

# Wound Care ADVISOR

PRACTICAL ISSUES IN WOUND, SKIN, AND OSTOMY MANAGEMENT

Official journal of National Alliance of Wound Care  
and Ostomy 

**Skin problems in  
lymphedema and  
chronic venous  
insufficiency**

**Business consult:  
How to prove a  
wound was  
unavoidable**

**Best practices:  
Compression  
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**How dietary  
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wound  
healing**

November/December 2013 • Volume 2 • Number 6  
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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.

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PRACTICAL ISSUES IN WOUND, SKIN, AND OSTOMY MANAGEMENT

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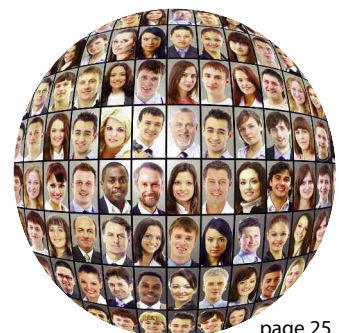
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# Clears the way for healthy tissue

Collagenase SANTYL® Ointment 250 units/g is the only FDA-approved enzymatic debrider that selectively removes necrotic tissue without harming granulation tissue



Collagenase SANTYL® Ointment is indicated for debriding chronic dermal ulcers and severely burned areas.

Occasional slight transient erythema has been noted in surrounding tissue when applied outside the wound. One case of systemic hypersensitivity has been reported after 1 year of treatment with collagenase and cortisone. Use of Collagenase SANTYL® Ointment should be terminated when debridement is complete and granulation tissue is well established.

Please see complete prescribing information on adjacent page.

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**DESCRIPTION:** Collagenase SANTYL<sup>®</sup> Ointment is a sterile enzymatic debriding ointment which contains 250 collagenase units per gram of white petrolatum USP. The enzyme collagenase is derived from the fermentation by *Clostridium histolyticum*. It possesses the unique ability to digest collagen in necrotic tissue.

**CLINICAL PHARMACOLOGY:** Since collagen accounts for 75% of the dry weight of skin tissue, the ability of collagenase to digest collagen in the physiological pH and temperature range makes it particularly effective in the removal of detritus.<sup>1</sup> Collagenase thus contributes towards the formation of granulation tissue and subsequent epithelization of dermal ulcers and severely burned areas.<sup>2, 3, 4, 5, 6</sup> Collagen in healthy tissue or in newly formed granulation tissue is not attacked.<sup>2, 3, 4, 5, 6, 7, 8</sup> There is no information available on collagenase absorption through skin or its concentration in body fluids associated with therapeutic and/or toxic effects, degree of binding to plasma proteins, degree of uptake by a particular organ or in the fetus, and passage across the blood brain barrier.

**INDICATIONS AND USAGE:** Collagenase SANTYL<sup>®</sup> Ointment is indicated for debriding chronic dermal ulcers<sup>2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18</sup> and severely burned areas.<sup>3, 4, 5, 7, 16, 19, 20, 21</sup>

**CONTRAINDICATIONS:** Collagenase SANTYL<sup>®</sup> Ointment is contraindicated in patients who have shown local or systemic hypersensitivity to collagenase.

**PRECAUTIONS:** The optimal pH range of collagenase is 6 to 8. Higher or lower pH conditions will decrease the enzyme's activity and appropriate precautions should be taken. The enzymatic activity is also adversely affected by certain detergents, and heavy metal ions such as mercury and silver which are used in some antiseptics. When it is suspected such materials have been used, the site should be carefully cleansed by repeated washings with normal saline before Collagenase SANTYL<sup>®</sup> Ointment is applied. Soaks containing metal ions or acidic solutions should be avoided because of the metal ion and low pH. Cleansing materials such as Dakin's solution and normal saline are compatible with Collagenase SANTYL<sup>®</sup> Ointment.

Deilitated patients should be closely monitored for systemic bacterial infections because of the theoretical possibility that debriding enzymes may increase the risk of bacteremia.

A slight transient erythema has been noted occasionally in the surrounding tissue, particularly when Collagenase SANTYL<sup>®</sup> Ointment was not confined to the wound. Therefore, the ointment should be applied carefully within the area of the wound. Safety and effectiveness in pediatric patients have not been established.

**ADVERSE REACTIONS:** No allergic sensitivity or toxic reactions have been noted in clinical use when used as directed. However, one case of systemic manifestations of hypersensitivity to collagenase in a patient treated for more than one year with a combination of collagenase and cortisone has been reported.

**OVERDOSAGE:** No systemic or local reaction attributed to overdose has been observed in clinical investigations and clinical use. If deemed necessary the enzyme may be inactivated by washing the area with povidone iodine.

**DOSAGE AND ADMINISTRATION:** Collagenase SANTYL<sup>®</sup> Ointment should be applied once daily (or more frequently if the dressing becomes soiled, as from incontinence). When clinically indicated, crosshatching thick eschar with a #10 blade allows Collagenase SANTYL<sup>®</sup> Ointment more surface contact with necrotic debris. It is also desirable to remove, with forceps and scissors, as much loosened detritus as can be done readily. Use Collagenase SANTYL<sup>®</sup> Ointment in the following manner:

1 – Prior to application the wound should be cleansed of debris and digested material by gently rubbing with a gauze pad saturated with normal saline solution, or with the desired cleansing agent compatible with Collagenase SANTYL<sup>®</sup> Ointment (See **PRECAUTIONS**), followed by a normal saline solution rinse.

2 – Whenever infection is present, it is desirable to use an appropriate topical antibiotic powder. The antibiotic should be applied to the wound prior to the application of Collagenase SANTYL<sup>®</sup> Ointment. Should the infection not respond, therapy with Collagenase SANTYL<sup>®</sup> Ointment should be discontinued until remission of the infection.

3 – Collagenase SANTYL<sup>®</sup> Ointment may be applied directly to the wound or to a sterile gauze pad which is then applied to the wound and properly secured.

4 – Use of Collagenase SANTYL<sup>®</sup> Ointment should be terminated when debridement of necrotic tissue is complete and granulation tissue is well established.

**HOW SUPPLIED:** Collagenase SANTYL<sup>®</sup> Ointment contains 250 units of collagenase enzyme per gram of white petrolatum USP.

Do not store above 25°C (77°F). Sterility guaranteed until tube is opened.

Collagenase SANTYL<sup>®</sup> Ointment is available in 15 gram and 30 gram tubes.

**REFERENCES:** 1. Mandl, I., *Adv Enzymol.* 23:163, 1961. 2. Boxer, A.M., Gottesman, N., Bernstein, H., & Mandl, I., *Geriatrics.* 24:75, 1969. 3. Mazurek, I., *Med. Welt.* 22:150, 1971. 4. Zimmerman, W.E., in "Collagenase," Mandl, I., ed., Gordon & Breach, Science Publishers, New York, 1971, p. 131, p. 185. 5. Vetra, H., & Whittaker, D., *Geriatrics.* 30:53, 1975. 6. Rao, D.B., Sane, P.G., & Georgiev, E.L., *J. Am. Geriatrics Soc.* 23:22, 1975. 7. Vrabc, R., Moserova, J., Konickova, Z., Behoukova, E., & Blaha, J., *J. Hyg. Epidemiol. Microbiol. Immunol.* 18:496, 1974. 8. Lippmann, H.I., *Arch. Phys. Med. Rehabil.* 54:588, 1973. 9. German, F. M., in "Collagenase," Mandl, I., ed., Gordon & Breach, Science Publishers, New York, 1971, p. 165. 10. Haimovici, H. & Strauch, B., in "Collagenase," Mandl, I., ed., Gordon & Breach, Science Publishers, New York, 1971, p. 177. 11. Lee, L.K., & Ambrus, J. L., *Geriatrics.* 30:91, 1975. 12. Locke, R.K., & Heifitz, N.M., *J. Am. Pod. Assoc.* 65:242, 1975. 13. Varma, A.O., Bugatch, E., & German, F.M., *Surg. Gynecol. Obstet.* 136:281, 1973. 14. Barrett, D., Jr., & Klubanski, A., *Am. J. Nurs.* 73:849, 1973. 15. Bardfeld, L.A., *J. Pod. Ed.* 1:41, 1970. 16. Blum, G., *Schweiz. Rundschau Med Praxis.* 62:820, 1973. *Abstr. in Dermatology Digest*, Feb. 1974, p. 36. 17. Zaruba, F., Lettl, A., Brozkova, L., Skrdlantova, H., & Krs, V., *J. Hyg. Epidemiol. Microbiol. Immunol.* 18:499, 1974. 18. Altman, M.I., Goldstein, L., & Horwitz, S., *J. Am. Pod. Assoc.* 68:11, 1978. 19. Rehn, V.J., *Med. Klin.* 58:799, 1963. 20. Krauss, H., Koslowski, L., & Zimmermann, W.E., *Langenbecks Arch. Klin. Chir.* 303:23, 1963. 21. Gruenagel, H.H., *Med. Klin.* 58:442, 1963.

