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Chronic Leg Wound Management

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Management of Chronic Leg Wounds

Objectives:

- To review the epidemiology and characteristics of chronic wounds
- To review new literature about the care of sub-acute and chronic wounds
- To provide practical direction on the management of chronic wounds, esp. venous insufficiency leg ulcers

1. The most common types of chronic wounds are venous leg ulcers, diabetic foot ulcers and pressure ulcers

- a. This session will focus on venous leg ulcers.
- b. Most of the principles used to evaluate and treat chronic (non-arterial) leg wounds can be applied to diabetic foot wounds and pressure ulcers.

2. Epidemiology of chronic leg wounds

- a. Increasing prevalence, correlated with increasing prevalence of diabetes and obesity
- b. 1% lifetime prevalence
- c. 70% venous, 25% arterial, 5% other
- d. Major source of disability and pain/morbidity

3. Chronic wounds differ from acute wounds

- a. “Stuck” in the inflammatory phase of repair
- b. Excess burden of necrotic tissue, often requires ongoing debridement
- c. Higher rates of critical infection
- d. Presence of biofilms
- e. Higher levels of matrix metalloproteinases (MMPs), elastase, plasmin and thrombin which damage growth factors, inhibit healing

4. Clinical Assessment

- a. Thorough history regarding circumstances surrounding development, wound duration, intensity of pain, lower extremity symptomatology at rest and with ambulation, drainage, prior vascular history, prior history of vascular intervention and comorbid medical diagnoses.
- b. Lower extremity arterial pulsations in femoral, popliteal, dorsalis pedis and posterior tibial distributions of BOTH lower extremities per ACC/AHA guidelines for grading.
- c. Base of ulcer and exudate characteristics, presence of surrounding erythema callus, edema/swelling, venous stasis pigmentation/hemosiderin, superficial venous varicosities/reticular venous structures/venous telangiectasias, lipodermatosclerosis, stigmata of lymphedema and atypical characteristics of ulceration.
- d. Presence of infection: acute or chronic (see 9e below)

5. Vascular Lab Evaluation

- a. Ankle-brachial indices bilaterally with 1st toe pressures bilaterally.

- i. Formal; non-invasive vascular lab
 - ii. Office; non-billable unless waveforms recorded
 - b. Venous duplex ultrasound lower extremity bilaterally
 - i. Evaluate for remote/acute deep venous thrombosis.
 - ii. Order for venous duplex study should state “evaluate for venous valvular incompetence, deep and superficial”, otherwise it will most likely only r/o DVT
- 6. Clinical characteristics of common types of chronic wounds**
 - a. Venous ulcers; medial malleolus or “gaiter” area, shallow, mild-moderate pain, exudative, maybe malodorous, often large, swollen legs, signs of venous insufficiency
 - b. Arterial ulcers: anterior or lateral leg and digits, often at points of pressure, deep or punched out lesions, wound may have minimal exudate, be dry or necrotic, only local swelling, faint pulses and reduced ABI, (25% will also have venous insufficiency)
 - c. Diabetic foot ulcers: same as arterial ulcers, more likely on plantar surfaces, over pressure points, are seldom painful, due to neuropathies, and may appear small
- 7. Risk factors for incident venous ulcers**
 - a. Up to 50% of patients have a history of leg injury (De Araujo, 2003)
 - b. Obesity, phlebitis, family history of varicose veins, inactive lifestyle, history of DVT, previous varicose vein surgery are risk factors
 - c. Factor V Leiden mutation increases risk of lower leg ulcer 3-fold (no history of DVT) to 13 fold (history of DVT) (Hafner 2001)
- 8. Risk factors for lack of healing of leg ulcers**
 - a. Consecutive series of 1324 legs in 1186 patients with venous ulcers (Gohel, 2005)
 - i. Age was the strongest predictor ($p < .001$), followed by ulcer chronicity ($p < .02$)
 - b. A simple model with two factors predicts healing of venous ulcers; greater than an inch (in diameter), greater than 6 mo duration. With zero score (neither factor present) 93% heal in 6 months with compression, with one 65% heal, and with both factors 13% heal at 6 months. ROC is 0.87, and nearly as good as complex models (Margolis, 2000)
 - c. Size of wound
 - d. Venous insufficiency
 - e. Arterial insufficiency
 - f. Diabetes
- 9. TIME principles of Wound Bed Preparation (WBP): getting to clean granulation tissue**
 - a. Moist wound healing vs. open to air “natural”

