- If you are viewing this course as a recorded course after the live webinar, you can use the scroll bar at the bottom of the player window to pause and navigate the course.
- This handout is for reference only. Non-essential images have been removed for your convenience. Any links included in the handout are current at the time of the live webinar, but are subject to change and may not be current at a later date.

Technical issues with the Recording?

- Clear browser cache using these instructions
- Switch to another browser
- Use a hardwired Internet connection
- Restart your computer/device

Still having issues?

- Call 866-782-9924 (M-F, 8 AM-8 PM ET)
- Email customerservice@OccupationalTherapy.com

WOUNDS: The OT Perspective

Nora Barrett, MS, OTR/L, CHT
Bend, OR

1

Learning Outcomes

- Identify wound characteristics to document status, select appropriate dressing and determine a treatment plan to promote wound closure.
- Recognize human factors that contribute to wound healing; identify wounds that need higher level medical care.
- List complications associated with delayed or chronic wound healing and functional implications.

2

CONTINUED

Disclosures

- Nothing to disclose

3

CONTINUED

Wound Healing Phases

- Hemostasis: initial response to wound
  - Vessels contract then dilate
- Inflammation: day 4-6
  - Leukocytes and macrophages
- Proliferation: day 7-21
  - Fibroblasts, re-epithelialization
- Maturation: day 21-2 years
  - 80% strength in remodeled tissue

4

Key Principles
Wound Bed Preparation & Management

- "TIME"
- Tissue management- remove necrotic tissue overlying wound base
  - Promotes bacterial growth
  - Obscures local wound infection signs
- Inflammation and infection control- reduce bacterial burden
- Moisture balance- avoid eschar formation, promote re-epithelialization and formation granulation tissue
- Edges- avoid maceration at wound edges

Advances in Skin & Wound Care 2016

5

Wound Assessment

- Location: Exposed tendon, joint or bone
- Size: dimensions (cm), include depth
- Color
- Drainage: type, amount
- Blisters

6

Human Factors Affecting Wound Healing

- Age
- Presence of chronic or systemic disease
- Immunosuppression
- Nutrition
- Edema
- Smoking
- Occupation

7

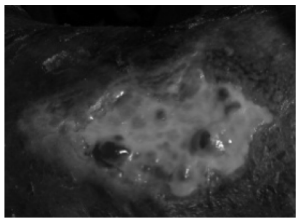
Wound Bioburden Cycle

- Contamination
  - Bacteria in wound without host reaction
- Colonization
  - Bacteria in wound, host reaction initiated
- Critical colonization
  - Bacteria multiplication causing delay in wound healing with no overt host reaction, pain possible
- Infection
  - Deposition and multiplication of bacteria in wound with associated host reaction

8

Superficial Infection: Early stages, not yet critical colonization

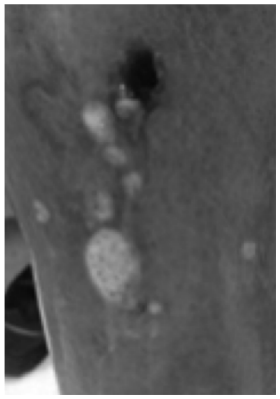
- "NERDS"
  - Nonhealing
  - Exudative
  - Red and bleeding surface
  - Debris (yellow or black necrotic tissue)
  - Smell



9

Deep Infection: Host response to tissue damage

- "STONES"
  - Size larger
  - Temperature increased
  - prObe or expOsed bone
  - New areas of breakdown
  - Exudate/erythema/edema
  - foul Smell



10

Conditions that limit expression of inflammation

- Neuropathy, ischemia, venous insufficiency
- Infection defined by secondary symptoms in these populations
  - Non-purulent exudate
  - Discolored or friable granulation tissue
  - Breakdown or pocketing at wound base
  - Abnormally foul odor

