Bedside Wound Care Delivery: Beyond the Slough

Shark Bird, MD, CMD
Janet Mackenzie, MD
Hiral Gallimore, MD
Tim Earley , NP
Kristin Wulff, MD

1

Beyond the Slough: Wound Care

Agenda for the session:

- **Arterial and Diabetic foot wounds**, Dr Hiral Gallimore
- **Venous wounds of the lower extremities**, Tim Earley NP

break

- **Pressure wounds**, Dr Kristin Wulff
- **Dressings**, *break*
- **Hands-on skills stations**
  - Bedside doppler for patients with arterial disease
  - Wound assessment
  - Lower extremity wraps
  - Dressings

2

Venous Ulcers

3

Case

- Mrs. Robinson, a well known socialite from the early 70's, has been admitted to Cougar Nursing and Rehab under your care. Upon initial evaluation you note that she has bilateral lower extremity swelling with discoloration below the knees extending to the ankles. The family is concerned about infection and cellulitis. The right lower extremity has a large open area wit irregular borders and copious exudate. It is beefy red and measures 12 cm x 8 cm and 0.5 cm deep.

4

Photo of venous wound with stasis dermatitis

5

Which of the following is most important?

- Immediately starting antibiotics to address the raging infection
- Evaluation of vascular statis of the legs with appropriate local wound care and compression/elevation
- ESR, CBC, CRP
- Transfer to hospital for evaluation to prevent possible limb loss

6

You decide to treat open wound and use compression. For a 4 layer compression dressing, what is the minimum ABI that will allow you to apply compression?

- 1.0
- 0.9
- 0.8
- 0.6

7

Intro to Venous Ulcers

- - **Definition:** Venous ulcers, also known as venous stasis ulcers, are chronic wounds that occur due to improper functioning of venous valves, usually in the lower extremities.
- - **Prevalence:** They account for approximately 70-90% of leg ulcers.
- - **Impact:** Significant morbidity, with potential for infection and reduced quality of life.

8

Characteristics of Venous Ulcers

- - **Location:** Commonly found on the inner part of the leg, just above the ankle (medial malleolus).
- - **Appearance:**
- - Shallow and irregularly shaped.
- - Often have a red base covered with yellow fibrin.
- - Surrounding skin may be swollen, discolored, and may have evidence of lipodermatosclerosis (hardening of the skin).
- - **Symptoms:** Itching, pain, swelling, and heaviness in the affected leg. May produce a large amount of exudate.

9

Diagnosis of Venous Ulcers

- - **Clinical Examination:** Assessment of ulcer characteristics, location, and leg appearance.
- - **Patient History:** Including previous ulcers, DVT, varicose veins, and family history of venous disease.
- - **Diagnostic Tests:**
- - **Doppler Ultrasound:** To evaluate venous reflux and obstruction.
- - **Ankle-Brachial Index (ABI):** To rule out arterial insufficiency.
- - **Duplex Ultrasound:** For detailed examination of venous anatomy and function.

10

Treatment of Venous Ulcers

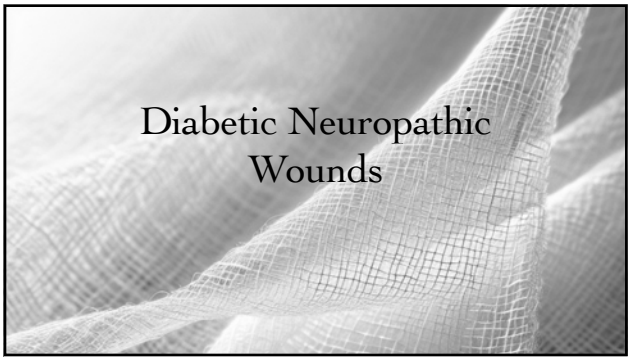
- - **Compression Therapy:** Mainstay treatment to reduce edema and improve venous return. Options include:
- - Compression stockings
- - Multilayer bandaging
- - **Wound Care:** Regular cleaning, debridement of necrotic tissue, and use of dressings that manage exudate and promote a moist wound environment.
- - **Medications:** Topical and systemic antibiotics for infection, pain management with analgesics.
- - **Lifestyle Changes:** Leg elevation, exercise to improve calf muscle pump function, weight management.
- - **Surgical Options:** Vein surgery (e.g., stripping, ablation, sclerotherapy) in cases of severe or recurrent ulcers.

