



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

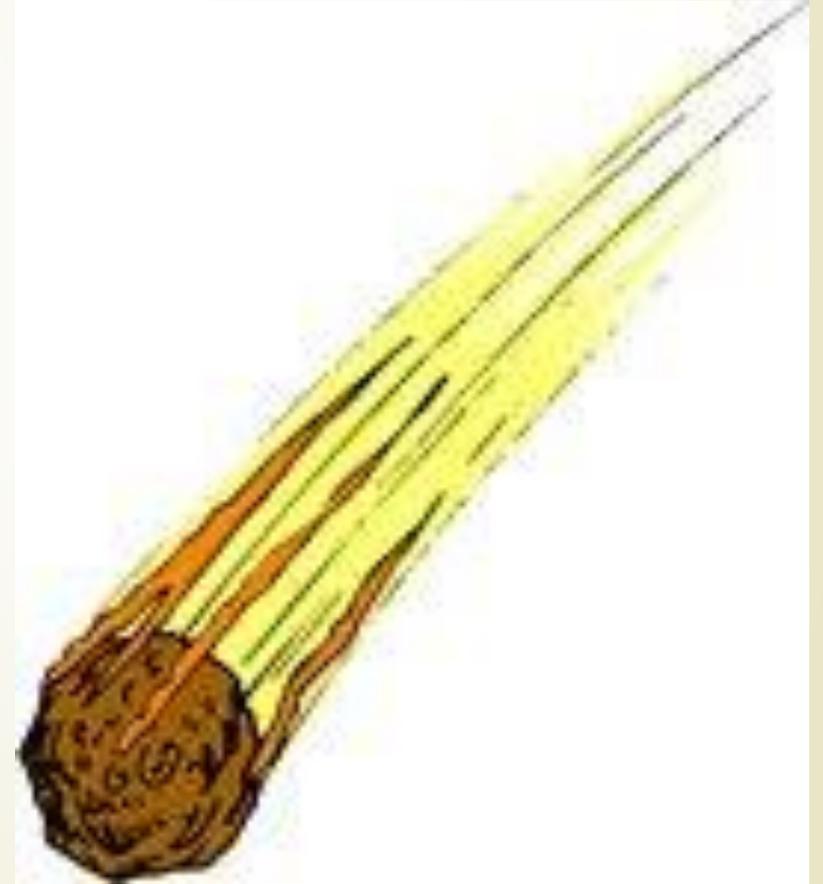
History of Wound Care

- ▶ 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



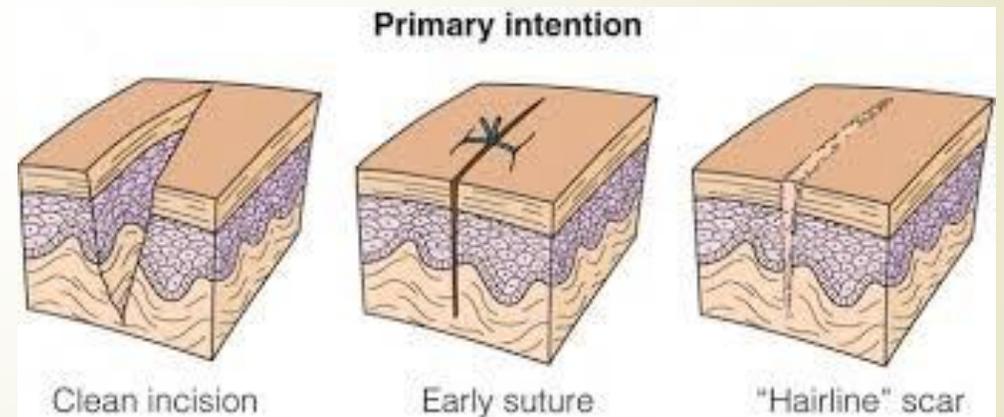
Review of Wound Healing

