CARE OF THE WOUND BED
CLIENT CENTERED CONCEPT

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Disclaimer

• I discuss a wide range of products, I do not represent and endorse a particular product or company

• The products discussed will be in form of categories

• When I recommend a product, it is due to the professional’s knowledge to the product
  • i.e. if professional is knowledgeable in product A compared to product B then the recommendation is with product A
  • I do not have any conflict of interests
OBJECTIVES

• Learn about wound bed preparation
  • Understand the basic pathophysiology of wounds/wound healing
  • Assess if a wound is suitable for self-management or if the patient should be referred to a physician
  • Understand the basic principles of wound cleansing and which products are inappropriate (i.e. hydrogen peroxide)
  • Familiar with how to choose an appropriate covering dressing (i.e. gauze, sterile pads etc.)
  • Be aware of the various categories and appropriate use of dressings (i.e. non-adherent, foam, gels etc.) —Both OTC and Rx
  • Be familiar with the appropriate use of topical wound care products (i.e. antiseptics, barrier creams, antibiotics)
THREE-PRONGED APPROACH

- Treat client concerns
- Treat the cause of the wound
- Treat the wound
TREAT PATIENT RELATED CONCERNS

- Pain
- Adherence to the plan of care
  - Lifestyle Changes
    - Ability to work
    - Nutrition
    - Blood glucose control
    - Smoking
- Costs
TREAT PATIENT RELATED CONCERNS

• Pain can cause activation of the sympathetic branch of the autonomic nervous system
  • Leads to tissue hypoxia
• Can also stimulate the hypothalamic-pituitary-adrenal axis
  • Releases cortisol
• Both impact negatively on wound healing
TREAT PATIENT RELATED CONCERNS

• Management of pain
  • Avoid antiseptics
  • Eliminate the cause for pain
  • Types of dressings
  • Protect wound margins
  • Provide analgesia as appropriate
  • Gentle dressing removal
TREAT PATIENT RELATED CONCERNS

• Nutrition
  • Low protein can prevent the production of granulation tissue that will contribute to a stalled healing environment for the wound
    • Health care professionals may request for serum albumin levels to determine low protein deficiency
TREAT PATIENT RELATED CONCERNS

• Medications
  • Can alter the healing process on the cellular level
    • Systemic steroids
    • Immunosuppressive drugs
    • Chemotherapy
    • Anticoagulants
    • Anti-inflammatory agents
    • Corticosteroids

• Be aware closure will take a while
TREAT PATIENT RELATED CONCERNS

• Smoking
  • Affects perfusion and oxygenation
  • Nicotine is a vasoconstrictor
  • Carbon monoxide lowers oxygen saturation
  • Hydrogen cyanide interferes with cellular transport of oxygen
  • Delays healing (tissue hypoxia)

• Encourage smoking cessation program
TREAT PATIENT RELATED CONCERNS

• Educate client and family the rational for care and its impact on the client’s life
• Poor adherence to care worsens disease, death and increase health care costs
• Encourage and emphasize the value of adherence and the positive effects
TREAT THE CAUSE OF THE WOUND

• Decrease or remove pressure
  • Pressure ulcers
  • Diabetic foot ulcer

• Adequate blood supply to heal wound

• Assess/ improve circulation
  • Venous leg ulcers
  • Arterial ulcers

• Eliminate infection or inflammation
TREAT THE CAUSE OF THE WOUND

• Address other contributing causes
  • Blood Glucose Control
  • Loss of Protective Sensation
  • Immunity
  • Co-morbidities
  • General health
TREAT THE WOUND

• Adequate vascular flow
  • Potential for healing?
• Cleanse the wound
• Debridement of non-viable tissue
  • Always ensure wound is healable!!!
• Inflammation and/or Infection are addressed
• Selection of wound care dressings
“DIME” CONCEPT

• D-Debridement
• I-Infection or Inflammation
• M-Moisture balance
• E-Edge of wound
“D”IME DEBRIDEMENT

• Debridement means
  • The removal of necrotic tissue (slough), exudate, bacteria and metabolic wastes from a wound in order to facilitate the healing process
  • Education is required for the rational of debriding necrotic tissue
    • Some of your clients thinks that having a “scab” (which is necrotic tissue) is a sign of healing
    • Skin cell (epithelium) will not migrate down under the scab nor will it climb over the dead tissue
  • Explain wounds will change during debridement, the wound may get deeper as the necrotic tissue is being cleaned out
“D”IME DEBRIDEMENT

- Enzymatic
- Surgical (Sharp)
  - Only performed by advance wound clinician or doctor
- Mechanical
- Autolytic
- Biological
Do NOT Debride if......

