Objectives

1. Describe the significance of pressure ulcer related pain
2. Outline a systematized approach to pain assessment
3. Appraise the evidence on the use of topical and systemic agents to treat pressure ulcer pain

Which wound is the most painful?

Pain is whatever the patient says it is
The Fifth vital sign: evaluate and document pain intensity/characteristics on a regular basis (before, during and after dressing change)

Persistent/background pain

Determine the etiology
Treat the cause or primary pathology

Leg Pain

- 45 year old truck driver
- History of diabetes, smoking, obesity
- Presents with leg edema, weeping skin, and burning sensation
- Warm to touch
- Treated with antibiotics with 1 week, no improvement
Stasis dermatitis

Atrophy blanche

Painful white areas with decreased capillary density often associated with lipodermatosclerosis
Venous leg pain

- Pentoxifylline (Trental): xanthine
  - phosphodiesterase inhibitor: increased PKA
  - reduce blood viscosity, platelet aggregation

- Flavonoids: Horse chestnuts (Escin), hydroxyethylrutoside and Dafion
  - prevent leucocytes activation
  - reduce proteoglycan degradation to prevent vascular leakage

- Aspirin (Effective when used with compression therapy; dosage of 300 mg once per day)

- Oral zinc

Ischemic pain

- Claudication
- Night pain
- Rest pain
- Reperfusion

- Smoking cessation
- Exercise
- Statin
- Surgical interventions
- HBO (localized O2)
- Vaso-dillators: NTG
- Cilostazol (phosphodiesterase inhibitor: PKA)
Neuropathic symptoms

- 50% people with diabetes
- Non-diabetic causes: malignant, metabolic, toxic (e.g., alcohol), infective (e.g., HIV), medication-related (chemotherapy)

- Numbness
- Tingling
- Prickling
- Burning
- Electrical sensations
- Knife like

Data were obtained from 127 patients with DFU who were recruited from 6 hospital-based diabetic outpatient clinics.

75% reported some pain related to DFU
57% reported DFU pain while walking and/or standing during the night.

Figure 1. Distribution of the percentage of patients who reported the occurrence of DFU pain while walking/standing and at night.
Hepatitis C: cutaneous manifestations and associated conditions

- Cryoglobulinemia (50% of Hep C patients).
- Leukocytoclastic vasculitis occurs with type II mixed cryoglobulinemia in the skin and mucous membranes.
- Thrombocytopenia occurs in approximately 10% of patients.
- Antiphospholipid syndrome and severe coagulopathies
- All conditions could be painful!!

Pyoderma gangrenosum

- Painful blisters which rapidly enlarge and ulcerate
- Pustular and crusted variants
- Wide raised border with translucent edges
- Debridement or trauma causes enlargement
- Associated with IBD, arthritis, and myeloproliferative diseases

Pain increased in the last 24 hours
### Signs and symptoms of localized wound infection

<table>
<thead>
<tr>
<th>Letter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>U</strong>: unhealthy tissue</td>
<td>Presence of &gt;50% of debris, red friable tissue or abnormal discoloration of granulation tissue</td>
</tr>
<tr>
<td><strong>P</strong>: poor healing</td>
<td>Changes in wound size of &lt;5-10% in last 7 days</td>
</tr>
<tr>
<td><strong>P</strong>: pain</td>
<td>Sudden emergence or increase in pain</td>
</tr>
<tr>
<td><strong>E</strong>: exudate</td>
<td>Moderate to heavy amount of exudate</td>
</tr>
<tr>
<td><strong>R</strong>: reek</td>
<td>Presence of foul odor</td>
</tr>
</tbody>
</table>

### Signs of local wound infection

- Increase in wound size or new areas of satellite breakdown
- Wound that probes to bone
- Increased periwound temperature of more than 2°F compared to temperature on contralateral limb
- Mild to moderate edema
- Redness of ≥2 cm beyond wound margin

### Lower compartment infection

- Increase in wound size or new areas of satellite breakdown
- Wound that probes to bone
- Increased periwound temperature of more than 2°F compared to temperature on contralateral limb
- Mild to moderate edema
- Redness of ≥2 cm beyond wound margin
Signs of deep wound infection

Local wound factors and pain

- Underlying pathology
- Infection
- Inflammation
- Peri-wound skin irritation
- Nerve damage wind up

- Debridement
- Dressing or adhesive removal
- Cleansing
- Packing and re-application of dressings or compression bandages
- Repositioning

Cognitive:
- Nocebo effect
- Appraisal
- Expectations
- Attention
- Catastrophizing

Emotional:
- Anxiety
- Depression
- Fear
- Anger

Personal:
- Personality
- Values (culture)
- Meaning
- Past pain experiences

Sensory:
- Location
- Timing
- Hypersensitivity versus allostasis

Contextual:
- Social support
- Appearance
- Stigma
- Work-related issues

Pain (intensity and quality)

- Treatment adherence
- Quality of life
- Stress/distance
- Social relationship
- Wound healing
Main causes of trauma and pain

- Trauma to the wound and to the surrounding skin
- Wound bed adherence
- Skin stripping due to aggressive adhesives
- Maceration
- Pain to the patient when removing dressings

Pain at dressing change

Adhesive, Skin stripping and pain
Dressing A  
Dressing B  
Woo et al (2009) Advances in Skin and Wound Care

Types of barrier  Description

Silicone  Silicones are polymers that include silicon together with carbon, hydrogen, and oxygen.

Zinc Oxide  An inorganic compound that is insoluble in water.

Acrylates  Film-forming skin preparation to form a protective interface on skin attachment sites.

