Wolters Kluwer Health | Lippincott Williams & Wilkins

Chapter 31
Skin Integrity and Wound Care

https://www.youtube.com/watch?v=jweDfxDffdY

Functions of the Skin

- Protection
- Body temperature regulation
- Psychosocial
- Sensation (Sensory organ for touch, heat, cold, socio-sexual and emotional sensations.)
- Vitamin D production
- Immunological
- Absorption
- Elimination

Question

Tell whether the following statement is true or false.

Blood vessels in the skin dilate to dissipate يشتت ، يبددheat.

A. True

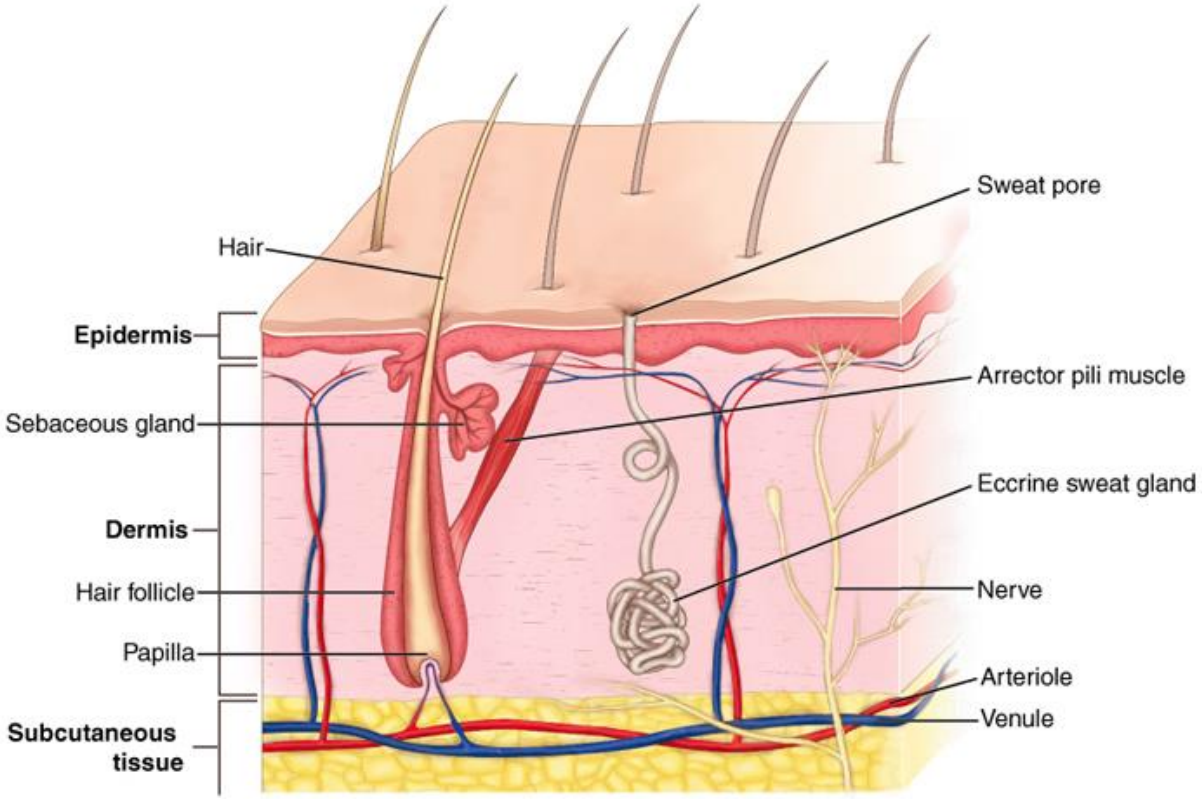
B. False

Answer

Answer: A. True

Blood vessels in the skin dilate to dissipate heat.

Cross-Section of Normal Skin



Factors Affecting the Skin

- Unbroken and healthy skin and mucous membranes defend against harmful agents.
- Resistance to injury is affected by age, amount of underlying tissues, and illness.
- Adequately nourished and hydrated body cells are resistant to injury.
- Adequate circulation is necessary to maintain cell life.

