

Topical Wound Therapy

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Financial and Other Disclosures

- ▶ None
- ▶ Name-brand specific products in use at ANMC and other local facilities will be discussed
- ▶ I receive no financial compensation for the products used at this or any other facility
- ▶ There is no intent to advertise for any of these products or manufacturers

Objectives

- ▶ Identify principles of wound healing
- ▶ Identify modern topical wound therapies and guidelines for their use
- ▶ Identify advanced wound therapies available at ANMC

Epidemiology and Impact

- ▶ 15% of Medicare beneficiaries
- ▶ 6.5 Million patients in the US (as of 2009)
- ▶ Annual cost estimate \$50 billion
- ▶ Majority of chronic ulcers are lower extremity ulcers
 - ▶ 1% of global population (18-64yo)
 - ▶ U.S. 10-35% with venous disease, 4% of those with active ulcers (>65yo)
 - ▶ Annual cost to treat a venous ulcer is \$10,563
 - ▶ Loss of 4.6 million work days

Principles of Wound Healing - DIWAMOPI

- ▶ Debride
- ▶ Identify and treat infection
- ▶ Wick or fill dead space
- ▶ Absorb excess exudate
- ▶ Maintain a moist wound surface
- ▶ Open or excise closed wound edges
- ▶ Protect from infection/trauma
- ▶ Insulate

Debride

- ▶ Only if the goal is healing
- ▶ Surgical / Sharp - bedside or in the OR
- ▶ Enzymatic - collagenase
 - ▶ Deactivated by many advanced dressings (Jovanovic, 2012)
 - ▶ Must be applied nickel thick
 - ▶ Moist wound bed or cross hatch
- ▶ Autolytic - occlusive cover dressing
- ▶ Mechanical - packing removal, irrigation/lavage
 - ▶ Not wet-to-dry, more on that in a minute
- ▶ Biological - “Maggot therapy”



Dry gangrene



Maggot Therapy, 1 application



Identify and Treat Infection

▶ Culture

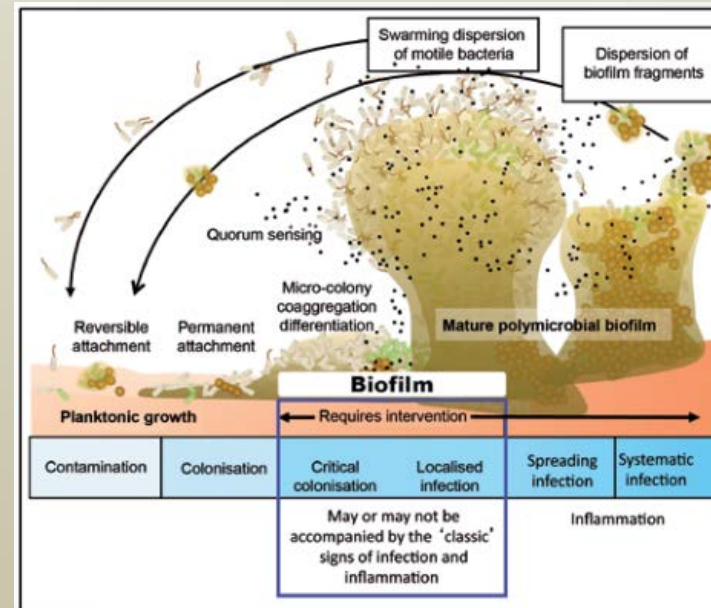
- ▶ Tissue sample
- ▶ Levine Technique



▶ Systemic antibiotics

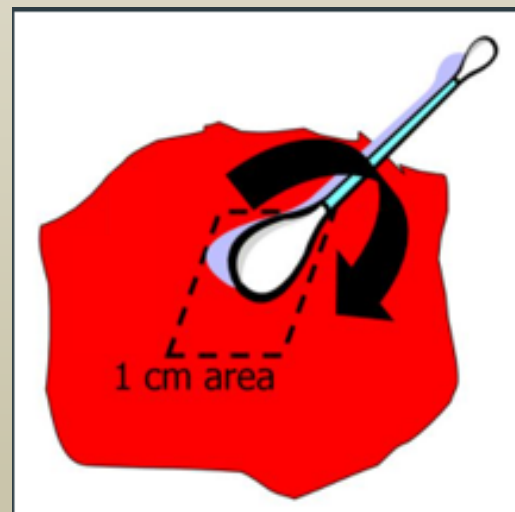
▶ Topical therapy

- ▶ Bactroban for MRSA
- ▶ Cadexomer Iodine
- ▶ Acetic Acid (Vinegar)
- ▶ Dakin's / Sodium Hypochlorite (Bleach)



