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اذكرونا بدعـوة طيبة ... ة
وإذا فيّ أي خطأ خبروني حتى أعدله.

Chronic Wounds

- *Chronic wounds are defined as wounds that have failed to proceed* through the orderly process that produces satisfactory anatomic and functional integrity or that have proceeded through the repair process without producing an adequate anatomic and functional result.

- A chronic wound develops when any acute wound fails to heal in the expected time frame for that type of wound, which might be a couple of weeks or up to six weeks in some cases.

* Wounds that don't heal within 3months are often considered chronic wound.

- The vast majority of chronic wounds can be classified into four categories:
  - Ischaemic Arterial Ulcers.
  - Venous Stasis Ulcers.
  - Diabetic wounds. → combination of ischemic + neuropathic
  - Pressure ulcers.

- A small number of wounds that do not fall into these categories may be due to causes such as radiation poisoning, ischemia, or malignancy.

Scope of the problem

- Incidence 2.7% - 29.5%
- High risk patients:
  - Quadriplegics
  - Neurosurgery
  - Orthopedic..post-op hips..up to 66%
  - Critical care MICU/CCU/SICU…33% - 41%
  - Prolonged anaesthesia time
  - Debilitated and elderly(age > 70)

Ischemic ulcers

- Ischemic arterial ulcers occur due to a lack of blood supply and are painful at presentation.
  - ischemia is one of the powerful stimulus to pain.

- They usually are associated with other symptoms of peripheral vascular disease, such as intermittent claudication, rest pain, night pain, and colour changes.
  - bad → edema + compromised vessels.
  - night pain → due to limb elevation (loss of effect of gravity)
    - Shutdown of the aerobic metabolism → ↓ ATP → influx of Ca^{2+} → ↑ lactic acid.
  - intermittent claudication → a cramping pain, localized to a group of muscles, that usually induced by walking to special distance (claudication distance) and relieved by rest

- On examination, there may be diminished or absent pulses with decreased ankle-brachial index and poor formation of granulation tissue. Other signs of peripheral ischemia, such as dryness of skin, hair loss, scaling, and pallor can be present.

↑ + thickened, prittle nails

differ between diabetic and non diabetic → diabetic pts have atherosclerosis which ↑ the ABI. Normal ABI (0.9 to 1) in diabetic pts (1 to 1.1)

- The wound itself usually is shallow with smooth margins, with palor of base and surrounding skin might be present.

because soundwaves pass through solids more easily than soft tissues

* Ambutation stump ulcer of previously amputated big toe.
* Floor contains granulation tissue, slough, head of the 1st metatarsal bone is visible also.
* punched out edges with minimal sloping
* Describe the surrounding skin.

ulcers may be formed once the toe is amputaed and this ulcer has high metabolism rate and the amount of blood is not sufficient so there will be progression to ischemia

* Gangrenous tissue on the 2nd and 3rd toes.
* The term gangrene is a gross descriptive term (macroscopic) indicates mummification of tissues with blackish discoloration from iron sulfide

devided into 2 types → dry gangrene → no infection → Tx → early management with amputation
expected management → auto amputation

→ wet gangrene → if there is infection
→ Surgical emergency
→ Severe infection if we didn't amputate it the pt would die.

ischemia is the most powerful stimulus for angiogenesis, so the ulcer in this place will be well vascularized + rich in capillaries and can be healed

Management of ischemic ulcers

- The management of these wounds is too-pronged and includes ***revascularization and wound care***.
  - It depends on the severity of the underlying arterial insufficiency.
- The affected region can sometimes be revascularized via vascular bypass or angioplasty.
- If infection is present, appropriate antibiotics are prescribed.

- When proper blood flow is established, debridement is performed.
- If the wound is plantar (on walking surface of foot), patient is advised to give rest to foot to avoid enlargement of the ulcer.

↳ off loading technique, to give chance for the ulcer to heal and to prevent not only vascular damage but also neuropathic

- Proper glycemic control in diabetics is important.
- Smoking should be avoided to aid wound healing.

Ischemic ulcer → distal locations
Venous ulcer
↳ tend to be on the gaiter area (below the knee and above the ankle).

Venous stasis ulcer

- The clinically characteristic picture is that of an ulcer that fails to re-epithelialise despite the presence of adequate granulation tissue.

- Venous stasis occurs due to the incompetence of either the superficial or deep venous systems.
  - ***Chronic venous ulcers usually are due to the incompetence of the deep venous system and are commonly painless.***

(gaiter area) → medial aspect of the lower 1/3 of the leg just above the medial malleolus

- Stasis ulcers tend to occur at the sites of incompetent perforators, ***the most common being above the medial malleolus, over Cockett's perforator***.

- The wound usually is shallow, with irregular margins and pigmented surrounding skin.