- i. Semi-moist/wet promotes wound healing by up to 50%, presumably due to better epithelialization, with fibroblasts moving across moist granulation tissue better. (GD Winter, Nature, 1962).
- ii. This has become standard of care, based largely on expert opinion (no RCTs)
- iii. Partial-thickness wounds may heal regardless of the treatment
- b. **T=TISSUE.** Evaluate type of tissue, i.e., healthy, clean, necrotic. Debride necrotic tissue
 - i. Surgical sharp debridement: Uses scalpel, scissors, or curette. Widely accepted by consensus. Diabetic foot ulcer literature has the most data supporting serial debridement. Topical lidocaine 2-4% usually effective for pain management. Seldom needed if neuropathic.
 - ii. Chemical debridement:
 - 1. Enzymatic debridement: Collagenase-based treatment is active against denatured collagen only. Gently, slowly dissolves more stubborn adherent fibrin, softens slough. No compelling evidence of healing of ulcers, but widely used.
 - iii. Mechanical debridement:
 - 1. Wet-to-dry dressings are an old tradition, with little evidence at all, generally accepted in surgical practice. Modern therapies are less painful. If a wet-to-dry is used, saline is the preferred agent. Use only on necrotic tissue. Dressing can adhere to and traumatize healthy tissue.
 - 2. Mechanical debridement with pulsed lavage or whirlpool therapy, which is performed less often than it was years ago, unless excessive skin folds, multiple wounds or a very large wound make cleansing the wound difficult with routine irrigation.
 - iv. Autolytic debridement: using the natural proteolytic enzymes in the wound exudate. Cover the wound with semi-occlusive, moisture retaining dressings (hydrocolloids, transparent films), change 3-5 days. Adding moisture, ie hydrogel dressings also promotes autolysis.
 - v. Biologic maggot therapy: There is data, however not widely used, usually for psychological/aesthetic reasons. Seldom covered by insurance.
- c. **I=INFECTION:** Identify and treat active infections
 - i. Clinical exam is not very reliable: In one representative study, 28% had infection by quantitative tissue biopsy when felt to be clinically free of infection. (Serena, 2008).
 - ii. Is it infected?
 - 1. Usual clinical signs including increased pain, fever, WBC, suggest cellulitis and point to need for systemic antibiotics.

2. Early signs of critical colonization (iii below) and a heavy bacterial bioburden include increased pain, increased, sometimes odorous exudate, or deterioration in appearance of a chronic wound. Early signs are best managed using a topical antimicrobial ointment, dressing or possibly an antiseptic cleanser for a limited period of time.
 3. A suboptimal healing rate, after edema has been managed (wound area decreases <10% over a 2-week period) may indicate infection
 4. Redness is not a reliable sign since venous ulcers will often have stasis dermatitis or early hemosiderin deposits with reddish hyperpigmentation that eventually becomes a more brownish hyperpigmentation.
 5. Deep tissue culture is the gold standard (AHCPR guideline, 1994), but superficial cultures, if done correctly, may provide some information for antibiotic therapy selection
- iii. Concept of continuum of bacterial load
1. Contamination: non-replicating bacteria, not significant
 2. Colonization: replicating but no host response
 3. Critically colonized: replicating bacteria slowing wound healing
 4. Infection (local or systemic): causing host response—pain, fever, wound deterioration, increased odorous exudate, other symptoms
- iv. Biofilms are complex microbial vs planktonic communities of bacteria and fungi embedded in a protective matrix of sugars and proteins that attaches the biofilm to a living (wound) or non-living surface (catheters, endotracheal tubes, implants, etc.). Current research indicates biofilms are likely present in most chronic wounds, delay healing, and are difficult to treat with topical antimicrobials. There is currently no good diagnostic test and controversy exists if biofilm is visible to the naked eye.
- v. Topical antiseptics work at all levels of cellular biology and resistance is less likely than with topical antibiotics. Older antiseptics like povidone iodine, weak bleach (Dakin's), acetic acid, hydrogen peroxide are generally not recommended because cellular toxicity exceeds antimicrobial benefit (AHCPR guideline, 1994). May aid in decreasing bacterial load and associated odor in necrotic wounds. Use selectively for a limited period of time, i.e. until odor resolves

