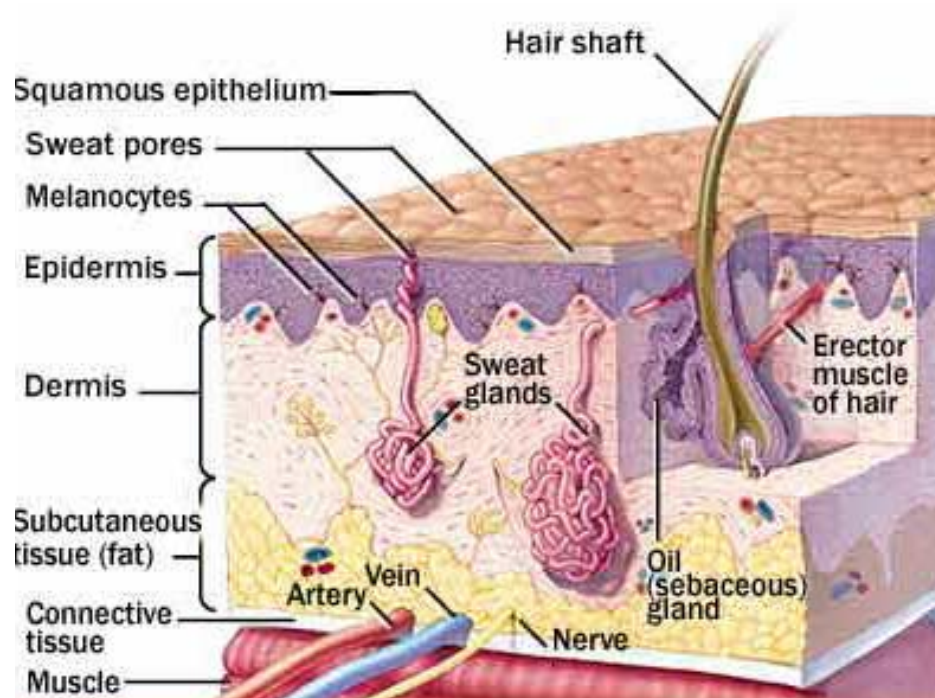


# Wound Exudates Analysis



By

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# What is a wound?

The wound is a breach in the skin and the exposure of subcutaneous tissue following loss of skin integrity.

1. It can be mild, severe, or even lethal.
  2. It can be a simple wound or Compound wound
  3. It can be Acute or Chronic.
- **Acute wound** is generally caused by external damage to the skin, including abrasions, minor cuts, lacerations, puncture wounds, bites, burns, and surgical incisions.
  - **Chronic wound** is an ulcer, usually on the lower leg, and usually associated with underlying diabetes or bedsore.

Wound infection can be either **community-acquired** or **nosocomial** in origin.

## BACKGROUND

- \* TYPE of EXUDATE SECRETED by an OPEN WOUND in RESPONSE to TISSUE DAMAGE
  - ~ MOST COMMON EXUDATE
- \* USUALLY INDICATIVE of **DAMAGE to CAPILLARIES**
  - ~ CAN BECOME DAMAGED DURING WOUND CARE



