Integumentary and wound care
Med surg

## Risk factors for skin disorders

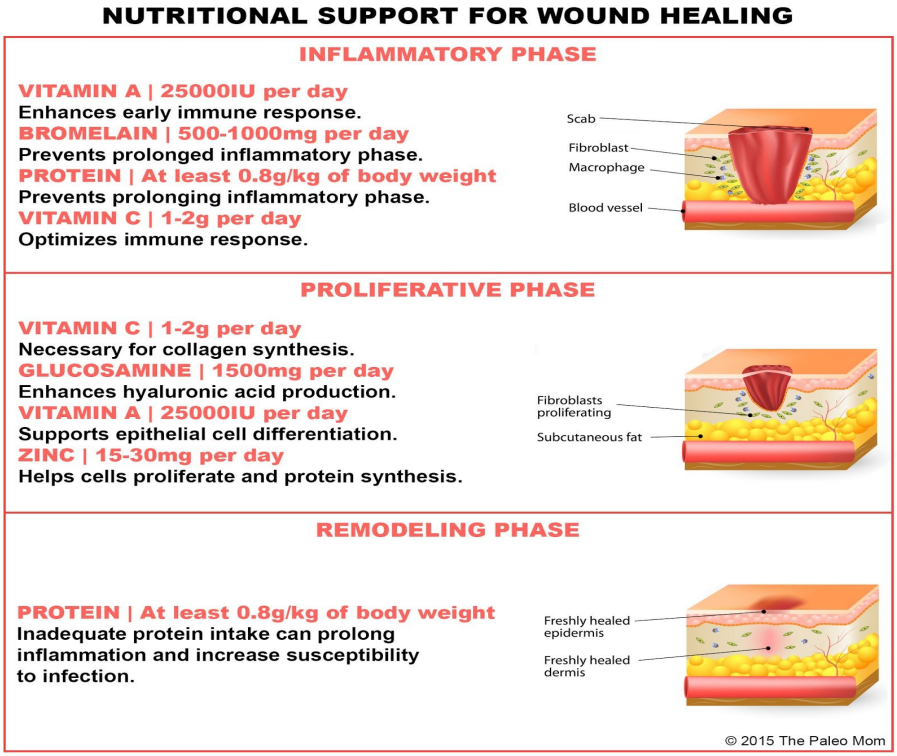
- Exposure to chemicals and pollultants, and radiation
- Race, age, indoor tanning, sun exposure
- Lack of personal hygeine habits, harsh soaps, and detergents
- Some medications and herbal suppliments
- Emotional stress, infection, injury , irritation, genetics, and systemic illness

### Psychosocial Impact

- Change in body image, decreased general well being, and decreased self esteem
- Social isolation, fear of rejection, restriction on physical activity, pain
- Disruption or loss of employment, cost of meds, hopstializations, and follow up care

### Phases of wound healing

1. Inflammatory phase : starts at time of injury lasts 3-5 days, local pain , edema, redness and warmth
2. Fibroplastic phase:  starts day post injury, lasts 2-3 weeks, scar tissue forms, granulation forms in the tissue bed
3. Maturation: begins as early as week 3, and may last 1 year, scar tissue becomes thinner, firm, and elastic upon palpation



## Healing by intention

1. **First intention:** wound edges are approximated and in place with sutures, wound is easily closed and dead space is elimenated
2. **Second intention:** occure w/ injuries that have tissue lossand require gradual filling in of deat space with connective tissue
3. **Third intention:** delayed primary closure, and occures when wounds are intentionaaly left open for several days for irrigation or removal of debris and exudateonce debris is removed the wound is closed by first intention.