1. Hypochlorous acid solutions are non-cytotoxic, no-rinse. 60sec kill rate of: S.aureus, MRSA, P.aeruginosa.
 2. Cadexomer iodine (Iodosorb), a slow-release starch, is effective. Pooled results from two RCTs (both groups using compression) showed increased healing at 4-6 weeks (RR 6.72, 95% CI 1.56 to 28.95) (Cochrane review, 2006)
 3. Chlorhexidine gluconate 4% cleanser is a clinically useful, inexpensive OTC that is cytotoxic to healthy tissue
 4. Manage excess exudates: exudate contains pro-inflammatory mediators that likely delay healing. Alginates (made from seaweed), foams and absorptive dressings absorb excessive fluid, promote moisture balance
 5. Dressings (see chart in appendix)
 - a. Purposes: reduce pain, reduce odor, reduce mess (absorb drainage), improve epithelialization, debride
 - b. Natural treatments: honey, maggots, tea-tree extract all have some evidence of effectiveness
 - c. Efficacy data: At least for venous ulcers, Cochrane review (2006) suggests there is no difference between hydrocolloids (n = 23), foams (n = 6), alginates (n = 4), hydrogel dressings (n = 6)
 6. Removing offending causes: Contact dermatitis to topically applied treatments may occur, causing redness, pain, and failure to resolve. In a community sample of patients with venous insufficiency, over half had skin patch tests consistent with contact dermatitis. Of those patients with a positive patch test, 87 percent were allergic to components of their stasis ulcer treatment (e.g., dressing or topical medication). Contact sensitivity was more common in patients with stasis dermatitis (62 versus 38 percent); the most common allergens were wool alcohols (lanolin), neomycin sulfate, parabens (a preservative), and fragrances. (Kulozic, 1988). Avoid use of neomycin in particular
- d. **M=MOISTURE BALANCE: Use dressings that keep wounds not too wet and not too dry**
- i. Dressings (see chart in appendix)
 - ii. Manage excess exudates: exudate contains pro-inflammatory mediators that delay healing. Hydrogels provide moisture as are mostly glycerin and H₂O. Hydrocolloids retain moisture by occlusion. They are impermeable to O₂, bacteria. Calcium alginates (made from

brown seaweed), foams, absorptive dressings absorb excess fluid, promote moisture balance.

1. Purposes: reduce pain, reduce odor, manage exudate and reduce mess (absorb drainage), improve epithelialization, debride
2. Natural treatments: honey, maggots, tea-tree extract all have some evidence of effectiveness
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e. **E=EDGE: Edge of wound/epithelial edge advancement**

- i. Indicates whether wound is healing
- ii. Address edges that are closed, calloused, macerated as this affects ability of wound to contract

f. **Manage and treat the ENTIRE patient and their comorbidities for the best outcomes**

- i. Treatments for edema
- ii. Leg elevation to reduce edema for mild cases (above the level of the heart, 30 minutes at a time, 3-4 times a day) is effective but hard to maintain
- iii. Compression hose for ulceration with edema is essential
 1. Mechanism of benefit likely mixed, with improved microcirculation, improved deep venous flow, reduced venous reflux, improved lymphatic flow
 2. Systematic review shows generally effective in healing compare to no compression, but results are mixed.
 3. The largest randomized controlled trial (200 people) found that four-layer elastomeric high compression bandaging healed significantly more ulcers over 12 weeks compared with no compression (54% with compression v 34% with no compression; $P < 0.001$). (O'Brien, BJS 2003) A sub-analysis of this found that people treated with compression had a greater improvement in the quality of life compared with those continuing with their usual care (no compression)
- iv. Prevention after symptomatic DVT shown in RCT 180 pts, risk reduction 0.49 (CI, 0.29 to 0.84; $P = 0.011$).
 1. Over all two positive studies, one negative study, expert opinion leans toward treating, especially in high risk patients: overweight, thigh DVT, symptomatic DVT, or recurrent DVT

