Dressing Up Your Wound

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Disclosure

- No financial disclosures, no financial relationships.
- The information provided in this presentation is current and based on recommendations from the manufacturers.
Goals

• To gain a basic understanding of what affects wound healing.

• To increase the knowledge base regarding various wound dressings and be able to comfortably choose the appropriate dressing for the wound/ulcer.
Management of Wounds with Dressings

• Ensure the underlying disease etiology is known or there is an understanding of the disease processes

• Understanding the underlying disease etiology and co-morbid conditions helps define dressings and the plan of care

• Be familiar with dressings, how they work, advantages and disadvantages, recommendations from the manufacturer, cost, how are the dressings applied and removed

• Base decisions on evidence
The Basics – What affects wound healing?

- Systemic factors - Ensure the underlying disease processes are known and are being treated
  - Diabetes, A1C 8% and under
  - Venous insufficiency, have studies been done and are there surgical interventions that can promote healing
  - If pressure, is there a plan to alleviate pressure, footwear, use of crutches, kneeled scooters, seating and mattresses
    - Minimize friction and shearing forces
  - Is there optimal blood flow or is impeded by reduced arterial flow, are they surgical interventions that would be beneficial or need to be done to improve healing
The Basics - What affects wound healing?

• What is the patients nutrition and hydration status, lab values
  • Low albumin
  • Low hemoglobin
  • Inflammation

• Immunocompromised
  • Cancer, arthritis, transplant
  • Medications

• Body type
  • Under or over weight, mobility

• Age
  • Elderly –
    • Skin changes
    • Mental status changes
The Basics - What affects wound healing?

- Infection
  - Local
  - Systemic
  - Osteomyelitis
- Desiccation and Maceration
- Necrosis
- Edema
  - Reduces nutrition and oxygen to the wound
- Pressure
  - The need to offload or reduce friction and shearing forces
- Smoking
The Basics - What affects wound healing?

• Assess the patient and care team assisting the patient to ensure they are able to do dressing changes
  • Identify barriers to participation in cares

• What are the patient’s goals
  • To heal
  • Palliative
  • End of life
The Basics - What affects wound healing?

• Biofilm
  • Is an extracellular polysaccharide matrix, with microorganisms imbedded
  • Become resistant to normal host responses, topical antibiotics and oral antibiotics
  • Complicates wound care due to the level of resistance
  • When removed during debridement, will improve wound healing
  • Debridement of the biofilm regularly decreases reformation
Question

• What pH of the skin allows it to become more permeable to irritants and increases the risk of breakdown?

A. Acid (0.0 to 5.5)
B. Neutral (5.5 to 7.5)
C. Alkaline (7.5 to 14.0)
The Ideal Dressing

• What is the ideal dressing?
Dressings

• When deciding to make a dressing change
  • Has the current dressing been working
  • How long has the dressing been used
  • Is there an active infection
  • Is the wound bed prepped
  • Are the underlying etiologies treated
  • Has the patient been adherent to previous and current recommendations
  • Re-education on the use of the dressings
Dressings

• Will review the major categories of dressing types

• Numerous products and product lines under each category

• Have incorporated manufacturers recommendations for indications of use application, and removal
Foams - Definition

• Description
  • Soft, conforming, silicone based dressing
    • Come composed of a polymeric membrane to soften and starch to wick exudate
  • Meant to pull exudate away from the wound
  • Create a moist environment for healing
  • Not suitable for dry Escher
  • Can be expensive if used daily
  • Can be used as a primary or secondary dressing, come in adhesive and non adhesive backing
Foams - Use

- Minimal to heavy exudative wounds
- Skin tears, superficial, partial and full wounds, abrasions, second degree burns, shallow pressure ulcers, venous ulcers, diabetic ulcers, arterial ulcers, traumatic wounds
- Not to be used in tunneling ulcers, third degree burns, some are contraindicated with active vasculitis or with the use of oxidizing agents
Foams – Application and Removal

• Application
  • Apply to wound base assuring so there is 2 inches surrounding wound
  • May be applied under compression

• Removal
  • Easily removed
  • Change every three days or may remain in place for 7 days, depending on the exudate
  • Can be changed when the exudate is near the edges of the dressing, or visible
Hydrocolloids - Definition

- Definition
  - Occlusive or semi-occlusive dressing composed of either gelatin, pectin or carboxymethylcellulose
  - Provide a moist environment, autolytically debrides necrotic wounds
  - Allows for granulation
  - Various sizes and shapes to allow for flexibility and ability to conform to the ulcer bed
Hydrocolloids - Use

