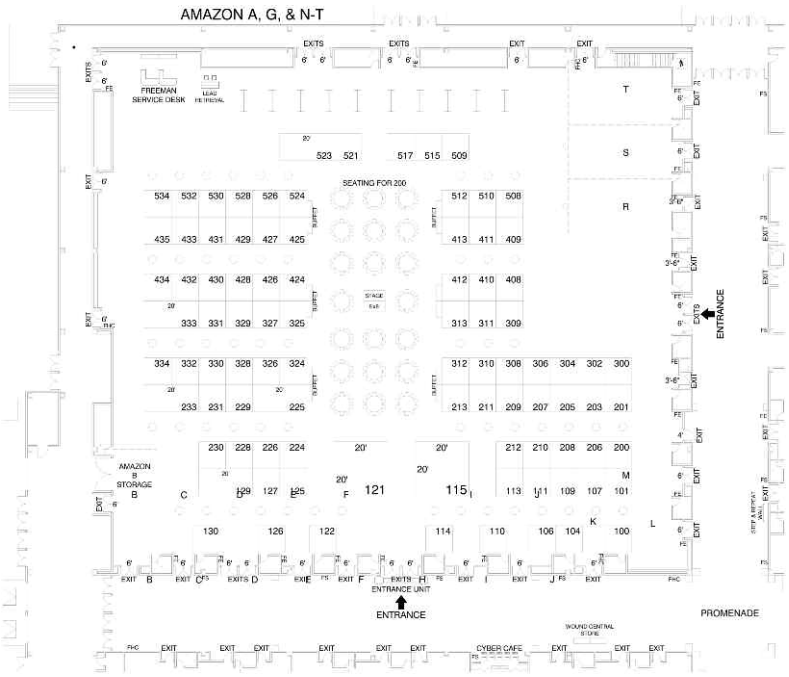
Wild on Wounds
2014 EXHIBITORS

Meet with exhibitors, learn about new products and have a chance to win a great prize!

Exhibits are located in the Amazon Exhibit Hall of Rio Hotel.

Exhibit hours:
Thursday, Sept. 18
12:00 pm to 2:00 pm

Friday, Sept. 19
12:00 pm to 2:00 pm



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AFH is a marketing company that promotes jewelry in over 50 conventions annually. We cater to today's modern, working professional. Please stop by our booth to view our current promotion of purchase any two items in the third piece is free.
www.conventionjewelry.com
See us in the registration area hall

Acelity (KCI, LifeCell, Systagenix)

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Acelity is a global wound care and regenerative medicine company, created by uniting the strengths of KCI, LifeCell and Systagenix. We are committed to advancing the science of healing and restoring people's lives. Headquartered in San Antonio, Texas, Acelity delivers value through our portfolio of innovative and complementary solutions that speed healing, reduce complications and lead the industry in quality, safety and customer experience. We believe in enabling better futures for everyone.
Acelity.com or call: 800-275-4524.
See us at booth 325

Advanced Tissue Co.

7003 Valley Ranch Drive
Little Rock, AR 72223
www.advancedtissue.com or call: 866-217-9900.
See us at booth 327

Advantage Wound Care

863 N. Douglas Ave. #100
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Providing superior bedside surgical wound care for patients in long term health care facilities. Advantage Surgical & Wound Care provides superior professional surgical wound care within the nursing home, SNF, or long term care facility. We provide treatment to those patients that have difficulty traveling to a separate facility for wound care. Surgical treatment that once required lengthy clinic appointments, expensive emergency transfers, or loss of patients to hospitalizations can now be easily performed at bedside, with minimal disturbance to the patient's daily activities, or the facility's nursing staff.
www.advantagewoundcare.org or call: 310-524-1300.
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Amerx Health Care Corporation

1300 S. Highland Ave.
Clearwater, FL 33756
Amerx Health Care brings **Oak Technology** to the practice of wound management through **Amerigel® Advanced Skin and Wound Care Products**. Available only in Amerigel products, **Oakin®** delivers the purest elements naturally produced in select Oak trees to promote wound healing.
www.AMERXHC.com or call: 800-448-9599.
See us at booth 313

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Anacapa Technologies, Inc.