Shallow ulcers with irregular margins and pigmented surrounding skin
↳ due to hemosiderin deposition.

perforators → connect between the superficial and deep veins

Hunterian perforator(s) in proximal thigh

Dodd perforator(s) in distal thigh

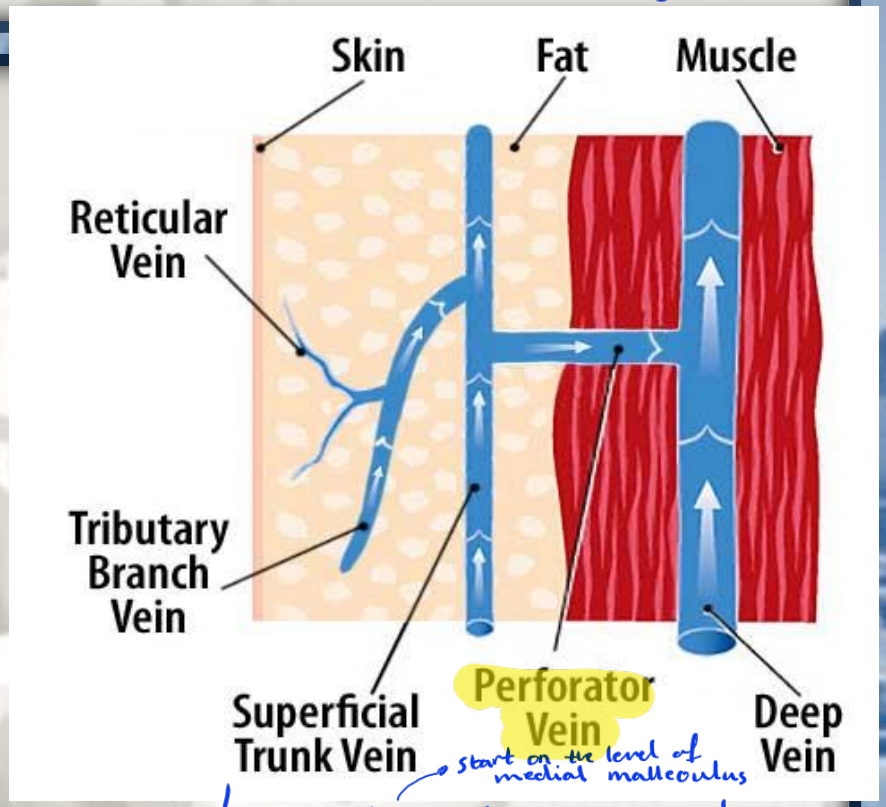
Boyd's perforator(s) below the knee

15
10 above the medial malleolus
5

Cockett's perforators of the posterior arch vein

we look which perforator has signs of incompetence espicially in pt with varicose vein.

* Peripheral heart → muscles → help in bumping the blood
+ venous valves → prevent back flow



