

WOUND ASSESSMENTS

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OBJECTIVES

By the end of this course participants will be able to:

1. Identify the parameters of a wound assessment
2. Name anatomical locations correctly
3. Deduce wound etiology
4. Stage Pressure Injuries
5. Properly measure wounds
6. Identify types of tissue and drainage types
7. Quantify tissue and drainage amounts
8. Identify pain, odor, and infection in a wound
9. Collect a proper wound culture accurately

WOUND ASSESSMENTS

Wounds and skin abnormalities are part of the integumentary system. Skin assessments (i.e. temperature, turgor, moisture, mucous membrane, etc.) are usually assessed on a per shift basis in acute care settings, while the parameters of a wound assessment may be assessed less frequently.

Two reason why:

1. It takes time to notice the wound is healing or perhaps recognize it is not changing at all.
2. Wound care products have come a long way! Many dressings are fine to keep in place for several days as long as no sign of saturation.

Just familiarize yourself with your facility's policy on assessment frequencies. Always escalate the issue if the wound is deteriorating!

WOUND ASSESSMENT PARAMETERS

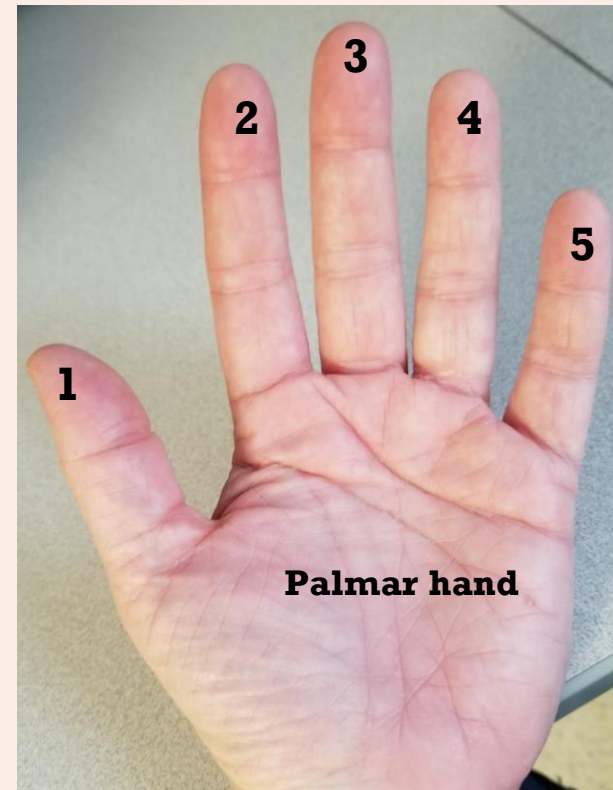
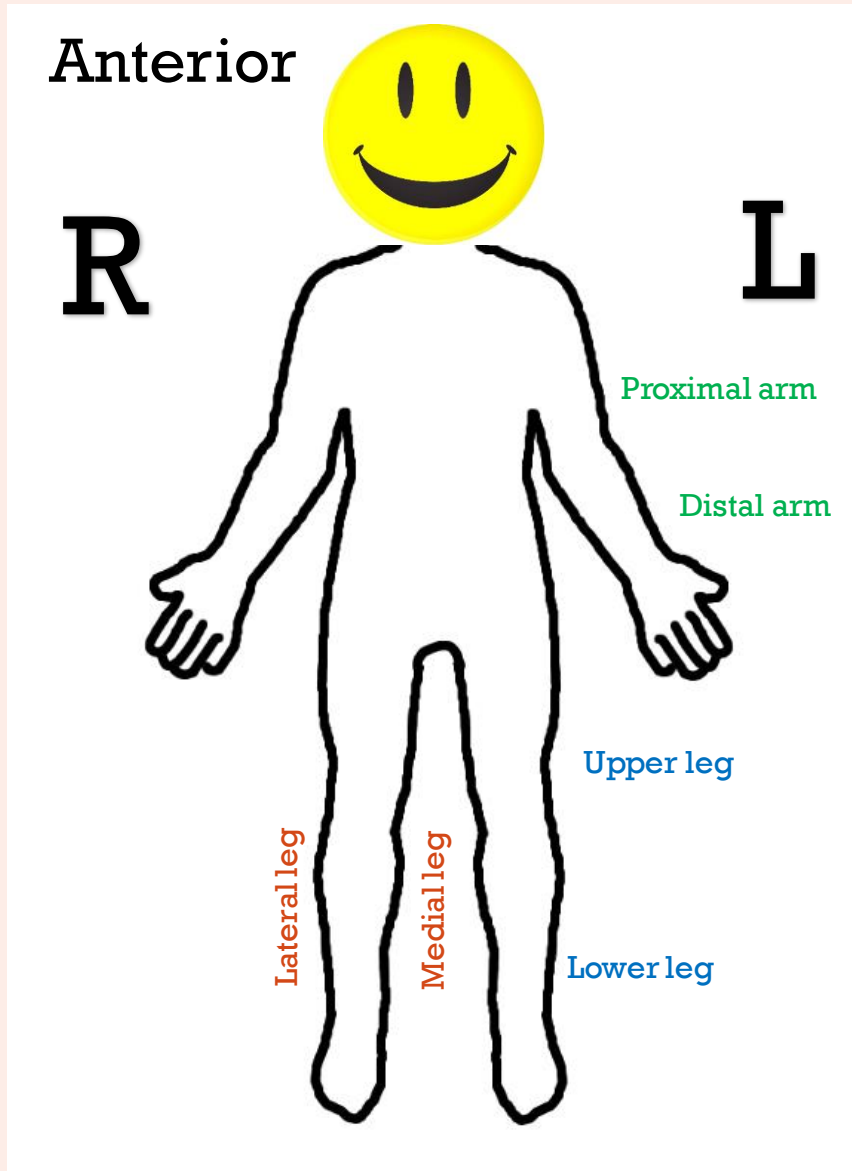
The basic parameters of a wound assessment:

1. Anatomical location
2. Wound Type
3. Stage/Category (if applicable)
4. Measurements
5. Tissue type & amount
6. Exudate type & amount
7. Odor (after cleansing)
8. Periwound description
9. Pain

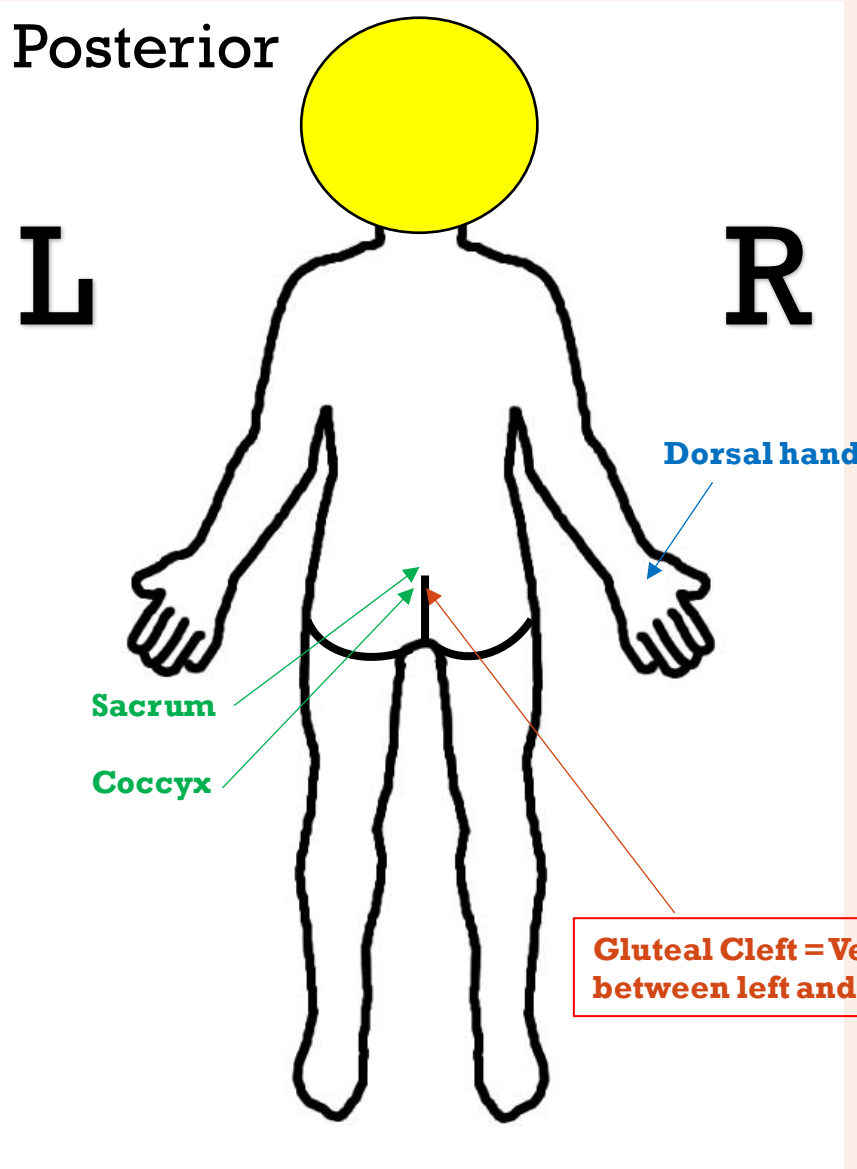
Next is to go further into detail for each parameter.

