# Wounds and Infection Control

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1

## Objectives

- Describe common skin and wound infections and how wounds can serve as a reservoir for pathogen transmission.
- Describe infection prevention practices during wound care.
- Identify resources and tools for incorporating infection prevention during wound care into your infection prevention and control (IPC) program

2

# Common Wound Types

- Pressure injury
  - Localized damage to the skin and underlying soft tissue usually over a bony prominence or related to a medical device.
  - The injury occurs as a result of intense and/or prolonged pressure or pressure in combination with shear.
  - npiap_pressure_injury_stages.pdf (ymaws.com)
- Diabetic ulcers
  - Neuropathy (nerve damage)
  - Microvascular disease
- Vascular wounds
  - Venous
  - Arterial
- Surgical wounds


NPIAP Pressure Injury Stages

The updated staging system includes the following definitions:

Pressure Injury:

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. The injury can present as intact skin or an open ulcer and may be painful. The injury occurs as a result of intense and/or prolonged pressure or pressure in combination with shear. The tolerance of soft tissue for pressure and shear may also be affected by microclimate, nutrition, perfusion, co-morbidities and condition of the soft tissue.

Stage 1 Pressure Injury: Non-blanchable erythema of intact skin
Intact skin with a localized area of non-blanchable erythema, which may appear differently in darkly pigmented skin. Presence of blanchable erythema or changes in sensation, temperature, or firmness may precede visual changes. Color changes do not include purple or maroon discoloration; these may indicate deep tissue pressure injury.

Stage 2 Pressure Injury: Partial-thickness skin loss with exposed dermis
Partial-thickness loss of skin with exposed dermis. The wound bed is viable, pink or red, moist, and may also present as an intact or ruptured serum-filled blister. Adipose (fat) and deeper tissues are not visible. Granulation tissue, slough and eschar are not present. These injuries commonly result from adverse microclimate and shear in the skin over the pelvis and shear in the heel. This stage should not be used to describe moisture associated skin damage (MASD) including incontinence associated dermatitis (IAD), intertriginous dermatitis (ITD), medical adhesive related skin injury (MARSI), or traumatic wounds (skin tears, burns, abrasions).

Stage 3 Pressure Injury: Full-thickness skin loss
Full-thickness loss of skin, in which adipose (fat) is visible in the ulcer and granulation tissue and epibole (rolled edges) are often present. Slough and/or eschar may be present but do not obscure the depth of tissue damage variety by anatomical location; areas of significant adiposity can develop deep wounds. Undermining and tunneling may occur. Fascia, muscle, tendon, ligament, cartilage and/or bone are not exposed. If slough or eschar obscures the extent of tissue loss this is an Unstageable Pressure Injury.

Stage 4 Pressure Injury: Full-thickness skin and tissue loss
Full-thickness skin and tissue loss with exposed or directly palpable fascia, muscle, tendon, ligament, cartilage or bone in the ulcer. Slough and/or eschar may be visible. Epibole (rolled edges), undermining and/or tunneling often occur. Depth varies by anatomical location. If slough or eschar obscures the extent of tissue loss this is an Unstageable Pressure Injury.

Unstageable Pressure Injury: Obscured full-thickness skin and tissue loss
Full-thickness skin and tissue loss in which the extent of tissue damage within the ulcer cannot be confirmed because it is obscured by slough or eschar. If slough or eschar is removed, a Stage 3 or Stage 4 pressure injury will be revealed. Stable eschar (i.e. dry, adherent, intact without erythema or fluctuance) on the heel or ischemic limb should not be softened or removed.

