Understanding Wound Products:
Stock Your Space Kit

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Objectives

- Discuss the history of wound care
- Describe the 3 methods of wound healing – primary, delayed primary and secondary intention
- Discuss the phases of wound healing
- List categories of wound dressings - their indications, uses, advantages, and precautions
History of Wound Care

- The earliest known record of the treatment of wounds was found on clay tablets in Egypt from about 2500 BC
- Advances by Hippocrates 460 – 370 BC
- Galen – physician to the Greek Emperor 131 – 201 AD
- Lumiere developed an non adherent dressing during WWI
- Bloom developed the first alternative to gauze during WWII
- Dr. George Winter - 1962
Review of Wound Healing

- Three basic types of healing
  - Primary
  - Delayed Primary
  - Secondary
Primary Intention

- Wound surfaces opposed
- Healing without complications
- Minimal new tissue
- Results optional
Delayed Primary (Tertiary intention)

- Left open initially
- Edges approximated 4-6 days later
Secondary Intention

- Surfaces not approximated
- Defect filled by granulation
- Covered with epithelium
- Less functional
- More sensitive to thermal and mechanical injury
Phases of Wound Healing

- Inflammatory
- Proliferative
- Remodeling

Astronaut using tools during a space walk. Credit: NASA
Homeostasis

- Vasoconstriction
- Clot formation
Inflammatory Phase

- Days 4 - 6
- Exposed collagen activates clotting cascade and inflammatory phase
- Fibrin clot = scaffolding and concentrate cytokines and growth factors
Proliferative Phase

- Angiogenesis and Provisional Matrix Formation, Epithelization
- Day 4 through 14
- Production of collagen is hallmark
- 7 days to 6 weeks
Remodeling Phase

- Random to organized fibrils
- Day 8 through years
- Wound may increase in strength for up to 2 years after injury
  - Collagen organization
  - Cross linking of collagen
Categories of Dressings

The selection of a dressing should be based on:
- the goals of the person with the wound
- the nature/volume of wound drainage
- issue in the ulcer bed
- condition of the skin around the ulcer
General Considerations

- Assess the wound at each dressing change to confirm the appropriateness of the current dressing regimen.
- Follow manufacturer’s recommendations especially related to frequency of dressing change.
- The plan of care should guide usual dressing wear times and contain provisionary plans for dressings changes if needed due to soilage, loosening, etc.
- Choose a dressing that will keep the wound bed moist.
- Choose a dressing that remains in contact with the wound bed or use a skin barrier product to keep the periwound skin dry and prevent maceration.
Gauze

- Description: Woven or non-woven. Material may be cotton, rayon and/or polyester
- Function: Absorptive or used for Packing
- Indications: Partial or full thickness wounds, Infected wounds, Wounds with cavities or tracts
- Advantages: Packing large wounds
- Precautions: Adheres to wound tissue when dry, may shred if cut
- Usage: Fluff the gauze and avoid tight packing, change interval is dependent of level of saturation
Transparent Film Dressings

- Thin, transparent polyurethane adhesive film, impermeable
- Function: Protects
- Indications: Partial thickness, minimally draining or closed wounds
- Advantages: Promotes autolysis, or used as a secondary dressing
- Precautions: Not recommended over infected wounds
- Usage: Allow 4-5 cm overlap from wound margin to surrounding skin. May be left undisturbed for up to 7 days
Hydrocolloid Dressing

- Description: Adhesive impermeable barrier. Variety of shapes, widths, sizes and thickness
- Function: Maintain a moist wound healing environment
- Indications: Partial and full thickness wounds. Minimal exudate. May be used in combination with other dressing materials
- Advantages: Barrier to external fluids, conformable, may be used in combination with compression for venous ulcers
- Precautions: Not recommended for third degree burns or wounds with heavy exudate, deep wounds, or friable periwound skin
- Usage: Select a dressing with a minimum of 2-3 cm overlap from the margin of the wound. May be cut to conform to difficult areas. Change up to 3 times per week
Hydrogel Dressing

- Description: Amorphous gel delivered from a tube or impregnated into packing materials. Composed of water and glycerin.
- Function: Donates fluid to the wound.
- Indications: Partial or full thickness wounds, dry to minimal exudate wounds, Necrotic wounds, Infected wounds. Use in combination with other dressing material such as gauze.
- Advantages: Promotes rapid autolysis, conforming.
- Precautions: Not indicated for use in heavily exuding wounds. Monitor periwound skin for maceration or candidiasis from inappropriate usage.
- Usage: sheets without adhesive border or wound fillers are changed up to once per day, sheets with adhesive covers are changed up to 3 times per week.
Foam Dressings

- **Description:** semi-permeable hydrophilic foam, impermeable barrier. Thin or traditional thickness. Conformable – other characteristics are dependant on the manufacturer.

- **Function:** Absorption – minimal to heavy drainage. Packing material.

- **Indications:** Partial and full thickness draining wounds, infected wounds, may be used in combination with other dressing materials.

- **Advantages:** Nonadherent forms protect friable periwound skin, conformable to shape around angular body contours, Used under compression in venous ulcers.