- v. Prevention of recurrent ulceration: Circumstantial evidence from two RCTs: those who stopped wearing hose were much more likely to re-ulcerate. (Cochrane 2000)
- vi. Compliance 50-75% due to nuisance, heat, rash, difficulty donning
- vii. Practical helps for using Jobst compression stockings:
 - 1. Washing new compression stockings
 - 2. Put on as early as possible in the morning
 - 3. Sit with firm back support
 - 4. Rubber gloves to slide the stocking
 - 5. Use a wire or molded stocking donner (available from DME that supplied stockings or online)
 - 6. Use a light silk hose underneath
 - 7. Talc powder on the leg
 - 8. Zipper back (Jobst Ulcer Care), or Velcro fastening bands (CircAid or Solaris Ready-Wrap)
- viii. Avoid if there is significant arterial disease. Check ABI and don't use if $ABI < 0.8$
 - 1. Compression bandages (Unna boot) may be better if weeping, eczema, ulcers, as effective as compression stockings, mainly when trying to decrease edema.
 - 2. Multiple layer compression bandage systems are especially useful to more rapidly decrease swelling before long term "maintenance" stockings are used
 - 3. An exercise program (at least ankle flexion/extension and heel-rise exercises) makes compression more effective.
 - 4. ICD, 4 hrs. per day: Systematic review says insufficient data, but could be a treatment Option (BMJ Clinical Evidence, 2007)

10. Other treatments:

- a. Oral medications:
 - i. Chestnut seed extract effective for venous insufficiency ulcers in several RCTs. (Diehm, 1996)
 - ii. Pentoxifylline shown better than placebo in meta-analysis, and can be considered for venous ulcers
 - 1. Pentoxifylline for treatment of venous leg ulcers: a systematic review. (Jull, 2002)
 - 2. RCT with 100 in each arm showed no results (Dale, BMJ, 2008)

- b. Granulocyte-macrophage colony stimulating factor (GM-CSF) has been effective in 2 RCTs and shows promise for the future. Injection is done around the lesion, which is painful. (DaCosta, 1997)
 - i. This may be a major growth area
- c. Cellular tissue products (CTPs)/Skin substitutes (Grafix, Apligraf, Epifix, Dermagraft, Primatrix and numerous other cellular and acellular tissue products) effective in several RCTs. Medicare covers limited frequency for diabetic foot and venous leg ulcers.
 - i. In 120 patients with difficult to heal venous ulcers, at 6 months healing was 47%, vs. 19% in the control group ($p < 0.005$) and the median time to complete wound closure was reduced ($p < 0.005$) (Falanga, 1999)
- d. Surgery to strip incompetent veins
 - i. Large ESCHAR study with 500 pts randomized to compression alone, or compression plus vein surgery. Healing at 24 weeks 65% vs. 65%, but recurrence 12% vs. 28%, hazard -2.76 [95% CI -1.78 to -4.27]; $p < 0.0001$)

11. When there is a component of lymphedema:

- a. Decongestive compression massage therapy has been demonstrated effective, but requires significant training, done by physical therapists, trained in manual lymph drainage (MLD).

12. Unusual wounds to watch out for:

- a. Malignancy, an increased risk in chronic non-healing wounds
 - i. In one report, 43 of 981 patients (2,448 ulcers) had either squamous cell or basal cell carcinoma within the ulcer (Yang, 1996)
 - ii. In another Swedish registry study, the risk of squamous cell CA in chronic leg ulcers was 1.6/1000 pts. (based on 10,913 ulcers)
 - iii. Consider biopsy of wounds which are not healing as expected
- b. Cutaneous TB, leishmaniasis
- c. Sickle cell: common in tropical regions, more in males
- d. Vasculitis
- e. Calciphylaxis
- f. Cryoglobulinemia
- g. Pyoderma gangrenosum

13. When to refer for surgery:

- a. Large venous ulcers not healing in a year or deterioration without identifiable cause

- b. Treatment of dysfunctional veins to reduce recurrence
- c. Treatment of acute wounds (trauma) when ready for skin grafting
- d. Arterial insufficiency to evaluate for revascularization.

14. Multidisciplinary approach to care, including a certified wound care nurse or referral to wound clinic if available, is very helpful.