1. ANATOMICAL LOCATION

Know anatomical terms (and use them)



1. ANATOMICAL LOCATION



2. WOUND ETIOLOGY (TYPE)

Commonly seen wound types include:

- Pressure Injuries
- Trauma (i.e. Skin tears, lacerations, abrasions)
- Surgical Incision/Open Surgical Wounds
- MASD = Moisture Associated Skin Damage
 - a) Incontinence Associated Dermatitis (IAD)
 - b) Intertrigo (moisture breakdown in skin folds)
 - c) Excoriation
- Lower Leg Ulcers
 - a) Arterial
 - b) Venous
 - c) Neuropathic (includes diabetic)
- Blisters (which can occur for multiple reasons)



TIPS FOR DECIDING WOUND ETIOLOGY

Use the anatomical location to help identify the wound type. For instance:

- Pressure injuries are located on or near a bony prominence (exception: medical device pressure injuries can occur away from bony prominences).
- Arterial ulcers are usually on the tips of the toes and tops of the foot.
- Venous ulcers are typically on the medial malleolus and the gaiter of the lower legs.
- Neuropathic ulcers frequently occur on sides and bottom of the feet.

TIPS FOR DEFINING WOUND ETIOLOGY

Why did the wound develop? What caused it to happen?

- Skin tears are due to a traumatic cause: fall, tape removal.
- Does the patient have poor lower leg circulation?
- Has the patient been subjected to prolonged pressure, friction/shear on a boney prominence?
- Does the patient have a moisture problem?
- Does the patient have neuropathy and/or is diabetic?

WOUND ETIOLOGY

The type (or etiology) of a wound can tell us a lot:

- How the wound developed (the cause):
 - i.e. Pressure injury means the bony prominence was subjected to prolonged pressure and friction/shear.
- What needs to be addressed to stop the wound from deteriorating or more wounds developing:
 - i.e. Lower leg arterial blood flow will need to be assessed and possibly revascularized in patients with arterial wounds.
- What is going on with the patient's body:
 - i.e. The patient has a wound with surrounding callus on the plantar foot. He is found to be positive for neuropathy using a Semmes-Weinstein monofilament test. Special shoes are ideal and regular podiatry visits for foot and nail care.

3. STAGING

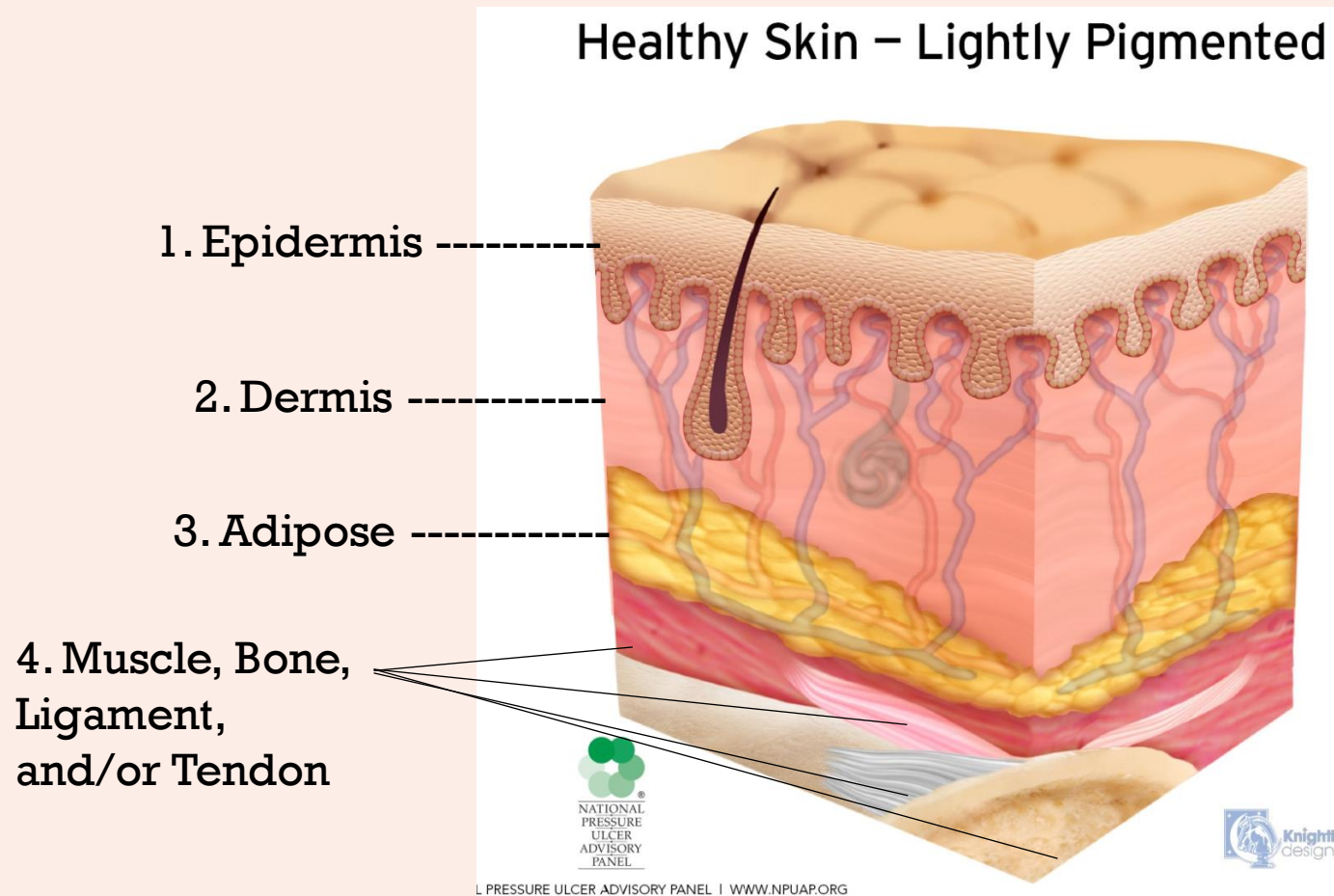
Some wound types have their own staging system:

1. Pressure Injuries → NPUAP Classification System
2. Diabetic Foot Ulcers → Wagner Scale
3. Skin tears → Payne Martin Classification System
4. Partial thickness: Any wound that only involves the epidermis and dermis.
5. Full thickness: Any wound that extends deeper than the dermis.