Clinical Infectious Diseases 2009

11

Antibiotics

- Cost effectiveness of topical vs. antibiotic resistance
- CDC: 30% prescribed Abx in US unnecessary, leading to resistance cdc.gov
  - 2015 National Action Plan for Combatting Antibiotic-Resistant Bacteria (CARB): goal= reduce inappropriate outpatient Abx by 2020
- NIH: resistance in a global public health challenge, accelerated by overuse of Abx worldwide ncbi.nlm.nih.gov
  - Resistance recognized as one of greatest threats to human health worldwide There Adv Drug Saf 2014

12

ER/Provider Referral

- Infection
- Exposed bone
- Exposed tendon
- Deep dermal/full thickness injury
  - Burn

13

Choosing the Optimal Dressing

- "NICE"
  - Necrotic
  - Infection
  - Characteristics/Color
  - Exudate
- "STAR"
  - not Systemic
  - not tissue Toxic
  - not Allergy inducing
  - not associated with Resistance

14

Dressing Options

- Product selection based on goal of healing wound, treating infection and optimizing function
  - Debridement
  - Antimicrobial agents
  - Moisture control
  - Least restrictive

15

Petrolatum based ointment

- Clean dry wounds
- Inexpensive, available OTC, small amount needed
- Can be used under compression and edema management sleeves, gloves or wraps

16

CONTINUED

Non-adherent coverage

- Designed to preserve injured epithelium
- Several design options:
  - Impregnated fine mesh gauze
  - Coated fabric with formulated emulsion
  - Sheet based coverage that adheres to intact skin, perforated to allow drainage
- Antimicrobials can be added
- Allows relative mobility

17

CONTINUED

Transparent films

- No absorption
- Semi-permeable
- Wound visible
- Protection from outside environment

18

CONTINUED

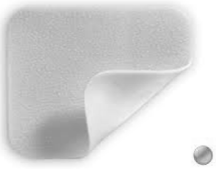
Hydrocolloids

- Impermeable to gases and water vapors
- Provides acidic environment
- No absorption
- Can be used over exposed tendon
- Can stay on wound several days

19

CONTINUED

Foams

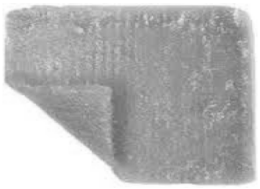


- Used on any size area
- Can be left in place 4-7 days
- Easy application and removal
- Polyurethane base
- Highly absorptive for moderate draining wounds
- Comes with antimicrobial agents added

20

CONTINUED

Active Leptospermum



- Decreases edema
- Increases autolytic debridement
- Used on wounds with slough and necrotic tissue
- Decreases bacterial burden and associated with lack of adapted resistance
- Effective against MDROs -J Trauma Acute Care Surg 2014

21

CONTINUED

Abandon ship!!

- Hydrogen peroxide (H2O2: antiseptic)
  - "May cause cell death.. should be avoided" -Ann Plast Surg 2002
  - "…infrequently used for infected wounds…. limited bactericidal and deriding activity.. more likely to cause cell damage and have no demonstrated benefit over saline irrigation" -Clin Infect Dis 2009
  - "No beneficial effect in promoting wound healing has been seen in literature. …inherent risk of fatal oxygen embolism formation. ….likely to result in tissue injury and associated with increased susceptibility to diseases due to unbalanced redox homeostasis" -Med Princ Pract 2017

22

CONTINUED

Abandon ship!!

- Epsom salts (Epsomite: magnesium sulfate compound)
  - "Little research exists as to the actual curative and palliative qualities of minerals" -J Environ Res Public Health 2006
  - Can dry out skin, can worsen some infections due to hot water soak mixed with salt and does not cure infection but may help draw out, work in combo with prescribed meds -4/2/18 healthline.com
- Wet to dry dressings
  - Painful, physiologically impede wound healing, allows wound base to dry and healing cells to desiccate within the wound, linked to less than optimal outcomes -J Home Care Hosp Prof 2011

23

CONTINUED

Cases

- Identify wound characteristics and how to document
- What does the dressing need to achieve to promote wound closure efficiently for optimal function?
- Are there any limitations or special considerations?
- Assess wound status over time with each case
- What is the end result?