- Wound is maintenance or palliative
- Dry ischemic wound
- Dry gangrene
WOUND CLEANSING

• Normal Saline, Sterile Water
• 20-30 cc syringe/18-20 gauge needle (optimal 10 psi)
  • If using a smaller syringe with a small needle, will increase pressure
• Catheter tip syringe/Rob Nel Catheter
• Never dry the wound bed after cleansing. Dry the peri-wound skin
• Pouring over a wound
  • Over a wound bed free from debris or necrotic tissue
• Cleansing wounds may keep superficial bacteria under control and rinse away their metabolic wastes
WOUND CLEASING

• Alcohol, peroxide, bleach, povidone iodine is not recommended for wound cleansing
  • These products are cytotoxic to tissues
    • Kills bacteria and good tissues—granulating tissues, cells, blood cells
Example
D“I”ME
(addressing)
INFECTION/INFLAMMATION

INFECTION

• All wounds contain bacteria
• Levels can range from contamination to colonization to critical colonization to infection
WOUND BACTERIAL BALANCE CONTINUUM

Positive Bacterial Balance

- Does not require antibiotics

Contamination

Colonization

Critical Colonization / Increased Bacterial Burden

Negative Bacterial Balance

Topical antimicrobials

Requires antibiotics

Infection

Increasing severity
CRITICALLY COLONIZED vs INFECTION

• Critically colonized
  • Non-healing
  • Bright red granulation tissue
  • Friable granulation tissue
  • Shiny
  • New areas of breakdown or necrosis
  • Increase exudate: may be clear before becoming purulent
  • Foul odor
  • Yellow or black necrotic tissue present on the wound surface
  • “Just doesn't look right”

• Wound infection
  • Swelling, induration, pain
  • Erythema (extends more than 2 cm beyond wound margin)
  • Increased temperature
  • Wound breakdown/ delayed healing
  • Increased size, foul odor
  • Undermining
  • Probes to bone
  • Increase or change in exudate

• Systemic infection
  • Fever/chills
  • Hypotension
  • Organ failure
CRITICAL COLONIZATION
INFECTED WOUND
MANAGEMENT

• Chronic wounds should show evidence of healing within four weeks and progress to healing by week 12, if it’s not, the wound might be...

• **Critically colonized wounds**
  • Debride necrotic tissue quickly
  • Use of topical antimicrobials that are non-cytotoxic (destroys good tissue)
    • Silver
    • Cadexomer iodine
    • Chlorhexadine
    • Honey
    • Povidone Iodine mixed with Normal Saline
    • Neomycin, bacitracin and silver sulfadiazine are associated with strong allergic sensitivity

• Recommend all antimicrobials should be used for 2-4 weeks max
TOPICAL ANTIMICROBIALS for CRITICALLY COLONIZED WOUNDS

- Silver products
  - Wear time 2-7 days
  - Some silver products may have a nanocrystalline silver, which provides release of silver directly into the wound
  - Broad spectrum antimicrobial
  - Some silver products may require activation by sterile water, normal saline will deactivate the silver
  - May need to read the insert to see what specifics is required
TOPICAL ANTIMICROBIALS for CRITICALLY COLONIZED WOUNDS

- Silver products
  - Hydrofiber with silver
  - Wear time 2-7 days
  - Destroys the bacteria living in the exudate of a wound
  - Once the exudate is absorbed, the bacteria is destroyed in the silver hydrofibers
  - Minimal to scant amount of silver will cross into the wound
  - Used for wounds with high levels of bacteria consisting exudate
  - Broad spectrum antimicrobial
TOPICAL ANTIMICROBIALS for CRITICALLY COLONIZED WOUNDS

• Cadexomer Iodine
  • Wear time 2-7 days
  • Broad spectrum antimicrobial
  • Cleans the wound bed by debriding slough and debris
  • Absorbs a small amount of exudate
  • Start brown in the wound and as the iodosorb absorbs exudate it turns clear
  • Slow release iodine

Should not be used for patients that have a sensitivity to iodine, Hashimoto’s Thyroiditis hyperthyroidism, non-toxic nodular & in children
TOPICAL ANTIMICROBIALS for CRITICALLY COLONIZED WOUNDS

- Chlorhexidine
  - Wear time 2-7 days
  - Slow release chlorhexidine
  - Broad spectrum antimicrobial
  - Non-adherence to the wound bed
TOPICAL ANTIMICROBIALS for CRITICALLY COLONIZED WOUNDS

• Honey
  • Medical grade honey from the Manuka plant
  • Lowers the pH of the wound (reduces protease levels)
    • In chronic wounds protease levels ↑, therefore pH is ↑
  • Maintains moist wound environment
  • Debrides necrotic tissue by osmotic activity
  • Antibacterial properties due to high sugar content and production of hydrogen peroxide
    • Hydrogen peroxide is deposited in honey by the bees (glucose oxidase)
TOPICAL ANTIMICROBIALS for CRITICALLY COLONIZED WOUNDS

