

# Under Construction: The Importance of Undisturbed Wound healing

Presenter:



# Learner Objectives

## Describe:

- ✓ The wound healing process
- ✓ The optimal healing environment
- ✓ Undisturbed wound healing

## Distinguish:

- ✓ Which wounds NEED disruption to heal versus
- ✓ Which wounds heal best with minimal disruption

## Identify:

- ✓ What constitutes an ideal wound dressing

## Define:

- ✓ The nurse's role in promoting 'undisturbed wound healing'



Image courtesy of D Nelson,

# Do You Know?

## ✓ 8.2 Million patients

Number of Medicare beneficiaries with at least 1 wound (15%)

## ✓ \$28.1 to \$96.8 billion

- Wound Treatment
- Medicare spending estimate
  - Hospital outpatients - \$9.9–\$35.8 billion
  - Hospital inpatients - \$5.0–\$24.3 billion

## ✓ 10- 21 minutes

Total amount of time staff nurses spend completing all tasks required for a single wound

**Many patients require wound treatments**  
**Costs are high**

### Numerous Wound Types

Arterial Ulcers

Diabetic Foot Ulcers

Venous Leg Ulcers

Pressure Ulcers

Surgical Wounds

Surgical wound infections

Traumatic wounds

Wound complications

1. Nussbaum, s. et Al. An Economic Evaluation of the Impact, Cost, and Medicare Policy Implications of Chronic Nonhealing Wounds. Copyright 2017, International Society for Pharmacoeconomics and Outcomes Research(ISPOR).Published by Elsevier Inc
2. Hurd T, Posnett J. Point prevalence of wounds in a sample of acute hospitals in Canada. Int Wound J. 2009 Aug;6(4):287-93.
3. Vowden K, Vowden P, Posnett J. The resource costs of wound care in Bradford and Airedale primary care trust in the UK. J Wound Care 2009;18(3):93-4,98-8. 3

# STOP



Did you know?  
[Click here to learn more.](#)

## The Daily Dressing Change!

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# Undisturbed Wound Healing: The Physiologic Process

# Undisturbed Wound Healing

Discovered nearly 60 years ago--  
Yet not all wound care regimens include this concept



## An Old Concept but a “New” Standard of Care

- First discussed in the 1970s in scientific literature
- Protects and supports all the normal processes of skin and wound healing
- Includes moist wound healing
- Leads to fastest wound closure rates

# Healing Takes Time



**Inflammatory  
Phase**



**Proliferative /  
Repair Phase**



**Remodeling /  
Maturation Phase**

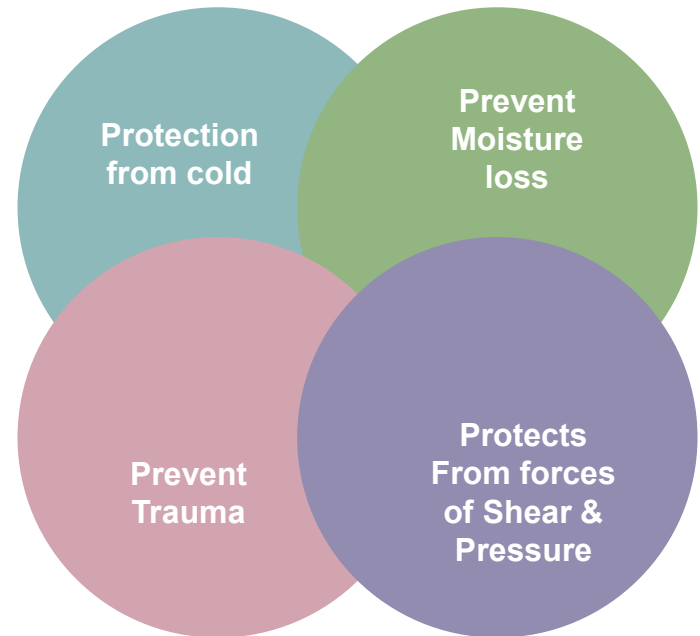
## Normal Wound Healing Cascade

- An orderly process
- Within a predictable amount of time
  - Approximately 4 weeks
  - Without complications