## TYPES of EXUDATE

### SEROUS

CLEAR, THIN, & WATERY FLUID

### SEROSANGUINEOUS

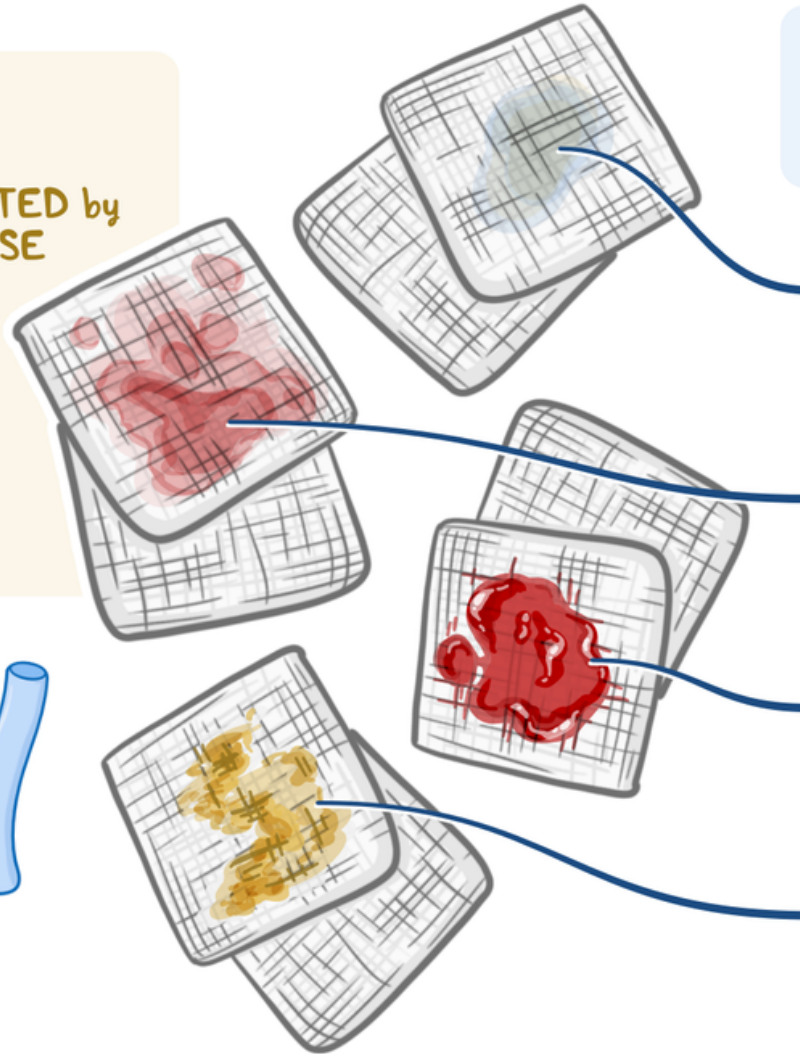
THIN & WATERY with LIGHT RED or PINK HUE

### SANGUINEOUS

BRIGHT RED, FRESH BLOOD (may be HEMORRHAGIC)

### PURULENT

THICK, OPAQUE, & ODOROUS BUILD-UP from INFECTION



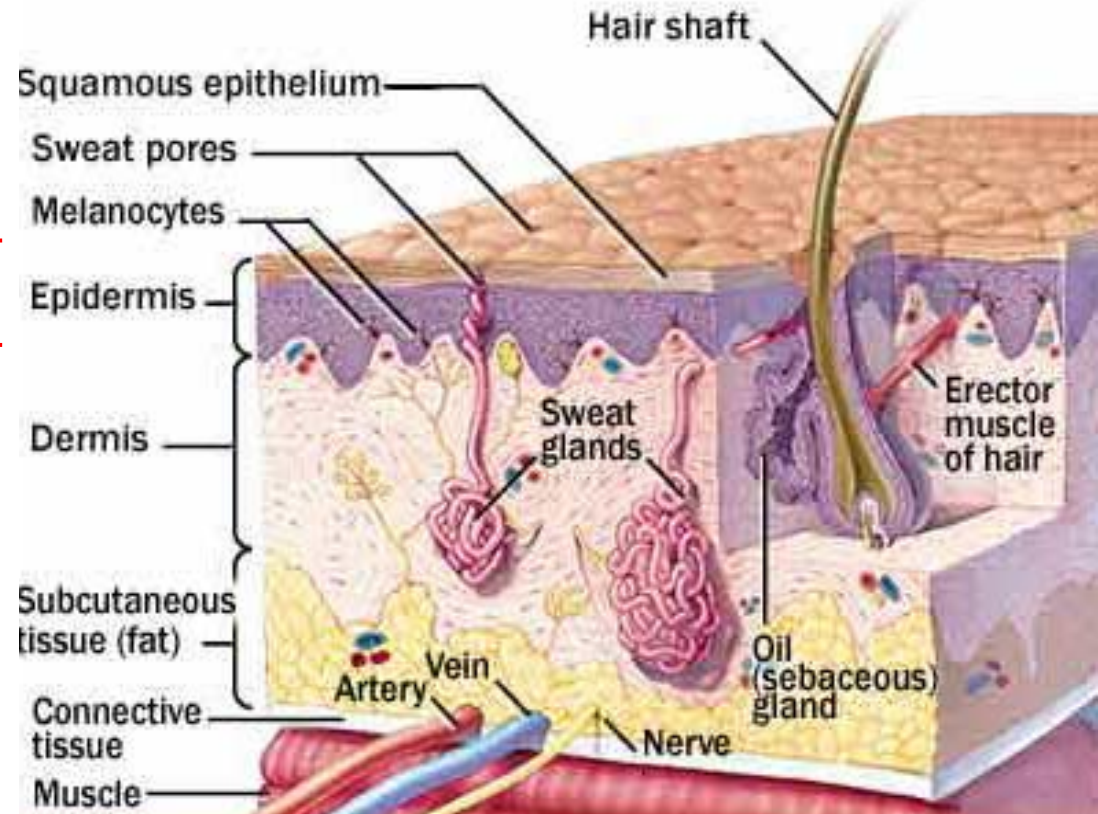
Exudate should also be documented by common terminology that includes:

1. **Serous** – Clear, watery drainage.
2. **Serosanguineous** – Pink/reddish, watery drainage
3. **Sanguineous** (or bloody) – Red, bloody-looking watery drainage. Hemorrhagic.
4. **Purulent** (or pus) – Yellow, green, creamy or cloudy; may be watery or viscous, odorous build up from infection.

# Classification of the wounds

## I. Depending on the depth of injury

- Superficial
- Partial thickness
- Full thickness
- Deep wound



+ bone, opened cavities, organs...etc.

# Classification of the accidental wounds

## II. Based on the origine

### 1. Mechanical:

- Abraded wound
- Punctured wound
- Incised wound
- Cut wound
- Crush wound
- Torn wound
- Bite wound
- Shot wound

### 2. Chemical:

- Acid
- Base

### 3. Wounds caused by radiation

### 4. Wounds caused by thermal forces:

- Burning
- Freezing

### 5. Special: Exotic, poisonous animals

# Classification of the wounds

## III. According to the bacterial contamination

Most wound infection is diagnosed clinically, with laboratory testing used to provide further information to guide management.

1. Clean wound
2. Clean-contaminated wound
3. Contaminated wound
4. Heavily contaminated wound

**All open skin wounds are colonized by bacteria:** These bacteria come from three main sources:

1. **The environment** (e.g. dust, foreign bodies, bacteria on hands, clothing and equipment).
2. **The surrounding skin** (normal skin contains colonizing bacteria, referred to as commensals).
3. **The mucous membranes** (gastrointestinal, oral and genitourinary).

# The presence of bacteria in a wound may result in:

Wound infection can be classified on a spectrum of five progressively more severe stages:

1. **Contamination** occurs when non-replicating bacteria enter the wound.
2. **Colonization** occurs when the bacteria begin replicating and adhere to the wound site but do not cause tissue damage.
3. **Local infection** occurs when the number of bacteria is greatly increased and begins to overwhelm the host immune system.
4. **Spreading invasive infection** occurs when the bacteria overwhelm the patient's immune system and begin to invade and damage the surrounding tissue.
5. **Septicemia** occurs when the infection spreads throughout the body via the bloodstream and causes systemic symptoms such as fever, chills, and tachycardia.

## Commensals bacteria may appear during bad collection

Alpha haemolytic streptococci

Coagulase negative Staph.

Corynebacterium spp.

Propionibacterium spp.

Bacillus spp.