Wound Culture - Levine Technique

- ▶ Clean the wound surface after dressing removal
- ▶ Debride necrotic tissue if indicated
- ▶ Re-clean wound surface
- ▶ Pick 1cm² of viable tissue
- ▶ Rotate culture swab with enough pressure to elicit drainage or bleeding



Cadexomer iodine paste - 1 week of tx



Recipes

Dakin's 0.025%

- ▶ 5mL bleach in 1 L distilled water
- ▶ 1tsp bleach in 4 ¼ cups DW
- ▶ Hospital basin 1/2 filled with a capful of bleach

- ▶ Commercial 0.25% Dakin's
 - ▶ "Half Strength" at our pharmacy
 - ▶ 1:10 ratio

Acetic Acid 0.25%

- ▶ 3 Tbsp white vinegar in 1 qt DW
- ▶ 2¼ tsp white vinegar in 1 cup DW
- ▶ Available in the Pharmacy

DIWAMOPI

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Wet to Dry/Damp

- ▶ Have been used for thousands of years
 - ▶ Sumerian clay tablet describes washing wounds with beer
 - ▶ Ancient peoples used lint as a dressing
- ▶ Supported by guidelines as “expert opinion”
- ▶ Lack of knowledge about advanced dressings
- ▶ Wounds *will* heal, but at what cost?
- ▶ Does not provide a moist wound healing environment
- ▶ Becomes hypertonic and desiccates wound tissue
- ▶ Prolonged inflammatory phase
- ▶ Drop in wound temp, vasoconstriction
- ▶ Increases chance of infection
- ▶ Painful
- ▶ Expensive and time consuming
- ▶ Disperses bacteria into the air

Cost Comparison

	Saline and Gauze	Advanced Dressing
Dressing change frequency	BID	3 x/wk
Price of dressing	\$0.75	\$10.00
Price of gloves	\$0.10	\$0.10
Price of irrigation syringe	\$0.86	\$0.86
Price of saline	\$1.12	\$0.56
Price of tape	\$0.08	\$—
Cost per dressing change	\$2.91	\$11.52
Materials cost/wk	\$40.74	\$34.56
Cost of 1 nursing visit	\$100.00	\$100.00
Costs of 1 wk of visits	\$1,400.00	\$300.00
Weekly labor costs	\$1,400.00	\$300.00
Weekly costs: labor + materials	\$1,440.74	\$334.56
Amount of progress after 4 wks	50	100
% Wound size reduction in 4 wks		
Costs for 4 wks of care	\$5,762.96	\$1,338.24
Cost per 1% reduction*	\$115.26	\$13.38
Supply cost per 1% healing with pt doing self-care*	\$3.26	\$1.38

*4-wk costs/% healing.

- ▶ 1/8 the time to change.
- ▶ True cost is in the time to heal and patient outcome
 - ▶ How valuable is being able to leave the house with a reliable, comfortable dressing?
 - ▶ What *is* the cost of less ER visits? Decreased rate of infection? Being healed two months sooner? Less scarring? Less pain?

Dressing Selection Grid

	Deep	Shallow
Wet	Need absorptive filler + cover	Absorptive dressing
Dry	Hydrating filler + cover	Add or retain hydration

Deep and Wet

- ▶ Filler
 - ▶ Alginate
 - ▶ Hydrofiber
- ▶ Cover
 - ▶ Gauze/tape
 - ▶ Tegaderm if exposed to contaminants
 - ▶ Surginet to protect from tape damage

Calcium Alginate



Deep and Dry

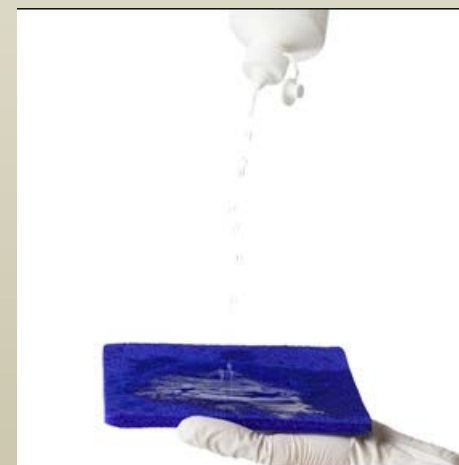
- ▶ Need a hydrating filler
 - ▶ Gel and fluff with damp gauze
- ▶ Cover
 - ▶ Gauze/tegaderm
 - ▶ Waterproof foam dressing