# The Wound Healing Response

- ⑩ Requires that each phase of healing be undisturbed in order to maximize wound closure rate<sup>1</sup>
- ⑩ Requires stable temperature to support leukocyte mobility, phagocytosis, and affinity of hemoglobin for oxygen
- ⑩ Requires moist but not wet conditions for all healing processes
- ⑩ Requires protection from the cellular distortion produced by trauma, shear, friction, and pressure to heal





# Wound Healing Stages

- **Hemostasis:**

Clotting or coagulation

- **Inflammatory Phase:**

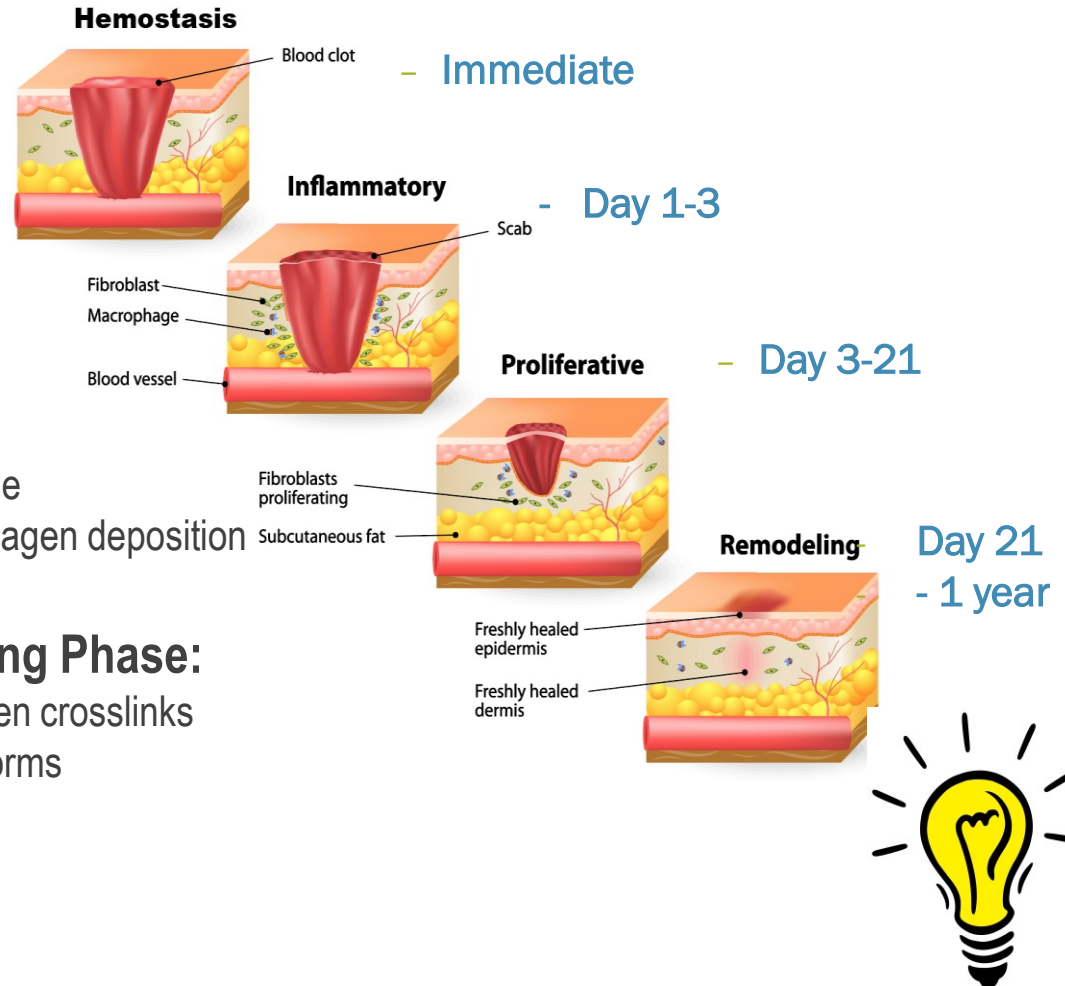
Prepares a clean wound bed

- **Proliferation Phase:**

- Builds granulation tissue via angiogenesis & collagen deposition
- The wound contracts

- **Remodeling Phase:**

- Collagen crosslinks
- Scar forms



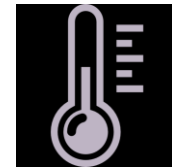
# What is Undisturbed Wound Healing and How Does it Work?