11

Preventions and Long-Term Management

- - **Preventive Measures:** Regular use of compression garments, skin care to prevent dryness and cracking, avoiding prolonged standing or sitting.
- - **Follow-Up Care:** Regular monitoring for recurrence, patient education on skin care, and signs of infection.
- - **Advanced Treatments:** Skin grafting for non-healing ulcers, use of bioengineered skin substitutes, and hyperbaric oxygen therapy.
- - **Multidisciplinary Approach:** Collaboration among healthcare providers including dermatologists, vascular surgeons, wound care specialists, and primary care physicians for comprehensive management.

12



13

Question 1

- 83 year old man with multiple dry wounds on his toes comes to you with increasing pain at night. Patient's history is significant for DM, HTN, smoking. Upon physical exam you notice that wounds are dry, stable eschar with no odor. But you also notice that the feet are cool to touch and you have difficulty palpating pulses. What is you next step?

14

Question 1

- Insert Picture

15

Question 1

- 83 year old man with multiple dry wounds on his toes comes to you with increasing pain at night. Patient's history is significant for DM, HTN, smoking. Upon physical exam you notice that wounds are dry, stable eschar with no odor. But you also notice that the feet are cool to touch and you have difficulty palpating pulses. What is you next step?
  A. Refer immediately to the ER for bilateral below the knee amputation
  B. Refer to ID for suspected Osteomyelitis
  C. Search for pulses with a handheld doppler, use results to guide next steps
  D. Suggest that patient make an appointment at a vascular surgery clinic

16

Question 1

- 83 year old man with multiple dry wounds on his toes comes to you with increasing pain at night. Patient's history is significant for DM, HTN, smoking. Upon physical exam you notice that wounds are dry, stable eschar with no odor. But you also notice that the feet are cool to touch and you have difficulty palpating pulses. What is you next step?
  A. Refer immediately to the ER for bilateral below the knee amputation
  B. Refer to ID for suspected Osteomyelitis
  C. Search for pulses with a handheld doppler, use results to guide next steps
  D. Suggest that patient make an appointment at a vascular surgery clinic

17

Question 1

- Doppler Signals
  - Monophasic
  - Biphasic
  - Triphasic

18

Question 1

- When to send out?
  - Cold, pulseless foot
  - Ascending Ischemia/ Gangrene

19

Question 1

- Treatment Options
  - Keep dry and intact
    - Betadine
    - Skin Prep

20

Question 2

- A 67 year old woman asks to see regarding a callous on her heel. On exam you note a wound surrounded by thickened callous and a soft central eschar cap. Foot is warm and there are marginally palpable pulses. History is pertinent for CHF, SCC, Alcohol abuse and DM with an A1c of 11. The patient states that the wound hurts mostly at night and describes it as electrical in nature. There is an odor noted from the wound but patient denies any current pain. What is the most appropriate next step?

21

Question 2

- Insert Picture

22

Question 2

- A 67 year old woman asks to see regarding a callous on her heel. On exam you note a wound surrounded by thickened callous and a soft central eschar cap. Foot is warm and there are marginally palpable pulses. History is pertinent for CHF, SCC, Alcohol abuse and DM with an A1c of 11. The patient states that the wound hurts mostly at night and describes it as electrical in nature. There is an odor noted from the wound but patient denies any current pain. What is the most appropriate next step?
  A. Refer immediately to the ER for unilateral below the knee amputation
  B. Refer to endocrinology for diabetic management
  C. Order Xray, ESR, CRP to work up for Osteomylitis, send deep wound culture
  D. Start empiric Keflex and take a surface swab of eschar and send for culture

23

Question 2

- A 67 year old woman asks to see regarding a callous on her heel. On exam you note a wound surrounded by thickened callous and a soft central eschar cap. Foot is warm and there are marginally palpable pulses. History is pertinent for CHF, SCC, Alcohol abuse and DM with an A1c of 11. The patient states that the wound hurts mostly at night and describes it as electrical in nature. There is an odor noted from the wound but patient denies any current pain. What is the most appropriate next step?
  A. Refer immediately to the ER for unilateral below the knee amputation
  B. Refer to endocrinology for diabetic management
  C. Order Xray, ESR, CRP to work up for Osteomylitis, send deep wound culture
  D. Start empiric Keflex and take a surface swab of eschar and send for culture

24

Question 2

- Osteomylitis Work up
  - Imaging
    - X-ray
  - Labs
    - ESR
    - WBC
    - CRP
  - Culture
    - Deep tissue >>> Surface Swab
    - Start empiric antibiotics after culture has been taken