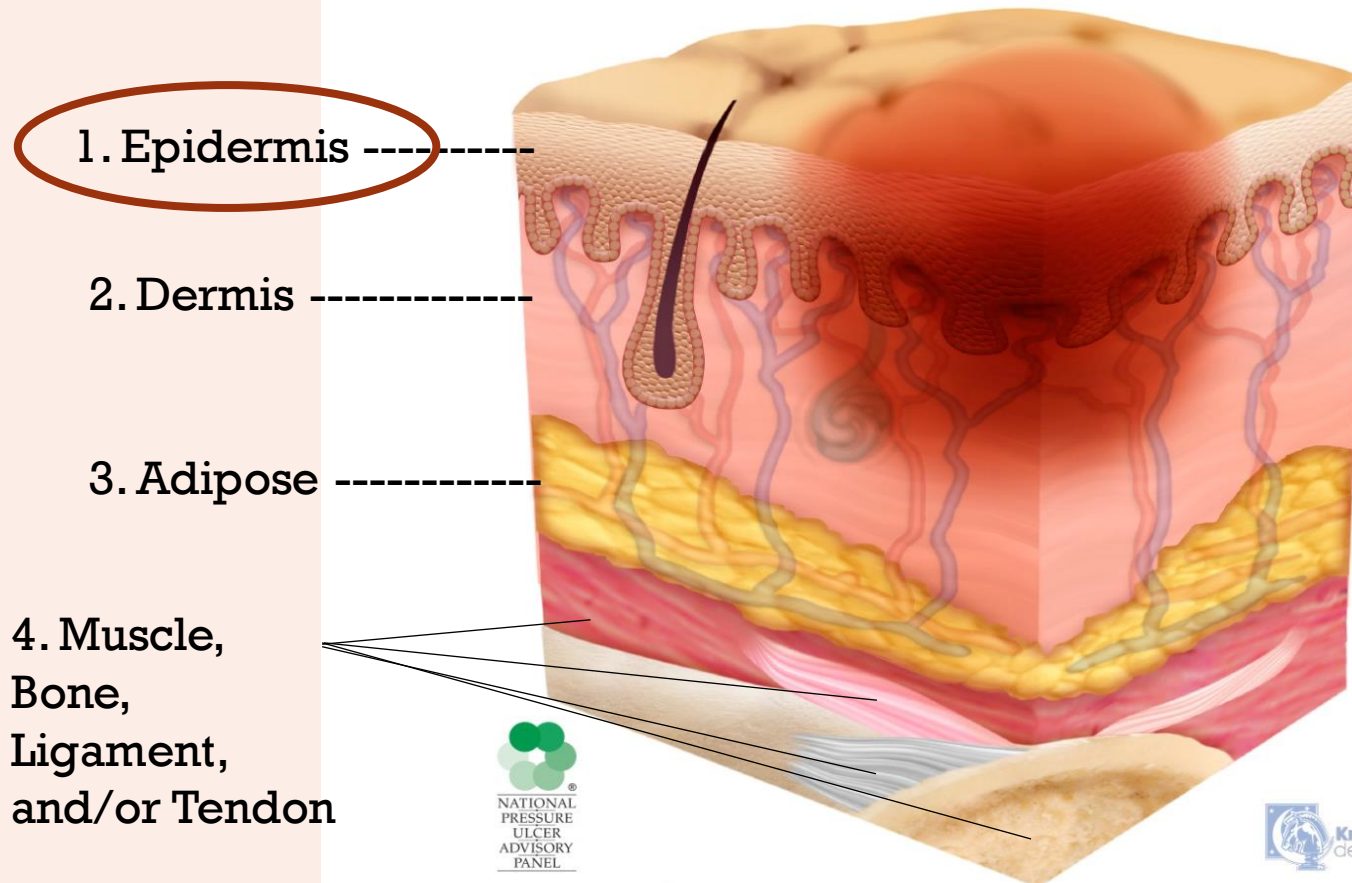
PRESSURE INJURY STAGING

The deepest level of tissue listed below that you can visualize in a wound bed is also the number stage next to it.



Stage 1: Epidermis (top layer of skin) is intact;
Nonblanchable erythema.
You **must** touch to assess.