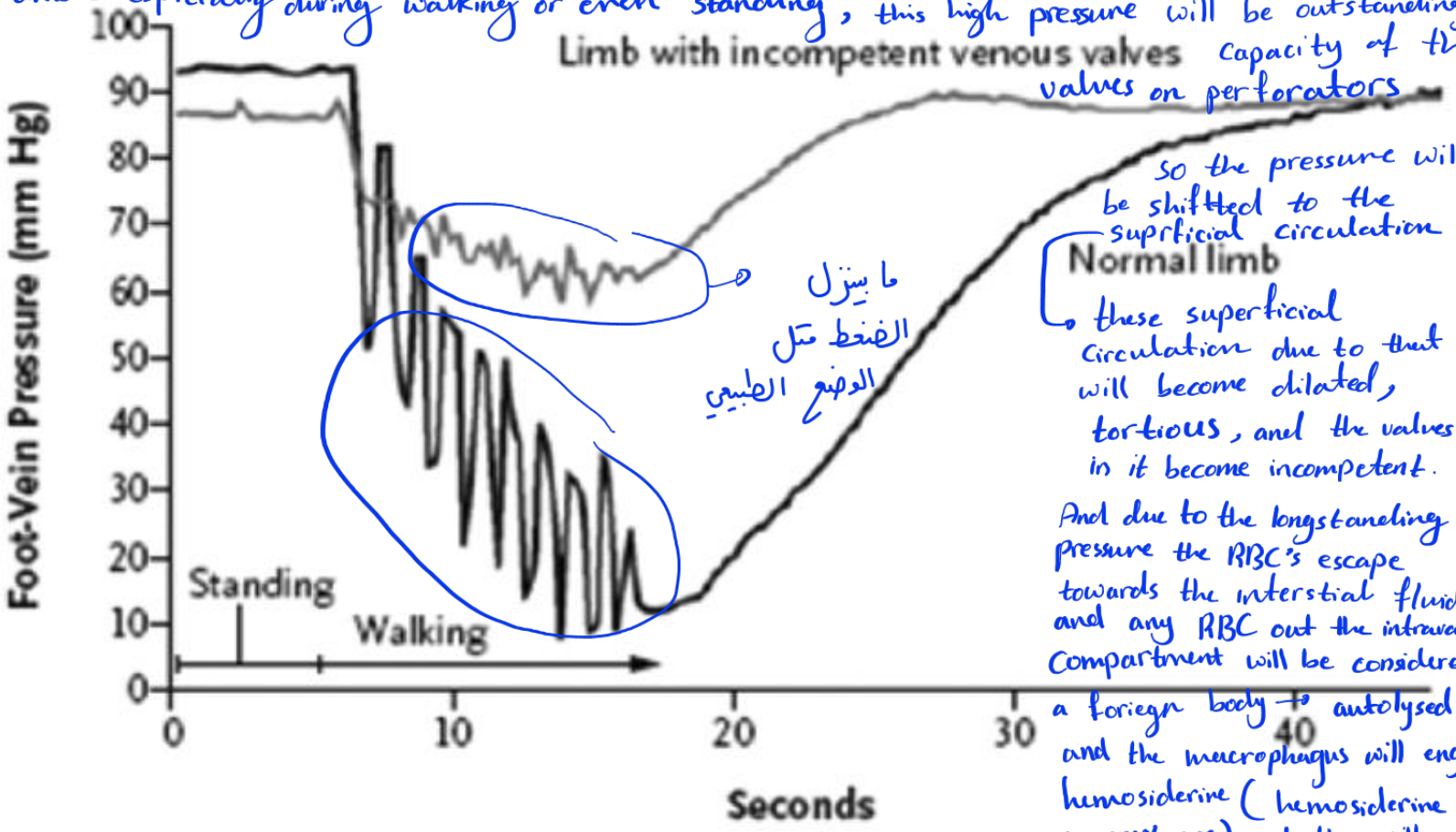
start on the level of medial malleolus

↳ greater + lesser → lateral malleolus saphinous

↓

femoral vein is end on the saphenofemoral junction (2 inches below + lateral to the pubic tubercle)

DVT pts suffer from chronic venous insufficiencies because the thrombus destroys the valve causing valve distruction and will cause significant amount of pressure at the ankle espicially during walking or even standing, this high pressure will be outstanding the capacity of the valves on perforators



ما ينزل الضغط مثل الوضع الطبيعي

So the pressure will be shifted to the superficial circulation

Normal limb

these superficial circulation due to that will become dilated, tortious, and the valves in it become incompetent.

And due to the longstanding pressure the RBC's escape towards the interstial fluid and any RBC out the intravascular compartment will be considered as a foriegn body → autolysed and the macrophagus will engulf the hemosiderine (hemosiderine laden macrophages) and this will cause a contineous chronic inflammation that will lead to fibrosis

(Reproduced from Coleridge Smith[17] with the permission of the publisher)

Inverted Champagne bottle sign

Management

- The cornerstone of treatment of venous ulcers is compression therapy.
  - It can decrease blood vessel diameter and pressure, which increases their effectiveness, preventing blood from flowing backwards.

- Compression is also used to decrease release of inflammatory cytokines, lower the amount of fluid leaking from capillaries and therefore prevent swelling, and prevent clotting by decreasing activation of thrombin and increasing that of plasmin.

- Most venous ulcers can be healed with perseverance and by addressing the venous hypertension.

- Recurrences are frequent. Therefore, compression stockings are advised to prevent the formation of new ulcers in people with a history of the same condition

+ Despite the presence of all features of healing ulcer (sloping edges, floor is rich with granulation tissue), yet it is a non healing ulcer "Chronic wound"
+ Most accepted theory behind the disease is the ↑ activity of the matrix metalloproteinases within the ulcer

↳ so the goal is to use inhibitors to the along with pressure garment → Can ↓ the inflammation therefore will help in the closure

Diabetic Foot ulcer

- One of the major complications of uncontrolled ***Diabetes Mellitus***,
  - Diabetic Foot Ulcers are a result of impedance of Wound Healing process due to a prolonged inflammatory phase.

we have 3 phases of wound healing ① Inflammatory ② Proliferative ③ Remodeling → لحتى يبلش أي Phase لازم اللي قبله

- Diabetes causes neuropathy, which inhibits nociception and the perception of pain. Thus patients may not initially notice small wounds to legs and feet, and may therefore fail to prevent infection or repeated injury.

بكون مخاطر بتكمل تدريجي

- Further, diabetes causes immune compromise and damage to small blood vessels, preventing adequate oxygenation of tissue, which can cause chronic wounds.

both humoral and cellular immunity is affected but the cellular is more (mainly the intracellular phagocytic activity "neutrophil, PMN)

- Pressure also plays a role in the formation of diabetic ulcers.

- Once ulceration occurs, the chances of healing are poor.

- The treatment of diabetic wounds involves local and systemic measures.
  - Achievement of adequate blood sugar levels is very important.
  - Most diabetic wounds are infected.
    - Eradication of the infectious source is paramount to the success of healing.

- Foot ulcers in diabetes require multidisciplinary assessment, usually by podiatrists, diabetes specialists and surgeons.

- Treatment consists of appropriate bandages, antibiotics, debridement, arterial revascularisation and platelet-rich fibrin therapies.

Trophic ulcer

- painless, over a weight bearing area, the floor is rich in granulation tissue the surrounding skin is seems to be thickened (hyperkeratosis)

↳ the surrounding skin is trying to protect itself by ↑ the thickness of stratum corneum

Decubitus / Pressure Ulcer

- A pressure ulcer is a localized area of tissue necrosis that develops when a soft tissue is compressed between a bony prominence and an external surface.

- Pressure ulcer formation is accelerated in the presence of ***friction, shear forces, and moisture***.