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



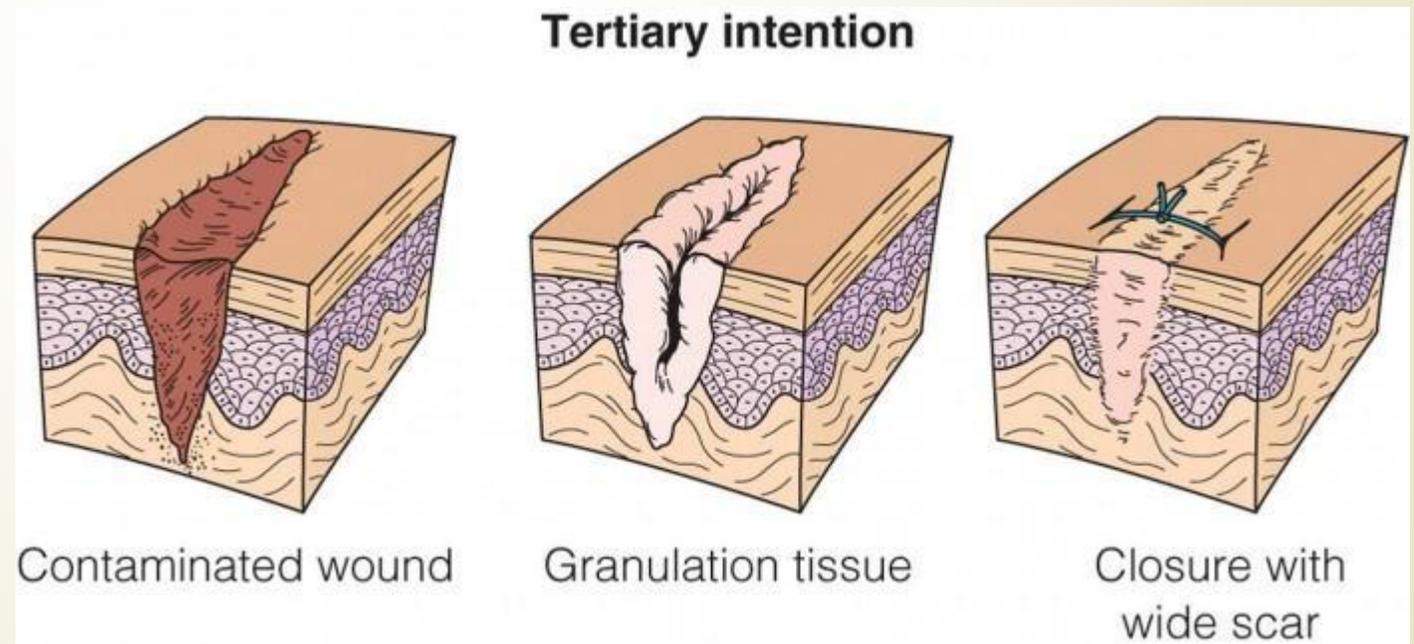
Primary Intention

- ▶ Wound surfaces opposed
- ▶ Healing without complications
- ▶ Minimal new tissue
- ▶ Results optional



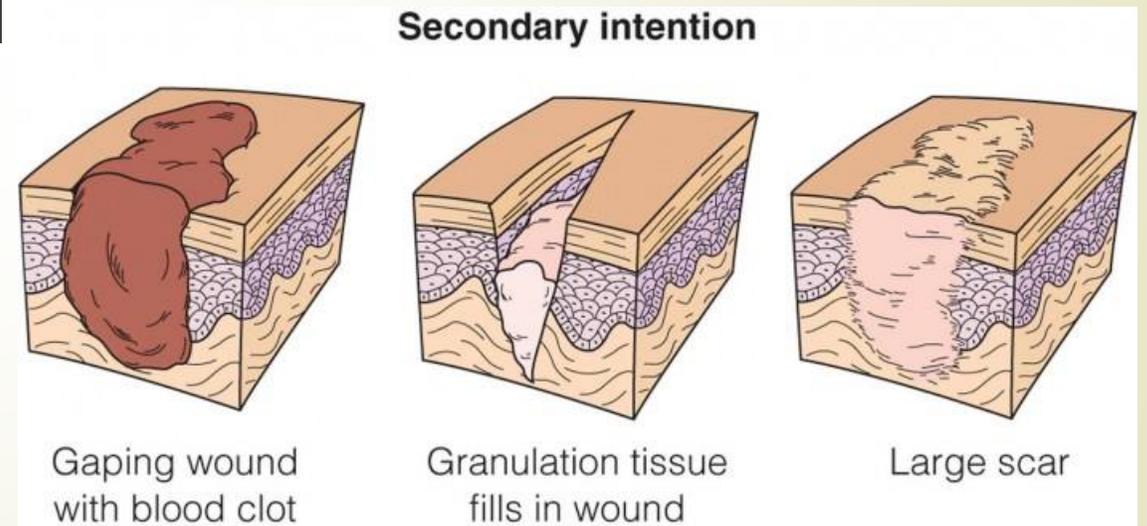
Delayed Primary (Tertiary intention)