National Pressure Injury Advisory Panel

3

# Wound Assessment

- Evaluation and documentation of every wound should be completed at least every seven days.
- Evaluation should include:
  - Wound type
  - Location on the body
  - Measurements and description
  - Assessment for complications (e.g., redness, swelling, or drainage)

CDC Train. (2019). Nursing Home Infection Preventionist Training Course. Module 10C – Infection Prevention during Wound Care. https://www.train.org/cdctrain/training_plan/3814

4

# Common Skin and Wound Infections

- Cellulitis
  - Most common diagnosed skin infection followed by wound infection.
- *Staphylococcus aureus or Staph aureus*
  - Colonizes anterior nose and skin
  - Methicillin-resistant *Staph aureus* or MRSA is among the most frequently encountered multidrug-resistant organisms or MDROs in nursing homes
  - A common cause of skin, soft tissue and wound infections in nursing homes
  - Presentation includes skin abscess, cellulitis and wound infections resulting in purulent drainage and delayed wound healing.
  - Can cause invasive bloodstream infections
- Group A Streptococcus
  - Causes pharyngitis (strep throat), cellulitis, and necrotizing fasciitis.
  - In nursing homes, causes outbreaks of wound infections, pneumonia, and invasive bloodstream infection.
  - A single case of invasive group A Streptococcus in a nursing home should prompt an outbreak investigation and notification to public health for additional guidance.

CDC Train. (2019). Nursing Home Infection Preventionist Training Course. Module 10C – Infection Prevention during Wound Care. https://www.train.org/cdctrain/training_plan/3814

5

# Why do we care about the presence of skin breakdown?

- It provides bacteria a portal of entry
- Wounds provide a surface for biofilm formation
- Wounds increase the likelihood of a person being colonized with Multi-Drug Resistant Organisms (MRDO)
- Surveillance definitions for skin and wound infections
  - Pus present at a wound, skin, or soft tissue site.
  - New or increasing presence of at least four of the following sign or symptom subcriteria:
    1. Heat.
    2. Redness.
    3. Swelling.
    4. Tenderness or pain.
    5. Serous drainage.
    6. One constitutional criterion (e.g., fever, leukocytosis).

Note: The presence of bacteria cultured from the wound surface without associated signs and symptoms is not sufficient evidence that the wound is infected.

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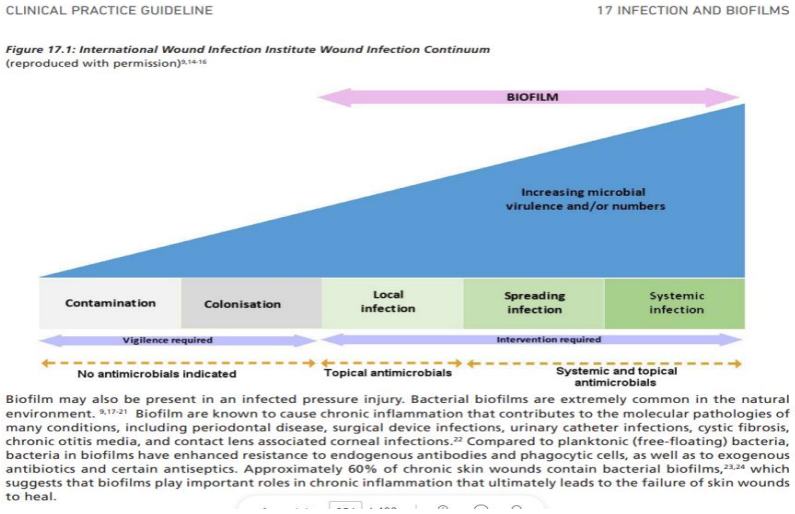
6

# Infection and biofilm

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7

# Infection Prevention

- Lapses in IPC practices during wound care can result in pathogen transmission.
- Potential routes of spread from resident wounds:
  - Lapses in hand hygiene.
  - Improper selection and use of personal protective equipment (PPE).
  - Splashes or sprays generated during irrigation (e.g., pulse lavage) of colonized wounds.
  - Contamination of shared wound care products or equipment.
- Colonized staff can serve as a source of pathogens if they interact closely with wounds without performing hand hygiene and using appropriate PPE.
- Improved IPC practices can minimize MRSA transmission

CDC Train. (2019). Nursing Home Infection Preventionist Training Course. Module 10C – Infection Prevention during Wound Care. https://www.train.org/cdctrain/training_plan/3814

8

# Recommended IPC Practices during Wound Care

- Standard precautions should be applied during wound care
  - Perform hand hygiene
  - Proper selection and use of PPE
  - Proper handling of wound care supplies and medications
  - Cleaning and disinfection of:
    - Environmental surfaces
    - Reusable wound care equipment

CDC Train. (2019). Nursing Home Infection Preventionist Training Course. Module 10C – Infection Prevention during Wound Care. https://www.train.org/cdctrain/training_plan/3814

9

# Hand Hygiene

Hand hygiene should be performed: Before and after wound care, even if gloves will be worn.