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## Protecting yourself from a job layoff

**W**ith uncertainty over how the Affordable Care Act (ACA) ultimately will affect operations, hospitals and other healthcare facilities are tightening up. In many areas, they're laying off staff. In May, the healthcare industry lost 9,000 jobs—the worst month for the industry in a decade—and another **4,000 jobs were lost in July.**

Medicare, Medicaid, and private insurance companies are reducing reimbursements to care providers, meaning less money is coming in and healthcare facilities have less money to pay out. In my experience, when job cuts are needed, the specialty and subspecialty positions

strategy might sound like a great way to save a job. But poor outcomes, supply costs, and high labor costs eventually win out. In the end, the job will be lost or absorbed into another position. One of the driving forces behind reimbursement in the future is a focus on quality, not quantity. Just as the ACA focuses on quality outcomes, wound and ostomy specialists need to ensure that their treatments and interventions are providing measurable positive outcomes.

Here are some ways to add security to your wound or ostomy care position:

- *Monitor and control wound management costs.* Don't confuse product prices with the cost of care. The real cost of wound care includes dressing costs, labor costs, cost of ancillary supplies (such as gloves and biohazard waste disposal), and cost of the duration of care (for instance, facility charges and travel costs for home care nurses).
- *Save money by using effective treatments with appropriate products.* Don't keep using ineffective treatments after 2 weeks of no change.
- *Increase your credibility.* Serve as a clinical resource who provides support, clinical expertise, and leadership.
- *Be an expert, not a know-it-all.* Know-it-alls overload others with data dump. Experts share specific information based on the consumer's or patient's unique and special needs.
- *Track healing rates along with wound incidence and prevalence.* Avoid focusing too much on the negative and re-



go first. Wound and ostomy care is a subspecialty, so we need to be prepared to protect our jobs—not only for ourselves but for our patients.

At a recent seminar, an attendee candidly admitted she doesn't use extended-wear wound dressings. She uses b.i.d. or t.i.d. dressing changes instead because, with so many treatments needed, her facility has to keep her around. At first, this

member to celebrate the positive.

- *Push prevention protocols and programs even more.*
- *Focus on building relationships with people in your organization and within the community.* Become a liaison between your facility and referring sources to enhance communication and improve coordination of care.
- *Share your accomplishments.* Keep management informed of cost savings, quality outcomes, and treatment successes. Send positive progress reports and updates to your patients' prescribing clinicians.
- *Be enthusiastic.* Let your bosses know you're motivated to work.
- *Think like the boss.* Show how your job performance benefits other parties. Explaining

isn't enough; demonstrate how it helps.

- *Always look for ways to help your employer reduce costs, increase revenues, or reposition a product or service.*

Final thought: If doing ABC gives you XYZ and you continue doing ABC, then you will always get XYZ. "When you can't change the direction of the wind, adjust your sails." – *H. Jackson Brown, Jr.*

*Donna Sardina*

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Check the site often for new wound care clinical information, news, and insight from authoritative experts.



## Hospital pressure-ulcer comparison data not accurate

Performance scores for rates of hospital-acquired pressure ulcers might not be appropriate for comparing hospitals, according to a study in the *Annals of Internal Medicine*.

**“Hospital report cards for hospital-acquired pressure ulcers: How good are the grades?”** funded by the Agency for Healthcare Research and Quality, analyzed 2 million all-payer administrative records from 448 California hospitals and quarterly hospital surveillance data from 213 hospitals from the Collaborative Alliance for Nursing Outcomes.

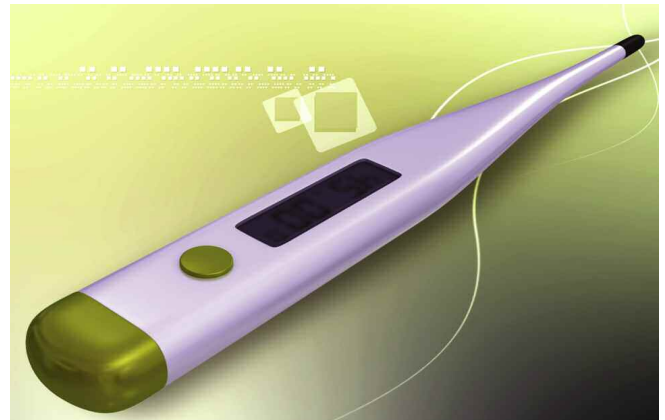
Overall, pressure-ulcer rates were about 10 times lower when they were based on billing data compared to rates calculated from bedside exams by nurses.

“Our findings provide a strong case for removing hospital rates for pressure ulcers from the Medicare’s Hospital Compare website in order to prevent comparisons that may be misleading to patients and policymakers,” says **Jennifer Meddings**, MD, one of the study’s authors.

## Temperature predicts diabetic foot ulcers

A systematic review and meta-analysis published in the *Journal of Foot and Ankle Research* has found that an increase in skin temperature in comparison to the other limb predicts foot ulcers in patients with diabetes.

Two of the authors of **“Is an increase in skin temperature predictive of neuropathic foot ulceration in people with diabetes? A systematic re-**



**view and meta-analysis”** searched the literature from 1960 to July 2011; ultimately, nine studies were selected for analysis based on established criteria.

Two temperature-monitoring techniques were used in the studies: infrared dermal thermometry and liquid crystal thermometry. Infrared is more widely used, more user friendly, and more cost effective.

An important take-away message from the study is temperature monitoring is an effective way to prevent diabetic foot ulcers.



## IFG and HbA<sub>1c</sub> predict diabetes in older adults

A study in *Diabetes Care* finds that older adults with both impaired fasting glucose (IFG) and elevated HbA<sub>1c</sub> levels have “substantially increased odds” of developing diabetes over 7 years.

**“Elevated HbA<sub>1c</sub> and fasting plasma glucose in**

**predicting diabetes incidence among older adults: Are two better than one?**” reviewed data from the Health, Aging and Body Composition study.

An important point of the study is that combined screening with fasting plasma glucose and HbA1c might identify older adults at high risk for diabetes.



## Studies on PAD interventions released

Two studies related to interventions for peripheral arterial disease (PAD) were presented at the 2013 Vascular Interventional Advances conference.

**DEFINITIVE AR**, a prospective, multicenter, randomized pilot study, included 102 patients with claudication who had lesions 7 to 15 cm long in femoropopliteal arteries. Patients either underwent directional atherectomy (using either the SilverHawk™ or TurboHawk™ plaque excision systems) followed by a paclitaxel-coated balloon (a combination referred to as DAART [directional atherectomy and antirestenotic therapy]) or only had the drug-coated balloon inserted.

Thirty days after the procedure, 88.6% of patients who underwent DAART and 89% of patients who only had the balloon inserted experienced improved

claudication of at least one level.

The **DURABILITY II study**, a prospective, multicenter, nonrandomized study, included 287 patients with a Rutherford class 2-4 claudication and femoropopliteal atherosclerotic lesions up to 20 cm in length. Most patients (95%) received a single EverFlex™ self-expanding nitinol stent; the remaining received more than one stent. Three years after the procedure, 70% of patients still had patent vessels. The researchers concluded that the stent is a “reasonable, durable treatment option in this challenging patient cohort.”

## CDC report: Antibiotic resistance deadly in U.S.

“**Antibiotic resistance threats in the United States, 2013**,” published by the Centers for Disease Control and Prevention (CDC), reports that every year, more than 2 million people contract infections that are resistant to antibiotics and at least 23,000 people die as a result.

Infections classified as “**urgent threats**” include carbapenem-resistant Enterobacteriaceae and *Clostridium difficile* diarrhea.

In addition to the human costs, antibiotic resistance adds \$20 billion in excess direct healthcare costs, with additional costs for lost productivity as high as \$35 billion a year.

The most important factor leading to antibiotic resistance is the inappropriate use of antibiotics. Up to half of antibiotics prescribed aren't needed or aren't prescribed appropriately.

The CDC suggests four core actions for addressing the problem:

- Preventing infections, preventing the spread of resistance
- Tracking resistance patterns

- Improving use of today's antibiotics (antibiotic stewardship)
- Developing new antibiotics and diagnostic tests

"If we don't act now, our medicine cabinet will be empty and we won't have the antibiotics we need to save lives," said CDC director Tom Frieden, MD, MPH.

Download an **infographic** about the report.