## An undisturbed wound:

- ✓ Minimal tissue movement or dressing replacement
- ✓ Allows uninterrupted healing



**Maintains Temperature**



**Reduces Risk of Infection**

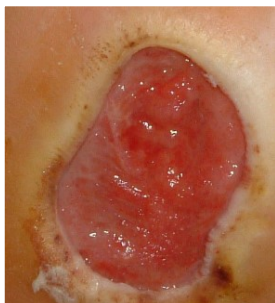


**Protects Against Trauma**

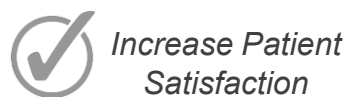
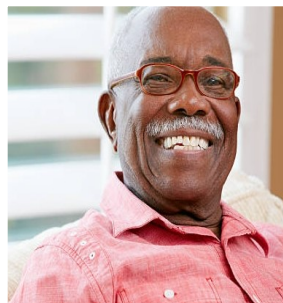


# Minimizing Wound Disturbance Provides Key Benefits

## Wound



## Patient



## Clinician



## Organization



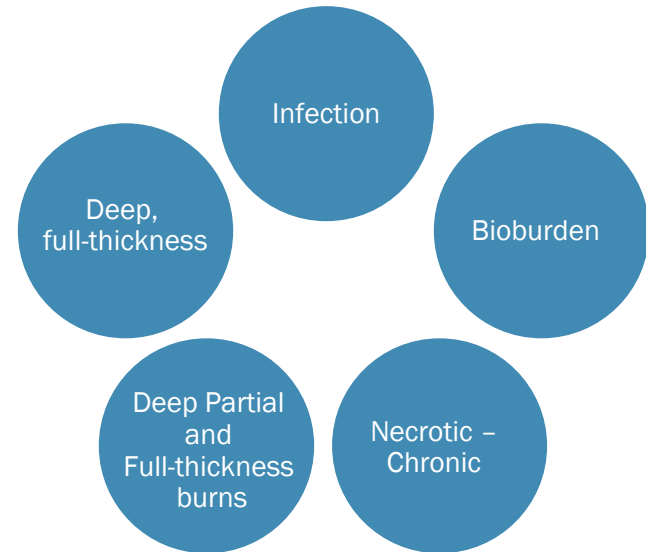
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For Optimal Outcomes

Wounds that **Need Disruption** to Heal

# These Wounds Need **Therapeutic Disruption** to Heal

- 10 Deep, full-thickness wounds with high exudate
- 10 Wounds with infection
- 10 Wounds with bioburden, including burns
- 10 Chronic wounds with necrotic tissue
- 10 Partial-to-full-thickness burns



# Wounds Need **Therapeutic Disruption** to Heal

- Deep, full-thickness wounds  
    With high exudate
- Wounds with infection
- Wounds with bioburden  
    Including burns
- Chronic wounds with necrotic tissue
- Partial-to-full-thickness burns



**Evaluate these wounds to determine if wound is needed. Options include:**

- **Ultrasonic, chemical or mechanical**

# Deep Full-Thickness Wounds

Negative pressure wound therapy is preferred for some deep, full-thickness wounds

In NPWT:

Cell membranes are purposefully distorted to force:

- Removal of wound exudate and edema
- Rapid resolution of inflammatory swelling
- Rapid granulation tissue formation





# Wounds with Infection and Bioburden

- Active disruption and removal of bioburden reduces the pro-inflammatory elements that lead to 'chronic' vs 'acute' wounds
- Removal of bioburden helps cells begin to create normal healing environment instead of chronic inflammation
- This can be obtained through negative pressure wound therapy with instillation, or ultrasonic, chemical or mechanical debridement



Did you know?  
[Click here to learn more.](#)

# Chronic Wounds with Necrotic Tissue

- ⑩ Necrotic tissue makes the wound chronic by keeping the process of inflammation going
- ⑩ Necrotic tissue must be removed to change the chronic wound into an acute wound, so that normal healing can begin
- ⑩ Here are a few examples of wounds that usually need debridement to progress in healing:
  - ✎ Deep pressure ulcers/injuries
  - ✎ Diabetic foot ulcers
  - ✎ Venous leg ulcers