- May be a primary or secondary dressing
- Pressure, partial and full thickness wounds, necrotic wounds and slough wounds
- For light to moderate draining wounds.
- Advantages – impermeable to bacteria, contaminants, self-adherent, moldable, light to moderate absorption. May be used under compression
- Disadvantage – not recommended for heavy exudate, wounds with sinus tracts, exposed tendon or bone. May leave residue and injure fragile tissue upon removal. Occlusive dressing limiting gas exchanges between wound and environment
Hydrocolloids – Application and Removal

• **Application**
  - Clean the wound, dry surrounding tissue and ensure grease free, remove any eschar. Apply dressing that is 1.25 inches or 3 cm larger than wound. Additional taping is not needed.
  - Hold in place with hand

• **Removal**
  - Leave in place up to 7 days unless leaking, discomfort or infection occurs
  - Press down on skin and lift edge of dressing until all edges are free
  - Not necessary to remove all residual material
Hydrogels - Definition

• Description
  • Water or glycerin based amorphous gels, gauzes, may also come in sheets
  • May not absorb exudate because of water content
  • Provides a moist healing environment promoting granulation
  • Offers autolytic debridement
  • May be a primary dressing or secondary if bought as a sheet
  • Soothing, reduces pain, hydrates wounds
  • Autolytic debridement, can be used when infection is present, and provides minimal or moderate absorption
  • Can be used to fill dead space
Hydrogels - Use

- Partial or full thickness wounds, dry wounds, cuts, abrasions, incisions, necrotic tissue or wounds with slough, minor burns – 1st and 2nd degree and tissue damaged by radiation, dry pressure wounds, venous stasis, infected and non-infected wounds, wounds with no drainage or light drainage

- Disadvantages - Not recommended for high exudative wounds, will dehydrate if not covered

- May require a secondary dressing to ensure moisture is in tact, and may macerate tissue if too moist
Hydrogels – Application and Removal

• Application
  • Cleanse the wound, dry the periwound
  • Apply a generous amount to the wound bed
  • Cover with secondary dressing, may repeat every 72 hours

• Removal
  • Remove all dressings, cleanse the wound and remove any dry exudate or dressing material before re-application
Alginates and Fibers – Definition

• **Description**
  - Made from spun fibers from brown seaweed
  - Made from sodium carboxymethylcellulose fiber
  - Via ion exchange, will absorb exudate and forms a gel to keep a moist environment
  - Comes in sheets or ropes, can be cut to various sizes, can be packed into a wound space as a filler
  - Some are impregnated with silver
  - Can absorb up to 20 times its weight in exudate
  - Facilitates autolytic debridement
  - Will not wick exudate laterally, reducing peri-ulcer damage.
Alginates and Fibers - Use

• For partial to full thickness wounds
• Moderate to heavy drainage
• Pressure ulcers 1 to 4, arterial, venous, surgical sites, trauma, DFU’s
• Contraindicated for dry or lightly draining wounds
• Not to be used as a surgical sponge
Alginates and Fibers – Application and Removal

• Application
  • Cleanse wound, apply to bed or may pack the wound with rope alginate
  • Apply to a moist wound
  • Not for a light draining wound and do not add extra moisture
  • Overlap edge 1/8 inch for shallow wound. Deep wounds, pack to 80% of depth to accommodate swelling of dressing. Cover with secondary dressing

Removal
• After removal, may rinse wound with saline
• Change when there is a strike through to the secondary dressing
• May be in place for 2 to 5 days
• Irrigate wound with saline to remove any remaining gel or fiber material, though the seaweed is biocompatible
Films – Description and Use

• Description
  • Transparent, conforming, inexpensive, made from polyurethane sheets
  • Semi-permeable to water vapor and oxygen and impermeable to bacteria and liquid
  • Offer no absorptive qualities

• Uses
  • As a protective dressing (primary) and short term or as a secondary to hold another type of dressing on (alginate or foam)
  • Skin tears, pressure ulcers, minor cuts and lacerations
Films – Application and Removal

• Application
  • Remove the backing, place over the wound or other dressing allowing for a 2.5 cm perimeter of intact skin
  • Moisture will inactivate the adhesive material

• Removal
  • Grasp the corner of dressing and pull parallel to skin, causing seal to break and reduce trauma to fragile skin
  • May be left on for 3 days
  • Change when exudate reaches the edge
Contact Layers – Description

