

Advanced Wound Care in the Peri Operative Setting

Courtney Treptau, RN, BSN, CWON



Introductions

- ▶ **Courtney Treptau**– RN, CWON
CentraCare Willmar Wound Center

A little about us..

- ▶ Wound centers in St. Cloud, Monticello and Willmar
 - Outreach programs in Sauk Centre and Paynesville
- ▶ Two monoplace hyperbaric chambers in both the St. Cloud and Monticello wound centers



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Where are our wound centers located?

 CentraCare - Benson Clinic 320-843-2030 1815 Wisconsin Ave (Use McKinney Ave Entrance) Benson, MN 56215	 CentraCare - Monticello Hospital 763-295-2945 1013 Hart Blvd Monticello, MN 55362
 CentraCare - Paynesville Hospital 320-243-3767 200 W 1st St Paynesville, MN 56362	 CentraCare - Redwood Clinic 507-637-2985 101 Caring Way Redwood Falls, MN 56283
 CentraCare - Rice Memorial Hospital 320-235-4543 301 Becker Ave SW Willmar, MN 56201	 CentraCare - Sauk Centre Clinic 320-352-6591 425 Elm St N Sauk Centre, MN 56378

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What services do we offer?

- ▶ Hyperbaric Oxygen Therapy
 - St. Cloud
 - Monticello



- ▶ Stoma & Ostomy care
 - Willmar
 - Redwood Falls
 - St. Cloud Hospital
- ▶ Outreach programs
 - Sauk Centre
- ▶ Local dressing changes by nurses
 - Paynesville
 - Benson

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What wounds do we treat?

- ▶ Diabetic, venous, arterial and pressure ulcers
- ▶ Post-surgical wounds
- ▶ Wounds or tissue damage post-radiation therapy
- ▶ Wounds present after re-vascularization procedures
- ▶ Compromised skin grafts and flaps
- ▶ Wounds that haven't healed within 30 days



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How to we help them heal?

- ▶ Vascular evaluation
- ▶ Wound debridement
- ▶ Cellular or tissue-based product application
- ▶ Compression therapy
- ▶ Negative pressure (VAC) therapy
- ▶ Pressure off-loading
- ▶ Hyperbaric oxygen therapy (HBO)



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Fiscal year 2026 fun facts

- ▶ Completed **1,407 hyperbaric oxygen treatments**
- ▶ Saw **2,036 new patient consults** between our St. Cloud, Sauk Centre, Monticello and Willmar wound centers
- ▶ Completed **18,675 visits** between our St. Cloud, Sauk Centre, Monticello and Willmar wound centers

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Objectives

- ▶ Classify Deep Tissue Injuries for prophylactic care and early intervention
- ▶ Understand indications for advanced wound care products frequently utilized in the perioperative setting
- ▶ Understand how to provide continuity of care for new ostomates
- ▶ Reflect and identify areas for improvement in their own healthcare setting for wound and ostomy patients

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Pressure Injuries: Reviewing the Basics

- “A pressure injury is localized damage to the skin and underlying soft tissue usually over a bony prominence or related to a medical or other device.”
- ▶ Stage I, II, III, IV, Unstageable, and Deep Tissue Injury
 - ▶ Playing detective to identify pressure as the etiology: Is it over a bone? Is it shaped like that bone? Were any medical devices present?
 - ▶ Identifying at risk patients: Age (neonates and >65), poor perfusion, sensory impairment, reduced mobility, increased moisture, malnutrition, pharmacologic, etc.

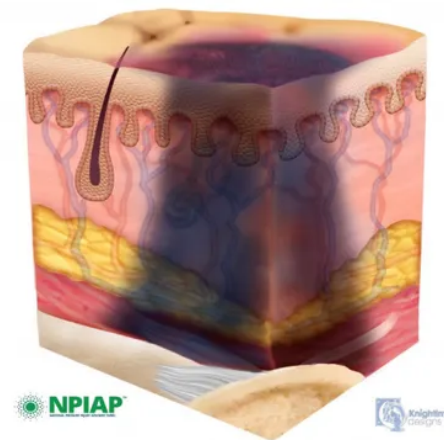


(NPIAP, Pressure Injury Stages, n.d)

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Deep Tissue Pressure Injuries

