

The Nuts and Bolts of Wound Care

A Standardized Approach to Wound Evaluations

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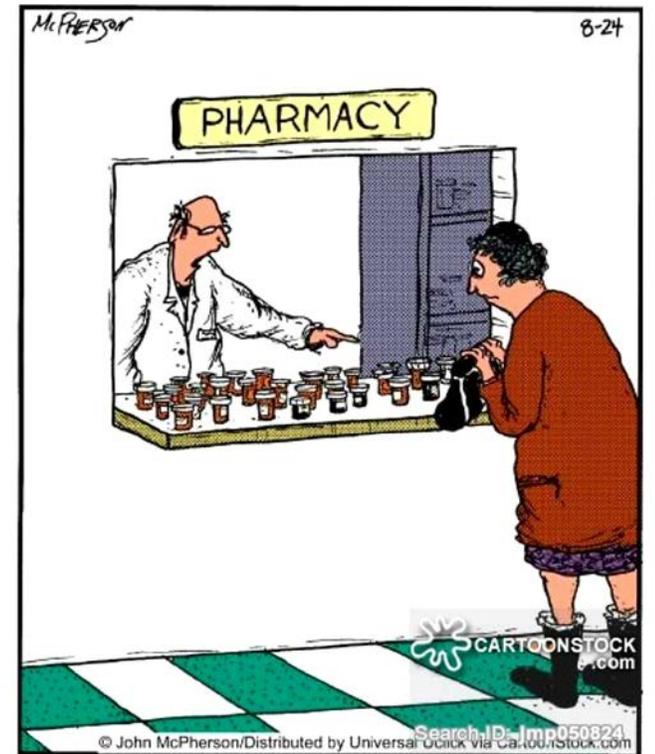
The Problem

- ▶ Aging population has led to more patients with diabetes, obesity, vascular disease and chronic wounds
- ▶ Wound care is a complex subspecialty that must take into account the multifactorial causes of chronic non-healing wounds
- ▶ In order to ensure the best patient outcomes there are a multitude of patient parameters that must be evaluated
- ▶ Today we will discuss an evidence-based approach to evaluating lower extremity ulcers

The Problem

- ▶ Medical advances in the 21st century have increased life expectancy
- ▶ Patients are taking more medications than ever before
- ▶ As a consequence of increased patient complexity we are now faced with the problem of difficult-to-heal wounds

*Nussbaum et al reports that 14% of Medicare beneficiaries have had at least 1 wound



"...which in turn will cause side effects of nausea, for which I'm giving you Trylitol, which will induce temporary blindness, which I'll counteract with..."

The Problem

- ▶ There is a need for education and training regarding proper wound care for all clinicians and medical personnel
- ▶ Establish guidelines for evaluation, diagnosis, and appropriate wound care treatment plans
- ▶ Ultimate goal is to provide safe, effective, efficient care in the office setting
- ▶ Key is a holistic approach based on diagnosis, wound assessment, wound bed prep, treatment and follow up.

Complete Medical History

- ▶ Critical Items:
 - ▶ Wound location
 - ▶ Duration
 - ▶ Trauma?
 - ▶ Previous wound care, if any
 - ▶ History of infection, antibiotics
 - ▶ Hospitalization for wound/cellulitis
 - ▶ Systemic risk factors; DM, PVD, PAD
 - ▶ Pain
 - ▶ Risk factors for venous or arterial disease; pain, swelling, fatigue, clotting disorders



"Why do you want to look at my history? I'm far better at Math and Geography."

Complete Medical History

- ▶ Contributing factors to difficulty in healing wounds:
 - ▶ Obesity
 - ▶ Diabetes
 - ▶ Infections
 - ▶ Vascular disease
 - ▶ Neuropathy
 - ▶ Inflammatory/autoimmune states
 - ▶ Malnutrition
 - ▶ Nicotine use
 - ▶ Renal dysfunction
 - ▶ Edema
 - ▶ Radiation

Medications

- ▶ Medications affecting wound healing:
 - ▶ Immunosuppressants
 - ▶ Steroids
 - ▶ Nonsteroidal anti-inflammatory agents
 - ▶ Hydroxyurea-antimetabolite used to treat cancer
 - ▶ Coumarins-blood thinners
 - ▶ Methotrexate-immunosuppressive

