

Pressure Ulcers

Pressure ulcers, also referred to as bedsores or decubitus ulcers, are localized injuries to the skin and underlying tissue caused by sustained pressure, shear, or friction, resulting in reduced blood flow and oxygen supply to the affected area. These ulcers are most commonly seen in individuals who are bedridden, immobile, or have limited ability to reposition themselves, such as those in advanced stages of illness or with significant disability. The risk of developing pressure ulcers is further heightened in individuals with incontinence, diabetes mellitus, peripheral vascular disease, cerebrovascular disease, hypotension, or sepsis. Specific anatomical areas with bony prominences and minimal subcutaneous fat, such as the sacrum, heels, and ischial tuberosities, are particularly vulnerable to pressure ulcer formation.

Pathophysiology

Pressure ulcers occur when sustained pressure exceeds the capillary closing pressure, leading to ischemia and subsequent cellular injury in the skin and underlying tissues. The lack of blood flow to the affected area results in tissue hypoxia, which damages the cells, leading to inflammation, necrosis, and ultimately the breakdown of the skin and subcutaneous structures. Shear forces, which occur when the skin is pulled in one direction while the underlying bone moves in the opposite direction, also contribute to the development of pressure ulcers by exacerbating tissue deformation and impeding blood flow.

Risk Factors

The risk of developing pressure ulcers is influenced by multiple factors:

➤ **Intrinsic Factors:**

- **Immobility:** Prolonged periods of immobility, such as in individuals who are bedridden or wheelchair-bound, increase the likelihood of pressure ulcer formation, especially if the individual is unable to reposition themselves independently.
- **Incontinence:** Urinary or fecal incontinence exacerbates skin maceration and increases the susceptibility of the skin to injury, promoting ulcer formation.
- **Comorbid Conditions:** Diabetes mellitus, peripheral vascular disease, cerebrovascular disease, and sepsis increase the risk of pressure ulcers due to compromised blood flow, impaired wound healing, and neuropathy.
- **Age:** Older adults have thinner skin, reduced collagen production, and decreased subcutaneous fat, which increases vulnerability to pressure ulcers.

- **Nutritional Deficiencies:** Malnutrition, especially deficiencies in protein and vitamins, impairs tissue repair and makes the skin more prone to breakdown.
- **Extrinsic Factors:**
 - **Pressure:** Prolonged or excessive pressure on the skin, especially over bony prominences, is the primary factor in the formation of pressure ulcers.
 - **Shear and Friction:** Forces that cause the skin to stretch or shear, especially in bedridden patients who are repositioned improperly, increase the likelihood of ulcer development.

Classification of Pressure Ulcers

Pressure ulcers are classified into four stages based on the extent of tissue involvement:

- **Stage I:** The earliest stage, characterized by non-blanchable erythema of intact skin. The affected area may be painful, firm, warm, or swollen, but there is no loss of skin integrity.
- **Stage II:** Partial-thickness skin loss involving the epidermis or dermis. The ulcer may present as a blister, abrasion, or shallow open sore, with a pink or red wound bed.
- **Stage III:** Full-thickness skin loss involving damage to or necrosis of subcutaneous tissue. The ulcer may extend into the fat layer but does not involve muscle, bone, or tendon.
- **Stage IV:** Full-thickness skin loss with extensive tissue damage that may involve muscle, bone, or supporting structures. These ulcers may expose bone, tendon, or muscle and are often associated with significant pain and functional impairment.

Additionally, unstageable pressure ulcers are those where the base of the ulcer is obscured by slough or eschar, preventing the clinician from determining the depth of tissue damage. Deep tissue injury (DTI) refers to a localized area of purple or maroon discoloration of intact skin or a blood-filled blister, indicating damage to underlying soft tissue.

Complications

Pressure ulcers can lead to a range of complications, particularly when left untreated or inadequately managed. These include:

- **Infection:** Bacterial infections, including cellulitis and osteomyelitis, are common complications, particularly in deep-stage ulcers that involve exposed bone or muscle.
- **Sepsis:** In severe cases, infection can lead to systemic inflammation, sepsis, and organ failure.
- **Squamous Cell Carcinoma:** Chronic non-healing ulcers can undergo malignant transformation, particularly in individuals with prolonged ulceration or in those with a history of immunosuppression.
- **Fistula Formation:** The development of abnormal connections between tissues or organs can occur if pressure ulcers extend deeply enough to involve other anatomical structures.

Diagnosis

The diagnosis of pressure ulcers is primarily clinical, based on the patient's history, including risk factors such as immobility and incontinence, as well as a physical examination of the affected area. The extent of the ulcer is assessed, and the stage of the ulcer is determined using the classification system outlined above. Imaging studies, including X-rays, MRI, or CT scans, may be used to assess for deep tissue involvement or suspected complications like osteomyelitis. In cases of suspected infection, tissue cultures may be performed to identify the causative organisms.

Treatment Strategies

Effective management of pressure ulcers involves a combination of preventative measures, wound care, and treatment of any underlying health issues. The goals of treatment include promoting wound healing, preventing infection, alleviating pain, and preventing recurrence.

➤ **Pressure Relief:**

- **Repositioning:** Repositioning patients every 2 hours is critical for preventing and managing pressure ulcers. This helps alleviate sustained pressure on vulnerable areas.
- **Supportive Devices:** The use of pressure-relieving devices, such as foam, air, or gel mattresses, cushions, and overlays, helps redistribute pressure and prevent tissue ischemia.

➤ **Wound Care:**

- **Debridement:** Removal of necrotic tissue is essential for promoting wound healing. This can be achieved through mechanical debridement, enzymatic agents, or surgical debridement in more severe cases.
 - **Dressings:** Maintaining a moist wound environment has been shown to accelerate healing and reduce pain. Hydrocolloid, foam, and alginate dressings are commonly used to dress pressure ulcers, depending on the ulcer's stage and exudate level.
 - **Topical Antimicrobials:** If infection is present, topical antibiotics (e.g., silver sulfadiazine) or antiseptics may be used to prevent bacterial growth in the ulcer.
- **Pain Management:** Pharmacologic interventions, such as acetaminophen or NSAIDs for mild pain, or stronger analgesics for more severe discomfort, are often required to manage the pain associated with pressure ulcer.
- **Nutritional Support:** Ensuring adequate nutrition is vital for wound healing. Patients should receive an adequate intake of protein, vitamins (especially Vitamin C and zinc), and calories to promote skin integrity and tissue regeneration.

Prevention

Preventing pressure ulcers is primarily focused on reducing the duration and intensity of pressure on susceptible areas. Key prevention strategies include:

- **Regular repositioning:** Ensuring that patients who are bedridden or immobile are repositioned at least every 2 hours.
- **Use of specialized mattresses and cushions:** These devices help reduce pressure and prevent ulcer formation in high-risk individuals.
- **Moisture management:** Protecting the skin from excessive moisture due to incontinence is crucial to maintaining skin integrity.

Conclusion

Pressure ulcers remain a significant concern in healthcare, especially for individuals with limited mobility or chronic conditions. Early identification, appropriate staging, and effective management strategies, including pressure relief, wound care, pain management, and nutritional support, are essential for preventing complications and promoting healing. Preventive measures, such as regular repositioning and the use of supportive devices, are key to reducing the incidence of pressure ulcers and improving patient outcomes.

References

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