- ▶ 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

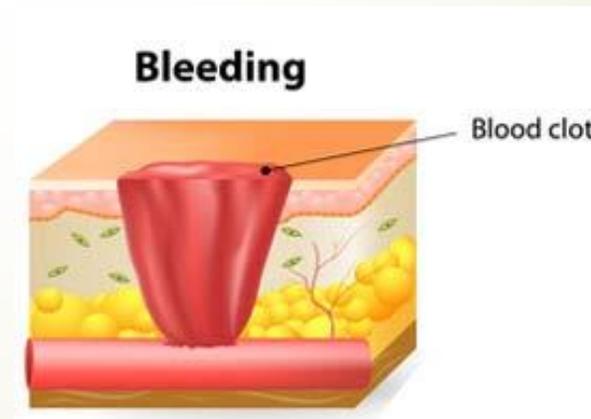
- Inflammatory
- Proliferative
- Remodeling



Astronaut using tools during a space walk. Credit: NASA

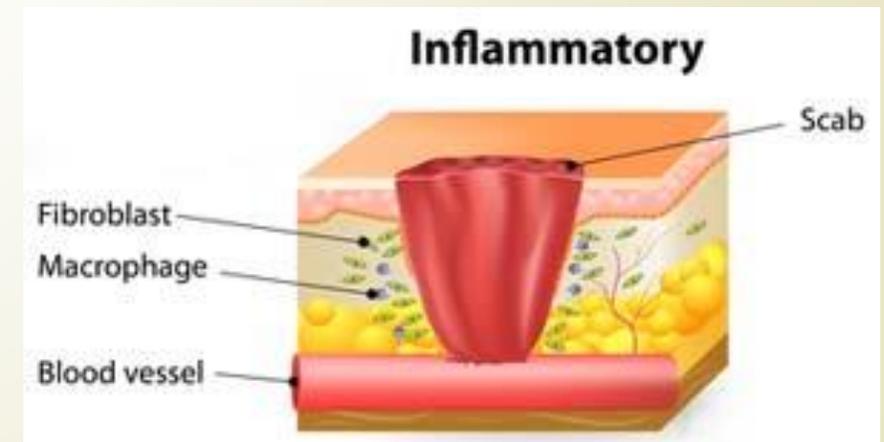
Homeostasis

- Vasoconstriction
- Clot formation



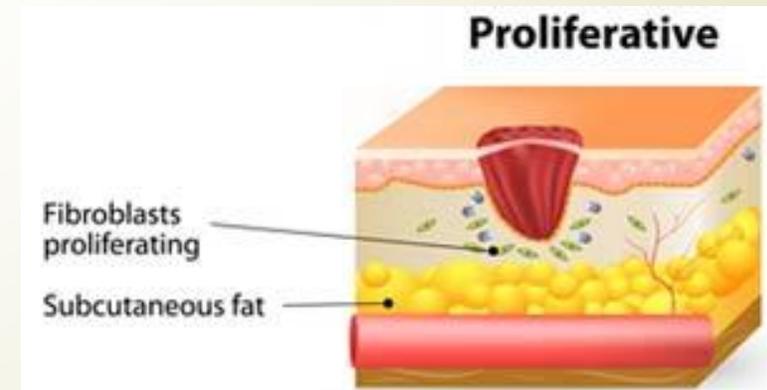
Inflammatory Phase

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



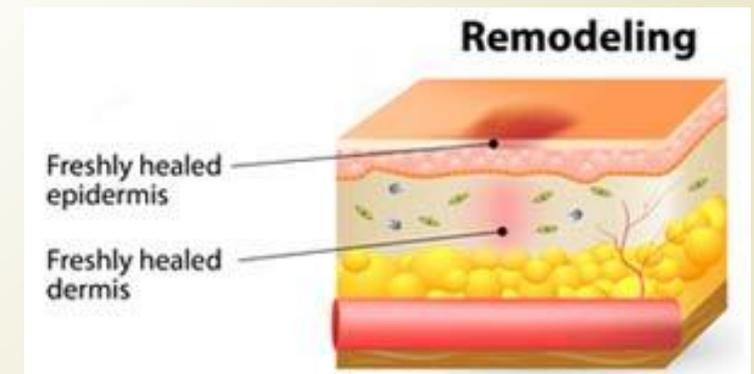
Proliferative Phase

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



Remodeling Phase

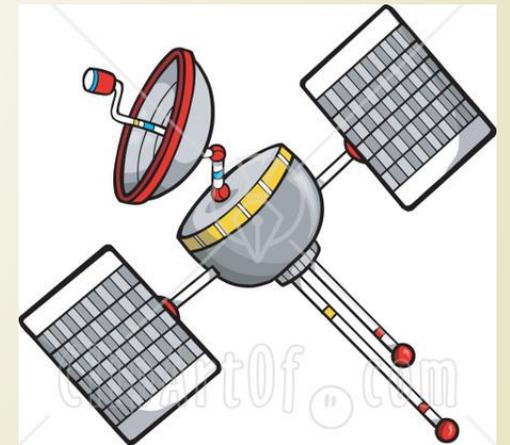
- Random to organized fibrils
- Day 8 through years
- Wound may increase in strength for up to 2 years after injury
 - Collagen organization
 - Cross linking of collagen



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 provisional 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



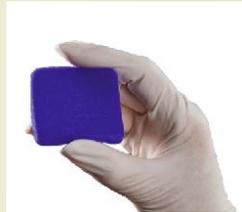
Alginate Dressings