Hydrocolloid  A hydrocolloid wafer consists of a backing with carboxymethylcellulose as the filler, water absorptive components, such as gelatin and pectin (commercial gelatin desserts) and an adhesive.

Why do we need to treat pain?
Allodynia and Hyperalgesia

A spiraling effect of pain

Cell damage → Release of pain and inflammatory mediators → Inflammation → Increased sensitivity of peripheral pain receptors and of the central nervous system → Hyperalgesia ↔ Alloodynia

Wound-related triggers (persistent)
- Infection
- Peri-wound skin irritation
- Nerve damage

Procedure-related triggers (episodic)
- Debridement
- Dressing or adhesive removal
- Cleansing
- Packing and re-application of dressings or compression bandages
- Repositioning

Cognitive
- Attention
- Catabolizing

Emotional
- Anxiety
- Depression

Sensory
- Location
- Timing

Contextual
- Social support
- Acceptance
- Stigma
- Work-related issues

Pain (Intensity and quality)

Cognitively
- Attention
- Catabolizing

Emotionally
- Anxiety
- Depression

Sensitively
- Location
- Timing

Contextually
- Social support
- Acceptance
- Stigma
- Work-related issues

Wound Healing

Quality of life

Stress/Interference

Social relationship

Wound healing

Woo © 2011
Pain and stress study

• 39 participants with a median age of 75 years.
• Female (72%)
• Physiological and psychological measurements of pain and stress (including numerical ratings, heart rate, blood pressure, respiration rate, salivary cortisol, galvanic skin response)
• A questionnaire survey of state and trait anxiety and chronic stress
• Recorded immediately prior to dressing change and in a control condition (at least 24 hours before/after dressing change, during a period of rest).
Conclusion

- This study highlights how increased acute pain and stress at dressing change may be related to chronic stress, which has been shown to contribute to delayed wound healing.

Effects of stress on wound healing

Psychological stress

- Hypothalamus
- Physiological responses
- Autonomic nervous system

- Hypothalamic-pituitary-adrenal
- Unhealthy behaviors
- Sympathetic-adrenal medullary

- Glucocorticoid hormones, cortisol
- Depression and anxiety
- Cigarette smoking
- Alcohol consumption
- Disturbed sleep
- Poor nutrition
- Norepinephrine and epinephrine
- Hyperglycemia

- Altered immune response
- Impaired wound healing

Pain and wound healing

- Pain intensity scores were compared between patients with healed ulcers and patients with non-healing ulcers.
- Patients with healed ulcers expressed lower levels of pain. The difference in mean pain scores was significant (1.67 versus 3.21, p<0.041).

Meet Doreen

History of ovarian carcinoma (1997)

Chemo+Rx
Nodules x 2 years: neck, upper chest
Imiquimod

Symptoms:
heavy exudate, odour, maceration of periwound area, itching, bleeding, bulky dressing

Pain in fungating wounds

<table>
<thead>
<tr>
<th>Types</th>
<th>Description</th>
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<tbody>
<tr>
<td>Nociceptive</td>
<td>Inflammatory response, local infection, systemic disease</td>
</tr>
<tr>
<td>Neuropathic</td>
<td>Radiation skin damage, local ischemia, invasion of soft tissue, injury to cutaneous nerves (neuropathic pain)</td>
</tr>
<tr>
<td>Iatrogenic</td>
<td>Dressing changes, radiotherapy</td>
</tr>
<tr>
<td>Psychogenic</td>
<td>Body image, loss of control, fear</td>
</tr>
</tbody>
</table>
Pharmacological

- Topical vs systemic
- Topical ibuprofen (dressing not available in the USA); morphine; topical lidocaine; lidocaine, capsaicin, and ketamine
- Nociceptive pain vs neuropathic pain
- Severity of pain: mild, moderate, severe
- History of pain and treatment

Nociceptive pain: WHO ladder

- Acetaminophen
- Nonsteroidal anti-inflammatory drugs (NSAIDs)
- Opioid therapy: (e.g., oral, transdermal, transmucosal, internasal, and sublingual)

Adjunctive agents

- Anticonvulsants: Antiepileptic-like gabapentinoids (gabapentin and pregabalin)
- Antidepressants (tricyclics, SNRI)
- Steroids and anti-inflammatory agents
- Anxiolytics (benzodiazepines), hypnotics
- Skeletal muscle relaxant
- N-methyl-D-aspartate (NMDA) receptor antagonists
- Nitrous oxide and oxygen
- Cannibis
Local versus systemic treatment

<table>
<thead>
<tr>
<th></th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Systemic</td>
<td>Multiple routes: oral, S/C, IM, IV, PR, Fast acting</td>
<td>Adverse effects depending on drug</td>
</tr>
<tr>
<td>Local</td>
<td>Low dose directly in wounds or regionally: skin, nerve Few adverse effects</td>
<td>Depends on wound exudation Pharmacokinetics?</td>
</tr>
</tbody>
</table>

Topical and physical therapies

- 3% Benzoyl peroxide (NSAID) (Jepson, 1992)
- Ibuprofen dressing (3 RCTs)
- Xylocaine: NPWT study
- EMLA (Cochrane Review): Reduction in pain compared to placebo (3 trials)
- Topical opioids
- Capsaicin: burning, toxic effects on keratinocytes and fibroblasts
- Topical steroids
- Electrical therapy
- Acupuncture
- Warm / cold compress
- Massage

Meeting psycho-social needs

- Relaxation strategies
- Distraction strategies
- Imagery
- Hypnosis
- Meditation / prayer
- Counselling / support groups
Allow patients to call ‘time out’

Thank you!