منقلش المريض كالتخت بدل ما نقلبه

- Other contributory factors in the pathogenesis of pressure ulcers ***include immobility, altered activity levels, altered mental status, chronic conditions, and altered nutritional status.***

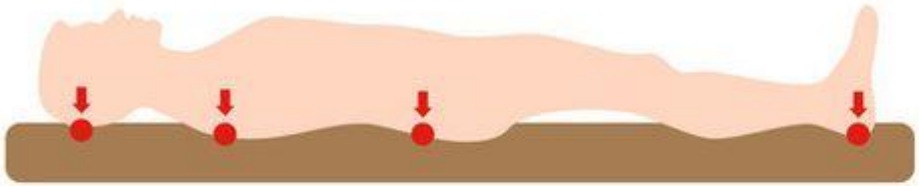
- The most common sites are the skin overlying the sacrum, coccyx, heels or the hips, but other sites such as the elbows, knees, ankles or the back of the cranium can be affected

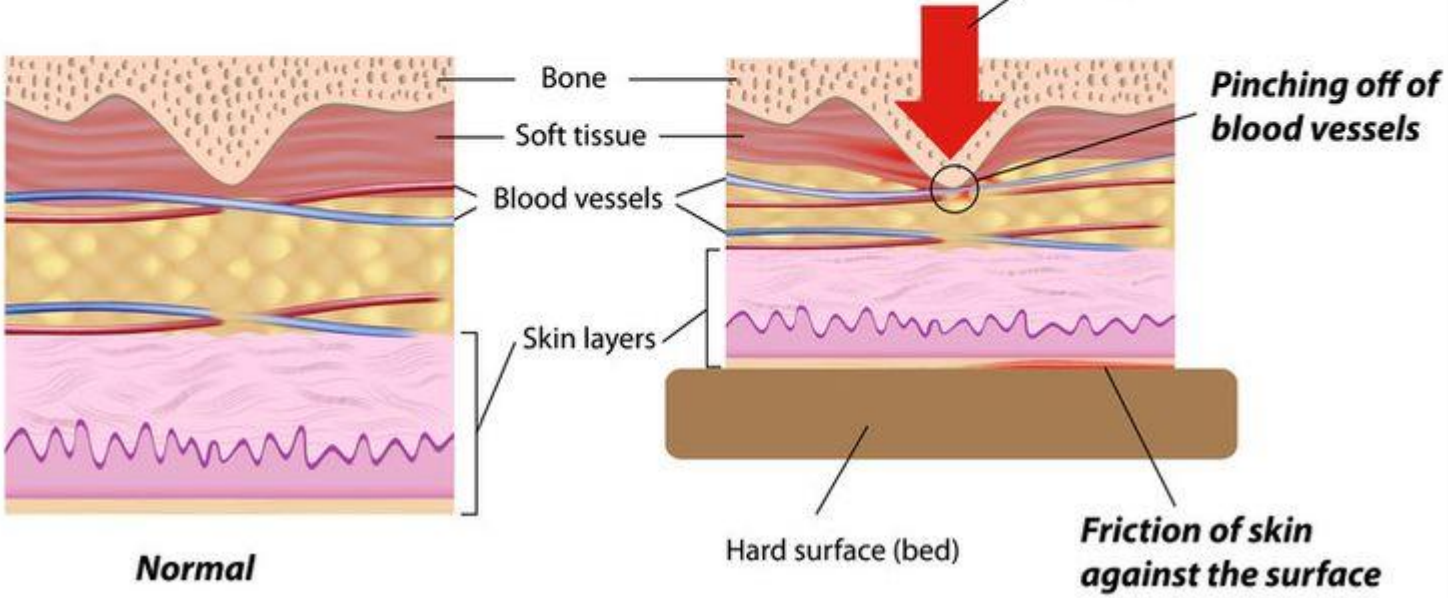
→ depending on the position of the pt.

Pathophysiology:

- If the capillary perfusion pressure > hydrostatic pressure in the capillaries → will collapse
- Each tissue has different metabolic rate, the higher the metabolic rate, the ↓ the eschemic time.
  - ex: neuronal cells metabolic rate ≈ 5 min, muscles ≈ 6 h, skin ≈ 12 h
  - If the pressure was > the ischemic time then this will cause irreversible damage.