- **Precautions:** not recommended for desiccated wounds or those with sinuses. Cavity dressing pillows should not be cut.
Alginate Dressings

- Description: Primary dressing derived from brown seaweed in rope or pad form, nonwoven pad or fibers composed of alginate salts. Gels as fluid is absorbed. Conformable moisture-retentive dressing which also insulates the wound.

- Function: Absorption, packing

- Indications: Full thickness wound cavity, undermined areas or tunnels. Moderate to heavy exudate, contaminated or infected wounds, odorous wounds with or without slough

- Advantages: absorbent packing agent, easy to use

- Precautions: Not recommended for non-draining wounds

- Usage: Loosely pack into a wound. Dressings may be layered into a deep wound. Secondary dressing is required to secure. Change up to once per day
Antimicrobial Dressings:
Silver, Gentian violet/Methyline blue, or cadexomer iodine

- Description: Topical antifungal and antimicrobial agents available as ointments, impregnated gauzes, pads, island dressings and gels
- Function: Control or decrease bioburden
- Indications: Partial or full thickness wounds, ordorous wounds with minimal to heavy exudate, highly contaminated or infected wounds
- Advantages: Decreases microbial levels in the wound which may reduce healing time, easy to use and understand
- Precautions: See manufactures insert as precautions for individual products vary. Not a substitute for systemic antibiotics
- Usage: Refer to package insert for each form has specific usage instructions.
Debriding Agents

- **Description:** Topical substances to help eliminate nonviable tissue by autolytic (Medical grade Honey) or enzymatic debridement (Collagenase)

- **Function:** To assist in the elimination of non viable tissue

- **Indications:** Full thickness wounds, eschar or necrotic tissue in the wound bed

- **Advantages:** Conservative debridement agents are easy to understand and may be used in many care settings

- **Precautions:** Use caution in patients with coagulation disorders

- **Usage:** Gauze may be used as a secondary dressing. When granulation tissue is present discontinue product use.
Contact Layer Dressings

- **Description:** a nonadherent woven polyamide net that is placed in contact with the wound base. Allows passage of exudate from the wound to a secondary dressing.

- **Function:** Protect the wound base.

- **Indications:** Full thickness granular wounds, minimal to heavy exudate, donor sites/split-thickness skin grafts, in combination with negative pressure wound therapy.

- **Advantages:** For use with large or deep wounds to protect the wound base, antimicrobials may be applied under dressing.

- **Precautions:** not recommended for shallow or dry wounds in the presence of viscous exudate.

- **Usage:** Applied to the wound base with a secondary absorbent dressing cover. Stays in place up to 7 days while the absorbent layers are changed as needed.
Collagen Matrix Dressings

- Description: Derived from bovine, porcine or avian sources. Available in non-adherent pouches or vials, gels loaded into syringes, pads, powders and freeze-dried sheets. Requires a secondary dressing.

- Function: Stimulate wound healing.

- Indications: Partial or full thickness wounds, minimal to moderate exudate, contaminate and infected wounds.

- Advantages: May accelerate wound repair. Slight absorption, no adherence to the wound, some forms may be left in the wound up to 7 days, may be used with topical agents.

- Precautions: not indicated in 3rd degree burns or patients with sensitivities to bovine materials.

- Usage: refer to package insert as each form has specific usage instructions.
Biological Dressings

- **Description:** Bioabsorbable matrix of collagen populated with living fibroblast and/or keratinocytes from a human or animal source
- **Function:** Promote wound healing
- **Indications:** venous ulcerations and full thickness neuropathic diabetic foot ulcers
- **Precautions:** Living cells are fragile and sensitive to extremes of temperature. They also have finite lifetime once shipped from the manufacturer
- **Contraindications:** Infected wounds or patient’s with known allergies to bovine collagen or hypersensitivity to the components of the shipping medium
- **Usage:** Refer to manufacturer’s guideline for specific instructions
Growth Factors

- Description: Short chain proteins found naturally in the body, autologous or recombinant, heat sensitive, cause specific cells to proliferate
- Function: Promote wound healing
- Indications: Diabetic, neuropathic and recalcitrant wounds, good vascularity, full thickness, clean granular wounds
- Advantages: Growth factor is delivered to the wound
- Precautions: contraindicated in patients with neoplasms
- Usage: Usually applied daily
Adjunct Treatments

- Negative Pressure Wound Therapy
  - Subatmospheric pressure used to promote wound healing
- Compression Therapy
  - Used primarily for patients with venous insufficiency
- Hyperbaric Oxygenation – HBO
  - Systemic, intermittent administration of oxygen delivered under pressure
Applying the Evidence

- Carefully read dressing package inserts to ensure appropriate interventions
- It is every clinician’s responsibility to educate other healthcare providers and to provide references for their consideration
- Contemporary practice should always incorporate evolving evidence
- Inspire change in your practice setting!

NASA, April 2004
QUESTIONS
References:


NPUAP. Dressings for the Treatment of Pressure Ulcers, Slide Deck, 2011