## Dehydrated amniotic membrane allografts improve wound healing

Adding dehydrated human amniotic membrane allografts (EpiFix®) to standard wound care improves wound healing in patients with diabetic foot ulcers, according to a study in *International Wound Journal*.



"A prospective randomised comparative parallel study of amniotic membrane wound graft in the management of diabetic foot ulcer," a prospective, randomized clinical trial, compared wound healing in two groups of patients: those who received standard care and those who received EpiFix.

After 6 weeks, the overall healing rate for patients who received EpiFix was 92%, compared to only 8% for patients who received standard therapy.



**View: EpiFix video**

## Inpatient diabetes education reduces hospital readmissions

The study "**Inpatient diabetes education is associated with less frequent hospital readmission among patients with poor glycemic control,**"



published in *Diabetes Care*, found patients with poorly controlled diabetes who received teaching had a readmission rate of 11% 30 days after discharge compared to 16% for those who didn't have the instruction. Education was also associated with reduced readmissions within 180 days, although the relationship was "attenuated."

The authors included 2,265 patients in the 30-day hospital readmission analysis and 2,069 patients in the 180-day analysis.

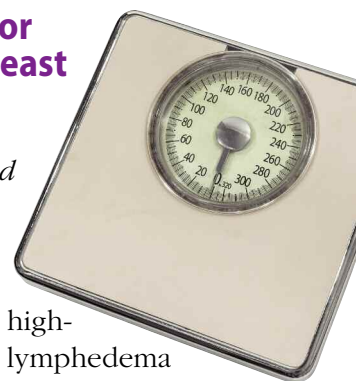
Patients received education from a certified diabetes educator or trainee.

## High BMI risk factor for lymphedema after breast cancer surgery

*Breast Cancer Research and Treatment* has published a research study that finds women who have a body mass index (BMI) of 30 or higher are at increased risk for lymphedema after surgery for breast cancer. Patients whose weight fluctuated by 10 pounds after surgery were also at higher risk.

"**Impact of body mass index and weight fluctuation on lymphedema risk in patients treated for breast cancer**" included 787 newly diagnosed breast cancer patients in the study.

The authors recommend "close monitoring or early intervention" for patients identified to be at risk. ■



## The long and short of it: Understanding compression bandaging

What you need to know  
about long-stretch and  
short-stretch compression  
bandaging in patients  
with peripheral arterial  
disease

By Robyn Bjork, MPT, WCC, CWS, CLT-LANA

**M**argery Smith, age 82, arrives at your wound clinic for treatment of a shallow, painful ulcer on the lateral aspect of her right lower leg. On examination, you notice weeping and redness of both lower legs, 3+ pitting edema, several blisters, and considerable denudement of the periwound skin. She is wearing tennis shoes and her

*feet have relatively little edema, but her ankles are bulging over the edges of her shoes; both socks are wet. Stemmer's*

*sign is negative. The wound on the right leg is draining copious amounts of clear fluid; it's dressed with an alginate, which is secured with conforming roll gauze. No signs or symptoms of infection are present.*

*Staff report Mrs. Smith recently had pneumonia and, at that time, started sleeping in her recliner at night due to difficulty breathing. She has chronic heart failure (HF) and usually has 1+ pitting edema of the legs, but had no skin problems before that. Acute HF has been ruled out. She also has Alzheimer's disease and wanders at night. She can't operate her recliner's electronic controls independently and fell twice trying to get out of the chair after the staff elevated the leg rest for her. Now they elevate her legs on a low stool and use a chair alarm.*

*In the past, Unna's boots were applied to both legs. But Mrs. Smith became agitated, and staff cut them off when a circumferential wound developed on the upper calf. Venous Doppler exam reveals an old deep vein thrombosis in the right leg. Ankle-brachial index (ABI) is 0.65 in the right leg and 0.7 in the left. Based on her ABI, a colleague informs the staff that compression therapy is contraindicated because Mrs. Smith has peripheral arterial disease (PAD). Meanwhile, her ulcer is getting worse and the family is unhappy with the situation.*

How would you heal this wound? As you've no doubt noticed, wound healing is more complicated than just wound assessment and treatment. To select the most appropriate bandaging system, you must understand the concepts of extensibility, recoil, containment, and working and resting pressures. This article can help



you understand bandaging principles so you can confidently and effectively treat edema and heal wounds such as those of Mrs. Smith.

### Extensibility: Long-stretch vs. short-stretch bandages

Extensibility is simply how much a bandage stretches.

- *Long-stretch* bandages contain elastic fibers that enable stretching to approximately 140% to 300% of their original length. Ace™ bandages are an example.
- *Short-stretch* bandages are woven with cotton fibers and stretch to about 30% to 60%. Examples include the Rosidal K® and Comprilan® bandages typically used in lymphedema management. A short-stretch system used in venous ulcer management is the Coban™ 2 layer compression system.

Some compression systems used in wound care have three or four layers. Although the total applied pressure of the bandaging system may be indicated in millimeters of mercury of force (mm Hg), individual layers may not be labeled as short-stretch or long-stretch. To test for yourself, simply stretch each layer to determine its type.

### Working pressure and containment

Different bandaging systems have different effects on the venous and arterial systems and ultimately on edema. The effects relate to working and resting pressures, which I like to describe as containment and recoil. As a wound care clinician, you need to

## Comparing short-stretch and long-stretch bandages

This chart describes some of the features of short-stretch and long-stretch bandages.

Short-stretch bandages	Long-stretch bandages
<ul style="list-style-type: none"><li>• Provide high working pressure and low resting pressure</li><li>• Promote calf-muscle pump</li><li>• Offer excellent edema containment</li><li>• Improve peripheral venous and arterial blood flow</li></ul>	<ul style="list-style-type: none"><li>• Provide low working pressure and high resting pressure</li><li>• Don't promote calf-muscle pump</li><li>• Offer poor edema containment</li><li>• May be hazardous for patients with peripheral arterial disease</li></ul>

understand how short-stretch and long-stretch bandaging systems differ so you can make the right choices for your patients. (See *Comparing short-stretch and long-stretch bandages*.)

Roughly 60% to 80% of the body's total blood volume resides in the venous circulation, ranging from 60 to 150 mL. The 2012 International Lymphoedema Framework's position document for compression therapy states that blood pressure in the foot veins is 10 to 20 mm Hg in a supine position and 80 to 100 mm Hg in a standing position. During ambulation, when the calf muscle pump is functioning and vein valves are competent, blood pressure decreases to 30 mm Hg.

During walking or weight shifting, calf-muscle contraction is the primary means of returning blood to the heart through the veins. Pressure generated from the calf muscle can reach up to 300 mm Hg, propelling 60% of venous volume proximally with each contraction. Multilayered short-stretch bandages create an external force against calf-muscle contraction. They

cause generation of inward pressure because they don't allow calf muscles to bulge outward when they contract and shorten. This force compresses and pumps the veins, propelling blood toward the heart; graduated compression of bandages (more pressure at the ankle than calf) prevents backward blood regurgitation through incompetent veins. This is called *working pressure*. Thus, multilayered short-stretch bandaging systems cause high working pressure. Multilayered short-stretch bandages also act as a semirigid force to prevent expansion of edema. They offer excellent containment of all forms of edema.

In contrast, long-stretch bandages stretch as edema increases. They also provide little resistance to calf-muscle contraction. Therefore, they have low working pressure, don't promote the calf-muscle pump, and provide poor edema containment.



**View: Calf-muscle pump video**

### **Resting pressure and recoil**

Resting pressure is the inward force a bandaging system exerts on a limb at rest, such as when the patient sleeps. It results from recoil of elastic fibers or the weave of cotton fibers in a bandage. Long-stretch bandages, which have elastic fibers, have high extensibility and recoil and therefore high resting pressure.

This sustained resting pressure poses a problem for patients with arterial disease. For example, at night, perfusion of an extremity decreases as the heart rate slows, blood pressure decreases, and the legs are elevated. Patients may tolerate a bandaging system with a long-stretch layer during

the day but may experience increased pain at night. In contrast, short-stretch bandages exert low resting pressure due to their limited recoil and are safer for patients with concurrent PAD.

According to experts, short-stretch bandaging systems with up to 40 mm Hg of compression can be applied safely to patients with ABIs above 0.5 and absolute ankle systolic blood pressure higher than 60 mm Hg. One study found short-stretch compression increased arterial blood flow to the limb and periwound skin by 28% when 31 to 40 mm Hg of compression was applied and increased venous ejection fraction by 103%.