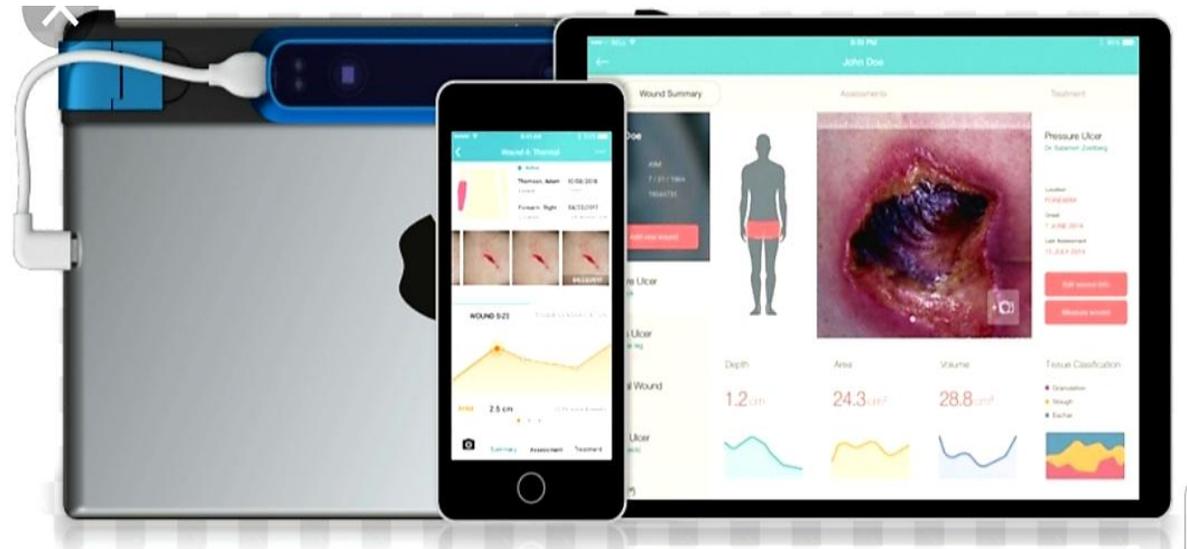
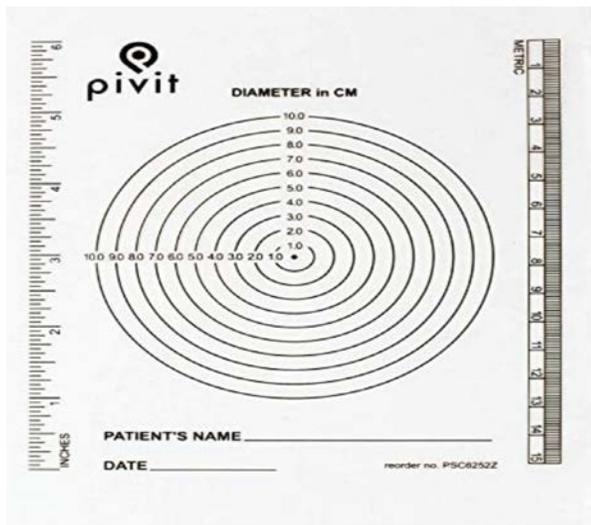
Other Disease States

- ▶ Other less common disease states can interfere with wound healing:
 - ▶ Sickle cell disease
 - ▶ Inflammatory bowel disease
 - ▶ Rheumatoid arthritis
 - ▶ Leukemia
 - ▶ Thrombocytosis
 - ▶ Cancer

Wound Examination

- ▶ Wound Measurements
 - ▶ Should be obtained at **every** visit
 - ▶ **Pre and Post debridement**

**Measure length, width and depth of wound in centimeters



Wound Examination

- ▶ Documenting wound appearance:
 - ▶ Color and character of wound tissue
 - ▶ Peri-wound tissue quality
 - ▶ Nonviable tissue-necrotic, eschar, slough
 - ▶ Dry or moist
 - ▶ Moist necrotic tissue can harbor bacteria
 - ▶ Granulation tissue, beefy red
 - ▶ Rich in collagen and budding blood vessel
 - ▶ Hypergranulation tissue
 - ▶ May be a sign of neoplasm
 - ▶ Epithelialization
 - ▶ New skin growth
 - ▶ Final stage of wound healing



Wound Examination

- ▶ Wound exudate
 - ▶ Amount
 - ▶ Color
 - ▶ Odor

STUDY ULCER ASSESSMENT

Indicate the % of each type of tissue. Enter a 0 (zero) in a box all empty boxes.		
-		
% Granulating		<i>(red/brown bumpy tissue that bleeds upon light debridement)</i>
% Non-viable tissue		-
% Epithelialized Skin		<i>(Healthy, pink wound bed with scattered islands of epithelium)</i>
TOTAL		Add the four numbers above. Categories should total 100%

STUDY ULCER EXUDATE

Volume (Check only one)	Type (Check only one)
No exudate	Not applicable: no exudate present
Minimal	Serosus: clear or light yellow watery plasma
Light/Small	Serosanguineous: pink to light red watery plasma
Moderate	Sanguineous: red with fresh bleeding
Heavy/Large/Copious	Purulent: thick and opaque exudate, of creamy yellow, green, white, or tan color

Wound Examination



Types of Wound Edges

- 1** *Attached:* Wound edge appears flush with wound bed or as a “sloping edge”
- 2** *Non-Attached:* Edge appears as a “cliff”
- 3** *Rolled Edges:* Wound edge appears curled under
- 4** *Epithelialization:* New, pink or purple, shiny skin tissue



Wound Etiology

- ▶ Diagnosing wound etiology early and accurately is essential
- ▶ Most common types of chronic wounds:
 - ▶ Postoperative
 - ▶ Traumatic
 - ▶ Pressure
 - ▶ Diabetic foot ulcers
 - ▶ Venous leg ulcers
 - ▶ Arterial ulcers
 - ▶ Atypical wounds

Wound Etiology

- ▶ Diabetic Foot Ulcers (DFUs)
 - ▶ Commonly found on weight-bearing surfaces of the feet
 - ▶ Result from increase plantar pressure
 - ▶ May be covered or surrounded by callus



Wound Etiology

▶ Wagner Ulcer Classification

Grade	Definition
Zero	No ulcer
One	Superficial skin ulcer
Two	Deep ulcer extending through dermis. Tendon, ligaments, joint capsule or bone may be exposed
Three	Deep ulcer with abscess, osteomyelitis or joint sepsis
Four	Localized gangrene - forefoot or heel
Five	Gangrene of the foot

Wound Etiology

- ▶ Venous Leg Ulcers (VLUs)
 - ▶ Typically found in the gaiter region of the leg
 - ▶ Area extending from the ankle to below the knee
 - ▶ Can be painful
 - ▶ Usually edema present
 - ▶ Heavy exudate
 - ▶ Fibrotic wound base



Wound Etiology

- ▶ Arterial Ulcers
 - ▶ Dry wound base
 - ▶ Necrotic tissue
 - ▶ Tight, shiny skin
 - ▶ Scant or absent hair growth
 - ▶ Very painful
 - ▶ Cool-cold skin temp