Developmental Considerations

- Infant's skin and mucous membranes are easily injured and subject to infection.
- A child's skin becomes increasingly resistant to injury and infection.
- The structure of the skin changes as a person ages.
- The maturation of epidermal cells is prolonged, leading to thin, easily damaged skin.

Causes of Skin Alterations

- Very thin and very obese people are more susceptible to skin injury.
  - Fluid loss during illness causes dehydration.
  - Skin appears loose and flabby رخو ضعيف.
- Excessive perspiration during illness predisposes skin to breakdown.
- Jaundice causes yellowish, itchy skin.
- Diseases of the skin cause lesions that require care.

Wound-definitions

- - A loss of continuity of the skin or mucous membrane which may involve soft tissues, muscles, bone and other anatomical structure.
- - Any disruption to layers of the skin and underlying tissues due to multiple causes including trauma, surgery, or a specific disease state.

Classification of Wounds

- Intentional or unintentional
- Open or closed
- Acute or chronic
- Partial thickness, full thickness, complex

Classification of surgical wounds according to the degree of contamination

- Clean wounds: Operations in which a viscus is not opened. This category includes non- traumatic, uninfected wounds where is no inflammation encountered and no break in technique has occurred.
- Clean-contaminated: A viscus is entered but without spillage of contents. This category included non-traumatic wounds where a minor break in technique has occurred.

Classification of surgical wounds cont'd

- **Contaminated: Gross spillage has occurred or a fresh traumatic wound from a relatively clean source. نظيف نسبيا Acute non-purulent inflammation may also be encountered يصدف.**
- **Dirty or infected : Old traumatic wounds from a dirty source with delayed treatment, أضعفَ نسيجاً، devitalized tissue, clinical infection, fecal contamination or a foreign body.**

Types of Wound

Type	Cause	Description and Characteristics
Incision الشق	Sharp instrument eg. Knife	Open wound; painful
Contusion الكدمة	Blow from a blunt instrument	Close wound, skin appears ecchymotic (bruised) because of damaged blood vessels
Abrasion الحك	Surface scrape, either unintentional (eg, scraped knee from fall) or intentional (eg, dermal abrasion to remove pockmarks)	Open wound; involving the skin ; painful
Puncture الثقب	Penetration of the skin and, often the underlying tissues from a sharp instrument	Open wound; can be intentional or unintentional
Laceration التمزيق	Tissues torn apart, often from accidents (eg, machinery)	Open wound; edges are often jagged
Penetrating wound الجروح الثاقبة	Penetration of the skin and the underlying tissues	Open wound; usually accidental (bullet or metal fragments)

Classification of wounds by depth

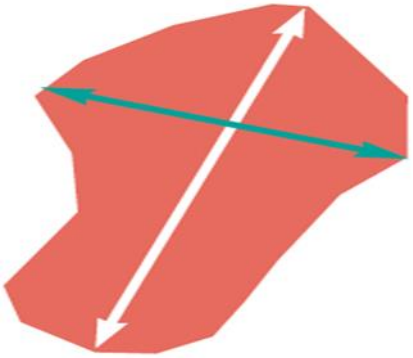
- Partial-thickness: Confined to the skin, the dermis and epidermis.
- Full-thickness : Involve the dermis, epidermis, subcutaneous tissue, and possibly muscle and bone

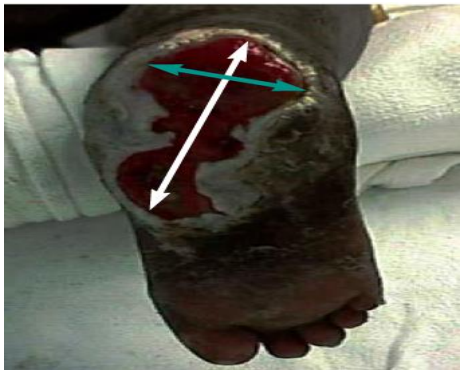
Wound assessment

- A complex process
- Involve examination of the entire wound
- Nurses visually assess wounds and document their findings to monitor and evaluate the progress of wound healing

Wound assessment cont'd

What to assess?





