Wound Care 101 - Debridement

Everything you always needed to know but didn’t want to ask ......

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Objectives for Wound Debridement

Will be able to discuss:
- Wound bed preparation – TIME as it relates to debridement
- Types of wounds that need to be debrided
- Types of wounds that do NOT need debridement
- Types of debridement
- When to use, or not use, different types of debridement
- Tools and PPE to use with sharp debridement

Wound Bed Preparation and TIME

Wound Bed preparation identifies major components of chronic wound care
System developed using the acronym TIME
- Tissue - Debridement
- Inflammation vs Infection - Maintenance of bacterial balance
- Moisture Imbalance - Exudate management
- Edge of wound
Removing the barriers allows for optimal wound repair and healing

TIME and Debridement

The TIME System for Wound Bed Preparation

<table>
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<th>Clinical Observations</th>
<th>Pathophysiology</th>
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<th>Effect of Actions</th>
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<td>Restore wound base matrix proteins</td>
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International Advisory Board on Wound Bed Preparation

Types of Debridement

- Autolytic debridement
- Mechanical debridement
- Enzymatic debridement
- Biodebridement
- Selective Sharp debridement
- Surgical debridement

Autolytic Debridement

Definition – Using the body’s own mechanisms to remove nonviable tissue.
Need adequate blood flow to wound bed & good nutrition
How it works
- Moisture retentive dressings
  - Transparent films
  - Hydrocolloids
- Wound fluid
  - Endogenous proteolytic enzymes
  - Inflammatory cells
Autolytic Debridement (cont.)

**Benefits**
- It is a selective process and does not harm healing tissue
- Less technical skill – can be done by caregivers
- Typically pain free and less stressful
- Can be used in conjunction with mechanical or sharp debridement to speed results
- Is an option when more aggressive treatments aren’t feasible

**Disadvantages**
- It is still the slowest form of debridement – it can take weeks
- Contraindicated in infected wounds
- Can damage surrounding intact skin
- Odor

Mechanical Debridement

**Definition** – Using an outside force to remove dead tissue. **Physically removes debris** from the wound bed.

**Methods**
- Wet to dry dressing
- Irrigation
- Pulsatile Lavage With Suction (PLWS)

Mechanical Debridement

Wet to Dry

**Benefits**
- Old and familiar
- Readily available anywhere, to anyone
- Can be used by caregivers

**Disadvantages**
- Non-selective – removes fragile, healthy tissue
- Painful
- Frequency of dressing changes causes:
  - Wound cooling
  - Vasoconstriction
  - Hypoxia
  - Increased cost of staff time and supplies

**Disadvantages continued**
- Moisture balance not maintained
- May cause surrounding tissue to become macerated or denuded
- May cause wound bed to become desiccated
- Provides no barrier to bacteria
- Removal disperses bacteria into the air
- Fibers left in wound bed
- Often used incorrectly

What is gauze good for?
Cleaning the periwound
# Mechanical Debridement

## Irrigation
- Basically a wound rinse
  - Should be done for most all dressing changes
  - More a rinse than a debridement
  - Uses a large syringe to wash out the wound
    - Saline
    - Sterile water (if following with a silver product)

## Pulsatile Lavage With Suction
- Irrigation up to 15 psi
- Suction between 60-100mmHg
- Uses NS which should be warmed to 80-85° F
- Single patient, multi use device
- Can soften & loosen non-viable tissue prior to sharp debridement
- Coded as selective debridement

## Indications
- Chronic wounds
- Infected wounds
- Wounds with non-viable tissue or debris
- Desiccated wounds
- Wounds located on edematous limbs

## Contraindications
- Patients with an INR > 3.0
- Pain with procedure
- Acute bleeding
- Patients on anti-coagulants
- Insensate patients

## Precautions continued
- Wounds near major vessels, nerve, tendon or bone
- Wounds near a cavity lining
- Bypass graft sites
- Grafts and flaps
- Facial wounds
- Suspicion of osteomyelitis

## Benefits
- Cleans and debrides
- Reduces bacteria
- Stimulates circulation
- Promotes granulation
- Reduced wound cooling
- Generally well tolerated
- Can be used in tunnels, tracts and undermining
- Reusable on single patient for 1 week
### Mechanical Debridement

**Pulsatile Lavage With Suction (cont.‘)**

- **Disadvantages**
  - Requires wall or portable suction
  - Need a place to hang saline
  - Set up & cleaning takes longer than treatment
  - Some patients have anxiety over “Power Washing” their wound

### Enzymatic Debridement

**Definition** - Is a topical ointment that uses enzymes that break the peptide bonds in collagen.

- **Applied:** nickel thick with daily dressing changes.

**Benefits**

- Selective – only works on nonviable tissue
- Can be applied by patient or caregiver
- Safe, effective, and easy to use.
- Should be painless
- Wound trauma reduced
- Highly effective combined with other techniques such as PLWS or sharp debridement.