Wound Etiology

- ▶ Pressure Ulcers
 - ▶ Definition: localized damage to the skin and soft tissue over a boney prominence
 - ▶ Staged according to depth and amount of tissue involved
 - ▶ Stage 1: intact skin with nonblanchable redness
 - ▶ Stage 2: partial thickness skin loss of epidermis
 - ▶ Stage 3: full thickness skin loss with visible sub Q or fat
 - ▶ Stage 4: full thickness skin loss with exposed bone, tendon or muscle
 - ▶ Unstageable: covered with slough or eschar
 - ▶ Not possible to determine deep tissue involvement



Wound Etiology

- ▶ Atypical Wounds:
 - ▶ Crucial to determine etiology of wound that does not fit the major types and is non-healing
 - ▶ Many disease processes can cause wounds
 - ▶ Neoplasms
 - ▶ Connective tissue disease
 - ▶ Graft vs host
 - ▶ Calciphylaxis
 - ▶ Pyoderma gangrenosum

BIOPSY!!

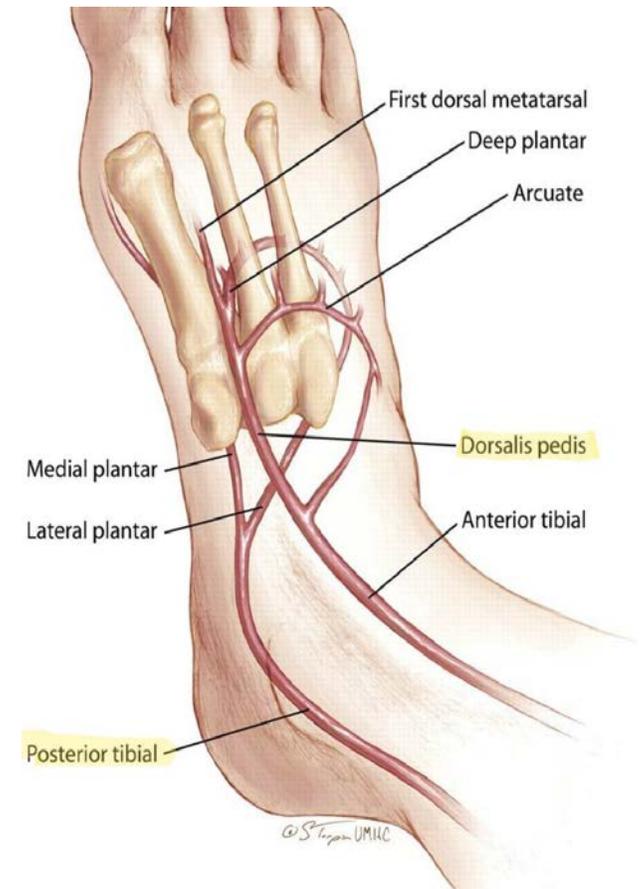


Inflow and Outflow

- ▶ Arterial flow
 - ▶ All patients with lower extremity wounds should be screened for arterial disease
 - ▶ Ankle-brachial Index (ABI)

$\frac{\text{Ankle (DP or PT) systolic pressure}}{\text{Brachial artery systolic pressure}}$

ABI Value	Interpretation	Recommendation
Greater than 1.4	Calcification / Vessel Hardening	Refer to vascular specialist
1.0 - 1.4	Normal	None
0.9 - 1.0	Acceptable	
0.8 - 0.9	Some Arterial Disease	Treat risk factors
0.5 - 0.8	Moderate Arterial Disease	Refer to vascular specialist
Less than 0.5	Severe Arterial Disease	Refer to vascular specialist



Inflow and Outflow

- ▶ Venous leg ulcers (VLUS) represent the largest proportion of lower extremity ulcers
- ▶ VLUs affect 1% of the population
- ▶ Risk factors:
 - ▶ DVTs
 - ▶ Edema
 - ▶ Varicose veins
 - ▶ Venous stasis dermatitis

Infection

- ▶ Most chronic wounds are colonized with bacteria
- ▶ Does the wound have clinic signs of true infection?
- ▶ Indication of invasive infection includes:
 - ▶ Periwound induration
 - ▶ Cellulitis extending >2cm beyond wound margins
 - ▶ Increased local warmth
 - ▶ Pain to palpation
 - ▶ Fevers, chills, nausea
 - ▶ Wound odor
 - ▶ Increased drainage
 - ▶ Friable or necrotic tissue
 - ▶ Color changes to wound tissue



Infection

- ▶ Erythema: cellulitis or dependent rubor?