- **Location**
- **Dimensions/Size**
- **Tissue viability** قابلية النجاح
- **Exudates/Drainage**
- **Periwound condition**
- **Pain**
- **Stage or extent of tissue damage.**
- **Swelling**

Question

Which one of the following types of wounds is caused by a blunt instrument that causes injury to underlying soft tissue with the overlying skin remaining intact?

A. Contusion

B. Abrasion

C. Laceration

D. Avulsion

Answer

Answer: A. Contusion

Rationale:

A contusion is caused by a blunt instrument and may result in bruising or hematoma.

An abrasion is the rubbing or scraping of epidermal layers of skin.

A laceration is the tearing of skin and tissue with a blunt or irregular instrument.

Avulsion is the tearing of a structure from normal anatomic position.

Principles of Wound Healing

- Intact skin is the first line of defense against microorganisms.
- Surgical asepsis is used in caring for a wound.
- The body responds systematically to trauma of any of its parts.
- An adequate blood supply is essential for normal body response to injury.
- Normal healing is promoted when wound is free of foreign material.

Principles of Wound Healing (cont.)

- The extent of damage and the person's state of health affect wound healing.
- Response to wound healing is more effective if proper nutrition is maintained.

Phases of Wound Healing

- Hemostasis
- Inflammatory
- Proliferation
- Maturation

Hemostasis

- Occurs immediately after initial injury
- Involved blood vessels constrict and blood clotting begins
- Exudate is formed causing swelling and pain
- Increased perfusion results in heat and redness
- Platelets stimulate other cells to migrate to the injury to participate in other phases of healing

Inflammatory Phase

- Follows hemostasis and lasts about 4 to 6 days.
- WBCs move to the wound.
- Macrophages enter wound area and remain for extended period.
- They ingest debris and release growth factors that attract fibroblasts to fill in wound.
- Patient has generalized body response.

Proliferation Phase

- Phase begins within 2 to 3 days of injury and may last up to 2 to 3 weeks.
- New tissue is built to fill wound space through action of fibroblasts.
- Capillaries grow across wound.
- A thin layer of epithelial cells forms across wound
- Granulation tissue forms a foundation for scar tissue development.

Maturation Phase

- Final stage of healing begins about 3 weeks to 6 months after injury.
- Collagen is remodeled.
- New collagen tissue is deposited.
- Scar becomes a flat, thin, white line.

Question

In which one of the following phases of wound healing is new tissue built to fill the wound space, primarily through the action of fibroblasts?

A. Hemostasis

B. Inflammatory phase

C. Proliferation phase

D. Maturation phase

Answer

Answer: C. Proliferation phase

Rationale:

In the proliferation phase, granulation tissue is formed to fill the wound.

In hemostasis, involved blood vessels constrict and blood clotting begins.

In the inflammatory phase, white blood cells move to the wound.

In the maturation phase, collagen is remodeled forming a scar.

Factors Affecting Wound Healing

- Age—children and healthy adults heal more rapidly
- Circulation and oxygenation—adequate blood flow is essential
- Nutritional status—healing requires adequate nutrition
- Wound condition—specific condition of wound affects healing
- Health status—corticosteroid drugs and postoperative radiation therapy delay healing

Wound Complications

- Infection
- Hemorrhage
- Dehiscence and evisceration
- Fistula formation

S&S of Presence of Infection

- Wound is swollen.
- Wound is deep red in color.
- Wound feels hot on palpation.
- Drainage is increased and possibly purulent.
- Foul odor may be noted.
- Wound edges may be separated with dehiscence present.

Question

Which one of the following wound complications is caused by overhydration related to urinary and fecal incontinence?