Anatomy of A Pressure Sore

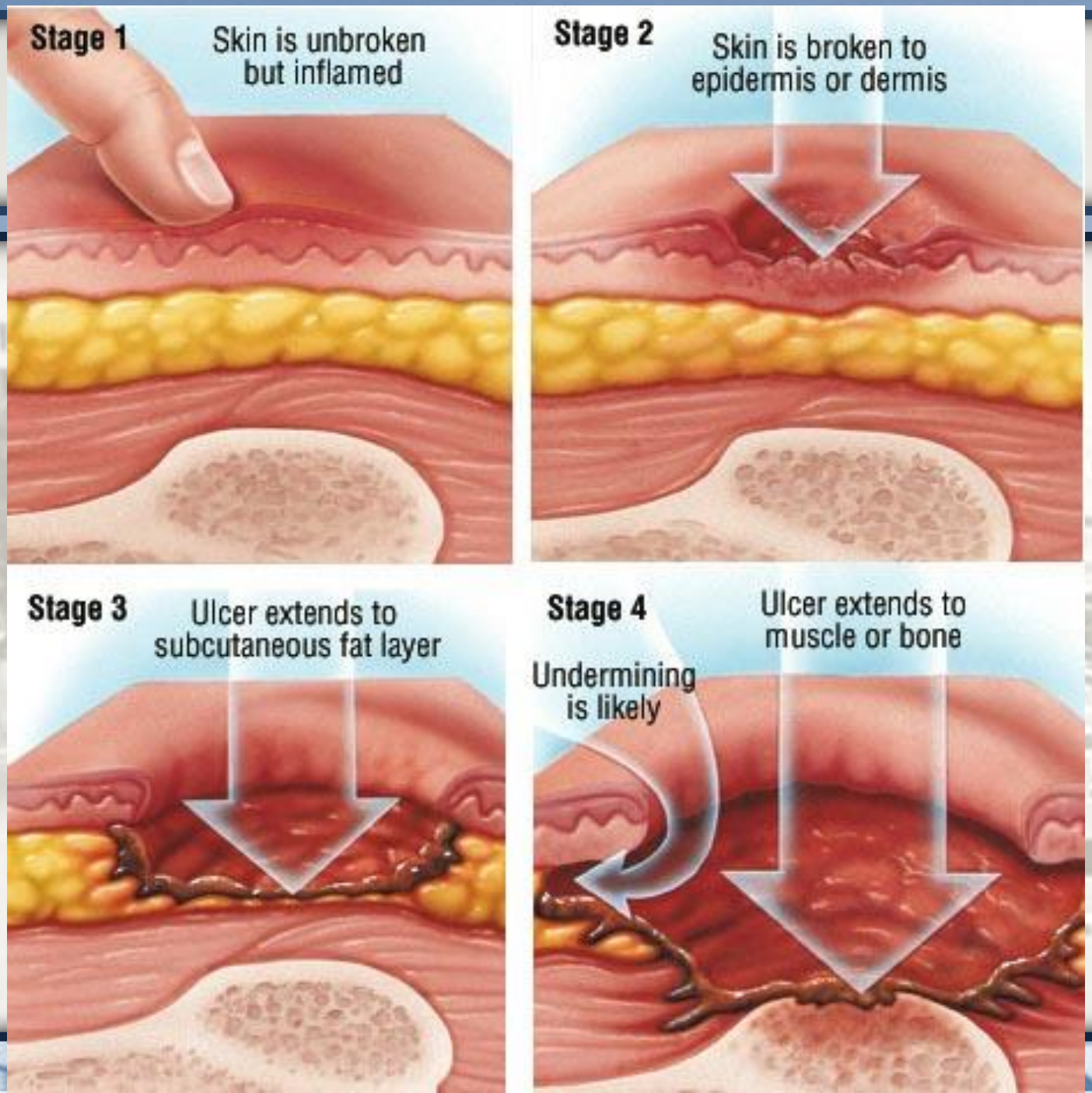


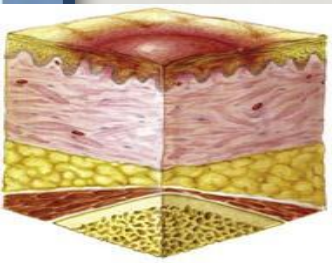


ICEBERG principle

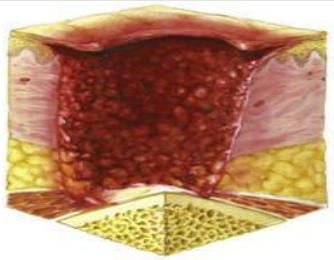
- Pressure is distributed in a roughly upright cone, expanding outward and down through the subdermal tissues:
- Eschar indicates Stage 3 or higher
- Subcutaneous wound is larger than the visible area of eschar

- **Pressure ulcers are divided into the following stages depending on severity:**
  - **Stage I: Intact skin with non-blanchable redness of a localized area usually over** a bony prominence.
  - **Stage II: Partial thickness loss of dermis presenting as a shallow open ulcer with a** red pink wound bed, without slough.
  - **Stage III: Full thickness tissue loss. Subcutaneous fat may be visible but bone,** tendon or muscle are not exposed.
  - **Stage IV: Full thickness tissue loss with exposed bone, tendon or muscle.**

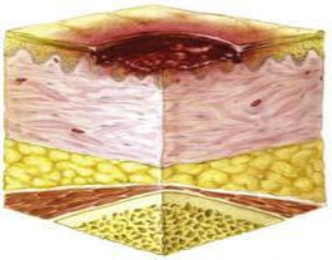

Stage 1
Skin is unbroken but inflamed
Stage 2
Skin is broken to epidermis or dermis
Stage 3
Ulcer extends to subcutaneous fat layer
Stage 4
Ulcer extends to muscle or bone
Undermining is likely