## Pathogenic bacteria

*Pseudomonas aeruginosa*

*Streptococcus pyogenes*

Proteus spp.

*Staphylococcus aureus*

*E.coli*

Enterococcus spp.

Klebsiella spp.

*Clostridium perfringens*

Morganella

Fusobacterium spp.

Providencia

Peptostreptococcus spp.

*Mycobacterium tuberculosis*

*Actinomyces israelii*

Bacteroides spp.

Nocardia spp.

Fungi (*Candida albicans*)



# Wounds caused by thermal forces

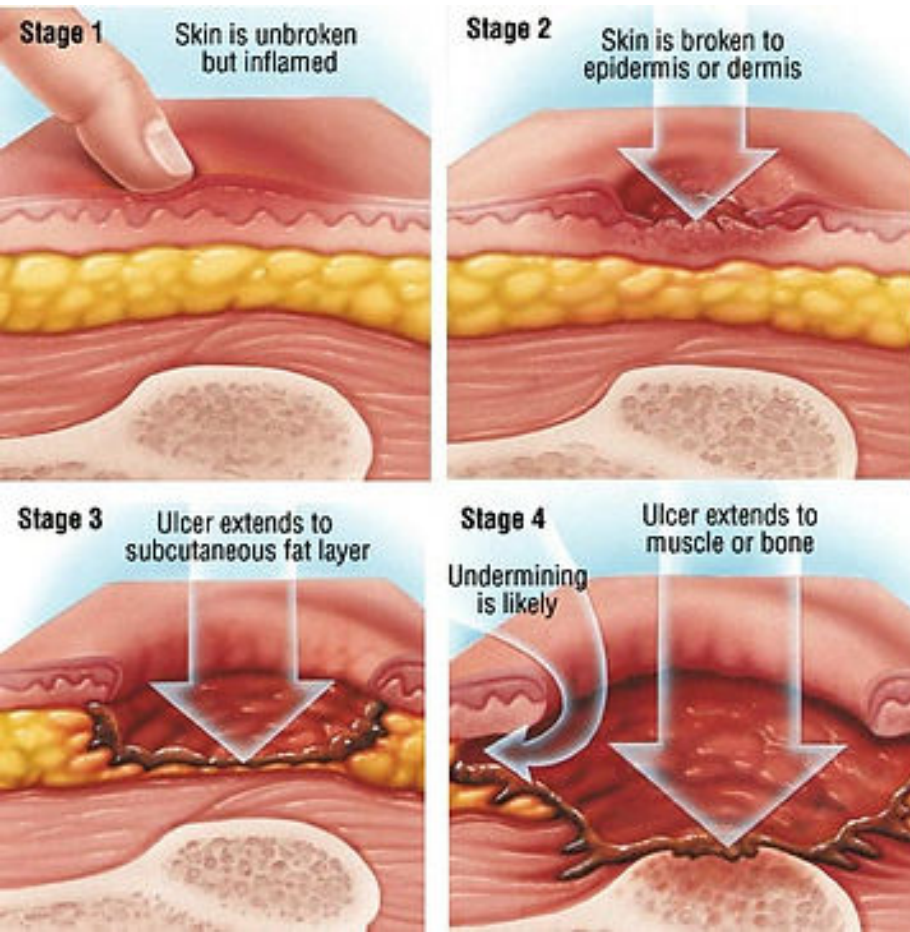
## Burning

- **1<sup>st</sup> degree** – superficial injury (epidermis).
- **2<sup>nd</sup> degree** – partial or deep partial thickness (epidermis+superficial or deep dermis).
- **3<sup>rd</sup> degree** – full thickness (epidermis + entire dermis).
- **4<sup>th</sup> degree** – (skin + subcutaneous tissue + muscle and bone)

**Bedsore:** Pressure ulcers (also known as pressure sores or bedsores) are injuries to the skin and underlying tissue, primarily caused by prolonged pressure on the skin.

