

WOUND DRESSINGS, PRODUCT SELECTION

Boone Hospital Wound Healing Center

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Goal & Objectives

Goal:

- To provide a description of the various dressing types, functions, and uses to optimize the wound environment to promote wound healing.

Objectives:

- The participant will understand the role of moist wound healing in the management of chronic wounds.
- The participant will describe the major categories of dressings including passive dressings, dynamic dressings, anti-infective dressings, and mechanical dressings
- The participant will list the function(s) of each of the major dressing categories including gauzes, hydrogels, hydrocolloids, transparent films, alginates, silver, and iodine dressings.
- The participant will identify appropriate dressing selections based on wound characteristics.

Ulcer Healing Philosophy

"A chronic wound is a window to underlying disease. Each wound is a symptom of underlying infirmities that undermine the potential for healing." – Dean Kane, MD

....in other words...

*Treat the **whole patient**,
not just the **"hole"** in the patient!*

Associate clinical professor for the Division of Plastic and Reconstructive Surgery at Johns Hopkins Hospital; also is the founder and past director of the Wound Center of Northwest Hospital Center.

Ulcers Are Costly!

Between 1 and 2% of the developed world population experiences a non-healing or chronic ulcer.¹

It is estimated that 2.4 million people may develop a foot ulcer at some point in their life.²

Treating chronic ulcers costs the US healthcare system over **\$25 billion** annually.³

1. Kirketerp-Møller et al (2008). *Distribution, Organization, and Ecology of Bacteria in Chronic Wounds*. *Journal of Clinical Microbiology*, 46(8):2117-2122.
2. International Diabetes Federation (2005). *Diabetes in North America: millions of feet at risk of amputations*. Retrieved October 6, 2008 from <http://www.idf.org/home/index.cfm?mode=1426>
3. Brem et al (2007). *Molecular markers in patients with chronic wounds to guide surgical debridement*. *Molecular Medicine*, 12(1-2): 30-39.

Ulcer Management History

Various products have been used throughout history to promote ulcer healing, manage moisture, and protect the body from infection.



- Cotton and wool have been used to absorb drainage
- Egyptians used gauzes soaked in wine vinegar or honey
- Greeks and Romans used metals as antiseptics
- Greeks used fig latex to decrease infection
- South American Indian tribes used ant mandibles as suture

Ovington, L.G. (2002) The evolution of wound management: ancient origins and advances of the past 20 years. *Home Healthcare Nurse*.

Ulcer Management History

Remember...

- ...Maalox and heat lamps? (dries out ulcer)
- ..."Betadine fudge"? (cytotoxic and drying!!)

More recent, but still out-dated...

- ...Normal Saline wet-to-dry dressings!
(drying, painful, contribute to ulcer infection)
- ...Dakin's or Clorapactin -soaked gauze dressings!
(cytotoxic, painful, drying)

Appropriate Dressing Selection

- Address requirements of the ulcer and the patient
 - Maintain appropriate hydration
 - Protect ulcer from external contamination
 - Control odor, bio-burden and ulcer pain
 - Promote debridement of necrotic tissue
- Meet goals and objectives of treatment
- Provide balance between cost and benefit

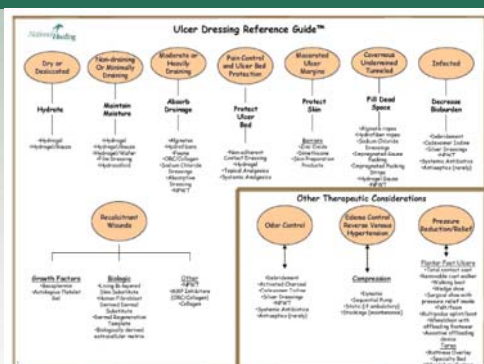
Dressings do not heal ulcers...
they enhance the body's ability to heal itself

Appropriate Dressing Selection

- Helps create the optimal ulcer healing environment
- Increases healing rates
- Reduces pain
- Decreases infection rates
- Provides cost effective care



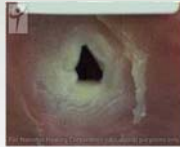
Dressing Reference Guide



Inappropriate dressings can cause...

Compromised peri-ulcer integrity

- Maceration
- Contact dermatitis
- Tape tears



Maceration



Contact Dermatitis

Inappropriate dressings can cause...

- Wound bed injury
- Tissue dehydration
- Hypertrophic granulation
- End Results:
 - Increased pain
 - Increased risk of infection
 - Delayed healing
 - Higher overall costs



Dehydration



Hypertrophic Granulation


Photos – NHC WHC

Key to Success


Accurate and **frequent** assessment of the ulcer's needs is a key component in appropriate dressing selection!

