Wounds

DEFINITION/ PATHOPHYSIOLOGY

A wound occurs when the integrity of any tissue is compromised (e.g. skin breaks, muscle tears, burns, or bone fractures). A wound may be caused by an act, such as a gunshot, fall, or surgical procedure; by an infectious disease; or by an underlying condition.

There are five types of open wounds, which are classified depending on their cause.

Abrasion

- An abrasion occurs when the skin rubs or scrapes against a rough or hard surface. Road rash is an example of an abrasion. There is usually not a lot of bleeding, but the wound needs to be scrubbed of debris and cleaned to avoid infection.

Incision

- A sharp object, such as a knife, shard of glass, or razor blade, causes an incision. Incisions bleed a lot and quickly. A deep incision can damage tendons, ligaments, and muscles.

Laceration

- A laceration is a deep cut or tearing of the skin. Accidents with knives, tools, and machinery are frequent causes of lacerations. The bleeding is rapid and extensive.

Puncture

- A puncture is a small hole caused by a long, pointy object, such as a nail, needle, or ice pick. Sometimes, a bullet can cause a puncture wound. Punctures may not bleed much, but these wounds can be deep enough to damage internal organs. If you have a puncture wound (even just a small one), visit your doctor to get a tetanus booster shot and prevent infection.

Avulsion

- An avulsion is a partial or complete tearing away of skin and tissue. Avulsions usually occur during violent accidents, such as body-crushing accidents, explosions, and gunshots. They bleed heavily and rapidly.

Pressure Ulcers

Stage	Definition	Appearance	Appropriate topical treatment	Average healing time (days)
I	Nonblanchable erythema of intact skin	Pink skin that does not resolve when pressure is relieved; discoloration; warmth; induration	DuoDerm q2-3d	14
II	Partial-thickness skin loss involving epidermis and/or dermis	Cracking, blistering, shallow crater, abrasion	Cleanse only with normal saline or "wound cleanser"; DuoDerm/Tegaderm dressing	45
III	Full-thickness skin loss into subcutaneous fatty tissues or fascia	Distinct ulcer margin; deep crater (in general, 2 mm or deeper [the thickness of a nickel])	Debride; irrigate with normal saline; apply DuoDerm/Tegaderm	90
IV	Full-thickness skin loss with extensive tissue involvement of underlying tissues	Extensive necrosis; damage to underlying supporting structures, such as muscle, bone, tendon, or joint capsule	Surgically debride; irrigate with saline (possibly under pressure); apply advanced topical dressings; consider antibiotics	120
*When the overlying skin is necrotic, the staging cannot be accurate until debridement is performed.				

ASSESSMENT:

- Assess site of impaired tissue integrity and determine etiology (e.g., acute or chronic wound, burn, dermatological lesion, pressure ulcer, leg ulcer).
- Assess characteristics of wound, including color, size (length, width, depth), drainage, and odor.
- Assess changes in body temperature, specifically increased in body temperature.
- Assess the patient's level of distress.
- Cause of the wound.

NURSING INTERVENTIONS

Guidelines for Care of the Untreated (new) Wound:

- Control any bleeding by applying direct pressure over the wound and elevating if it is on an extremity. Consider use of tourniquet.
- Prevent infection by cleaning or flushing abrasions or lacerations with plain water and covering the wound with a clean or sterile dressing, if possible.
- When applying a dressing, wrap the wound tightly enough to apply pressure and approximate the wound edges, if possible.
- If bleeding saturates the first dressing, apply a second layer without removing the original dressing. Removing it may disturb clots that have already formed and increase bleeding.
- Apply ice bag to the wound to reduce swelling and pain.
- If bleeding is severe or internal bleeding is suspected assess the patient for signs of shock.

Guidelines for Care of the Established Wound:

- Monitor site for impaired tissue integrity at least once daily for color changes, redness, swelling, warmth, pain, or other signs of infection.
- Monitor for proper placement of tubes, catheters, and other devices. Assess skin and tissue affected by the tape that secures these devices.
- Do not position patient on site of impaired tissue integrity. If ordered, turn and position patient at least every 2 hours, and carefully transfer patient.
- Pre-medicate for dressing changes as necessary.
- Monitor patient's continence status and minimize exposure of skin impairment site and other areas to moisture from incontinence, perspiration, or wound drainage.
- Wet thoroughly any gauze dressings with sterile normal saline solution before removal.
- Administer antibiotics as ordered.
- Patients who are immobile should not be positioned directly on the femur trochanters; foam wedges and pillows are useful to pad pressure points; to prevent direct contact between bony prominences; and, to raise their heels off the bed surface.
- Pressure ulcers can also be induced by shear forces if patients slide down the bed; therefore, try to use the lowest degree of elevation of the head of the bed that the patient's medical conditions allow.
- Keep a sterile dressing technique during wound care.