• Povidone Iodine
  • If used straight for long period/time
    • Causes drying of the tissues (necrotic and intact tissue)
    • Prevents infection in non-healing wounds due to inadequate blood flow
    • Provides auto-amputation of necrotic non-healing wounds
  • Mixed with Normal Saline (50/50) can provide antiseptic properties
    • Cleans the wound bed from microorganisms
    • Use short term only
    • Cheap and easily accessed
**MANAGEMENT**

- **Infection**
  
  *If the wound does NOT respond in 2-4 weeks of topical antimicrobials or worsens, then systemic agent should be used*

- Assessment by MD
- If wound probes to bone osteomyelitis may be present
- Swabs or cultures to be used to assist the MD which antibiotics should be used
- Clinical presentation of infection assists with diagnosing infection
- Topical antibiotics are prescribed by MD
  - Bacitracin, neomycin ect (high allergic reactions to these products)
INFLAMMATION

Critical colonization can cause a prolonged or chronic inflammatory response:

Management:

• Debride necrotic tissue to red, granulating tissue of a potential healing wound
• Utilizing topical antimicrobials for short term to place wound back to bacterial contamination
• Remove cause of persistent inflammatory state
  • wound deteriorating product
  • continuous pressure or trauma
DI"M"E
MOISTURE BALANCE

• Select a dressing that is appropriate for the needs of the wound, client and caregiver
• Dressing selected should provide:
  • Appropriate moisture for the wound environment
  • Prevent infection
  • Pain free
  • Not cause damage to the wound or periwound
  • Has a long wear time
  • Provides thermal insulation
  • Cost effective
MOISTURE BALANCE

Not too wet not too dry just like the whites of your eye

Virginia McNaughton
DRESSING SELECTION - FORM AND FUNCTION

- Determine the need. Is it...
  - To absorb excess exudate?
  - To provide moist wound environment?
  - Odor control?
  - Control bacterial growth?
PRODUCTS

• Foam dressings
  • Wear time 2-7 days
  • Non-adherent to the wound bed
  • Provides moist environment and thermal insulation
  • Highly absorptive
  • Semi-permeable
  • Not used for dry wounds if autolytic debridement is required
  • Less frequent changing depending on amount of exudate
  • Keeps exudate off periwound tissues

• DO NOT OFFER PRESSURE RELIEF!!
FOAMS
PRODUCTS

• Calcium alginate
  • Wear time 2-7 days
  • When in contact with wound exudate, a soft gel forms maintaining a moist wound environment
  • Used for highly exudating wound
  • Used for bleeding wounds caused by sharp debridement, friable tissues or trauma causing bleeding (has haemostatic properties)
  • Requires a secondary dressing
  • derived from seaweed
  • Not used for dry wounds if autolytic debridement is required
  • Avoid wicking/packing into tunnels where the base is not visible-risk of breakage
CALCIUM ALGINATE
CALCIUM ALGINATE
PRODUCTS

• Hydrofibers
  • Wear time 2-7 days
  • Highly absorbent
  • Requires secondary dressing
  • Converts to a gel when absorbs exudate which keeps the wound bed moist
  • Not to be used on dry wounds
  • Avoid wicking/packing into tunnels where the base is not visible-risk of breakage
HYDROFIBER
PRODUCTS

• Hydrogels
  • Wear time 1-5 days
  • No absorbency
  • Provides moisture to the wound bed
  • Used for autolytic debridement
  • Gentle on granulating and epithelializing wounds
  • Can be used on infected wounds
  • Need secondary dressing
  • Can be placed on gauze strips for wicking/packing wounds
  • Donate moisture
HYDROGELS
PRODUCTS

• Hydrocolloids
  • Wear time 2-7 days
  • Occlusive
  • Used for autolytic debridement
  • Used with scant exudating wounds
  • Not to be used with infected wounds
  • Odor common with removal due to autolysis of necrotic tissue
  • When autolysis occurs, it is normal to see “bubbling” of the product
  • Waterproof and prevent bacterial and environmental contamination
HYDROCOLLOIDS
PRODUCTS

• Films
  • Wear time up to 7 days
  • Semi-permeable
  • No absorbency
  • Does not adhere to wound bed
  • Protects reddened areas
  • Protects epithelialized tissue
  • May be used as a secondary dressing with gels, alginites, foams, hydrofibers
  • Facilitate autolytic debridement to dry, necrotic tissue
  • Protects intact skin from shearing and friction
FILMS

Peripheral I.V.