Stage 1 Pressure Injury - Lightly Pigmented



Touch intact skin. If erythema lightens,
then color returns, it is NOT a stage 1

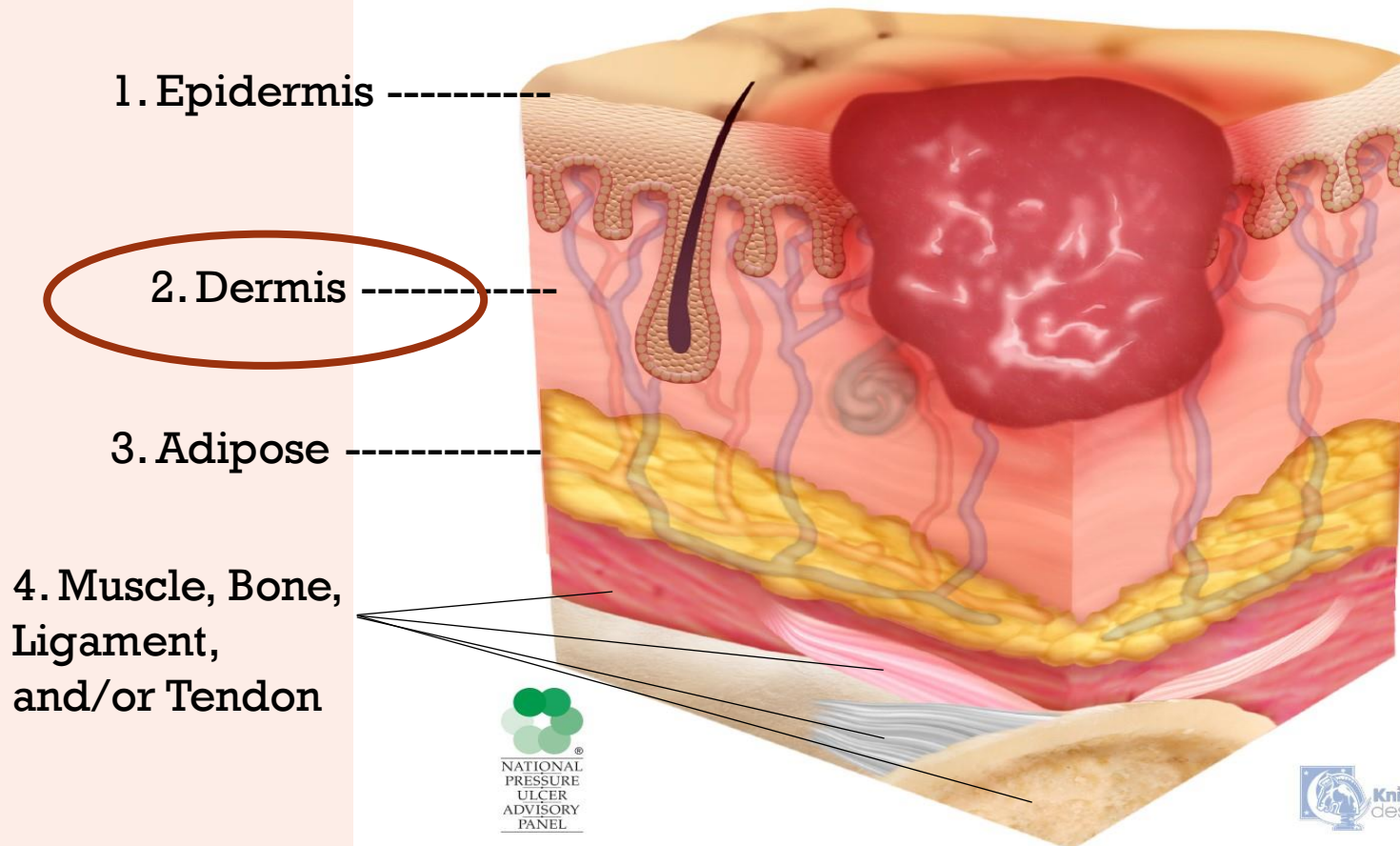


Blanchable Erythema



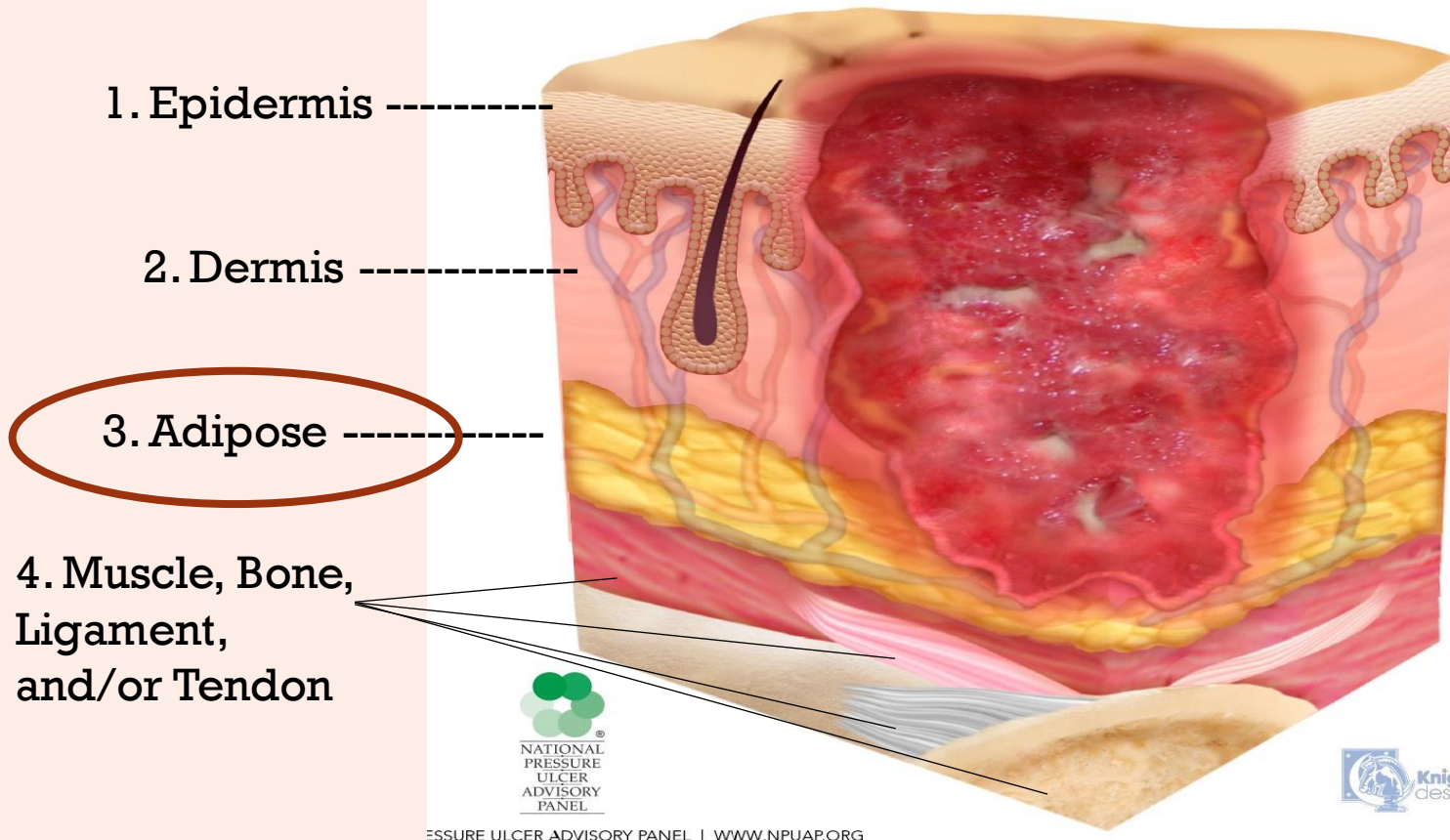
**Stage 2: Epidermis is open/lost; Dermis is visible.
VERY shallow wound. NO depth. NO slough.**

Stage 2 Pressure Injury



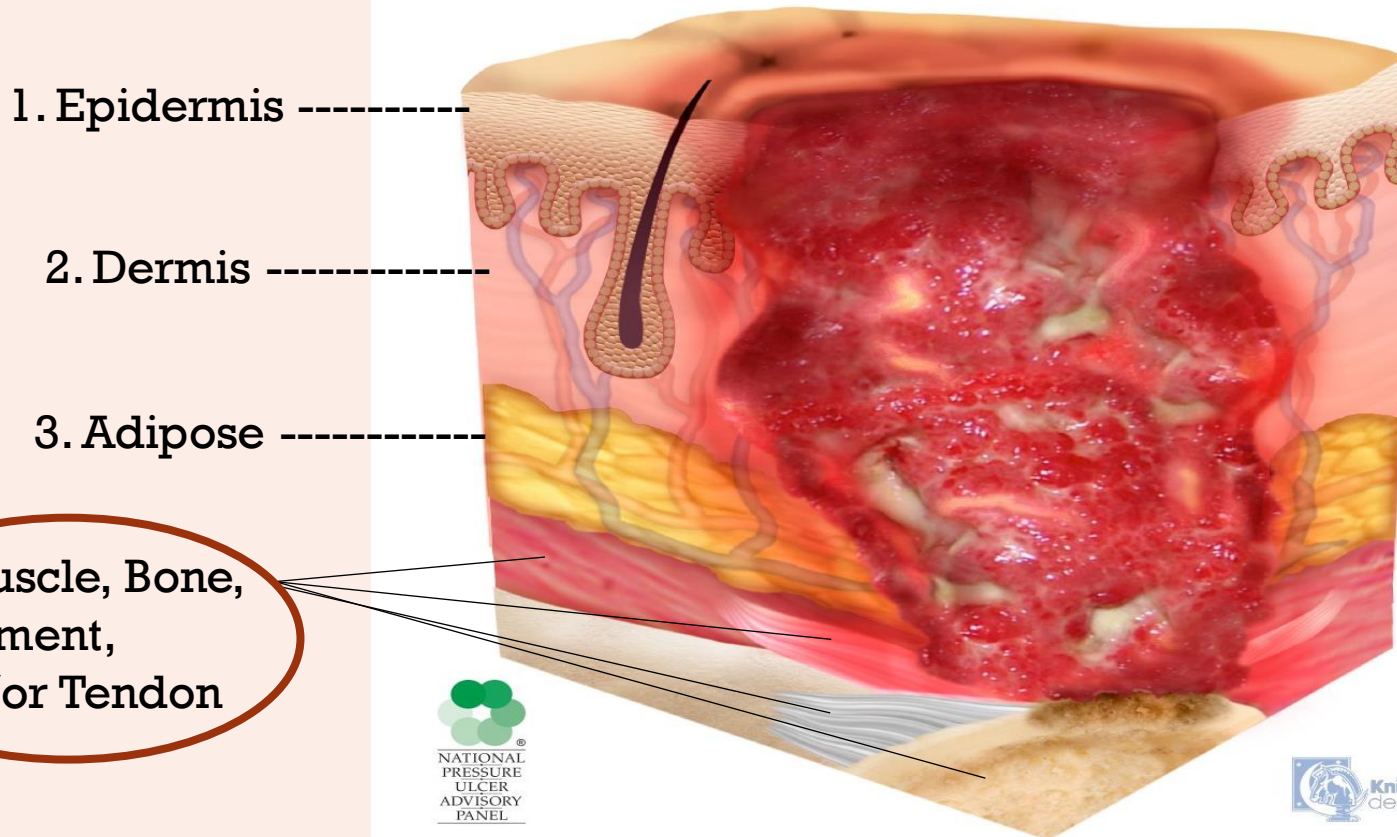
Stage 3: Epidermis is lost; Dermis is lost. Adipose now exposed (may look pink/red & granular). Minimal to moderate depth. Possibly has slough, undermining, tunneling. NO bone, NO muscle, NO tendons yet.

Stage 3 Pressure Injury



**Stage 4: Epidermis is lost; Dermis is lost; Past adipose;
Muscle, Bone, Ligament, and/or Tendon visible.
Moderate to severe depth. Possibly has eschar and/or slough.**

Stage 4 Pressure Injury



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INDETERMINATE STAGES

Sometimes you cannot stage a pressure injury right away as a stage 1,2,3 or 4 for two reasons:

- a. **UNSTAGEABLE**: there is too much non-viable tissue on the wound bed (slough and/ or eschar) that is blocking the view of possible muscle/bone or ligament. This is called “unstageable”. Unstageable pressure injuries are a stage 3 or 4 underneath that slough or eschar, but we can not tell which one just now.

