

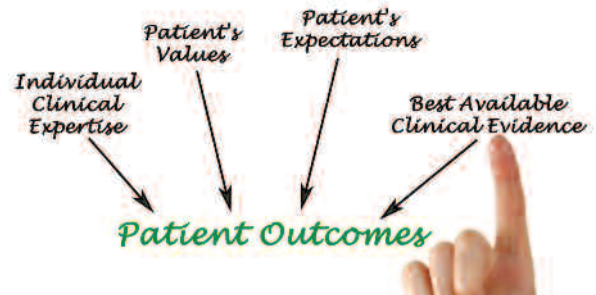
Managing chronic venous leg ulcers — what's the latest evidence?

By Jodi McDaniel, PhD, RN

Chronic venous leg ulcers (CVLUs) affect nearly 2.2 million Americans annually, including an estimated 3.6% of people over the age of 65. Given that CVLU risk increases with age, the global incidence is predicted to escalate dramatically because of the growing population of older adults. Annual CVLU treatment-related costs to the U.S. healthcare system alone are upwards of \$3.5 billion, which are directly related to long healing times and recurrence rates of over 50%.

CVLUs are not only challenging and costly to treat, but the associated morbidity significantly reduces quality of life. That makes it critical for clinicians to choose evidence-based treatment strategies to achieve maximum healing outcomes and minimize recurrence rates of these common debilitating conditions. These strategies, which include compression therapy, specialized dressings, topical and oral medications, and surgery, are used to reduce edema, facilitate healing, and avert recurrence.

In 2006, the Wound Healing Society (WHS) developed guidelines for treating CVLUs based on human and animal studies; the guidelines were updated in 2015 by an advisory panel of academicians, clinicians, and researchers, all with expertise in wound healing. The guidelines are organized by categories: diagnosis, compression, infection control, wound



bed preparation, dressings, surgery, use of adjuvant agents (topical, device, and systemic), and long-term maintenance. Each recommendation is evaluated according to strength of evidence. (See *Levels of evidence*.)

WHS guidelines provide clinicians with evidence-based treatment recommendations for caring for patients with CVLUs. A summary of the guidelines regarding compression, infection control, wound bed preparation, dressings, and long-term maintenance, is provided in this article. You can access the full guidelines at <http://onlinelibrary.wiley.com/doi/10.1111/wrr.12394/full>.

Lower extremity compression

External compression has long been the gold standard for treating venous hypertension and the associated edema and ulcerations of the lower extremities. Level 1 recommendations from WHS state to use:

- a class 3 (most supportive) high-compression system to enhance healing of CVLUs. Methods of compression include multilayered elastic compression, inelastic compression, Unna's boot, and compression stockings. Consider patient cost and comfort when choosing the method.
- intermittent pneumatic pressure with or without compression dressings to stimulate venous return.

Levels of evidence

These are the definitions of levels of evidence used by the Wound Healing Society.

Level I	Meta-analysis of multiple randomized controlled trials (RCTs) or at least two RCTs supporting the intervention of the guideline
Level II	Less than Level I, but at least one RCT and at least two significant clinical series or expert opinion papers with literature reviews supporting the intervention; experimental evidence that is quite convincing, but not yet supported by adequate human experience.
Level III	Suggestive data of proof of principle, but lacking sufficient data, such as meta-analysis, RCT, or multiple clinical series

Infection control

Preventing or treating infections as soon as possible are important because overgrowth of bacteria in the wound bed impedes wound healing. The only level I recommendation from WHS in this category is to debride (using sharp, enzymatic, mechanical, biological, or autolytic methods) necrotic or devitalized tissue that can be a source of bacterial growth.

Level II recommendations:

- Collect a tissue biopsy or use a quantitative swab technique to determine the type and level of infection in the CVLU.
- Prescribe an appropriate topical or systemic antimicrobial therapy based on the findings from tissue biopsy or culture and discontinue the antimicrobial agent when the bacteria is “in balance” (defined as $\leq 1 \times 10^5$ CFU/g of tissue with no beta-hemolytic streptococci) to reduce the chances of cytotoxic effects or bacterial resistance.
- Use systemic gram-positive bactericidal antibiotics to treat cellulitis around the CVLU site.
- Reduce bacteria levels in CVLU tissue before trying surgical closure ($\leq 1 \times 10^5$ CFU/g of tissue with no beta-hemolytic streptococci).

Wound bed preparation

Wound bed preparation is used to accelerate healing or to facilitate the effectiveness of other therapeutic measures. To achieve these goals, the level I recommendation from WHS is to document the history, recurrence, characteristics (location, size, exudate, staging, condition of surrounding skin, pain), and healing rate of CVLUs on a regular and ongoing basis to determine if care plans need reassessment.

Level II recommendations:

- Complete a comprehensive history and physical examination to assess for factors that may be contributing to tissue damage. These factors include systemic diseases, medications, nutritional status, and potential causes of inadequate tissue perfusion and oxygenation, such as dehydration and cigarette smoking.
- Perform maintenance debridement to remove cellular debris, necrotic tissue, excessive levels of bacteria, and senescent cells, which will help create an optimal healing environment.