Ulcer Considerations

- Tissue type
- Exudate levels
- Bacteria levels
- Size and Depth




Ulcer Considerations



Healthy Granulation

Granulation and Epithelium

- Protect
- Preserve Moisture




VLU post application of Apligraf
Note the epithelial tissue throughout the wound base

Ulcer Considerations

Necrotic Devitalized Tissue

- Remove these tissues
- Promote autolysis



Ulcer Considerations



Dead Space

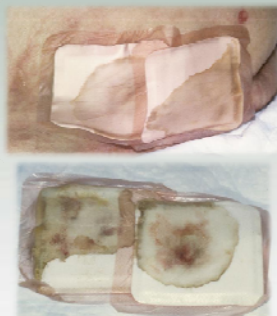
- Eliminate dead space
- Do not pack tightly



Ulcer Considerations

- No Exudate – add moisture
- Low Exudate – preserve moisture
- Moderate Exudate – absorb excess exudate
- Significant Exudate – absorb & manage exudate

Inappropriate Dressing: Heavily Exudative Ulcer



- Strikethrough of exudate
- Peri ulcer maceration
- Skin stripping secondary to dressing adhesives

Photos – Courtesy of C. Broussard

Ulcer Considerations

- Contaminated ulcers
 - Cleanse with saline
- Colonized ulcers
 - Debridement
 - Control surface bacteria with antimicrobial dressings
- Infected ulcers
 - Debridement
 - Control surface bacteria with antimicrobial dressings
 - Manage odor with activated charcoal dressings



**Grossly infected heel ulcer.
Surgical Debridement Indicated,
then consider topical management**

Inappropriate vs. Appropriate Dressing Selection



Passive Dressings

Many dressings are referred to as passive dressings

- No active role interaction with wound tissues
- Maintain a moist wound environment
 - Lend moisture
 - Absorb exudate

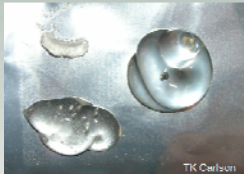
Passive dressing categories should be the first selected to maintain a moist wound healing environment. Step up to active treatment modalities when passive dressings inadequate.

Moist Wound Healing Evidence

- Less intense, less prolonged inflammation (Rovee et al, 1972)
- More rapid keratinocyte proliferation and migration (Winter, 1962)
- Earlier differentiation of keratinocytes to restore cutaneous barrier function (Vogt et al, 1995)
- Increased fibroblast proliferation (Katz et al, 1991)
- Increased collagen synthesis (Leipziger et al, 1985)
- Earlier, less prolonged angiogenesis (Lydon et al, 1989)
- Earlier full-thickness wound contraction (Pirone et al, 1990)

Sharman, D. (2003) Moist wound healing: a review of evidence, application and outcome. *The Diabetic Foot* Vol 6(3)

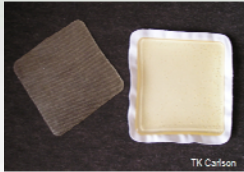
Hydrogel



TK Carlson



IK Carlson



TK Carlson



TK Carlson

Hydrogel

Characteristics

- Maintains clean, moist ulcer environment (macerates if applied outside the ulcer margins)
- Non-adherent to ulcer base when applied correctly
- Cooling and soothing = decreased pain
- Promotes autolytic debridement



For National Health Service educational purposes only

Indications

- Dry partial thickness or full thickness ulcers
- Minimally draining ulcers

Hydrocolloids



Photograph downloaded on 11/21/08 from <http://jan.ucc.nyu.edu/~dew/woundproducts/products.html> on

TK Carlson

Hydrocolloids

Characteristics

- Maintains a clean, moist ulcer environment
 - Reduces ulcer contamination
 - Promotes autolytic debridement
- May reduce pain and protect ulcer

Indications

- Partial or full thickness

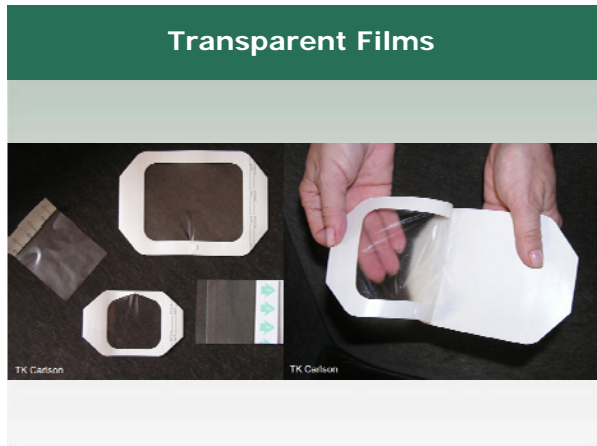
Precautions

- Caution in acutely infected ulcers
- Contraindicated with dry eschar in presence of arterial insufficiency