Sacral Pressure Ulcer

Central Line

Skin Protection Dressing

Acute Wound Dressing
PRODUCTS

• Non-adherent
  • Wear time 1-5 days
  • No absorbency
  • Petroleum impregnated gauze
  • Requires secondary dressing
  • Paraffin Tulle Gras dressing made from open weave gauze
  • May promote maceration to the periwound tissue
  • Not to use on heavily exudating wounds
NON-ADHERENTS
PRODUCTS

• Non-adherent (silicone products)
  • Wear time up to 7 days
  • Non-adhesive silicone or polyurethane mesh wound contact layer
  • Used for when the wound be should not be disturbed or is extremely sensitive to pain
  • Not to be used for highly exudating wounds
  • Requires secondary dressing
  • Can use hydrogels or antifungal/antibacterial cream over top of mesh
  • Able to cleanse wound with the mesh left in place
PRODUCTS

- Composite dressings
  - Wear time 2-7 days
  - Multiple layers
  - Used as primary or secondary dressings
  - Used for wounds with minimal to heavy exudate
  - Can be used on granulating tissue to necrotic tissue
  - Due to adhesive border, do not use on paper thin or fragile tissue
  - Used for highly exudating wound
COMPOSITES
PRODUCTS

• Charcoal dressings (odor control)
  • Wear time 1-7 days
  • Have a deodorizing effect
  • Useful for very malodorous wounds
  • Can act as a primary or secondary dressing
    • Read the instructions
  • Depending on product, can be used for highly exudating wounds
  • Good for malignant lesions, infections and non-viable tissue (lots of anaerobes)
CHARCOAL
PRODUCTS

• Gauze
  • Wear time 4-8 hours to daily
  • Made of cotton, rayon or combination mesh
  • Various sizes
  • Often used as a secondary dressing
  • Fills dead space
  • Provides mechanical debridement
  • Not to be used as a primary dressing on granulating wounds
  • Does not provide moist wound healing
  • Does not provide bacterial barrier
    • Potential for increased microorganisms from entering (Lawrence (1994) demonstrated that bacteria passed through 64 layers of gauze)
  • When using packing strips, use continuous strips for undermining or tunnelling
  • Wet to dry dressings – acts as a osmotic agent
    • Pulls moisture from wound bed drying out wound
  • Change dressings 2-4 times daily
PRODUCTS

• Gauze

THEREFORE

GAUZE IS NOT COST EFFECTIVE
GAUZE
SUMMERIZING PRODUCTS

• Use a dressing that will keep the wound bed continually moist
• Choose a dressing that keeps the periwound skin dry while keeping the wound bed moist
• Choose a dressing that controls exudate
“IF THE WOUND IS DRY, ADD MOISTURE. IF THE WOUND HAS DRAINAGE, ABSORB IT. IF THE WOUND HAS NECROTIC TISSUE, DEBRIDE IT.”

DIM“E”
EDGE OF WOUND

• Wound should show a 20-40% reduction in size in the first 2-4 weeks
• A 50% reduction in size at week 12 is a good predictor that the wound will heal
• If wound edge is not migrating/stalled, go back to reassess the DIME concept and looking at the whole client
• If these have been addressed, nutrition optimized and moist wound healing provided but still no edge effect, advanced therapies may need to be considered
• Consult with Advance Wound Care Clinician, Enterostomal Therapy Nurse, or specialized physician to help troubleshoot non-healing wounds
Chronic Ulcer

Treat the Cause

Local Wound Care

Patient Centered Concerns

Debridement - Infection & Inflammation - Moisture Balance

Edge of Wound Effect

Non-healing Wounds
- Biological Agents
- Electrical Stimulation
- Hyperbaric Oxygen Therapy
- Negative Pressure Wound Therapy
- Surgical Procedures

Thank you!

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REFERENCES

• Winnipeg Regional Health Authority (2003). Care of the wound bed. WRHA Regional Wound Care Recommendations
• Baranoski, S; Ayello, E; McIntosh, A; Galvan, L; Scarborough, P (2008). Wound treatment options. Wound Care Essentials: Practice Principles 2nd ed. Wolters Kluwer Health, Lippincott Williams & Wilkins pg. 136-171
• Bruton, K (RN, ET Clinical Resource Nurse), Northumberland Hills Hospital. Forms & Functions of Wound Dressings presentation
• Sibbald, G; Goodman, L; Woo, K; Krasner, D; Smart, H; Tariq, G; Ayello, E; Burrell, R; Keast, D; Mayer, D; Norton, L (2011). Special considerations in wound bed preparation 2011: an update. Advances in Skin and Wound Care; 24(9): 415-436