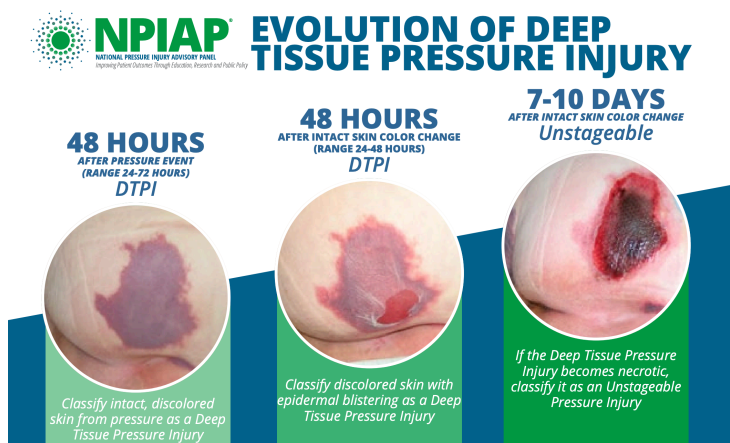
- ▶ “The pressure is exerted at the muscle-bone interface.”
- ▶ Delayed presentation can make these difficult to identify early and treat
- ▶ Often progress to Unstageable, Stage III, or Stage IV pressure injuries



(NPIAP, Evolution of Deep Tissue Pressure Injury 2021)

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- ▶ "The National Pressure Injury Advisory Panel created a photographic timeline to help clinicians more reliably determine events leading to DTI."

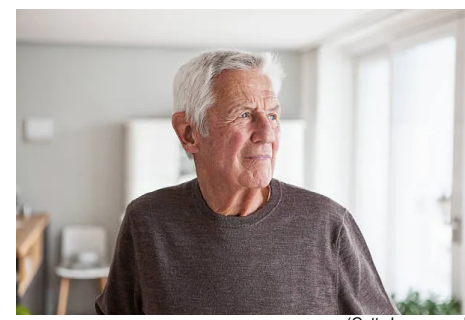


(NPIAP, Evolution of Deep Tissue Pressure Injury 2021)

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Case Study:

76 year old male patient admitted to Medical Surgical Unit following scheduled total hip arthroplasty. Post-op day #2 he was noted to have new purple, maroon discoloration to right heel following ~24-48 hours of aching pain to this area. Injury documented as a bruise and patient discharged to short term skilled nursing facility for rehabilitative stay.



(Getty Images, n.d.)

- Pertinent medical Hx. includes:
- Taking Eliquis daily for a-fib
 - Wife recently passed away and last albumin was 3.4 g/dL
 - Otherwise relatively healthy and ambulatory with limited health concerns

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Case Study continued:

Within 48 hours of arrival to SNF worsening purple discoloration noted with epidermal layer sloughing and sanguineous drainage to left heel. Ongoing pain and difficulty bearing weight. Tissue boggy with palpation. Increased edema noted to surrounding tissue



(iStockphoto, n.d.)

Case Study continued:

Referral to outpatient wound care setting 7 days after skin discoloration noted. Diagnosed with deep tissue injury. Patient treated for over a year with serial sharp debridement, application of autolytic/ antimicrobial dressings, and compression therapy. NPWT recommended, but patient declined. Biologic skin substitute applied to optimized ulceration to achieve closure of wound.



(WoundsInternational, 2023.)

Why does it matter?

This patient was convinced the pressure event causing his injury occurred in the OR. Due to lack of early documentation and delayed presentation of DTIs, the cause of his ulceration could never be confirmed. Therefore, this was reported as a HAPI. Early assessment and recognition of this wound as a DTI could have prevented worsening necrotic tissue and patient referred to advanced wound care earlier. If it was truly acquired in the surgical setting what prophylactic interventions could have been initiated to prevent this event from occurring?

A Deep Dive on Dressings

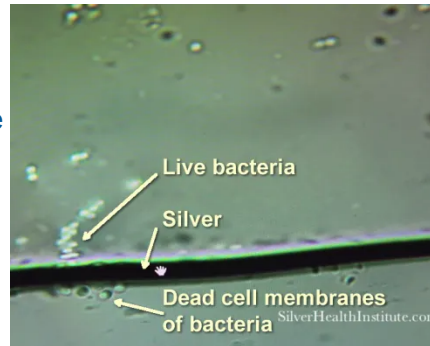
Why the hype on Silver and Wound VACs?



How does Silver work?

- ▶ Silver dissolves and ionizes when exposed to water, bodily fluids, or organic tissue. These silver ions then deposit into the cell walls and vacuoles of bacteria damaging the cell's structure within. "Once inside the cell, silver ions bind to DNA and RNA molecules, causing them to condense. This makes it more difficult for ribosomes to transcribe or read the DNA and RNA, a process necessary to protein synthesis and cell division".
- ▶ Antifungal, anti-inflammatory and antibacterial

(Mohamed et al., 2020)



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Silver dressings



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Silver: Benefits

- ▶ Reduces infection risk and secondarily decreases overall healing time
- ▶ Most insurances will cover silver dressings for use outpatient
- ▶ Very low risk for damage to body's natural cells
- ▶ Allergic reactions are rare
- ▶ Many formulations utilize extended release silver nanoparticles so dressings can stay in place for up to 7-14 days, optimizing thermal environment for cell proliferation