**Considerations:**

- Consider use for the patients who can not tolerate sharp or surgical debridement
- Observe caution with infected wounds
- Requires moisture to work
- Works from the bottom up

**Disadvantage:**

- Only product currently available in the US is Santyl.
- Prescription drug that has to be ordered by the doctor
- Is expensive even when insurance covers it. Most co-pays are about $80/tube. (Call your local Santyl Rep to help you.)
- Can be slow

### Biodebridement

**AKA Maggot Therapy**

**History**

- Baron Larrey – Physician to Napoleon’s armies ~ 1800
- J. F. Zacharias – a surgeon in the Confederate Army during the Civil War in the 1860’s
  - “During my service in the hospital at Danville, Virginia, I first used maggots to remove the decayed tissue in hospital gangrene and with eminent satisfaction. In a single day they would clean a wound much better than any agents we had at our command. I used them afterwards at various places. I am sure I saved many lives by their use, escaped septicemia, and had rapid recoveries.”

**Using maggots for wounds**

- Maggot Therapy
- Maggot Debridement Therapy – MDT
- Larva Therapy
- Larval Therapy
- Biodebridement
- Biosurgery

**Sterile not sterile**
Biodebridement (cont.)

Used extensively in US hospitals in the 1930s & 1940s
Abandoned by the mid 1940’s with the introduction of antibiotics & aggressive surgical debridement coming out of World War II
Reintroduced in US in late 1980’s, followed by UK, Israel & Europe

Mechanism of action
– Combined mechanical & chemical debridement
  • Mouth hooks pierce & tear necrotic tissue to facilitate penetration of enzymes
  • Secrete proteolytic digestive enzymes which dissolve necrotic tissues
– Stimulate healthy tissue growth
– Breakdown & inhibition of biofilm

Biodebridement (cont.)

Disinfect the wound
Maggots ingest bacteria from the wound which is killed as it passes through the digestive tract (including Escherichia coli)
Ammonia excreted as a waste product increases pH of wound, creating an alkaline environment unfavorable to many bacterial species

Indications
– Necrotic wounds
  • Pressure Ulcers
  • Venous stasis ulcers
  • Neuropathic foot ulcers
  • Post surgical wounds
  • Traumatic wounds

Contraindications
– Allergy to fly larvae
– Acute, advancing infection
– Infected bone or tendon without surgical or antibiotic treatment
– Wound not exposed to outside
– Ischemic limb
– Natural or pharmacologically induced coagulopathy
– Exposed deep organs or structures

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Biodebridement (cont.)

- Considerations
  - Containment
  - WB surfaces
  - Airflow
  - Drainage

- Sources
  - Monarch Labs, Irvine, CA (loose)
  - BioMonde, Gainesville, FL (contained)

The Yuck Factor

- Patient acceptability of larval therapy for leg ulcer treatment… Petherick et al. 2006
  - 41 subjects with leg ulcers
  - 77% would consider maggot therapy
  - No evidence of widespread resistance

Sharp vs. Surgical

- Conservative sharp debridement is the selective removal of clearly identified non-viable tissue using scalpel, scissors and/or forceps with little to no bleeding and is appropriate for select wounds that are covered partially or fully with non-viable tissue.

- Surgical debridement is the removal of non-viable tissue and may also include anesthesia, bleeding and the removal of viable tissue, it is performed by a surgeon.

Surgical debridement (cont.)

- Indications
  - Wide excision is required
  - Very large area requiring debridement
  - Structural involvement
    - Tendons
    - Bone
    - Vessels
    - Nerves
    - Fascia
    - Joints
    - Viscera

- Suspected structural involvement
- Wound crosses fascial plane
- Anesthesia is required
- Presence of abscess, undermining our tunnel requiring exploration/opening/draining
- Small wound opening with large wound base

Why Debride?

- Non-viable tissue
  - Eschar
    - Thick, leathery
  - Tan, brown, black
  - Slough
    - Loose or adherent, stringy
  - Grey, yellow, green
  - Callos
  - Hides the base of the wound
  - Promotes bacterial growth
  - Impedes the healing process
When not to debride as a PT

- Surgical debridement is indicated
- Acute untreated systemic infection
- Clotting disorders and/or anticoagulation therapy with an INR > 3.0
- Wounds with dry stable eschar on the heel or covering a non-infected wound on an ischemic extremity.
- Ischemic limb with severe arterial insufficiency or with dry gangrene

When not to debride

- When you can’t fully see the area that needs debriding
- When there is concern about proximity to underlying structures

Cautions

- Know your anatomy
- Avoid structures
  - Tendons
  - Bone
  - Vessels
  - Nerves
  - Fascia
  - Joints
  - Viscera

STOP!

- Excessive bleeding
  - Pressure
  - Calcium alginate
  - Silver nitrate
- Excess pain
- Facial layer
- Exposed joint
- Patient or clinician fatigue

Tools

- Scalpel
  - Crosshatching – used on eschar prior to use of topical agents to soften prior to further debridement
  - Shaving – to remove thin layers
  - Cutting – to remove larger pieces when you won’t cut into viable tissue
- Scissors
  - Another method to cut off larger pieces
Tools (cont.)

- **Curette**
  - Smaller areas or thin surface slough
  - Roughen small areas with rolled edges
- **Forceps**
  - Picking out loose bits of slough or debris
  - Holding tissue to cut with scalpel or scissors

PPE

- **Gown**
- **Gloves**
- **Mask with face shield**

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Questions

Debridement – Hands On
Let’s get started ! !