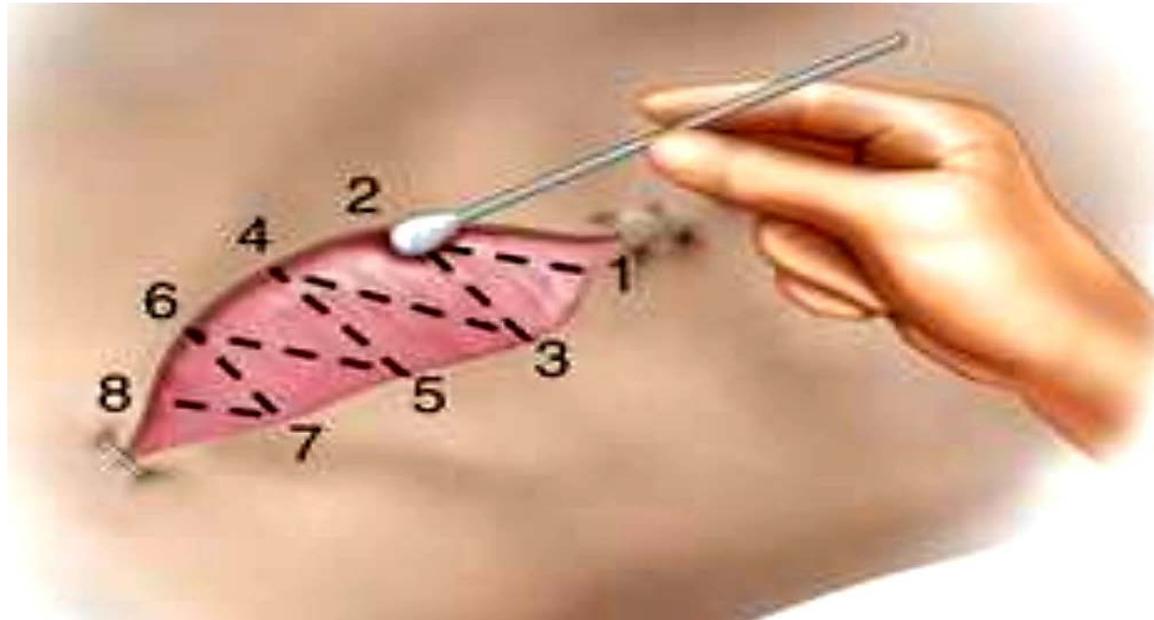


Infectious Disease Society Diabetic Foot Infection Classifications

Clinical Manifestation of Infection	PEDIS Grade	IDSA Infection Severity
No symptoms or signs of infection	1	Uninfected
Infection involving the skin and the subcutaneous tissue only (without involvement of deeper tissues and without systemic signs as described below). At least 2 of the following items are present: <ul style="list-style-type: none"> • Local swelling or induration • Erythema >0.5–2 cm around the ulcer • Local tenderness or pain • Local warmth • Purulent discharge (thick, opaque to white, or sanguineous secretion) Other causes of an inflammatory response of the skin are excluded (eg, trauma, gout, acute Charcot neuro-osteoarthropathy, fracture, thrombosis, venous stasis)	2	Mild
Erythema >2 cm plus 1 of the items described above (swelling, tenderness, warmth, discharge) or Infection involving structures deeper than skin and subcutaneous tissues such as abscess, osteomyelitis, septic arthritis, fasciitis No systemic inflammatory response signs, as described below	3	Moderate
Any foot infection with the following signs of a systemic inflammatory response syndrome. This response is manifested by 2 or more of the following conditions: <ul style="list-style-type: none"> • Temperature >38°C or <36°C • Heart rate >90 beats/min • Respiratory rate >20 breaths/min or PaCO₂ <32 mm Hg • White blood cell count >12,000 or <4000/mm³ or 10% immature (band) forms 	4	Severe

Infection

- ▶ Infected wounds should be reassessed in 48-72 hours
- ▶ Most common cause of a previously improving wound to worsen is change in bacterial load
- ▶ Wound cultures



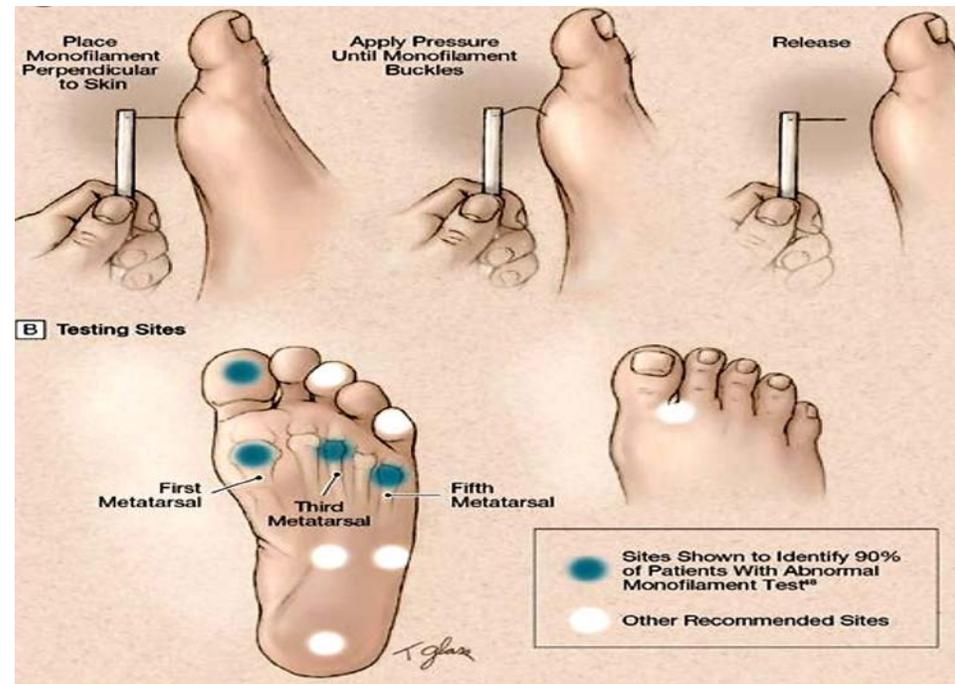
Debridement

- ▶ Goal of wound care is to create an environment favorable to wound healing
- ▶ Removal of necrotic or non-viable is essential
 - ▶ Chronic wounds are stuck in a cycle of inflammation; regular debridement can transform wounds from chronic to active
 - ▶ Traditional methods of debridement:
 - ▶ **Surgical** - scalpel, curette, etc., performed in the OR or clinic
 - ▶ **Autolytic** - covers a wound with an occlusive dressing, intrinsic enzymes digest fibrosis, infection risk
 - ▶ **Enzymatic** - collagenase, slow to act
 - ▶ **Maggot** - green blow fly larvae, discriminate for necrosis and fibrosis
 - ▶ **Hydro-surgical** - high pressure water, indiscriminate, bleeding risk
 - ▶ **Ultrasonic** - Uses low-frequency ultrasound energy to remove unwanted, necrotic tissue