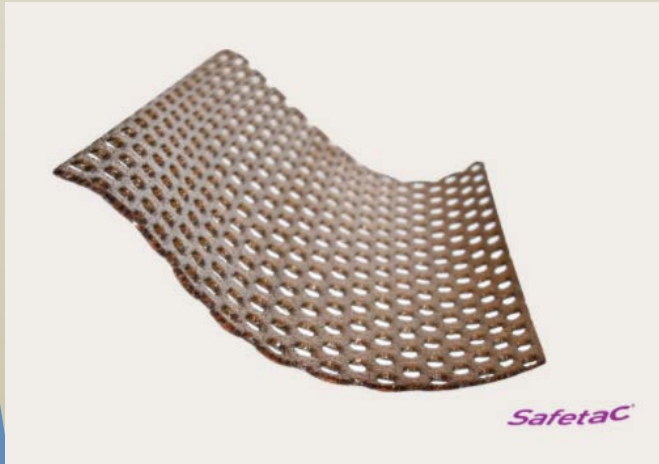
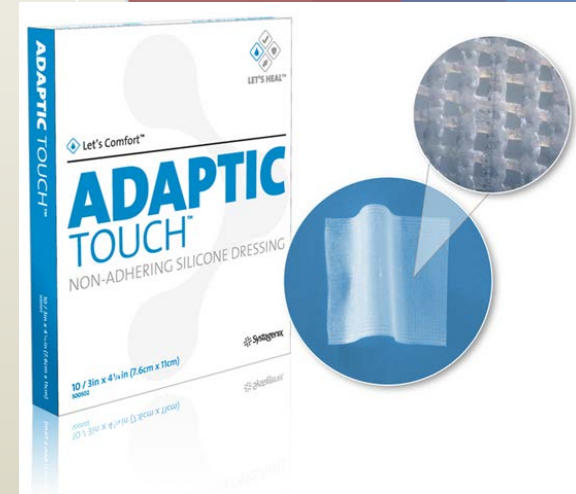
Shallow and Wet

- ▶ Foam dressing
 - ▶ Mepilex(Ag)/ Allevyn
 - ▶ AMD Foam - PHMB infused
 - ▶ Hydrofera Blue (Classic and Ready)
 - ▶ Polymem
- ▶ Contact layer and gauze cover
 - ▶ Mepitel
 - ▶ Adaptic
 - ▶ Silverlon
 - ▶ Acticoat
 - ▶ Xeroform/Vaseline gauze (one layer, otherwise occlusive)
- ▶ Alginate
- ▶ Hydrofiber

Foam Dressings



Contact Layers



Extra heavy drainage?

- ▶ Superabsorbers
 - ▶ Mextra - pouch-like and cannot be cut to fit
 - ▶ Enluxtra - can tape together to make a large dressing
 - ▶ Exudry - Similar to ABD pad with antishear layer. Not cut to fit
- ▶ Contact / Transfer layer
 - ▶ Use a thin contact layer and change the top dressing as needed, but leave the contact layer in place
 - ▶ Time able to stay varies by product, generally silver dressings can stay for 7 days
- ▶ Pouching system

Superabsorbers



Wound pouches



Shallow and Dry

- ▶ Solid hydrocolloids
 - ▶ Duoderm
 - ▶ Thin
 - ▶ Signal
 - ▶ Indicated for pressure ulcers, but I prefer multilayer bordered foam (mepilex)
- ▶ Transparent adhesive dressings
 - ▶ Tegaderm
 - ▶ Op-site
- ▶ Hydrogel
- ▶ Contact layer + gauze dressing

Hydrocolloid and Transparent Dressings



Open Wound Edges

- ▶ Silver Nitrate / AgNO₃
 - ▶ Closed wound edges
 - ▶ Hypergranulation
 - ▶ Bleeding
- ▶ Sharply



Using Compression

- ▶ Ensure safety - Exam and ABI
- ▶ If + for PVD
 - ▶ Modified compression
 - ▶ Vascular referral
 - ▶ Goal is not healing without adequate blood flow
- ▶ Most wounds do better with compression, even if CVI is not primary etiology
- ▶ Continue to Elevate
 - ▶ Above the level of the heart—
Recliner is not enough

- ▶ Stockings
- ▶ Unna's boot
- ▶ Multilayer Compression Wrap
- ▶ Velcro wraps
- ▶ Ace wraps



Collagens and Tissue Substitutes

- ▶ Wounds stall in the inflammatory phase
- ▶ Increase in MMP's which can degrade ECM

- ▶ Collagens bind and inactivate MMP's

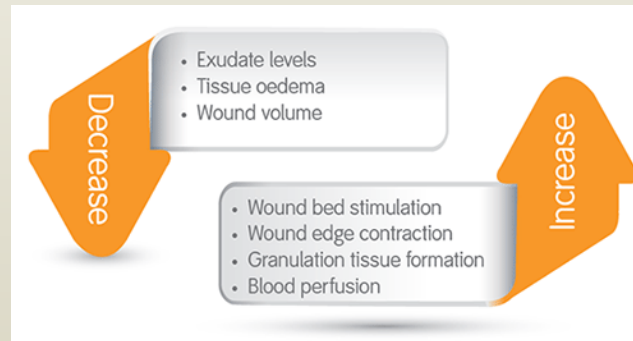
- ▶ Promogran Prisma
 - ▶ Hemostatic
 - ▶ Silver
- ▶ Endoform
- ▶ Grafix, Epifix, Acell, Apligraf, BTM, Integra and a number of other brands