# Deep Partial- to Full-Thickness Burns

- These burns extend into the reticular dermis, and damage hair follicles and sebaceous glands
- They can cause contracture and scarring
- Necrotic tissue must be debrided to viable tissue
- Skin grafts are used to cover excised areas and provide tissue to cover the defect



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# **For Optimal Outcomes Do Not Disturb:**

Wounds that Need Minimal Disruption

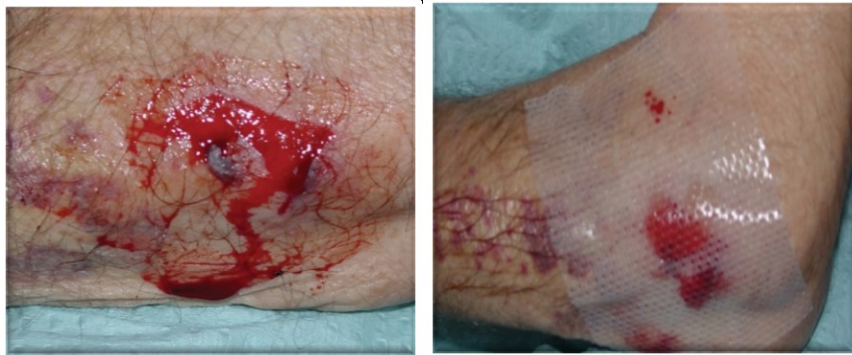
# Wounds that Heal Best with Minimal Disruption

- Cleansed skin tears
- Clean abrasions
- Clean surgical incisions
- Cleansed ulcers and ruptured blisters
- Cleansed, debrided burns
  - Especially with skin grafts
- Wounds treated with cellular tissue products
  - Such as amniotic membrane grafts



# How Not to Manage a Skin Tear

- Skin tears need very gentle cleansing
- An atraumatic, long-wear dressing will
  - ▢ support adhesion of any clean remaining flap to re-adhere to the wound base
  - ▢ reduce pain upon dressing removal
  - ▢ reduce need for frequent dressing changes
- Indicate on dressing which corner to remove in order to not disrupt remaining flap



Well-managed skin tear



Adhesive strips are no longer a preferred treatment for skin tears



# Debrided Burns

## Goal

- Protect from infection
- Provide moist, warm environment
- Prevent drying and sticking to dressing
- Absorb drainage
- Support re-epithelialization



Use of antimicrobial dressings for burn care enable fewer dressing changes

**Secure      Protect      Absorb**  
***ALLOW UNDISTURBED HEALING***



# Clean Surgical Incisions

## *The “Ideal”* post-op dressing

- Manages exudate
  - Provides bacterial barrier
  - Protects against periwound skin injury
  - Allows flexibility in movement
- Especially mobilization after surgery



# Cleansed Abrasions

## *Goal*

- Manage exudate
- Cover and protect nerve endings
- Keep tissue stable in place
  - Allow to re-epithelialize
- Maintain moist and warm conditions
- Protect from bacteria and trauma



**Secure      Protect      Absorb**  
***ALLOW UNDISTURBED HEALING***

# Clean Ulcers and Ruptured Blisters

## Goal

- Protect from pressure, shear, friction during wear
- Create bacterial barrier
- Prevent moisture and temperature loss
- Absorb drainage
  - Protect from maceration
- Support re-epithelialization



**Secure      Protect      Absorb**  
***ALLOW UNDISTURBED HEALING***



# Wounds with Cellular Tissue Products

## Cellular Tissue Products

- Bioengineer skin substitutes
- Gels containing Growth factors

## Require

- Securement that will not strip off the graft upon removal
- Ability to absorb exudate is essential for the graft to 'take'



**Long wear for the securement dressing will assist graft adhesion and wound healing**

# External Factors That Can Disrupt Healing

- On-going trauma to the wound and peri-wound  
Pressure, shear, friction further damage fragile tissue
- Wet or dry wound environment  
Moisture trapped next to wound and skin weakens skin structures
- Wound drainage remains in contact with the wound  
Drainage contains enzymes and bacteria  
Harmful if in contact with the wound
- Cooler temperature  
Slows healing  
Inhibits cellular function



Rippon M, Davies P, White R. Taking the trauma out of wound care: the importance of undisturbed healing. *J Wound Care*. 2012;21(8):359-68.