### **Making the right choice for Mrs. Smith**

For Mrs. Smith, I'd start with a lightweight, padded, short-stretch bandaging system such as the Coban Lite 2 layer compression system, made up of a thin foam inner layer and an outer short-stretch Coban layer. (*Note:* Most Coban rolls are medium stretch unless labeled short stretch.) This will enable her to walk at night. Short-stretch bandages have low resting pressure, so they're safe to apply even though she has underlying PAD. The foam padding will protect her skin and avoid constriction and edging at the proximal aspect of the bandage. Also, the short-stretch system will recoil a bit as edema decreases, preventing the bandage from sliding down. When she walks, it will exert high working pressure to improve venous return.

Since Mrs. Smith's recovery from the acute bout of pneumonia, staff need to reestablish the pattern of her sleeping in bed instead of the recliner, to decrease her dependent edema. This will keep her bandages from becoming tighter and un-



comfortable at night. Once her venous and dependent edema improve, her skin ulcer will heal rapidly and the leg blisters and redness will resolve. Alginate or foam can still be used effectively under the bandaging system, and skin protectant can be applied to prevent further denudement.



**Click here** if you're concerned whether to apply compression to a patient with HF, like Mrs. Smith.

**Click here** to download the International Lymphoedema Framework's consensus document for compression therapy.

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# How dietary protein intake promotes wound healing

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

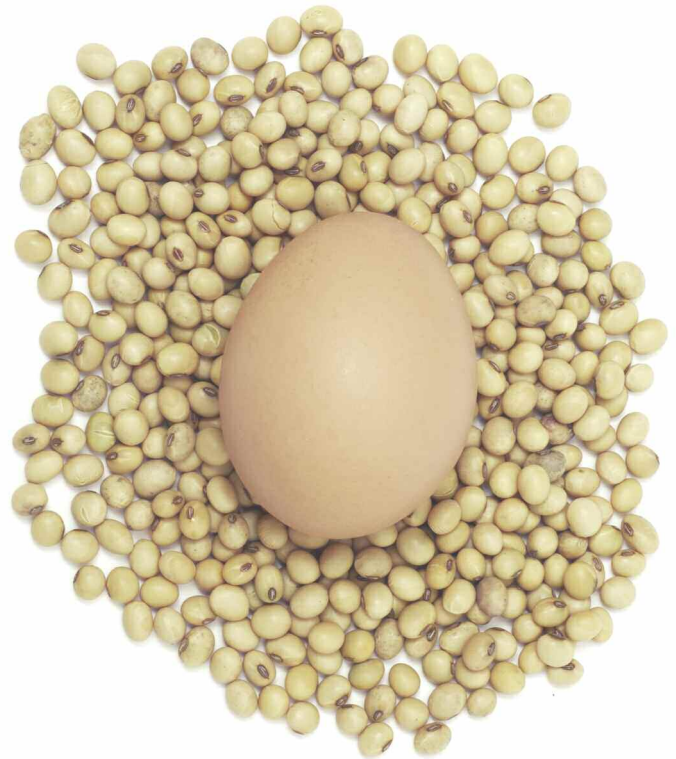
By Nancy Collins, PhD, RD, LD/N, FAPWCA, and Allison Schnitzer

**N**utrition 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<sub>2</sub>), 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 re-

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

quirements sometimes reach 1.5 to 3 g/kg to offset extensive protein loss through urine and burn-wound exudate.

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 beverage.

## 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](http://www.boost.com/nutritional-drinks/boost-original?gclid=COi9_uKDj7gCFegWMgodfWIA1Q)
- [www.carnationbreakfastessentials.com](http://www.carnationbreakfastessentials.com)
- [www.ensure.com](http://www.ensure.com)
- [www.pro-stat.com](http://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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## What you need to know about hydrogel dressings

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

Hydrated polymer (hydrogel) dressings, originally developed in the 1950s, contain 90% water in a gel base, which helps regulate fluid exchange from the wound surface. Hydrogel dressings are usually clear or translucent and vary in viscosity or thickness. They're available in three forms:

- *amorphous* hydrogel—free-flowing gel, packaged in tubes, foil packets, and spray bottles
- *impregnated* hydrogel—amorphous hydrogel saturated onto a gauze pad, nonwoven sponge ropes and/or strips
- *sheet* hydrogel—a gel supported by a thin fiber mesh. The dressing can overlap intact skin and generally won't harm it. It's available with and without adhesive borders and can be cut to fit the wound.

### Benefits

By providing moisture to the wound, hydrogel dressings create a moist healing en-



Types of hydrogel dressings, clockwise from top left: amorphous, impregnated, and sheet.

vironment, which promotes granulation, epithelialization, and autolytic debridement. The high water content of hydrogel dressings cools the wound, producing pain relief that can last up to 6 hours. Dressing-change discomfort is also reduced because hydrogels don't adhere to the wound surface.

In summary, hydrogel dressings:

- are soothing and reduce pain
- rehydrate the wound bed
- facilitate autolytic debridement
- fill in dead space (amorphous and impregnated types)
- can be used when infection is present.

### Indications

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

- dry or slightly moist wounds
- soothing painful wounds

- partial- and full-thickness wounds
- wounds with granulation tissue, eschar, or slough
- abrasions or minor burns
- radiation skin damage.

## Disadvantages

Hydrogel dressings are *not* recommended for wounds with heavy exudate. In addition:

- some require a secondary dressing
- some are difficult to secure
- they may cause periwound maceration
- they can dehydrate easily if not covered.



Amorphous hydrogel dressing

## Frequency of dressing changes

The frequency of dressing changes varies from daily to every 4 days depending on specific manufacturer guidelines.

1. Wash your hands and put on gloves.
2. Note the date on soiled dressing; then remove it and put it in a trash bag.
3. Remove your gloves, wash your hands, and put on new gloves.
4. Clean the wound with normal saline or prescribed cleanser.
5. Pat the tissue surrounding the wound dry with clean gauze.
6. Remove your gloves, wash your hands, and put on new gloves.
7. Apply liquid barrier film or moisture barrier ointment to the periwound area to protect the skin from maceration.
8. Apply the dressing

### *Amorphous hydrogel dressing*

- a. Apply the product with a sterile tongue blade or cotton-tipped applicator, spreading it evenly over the wound

bed to a thickness of 5 mm (¼ inch). Or, a sterile gauze pad may be saturated with hydrogel and placed into the wound with no overlap onto the surrounding skin.

- b. Insert appropriate packing materials as needed.
- c. Cover the dressing with a secondary wound dressing. The secondary wound dressing should cover the entire wound bed.

### *Gauze impregnated with hydrogel*

- a. Lay the dressing directly on top of the wound or loosely pack it into the wound bed.
- b. Cover the dressing with a secondary wound dressing. The wound dressing should cover the entire wound bed.

### *Sheet hydrogel*

- a. Use a marker to trace the outline of the wound on the dressing.
  - b. Using clean scissors, cut the hydrogel sheet to the size of the wound.
  - c. Apply the sheet to the wound bed, taking care not to overlap onto intact skin.
  - d. Cover the sheet with a secondary wound dressing. The wound dressing should cover the entire wound bed.
9. Dispose of waste in an appropriate container. Remove your gloves and discard; then wash your hands.

## How to remove

1. Wash your hands and put on gloves.
2. Gently remove the secondary wound dressing.
3. Remove the hydrogel dressing:
  - a. Amorphous hydrogel dressing: Rinse away any remaining gel with a wound cleanser or normal saline if necessary.
  - b. Hydrogel impregnated gauze or hydrogel sheet: Gently lift one edge of



the dressing and peel it back slowly. If the dressing has adhered to the wound surface, saturate the dressing with wound cleanser or normal saline to soften it; then gently remove.

4. Check the removed dressing for type, amount, color, and consistency of exudate.

Discard the old dressing in an appropriate container. Remove your gloves and discard; then wash your hands.

### Examples

Here are links to samples of each type of hydrogel dressing:

- [Amorphous hydrogel dressings](#)
- [Impregnated hydrogel dressings](#)
- [Sheet hydrogel dressings](#)

### PATIENT EDUCATION RESOURCE

**University of Virginia Health System hydrogel dressing instructions.**

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## How do you prove a wound was unavoidable?

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

A pressure ulcer that a patient acquires in your facility or a patient's existing pressure ulcer that worsens puts your organization at risk for regulatory citations as well as litigation. Unless you can prove the pressure ulcer was unavoidable, you could find yourself burdened with citations or fines, or could even end up in court.

### Unavoidable pressure ulcers

In 2010, the National Pressure Ulcer Advisory Panel (NPUAP) hosted a multidisciplinary conference to establish a consensus on whether all pressure ulcers are avoidable. The panel reached a consensus that unavoidable pressure ulcers may develop in patients who:

- are hemodynamically unstable
- are terminally ill
- have certain medical devices in place
- are nonadherent with repositioning and artificial nutrition.

Although the panel agreed that certain situations can lead to unavoidable pressure ulcers, it emphasized the care setting should provide pressure-ulcer prevention.