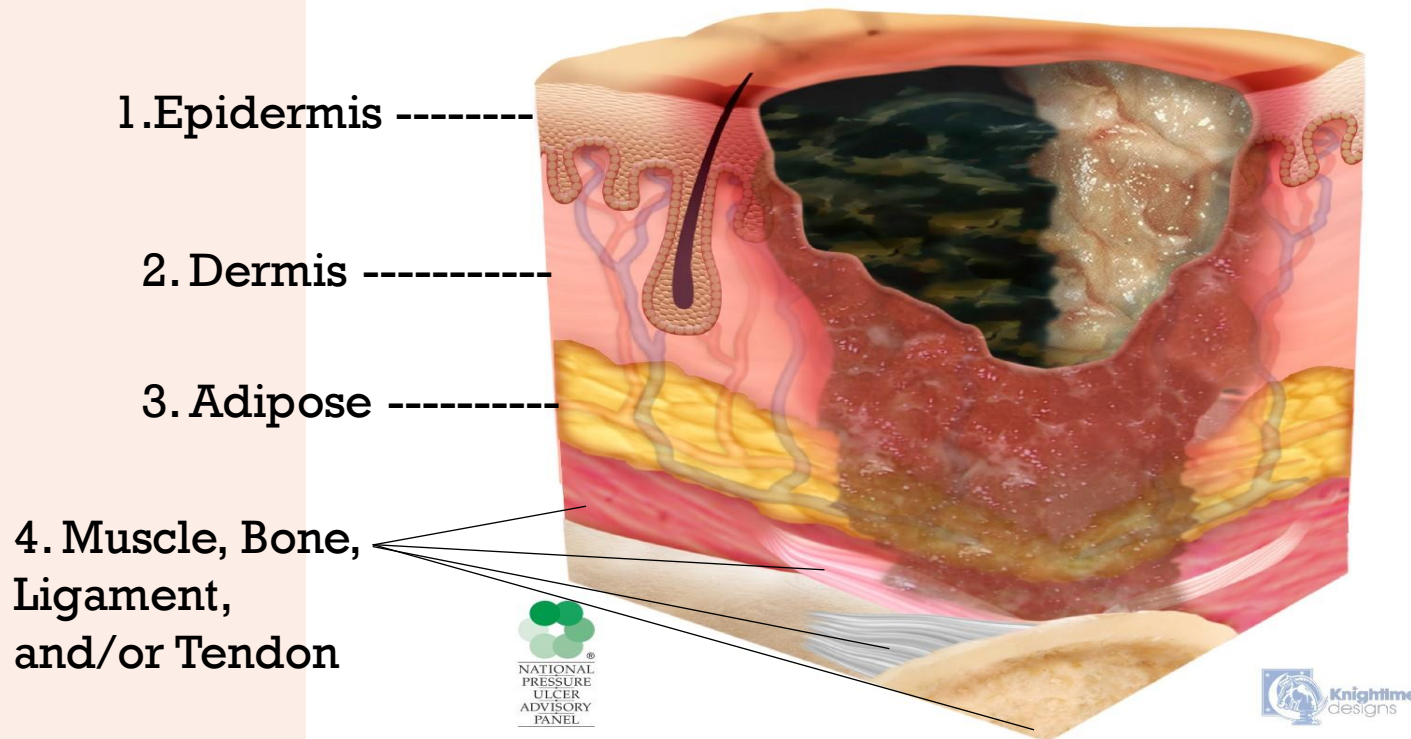
- b. **DEEP TISSUE PRESSURE INJURY**: the pressure injury damage began at a level of tissue much deeper than the skin and made its way outwards towards the outer surface. This is called a “deep tissue pressure injury”. Maroon, purple or even blue discoloration is the first visible indication of a DTPI, although bogginess can be detected even earlier. DTPIs are coined “evolving” if the wound appears to still be worsening (in color, size, depth). Once the DTPI stabilizes from good prevention interventions, it will be staged 1, 2, 3 or 4 based on the deepest tissue that ever became visible.



Unstageable: Too much eschar and/or slough is obscuring the wound bed to determine staging.

Unstageable pressure injuries are either stage 3 or 4 underneath but cannot tell which one right now.

Unstageable Pressure Injury - Slough and Eschar

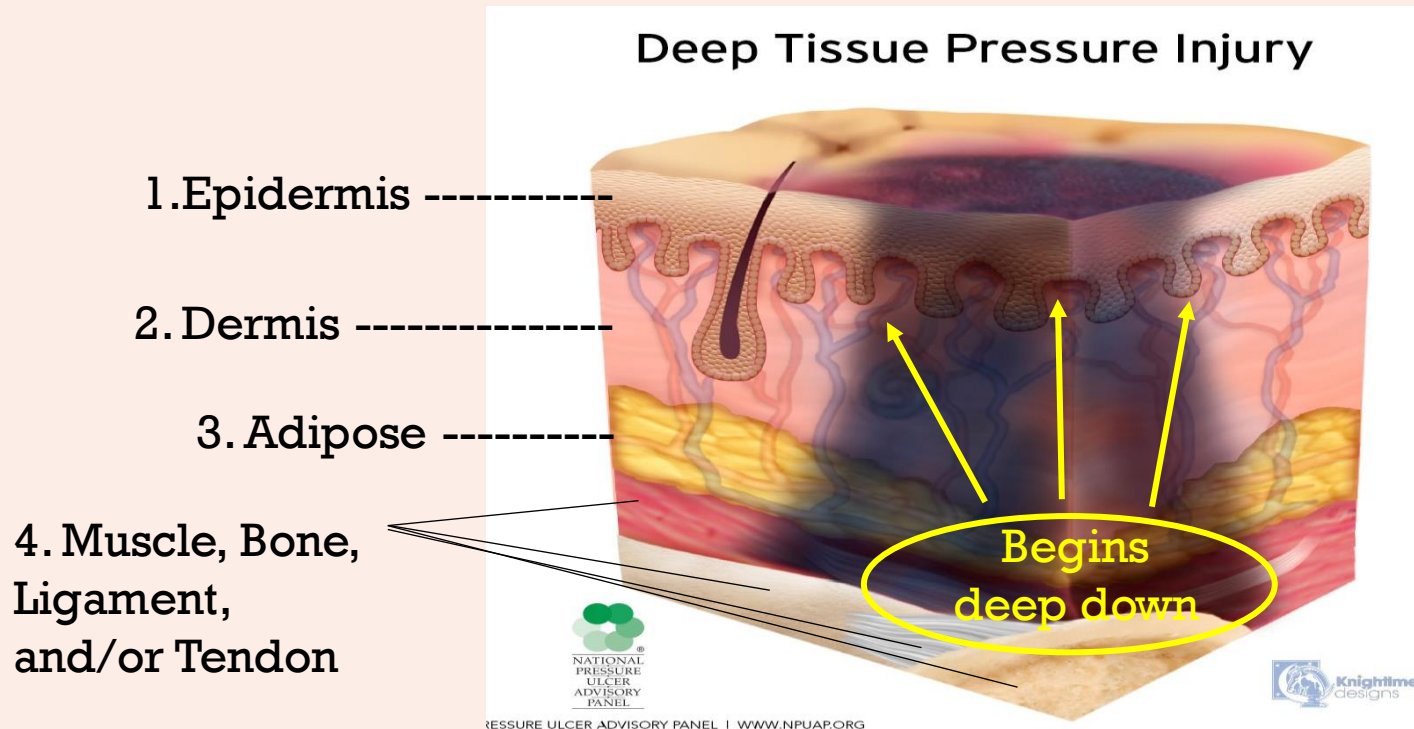


Deep Tissue Injury

Pressure down near the bone is injuring the nearby tissue by constricting blood supply & physically crushing cells. The damage spreads out and up towards the surface. We detect boggy skin upon palpation, then we visualize maroon or purple discoloration of the skin.

It will continue to evolve if no interventions and eventually break open. These wounds can go from bruised looking skin to expose bone very quickly due to the hidden damage that had been occurring for up to 3 full days before anything was visible on the outside.

With interventions, the wound should stop evolving worse and begin to stabilize towards a recognizable stage 1,2,3 or 4 pressure injury. Usually once the purple or maroon discoloration resolves, a stage can be determined.



One page snapshot: Unique Features of Pressure Injury Stages

Stage 1: Skin is intact; Nonblanchable erythema.
You *must* touch to assess.

Stage 2: Epidermis is open/lost; Dermis is visible.
VERY shallow wound. NO depth. NO slough.

Stage 3: Epidermis is lost; Dermis is lost. Adipose now exposed (may look pink/granular).
Minimal to moderate depth.
Possibly has slough, undermining, tunneling. NO bone, NO muscle, NO tendons.

Stage 4: Epidermis is lost; Dermis is lost; Past adipose; Muscle, Bone, Ligament, and/or
Tendon visible.
Moderate to severe depth. Possibly has eschar and/or slough.

Unstageable: Too much eschar/slough is obscuring the wound bed to determine staging.
Unstageables are either a stage 3 or 4 pressure injury underneath.

Deep Tissue Injury: Pressure at the bone level is injuring tissue by constricting blood supply. The injury grows outwards to the epidermis and presents as a “bruise”.

Without intervention, wound will continue to enlarge under the surface, eventually may open at the epidermis, and can have an exposed wound bed down to the bone.



4. MEASUREMENTS

1. Length
2. Width
3. Depth
4. Tunnels
5. Undermining

When measuring a wound, always use an actual tool for measuring. Estimating wound measurements is highly inaccurate. All wounds will have a length and width. If the wound is flat, meaning it has no depth, then mark depth as 0 cm. If the wound does not have tunnels or undermining, then comment “no tunnels or undermining”. This way we know the wound was assessed for these things and found absent.