WHS also makes one level III recommendation, which is to cleanse the wound with sterile water or saline initial-



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Staphylococcus aureus

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*J. Lindfors, Ostomy/Wound Management. 2004; 50 (8): 28-41.



ly and at dressing changes to remove debris. Using increased intermittent pressure to deliver the water or saline solution is acceptable.

Dressings

WHS recommendations are to consider patient activity, wound location, and peri-wound skin quality when choosing a dressing that:

- sustains a moist wound environment (for example, a continuously moist saline gauze dressing), which promotes cell migration, matrix formation, and debridement and helps reduce CVLU-associated pain.
- diminishes wound exudate and therefore protects skin around the CVLU from maceration.
- is cost effective (factor in clinician time, application time, healing rate, and unit cost).
- remains in place, reduces shear and friction, and does not cause further tissue damage; adhesives are not required when using compression systems. (Note: This is the only level II recommendation; the others are level I.)

Another level I recommendation is to consider using adjuvant therapies (topical, device, or systemic) if there is no healing progression within 3 to 6 weeks of beginning a treatment plan.

Long-term maintenance

CVLUs are considered long-term problems because of their high recurrence rates, so long-term maintenance is required even after ulcers have healed.

WHS guidelines for long-term maintenance and prevention of CVLUs state that patients:

- with healed CVLUs should wear com-

pression stockings continually and indefinitely to help reduce venous hypertension—the underlying cause of CVLUs. (Level I recommendation.)

- should perform exercises that increase calf muscle pump function on a regular basis. (Level III recommendation.)

A patient-centered care plan developed by a multidisciplinary team that includes evidence-based treatment strategies for CVLUs will produce the best possible healing outcomes and help prevent recurrences of these recalcitrant wounds. ■

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Antibiotic use in pressure injury infections

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

Antibiotic overuse contributes to the problems of antibiotic resistance and healthcare acquired infections, such as *Clostridium difficile*. Antibiotic stewardship programs improve patient outcomes, reduce antimicrobial resistance, and save money. These programs are designed to ensure patients receive the right antibiotic, at the right dose, at the right time, and for the right duration.

Clinicians need to understand the proper role of antibiotics in patients with pressure injuries (PIs) so optimal benefits are achieved. Here are a few considerations to keep in mind.

First steps

Before starting an antibiotic, culture the PI and use the results to choose the appropriate drug. Debride devitalized tissue to decrease bacterial growth. Support the patient by addressing nutritional deficits, stabilizing glycemic control, improving arterial blood flow, and reducing immunosuppressant therapy, if possible. These actions will enhance antibiotic response and wound healing.

Role of antiseptics

Antiseptics are agents that inhibit or destroy the development and growth of microorganisms in or on living tissue. These agents have multiple targets and a broad spectrum of activity that includes bacteria, fungi, viruses, protozoa, and even prions.

Antiseptics may be considered when

PIs are not expected to heal, but clinicians want to control bacterial bioburden. Consider nontoxic topical antiseptics at the appropriate strength for a limited time until bioburden is controlled.

Commonly used antiseptics for PIs are iodine compounds (slow-release cadexomer iodine); silver compounds, including silver sulfadiazine; polyhexanide and polyaminopropyl biguanide; chlorhexidine; sodium hypochlorite; and acetic acid. Discontinue the antiseptic once the PI is clean and the surrounding inflammation is reduced.

Role of topical antibiotics

The use of topical antibiotics for a locally infected PI is limited because of side effects, resistance, and hypersensitivity reactions. However, a short (2-week) course of topical antibiotics may be considered in the following situations:

- The PI is not healing despite proper wound management.
- The PI appears clean, but continues to have a bacterial bioburden. After the bioburden has decreased, discontinue the topical antibiotic.

Silver and honey dressings are an option for PIs infected with multiple organisms because they offer broad antimicrobial coverage. Silver sulfadiazine may be helpful for heavily contaminated or infected PIs.

Ensure the patient is not allergic to honey or has silver or sulfur sensitivities. Silver may have toxic properties, so limit the length of time it's used.

Role of systemic antibiotics

Systemic antibiotics are indicated for managing PIs with evidence of systemic infection, such as positive blood cultures, sys-

temic inflammatory response syndrome, sepsis, advancing cellulitis, fasciitis, or osteomyelitis. In the presence of ischemic tissue, topical antibiotics may be used in conjunction with systemic antibiotics.

Unlike topically applied agents, systemic antibiotics can reach the base of the infected tissue. Antibiotics should be chosen based on confirmed antibiotic susceptibilities of the known pathogens. For life-threatening infections, empiric antibiotics should be based on local antimicrobial susceptibility patterns and reevaluated when definitive cultures become available.

Grossly infected or abscessed PIs should be drained and debrided to treat related sepsis or advancing cellulitis before starting systemic antibiotics.

Appropriate intervention

Infected PIs can lead to sepsis. If used appropriately, antiseptics and antibiotics can help reduce the risk of sepsis and antibiotic resistance. ■

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