Ovington L. Hanging wet-to-dry dressings out to dry. *Adv Skin Wound Care*. 2002;

Cohen, Levy, et al. Sacral soft tissue deformations when using a prophylactic multilayer dressing and positioning system. *J Wound Ostomy Continence Nurs* 2018;

Davis S, Li J, Gil J, et al. A closer examination of atraumatic dressings for optimal healing. *Int Wound J*. 2013;

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# Advanced Dressing Technology

## Supports Undisturbed Wound Healing



# Wounds: Acute and Chronic

Diabetic foot ulcers



Venous leg ulcers



Pressure ulcers



Traumatic wounds



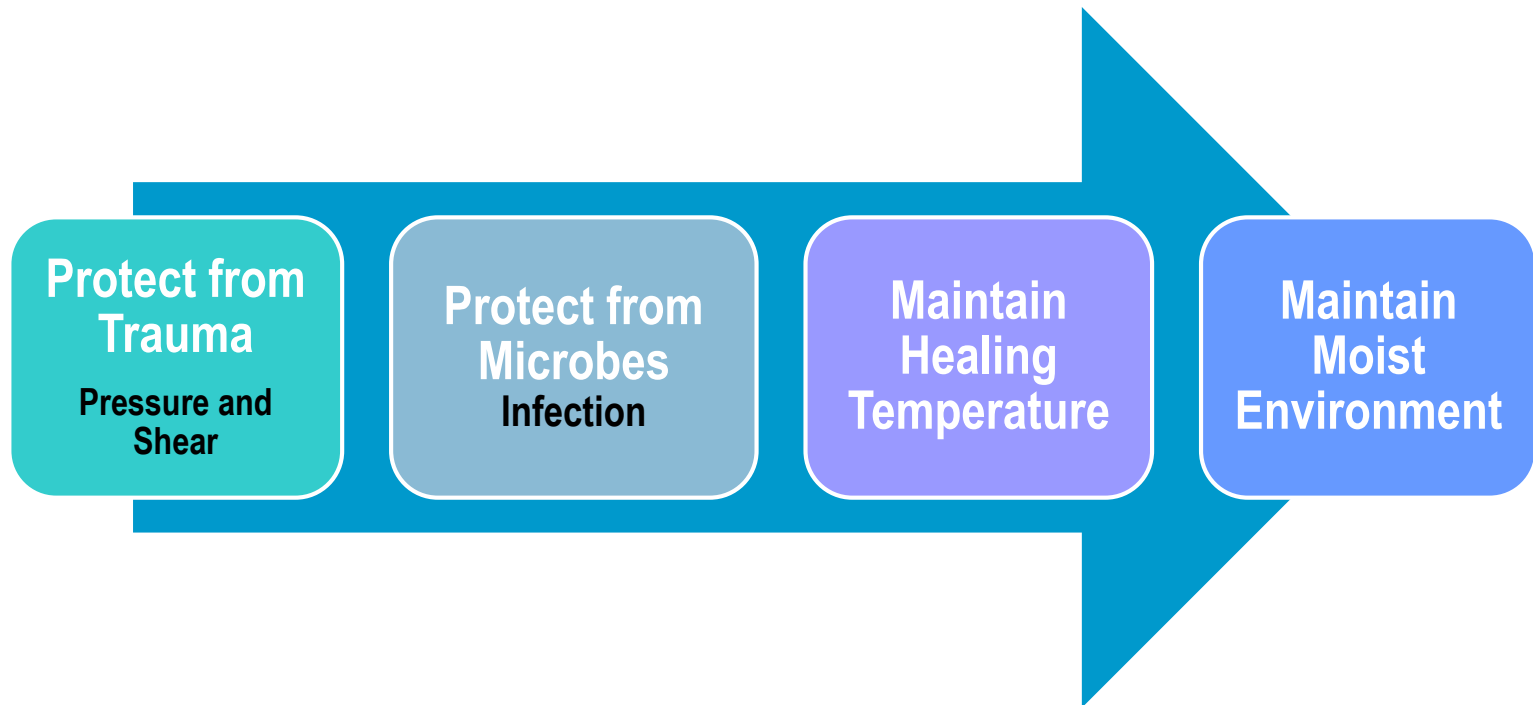
Skin tears



Understand wound etiology and history  
in order to choose the correct dressing

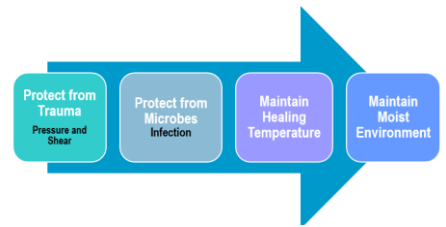


# Support The Wound Healing Response



Each phase of healing must be minimally disturbed in order to maximize the wound closure rate