24

Pilot fingertip amps

- RHD pilot, R MF/RF tips amputated in lawnmower
- DOI 9/5/18, referred 9/10/18 for Lalonde protocol
  - Indication: fingertip amp distal to DIP
  - Less restrictive, lower flexion contracture rate then V-Y advancement flap


25

Pilot fingertip amps

- 9/20/18


26

CONTINUED

Pilot fingertip amps

- 10/3/18

27

CONTINUED

Pilot fingertip amps

- 10/15/18
- Grasp II: R 80# L 95#

28

CONTINUED

Pilot fingertip amps

- 10/29/18
- Holding, gripping controls

29

CONTINUED

Pilot fingertip amps

- 11/26/18
- Soreness radial MF pressure
- Initial contact sensitivity, FM manipulation limited

30

Pilot fingertip amps

- 12/10/18 discharge
- MF pressure at fingernail
- RF “back to normal”

31

Open laceration, PIP UCL sprain

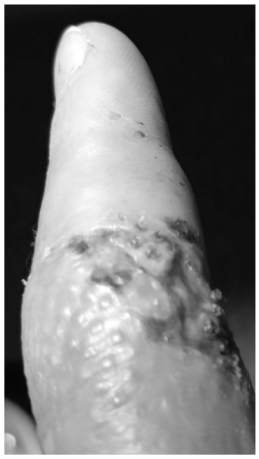
- 48 yo F
- Financial planner, very active outdoors
- Lives Alaska and Bend, OR
- DOI 9/26/18 visiting San Diego
- Mechanism: bike crash, finger caught ?
- Sutured, injection and po Abx in ED
- Returned to Bend, dressing x4 days- macerated, open
- Saw MD in Bend, diagnosed with unstable PIP UCL at complex lac site. Referred for WC, oval-8 orthotic

32

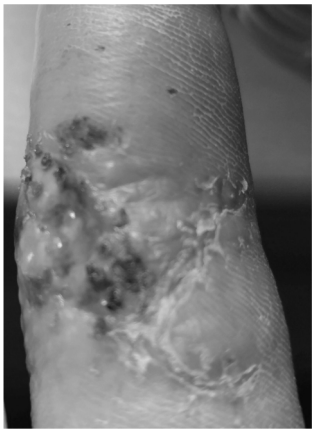
CONTINUED

Open laceration, PIP UCL sprain

- 10/14/18
- PIP AROM
  - 20/50
- DIP AROM
  - 0/10



Lateral view R IF



Volar view R IF

33

CONTINUED

Open laceration, PIP UCL sprain

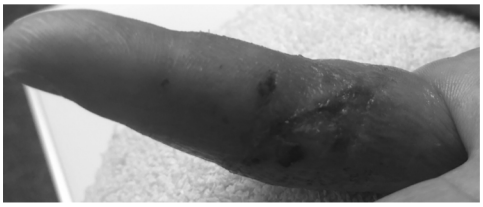
- 10/19/18

34

CONTINUED

Open laceration, PIP UCL sprain

- 10/23/18
- PIP AROM 15/50
- DIP AROM 0/20
- Cont dorsal orthotic, IP flexion to palm, extension to orthotic



35

CONTINUED

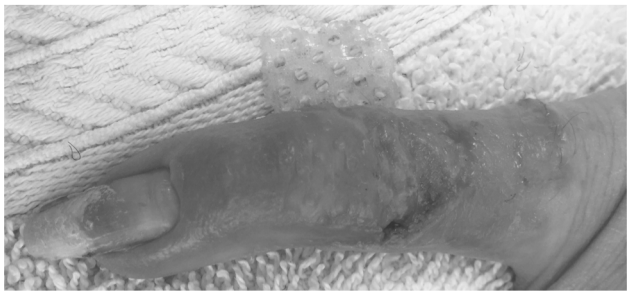
Open laceration, PIP UCL sprain

- 12/18/18
- PIP AROM
  - 30/80
- DIP AROM
  - 0/35
- Sensibility normal (SWM, static 2pd)
- Following for ROM, scar, return to sport