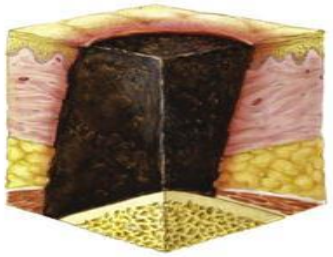
Stage 1



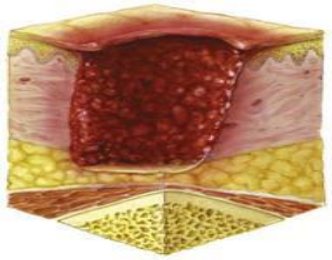
Stage 4



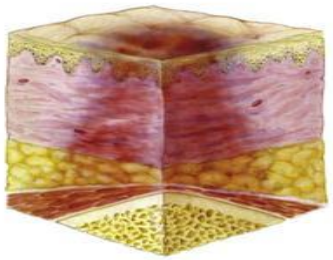
Stage 2



Unstageable



Stage 3



Suspected deep tissue injury

PUPPS 3 – The National Pressure Ulcer Advisory Panel (NPUAP) Pressure Ulcer Staging System

Pressure ulcers are classified by the depth of tissue damage present.
The following staging of pressure ulcers are recommended for use by the Australian Wound Management Association, which is consistent with the recommendations of the National Pressure Ulcer Advisory Panel (NPUAP) U.S.A.

Stage 1

Observable pressure related alteration of intact skin whose indicators as compared to the adjacent or opposite area of the body may include changes in one or more of the following: skin temperature (warmth or coolness), tissue consistency (firm or boggy feel) and/or sensation (pain, itching).
The ulcer appears as a defined area of persistent redness in lightly pigmented skin, whereas in darker skin tones, the ulcer may appear with persistent red, blue or purple hues.

Please note: heel pressure ulcer covered with a film dressing

Stage 2

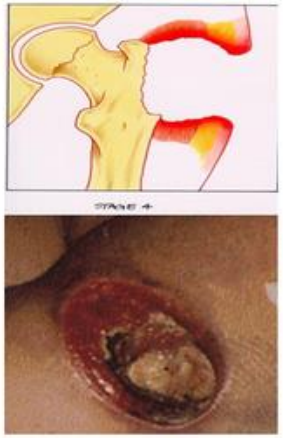
Partial thickness skin loss involving epidermis and/or dermis. The ulcer is superficial and presents clinically as an abrasion, blister, or shallow crater.

Stage 3

Full thickness skin loss involving damage or necrosis of subcutaneous tissue that may extend down to but not through underlying fascia. The ulcer presents clinically as a deep crater with or without undermining of adjacent tissue.

Stage 4

Full thickness skin loss with extensive destruction, tissue necrosis or damage to muscle, bone, or supporting structures (for example, tendon or joint capsule). Undermining and sinus tracts may also be associated with Stage 4 pressure ulcers.



+ If we want to manage, then prevention is the best management, which requires contineous care from nursing

MANAGEMENT

- The most important care for a person at risk for pressure ulcers and those with bedsores is the redistribution of pressure so that no pressure is applied to the pressure ulcer.
- Debridement and Dressing is helpful in existing cases.
- Stage 1&2
- Stage 3&4