25

Question 2

- Diabetic Wounds and Neuropathy
  - Manage expectations
  - Pain complaints increase as wounds heal

26

Question 2

- Diabetic Wound Management
  - Attempt better glucose control
  - Higher risk of infxn
  - Moisture Management

27

Understanding and Assessing Pressure Injuries

Kristin L. Wulff, MD, ABAARM, CWSP
October 31, 2024

28

Introduction and Key Takeaways

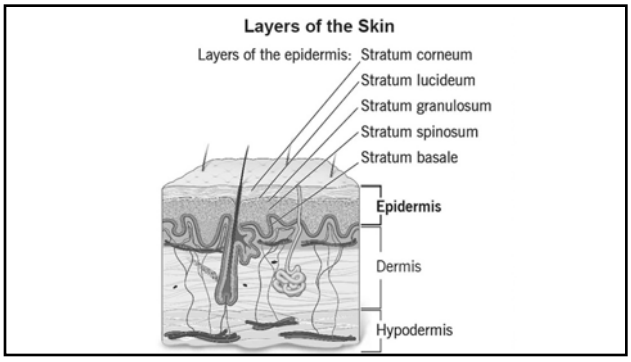
- What are pressure injuries and why are they important?
- Impact on patient outcomes and healthcare costs.

29

Quick Summary of the Six Stages

- Stage 1 through Stage 4
- Unstageable
- Deep Tissue Injury

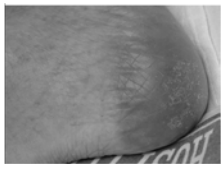
30

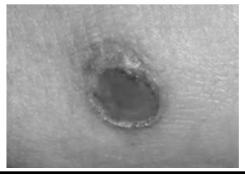


31

Stage 1 & Stage 2 Pressure Injuries

- Stage 1: Intact skin with non-blanchable redness
- Stage 2: Partial thickness skin loss with exposed dermis, may appear as a blister

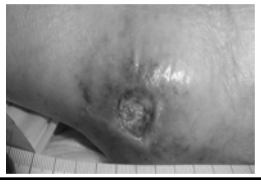


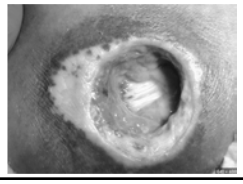


32

Stage 3 & Stage 4 Pressure Injuries

- Stage 3: Full thickness skin loss with visible adipose tissue.
- Stage 4: Full thickness tissue loss exposing muscle, tendon, or bone.

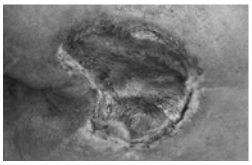


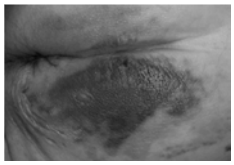


33

Unstageable Pressure & Deep Tissue Injuries

- Unstageable: Full thickness skin and tissue loss, obscured by slough or eschar.
- Deep Tissue Injury: Persistent deep red or maroon discoloration; skin may be intact.



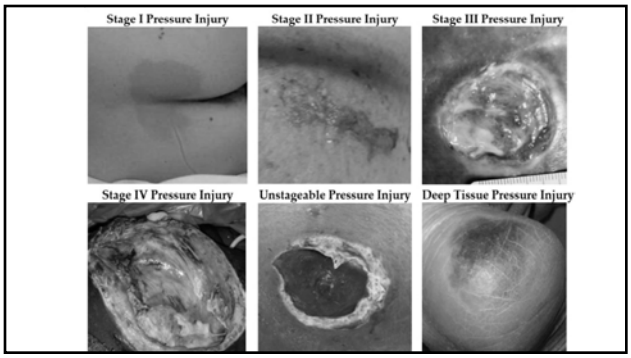


34

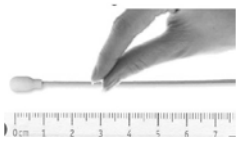
Key Assessment Techniques

- How to measure pressure injuries (length, width, depth).
- Key signs of infection (redness, warmth, odor, drainage).

35



36



37

Case Study: Miss MultiPressure Polly

- 80 year old female, bedridden, with a history of diabetes and dementia.
- Injuries:
  - Right heel – non-blanchable erythema
  - Right elbow – partial thickness skin loss
  - Left hip – full thickness skin loss with visible adipose tissue
  - Sacrum – full thickness tissue loss exposing muscle and bone
  - Left heel – covered with dry eschar
  - Right ischium – dark purple discoloration with intact skin

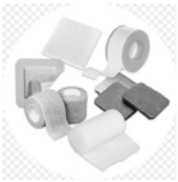
38

Documentation & Reassessment

- Importance of regular, detailed documentation
- Include wound dimensions, progression, and photographic evidence if available.