Collagens and Tissue Substitutes



Negative Pressure Wound Therapy

- ▶ VAC Ulta (inpatient)
 - ▶ Standard
 - ▶ Veraflo "Rinser"
 - ▶ Cleanse Choice "Scrubber"



- ▶ Activac
- ▶ SNAP
- ▶ PICO



Wound Clinic at ANMC

- ▶ Staffed by an APRN and wound certified RN's
 - ▶ 1 RN for inpatient
 - ▶ 1 RN for outpatient
- ▶ Operated out of the General Surgery Clinic
- ▶ Specialty / Referral service
 - ▶ Inpatient "Wound Care Consult"
 - ▶ Outpatient "Wound Care Referral"
- ▶ Teleconsult available for Rural providers
- ▶ Contact via phone, Cerner message, TigerText, email, AFHCAN
 - ▶ Photos are much appreciated

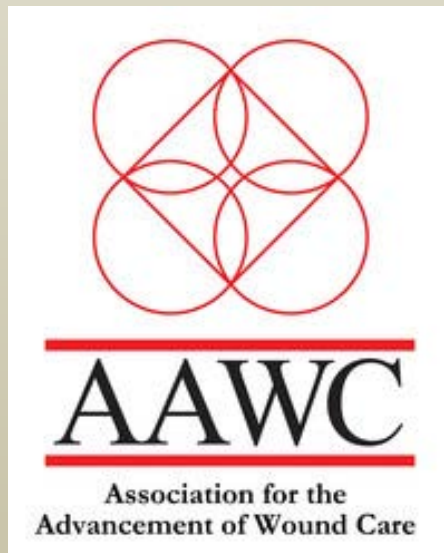
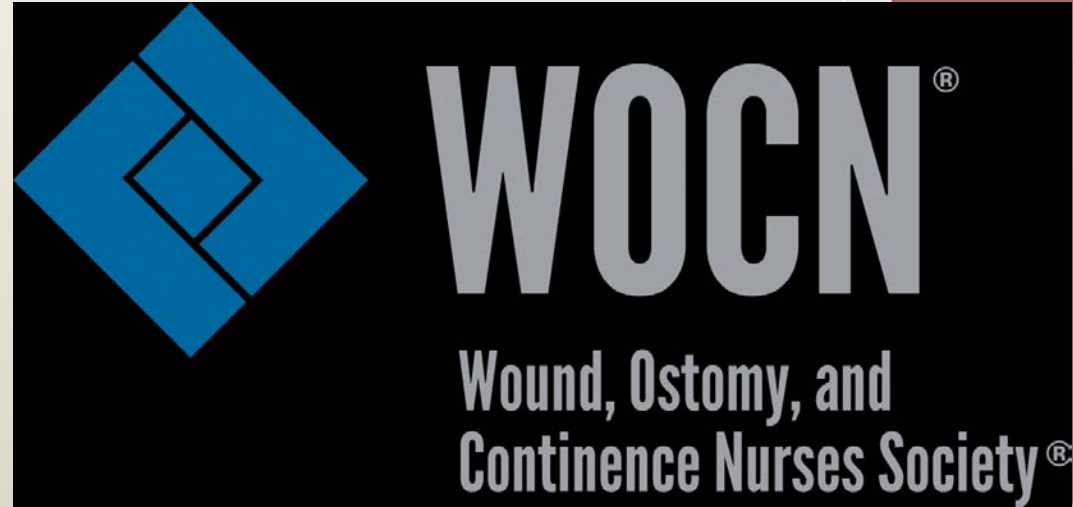
Wound Clinic at ANMC

- ▶ Outpatient negative pressure therapy
- ▶ Lower extremity compression therapy
- ▶ Biodebridement
- ▶ Advanced tissue substitutes
- ▶ Epidermal grafting
- ▶ Education
- ▶ Expanding therapies as able
- ▶ Venous ulcers
- ▶ Arterial ulcers
- ▶ Diabetic Foot ulcers (with Podiatry)
- ▶ Pyoderma Gangrenosum (with Derm)
- ▶ Frostbite
- ▶ Burns
- ▶ Delayed surgical wounds
- ▶ Large traumatic wounds
- ▶ Pressure ulcers
- ▶ Ostomies
- ▶ Feeding / Percutaneous tubes
 - ▶ Tube and the skin only

Resources

**WOUND
SOURCE**®

*The World's Definitive Source for
Wound Care & Product Information*



References

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- ▶ www.woundsource.com

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