Edema Treatment – Just the Basics

- Compression is the key treatment
- You need to reduce swelling before you have patient get compression stockings. The compression stocking will not reduce the swelling.
- Exercise is crucial in preventing and controlling edema in the leg. Walking and calf pump exercises. Patient should avoid sitting more than 1 hour at a time. If WC bound, they need to elevate their legs more.
- Elevation is only achieved with legs at or above heart level. The patient should always sleep in bed at night and should elevate 2-3 times a day for 20-30 minutes each time.
- Good skin care is crucial. Keep skin clean and dry. Lotion legs every day. Treat wounds immediately.

Additional billing information

2020 Medicare APC rates for CPT code #29581, used for application of multi-layer compression wrap: Professional fee rates:

Office/Physician based clinic =\$87.67

Facility/Hospital based clinic= \$28.05

Documentation Requirements for wound debridement

- Wound location
- Anesthetic used or not, and name it
- Tissue level
- Tissue Type and % debrided
- Tools used
- Outcome/response
- Hemostasis obtained, what method?
- Pre/post-debridement measurements
- Post procedure treatment
- Patient tolerance

•https://www.cms.gov/medicare-coverage-database/details/lcd-details.aspx?LCDId=33614&ContrlId=275&ver=11&ContrVer=1&CntrctrSelected=275*1&Cntrctr=275&s=57&DocType=1&bc=AggAAAQAAAA&

•Provides guidance on indications, corresponding ICD 10 codes for coverage, documentation requirements

Basic wound care supply list for outpatient clinic

Dressings/Topicals	Size
Gauze: Clean, non-sterile in bulk (i.e. 150-200ct) package	4"x4" and 2"x2" Plain strip gauze
Abdominal pads (ABDs)	8x10"- can be cut
Hydrogel	Larger tube or unit dose packages (based on frequency of use)
Calcium alginate (box of 5)	4"x4"
Hydrocolloid (box of 5)	4"x4" (can be cut in half, diagonal)
Cotton-tipped applicators, tongue-blades	-
Roll gauze	3-4"
Paper tape	2"
Silver sulfadiazine 1% cream	50-85gm container
Iodosorb gel	40gm tube
Triamcinolone cream 0.1%	-
Aquaphor/Hydrophor ointment	1# tub

Cleansers	Size
Liquid body/skin cleanser	-
Wound cleanser (bottle with trigger spray)	-
Normal saline	500cc bottle – dispose after 24 hrs. or single dose 15ml 0.9% saline vials
Hypochlorous acid solutions – non-cytotoxic, no rinse	4-8oz. Some have only 30day shelf life once opened (Vashe), others up to 1yr, ie Puracyn Plus

Miscellaneous	Size
Wound measuring guides, paper tape measures	-
Scissors, disposable debridement kits (scalpel, scissors, forceps)	4mm disposable curettes
Tubigrip and mfg's measuring guide/tape for proper sizing	Size E, F and G fit most
Disposable waterproof under pads (to contain irrigant, wound exudate, to set up clean field as needed). Washcloths, towels	-
Germicidal disposable (cavi) wipes to clean surfaces, equipment between each patient. Hand sanitizer	-

Coban 2 - Multilayer Short Stretch Compression System

- ✓ One of a number of multilayer compression systems (2-4 layers)
- ✓ Single use only and latex free
- ✓ Works best with venous insufficiency with/without ulcers and with venous insufficiency with lymphedema component
- ✓ Allows shoes to fit
- ✓ Allows ankle to bend which maximizes the calf pump function
- ✓ Always used over an absorptive dressing when an ulcer is present
- ✓ This bandaging system requires practice to apply. Only put on by clinician-not intended for patient to apply

Steps for Application:

1. Start with foam layer and wrap around foot starting at 5th metatarsal with foot at 90 degree/neutral angle
2. Keep foot at 90 degree/neutral position-avoids constriction, allows ankle movement
3. Leave heel open and wrap with No stretch or pull. The first layer is only a padding layer. Wrap at base of heel and then spiral up leg with minimal overlap and finish at top of calf on inside of leg. Give entire leg a squeeze to set the bandage.
4. Begin 2nd short stretch layer at 5th metatarsal, wrap around forefoot and then around base of heel. Then go around ankle bones and then come back and wrap around heel.
5. Then spiral up leg covering 50% of prior wrap ending at top of calf. Unroll this layer on limb. Do not crank on tight. Start with just rolling onto leg for first application to see if patient tolerates. Squeeze entire leg to set bandage.
6. Very large limbs may require more than one box to cover entire leg.
7. Change bandage every 3-4 days initially and then 7-10 days. This depends on the amount of exudate.