### Making the case

So how do you prove the pressure ulcer was unavoidable? With the nursing process: Assess, develop a plan of care based on the assessment, implement the plan of care, and evaluate and revise the



plan of care as needed. Following this process helps you prove the patient's skin broke down despite appropriate preventative interventions.

All patients should be assessed for pressure-ulcer risk factors. Although the Braden Scale for predicting pressure ulcer risk is a good place to start, remember to assess for additional risk factors to ensure your assessment is truly comprehensive. These factors include such diagnoses as cancer, such medications as steroids, and nonadherence to the plan of care.

Base the plan of care on the results of your assessment, with the goal of modifying, stabilizing, or eliminating the ulcer risk factors. Ensure interventions correlate with identified risk factors. For example, if the patient is immobile, then appropriate correlating interventions might be a pressure redistribution mattress and wheelchair cushion, a turning and repositioning schedule, and heel lift devices. A common issue with plans of care is that they don't always reflect all the good care you're

providing. It's best to audit them on a regular basis.

Once the plan of care is developed, it's time to put it into action. Nursing assistant assignment sheets should clearly reflect the interventions they should be providing, including the type of products that should be used. All staff members are responsible for monitoring the patient to ensure interventions are being completed. If the patient is nonadherent with the plan of care, have a risk/benefit conversation with the patient and provide alternatives, if possible. Fully document the conversation in the patient's health record, and be sure the plan of care reflects the patient's wishes.

At scheduled time frames per your care setting, and with any significant changes in the patient's condition, complete a new risk assessment; then review and update the plan of care as needed.

### Protect yourself and your organization

Overall, your goal is to prove you assessed for risk factors and implemented a plan of care based on what you found; however, despite your best efforts, the patient developed a pressure ulcer. If your documentation and plan of care clearly reflect the interventions you have been implementing, you'll be able to make your case that the ulcer was unavoidable. ■

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

## Making professional connections

### Improving your networking skills can help you climb the career ladder.

By Kathleen D. Pagana, PhD, RN

Are you making connections that benefit your career? Are you comfortable starting a conversation at a networking session? Do you know how to exit a conversation gracefully when it's time to move on?

These are questions and concerns many clinicians share. Career success takes more than clinical expertise, management savvy, and leadership skills. Networking can be the critical link to success. This article helps you improve your networking skills by focusing on what to do before, during, and after a networking opportunity.

### The value of networking

Networking is all about making connections and forming relationships. Business gets done through relationships. These relationships connect you to new colleagues, new opportunities, new information, and different practice settings. For example, at a convention, I met a manager for a large



## Expanding your network

Stumped for ways to make more connections? Here are some ideas.

- Join professional organizations.
- Attend professional meetings.
- Serve on committees.
- Volunteer in your community.
- Participate in local sports by joining a league or team.
- Attend cocktail receptions.
- Join a health club or gym.
- Use social media, such as LinkedIn.

healthcare organization, who told me he needed speakers and asked if I had an interest. This contact has led to more than 50 speaking engagements.

Don't make the mistake of thinking networking occurs only in professional settings. It can happen anywhere. Don't underestimate its power, either. Several years ago, I was at a yoga class when a friend told me her son was seeking a sales position at a laboratory and diagnostic testing company. I had a personal contact at that company, and through this connection, her son was able to get an interview that led to a job. So think of networking as part of your job, not just as an add-on to indulge in when you have time. (See *Expanding your network*.)

### Getting ready to network

Before a networking opportunity, be sure to plan. Find out who will be there, and plan to meet at least several new people. You may be able to ask a colleague to introduce you personally to someone you've been wanting to meet.

Prepare by being well read. Read newspapers, magazines, and key journals or newsletters related to your conference or specialty. Determine what type of clothing

to wear for the event. You'll have enough on your mind; why worry about your clothing? You don't want to show up at a dressy cocktail party in a business suit, or not attend because you didn't pack the right clothing.

I'm amazed at how many people I meet at networking events who don't have a business card. Handing out a business card is one of the best ways to follow up and stay connected. Many online businesses, such as VistaPrint.com, offer cards at a low cost.

But don't pass out your business cards as though you're dealing a deck of cards. You want people to ask for your card. To make this happen, ask the other person for his or her card. (See *How to avoid networking mistakes*.)

### Networking in action

Networking is active, not passive. Always be ready to introduce yourself. Don't just stand next to someone waiting to be introduced; take the initiative. Put out your hand for a firm handshake and state your name in a confident voice. For example, "Hi, I'm Mary Balon. I'm a wound care nurse."

Small talk is an easy way to start a conversation until you find a commonality. It breaks the ice and makes people feel comfortable. If you have trouble getting a conversation started, use the acronym OAR. In the example below, imagine you're standing next to someone at a convention in Boston.

- **O**bserve. Make an observation. ("It looks as if there are thousands of people here.")
- **A**sk a question. ("Have you attended this conference before?")
- **R**eveal something about yourself. ("This is my first time in Boston.")

You can practice this easy technique anywhere, anytime—for instance, when standing in a cafeteria line, waiting for a meeting to start, or checking out at the grocery store.

### Networking no-no's

Networking doesn't mean flitting from person to person, handing out business cards and pumping hands with as many people as possible in a brief period of time. If you don't care about the people you meet, they'll sense your insincerity. Instead, show respect, courtesy, and consideration for others. We may forget what people say to us, but we remember how they made us feel. One of the most important things we can offer someone is our full attention. Be a good listener. Focus on being a good resource for others—not on your own agenda.

Don't monopolize those you meet. The last thing you should do is tie people up and prevent them from moving on and meeting others. When it's time to disengage from a conversation, do it gracefully. Here are some polite ways:

- “It was great meeting you. I'll let you have some time to speak to others.”
- “It was great speaking with you. I hope to connect later during the convention.”
- “Juliana, it has been a pleasure meeting you. Will you excuse me? I see my roommate over there, and I promised I'd catch up with her.”

### Networking follow-up

Networking doesn't end when the conference or meeting does. If you planned to follow up with someone you met, do it. Once you've returned to work, it's easy to get busy and forget to follow up.

Make following up a priority by sched-

## How to avoid networking mistakes

The table below lists common networking mistakes and gives tips for avoiding them.

Networking mistake	How to avoid it
Skipping the networking reception	Arrive early and plan to mingle.
Having a negative attitude	Approach the event with enthusiasm.
Focusing only on your personal agenda	Try to be a resource for others.
Forgetting your business cards	Always carry your business cards.
Connecting only with your friends	Plan to expand your network.
Failing to follow up	Schedule time for following up on the connections you've made.

uling time for it. Look for ways to keep connecting with people. Send notes, meet for lunch, and acknowledge accomplishments. Relay information (useful articles, websites, information about a job opening or other opportunity) to someone who could benefit. Don't connect only when you need a favor.

Building new relationships is the essence of networking. Whom you know and the connections you develop affect your success. The “soft” skill of networking can make a big difference in your career. ■

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# Making sure patients have the ostomy supplies they need

By Connie Johnson, BSN, RN, WCC, LLE, OMS, DAPWCA

**N**o matter where you work or who your distributors are, ensuring the patient has sufficient ostomy supplies can be a challenge. Whether you're the nurse, the physician, the patient, or the family, not having supplies for treatments can heighten frustration with an already challenging situation, such as a new ostomy. Here's how to reduce the chance of experiencing frustrations related to ostomy supplies.

## Start early

Start teaching patients about ostomy supplies preoperatively, if possible. Although the ostomy size and whether convex products are needed can't be determined until the postop visit, you can explain what is available from different companies and the best options for obtaining supplies, depending on whether or not the patient has insurance. Postop teaching is difficult enough with a major life-changing situation and postop pain, so taking initial steps before surgery helps the patient feel better prepared. Keep in mind, however, that preop teaching in an emergency situation isn't always an option.

## Acute and subacute care

For patients in an acute-care setting, all supplies are provided as part of the daily rate of service. The hospital's group-

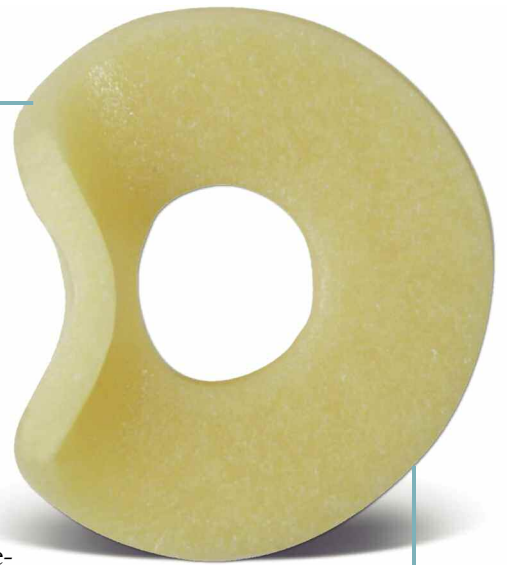
purchasing contract determines which company provides ostomy supplies. Frequently patients and families are provided with several supplies be-

fore discharge to help get home care started. It's also important to help patients and families to set up an ordering process.