• **Description**
  • Impregnated gauze dressings, woven or non-woven material, can be silicone based
  • May be impregnated with petrolatum or iodinated agents
  • Non adherent sheets to reduce wound contact with other layers
  • Porous, allows fluid to pass and be absorbed in the next dressing
  • Inexpensive
Contact Layers - Use

- May be used as a primary or secondary dressing
- Partial or full thickness wounds, surgical incisions, donor sites, skin tears, traumatic wounds, chronic wounds
Contact Layers – Application and Removal

• **Application**
  - Apply over wound bed or collagens
  - Offers moisture protection and can be covered with additional foam or other dressings for moisture
  - Can be left in place for several days depending on amount of exudate, with the layer remaining in place and change of the absorptive layer

• **Removal**
  - Easy to remove, lift and remove
Topicals – Description and Use

Iodosorb

• Description
  • Antimicrobial gel with smart release formula. It provides a sustained release of iodine while absorbing slough, debris and exudate
  • Delivers sustained broad spectrum antimicrobial for 72 hours.

• Use
  • For cleaning wet ulcers, venous stasis ulcers, pressure ulcers, infected traumatic wounds and surgical wounds
  • Contraindicated with patients allergic to iodine, Hashimoto's disease or nontoxic nodular goiter, hx of thyroid disorder, breast feeding or pregnant patients
Topicals – Application and Removal

Iodosorb

• Application
  • Clean wound with saline, don’t dry surface. Apply 1/8 to ¼ inch on dry gauze and place on wound
  • A single application should not exceed 50 gram and one week application should not exceed 150 g

• Removal
  • Change Iodosorb 3 times a week or when Iodosorb has changed from brown to yellow-grey
  • Use saline or sterile water to remove, use a sterile west swab to remove dressings
  • Blot excess exudate leaving a slightly moist environment before re-applying
Topicals – Description and Use

Silvadene

- Description
  - Silver sulfadiazine a topical sulfonamide/silver
  - Stops the spread of bacteria.
  - Not recommended for children younger than 2 months
  - Category B for pregnancy. Cautious use with liver, G6PD or renal failure patients when used in large amounts.
  - Can reduce pain

- Use
  - For burns
Topicals – Application and Removal
Silvadene

• **Application**
  • Apply 1/16 of an inch thick to ulcer or burn once to twice a day
  • Caution with pregnancy to severe renal insufficiency
  • Cover with nonstick dressing or gauze

• **Removal**
  • Wipe ulcer bed with soft gauze
Topicals – Description and Use

• Description
  • Made from either 80 or 95% Leptospermum honey
  • Provides a moisture balanced environment, highly osmotic to debride
  • Low pH, helps to lower the pH of the ulcer bed, non-toxic
  • Contraindicated if allergic to honey or alginates

• Use
  • Light to moderate exudative wounds, diabetic foot ulcers, venous, arterial and mixed ulcers, pressure ulcers, 1st and 2nd degree burns, surgical, trauma, donor sites
Topicals – Application and Removal

• Application
  • Cleanse wound bed
  • Apply directly to the wound and cover with appropriate dressing, foam, alginate, composite
    • If using the composite, cut to size of wound margins not overlapping the wound

• Removal
  • Will depend on the amount of exudate and when the secondary dressing has reached its capacity
  • If dry, moisten with saline and cleanse before re-application
Antimicrobials

• Description
  • Topical products, may contain iodine, silver or polyhexethylene biguanide
  • The active ingredients deliver antimicrobial or antibacterial properties to the wound
  • Used to reduce the biofilm on a wound, when the risk of infection is great, and provides a barrier and inhibit growth of bacteria
  • Silver components in dressings are activated when moist
  • Various types of dressings and includes foams, alginates, hydrofibers, charcoal dressings, hydrocolloids
Antimicrobials

- Acetic acid
  - 0.25% to 0.5% product that is made from white vinegar and water
  - Effective on *Pseudomonas*
  - Works by altering the pH of the skin
  - pH of 3
Collagens – Description

**Description**
- Collagen is the most abundant protein in the body, it is insoluble and comprised of fibrin from fibroblasts, made from bovine, porcine.
- Helps to stimulate a healthy wound bed by providing a scaffolding.
- Offers a moist healing environment.
- Can be used in combo with other dressings.
- Easy to apply and are non-adherent.
- Some collagens provide a hemostatic property.
- Can be used under compression.
Collagen - Uses

• Can be used on DFU's, venous, pressure, traumatic, recalcitrant, and surgical wounds that are free of necrotic tissue