- ▶ 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



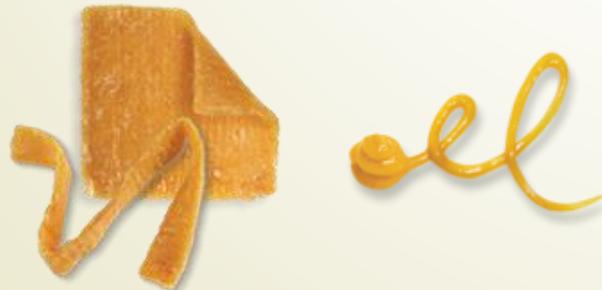
Antimicrobial Dressings: Silver, Gentian violet/Methylene blue, or cadexomer iodine

- ▶ 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, odoriferous 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.

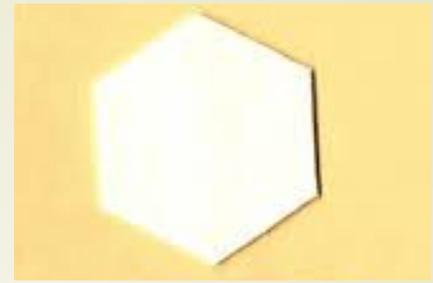


Contact Layer Dressings

- ▶ 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



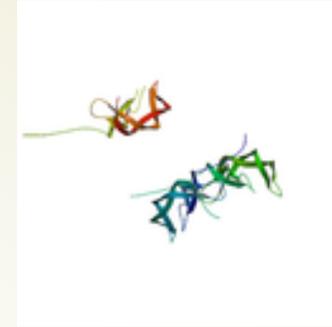
- Description: Derived from bovine, porcine or avian sources. Available in non-adherent pouches or vials, gels loaded into syringes, pads, powders and freeze-dried sheets. Requires a secondary dressing
- Function: Stimulate wound healing
- Indications: Partial or full thickness wounds, minimal to moderate 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 manufacture'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





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