Hydrocolloids: Special Considerations


- When applying dressing, extend 1 ½- 2 inches past ulcer edges
- Peri-ulcer tissue must be intact
- Utilize a skin sealant under adhesive products to protect the peri-ulcer skin
- Hydrocolloid wear-time is typically 4-7 days; early removal contributes to peri-ulcer skin stripping.
- Wound may have a mild odor and tan exudate when hydrocolloid is removed; cleanse thoroughly before assessing for infection



Transparent Films

Characteristics

- Permeable to oxygen and water vapor
- Slow moisture loss through evaporation
- Maintains moisture
- Non-absorbent
- Protects from bacteria and other contaminants
- Creates a "second skin" to protect against friction



For National Health Care Personnel Education Institute

Indications

- Partial thickness ulcers with minimal ulcer drainage
- High shear areas

Transparent Films: Special considerations

- Peri-ulcer tissue must be intact
- Dressing should extend 1½ to 2 inches past ulcer edges
- Utilize a skin sealant to protect the peri-ulcer skin
- Avoid use of transparent dressings on patients with fragile epidermis

Alginates



Alginates

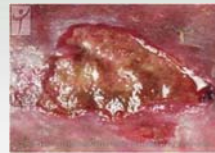
Characteristics

- A natural seaweed polysaccharide
- Biodegradable, highly absorbent
- Converts into viscous, hydrophilic gel maintaining moist ulcer environment
- Some autolytic debridement and hemostatic properties



Indications

- Partial and full thickness ulcers
- Moderate to heavy ulcer drainage



Hydrofibers



Photograph downloaded from: http://www.kinokan.dk/eneste_nyheder153.htm on 11/20/08

Hydrofiber

Characteristics

- Carboxymethylcellulose
- Absorbs heavy exudate
- Converts to a gel
- Keeps ulcer base moist
- Promotes autolysis

Indications

- Partial and full thickness ulcers
- Moderate to heavy ulcer drainage



Foam Dressings



Foam Dressings

Characteristics

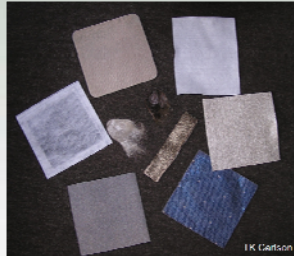
- Insulating
- Absorptive
- Maintains moist ulcer environment
- Promotes some autolytic debridement
- Generally non-adherent to ulcer base
- Extremely versatile
 - May be used as “padding”
 - Spot compression

Indications

- Partial and full thickness ulcers
- Moderate to heavy drainage



Anti-Infective Dressings



Anti-Infective Dressings

- Cadexomer Iodine
- Silver Dressings
- Indications: Infected or Colonized Wounds
- Long term use of silver may inhibit cell proliferation



Composite Dressings

Characteristics

- Combined physically distinct components into a single dressing:
 - Antibacterial barrier
 - Absorptive layer
 - Semi-adherent or non-adherent property
- Considered absorbent dressing



Indications

- Partial or full thickness ulcers
- Product selection based on ulcer characteristics

Non-Adherent Contact Layer

Characteristics

- No adherence to ulcer bed
- Protects the ulcer bed
- Decreases pain with dressing changes

Indications

- Healthy red granulated ulcer bed
- Pain with dressing changes
- Secure biologic product in place
- Skin tears
- As primary dressing under foam in negative pressure



Palliative Dressings

Considerations

- Product choice should be based on ulcer moisture characteristics
- Maintain peri-ulcer integrity
- Non-adherent to decrease pain



Photo - NHC WHC

Charcoal Dressings



Characteristics

- Odor absorption
- Exudate absorption
- May also provide anti-microbial action if combined with silver

New Dressing Technology

- New dressing technology constantly developing to enhance cost effective wound healing
- Clinicians must weigh cost vs benefit
- Review of product's clinical trials enables evidenced-based decision-making

Niche Dressings

There are a number of products that don't fit into the "classic" dressing categories

For example:

Honey dressings

- Available in various formulations
- Studies indicate may have anti-infective and autolytic debridement properties
- Sodium chloride impregnated dressings

Remember the Goal...

Maintain Moisture

- Transparent film
- Hydrocolloid
- Hydrogel Sheet

Add Moisture

- Amorphous hydrogel
- Impregnated hydrogel gauze

Protect ulcer surface

- Contact layer
- Impregnated hydrogel gauze

Absorb Moisture

- Foam
- Alginate
- Hydrofiber
- Composite dressing

Control Bacteria

- Silver
- Cadexomer Iodine

Control Odor

- Activated charcoal

Dressing selection should manage exudate and maintain a moist wound healing environment

How Important is Moisture Maintenance?



Complex Ulcers Often Require Active Treatment Modalities



Summary: Appropriate dressings...

Achieve Desired Goal:

- Enhance ulcer healing process as part of a comprehensive multidisciplinary ulcer healing plan of care.

Outcomes:

- Rapid healing
- Decreased morbidity
- Decreased recurrence
- Decreased costs