In some cases, patients may need sizes not provided through the designated supplier, so you'll have to obtain supplies from another company. Some patients may also need personal molding; the only company that supplies a molding kit and personalized appliances for patients is **Nu-Hope Ostomy**.

The average cost is \$10 for a box of 10 barriers as well as \$10 for a box of 10 pouches, which are billed to the hospital as part of the day rate. Personalized pouches are more expensive, and cost depends on several factors: size, convexity, or whether one or two pieces are needed. Patients frequently incur out-of-pocket expense for these special needs when they aren't in a hospital or rehabilitation facility or they are under home care services. Out-of-pocket expense begins when patients are discharged from service. Medicare provides minimal reimbursement for specialty-made appliances.

Subacute-care facilities pay a higher rate for supplies: an average of \$120 for a box of 10 barriers and \$120 for a box of 10 pouches. When a patient is in subacute care, the cost of supplies is covered by the day rate, although the facility is charged more for the same product by the distributor than what an acute-care setting pays.



## Long-term care

Long-term care supplies are normally provided by families, or the facility where the patient resides can help with purchasing appropriate supplies through local distributors and/or durable medical equipment (DME) companies. Patients who are insured usually still have a copay. Supply costs are similar to those of subacute-care facilities—an average of \$120 per box of both barriers and pouches.

Medicare has specific guidelines that most insurance companies follow when it comes to supply coverage—20 barriers and 20 pouches monthly. This may seem like an overabundance of supplies because patients experience an average wear time of about 3 to 5 days. On the other hand, if patients have a few bad days, (for instance, due to an inability to apply the stoma barrier correctly, using multiple wafers because skin moisture or effluent leaking while changing the appliance), they can easily use up their month's allotment before the month is out. If there is a significant change in the stoma and a new barrier or pouch is needed, this becomes an additional patient expense.

## Home care

Home care situations are slightly different. While being treated through a home care agency, Medicare patients have their supplies provided and paid for by the agency. Private insurance and self-pay patients are expected to provide their own supplies through local distributors, with the assistance of the home care agency. The cost of supplies from distributor to home care agency and the cost of supplies for patients to purchase from a local DME or home medical supplier remains un-

changed at an average of \$120 per box of barriers or pouches.

## Advice for patients

Let patients know that planning ahead is important. For most distributors, the time from order to delivery is 24 hours to 3 days. If personalized pouching is necessary, shipping can take anywhere from 7 to 10 days. Here are some other key education points:

- Have an ostomy clinician as a resource.
- Know where you can obtain your supplies, and have a back-up distributor in case supplies from your current distributor are temporarily disrupted.
- If you are a self-pay patient or are unable to afford supplies, your local ostomy clinician may be able to guide you to obtaining supplies free of charge or at a minimal fee. One possible source is the company that makes the product; some companies offer older-model or discontinued supplies at reduced costs (or for free) to those in need.
- Contact the United Ostomy Association of America (UOAA) with questions. UOAA is an excellent source for ostomy-care information. And if you are fortunate enough to have your ostomy reversed, the UOAA can help you identify where you can donate unused supplies.

## Helping patients help themselves

Working to maintain patients' dignity can be difficult during major life-changing events, such as an ostomy. Although we clinicians can't have all the answers, providing education and resources related to supplies can help ease the stress of patients and their families. ■

Connie Johnson is a wound care nurse/ostomy management specialist in Plainsboro, New Jersey.

# Dermatologic difficulties: Skin problems in patients with chronic venous insufficiency and phlebolymphe­dema

Learn how to identify and treat these challenging skin conditions.

By Nancy Chatham, RN, MSN, ANP-BC, CWOCN, CWS; Lori Thomas, MS, OTR/L, CLT-LANA; and Michael Molyneaux, MD

**S**kin problems associated with chronic venous insufficiency (CVI) and phlebolymphe­dema are common and often difficult to treat.

The CVI cycle of skin and soft tissue injury from chronic disease processes can be unrelenting. If not properly identified and treated, these skin problems can impede the prompt treatment of lymphede­ma and reduce a patient's quality of life.

This article reviews skin problems that occur in patients with CVI and phlebo­lymphe­dema and discusses the importance of using a multidisciplinary team approach to manage these patients.

## Understanding dermatologic changes

The dermatocellular and pathophysiologic changes that occur in patients with CVI and phlebolymphe­dema are a result of years of abnormal vascular and lymphatic flow. There is increasing evidence that the structural fibroproliferative tissue changes in this patient group are caused by fibrin cuffs and white blood cell activation and trapping. Fibroproliferation leads to thickening of the epidermal, dermal, and soft-tissue structures of the affected limb, which damages the skin capillaries and



makes them less structurally sound. Once capillaries lose structure, lymphatic pressure increases and leads to lymphatic structural damage and phlebolymphe­dema.

Scientists also have identified the abnormal expression of inflammatory cytokines, adhesion molecules, and growth factors in patients with CVI. In addition, they've found abnormal extracellular matrix in the dermal and epidermal layers. These cellular changes have been identified in patients with early-stage CVI, whose only symptoms may be swelling and dermatitis.

Changes in the skin are a key way to identify the presence of phlebolymphe­dema in patients. It's important to recognize that many of these changes indicate that both CVI and lymphede­ma are present, which influences the treatment protocol used. If lymphede­ma is present, for example, complete decongestive therapy



## About lymphedema

Lymphedema is a chronic condition marked by the accumulation of protein-rich fluid and changes to the tissue and skin. It's the protein in the fluid that makes lymphedema different from other edemas, such as the edema seen in early-stage chronic venous insufficiency (CVI). The high protein levels also contribute to the chronic skin changes that characterize the progression of lymphedema.

These skin changes are hallmarks in the staging of lymphedema. It's not the size of the limb or the amount of time a person has had lymphedema that defines the stage; it's the skin.

**Stage 1:** Significant skin changes haven't occurred, but protein-rich edema is present and pitting occurs. At this stage, lymphedema can be easily confused with other types of edema.

**Stage 2:** As lymphedema progresses, frequent infections (cellulitis) may occur and chronic skin changes begin to appear. The tissue becomes harder (fibrotic) and more difficult to pit. Edema no longer reduces with elevation, and there is often a positive Stemmer sign (when the skin at the dorsum of the second toe is thicker and difficult to lift up).

**Stage 3:** If the condition continues without proper treatment, the patient can progress to stage 3. In stage 3, more severe skin changes are noted, such as hyperkeratosis, papillomas, cysts, fistulas, fibrosis, deep skin folds, and even ulcerations.

Skin care is extremely important in the treatment of lymphedema. Because the lymphatic system plays an important role in the immune system, a patient's limb is at a

higher risk of infection when the skin barrier is broken and the lymphatic system compromised.

The treatment for lymphedema is complete decongestive therapy (CDT), which includes skin care as one of the main components. Skin conditions can pose a problem when treating patients with CVI and phlebolymphe-  
dema. Compression therapy using multicomponent wraps, local wound care, and CDT is the standard of care for treating this patient population. However, many of the common skin conditions that occur in patients with CVI and phlebolymphe-  
dema are considered a contraindication to compression therapy as well as manual lymphatic drainage.

Download "[Lymphedema Risk Reduction Practices](#)," a position statement from the National Lymphedema Network.

(CDT) should be used if no contraindications exist.

Descriptions and treatments for many of the skin conditions that commonly occur in this chronic disease process are included in the following list, which is organized alphabetically.

### Atrophie blanche

Atrophie blanche lesions are fragile, smooth, ivory-white plaques associated with changes in the thin soft tissue. In patients with CVI, these lesions are a pre-ulcer state as opposed to a scar from previously healed ulcerations. Scattered petechial flecks are often seen within the atrophy tissue and hemosiderin pigmen-



tions in the periphery of the lesion.

Treatment for atrophie blanche isn't agreed upon in the literature, but identifying the cause can help drive the development of individualized plans of care. The daily plan of care for CVI-related disease, for example, includes conservative compression therapy, limited use of low-potency topical steroids for 2 weeks, and therapeutic creams. Take special care when applying compression to areas of atrophie blanche to avoid secondary injury.