39

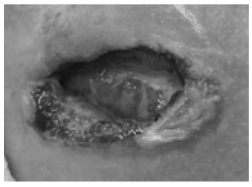
IV. The Big Wide World of Dressings



40

The Dilemma: Mrs. Hufflepuff

- 4:55PM Friday
- New admission with big wound
- No discharge wound orders
- Wound nurse is on vacation off-grid
- Floor nurses are asking you for orders
- *????*



41

Dressings: Quick, Easy, Cost-Effective

1. ***Easy algorithm*** using six basic products appropriate for most wounds.
   - Not necessarily the *best* dressing long term, but a good medically appropriate starting point. A "Do No Harm" approach
2. ***Cost Effective***
   - *Does anyone look at how much is spent on dressings every month?*
     - Yep
   - *Is it better for the clinician to decide how to best use resources than have the financial people make these clinically-related decisions?*
     You betcha

42

Dressings: Selection

- Primary consideration in dressing selection is ***moisture balance***
- Dressings either *contribute* moisture or *remove* moisture
  - Drier wounds generally need dressings that donate moisture
  - Wet wounds generally need moisture absorbing dressings

Moisture donating

Moisture removing

43

Dressings: Rules of Thumb

- If it's dry, wet it (exception for dry arterial wounds and dry heel eschar)
- If it's wet, dry it
- If it's deep, fill it
- If it's shallow, cover it
- If it's infected, treat it and watch it
- If it's pink, protect it
- If it's dead, debride it

44

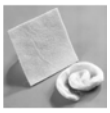
If It's Dry*, Wet It: Moisture Donating Dressings

- Dressings indicated for light to moderate drainage
  Not for use in wounds with heavy exudate
- Donate moisture:
  - Hydrogels
  - Honey products
  - Collagen gels
  - Ointments
  - Other gels
- Retain existing moisture in wound bed:
  - Hydrocolloids
  - Petrolatum gauze, Xeroform

*"Dry" means lightly draining or dry wounds, not just dry wounds

45

If It's Wet, Dry It: Moisture Removing Dressings



- Dressings indicated for moderate to heavy drainage
  Not for use in wounds with light exudate
- Two commonly available products:
  - Alginate
    - Derived from brown seaweed
  - Hydrofiber
    - Synthetic product
    - Interchangeable with alginate
- Saturated product forms a gelatinous substance on the wound bed
  - Helps maintain proper moisture balance in the wound bed
  - *It's not pus!*

46

Secondary Dressings

- Border gauze. Can use with anything
- ABD pads.
  - Used for wet wounds. Inexpensive, so can use for padding if needed
- Foam dressings –
  - Moderate to heavy drainage. CMS reimbursement considerations
- Superabsorbent
  - Usually covered for daily use
  - Most formularies have this
- Hydrocolloids
  - Light to moderate drainage, but not typically used as secondary dressing
  - Change 2-3x/week
- Clear film not recommended on elderly skin

47

The Issue With Foam…

- Great dressing
  - Nurses love it
  - Providers love it
  - Soft and cushiony on the skin

But…

- CMS only covers three foam dressings per week
- If ordered daily, facility pays out of pocket for four dressings per week
- Be mindful of your orders and consider reimbursable dressings whenever possible
  - Patient "needs" vs Provider "wants"

48

While we are discussing expense: Collagenase

- Very good product
  - The only enzymatic product available in the US
- Clinical considerations
  - Silver ions inactivate collagenase. Don't use with silver dressings
  - Many commercial cleansers decrease effectiveness. Use saline to clean wounds
- Cost
  - The most expensive item on the wound cart
  - Hundreds of dollars per tube
  - Some patients may be covered outside of daily resource allocations

The point: It's unwise to routinely use Santyl on every sloughy wound. Use clinical judgement for method of debridement

49

Easy Algorithm:

Is the wound wet or dry?

WET WOUND

Primary dressing:
- **Alginate**
- **Hydrofiber**
- Gauze (to cover or pack)

Secondary dressing:
- Border gauze
- ABD pad
- Superabsorbent dressing
- Foam

DRY*/MOIST WOUND

- Primary dressing:
  - **Hydrogel**
  - **Honey gel**
  - Gauze (to cover)
- Secondary dressing:
  - Border gauze
  - Non-stick
  - other

****Exception: Do not moisten dry stable heel eschar or dry arterial wounds/black toes/dry gangrene***

50

Tips:

Try to use one primary dressing and one secondary dressing whenever possible

Simpler dressing orders
- Are more likely to be done correctly
- Are more likely to be done as scheduled

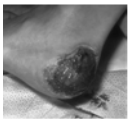
51

Let's Try it Out!