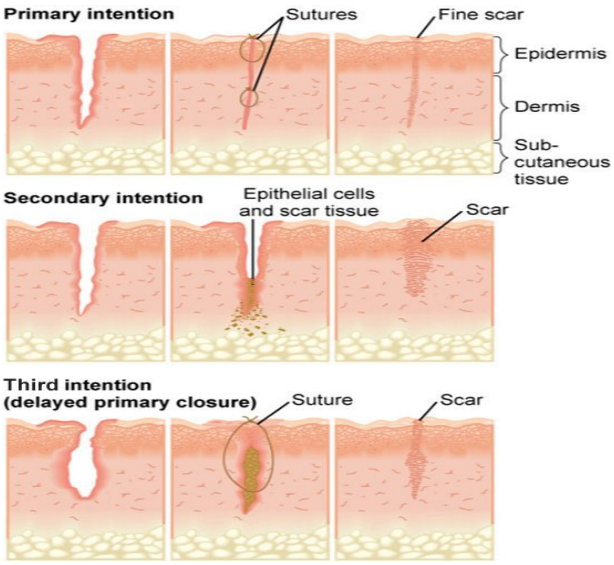



**Table 1: Types of Wound Exudate**

- **Serous:** clear, amber, thin and watery
- **Fibrinous:** cloudy and thin, with strands of fibrin
- **Serosanguineous:** clear, pink, thin and watery
- **Sanguineous:** reddish, thin and watery
- **Seropurulent:** yellow or tan, cloudy and thick
- **Purulent:** opaque, milky; sometimes green
- **Hemopurulent:** reddish, milky and viscous
- **Hemorrhagic:** red, thick

## Diagnostic tests collect samples before giving ABX

**Skin biopsy:** collection of a small peice of skin for histopathology, can be done with a punch, exiscion or shave.
-obtain informed consent, clean site pre proocedure
-post procedure, place specimen in proper container for patho and label, use surgical asepsis, asess site for bleeding and infection

**Skin culture test:** obtained with a sterile applicator in the appropriate tube, scraping, punch biopsy, fluid collection

- Place immediatly on ice ( viral) send to lab

**Woods light:** uv light used to view skin through a special glass
-darken the room , assist the client during change from dark room to light room ( eye adjusemnt could pose saftey issues)

**Diascopy**: allows clearer inspection of leisons by removing erythmea caused by increased blood flow to the area. A glass slide is placed over the leision causing blanching, leaving the leison easir to inspect

## Disorders

***Canida albicans:*** Superficial fungal infection of the skin and mucous membranes, AKA yeast infection or thrush
**Risk factors:** immunosupression, chemo, antibiotic therepy LT, diabetes, and obese pts.
**Common areas:** mucous membranes, perineum, vagina, axilla , and under the breast
**Assessment:** skin will be red and irritated, mouth will have white patches,
**Interventions:** teach to clean and dry skin folds, inspect skin folds frequently clean andry often, frequent mouth care, tepid temp when giving foods and drink, antifungal meds may be prescribed.

***Herpes Zoster :*** " shingles" : With a hx of chickenpox, shingles, is caused by reactivation of the varicella-zoster virus. Shingles can occure during an immuno compromised state in a client with hx of chicken pox. Dormant virus lives along the dorsal nerve root ganglia of the sensory, spinal and caranial nerves. Eruptions occur along the infected nerve.

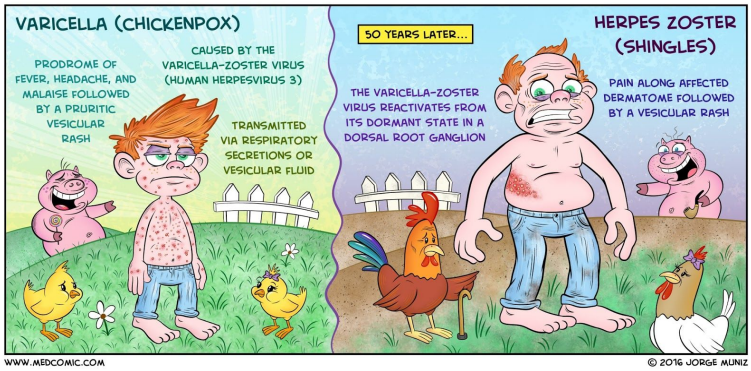
- Potsherpatic neuralgia can remain after the eruption clears
- Is contagious to those who have never had chicken pox
- Herpes simplex virus is another type of virus that causes vesicles on the lip ( type 1) or genitals type (2)

**Assessment:**

-unilaterally clustered vesicles along the throax, face, or trunk
- fever, malaise, burning pain, paresthesia, puritis

**Interventions :**

1. Isolate the client, (standard precautions), look for infections or necrosis, bells palsy may be a complication, assess cranial nerve fx and neurovascular status
2. Use an air matress, cool environment (warmth and touch aggrivate the pain)
3. Prevent the client from scratching, light weight loose clothes, keep skin clean
4. Teach about antiviral medications or and topical, vaccinations( zostavax) for clients over 60.