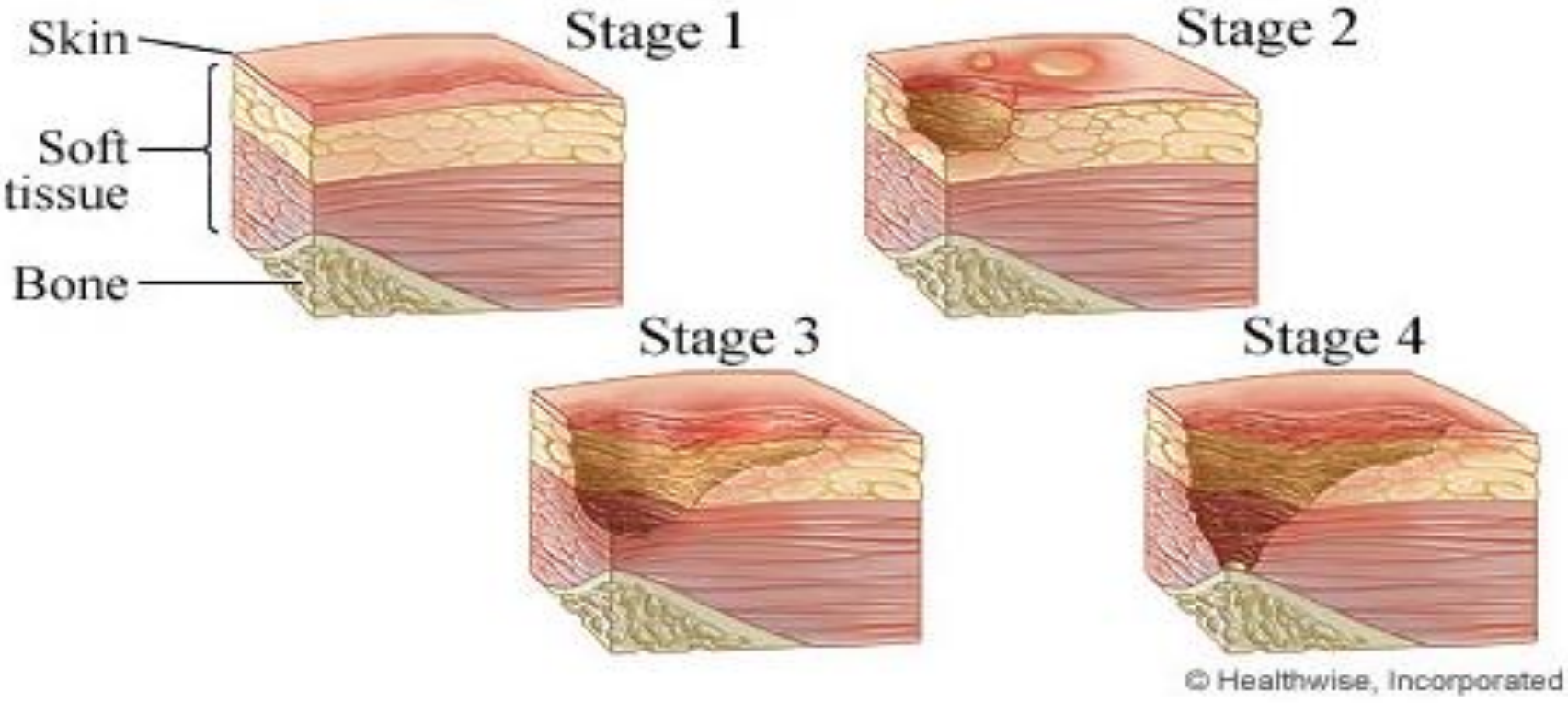
to keep it dry as much as possible

need the care provided by a surgeon → debridment, cleaning, removal of anything + planning for closure

care can be taken by day-care sittings

Stages of Pressure Sores

* For the closure to be success it need to be cleaned and in order to that fecal and urinary stream (catheter) diversion should be done.
  by colostomy or hartmann procedure




Did you turn me today?
People who can't move themselves need your help.
For more information on pressure ulcer prevention please visit
www.preventpressureulcers.ca
pressure ulcer awareness

Malignant transformation of chronic wounds

- Any wound that does not heal for a prolonged period of time is prone to malignant transformation(Marjolin Ulcer)
- Malignant wounds are differentiated clinically from non-malignant wounds by the presence of overturned wound edges.
- In patients with suspected malignant transformations, biopsy of the wound edges must be performed to rule out malignancy.
- Cancers arising de novo in chronic wounds include both squamous and rarely basal cell carcinomas.