After removal of PPE, including if gloves are changed during the procedure.

Gloves need to be worn during wound care dressing changes or procedures.

Gloves need to be changed when moving from dirty to clean tasks.


Graphic from World Health Organization

10

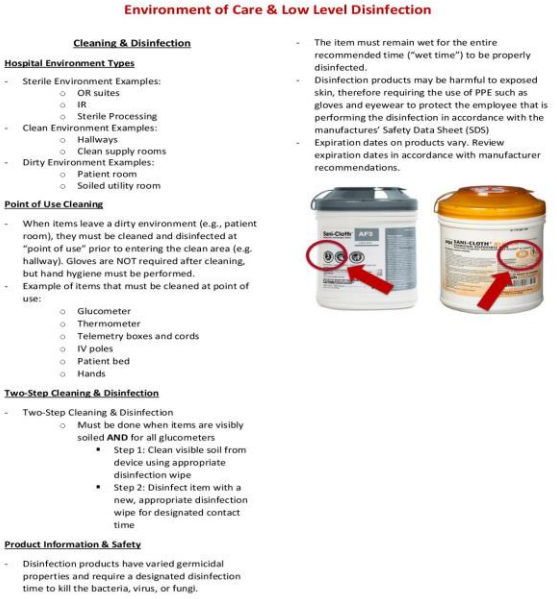
# PPE

- Gown, gloves and face protection
  - Minimize cross contamination of wounds and clothing
  - Protects staff from splash or aerosols
- Gowns should be worn during wound care when significant contact with the resident or immediate environment occurs.
- Face protection should be worn during wound care that produces splashes or aerosols.

CDC Train. (2019). Nursing Home Infection Preventionist Training Course. Module 10C – Infection Prevention during Wound Care. https://www.train.org/cdctrain/training_plan/3814

11

Clean surfaces and equipment are needed to prevent pathogen transmission. Perform before and after wound procedure.



**Environment of Care & Low Level Disinfection**

**Cleaning & Disinfection**

**Hospital Environment Types**

- Sterile Environment Examples:
  - OR suites
  - IR
  - Sterile Processing
- Clean Environment Examples:
  - Hallways
  - Clean supply rooms
- Dirty Environment Examples:
  - Patient room
  - Soiled utility room

**Point of Use Cleaning**

- When items leave a dirty environment (e.g., patient room), they must be cleaned and disinfected at "point of use" prior to entering the clean area (e.g. hallway). Gloves are NOT required after cleaning, but hand hygiene must be performed.
- Example of items that must be cleaned at point of use:
  - Glucometer
  - Thermometer
  - Telemetry boxes and cords
  - IV poles
  - Patient bed
  - Hands

**Two-Step Cleaning & Disinfection**

- Two-Step Cleaning & Disinfection
  - Must be done when items are visibly soiled **AND** for all glucometers
    - Step 1: Clean visible soil from device using appropriate disinfection wipe
    - Step 2: Disinfect item with a new, appropriate disinfection wipe for designated contact time

**Product Information & Safety**

- Disinfection products have varied germicidal properties and require a designated disinfection time to kill the bacteria, virus, or fungi.
- The item must remain wet for the entire recommended time ("wet time") to be properly disinfected.
- Disinfection products may be harmful to exposed skin, therefore requiring the use of PPE such as gloves and eyewear to protect the employee that is performing the disinfection in accordance with the manufactures' Safety Data Sheet (SDS)
- Expiration dates on products vary. Review expiration dates in accordance with manufacturer recommendations.