**Methicillian-resistant staphylococcus Aureus "MRSA"**: Skin wound becomes infected with MRSA.
-MRSA is also called health care associated infection and can range from mild to severe and can present as folliculitis or furnicles .
If MRSA infects the blood, sepsis, organ damage, and death can occur
**Assessment:**
-A culture and sesnitivity test of the skin or wound confirms the presense of MRSA and leads to the choice of antibiotic therapy lol
**Interverntions :**

- Standard precautions , monitor for s/sx of further infection, administer antibiotic therapy.
- MRSA is contangious and spread via direct contact with infected skin


## ***Erysipelas and cellulitis***

**Erysipelas:** acute superficial rapidly spreading inflammation of the dermis and lypmhatic caused by streptococcus. Which enters via trauma, wound, abrasion, or bite
**Cellulitis** : infection of the dermis and hypodermis, usually caused by strep or staph.
**Assessment:**
-pain, tenderness, erythmea, warmth, edema and fever
**Interventions:**
-promote rest, apply warm compress to promote circulation, apply antibacterial dressings, ointments or gels as prescribed
-administer antibiotics as prescribed for an infection, obtain a culture of the area before initiating the antibiotics

**Poision ivy/ oak/ sumac**:
a dermatitis that develops from contact with these plants.

**Assessment**
-Papulovesicular leisions,
- severe puritis

**Interventions**
-cleanse the skin of plant oil,
-apply cool wet compress
- ,apply topical products ( calamine) to relieve the itching,
- glucocorticoids may be prescribed.

## Bites and stings

Almost all spider bites are venamous, but the most harmful are, brown recluse , black widow, scorpion, bees, wasps and tarantulas produce toxic reactions in humans . ***contact poision control immediatly to determine best management.***

## *Spider bites*

***Brown recluse bite:*** can cause skin leisions a necrotic wound or loxoscelism (systemic effects) -immediatly apply ice to deactivate the necrosing enzyme continue for 4 days, topical aneseptics and antibiotics may be needed.


***Black widow bite***: small red palpule, venom causes neurotoxicity, apply ice immediatly to inhibit the action of the toxin, systemic toxicity can occur , supportive therapy may be required in the hospital.

***Tarantulas:*** bites cause swelling , reddness, numbness, and lymph inflammation/ pain at site. Tarantula launches his barbed hairs at the victim. Sticky tape is used to remove hairs, skin is irrigated and limb is immobilized. Tetnus prophylaxis is necessary, antihistamines and corticosteroids are given.

***Scorpion stings*** : scorpions inject venom into thier victims through an apparatus in thier tail

-most stings cause pain, local inflammation, mild systemic reactions, that are treated with analgesia , wound care, and supportive treatments.
-the bark scoripion can inflict a serious and fatal sting that is neurotoxic, victim should be taken to the ER stat for an antivenom


***Bees and wasps stings***: usually cause a wheal and flare reaction. Emergancy care involvesquick removal of the stinger. Apply an ice pack, sever allergy can progress to anaphylaxis and immediate emergancy care is needed. Have n epi pen ready if allergic.

**Snake bites:** some are venomous and can cause serious systemic reactions in the victim, pt should be removed from the snake and rest, immobilize extremity, remove constricting clothes and jewlery,keep victim warm and away from alcohol and caffine, if you cant get an er right away use a tourniquette, hospital is required stat!

[Frostbite]

Damage to the tissues and blood vessles as a result of prolonged exposure to the cold . fingers toes face and ears are most commonly affected.