• A primary dressing for full and partial thickness wounds and ulcers

• Can be used on non-infected and infected wounds, donor sites, areas of undermining and tunneling, minimal to heavy exudate
Collagens – Application and Removal

• Application
  • Must have an eschar free ulcer bed, no black ulcers or wounds
  • Contraindicated with 3rd degree burns, sensitivity to the product components
  • Debride the wound bed of non viable tissue, remove eschar if possible and cleanse the wound with saline or what your practice dictates
  • Apply directly to bed, will self moisten with exudate or may moisten with saline
  • Secondary dressing to cover and ensure collagen does not dry out, dressings to absorb exudate

• Removal
  • Remove the secondary dressing and cleanse the wound bed
  • Depending on the collagen, may be left in place up to 7 days or the discretion of the provider
  • Should be absorbed in the wound bed
  • Not necessary to remove the collagen, unless dried out.
Methods of Debridement

• Debridement if part of the wound prep
• Includes
  • Surgical sharp and conservative sharp
  • Ultrasonic mist
  • Biosurgical – maggot therapy
  • Mechanical – wet to moist gauze, whirlpool
  • Chemical – enzymatic, Dakin’s
  • Santyl – collagenase ™
Collagenase – ___________

• Description
  • An enzymatic cleaner
  • Actively removes necrotic tissue to help reduce the debris from accumulating
  • Allows granulation to occur
  • Does not harm healthy tissue

• Use
  • On wounds/ulcers that have debris, DFU’s, Decubiti, chronic dermal ulcers
Collagenase – ________________

- **Application**
  - Cleanse wound bed
  - Apply 2 mm thickness daily
  - If wound is dry, may require additional moisture
  - Cover with appropriate dressing
  - Do no use dressings with silver or iodine

- **Removal**
  - Remove once a day with gauze
Wound Facts

• What is the percentage of patients with diabetes that go on to develop diabetic ulcers?
  • A. 25%
  • B. 50%
  • C. 30%
  • D. 15%
Wound Facts

- Venous ulcers have a higher incident rate in patients over 65 years of age. What is the rate of reoccurrence and how much does one episode of treatment cost?
  - A. 65% and $50,000
  - B. 70% and $40,000
  - C. 75% and $35,000
  - D. 50% and $50,000
  - E. 45% and $50,000
• CASE STUDIES
Case #1

• 43 year old male
  • PMH
    • Diabetes, hypertension, venous insufficiency, morbid obesity, ST-MI, previous lower leg and toe ulcers, diabetic neuropathy, non-smoker
    • Has worn compression consistently, 8-10 mm/hg knee high stocking
  • Studies
    • ABI and TcPo2’s were 1.19 on right and 1.27 on left
    • MRI – no sign of osteo
  • Exam
    • PT and DP, palpable, +4
    • Bilateral leg edema, left > right
Case #1

• ABI
  • Normal 1.0 to 1.3
  • < 0.9 or > 1.3 (> 1.4 typically reflects non-compressible vessels due to calcification)
  • < 0.9 some level of arterial disease
  • < 0.5 ischemia, wound healing unlikely

• TBI
  • > 0.7 normal
  • 0.4 ischemia

• TcP02
  • > 40 Normal
  • < Hypoxia occurring with reduced wound healing
Case #1
Case #1

• Ulcer
  • Cellulitis of toe and dorsal foot, erythema, swelling, tunneling under the plantar toe, ulcer is circumferential, little healthy tissue, bone palpable
  • On antibiotics for infection, erythema improving
  • Drainage – moderate
  • Peri-ulcer maceration
  • Odor
Case #1

• Options and rationale?
  • A. Hydrogel for debridement, an antibiotic for infection and absorptive dressings, no compression
  • B. Iodosorb for an antibacterial, absorptive dressing, no compression
  • C. Debridement once a week, then apply a collagen, compression
  • D. Packing as needed, Iodosorb for antibacterial, compression
Case #2

- 64 year old female
  - PMH
    - Diagnosed with systemic lupus erythematosus in 1991, hypertension, otherwise healthy
    - Non – smoker
  - Studies/Meds
    - On Imuran for Lupus
    - No history of venous or arterial insufficiency
  - Exam
    - +4 pedal pulses
    - Trace bi-lateral dependent lower extremity edema
Case #2
Case #2
Case #2