Short Stretch Compression Bandages:

- ✓ Low resting pressure, high working pressure
- ✓ It is applied firmly but do not pull stretch out.
- ✓ It forms a second skin and thus, helps the calf pump activates more effectively.
- ✓ Works well with patients with venous insufficiency with lymphedema component
- ✓ Each layer provides about 8-10 mmHg
- ✓ Patient to leave on 23/24 hours a day removing only to shower, bathe or change dressing
- ✓ Use over an absorptive dressing if wound is present
- ✓ Easy to apply and can be put on by patient or family member

- ✓ Cost effective: Washable and re-useable up to 6-8 weeks.
- ✓ Comprilan comes in different widths. Smaller the width, the higher the pressure. The most typical sizes used are 8cm and 10cm.

Steps for Application:

1. Always use stockinette or tubigrip as first layer. Consider there is latex in Comprilan and tubigrip prior to use, and with any sensitivity or allergy. May need latex-free wrap.
2. Start at base of toes. Wrap around forefoot and then around ankle bones. Then wrap around heel and spiral up leg covering 50% of prior wrap ending either midcalf or at top of calf. Apply firmly, not tight. **YOU CANNOT SQUEEZE THE SWELLING OUT.**
3. You can then place tubigrip over the top or wrap an additional Comprilan starting at the ankle and again spiraling up leg finishing at top of calf, depending on how much compression is needed. Start low, go slow. Each layer of wrap provides approximately 8-10 mm Hg pressure.
4. Secure with tape and not clips which can injure skin.
5. Use girth measurements as an objective measure of progress with compression bandages. Helpful for insurance coverage.

Wound Care Dressing *Limits* for Medicare Outpatients

Dressing Type (examples)	SIZE (based on wound size)	Drainage Amount	Change frequency allowed
Collagen Powder (1g) (Stimulen, Triple Helix, Puracol)	-	Low/Mod	1x/d or 30/mo
Collagen (Prisma, Promogran, Epiona, Puracol)	2x2, 4x4, 8x8	Low/Mod	1x/d or 30/mo
Collagen Ag	-	Low/Mod	1x/d or 30/mo
Calcium alginate w/silver (Silvercel)	2x2, 4x4, 6x6	Mod/Heavy	1x/d or 30/mo
Calcium alginate (Calcicare, Melgisorb)	2x2, 4x4, 6x6	Mod/Heavy	1x/d or 30/mo
Foam silicone	2x2, 4x4, 6x6, 8x8	Mod/Heavy	3x/wk or 12/mo
Foam dressing w/border (Optifoam, Mepilex, Allevyn, Tielle)	2x2, 4x4, 6x6, 8x8	Mod/Heavy	3x/wk or 12/mo
Hydrocolloid (Duoderm, Duoderm-thin, Replicare, 3M)	Varying sizes, shapes	Low/Light//Mod	3x/wk or 12/mo
Hydrogel (Solosite, 3M, Skintegrity, Duoderm, Intrasite)	Up to 3oz	None/Low	1x/day
Impregnated gauze-adaptic, xeroform	3x8, 5x9	Any	1x/d or 30/mo
Secondary Dressings	SIZE (based on wound size)	Drainage Amount	Change frequency allowed
ABD pad	5x9, 8x10, 8x7.5, 12x16	Mod/Heavy	1x/d or 30/mo
Conforming bandage	3", 4"	Any	14/wk
Roll gauze	3", 4"	Any	Daily or 30/mo
Non-sterile gauze pads	4x4" (200 bulk)	Any	100/mo/each wound
Paper tape (Medipore, Paper, Silicone)	1-6" widths, 2" is standard	Any	2rolls/mo