***Assessment:***

1. **First degree** invloves white plaque surrounded by a ring of hypermia and edema.
2. **Second degree** : large clear fluid filled blisters with partial thickness skin necrosis
3. **Third degree:** involves formation of small hemorrhagic blisters, usually followed by eschar formation, requiring debridment.
4. **Fourth degree:** no blisters or edema noted, full thickness necrosis, with visual tissue loss extened to muscle and bone.

***Interventions***

Rewarm the affected area rapidly and continuosly with warm water bath towels at 104* F to thaw the frozen part. Handle affected area gently, give analgesia as needed, avoid compression, monitor for signs of compartment syndrome,tetnus prophylaxis as needed, debridment and amputation may be needed if gangreen develops

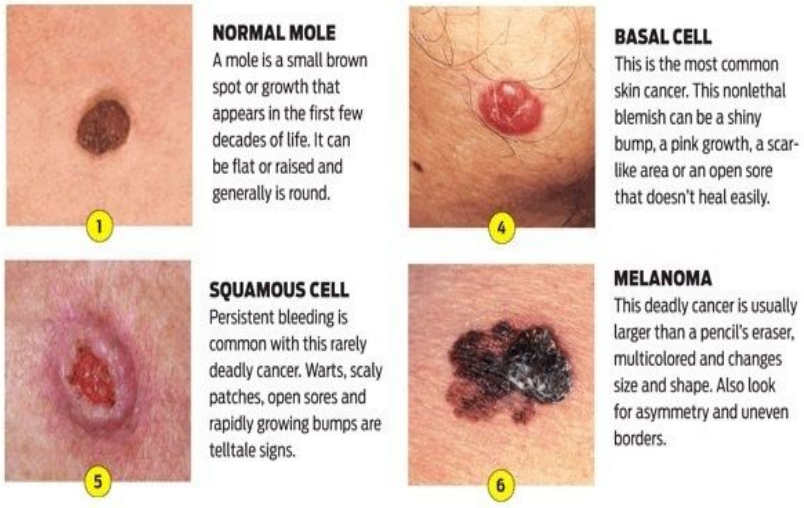

**Acitinic keratoses:** caused by chronic exposure to the sun and appear as rough scaly, red, or brown lesions that are usually found on the face, scalp, arms, and back of hands.

-lesions can progress to squamous cell carcinoma

- treatments includes medications, excisions, cryotherapy, cuttrage, and laser therapy

## ***Skin Cancer***

A malignant leison of the skin whic may or may not metastize. Over exposure to the sun is a primary cause, othe causes: chronic damage to the skin, genetic predisposition, ionizing radiation, light skinned race, age oler than 60, outdoor occupation, and exposure to chemical carcinogens. DX is confirmed by biopsy




**Basal cell:** rises from the basal cells contained in the epidermis. Metastasis is rare, but unerlying tissue damage can progress to organ tissue.

**Squameous cell :** a tumor of the epidermal keratinocytes and can infiltrate surrounding structures and move to lymph nodes.

**Melanoma :** can occur on any place on the body, especially where birthmarks or moles are, highly metastic to the brain, lungs, bone, and liver. Survial depends on early dx

**Assessment**

-change in color, shape,or size,of preexisting leisions, puritis, local soreness.

**Interventions**

Educate on risks and prevention, perform monthly skin inspection, have moles or leisons reported to HCP, avoid contact with chemical irritants, wear layered clothes in the sun, avoid sun exposure (10am-4pm)

**Management**

Surgical or nonsurgical interventions , provide education on medication, assist with surgical management.

# Psoriasis

Chronic, non infectious skin inflammation involving keratin synthesis that results in psoratic patches; however, a break in the skin integrity can lead to infection in the affected area. Various forms exist with psoriasis vulgaris being most common

- Common causes: stress, trauma, infection, hormonal changes, obesity, autoimmune disorder, climate change and genetics
- May be exacerbated by certain medications
- Koebner phenomenon: the development of psoratic leisons, at a site of injury( scratch/sunburn)
- Arthritis may develop, goal of therapy is to reduce cell proliferation.

**Assessment**

Puritis, shedding, silvery patches, white scales on raised red round plaque, usually affects knees, elbows, scalp, scaral reigion and legs

Yellow thickening nail changes are noted, joint inflammation.