**Bedsore most often develop** on skin that covers bony areas of the body, such as the heels, ankles, hips, and tailbone.

**Bedsore can develop over hours or days:** Most sores heal with treatment, but some never heal completely.



### Stages of bedsores:

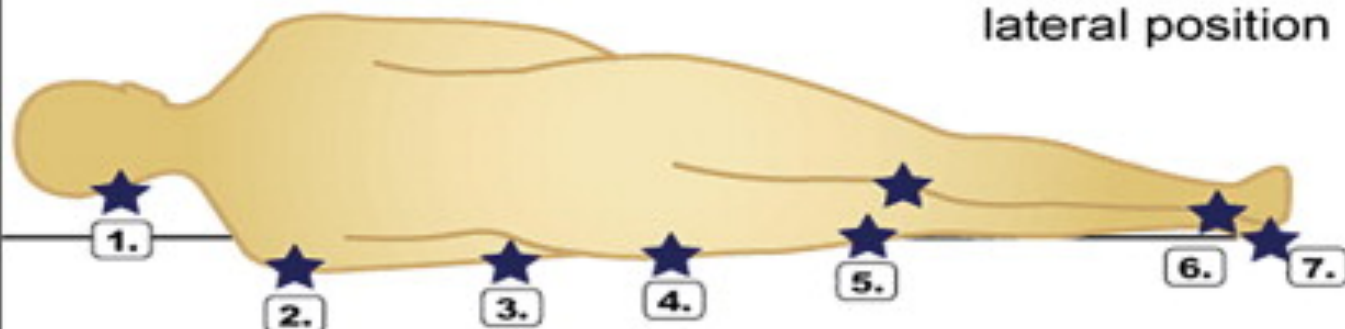
1. **Stage-1:** Skin unbroken but inflamed.
2. **Stage-2:** Skin is broken to the epidermis or dermis.
3. **Stage-3:** Ulcer extends to the subcutaneous fat layer.
4. **Stage-4:** Ulcer extends to muscle or bone.

### supine position



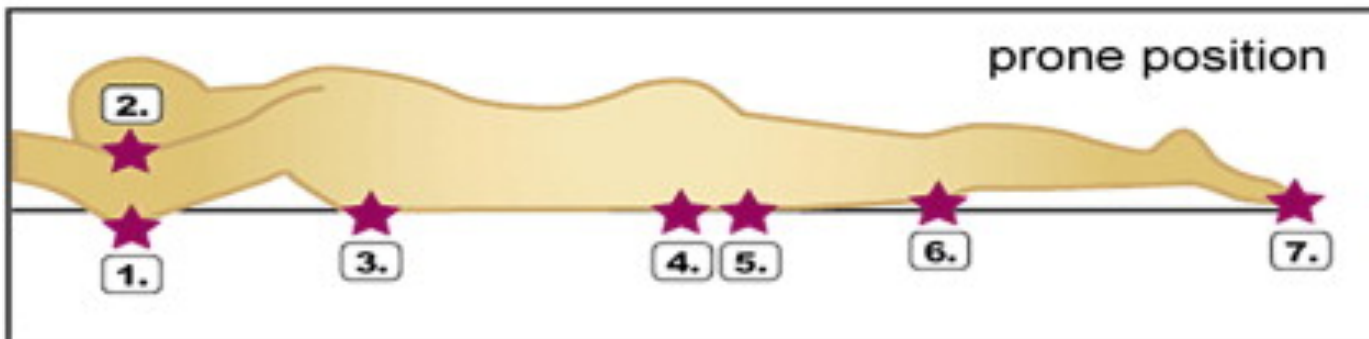
1. occiput
2. scapula
3. sacrum
4. heels

### lateral position



1. ear
2. acromion process
3. elbow
4. trochanter
5. medial & lateral condyle
6. medial & lateral malleolus
7. heels

### prone position



1. elbow
2. ear, cheek, nose
3. breasts (female)
4. genitalia (male)
5. iliac crest
6. patella
7. toes