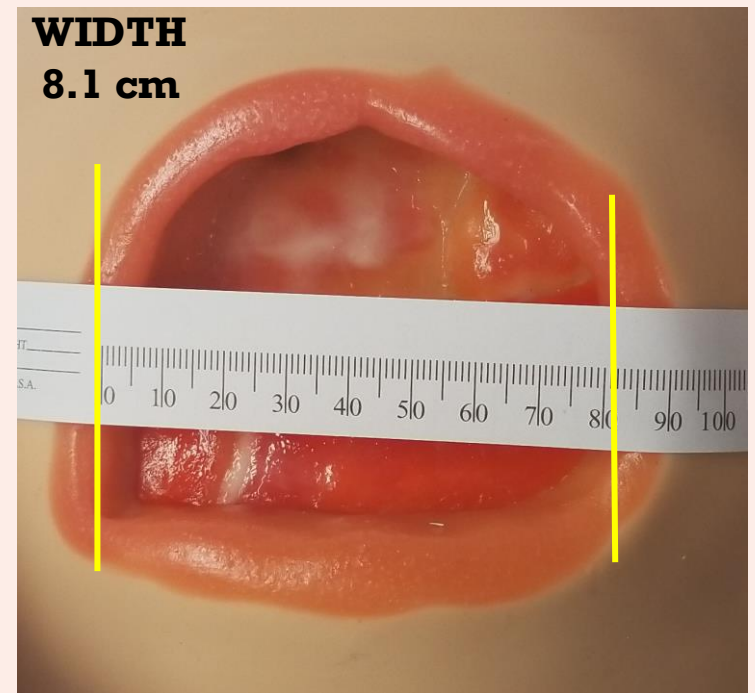
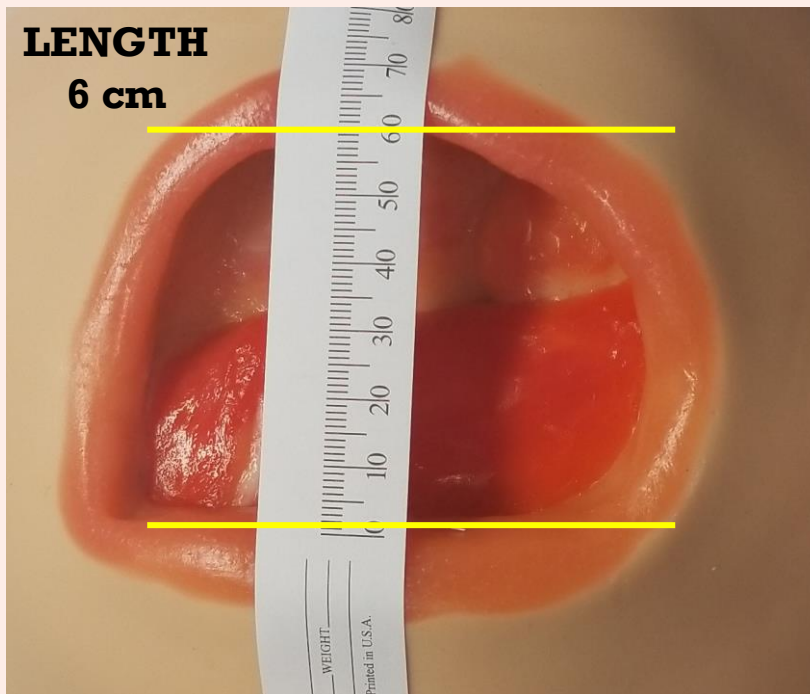


MEASURING WOUNDS (IN CENTIMETERS)

- Length Longest measurement that runs closest to the head to toe direction.
- Width Widest part that is perpendicular (90 degree rotation) to length.
- Depth: Touch swab to the deepest part of the main wound bed & measure.
- Tunneling: Any tract going inwards through tissue from the main wound bed is a tunnel.
- Undermining: When the edge of the wound is an overhang, laying over empty space in the larger wound bed below.

MEASURING WOUNDS (LENGTH & WIDTH)

HEAD



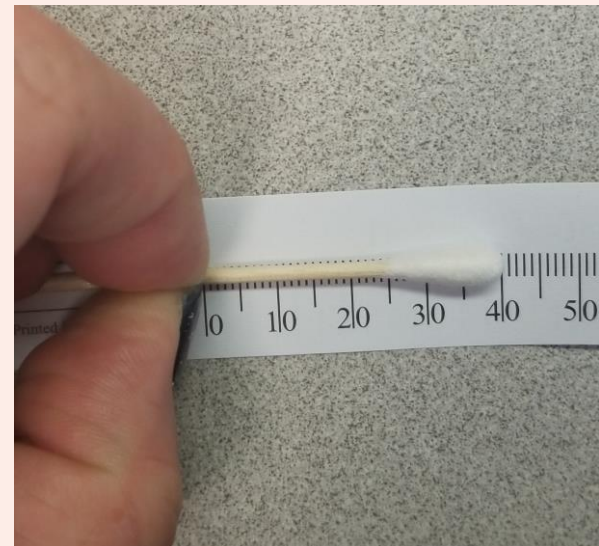
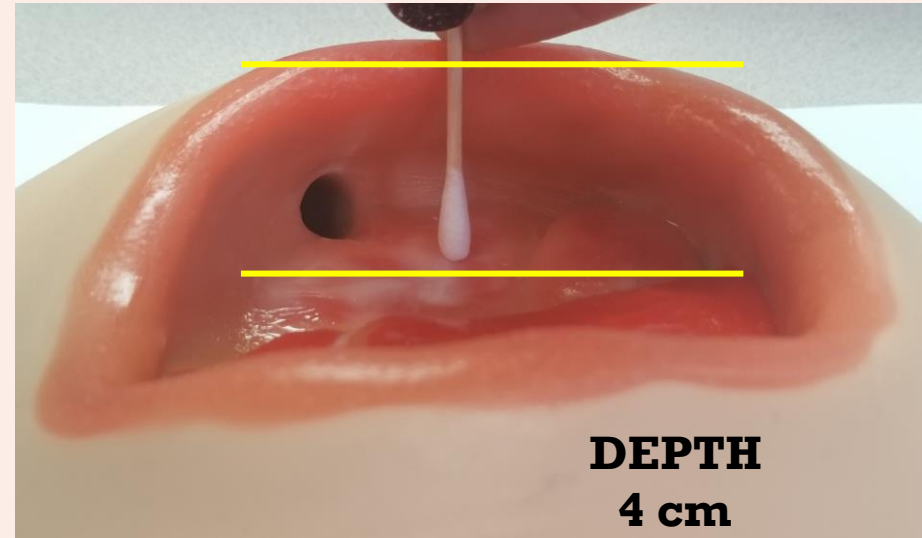
TOE



MEASURING WOUNDS (DEPTH)

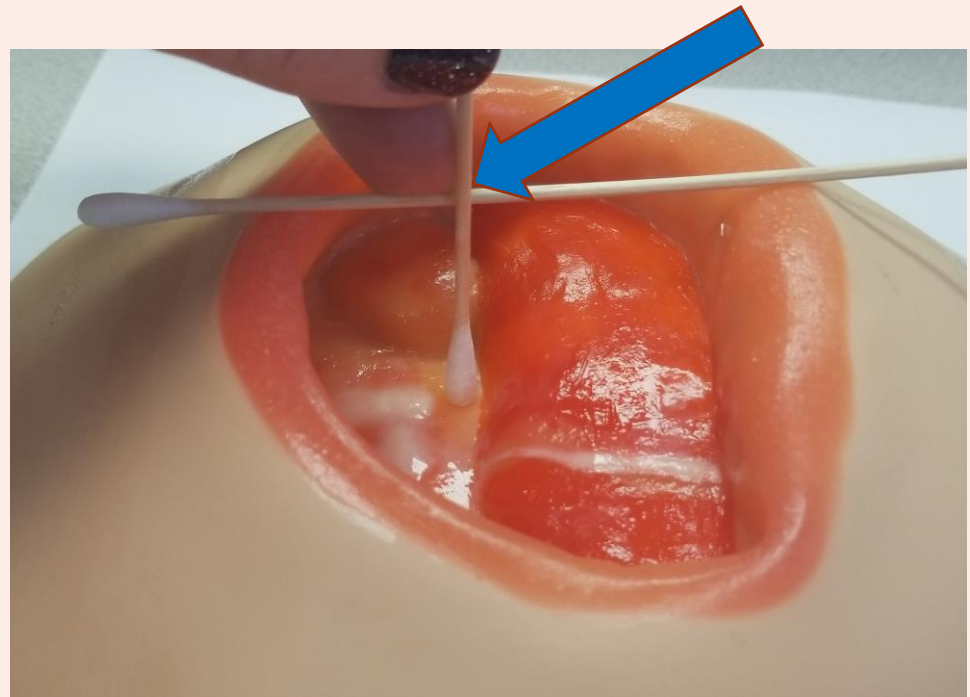
Gently place a swab straight down to the deepest part of the main wound bed. Place a fingertip at the level of the wound edge. Hold the swab along a ruler to measure.