Note: Size of dressings must match the size of the active wound, i.e., 6"x6" foam not covered for a 1.5x1.5cm wound

Dressing Selection Grid	
Deep Wet Wounds	Deep Dry Wounds
Fillers: Calcium alginates, flat or rope; Hydrofibers; Gauze and specialty gauze; Methylene blue/gentian violet foams	Fillers: Hydrogel, saline gauze, methylene blue/gentian violet foam
Cover Dressings: Gauze/tape; foam border; Super absorbent pads	Cover Dressings: Gauze and transparent film; waterproof adhesive foam
Shallow Wet Wounds	Shallow Dry Wounds
<ul style="list-style-type: none">• Foam border dressings• Flat border alginate or alginate and wrap gauze• Hydrofiber and adhesive foam or wrap gauze• Nonadherent contact layer and gauze cover	<ul style="list-style-type: none">• Solid hydrogels• Hydrocolloids• Transparent adhesive dressings• Non-adherent contact layer and gauze cover

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Table of Wound Dressing Characteristics

Product (specific brands)	Characteristics of product	Indications for use
Hydrogel <i>(Normigel, Curasol, Tegaderm Hydrogel, Vigilon, Solosite, Saf-gel)</i>	Formulated as sheets or gels, water-based, nonadherent, hydrophilic polymer-based dressing. May absorb small amount of exudate by swelling, but are primarily designed to hydrate the wound. Effective alternative to saline gauze dressings for more consistent moisture balance.	Small amount of exudate. Commonly used to promote autolysis when used to increase hydration /moisture over wound bed as promotes collection of enzymes in exudate,phagocytize non-viable tissue on necrotic, fibrinous wounds.
Hydrocolloid <i>(DuoDerm, Replicare, Restore, Comfeel, Tegisorb)</i>	Generally composed of gelatin, pectin and adhesive agents that form a viscous, colloidal gel as fluid is absorbed/interacts with the dressing. Absorbs very minimal amount exudate. Outside transparent film layer provides occlusion and makes them impermeable to moisture vapor, bacteria, when intact seal on skin.	Wounds with low exudate, promotes autolytic debridement. Use over piece of alginate that covers wound only and allows dressing adhesive to seal to surrounding skin. Contraindicated if signs of infection. Indicated for Stage II coccyx pressure ulcers to prevent fecal/urine contamination. Change Q2-3days.
Alginates <i>(Algisite M, Curasorb, Tegaderm Alginate, Melgisorb)</i>	Derived from brown seaweed, calcium ions in the alginate fiber exchange with sodium ions of the exudate to form a fibrous gel, wicking exudate up/off the wound bed. Calcium ions activate the clotting cascade. Non-adhesive, non-occlusive, conformable, comes in pads and rope forms. Cover dressing is usually gauze.	Wounds with moderate -heavy exudate, and deep or cavity wounds. Effective under compression.
Foam dressings <i>(Mepilex, Allevyn, Polymem, Biatain, Tegaderm Foam)</i>	Polyurethane sheets of polymers that are highly absorbent, waterproof, come with and without adhesive edges, in pad or cavity-type form for packing.	Wounds with small to moderate to heavy exudate, for covering more superficial wounds, and venous ulcers. Must be used over alginate dressing when more than small-mod exudate to decrease risk of maceration.
Semi permeable adhesive films <i>(Tegaderm, Opsite, Bio-occlusive)</i>	Thin layer of polyurethane with an adhesive. Permits the passage of gases and water vapor but not exudate, are transparent and allow visualization of the wound.	Wound with minimal to no exudate.
Paraffin gauze <i>(Vaseline, Adaptic)</i>	Gauze fiber coated with petrolatum. Nonabsorbent.	Superficial dry wound, or wound with minimal exudate, and if wound is particularly painful and dressing that “sticks” causes increased pain with removal, despite moistening.
Simple, low-adherence gauze	Cotton or Viscose backing and a non-adherent coating which may be polyethylene, polypropylene or artificial silk. Generally, are nonabsorbent and serve as a contact layer. Protects the wound bed from trauma due to adherence, however, can macerate if excess exudate.	Superficial dry wound, or wound with minimal exudate, and if wound is particularly painful. Telfa may cause increased maceration if wound is draining.