52

Mrs. Prim Avera's heel

- Mrs. Prim Avera developed this heel wound.
  - Wound bed is granulated, clean
  - Small amount of drainage
- *Ask Yourself: Is it Wet or Dry?*
- *Need to donate moisture or remove moisture?*



Of the following options, which is the most appropriate for this wound?

- A. Calcium alginate, dry dressing, heel offloading
- B. Honey gel, open to air, heel offloading
- C. Hydrogel, dry dressing, heel offloading
- D. Hydrogel, foam dressing, heel offloading

53

C. Hydrogel, dry dressing

- For lightly draining wound, need to add or preserve moisture in the wound bed.
- Calcium alginate – removes moisture
- Foam dressings – removes moisture
- Hydrogel and Honey gel would both be appropriate with an appropriate secondary dressing

As always, don't forget the offloading!

54

But What About…?

- Periwound protection: Barrier cream, skin prep
  - Prevent maceration, irritation
- Antimicrobial:
  - Silver, honey, hydrofera blue, cadexomer iodine, hypertonic saline (Mesalt)
- Negative pressure: PICO, traditional
- Advanced wound care products: cultured tissue products (skin substitutes)
- Necrosis:
  - Santyl, Autolytic, Sharp debridement
- Pain, sticking: contact layer
- Tunnel:
  - Gauze packing strips (iodoform gauze) or hypertonic saline strips (Mesalt)
  - Alginate rope for wider areas. Can break in tight tunnels

Beyond the scope of this talk
Ask me in the hands-on session

55

Question

- All of the following are relatively *expensive* dressing materials EXCEPT:
  - A. Santyl
  - B. Hydrofera blue
  - C. Collagen powder or gel
  - D. Hydrogel
  - E. Iodosorb gel

56

Answer - D

- Hydrogel is inexpensive and present on every formulary
- Santyl – very expensive.
  - Do not use routinely on every necrotic wound remember other debridement options: sharp, autolytic.
- Hydrofera blue – moderately expensive
  - Not prohibitive if dressings are changed only 1-2x/week
- Collagen – expensive
  - Good to try on wounds that have not responded to first-line treatments
  - If wound stalls and collagen dressing seems to help, continue
- Cadexomer Iodine (Iodosorb gel) – moderately expensive
  - Not prohibitive if changed every two days or 3x/week instead of daily

57

Question

- All of the following are relatively *inexpensive* dressing materials EXCEPT:
  - A. Alginates
  - B. Product left by the rep last week
  - C. Petrolatum gauze, perforated or bismuth (Xeroform)
  - D. Hydrocolloids
  - E. Border gauze

58

Answer - B

- Reps typically leave new products that are expensive and have no generic equivalent
- Hydrogel, alginate, hydrocolloids and petrolatum gauze are readily available and inexpensive
  - Good first choice for treatment

59

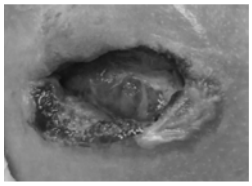
Now let's treat some more patients!

Putting it all together…

60

Mrs. Hufflepuff, Take II

- Mrs. Dora Hufflepuff is a 74 year old woman with a stage 4 pressure wound of the sacrum.
- On exam today you note:
  - Mrs. Hufflepuff yelps when the dressing is removed.
  - Incontinent of watery stool
  - Heavy drainage
  - No undermining
- Which of these are significant issues to consider when determining dressing selection?
  - A. Pain with dressing removal
  - B. Watery stool incontinence
  - C. Heavy drainage
  - D. All of the above



61

Answer is D. All of the above

- Pain with dressing removal
  - Need contact layer (perforated petrolatum gauze, silicone contact layer)
  - Not reimbursed by CMS in this case, but is medically necessary due to pain
- Watery stool incontinence
  - Typically requires daily rather than 3x/week dressing changes
  - Foam not the best initial choice for this wound
  - Consider border gauze or superabsorbent dressing
- Heavy drainage
  - Requires absorbent dressing
  - Alginate or hyrofiber good first-line options

62

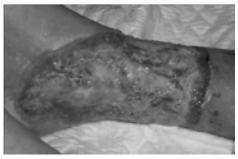
Mr. Paddy O'Furniture

- You remove a saturated dressing from this lower leg wound

Ask yourself:
Does it need moisture donating or moisture removing dressing?