Tip: Do not consider the length of a tunnel as the wound “depth”.



MEASURING WOUNDS (DEPTH)

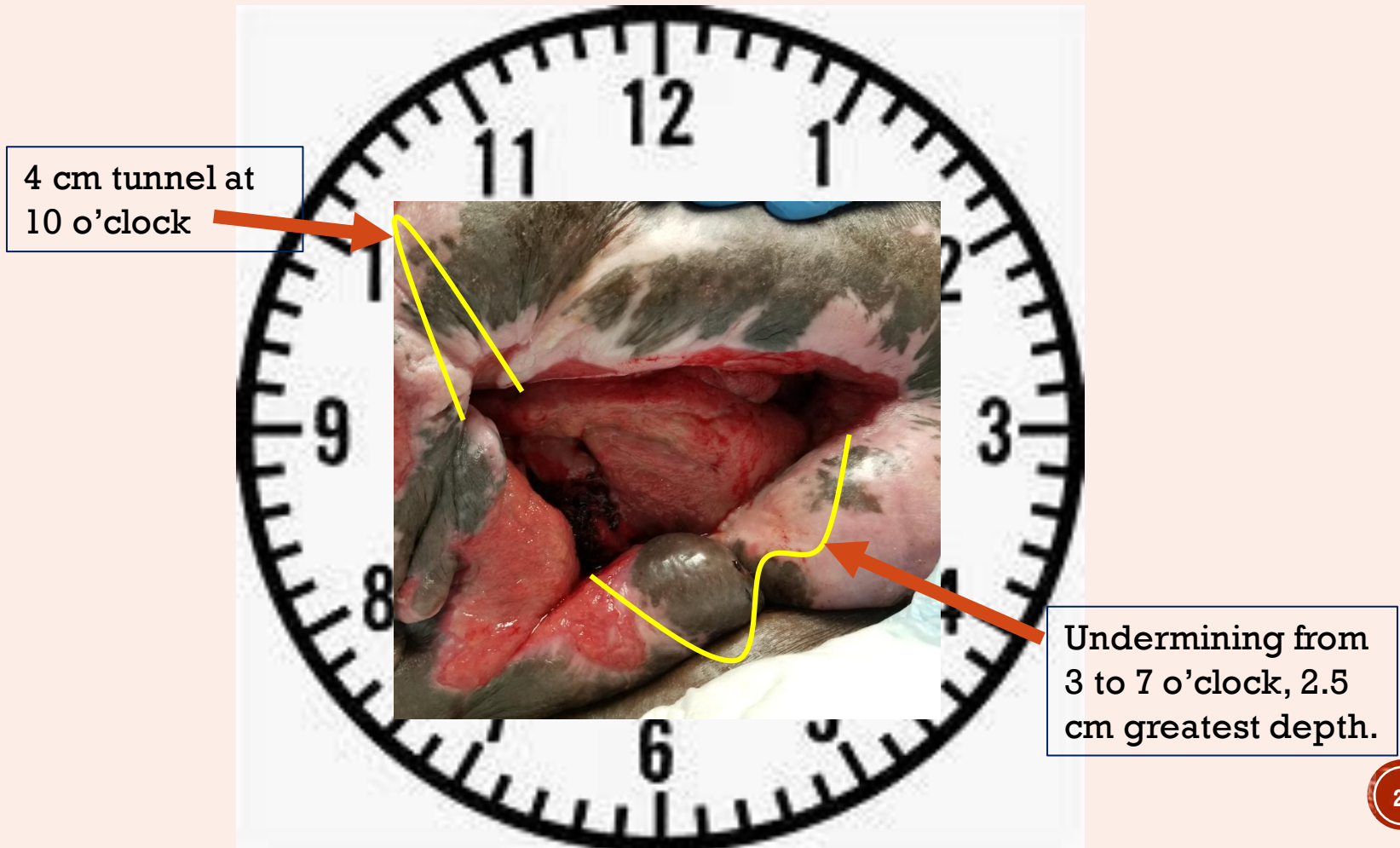
If the deepest point is away from the wound edge, touch the swab to the deepest spot of the main wound bed. Then lay another swab across the top of the wound bed. The intersection of the two swabs (on the bottom of the horizontal swab stick) is the depth.



DEPTH

UNDERMINING AND TUNNELING

Describe location of tunnels or undermining using the hours on a clock.
Insert a moisten swab into the depth of the space to record the tunnel depth or the deepest part of the undermining. Tunnels have one spot (or hour) on the clock while undermining will go clockwise from one time to another.

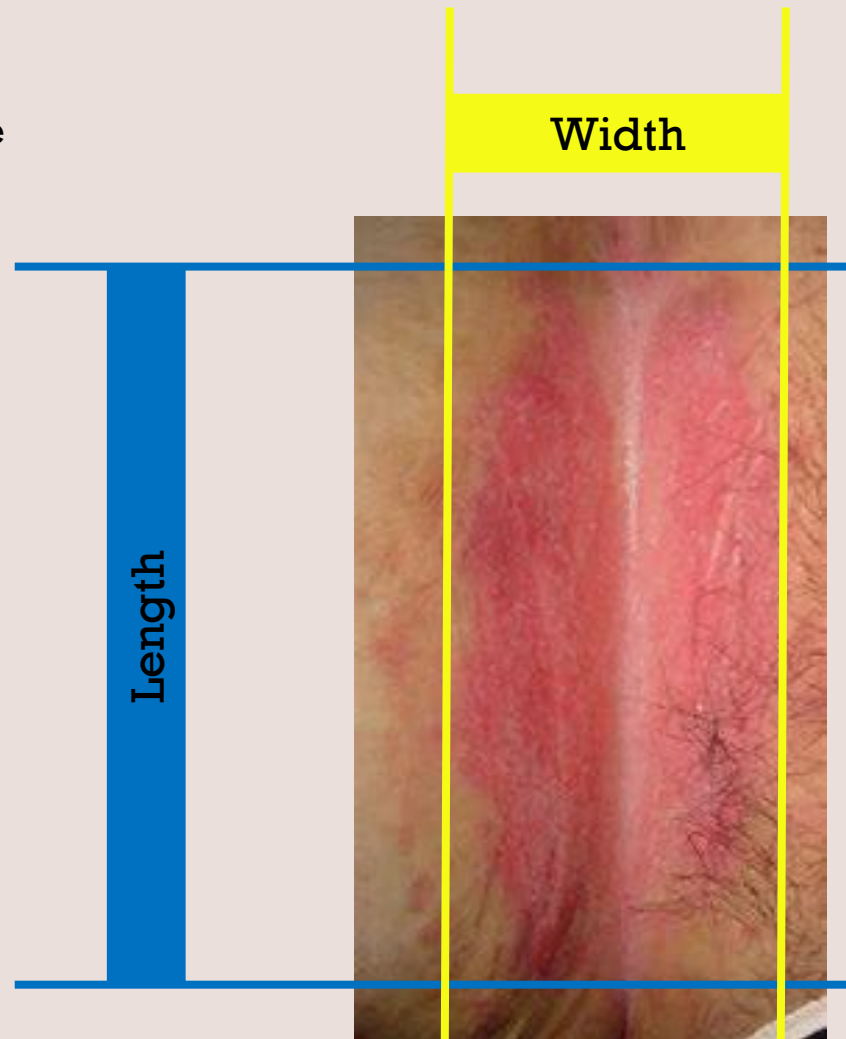


HOW TO MEASURE A CLOSED WOUND

Closed wounds & abnormalities can be measured by using the edges of the discoloration as markers.