# The Ideal Wound Dressing



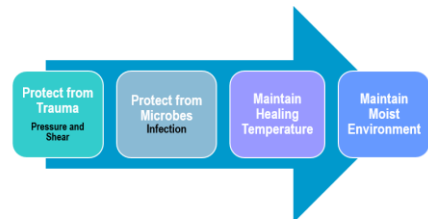
- Effective barrier
  - Prevents physical trauma and bacterial invasion
- Stays in place
  - Conforms and adheres well
- Absorbs to maintain a moist environment
  - Not wet or dry
- Minimal tissue trauma upon removal
  - Wound and Peri-wound skin
- Non-toxic / no foreign bodies



The more effectively a dressing accomplishes all these tasks  
The fewer dressing changes are needed

# Fillers

## Promote Undisturbed Wound Healing



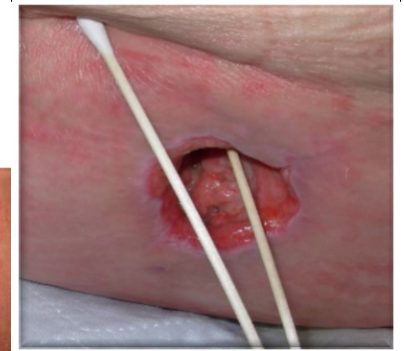
### Wound with depth

### Dressing Goal

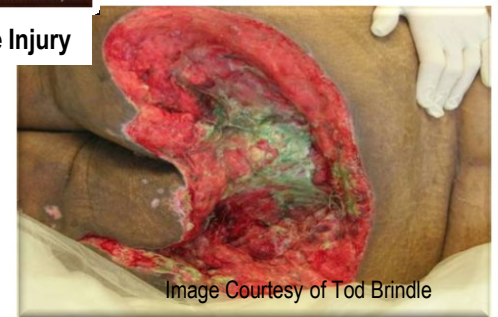
- Better absorption and fill dead space
  - Handle moderate to heavy exudate
  - Extend wear time
  - Promotes optimal wound healing environment



Stage 3 Ischial Pressure Injury



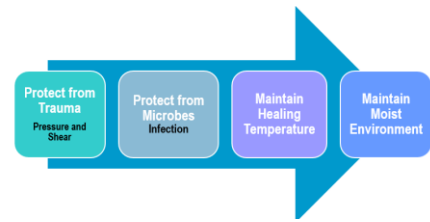
Wound with Undermining



Stage 4 Pressure Injury

# Fillers

## Promote Undisturbed Wound Healing



### Wound with depth require a filler + a cover dressing

- Construction varies - Hydrofiber vs gelling fiber
  - Distinguishing features
    - Amount of absorption
      - Prevent wet wound and peri-wound environment
    - Ease of removal – ability to remain intact
    - Amount of cleansing required
    - Pain with cleansing and dressing changes
- Forms
  - Rope – evacuate tunnels
  - Sheet – fill contours



**Available with or without antimicrobial protection**

# Clinical Challenge

## Venous Leg Ulcers Under Compression



### The ideal dressing under compression

Dressing change frequency matches compression therapy change

Moist wound environment maintained

- Effective absorption and retention under compression
- No leaking or maceration
- Channels and keeps exudate away from wound bed

Does not adhere

Atraumatic

Silver dressings – antimicrobial

Use short term to treat infection

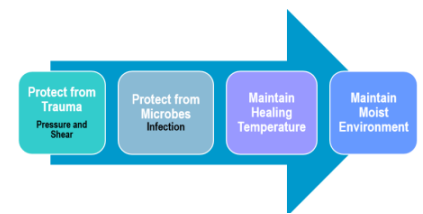


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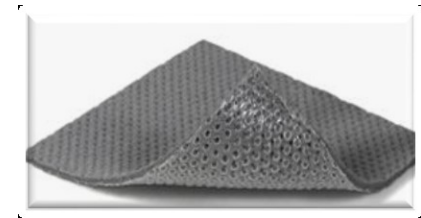
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# Contact Layers