### Cellulitis

Commonly seen in patients with CVI and lymphedema, cellulitis is a soft-tissue in-

fection caused by a secondary bacterial invasion. It's treated with systemic antibiotic therapy based on the severity of the presenting symptoms. In addition, topical antimicrobials are used to absorb and contain drainage. In cases of acute cellulitis, postpone compression therapy and manual lymphatic drainage (MLD) until the patient has been actively treated with antibiotics and symptoms have improved.



**Excoriation** with pruritus is a common complaint in patients with cellulitis and likely related to edema and release of mast cells. Treatment consists of routine skin care with fragrance-free, pH-balanced mild cleansers, therapeutic creams, topical steroids twice a day for 2 weeks, and compression therapy. Oral antihistamines may be beneficial in addition to a short course of systemic steroids. If there's no improvement with treatment, refer the patient to a dermatologist.



### Cutaneous fungal infections

Patients with CVI and phlebolymphe­dema are typically managed with compression hose and multicomponent compression wraps that can predispose them to the development of cutaneous fungal infections. The dermatophyte fungi—a common cause of infections of the skin, hair, and nails—are made up of three categories: *Microsporum*, *Trichophyton*, and *Epidermophyton*. In clinical practice, the term “tinea” is used to describe the fungal disease, followed by the location of the infection.



Onychomycosis is an example of tinea of the nail and nail plate.

Untreated cutaneous fungal infection is a contraindication to active MLD. Long-term treatment is often required to treat these infections. Topical therapy should be applied twice a day for 4 weeks. Before prescribing oral therapy for cutaneous fungal infections, assess the patient's liver function and monitor liver function during treatment.

### Fibromas

Fibromas are benign skin lesions formed by the collection of fibrous connective tissue. Fibromas that are associated with dilated lymphatic vessels can be soft stalk or mushroom-like in appearance, similar to skin tags. They are typically nontender. During compression wrapping, use protective barriers to prevent traumatic injury of fibromas. Treatment is generally conservative, but fibromas can be surgically removed if necessary.



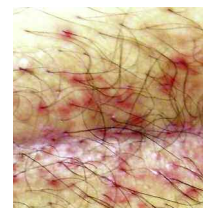
### Fissures

Fissures are cracks in the epidermis and dermis, commonly associated with a buildup of hyperkeratosis and anhidrosis. Treatment includes debridement of the hyperkeratosis and exfoliating after bathing, followed by therapeutic moisturizing creams applied to the affected area of the patient's skin.



### Folliculitis

Folliculitis is an inflammation of the hair follicle. Although there are several types of folliculitis, the most common type seen in patients with CVI, phlebolymphe­dema, and lymphedema is caused by mechanical irritation to the follicle. Some cases of folliculitis have a fun-



gal component, while in others a secondary bacterial infection develops. To help prevent folliculitis, discuss with patients the importance of skin care, hygiene, prompt treatment, and moisture management, as well as friction-reduction methods in clothing, garments, and compression wrapping.



### **Hemosiderin staining**

Caused by red blood cells breaking down and releasing iron complexes, hemosiderin staining is a permanent discoloration of the skin in patients with chronic venous hypertension. When left untreated in the presence of CVI, hemosiderin staining is a precursor to lipodermatosclerosis.



### **Hyperkeratosis**

Hyperkeratosis is dry, flaky skin that builds up in multiple layers. Patients with hyperkeratosis seem to have hyperproliferative keratinocytes that contribute to the thickening of the epidermis and dermis. Daily hygiene and skin care treatment is imperative for patients with hyperkeratosis. Have the patient apply therapeutic-based moisturizers one to two times daily and avoid lanolin and fragrance-based products. In addition to normal bathing, mechanical removal of the cellular debris will decrease the risk of secondary infections. Patients can mechanically remove skin debris by using a washcloth or more abrasive exfoliation products, such as loofah or mesh bath sponges. Advise patients using exfoliating-type products to replace them frequently and disinfect them with a diluted bleach solution after each scrub.

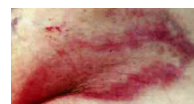


### **Ingrown toenails**

Ingrown toenails, a common dermatologic problem in patients with CVI and phlebolymphe-  
dema, occur when the nail plate grows into the nail folds. Most frequently affecting the great toe, this condition can result from cutting the nail too short or angling the edges of the nail rather than trimming the nail straight across. Pressure and friction on the edge of the nail caused by shoes and compression garments can also contribute to the development of ingrown toenails.

### **Intertrigo**

Intertrigo is caused by moisture and typically occurs between the toes and in skin folds. It appears as a white discoloration with sloughing of the epidermis and dermis layers. Intertrigo can result in partial-thickness skin ulceration and may be associated with fungal or bacterial infections. Treatment consists of cleansing the affected area with mild soap and water or a commercial cleanser and drying well. If a fungal or bacterial component is present, have the patient apply a topical treatment twice a day for 2 weeks along with an absorptive product, such as a topical antimicrobial textile, in the area of excess moisture.



### **Lymphorrhea**

Lymphorrhea is the leaking of large volumes of serum fluid from a break in the skin. It occurs in patients with altered lymphatic transport and in areas with increased interstitial pressures, such as where a lymphocyst has burst and a lymph fistula formed. Treatment includes absorption, use of topical antimicrobials, compression therapy, and CDT.



### **Lymphocyst**

A lymphocyst is a collection of impaired

lymphatic fluid in the adjacent connective tissue that looks like a small translucent bubble. In addition to CDT, treatment includes observation and conservative topical treatment to avoid trauma to the cyst. Special efforts may need to be taken to protect the cyst and keep it from breaking during compression. Do not use MLD over the cyst.



### **Malignancies**

Malignancies have been associated with CVI ulcerations and lymphedema. When lesions are present or recurring or fail to respond to standards of care, perform a thorough history, physical, and differential diagnosis for angiosarcomas, basal cell carcinoma, Kaposi's sarcomas, melanomas, and squamous cell carcinoma. A punch biopsy should be performed or the patient referred to a dermatologist for further evaluation. If cancer is suspected, it's recommended to withhold MLD and CDT until getting clearance from a physician.



### **Pachydermia**

An abnormal thickening of the skin, pachydermia has a woody appearance with puzzle-shaped dermal scaling. Treatment includes skin care and compression. In addition, manual techniques more aggressive than MLD can be used to break up the fibrotic tissue. Contraindications for fibrotic manual techniques include varicosis, pain, hemophilia, anticoagulant medications, deep vein thrombosis and heterotopic ossification, and radiation fibrosis, as well as general precautions for the use of MLD in patients with CVI.



Various special foams can also be used to break up fibrotic tissue. These foams

include high-density foam such as Komplex Foam (Lohmann & Rauscher) and Komplex II "spaghetti foam" (Lohmann & Rauscher). Many companies also make products for use on fibrotic tissue that can be cut or formed to fit the treatment area, including Swell Spots (Solaris) and Lymph Pads (Mediven). When using these products, consider skin integrity, pain, circulation, and general compression precautions. In addition, the same contraindications for fibrotic manual techniques should be considered depending on the product used.

When using more aggressive foams such as Komplex II, monitor patients more frequently. In addition, rotate foam placement or use it on alternate days to prevent skin breakdown or blistering. The skin's woody appearance in patients with pachydermia may show some signs of softening with treatment; however, it's a long treatment process that requires the dedication of patients and caregivers.

### **Papillomas**

Commonly referred to as papillomatosis cutis lymphostatica in patients with lymphedema, papillomas are a benign skin growth of epithelial neoplasm that may contain villous or fibrous vascular outgrowths. These areas tend to be hyperkeratotic and have a furlike appearance. Due to their surface vascular supply, the villi may bleed easily if disturbed. Treatment includes selective and conservative debridement of hyperkeratosis, and exfoliating and skin care after bathing, followed by the application of therapeutic urea-based creams to the targeted areas.



### **Pressure ulcerations**

In patients with CVI, phlebolymphedema, and lymphedema, pres-



sure ulcerations on the ankles, toes, knees, skin folds, and thighs are often caused by pressure, friction, and shear from wraps or garments. Treatment consists of moist wound care and offloading the area of pressure friction. In addition, foam, soft felts, and absorptive padded products can be incorporated into the plan of care.

### Stasis dermatitis

Stasis dermatitis is a response to the inflammatory state within the epidermis and dermis. Sometimes referred to as eczematous, stasis dermatitis is generally located around the gaiter region of the lower extremities. Signs and symptoms include pruritus; dry, flaking skin; and occasional weeping. In addition to providing appropriate compression therapy, treatment of stasis dermatitis focuses on pruritus relief, adequate moisturization, and absorption containment and reduction of local inflammation.



### Toe and foot deformities

Toe and foot deformities, which have many causes, can be difficult to wrap in patients with CVI and phlebolymphe-  
dema. In addition, finding appropriate footwear to accommodate wraps and garment systems—without causing additional pressure to the bony prominence of the foot—is especially challenging. To offload pressure, use foam felt and gel padding to pad foot and toe deformities. Custom footwear can also be used to accommodate foot and toe deformities. In some cases, custom footwear may be covered by the patient's reimbursement source, such as for patients with diabetes.