Graphic from Nebraska Medicine Infection Control and Epidemiology

12

# Single vs Multi-Use items

Nebraska Medicine

**Soiled Reusable Instrument Process & Transport**

**Before patient procedure: Gather a clean, rigid, leak-proof, *biohazard-labeled*, reusable unit transport container from clean supply room.**

| | |
|---|---|
| | Step 1:<br>Don Personal Protective Equipment (PPE) and wipe gross soiled debris with germicidal wipe from instruments. This is done at point of use (at bedside/ in procedure room). |
| | Step 2:<br>Place cleaned instrument(s) in **biohazard labeled unit transport container**. Place lid on container. Remove PPE and perform hand hygiene. Transport to unit designated soiled/dirty utility room. |
| | Step 3:<br>Don required PPE:<br>Gloves and goggles (or face shield) |
| PREKLENZ | Step 4:<br>Place instruments in open position in the Sterile Processing Department (SPD) red biohazard bin and spray with Pre-Klenz Gel. Place lid on red biohazard bin and ensure unit name is legible on bin.<br>***Note: Instrument(s) must remain wet until Volunteer Services retrieves bin.**<br>***Unit staff is responsible for ensuring instrument(s) remain wet. This may require return visits for reapplication.*** |
| | Step 5:<br>Disinfect unit transport container with germicidal wipe. Allow for appropriate wet times. Return unit transport bin back to clean utility room. |
| | Step 6, if applicable:<br>**Unit Specific Instruments require a completed reprocessing form prior to transport to SPD.**<br>When unit is notified of Transport Volunteer's arrival, unit designee verifies Unit Specific Instrument count and finishes SPD form.<br>**Questions regarding which instruments are *unit specific* should be directed toward unit leadership.** |

Graphic from Nebraska Medicine Infection Control and Epidemiology

13

# Wound Supply Storage

- Wound care supplies might be stored on clean supply carts that are accessed for more than one resident.
- Care must be taken to prevent contamination of clean supplies.
- Recommended practices include:
  - The clean supply cart should never enter the resident's immediate care area.
  - Supplies on the cart should only be handled by individuals with clean hands.
  - Gather wound care supplies before entering the resident's room.
  - During the dressing change keep clean and dirty supplies separate.
  - Clean unused supplies that enter the residents care area should not be returned to the clean supply cart. The supplies remain dedicated to that resident or should be discarded.

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14

# Safe Handling of Topical Medications

- Multi-dose creams or ointments should be dedicated to an individual resident, be properly labeled and properly stored.
- For topical medications that can not be dedicated to an individual these steps should be followed:
  - Allocate a small amount for single resident use prior to the procedure.
  - Store the remainder of the multi-dose medication in a dedicated clean area.
  - Containers entering the resident care area are for single use.

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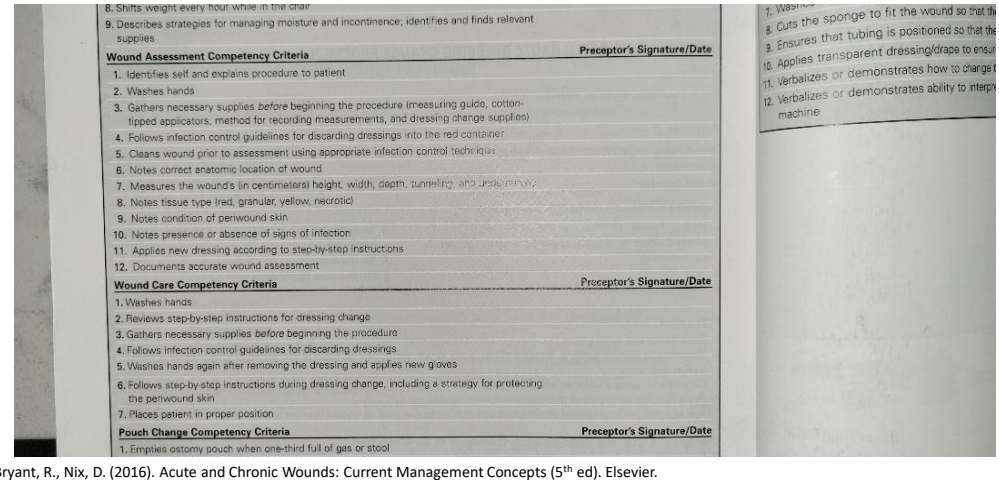
15