A. Necrosis

B. Edema

C. Desiccation

D. Maceration

Answer

Answer: D. Maceration

Rationale:

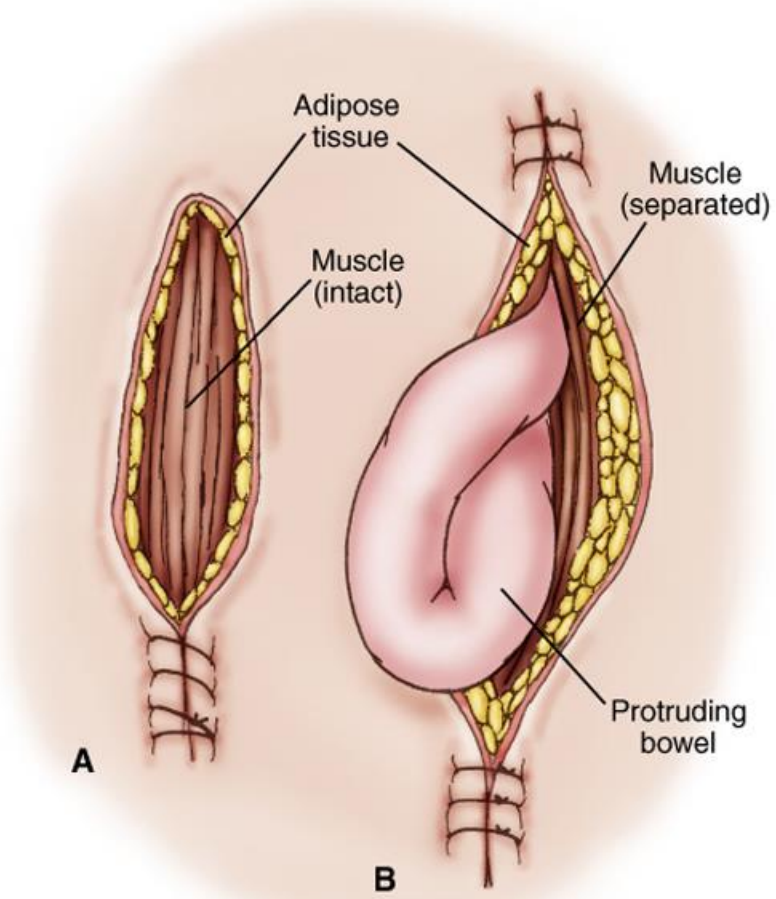
Maceration is caused by overhydration related to incontinence that causes impaired skin integrity.

Necrosis is dead tissue present in the wound that delays healing.

Edema is swelling at a wound site that interferes with blood supply to the area.

Desiccation is the process in which the cells dehydrate and die.

Wound Dehiscence and Evisceration



Psychological Effects of Wounds

- Pain
- Anxiety
- Fear
- Change in body image

Pressure ulcer

- **Any lesion caused by unrelieved pressure that results in damage to underlying tissue**

Factors Affecting Pressure Ulcer Development

- Aging skin
- Chronic illnesses
- Immobility
- Malnutrition
- Fecal and urinary incontinence
- Altered level of consciousness
- Spinal cord and brain injuries
- Neuromuscular disorders

Mechanisms in Pressure Ulcer Development

- External pressure compressing blood vessels
- Friction or shearing forces tearing or injuring blood vessels