Examples:

- Stage 1 pressure injury
- Intact deep tissue pressure injury
- Blanchable erythema
- Intertrigo

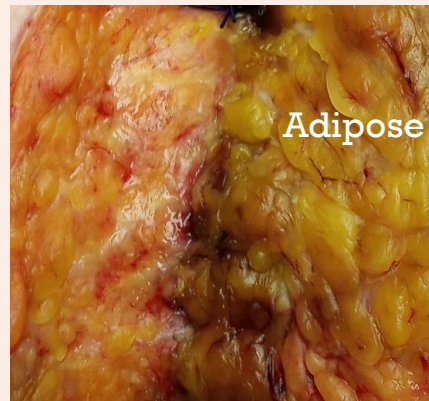
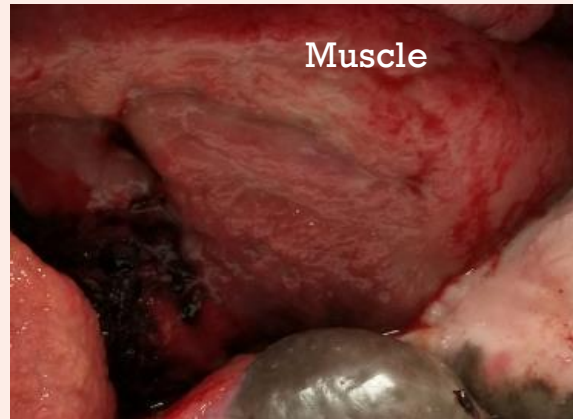


5. WOUND BED TISSUE

Tissue Types

- Granulation
- Hypergranulation*
- Epithelial*
- Eschar
- Bone*
- Tendon/Ligament
- Slough
- Scar tissue
- Adipose
- Muscle
- Fascia*

*List does not include all possible tissues and not all the above are pictured here.



5. WOUND BED TISSUE

To describe the amount of each tissue in a wound bed, consider the wound or affected area as the entire whole: 100%. Estimate what percent of the whole is made up of each tissue type. Sometimes it is just not possible to tell what type of tissue is present. Describe the color and % in these cases. Describe the color and % in these cases.



85% brown-black eschar
5% tan slough
10% maroon-red tissue



45% tan slough
15% brown eschar
15% pink dermis
25% pink-red tissue



100% intact
erythema



6. EXUDATE (DRAINAGE)

Type	Consistency	Color
Serous	Thin, Watery	Clear, transparent yellow
Sanguineous	Viscous	Bright or dark red
Purulent	Thick	White, cream, green, yellow, tan
Serosanguineous	Thinner than blood	Translucent red or pink
Seropurulent	Thicker than serous (Thinner than purulent)	Transparent cream, yellow, tan, green.

A common scale to use in describing the amount of drainage is:

- a) None
- b) Scant
- c) Small
- d) Moderate
- e) Copious

Most will agree these all seem subjective. To help quantify the terms, look at 1) how much drainage is on the recently removed dressing and 2) how dry, moist or wet is the wound bed. See the next slide for examples.



Drainage Amount

NONE

SCANT

SMALL

MODERATE

COPIOUS

Dry wound bed

Moist wound bed

Wet, possibly overflowing wound bed



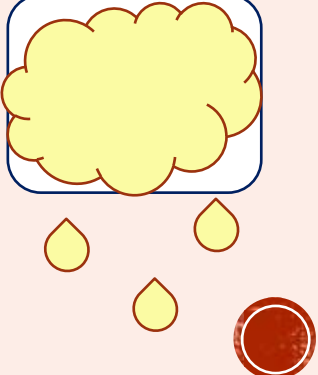
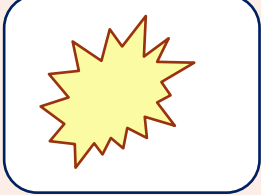
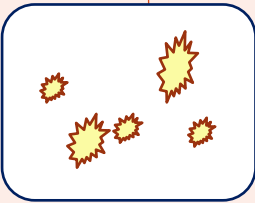
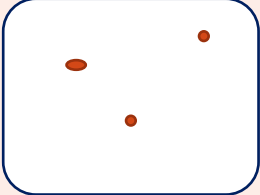
No drainage on dressing

No measurable drainage on dressing

Less than 25% of dressing has drainage

26-75% of dressing has drainage

More than 75% of dressing has drainage



7. ODOR

After cleansing the wound, note if any malodor is detectable. Describing the odor of a wound that has been under a dressing and drainage has been exiting the body is not an accurate way to measure odor until cleansed.

1. None
2. Faint
3. Moderate
4. Strong



8. PERIWOUND

The skin directly surrounding the wound is called the “periwound”. This parameter can tell you a lot about the wound etiology, current healing status and how the wound has been responding so far to the specific treatment being provided. Some common terms for describing the periwound are below.

Descriptor	Meaning
Boggy	Feels spongy
Indurated	Feels hardened
Erythema	More pink or red than normal (for ethnicity)
Ecchymotic	Bruised
Edematous	Swollen
Callus	Thickened and toughened skin from repeated trauma
Maceration	Skin is softening and thinning due to moisture
Excoriated	Wearing away of skin, from rubbing or chemical damage (i.e. stool)
Denuded	Epidermal loss due to prolonged contact with moisture and friction



9. PAIN

We have become accustomed to asking our patient if they are experiencing pain. When working with a wound, take notice of when the patient shows signs of pain. Is there absence of pain or is there pain present:

- during repositioning?
- when the dressing is removed?
- while cleaning or placing a new dressing?

It is possible to prevent future pain in cases where the type of dressing is causing pain. Knowing what wound care products are available and learning tips for avoiding adhesive are good ways to do this.



SIGNS OF WOUND INFECTION

Wound bed infection may be present if any of the following are noted:

- ❖ Increased drainage
- ❖ Thickened drainage
- ❖ Friable tissue (bleeds easily)
- ❖ Redness around the wound
- ❖ Warmth around the wound
- ❖ Induration of the periwound (feels hardened)
- ❖ Malodorous after cleansing
- ❖ Increase in pain

WHY CULTURE A WOUND?

When we recognize telltale signs of infection in the wound bed, you can expect the doctor to prescribe a broad spectrum antibiotic.

So why culture the wound?

The organism causing infection may not be susceptible to the initial antibiotics prescribed. Also, a wound culture sample is best collected *before* any antibiotics are prescribed so as not to affect the bacterial growth in the lab.

WHY CULTURE A WOUND?

Another reason is a wound that is stalled (not healing but not deteriorating either) may have a “silent” infection in the wound bed and should be cultured.

Also consider that patients can have more than one infection at a time. This means a person with a confirmed urinary tract infection should also have a thorough wound assessment completed to make sure two infections with multiple pathogens are not simultaneously occurring.

COLLECTION OF SAMPLE

For a wound culture you will need:

- Normal saline & gauze
- Proper collection tubes (Anaerobic & Aerobic)
- Lab baggie
- Pen/Marker
- Patient labels
- Anything else your facility may include

WHY TWO TUBES?



Anaerobic

Bottom is filled with gel to keep sample (and potential anaerobes) in an oxygen-free environment for transport.



Aerobic

Bottom is filled with moist foam to keep sample from drying out during transport while also oxygenated

Do not be surprised if products have come out or will in the future that can do the job of both tubes. Advances are constantly occurring.



COLLECTION METHOD:

- 1) Cleanse the wound
- 2) Pop the transport tube top off; Remove swab from culture package.
- 3) Select a pink or red section of the wound bed. Press the swab into the tissue and roll. Repeat in several sections. FYI: This is called the “Levine method” of sampling and is considered the best method.
- 4) Place sample swab down into transport tube.
- 5) Label with at minimum patient label, your initials, collection date/time and wound site.
- 6) Repeat for all culture tubes.

APPROXIMATE MICROBIOLOGY TIMELINE

- 1) A gram stain of specimen to see what broad category of organism is present will be done (i.e. Gram negative rods, gram positive cocci). Same day results.
- 2) Inoculate nutrient rich plates with the specimen to coax the bacteria to grow.
- 3) Once organism(s) grow, isolate bacteria and identify it (i.e. MRSA, E. Coli, Pseudomonas). Results 2-3 days.
- 4) Test the isolated bacteria against a battery of antibiotics to determine resistant or susceptible options. Results usually within a day of #2 above.

WOUND ASSESSMENT SUMMARY

- ✓ A thorough wound assessment is the basis for setting the patient up for success.
- ✓ The basic parameters of a wound assessment:
 1. Anatomical location
 2. Wound Type
 3. Stage/Category (if applicable)
 4. Measurements
 5. Tissue type & amount
 6. Exudate type & amount
 7. Odor (after cleansing)
 8. Periwound description
 9. Pain

Breakdown the wound assessment into each parameter, look up unfamiliar terms and practice assessment with a wound care professional to gain more confidence. Use what you assess to help you see the bigger picture with regards to the patient's overall well being.



REFERENCES

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