Neuropathy

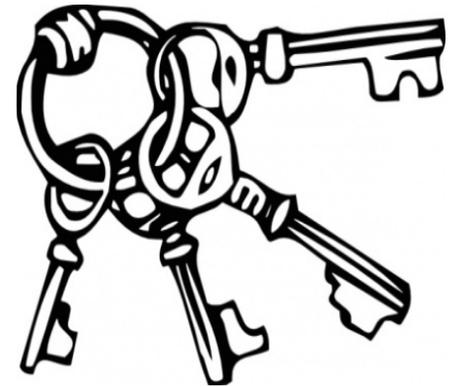
*Diabetes is the most common cause of peripheral neuropathy

- ▶ Assessing foot sensation with a mono-filament



Offloading

- ▶ Relief of pressure from the wound is an important issue that needs addressed
- ▶ Plantar foot ulcers result from abnormal foot pressures and repetitive stress
- ▶ Pressure relieving footwear, removable cast walker, or total contact cast to off-load plantar foot pressure should be employed



Offloading



Total Contact Cast (TCC) vs Removable Cast Walker (RCW)



- Removable cast walkers advantages:
 - allow access to wounds for bandage changes
 - can remove to sleep and shower.
- Potential downfall:
 - lack of forced compliance otherwise seen with TCCs
- Although studies show similar plantar pressure reduction for both, faster healing rates occur with TCCs

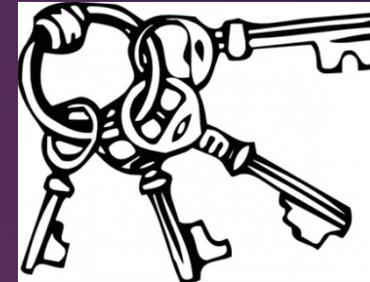
Key Practice Pearls

The total contact cast (TCC) is the ideal method of off-loading for most patients

TCC use is supported by the highest level of evidence

Pressure and strain reduction are imperative in healing plantar foot ulcers

TCC is the gold standard for off-loading plantar foot ulcers



Total Contact Cast

Pros

- ▶ Ability to off load effectively
- ▶ May also help to reduce edema
- ▶ Insure appropriate patient compliance

Cons

- ▶ Lack of product availability
- ▶ Cost
- ▶ Training required
- ▶ Lack of access to wound
- ▶ Contraindicated in infected wounds and severe PAD

TCC Indications/Contraindications

Indications:

Wound must be non-infected

Adequate blood supply to heal (ABI \geq 0.7)

Wounds that do not probe to tendon, capsule, or bone, or with abscesses

Contra-indications:

Acute infection

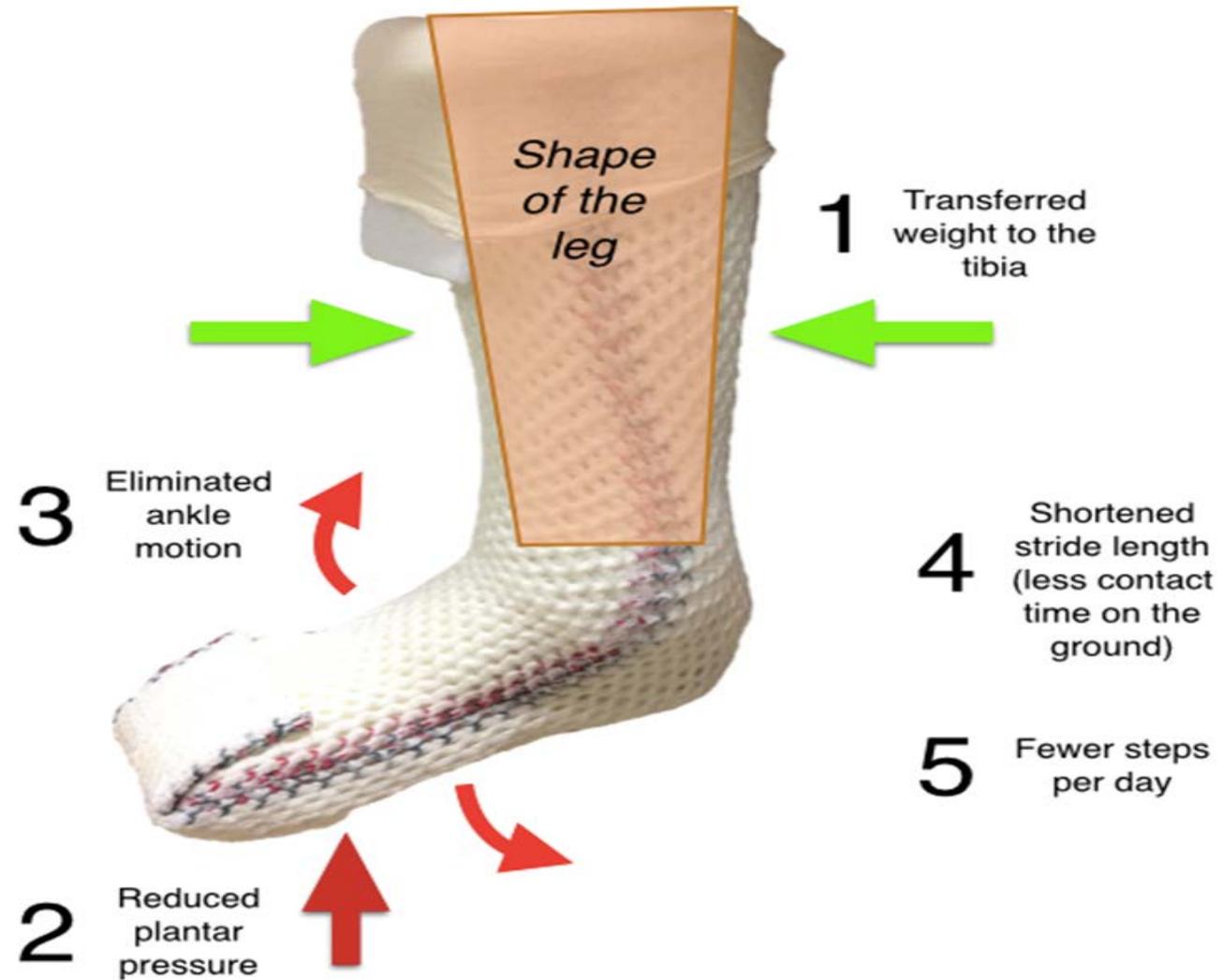
Severe ischemia

Wagner grade 3 and 4

Non-compliance with visits

Allergy to casting material

How TCCs Work



Off-loading Consensus Article

ORIGINAL ARTICLES

The Management of Diabetic Foot Ulcers Through Optimal Off-Loading

Building Consensus Guidelines and Practical Recommendations to Improve Outcomes

Robert J. Snyder, DPM, MSc*
Robert G. Frykberg, DPM, MPH†‡
Lee C. Rogers, DPM§
Andrew J. Applewhite, MD||
Desmond Bell, DPM¶|#**
Gregory Bohn, MD††
Caroline E. Fife, MD‡‡§§
Jeffrey Jensen, DPM*
James Wilcox, RN||||

Background: We sought to develop a consensus statement for the use of off-loading in the management of diabetic foot ulcers (DFUs).

Methods: A literature search of PubMed for evidence regarding off-loading of DFUs was initially conducted, followed by a meeting of authors on March 15, 2013, in Philadelphia, Pennsylvania, to draft consensus statements and recommendations using the GRADE (Grading of Recommendations Assessment, Development, and Evaluation) approach to assess quality of evidence and develop strength of recommendations for each consensus statement.

Results: Evidence is clear that adequate off-loading increases the likelihood of DFU healing and that increased clinician use of effective off-loading is necessary. Recommendations are included to guide clinicians on the optimal use of off-loading based on an initial comprehensive patient/wound assessment and the necessity to improve patient adherence with off-loading devices.

Conclusions: The likelihood of DFU healing is increased with off-loading adherence, and, current evidence favors the use of nonremovable casts or fixed ankle walking braces as optimum off-loading modalities. There currently exists a gap between what the evidence supports regarding the efficacy of DFU off-loading and what is performed in clinical practice despite expert consensus on the standard of care. (J Am Podiatr Med Assoc 104(6): 555-567, 2014)

- ▶ Total Contact Casting (TCC) is the preferred method for offloading diabetic plantar foot ulcers
- ▶ TCC has most consistently demonstrated the best healing outcomes and is a cost-effective treatment
- ▶ The likelihood of ulcer healing is increased with offloading adherence
- ▶ Advanced therapeutics are unlikely to succeed in improving wound healing outcomes unless effective offloading is obtained

Compression

- ▶ Compression is key to treating most lower leg ulcers
- ▶ 40% of women and 17% of men are reported to have venous insufficiency
- ▶ Compression should reduce edema at the maximum level the patient can tolerate

Venous Insufficiency

- ▶ Improper functioning of the valves in the veins of the legs cause insufficient amounts of blood to be pumped back to the heart.
- ▶ It is neither uncommon or benign
- ▶ Major cause of skin disorders, edema and lower extremity ulcerations
- ▶ Usually gets worse over time

Venous Insufficiency

VARICOSE VEINS	CHRONIC VENOUS INSUFFICIENCY		
Bulging Veins	Leg Swelling	Skin Color and Texture Changes	Venous Ulcers
			