Surgical wounds follow a standard sequence when healing. The nurse can expect:

- There should be an absence of bleeding and the appearance of a clot binding the wound edges. The wound edges are well approximated and bound by fibrin in the clot within the first few hours after a surgical closure.
- There should only be inflammation at the wound edges for the first one-to-three days.
- As granulation tissue starts to bridge the wound there should be a reduction in inflammation as the clot diminishes. The wound should be closed with seven-to-10 days.

Increases in inflammation, fever, and drainage likely indicate an infection of the wound site. The wound edges will appear brightly inflamed and swollen.

- Collagen synthesis starts four days after injury and continues for six months or longer, forming the scar.
- Scar size will lessen over a period of months or year. An increase in scar size indicates keloid (irregularly shaped scars that progressively enlarge) formation.

Characteristics and Uses of Wound-Dressing Materials

Category	Examples	Description	Applications
Alginate	AlgiSite, Comfeel, Curasorb, Kaltogel, Kaltostat, Sorbsan, Tegagel	Alginate dressings are made of seaweed extract containing guluronic and mannuronic acids that provide tensile strength and calcium and sodium alginates, which confer an absorptive capacity. Some can leave fibers in the wound if they are not thoroughly irrigated. The stray fibers are eventually absorbed by the body. These dressings are secured with secondary coverage.	These dressings are highly absorbent and useful for wounds that have copious exudate. Alginate rope is particularly useful to pack exudative wound cavities or sinus tracts.
Hydrofiber	Aquacel, Aquacel-Ag, Versiva	An absorptive textile fiber pad, hydrofiber is also available as a ribbon for packing of deep wounds. This material is covered with a secondary dressing. The hydrofiber combines with wound exudate to produce a hydrophilic gel. Aquacel-Ag contains 1.2% ionic silver that has strong antimicrobial properties against many organisms, including methicillin-resistant *Staphylococcus aureus* and vancomycin-resistant enterococci.	Hydrofiber absorbent dressings are used for exudative wounds.
Debriding agents	Hypergel (hypertonic saline gel), Santyl (collagenase), Accuzyme (papain urea)	Various products provide some chemical or enzymatic debridement.	Debriding agents are useful for necrotic wounds as an adjunct to surgical debridement.

Foam	LYOfoam, Spyrosorb, Allevyn	Polyurethane foam has absorptive capacity.	These dressings are useful for cleaning granulating wounds with minimal exudate.
Hydrocolloid	CombiDERM, Comfeel, DuoDerm CGF Extra Thin, Granuflex, Tegasorb	Hydrocolloid dressings are made of microgranular suspension of natural or synthetic polymers, such as gelatin or pectin, in an adhesive matrix. The granules change from a semihydrated state to a gel as the wound exudate is absorbed.	Hydrocolloid dressings are useful for dry necrotic wounds, wounds with minimal exudate and for clean granulating wounds.
Hydrogel	Aquasorb, DuoDerm, Intrasite Gel, Granugel, Normlgel, Nu-Gel, Purilon Gel, KY Jelly	Hydrogel dressings are water-based or glycerin-based semipermeable hydrophilic polymers; cooling properties may decrease wound pain. These gels can lose or absorb water depending upon the state of hydration of the wound. They are secured with secondary covering.	These dressings are useful for dry, sloughy, necrotic wounds (eschar).
Low-adherence dressing	Mepore, Skintact, Release	Low-adherence dressings are made of various materials designed to remove easily without damaging underlying skin.	These dressings are useful for acute minor wounds, such as skin tears, or as a final dressing for chronic wounds that have nearly healed.
Transparent film	OpSite, Skintact, Release, Tegaderm, Bioclusive	Transparent films are highly conformable acrylic adhesive films with no absorptive capacity and little hydrating ability. They may be vapor permeable or perforated.	These dressings are useful for clean, dry wounds with minimal exudate. They also are used to secure an underlying absorptive material, to protect high-friction areas and areas that are difficult to bandage (eg, heels) and to secure intravenous catheters.

PATIENT TEACHING

- Educate patient about proper nutrition, hydration, and methods to maintain tissue integrity.
- Teach skin and wound assessment and ways to monitor for signs and symptoms of infection, complications, and healing.
- Instruct patient, significant others, and family in proper care of the wound including hand washing, wound cleansing, dressing changes, and application of topical medications.

CULTURAL CONSIDERATIONS

- A wound on any part of the body can be devastating to the person and the family.
- The cause of the wound can be upsetting to the person and he/she may want to hide the nature of the cause.
- Be mindful that the person's cultural group will have some remedies passed on from relatives that claim their method is the only one to use. Tread lightly in this case so as not to upset the patient or those in family. It would be best to listen carefully to what is being suggested and not demeaner anyone.

COORDINATING CARE WITH NURSING ASSISTANT

- Involve the Nursing Assistants in the care planning process.
- Go over the plan and answer questions as they arise.
- Take opportunities to teach any CNA on wound care by eliciting help with dressing changes.
- Monitor the frequency of position changes when in bed or even when up in chair.
- If any CNA wants to report that the patient's wound "doesn't look right", then respond quickly as this observation could be extremely valuable.

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