### Venous stasis ulcerations

Caused by chronic sustained venous hypertension, venous stasis ulcerations are typically irregular in shape and ruddy in color, with accompanying per ulcer skin changes consistent with CVI disease.

They occur most commonly on the lower extremities: in the lower leg, medial or lateral gaiter region, proximal to the ankle, as well as distal to the malleolus. Treatment is centered on the CVI clinical, etiology, anatomy, and pathophysiology (CEAP) classification, pathology presentation, moist wound care, management of the bioburden, compression therapy, and patient education. Patients with phlebolymphe-  
dema who have venous stasis ulcerations should be referred to a lymphedema therapist for decongestive therapy in conjunction with the standard of care.



### Using a multidisciplinary management approach

The management of skin problems in patients with CVI and phlebolymphe-  
dema requires a multidisciplinary approach. The team needs to understand the cause of the disease, use of appropriate diagnostic testing, and the importance of closely supervising implementation of the treatment plan. The team should consist of medical practitioners trained in wound care and lymphedema management, including physicians, specialist physicians, nurse practitioners, wound care nurses, nurses, physical therapists, occupational therapists, and certified lymphedema therapists.

In addition to care from specialty-trained providers, patient and caregiver education and adherence are paramount to the successful management of this disease process. Clinicians must also stress to patients the importance of good daily skin care, edema management, and prompt

treatment of complications by a trained professional. ■

**Read** a summary of risk reduction strategies related to skin care for patients with lymphedema.

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# Clinician RESOURCES

A variety of resources to end the year and take you into 2014.

## On the road again



Give your patients with an ostomy this information from the

**Transportation Security Administration** to help them navigate airport screening:

- You can be screened without having to empty or expose your ostomy, but you need to let the officer conducting the screening know about the ostomy before the screening starts.
- You can be screened using imaging technology, a metal detector, or a thorough patdown.
- Your ostomy is subject to additional screening. In most cases, this means you will pat down your ostomy and then your hands will undergo explosive trace detection.

You may also want to suggest your patients download a **free travel communication card** from the United Ostomy Associations of America, Inc.



## Nutrition guidelines for patients with diabetes

Access “**Nutrition therapy recommendations for the management of adults with diabetes**,” published by *Diabetes Care*.

The position statement from the American Diabetes Association (ADA) discusses goals of nutrition therapy and provides recommendations in several areas, including effectiveness of nutrition therapy, energy balance, eating patterns, alcohol, sodium, omega-3 fatty acids, carbohydrates, glycemic index and glycemic load, and dietary fiber and whole grains.

The ADA recommends that people with diabetes should make nutrition therapy a part of their treatment plan, but adds that there is no “one size fits all” eating plan. The **position statement** calls for all adults diagnosed with diabetes to eat a variety of nutrient-dense foods in appropriate portion sizes as part of an eating plan that takes into account individual preferences, culture, religious beliefs, traditions, and metabolic goals.

## Compression club

The International Compression Club (ICC) is committed to getting the word out to health professionals and patients about the value of compression therapy.

The **ICC's website** includes consensus statements and education tools such as a video on the use of compression bandages.

## Do not crush!

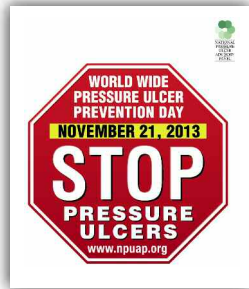
Not sure you can crush that pill? You might want to check a list of oral drugs that shouldn't be crushed.

John F. Mitchell, PharmD, FASHP, Medication Safety Consultant, assembled the list, which is available for **download**.



## World Wide Pressure Ulcer Prevention Day

World Wide Pressure Ulcer Prevention Day is November 21, 2013. Please join the National Pressure Ulcer Advisory Panel (NPUAP) in the promotion of this special awareness day by downloading and posting the **prevention day sign** at your facility.



## Present your patients with your credentials: Custom printed business cards from the NAWCO Online Print Shop

Hundreds of WCCs, DWCs, LLEs, and OMS certificants are now using the new NAWCO Print Shop for custom business materials. We receive new orders daily for personalized business cards and other business materials.

All printed materials are designed to provide the professional image of each certification and feature one or all of your current NAWCO credentials. Each piece will visually help promote you and your certification(s). Use these materials for your patients and associates. The site is available on the NAWCO website under the SHOP tab. **Click here to visit the Print Shop.**

Note: You must hold current WCC, DWC®, LLE®, or OMS certification to print materials. NAWCO will verify certification status of all orders. Individuals who don't hold a current NAWCO certification may not order on this site.



## Wear your certification with pride: Great clothing from the NAWCO Company Store

Select from shirts, blouses, jackets, scrubs, or

lab coats. This apparel is the same as that worn by your WCC instructors. Embroidery is free. Choose logos for all four NAWCO certifications: WCC, DWC, LLE, and OMS.

Order now and you will receive a complimentary NAWCO water bottle. Each bottle is made from ultra-lightweight BPA-free PE plastic with an aluminum foil coating:

- Holds approximately 25 oz.
- Collapsible for easy storage
- Features push/pull drink spout
- Includes attachable lock ring
- Dishwasher safe
- Freezer safe

When you order custom printing or clothing, a portion of the proceeds will be earmarked for certificants wanting to recertify, but who need financial assistance. The site is available on the NAWCO website under the SHOP tab. **Click here to shop.**

## WCCs localize with regional wound care seminars

Do you want to meet WCCs and other wound care professionals in your community? Help host a regional WCC wound care seminar. NAWCO is planning a series of 1-day seminars in 2014. A seminar is a great way to gather dozens of clinicians in your area. We are seeking individuals who want to help coordinate a local/regional WCC 1-day wound care seminar.

Earn important continuing education credits, meet other WCCs, and demonstrate your leadership by helping us with this mission of "giving back." All proceeds from WCC 1-day wound care seminars will be made available for a special scholarship fund to help new candidates become wound care certified. It's fun and a great experience. **Click here to contact NAWCO.**



## **New and recertified certificants**

Below are WCC, DWC, and OMS certificants who were certified or recertified in August and September 2013.

### **Certified**

Michael Abreu  
Kosha Mae Acierto  
Marissa Acob  
Cary Acopiado  
Shalani Albayalde  
Cheryl Alinan Reyes  
Donna Anderson  
Sandra Andrews  
Lourdes Arada  
Ritchie Arce  
Robin Arnoldy  
Martin Aunon  
Caroline Barreto  
Zaida Barreto  
Jennevie Benito  
Laura Berger  
Maria Bernal  
Julie Berninger  
Juee Bhavsar  
Emmanuel  
Borromeo  
Nicole Brockman  
Nada Burge  
Erin Burns  
Lorna Campbell  
Cristine Cardello  
Mindy Carlyon  
Cherrile Carter  
Hector Cascalla  
Julie Cato  
Ashton Chase  
Sarah Ciancio  
Tracy Clark  
Melanie Clibon  
Linda Corazo  
Annissa Covalt

Cathryn Craig  
Rosemary Critelli  
Tina Crivello  
Donna Crosier  
Kristen Daigle  
Amy Dart  
Dianna Dashner  
Araceli De Eisenfeld  
Francis De Guzman  
Jane Dillon  
Melissa Domingo Sy  
Laura Donovan  
Joshua Douglas  
Odontuya Dovdon  
John Edoga  
Jaquolin Eskandr  
Linda Falardeau  
Jenny Fencil  
Kara Ferguson  
Susan Ferrey  
Molly Figgemeier  
Catherine Fiorentino  
Marilyn Fischer  
Gissel Florentino  
Alexsandra Flores  
Sandra Fullerton  
Norma Gacuya  
Misty Gagne  
Angela Galloway  
Juan Garcia  
Garrigos  
Erica Garrett  
Timothy Gentry  
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Amy Geyso  
Stacey Gillis  
Sherri Gleesing

Teresa Golden  
Kari Graceland  
Ritter  
Karen Greenwald  
James Griffin  
Emily Griffith  
Melissa Griglak  
Maurene Gustafson  
Rachel Hairfield  
Annalyn Hammer  
Michael Hanson  
Kimberly Harmon  
Peggy Heider  
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Jeffrey Hermoso  
Tara Hoppe  
Tracy Horne  
Lynne Howes  
Joan Hunt  
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Princess Jarrett  
Melissa Jean  
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Wendy Johnson  
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Judy Kuhn  
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Shelly Lauters  
Patricio Lemana  
Wendy Lizak  
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