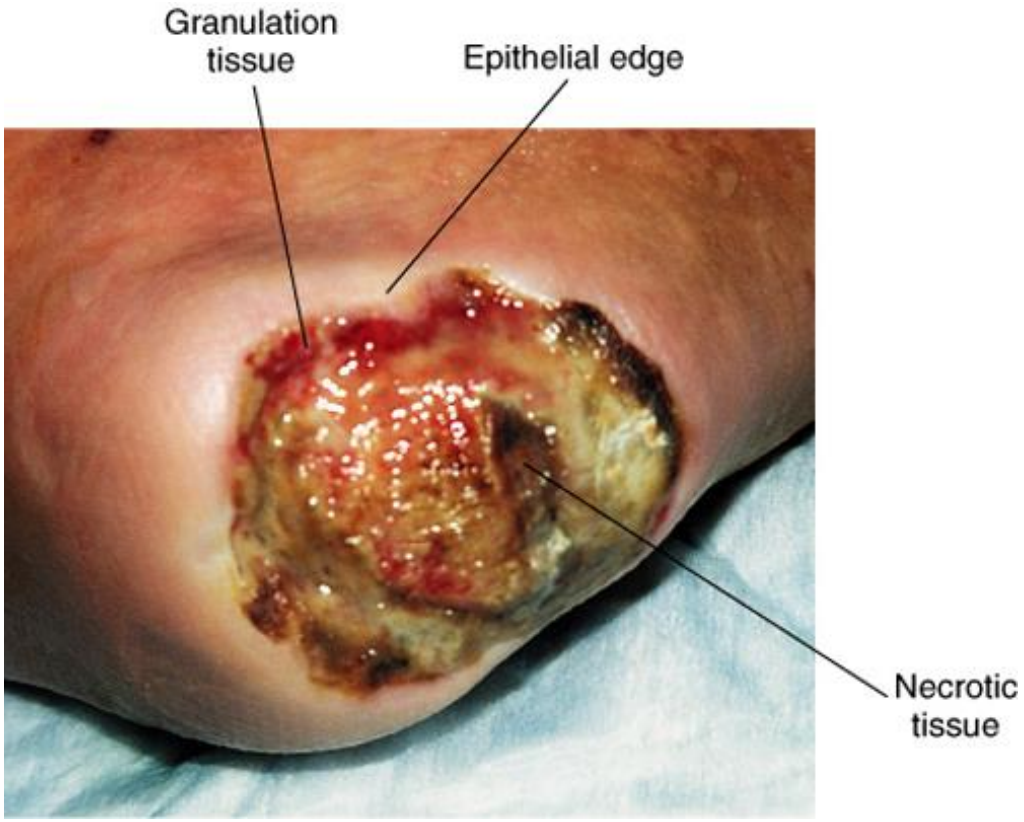
Stages of Pressure Ulcers

- Stage I—nonblanchable erythema of intact skin
- Stage II—partial-thickness skin loss
- Stage III—full-thickness skin loss; not involving underlying fascia
- Stage IV—full-thickness skin loss with extensive destruction
- Unstageable—base of ulcer covered by slough and or eschar in wound bed

Measurement of a Pressure Ulcer

- Size of wound
- Depth of wound
- Presence of undermining, tunneling, or sinus tract

A Wound With Various Types of Wound Surface Tissue



Question

Tell whether the following statement is true or false.

A Stage III pressure ulcer requires debridement through wet-to-dry dressings, surgical intervention, or proteolytic enzymes.

A. True

B. False

Answer

Answer: A. True

A Stage III pressure ulcer requires debridement through wet-to-dry dressings, surgical intervention, or proteolytic enzymes.

Cleaning a Pressure Ulcer

- Clean with each dressing change.
- Use careful, gentle motions to minimize trauma.
- Use 0.9% normal saline solution to irrigate and clean the ulcer.
- Report any drainage or necrotic tissue.

Wound Assessment

- Inspection for sight and smell
- Palpation for appearance, drainage, and pain
- Sutures, drains or tube, and manifestation of complications

Presence of Infection

- Wound is swollen.
- Wound is deep red in color.
- Wound feels hot on palpation.
- Drainage is increased and possibly purulent.
- Foul odor may be noted.
- Wound edges may be separated with dehiscence present.