• Ulcers
  • Occurred March 2015 with an initial malleolar outbreak, bilateral lower legs, secondary to Lupus
  • Large amount of serous drainage with daily to TID dressing changes
  • Multiple bouts of cellulitis with oral antibiotics
  • Painful ulcers, adherent and non adherent slough and eschar present
  • Peri-ulcer skin breakdown from the drainage
  • Pseudomonas present on some of ulcers, green tinged, odor present
Case #2

• Options and rationale

• A. Continue with oral antibiotics and also start with a topical antibiotic to reduce biofilm
• B. Initiate Santyl for debridement
• C. Initiate an alginate or hydrofiber for absorption along with ABD’s
• D. Initiate the use of foam dressings for absorption of drainage and protect per-ulcer from additional breakdown
• E. Initiate Hydrogel to soften the eschar and debride the ulcer
• F. Initiate a topical antimicrobial, such as Iodosorb to help debride
Case #2
Case #2

- What is next?
Case #2
Case #3

- 72 year old female
  - PMH
    - Hypertension, hyperlipidemia, smoking history, was treated with antibiotics, and recently completed Doxycycline

- Studies
  - Venous insufficiency study notes no incompetent perforators on left, small incompetent perforator of right thigh
  - Arterial studies – normal TBI’s 1.12 and 1.15 and TcP02’s were normal
Case #3
Case #3

• Exam
  • Palpable pulses
  • Cellulitis resolving, no other symptoms of infection
  • Dependent edema, slough present on ulcer bed on shin and eschar on the ankle wound

• Wound
  • Right anterior shin, and lateral malleolar occurred from trauma from pokes from a raspberry bush 2 months previous
  • At home cares included cleaning with hydrogen peroxide and topical antibiotic cream
  • Worsened, presented to per primary, was told to leave it open to air
  • Drainage has increased
Case #3

• Options and rationale?
  • A. Debride the wound, continue with topical antibiotic cream
  • B. Debride, initiate a topical to debride the ulcer
  • C. Debride, initiate a foam dressing
  • D. Cover with dry gauze
Case #4

- 79 year old female
  - PMH – hypertension, hyperlipidemia, A-fib, degenerative joint disease, known venous insufficiency with previous ablations

- Studies
  - Normal arterial studies
  - Venous insufficiency studies note previous ablations
  - Biopsy done notes venous etiology
  - Xray notes no osteo
Case #4
Case #4

• Wounds
  • Has had the wounds for 3 years
  • Presented 1 year ago where recommendations were given, did not follow them
  • Presented again at the referral of her primary, her local physician recommended an amputation
  • Previous dressings used have included ____________, Silvadene, Dakin’s, ____________ (done elsewhere)
  • Copious green tinged drainage, adherent and non adherent slough, fibrin, odor, peri-ulcer is irritated, excoriations
Case #4

- Options and Rationale?
Case #4

• Options and Rationale

• A. Debridement, Dakin’s solution soaks once daily, ABD’s
• B. Debridement, Alginate dressing, ABD’s
• C. Debridement, ABD’s
• D. Referral to orthopedics for amputation
• E. Debridement, Acetic acid soaks, Alginate, ABD’s
Case #4

• COMPRESSION, COMPRESSION, COMPRESSION
Case #5

- 26 year old male
  - PMH
    - Poorly controlled diabetes, with diabetic retinopathy
    - Peripheral arterial disease, previous revascularization and stenting done for claudication symptoms, scheduled for another surgery
    - Nicotine and cannabis dependency
  - Studies
    - Right ABI 0.55, TBI 0.12
    - Left ABI 1.05
    - TcP02’s – R proximal – 5-3-15, R distal 2-2-2
    - Osteo of 3rd toe
Case #5

• Wounds
  • Ischemic third and fourth toe
  • Auto-amputation starting
  • Malodor, scant drainage
  • Edema
Case #5
Case #5

- Options and Rationale

- What would you do first?
  - A. Discuss amputation options and refer patient to orthopedics for amputation
  - B. Dress with a dry gauze to pad and protect
  - C. Use a topical antibacterial, ex Iodine based dressing, cover to pad and protect
  - D. Use hydrogel for debridement, cover to pad and protect
Case #5

• Do you debride with this patient?

• A. Yes

• B. No
Review

• Basics of wounds and wound stalling
• Dressings basics, application
• Case studies
Conclusion

• Keep the patient involved in the care to increase adherence to recommendations

• Review goals, what is it the patient wants and is it logical?

• Understand the underlying etiology and ensure that is also being treated

• Use a dressing for a period of time, unless there is a huge change, stay the course

• Ensure the best dressing is being used