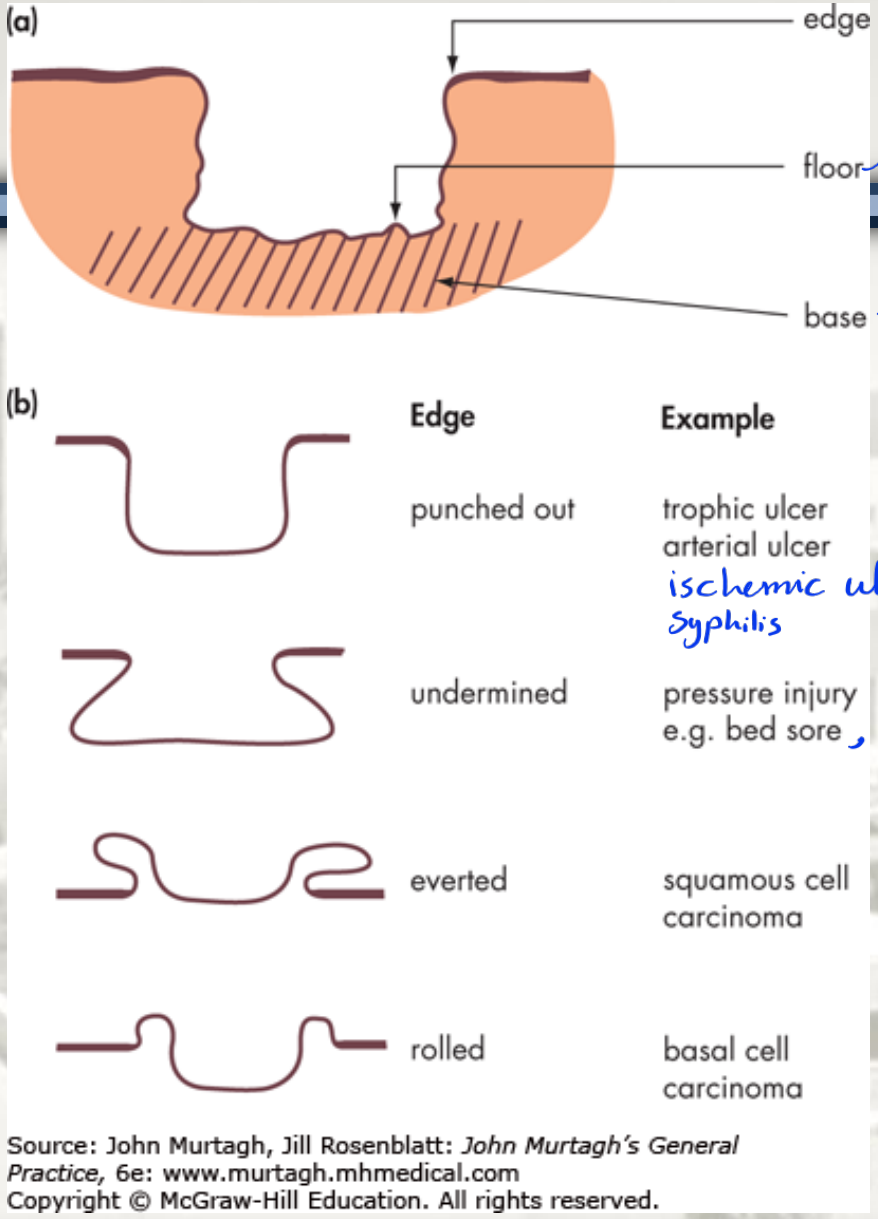
Chronic Wounds

- Chronic wounds are much easier to prevent than to treat.

- The best way to prevent a chronic wound is to actively and appropriately manage chronic medical conditions such as diabetes, high blood pressure, venous insufficiency and peripheral neuropathy.

- Skin should be routinely inspected in these individuals. Steps should be taken to prevent trauma to the skin of the legs and feet, such as wearing shoes, ensuring clothing is not wrinkled or bunched over bony areas and maintaining proper hygiene and nutrition.

- If a cut or wound does occur, immediate care and attention should be provided.

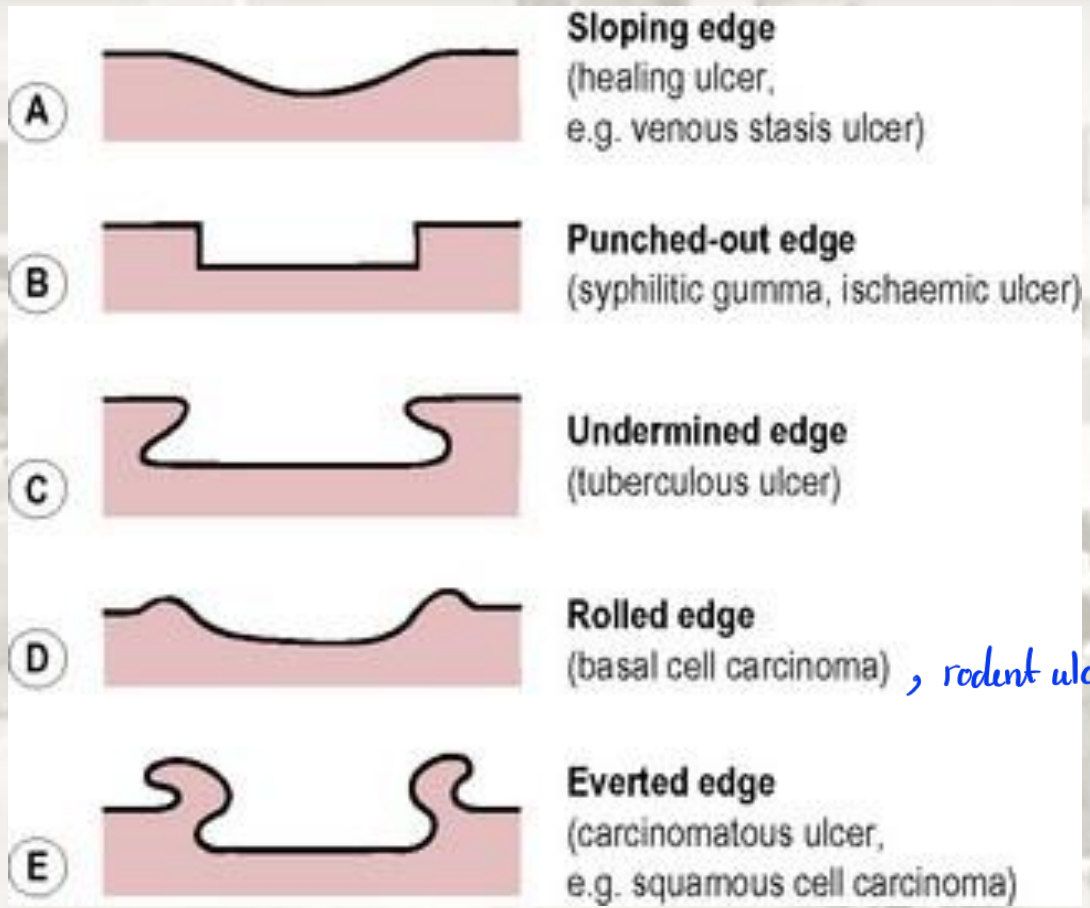


is what we see.

is what we feel.

ischemic ulcer
Syphilis

TB ulcers



Sloping edge
(healing ulcer,
e.g. venous stasis ulcer)

Punched-out edge
(syphilitic gumma, ischaemic ulcer)

Undermined edge
(tuberculous ulcer)

Rolled edge
(basal cell carcinoma), rodent ulcer

Everted edge
(carcinomatous ulcer,
e.g. squamous cell carcinoma)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