Assessment of Wound Drainage

- Serous
- Sanguineous
- Serpsamgiomepis
- Purulent

Types of Wound Drainage

- **Exudates is material, such as fluid and cells, that has escaped from blood vessels during the inflammatory process and deposited يترسب in or on tissue surfaces. The Nature and amount of exudate vary according to: Tissue involved, Intensity and duration of the inflammation, and the presence of microorganisms.**

1. Serous Exudate

- **Mostly serum**
- **Watery, clear of cells**
- **E.g., fluid in a blister بثرة**

- **A purulent Exudate**
- **Is thicker than serous exudate because of the presence of pus.**
- **It consists of leukocytes, liquefied dead tissue debris, dead and living bacteria.**
- **The Process of pus formation is referred to as suppuration القيح, and the bacteria that produce pus are called pyogenic bacteria.**
- **Purulent exudate vary in color, some acquiring إكتِساب البعضِ tinges of blue, green, or yellow. The color may depend on the causative organism.**

- **A sanguineous (hemorrhagic) Exudate**
- **It consists of large amount or blood cells, indicating damage to capillaries that is very severe enough to allow the escape of RBCs from plasma**
- **This type of exudate is frequently seen in open wounds.**
- **Nurses often need to distinguishلتَمييزwhether the exudate is dark or bright. Bright indicate fresh blood, whereas dark exudate denotes اسودolder bleeding.**

Purposes of Wound Dressings

- Provide physical, psychological, and aesthetic comfort.
- Remove necrotic tissue.
- Prevent, eliminate, or control infection.
- Absorb drainage.
- Maintain a moist wound environment.
- Protect wound from further injury.
- Protect skin surrounding wound.

Types of Wound Dressings (عملي)

- Telfa
- Gauze dressings
- Transparent dressings

Types of Bandages (عملي)

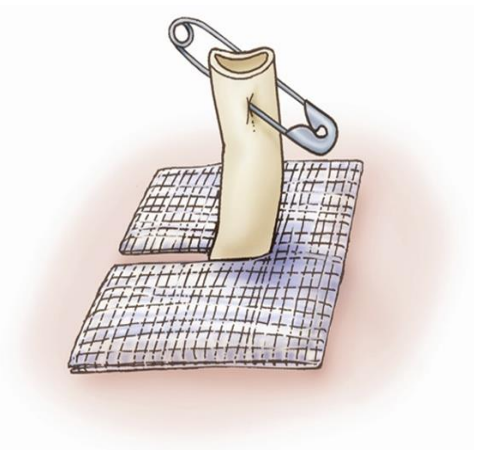
- Roller bandages
- Circular turn
- Spiral turn
- Figure-of-eight turn
- Recurrent-stump bandage

Types of Binders (عملي)

- Straight—used for chest and abdomen
- T-binder—used for rectum, perineum, and groin area
- Sling—used to support an arm

Type of Drainage Systems

- Open systems
  - Penrose drain



- Closed systems
  - Jackson-Pratt drain
  - Hemovac drain

Color Classification of Open Wounds

- **R = red—protect**
- **Y = yellow—cleanse**
- **B = black—debride**
- Mixed wound—contains components of **RY&B** wounds

The RYB color code*

*This concept is based on the color of the open wound rather than the depth or size of the wound.

R=Red Y=Yellow B= Black

- ✓On this scheme, the goal of wound care is to *protect* (cover) red, *cleanse* yellow, and *debride* black.
- ✓The RYB code can be applied to any wound allowed to heal by *secondary intention.*

Red wounds

* Usually in the late regeneration phase of tissue repair (ie, developing granulation tissue) and are clean and uniformly pink in appearance
* They need to be protected to avoid disturbance to regenerating tissue.

* Examples are superficial wounds, skin donor sites, and partial- thickness or second – degree

Yellow wounds

* Characterized primarily by liquid to semiliquid "slough مستنقع" that is often accompanied by purulent drainage.
* The nurse cleanses yellow wounds to absorb drainage and remove nonviable tissue. Methods used may include .
  * Applying wet-to-wet dressing; irrigating the wound; using absorbent dressing material such as impregnated nonadherent, hydrogel dressing, or other exudate absorbers; and consulting with the physician about the need for a topical antimicrobial to minimize bacterial growth.

Black Wound

* Covered with thick necrotic tissue or Eschar.
* e.g.. third degree burns and gangrenous ulcer.
* Required debridement .
* When the eschar is removed, the wound is treated as yellow, then red.