301 E. Arrow Hwy. #106
San Dimas, CA 91773
Anacapa is a veteran-owned, federally-certified small business based in San Dimas, CA. The company is an FDA-licensed drug and device manufacturer engaged in the production of branded proprietary topical anti-infective agents.
www.anacapa-tech.net or call: 909-394-7795.
See us at booth 129

Angelini Pharma Inc.

8322 Helgerman Court
Gaithersburg, MD 20877
Angelini Pharma Inc. is the exclusive distributor of BioPad and Silverstream for the treatment of chronic wounds.
http://angelini-us.com or call: 800 726-2308.
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Argentum Medical, LLC (Silverlon)

2571 Kaneville Court
Geneva, IL 60134
Silverlon dressings are 7 day use metallic silver based antimicrobial barrier dressings for wounds, burns and post-surgical patient care.
www.silverlon.com or call: 888-551-0188.
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BSN Medical, Inc.

5825 Carnegie Blvd.
Charlotte, NC 28209
BSN medical, a global medical device company and one of the leading suppliers in of casting, bandaging, compression therapy and traditional and advanced wound care products. Our well-known brands include: Cutimed®, Gypsona®, Orthoglass®, JOBST®, Delta-cast®.
www.bsnmedical.com or call: 704.554.9933.
See us at booth 127

Calmoseptine, Inc.

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www.calmoseptine.com or call: 714-840-3405.
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Cellerate RX ACTIVATED COLLAGEN (CRX)

CellerateRX – Wound Care Innovations

16633 Dallas Pkwy., Suite 250
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A line of activated collagen products that are used for acute and chronic wounds in the clinic, as well as in surgical closure by many surgeons around the country.
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Central Solutions, Inc.

401 Funston Road
Kansas City, KS 66115
Central Solutions is an FDA and EPA registered formulator of skin care & infection control offerings, including the BoaVida line of skin protectant products.
www.centralsolutions.com or call: 913-621-6542.
See us at booth 225

Coloplast

1601 West River Road
Minneapolis, MN 55411
Coloplast develops products and services that make life easier for people with very personal and private medical conditions. Our business includes ostomy care, urology, continence care, and wound & skin care.
www.coloplast.us or call: 800-533-0464.
See us at booth 126

ConvaTec

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Skillman, NJ 08558
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www.convatec.com or call: 800-422-8811.
See us at booth 122

Crawford Healthcare

2005 South Easton Road
Doylestown, PA 18901
www.crawfordhealthcare.com/us
or email:
us.info@crawfordhealthcare.com.
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www.darcointernational.com or call: 800-999-8866.
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DM Systems Inc.

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www.polymem.com or call: 817-900-1301.
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Las Vegas, NV 89118
(Electrical Nerve Stimulator). A TENS unit is designed to modulate pulse width, frequency, and intensity and is used by doctors, chiropractors, physical therapists, and sports rehabilitators. Its primary functions are pain relief and muscle relaxation but it can also be used for strengthening a muscle (abs, arms, hips), removing cellulites, and losing weight.
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GWM Products, LLC

8925 Sterling Street, ST 100
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www.gwmproducts.net or call: 855-872-2013.
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Suite K103
Englewood, CO 80112
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www.healgenix.com or call: 800-974-5085.
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Healogics

5220 Belfort Road, Suite 130
Jacksonville, FL 32256
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Healogics.com or call: 800-379-9774.
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Hill-Rom Corporate Offices
1069 State Route 46 East
Batesville, IN 47006
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Charlotte, NC 28273
www.joerns.com
www.recovercare.com
or call: 800-826-0270 or
888-750-7828.
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Kiss Healthcare

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Chino Hills, CA 91709
www.kisshealthcare.com or
call: 909-632-1361.
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