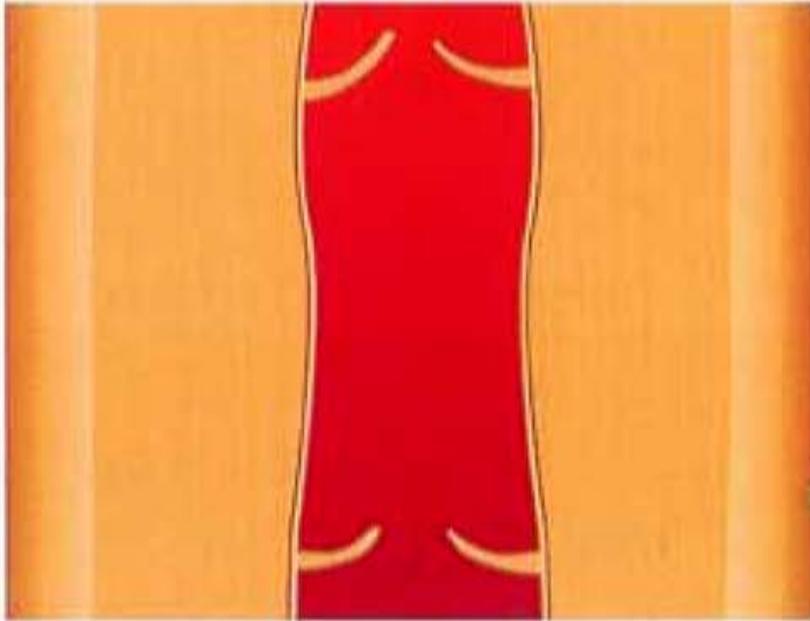
Photos by Rajabrata Sarkar, MD, PhD

Compression

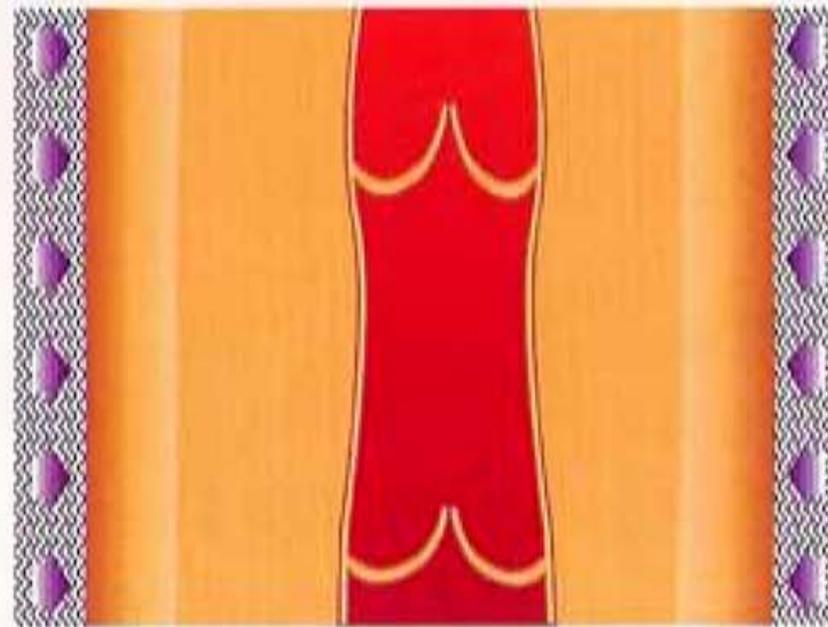
- *Graduated compression therapy can reduce vessel diameter and redirect blood centrally, reduce edema, and improve arterial circulation
- *There is evidence that compression can decrease destructive proteases and inflammatory cytokines that contribute to ulceration

Compression

without compression stocking



with compression stocking



Compression Material

There are basically two different forms of compression therapy

—Non Elastic: these bandages only have an effect during movement, when contraction and relaxation of the muscles cause volume changes of the extremities. (Unna's boot)

—Elastic: these bandages adjust to the volume changes of the extremity, and by their elastic tension exert continuous pressure on the surface of the skin. (MLCT)

Types of Compression

Elastic Material (*long-stretch*)



Multicomponent Multilayer: (*short/long-stretch*)



Non Elastic Material: (*short-stretch*)

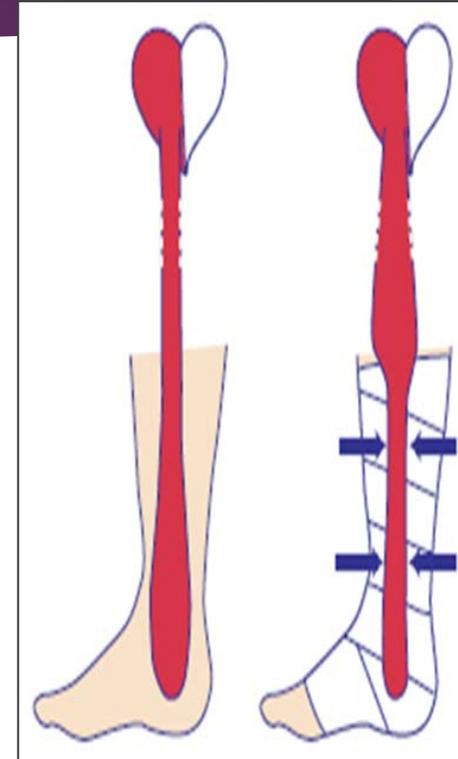


Partsch H, Menzinger G, Mostbeck A. Inelastic leg compression is more effective to reduce deep venous refluxes than elastic bandages. *Dermatol Surg.* 1999;25:695-700.

Contraindications

Congestive Heart Failure

Patients with decompensated heart failure may receive compression therapy with caution because compression therapy redistributes blood towards the center of the body, thereby increasing the pre-load of the heart and possibly causing further overload and or even death.



Weingarten M. State-of-the-art treatment of chronic venous disease. Clin Infect Dis. 2001;32(6):949-954.

Pascarella L, et al. Venous hypertension and the inflammatory cascade: major manifestations and trigger mechanisms. Angiology. 2005;56:S3-S10.

Compression



“I’m wrapping it tightly to keep the ankle from swelling.”

Wound Dressing Selection Guide

Clinical Situation	Wound Care Goals	Care Considerations	Suggested Generic Products: Write in available brands names
TISSUE TYPE -Epithelium or granulation	In a HEALING wound: •Protect healing wound •Promote moisture balance	•Select a dressing or dressing combination that can remain in place as long as possible and maintain an appropriate moisture balance	•Acrylic: •Calcium alginate: •Film/membrane: •Foam: •Gauze (daily dressing changes only): •Gelling fibre: •Hydrocolloid: •Hydrogel: •Non-adherent synthetic contact layer:
	In a NON-HEALING wound, the above goals PLUS: •Stimulate healing in a non-healing or stalled wound	•Select a dressing that can remain in place as long as possible and maintain an appropriate moisture balance	•Acrylic: •Film/membrane: •Foam: •Gauze (daily dressing changes only): •Hydrocolloid:
		If granular tissue is friable (inflamed): •Treat the cause of the inflammation •Consider selecting a primary dressing with anti-inflammatory actions	•Biologic dressings with protease inhibition: •Calcium alginate: •Silver compounds: •Ibuprofen-impregnated dressings:
		If the wound is not inflamed: •Consider a pro-inflammatory primary dressing to 'kick start' healing	•Iodine compounds: •Honey:

Wound Dressing Selection Guide

Clinical Situation	Wound Care Goals	Care Considerations	Suggested Generic Products: Write in available brands names	
TISSUE TYPE <i>cont'd.</i>	-Slough or eschar	In a HEALING wound: •Debride necrotic tissue (except for dry stable eschar on heels) •Prevent infection •Promote moisture balance	•Select a dressing or dressing combination that supports autolytic debridement and can absorb excess exudate •If hard eschar is present, consult a health-care professional who has the authority (and knowledge/skills) to perform sharp debridement	-Acrylic: -Calcium alginate: -Film/membrane: -Foam: -Gauze (woven – for mechanical debridement): -Gelling fibre: -Hydrocolloid: -Hydrogel: -Hydrophilic dressing: -Hypertonic:
		In a NON-HEALABLE wound: •Dry and stabilize necrotic tissue •Prevent infection	For wounds with slough or eschar: •Consider painting with an antimicrobial/antiseptic solution •Choose a dressing or dressing combination that keeps the wound clean, dry and free of infection or leave the wound open to air (if appropriate)	-Gauze (loose, non-woven) ± chlorhexidine derivative: -Non-adherent synthetic contact layer ± iodine compound:
		In a HEALING wound: •Promote moisture balance	If the wound is too dry select dressings that: •Add moisture •Require less frequent dressing changes •Prevent trauma when removed	-Acrylic: -Film/membrane: -Hydrocolloid: -Hydrogel: -Hydrophilic dressing: -Non-adherent synthetic contact layers:
		In a NON-HEALABLE wound: •Dry out the wound	If the wound is too wet select dressings that: •Absorbs moisture •Are indicated for more frequent dressing changes •Protect the periwound tissue from moisture drainage Identify why exudate has increased: Infection or trauma? * Not to be used on non-healable wounds	-Calcium alginate *: -Foam *: -Gauze (daily dressing changes or non-healable wounds): -Gelling fibre *: -Hypertonic *:
EXUDATE AMOUNT	-None -Scant -Small -Moderate -Large	In a HEALING wound: •Promote moisture balance In a NON-HEALABLE wound: •Dry out the wound	-Acrylic: -Film/membrane: -Hydrocolloid: -Hydrogel: -Hydrophilic dressing: -Non-adherent synthetic contact layers:	



Wound Dressing Selection Guide

Clinical Situation	Wound Care Goals	Care Considerations	Suggested Generic Products: Write in available brands names	
EXUDATE TYPE	-Serous	<ul style="list-style-type: none"> Absorb exudate 	<ul style="list-style-type: none"> Identify cause of exudate unless it is an initial response to injury 	<ul style="list-style-type: none"> Foams: Gauze: Gelling fibres:
	-Sero-sanguineous	<ul style="list-style-type: none"> Stop small bleeding Absorb exudate 	<ul style="list-style-type: none"> Treat the underlying cause of the bleeding (if possible) (e.g., trauma, infection) 	<ul style="list-style-type: none"> Calcium alginate: Absorbable hemostatic agents: Non-adherent synthetic contact layers (as prevention):
	-Purulent	<ul style="list-style-type: none"> Minimize odour Treat infection Absorb exudate 	<ul style="list-style-type: none"> Treat the underlying cause of the purulent drainage (e.g., infection) and control odour (if possible) 	<ul style="list-style-type: none"> Charcoal: Antimicrobial agents <ul style="list-style-type: none"> Gentian violet/methylene blue: Honey: Iodine (povidone and cadexomer): Polyhexamethylene biguanide (PHMB): Silver:
PERIWOUND TISSUE	-Macerated or excoriated	<ul style="list-style-type: none"> Dry the periwound tissue Protect periwound from further damage 	<ul style="list-style-type: none"> Select products to directly protect the periwound skin and provide a barrier to the adhesive, exudate or trauma If excoriation is present select products that will provide a healing environment and prevent further damage Select more absorptive wound dressings and increase dressing change frequencies to prevent further damage 	<ul style="list-style-type: none"> Films/membranes: Hydrocolloids: Hydrophilic dressing:
LOCALIZED, SPREADING OR SYSTEMIC INFECTION	<ul style="list-style-type: none"> Reduce bacterial burden 	<ul style="list-style-type: none"> Treat the cause of the infection (if possible) Select a topical antimicrobial primary dressing Select a secondary dressing that can remain in place as long as possible and maintain an appropriate moisture balance Spreading or systemic infections require systemic antimicrobial therapy in addition to topical treatment 	<ul style="list-style-type: none"> Antimicrobial agents <ul style="list-style-type: none"> Gentian violet/methylene blue: Honey: Iodine (povidone and cadexomer): PHMB: Silver: Hypertonic dressings: 	

cont'd...

Wound Dressing Selection Guide

Clinical Situation	Wound Care Goals	Care Considerations	Suggested Generic Products: Write in available brands names
WOUND PAIN	<ul style="list-style-type: none"> Minimize or eliminate wound-related pain 	<ul style="list-style-type: none"> Treat the cause of the pain (if possible) Choose primary dressings that prevent dressing adherence to the wound bed or dressings that prevent periwound maceration 	<ul style="list-style-type: none"> Foam dressing with continuous release of ibuprofen:
			<ul style="list-style-type: none"> Hydrogel:
			<ul style="list-style-type: none"> Non-adherent synthetic contact layer:
WOUND WITH DEPTH, UNDERMINING OR TUNNELS	<ul style="list-style-type: none"> Fill the dead space 	<ul style="list-style-type: none"> Packing must be firm enough to prevent premature bridging of granulation tissue at the base, yet not so firm that it causes pressure damage 	<ul style="list-style-type: none"> Calcium alginate (not recommended for tunneling wounds):
			<ul style="list-style-type: none"> Specialized foam dressings (e.g., foam dressings that are indicated for use as a wound filler):
			<ul style="list-style-type: none"> Gauze:
			<ul style="list-style-type: none"> Gelling fibre:
			<ul style="list-style-type: none"> Hypertonic gauze ribbon:

Any Questions?





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