## Promote Undisturbed Wound Healing



Use of Contact Layer with Skin Tear

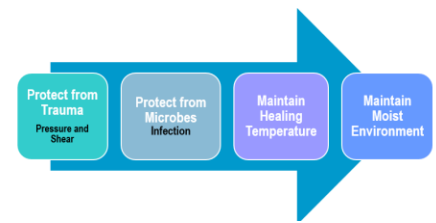


Silver Contact Layer

### Single layer dressing - non-adherent, porous

- Decrease painful dressing changes
- Allows exudate to pass through to absorbent cover
  - Not** changed with each dressing change to minimize disturbance of the wound
- Manages minimal to heavy exudate
- Antimicrobials are available for 7-14 day wear time





# Assess Dressing Performance

## Dressing Assessment

- Leaking
- Lifting
- Falling off

- Patient anxiety
- Pain medication
- Reduced patient activity

- Wet wound
- White milky peri-wound skin

- Sticking / Bleeding
- Peri-wound stripping
- Blistering

## Adverse Event

**Protective Barrier  
Not Maintained**

**Pain and Stress**

**Healing  
environment not  
maintained**

**Trauma due to  
excessive  
adhesion**

## Possible Impact

Delayed healing

Dressing Waste

Patient and staff  
dissatisfaction

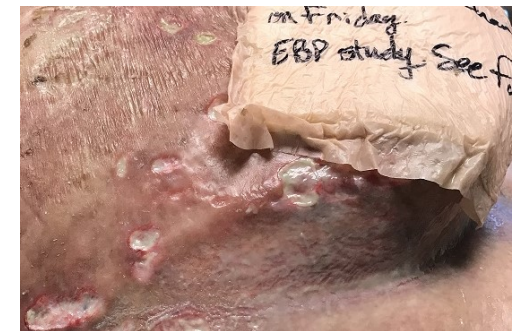
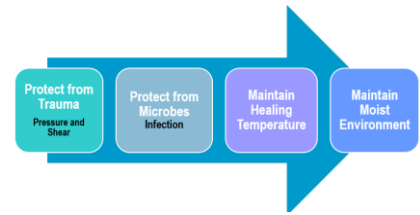


Image Courtesy of Leigh Tyson  
**Ineffective Barrier**



# When the Dressing Isn't Effective



## Dressing-related Complications



Maceration



Blistering



Stripping Lesions



Drying

## Additional Cost of Dressing-related Complications

- Maceration \$225
- Skin stripping/ shearing \$193
- Skin reaction/ dermatitis/ blister \$157
- Adherence to wound \$149
- Drying \$82

**When therapy is perceived as high unit cost, access may be limited**

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# The Advantages of Undisturbed Wound Healing

# Undisturbed Wound Healing

## The Patient Advantage

### What Wound Patients Want

#### A **normal life** while their wound heals

- To heal as fast as possible
  - No infection
- Fewer dressing changes
  - No wound pain and less stress
- Resume activity
  - Mobility
  - Shower
- Ease of dressing application with self care



Did you know?  
[Click here to learn more.](#)

Meeting report: Novel technology for advanced wound dressings — first clinical outcomes from an international multi-disciplinary perspective. *Wounds International* 2018 Vol 9 Issue

Rippon M, Davies P, White R. Taking the trauma out of wound care: the importance of undisturbed healing. *J Wound Care*. 2012;21(8):359-68.