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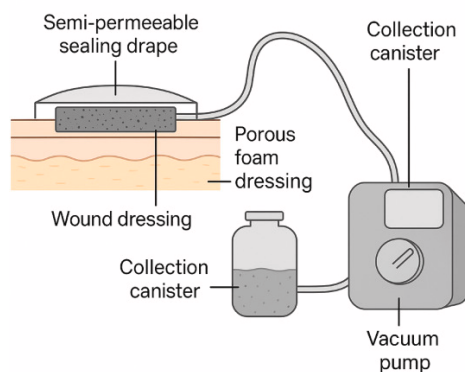
Silver dressings: Limitations and Drawbacks

- ▶ Know your moisture balance. Not all silver dressings are appropriate with highly exudative wounds
- ▶ Not compatible with biologic skin substitutions
- ▶ Despite studies and marketing from companies saying they are MRI safe, many Imaging departments will not perform MRIs with silver based dressings in place

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Negative Pressure Wound Therapy

- ▶ Macrodeformation: physically contracting wound margins
- ▶ Reduction of edema
- ▶ Promote angiogenesis
- ▶ Decrease bacterial load
- ▶ Modulation of inflammation
- ▶ Formation of granulation tissue



(Zeng et al., 2026)

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NPWT



(Medela, n.d)



(Solventum, n.d)



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NPWT: Benefits

- ▶ Quicker rate of healing/ granulation tissue formation
- ▶ Quicker healing for wounds with depth, undermining, or tunneling
- ▶ Remove exudate
- ▶ Decrease rate of dehiscence and SSI
- ▶ Maintain thermal environment for optimal healing
- ▶ Prevent external contamination
- ▶ Increased tensile strength
- ▶ Increased collagen production at incision site
- ▶ Reduced scar tissue



(Orthohyd, n.d.)

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NPWT: Limitations and Drawbacks

- ▶ Requires prior authorization for outpatient therapy/ Delay in therapy
- ▶ Access to healthcare providers that can manage therapy/ change NPWT dressings
- ▶ Physical/ cognitive limitations to safely carry pump
- ▶ At home 'trouble-shooting' for after hours malfunction
- ▶ Dressing changes can be painful/ take longer to apply
- ▶ Complications due to application errors

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Single-use NPWT: Benefits

- ▶ Decrease number of weekly dressing changes
- ▶ Offer a lot of the same benefits to wound healing that traditional NPWT does
- ▶ Smaller and more portable than traditional NPWT
- ▶ Can be a good option for closed-incision NPWT in high risk patients



(Gerlee & Häbber, 2024)



Single-use NPWT: Limitations and Drawbacks

- ▶ Not a good option for highly exudative wounds
- ▶ Not appropriate for wounds with depth, undermining, or tunneling
- ▶ No way to patch dressing if it breaches seal
- ▶ Patient's can end up in ER where staff are ill-equipped to manage the NPWT



(Solventum, n.d)

Our patients are falling through the cracks

How to improve continuity of care for ostomates



(Ostomy.org, n.d)

Ostomate Education

- ▶ According to a 2018 survey research study, 49% of respondents said they received "inadequate information" following their ostomy surgery.
- ▶ Acknowledging bias within a survey study and the "squeaky wheel" mentality. However, still an important take away that a high number of patient's are being discharged without the resources to succeed at home with their ostomy care.
- ▶ Exponentially worsening in the last 10 years

(Miller, 2018.)

Digging Deeper: 13 areas for improvement

- ▶ Attitude of healthcare provider was dissatisfying to patient
- ▶ Ostomy Nurse- should have seen one sooner or did not get to
- ▶ Provider's Lacked Knowledge
- ▶ Lack of product knowledge/ exposure
- ▶ Minimal preoperative information
- ▶ Limited education on how to "fix issues at home"
- ▶ Wrong information given
- ▶ Missing information
- ▶ Lacking resources for support
- ▶ Limited emotional support
- ▶ Questions not being answered
- ▶ Feeling hurried or dismissed
- ▶ Desire for supervised pouch change

So how do we fix it?

- ▶ Basic standard of care should be a post-op referral to ostomy specialist. Stomas can change dramatically and every ostomate needs someone to follow with for ongoing needs/ education
- ▶ Care coordinator for identifying ostomy specialists in your area
- ▶ Are video visits available for this patient if no specialists are within region?
- ▶ Pre-op education and stomal marking
- ▶ Embracing the "I don't know, but I will find out for you" attitude

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Key Takeaways

- ▶ When to refer a patient for wound care. What services are out there for our patients
- ▶ Be on the lookout for DTIs and think critically about how to prevent them in your facility
- ▶ Can my patient benefit from advanced wound care if not already implemented?
- ▶ Help improve continuity of care for ostomates



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