36

Pseudomonas finger

- Mallet injury, casted, placed gel under cast
- Did not return in prescribed timeframe
- Smell of pseudomonas, new open areas



37

Cellulitis post-Dupuytren's release

- h/o Waldenstrom macroglobulinemia, pre-op Abx
- DOS 10/9/18, onset cellulitis 10/22/18 MD follow-up, Abx changed
- OT 10/23/18
- 11/1/18 cleared
- 11/16/18 full ROM

38

Dog bite—> necrotizing fasciitis




39

Dog bite—> necrotizing fasciitis

- DOI 6/23/18 in Tucson, AZ; puncture R dorsal MCP
- Allowed to close on own, healed "in a few days"
- 7/8/18 painful swelling
- OR for I&D 7/8/18-7/13/18
- 3 total Abx, 1 vaccine
- 1st therapy visit 7/16/18
- 1 follow-up 7/20/18
- Returned to Tucson

40

CONTINUED

OT Documentation/Reimbursement

- Senate Bill Report SSB 5018 (2011)
- AOTA Position Paper *"The Role of Occupational Therapy in Wound Management" (2013)*
- Medicare: subject to local coverage determinations
  - Wound Care (code) can only be charged if shares debridement of *eschar*
  - Suture removal, dressing changes, removal of scans or clean drainage NOT BILLABLE
  - Local Coverage Determination for Wound Care (L34587): list of ICD-10 codes supporting medical necessity
- Private insurers: contact in advance

41

CONTINUED

References:

- cdc.gov
- Dale BA, Wright DH. Say goodbye to Wet-to-dry wound care dressings: changing the culture of wound care management within your agency. J Home Care Hosp Prof 2011;29(7):429-440.
- Finkelman RB. Health benefits of geologic materials and geologic processes. Int J Environ REs Public Health 2006;3(4):338-342.
- Halim AS, Khoo TL, Saad AZM. (2010). Biologic and synthetic skin substitutes: An overview. Ind J Plast Surg. 2010; 43: S23–S28. doi.org/10.4103/0970-0358.70712
- Israili ZH. Antimicrobial properties of honey. Amer J Therapeut 2014;21(4):304-323.
- Krauss EM, Lalonde DH. Secondary healing of fingertip amputations: a review. Hand 2014;9:282-288. do:10.1007/s11552-014-9663-5.
- Leaper DJ, Schultz G, Carville K, et al. Extending the TIME concept: what have we learned in the past 10 years? Int Wound J 2012; 9 (Suppl. 2):1-19.
- Lipsky BA, Hoey C. Topical antimicrobial therapy for treating chronic wounds. Clin Infect Dis 2009; 49: 1541-1549.

42

CONTINUED

References (cont):

- Llor C, Bjerrum L. Antimicrobial resistance: risk associated with antibiotic overuse and initiatives to reduce the problem. There Adv Drug Saf 2014; 5(6):229-241.
- ncbi.nlm.nih.gov
- Serena T, Connell H, McConnell S, et al. Novel multivalent wound-healing ointment provides bioburden control and moisture management: a retrospective registry data analysis. Adv Skin Wound Care 2016;29(10):461-468.
- Sibbald RG, Woo K, Ayello E. Increased bacterial bioburden and infection: the story of NERDS and STONES. Adv Skin Wound Care 2006;19(8):447-461.
- Tirado DJ, Hudson NR, Maldonado CJ. Efficacy of medical grade honey against multidrug-resistant organisms of operational significance:Part I. J Trauma Acute Care Surg 2014;77(3):S204-S207.
- Zhu G, Wang Q, Lu S, et al. Hydrogen peroxide: a potential wound therapeutic target? Med Princ Pract 2017;26:301-308.

43

CONTINUED

Questions?

- barnora@gmail.com

44