# Wound Care Competency Criteria



8. Shifts weight every hour while in the chair
9. Describes strategies for managing moisture and incontinence; identifies and finds relevant supplies

| Wound Assessment Competency Criteria | Preceptor's Signature/Date |
|---|---|
| 1. Identifies self and explains procedure to patient | |
| 2. Washes hands | |
| 3. Gathers necessary supplies *before* beginning the procedure (measuring guide, cotton-tipped applicators, method for recording measurements, and dressing change supplies) | |
| 4. Follows infection control guidelines for discarding dressings into the red container | |
| 5. Cleans wound prior to assessment using appropriate infection control technique | |
| 6. Notes correct anatomic location of wound | |
| 7. Measures the wound's (in centimeters) height, width, depth, tunneling, and undermining | |
| 8. Notes tissue type (red, granular, yellow, necrotic) | |
| 9. Notes condition of periwound skin | |
| 10. Notes presence or absence of signs of infection | |
| 11. Applies new dressing according to step-by-step instructions | |
| 12. Documents accurate wound assessment | |

| Wound Care Competency Criteria | Preceptor's Signature/Date |
|---|---|
| 1. Washes hands | |
| 2. Reviews step-by-step instructions for dressing change | |
| 3. Gathers necessary supplies *before* beginning the procedure | |
| 4. Follows infection control guidelines for discarding dressings | |
| 5. Washes hands again after removing the dressing and applies new gloves | |
| 6. Follows step-by-step instructions during dressing change, including a strategy for protecting the periwound skin | |
| 7. Places patient in proper position | |

| Pouch Change Competency Criteria | Preceptor's Signature/Date |
|---|---|
| 1. Empties ostomy pouch when one-third full of gas or stool | |

7. Was
8. Cuts the sponge to fit the wound so that th
9. Ensures that tubing is positioned so that the
10. Applies transparent dressing/drape to ensu
11. Verbalizes or demonstrates how to change t
12. Verbalizes or demonstrates ability to interpr machine

Bryant, R., Nix, D. (2016). Acute and Chronic Wounds: Current Management Concepts (5th ed). Elsevier.

16

# The Bad and Good


17

# Implementation of IPC Practices

- Develop policies and procedures
  - Wound evaluation, wound documentation and wound care plan
  - Hand hygiene and PPE use
  - Handling of wound care supplies and storage carts
  - Handling multi-dose topical medications
  - Cleaning and disinfection of environmental surfaces and reusable wound care equipment
- Provide training and education
- Access to clean supplies along with a process to maintaining adequate supplies
- Wound and skin care competency
  - Wound care should only be completed by credentialed staff who have completed the necessary education, training and competency.
- Ensure that consultants performing wound care follow your established IPC practices

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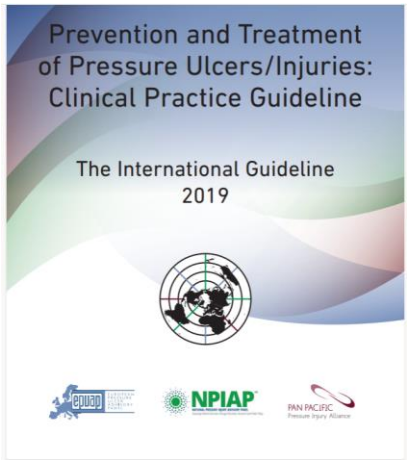
18

# Excellent Resource with Evidence-Based Guidelines




19

# References

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CDC Train. (2019). Nursing Home Infection Preventionist Training Course. Module 10C – Infection Prevention during Wound Care. https://www.train.org/cdctrain/training_plan/3814

National Pressure Injury Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers: Clinical Practice Guideline. Emily Haesler (Ed.). Cambridge Media: Osborne Park, Western Australia; 2019.

20