Haessler, E., Ed. National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel, and Pan-Pacific Pressure Injury Advisory Panel: Prevention and treatment of pressure ulcers Clinical Practice Guideline. Perth: Australia, 2014

# Undisturbed Wound Healing

## The Wound Clinician Advantage

### Superior dressing performance provides confidence

- The dressing stays on to protect
- Fastest possible healing is facilitated
- Fewer unnecessary repeat wound team consults
  - Less wasted time
- Maximize reputation and trust
  - Between the wound nurse and the patient
  - With Interdepartmental professionals as they observe dressing performance

Superior Performance  
Longer Wear Time



Right Dressing - Right Patient  
*Right Time*

# Undisturbed Wound Healing

## The Nursing Advantage

### Protect the patient while saving valuable time

- Wound protocols simplified
  - 1 dressing manages
    - many wound types & various complexities
  - Fewer dressing types
- Reduced number of dressing changes
  - Improves patient comfort
  - Saves nursing time
- Prevents wound trauma from many sources
  - Lying and positioning in bed
  - Transport and transfers
  - Procedures

Superior Performance  
Longer Wear Time



Right Dressing - Right Patient  
*Right Time*

Rippon M, Davies P, White R. Taking the trauma out of wound care: the importance of undisturbed healing. *J Wound Care*. 2012;21(8):359-68.

Tyson L. Study first: driving the case for improving hospital care. Poster presentation at the Symposium for Advanced Wound Care. Spring 2019.

Nelson, D. A new bordered foam dressing technology improves wound outcomes and satisfaction while reducing dressing utilization in acute care. Poster Presentation, WOCN Society Annual Conference. June 2019.

# Undisturbed Wound Healing

## The Time and Money Advantage

Nursing time is the largest contributor to wound care cost

Staff nurse time for wound treatment

Acute care - 10-13 minutes

Tyson – More efficient dressing reduced dressing changes

At 5 minutes per dressing change

**21.5 less hours of nursing time to care for wounds**

Effective dressing performance allows

- Less frequent routine dressing changes
- One-and-done application
- Less trips to Supply Room
- Less documentation

### Tasks Associated with Dressing Changes

Travel to Patient Room

Wound assessment

Patient education

# Undisturbed Wound Healing In the Post Acute Setting

## Fewer dressing changes have even greater impact

- **Long Term Acute Care Hospital:**
  - ICU acuity with long length of stay - 25-35 days
  - Extended wear time is an advantage
  - Frequent turnover of staff –
  - Simple protocols and ease of use are an advantage
- **Home Health**
  - Goal – resume a normal life
  - Priority - comfort during wear and at dressing change
  - Potential to reduce the number of home visits
    - Dressing performance allows weekly vs bi-weekly visits
      - Ability to stay on
      - Manage more exudate
    - Self monitor by patient

Superior Performance  
Longer Wear Time



Right Dressing - Right Patient  
*Right Time*



# Price of a product versus the cost of care

Product cost per item vs. actual cost of care

- More effective dressings cost less overall

Cost in Use

- Increased wear time
- Reduced the number of dressing used over time
- Reduced staff time used for dressing changes



Formulary dressing selection is a clinical decision

- Request denied?  
Consider a QIP



Effective  
Dressing  
Cost in  
Use

Ineffective  
Dressing  
Cost Per  
Item

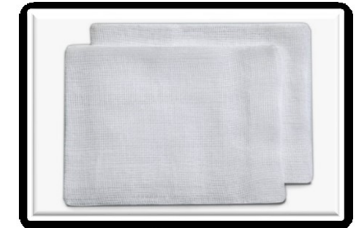


# Dressing Waste

Dressings that perform effectively are a high-tech tool  
Not just another version of gauze and tape

## Beware of Inadvertent Waste

- Ensure that the high-tech tool doesn't go home in your pocket
- Write the date of dressing change on the dressing  
Prevent changes due to uncertainty
- Stop routine dressing changes with bathing
- Organize the Supply Room  
Prevent wrong dressing selection



Gauze



Wet-to-dry Dressing



# Reduce Dressing Waste and Inefficiency

## Address inefficient routines related to dressings

- In-servicing and education on undisturbed wound
- Multi-disciplinary skin champion team
  - Educate and coach staff at bedside
- EMR prompts
  - Document clinical indication for dressing change
- Quarterly review of dressing utilization
  - Utilization incongruent with protocols



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# Conclusion

# Undisturbed Wound Healing



*Supports the Patient*



*Protects and supports  
the Wound*



*Helps the Clinician*



*Saves Time & Money*

# Undisturbed Wound Healing Begins with YOU!

- ✓ Patient education
- ✓ Product selection
- ✓ Staff education
- ✓ Professional discipline





**Undisturbed Wound Healing**

The “New” Standard of Care