Of the options below, what is an appropriate primary dressing for Mr. Paddy O'Furniture's wound ?

- A. Hydrogel
- B. Alginate
- C. Wet to dry
- D. ABD pads



63

Answer – B. Alginate

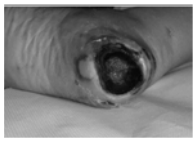
- Alginate – moisture removing, absorbing. Needed in this case with heavy drainage
- Hydrogel – moisture donating.
- ABD pads – moisture removing, absorbent, but not a primary dressing
- Wet to dry – was standard of care in 1970
  - This is not 1970
  - Painful, causes tissue trauma
  - Does not provide moist wound healing

Note: This wound should also be debrided with either sharp debridement (scalpel or curette), enzymatic debridement (Santyl), or autolytic debridemenet

64

Mrs. Mary Poppinski

- Mrs. Mary Poppinski is an 81 year old long-term resident of Merry Meadows with this firm, dry heel wound.



- What is the most appropriate initial treatment for this wound?
  - A. Santyl, heel offloading
  - B. Honey gel, heel offloading
  - C. Skin prep, heel offloading
  - D. Cadexomeric iodine (Iodosorb gel), heel offloading

65

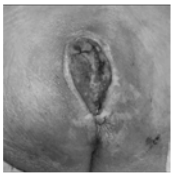
C. Skin prep

- Skin prep –
  - Provides protective layer over eschar
  - Can also use providone iodine painted on the surface
  - Can use dry dressing if a cover dressing is needed
- Santyl – do not debride dry stable eschar on the heel.
- Honey gel – adds moisture; dry stable eschar should stay dry
- Cadexomeric iodine (Iodosorb gel) – Good for clean open wounds on the heel, but this is not open

66

Mrs. Anne Oakley

- Mrs Anne Oakley is a 78 year old diabetic woman with this sacral wound.
  - Exudate is heavy serosanguinous
  - A narrow, deep tunnel is present



Ask yourself: wet or dry wound?
Should the dressing add moisture or take it away?
Does anything need to be done to address the tunnel?

Which of the following is the best primary dressing?

- A. Iodoform packing strip in the tunnel, honey gel
- B. Iodoform packing strip in the tunnel, collagen sheet
- C. Hypertonic saline gauze strip in the tunnel, calcium alginate
- D. Nothing in the tunnel, calcium alginate

67

Answer – C. Hypertonic saline gauze strip in the tunnel, calcium alginate

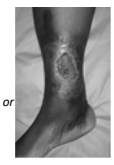
- Wet wound, need absorbent dressing. Honey gel, collagen sheet do not remove moisture
- Need to pack a tunnel
- Hypertonic saline gauze (Mesalt) comes in packing strips or sheets
  - Good for packing in tunnels
    - Antimicrobial
  - Iodoform gauze packing strips would also be good for the tunnel in this case

68

Mrs. Ivana Walkaround - Odor

- You have been taking care of Mrs. Ivana Walkaround's venous wound for months. The wound has shown slow but steady progress.
- This week:
  - Minimal drainage
  - Odor present (new)
  - No periwound erythema or induration

Does it need moisture donating dressing or moisture removing dressing?
Is odor a factor?



What is the best dressing for this wound?

- A. Silver hydrogel, hydrofera blue, 2x/week
- B. Silver alginate, foam dressing, 3x/week
- C. Silver hydrogel, gauze dressing, 3x/week
- D. Silver alginate, foam dressing, 3x/week

69

Answer: B. Silver alginate, foam dressing, 3x/week

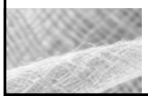
- Dry (moist) wound, needs moisture donating dressing
- Odor suggests heavy or critical colonization of bacteria
  - Silver products can be helpful with this
  - Hydrofera blue is also antimicrobial, but not for dry/moist wounds
- Other antimicrobial treatments:
  - Honey products
  - Iodine products (cadexomer iodine, not providone iodine on open wounds)
  - Hypertonic saline gauze (Mesalt)
  - PHBM (polyhexamethylene biguanide), typically infused in AMD dressings and AMD rolled gauze

70

Thank you!

Exciting Hands-on Skills Stations after the break

- Dopplers, arterial disease
- Wound assessment
- Lower extremity wraps
- Dressings



71