**Interventions**

-provide emotional support, instruct the client to use prescribed therapy and avoid OTC medications, do not scratch the affected area, monitor for secondary skin problems such as infection, wear light cotton clothing, identify ways to reduce stress

***Steven johnsons syndrome:*** drug induced skin reaction that occurs through an immunological response. Similar to toxic epidermal necrolysis. May be mild or severe and may cause vesicles, erosions, and crusts on the skin, if severe systemic reactions occur that involve the respiratoty tract, renal system, eyes.

-most commonly occurs in clients with cancer who receive immunotherapy or chemotherapy.

-tx includes immediate cessation of antibiotics or med that is causing the syndrome, corticosteroids, other ABX, and supportive therapy.

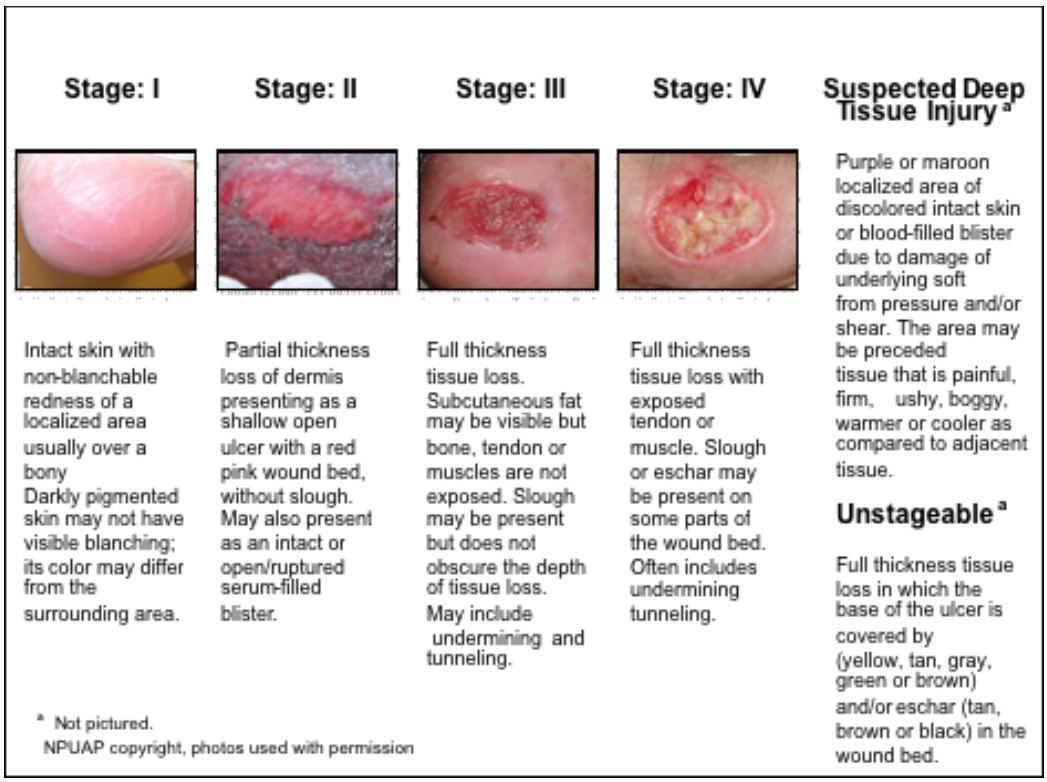
Pressure ulcers

Impairment of skin integrity, a pressure ulcer can occur anywhere on the body, tissue damage occurs when the skin and tissue are compromised between a boney prominance and external surface for a period of time.  Tissue compression restrics blood flow to the skin causinh ischemia

***Risk factors***

-skin pressure, skin shearing and friction, immobility, malnutrition, incontinence, decreased sensory preception.

**Assessement**




**Interventions**

-identify risks, *avoid direct massage to reddened skin areas, massage can damage capilliary beds and cause necrosis*

-prevent ulcers by repositioning pt frequently q2h, using pressure relief devices,. Ensuring adequate nutrition, cleanse skin, passive ROM q8h

-frequently assess skin for intactness, use barrier creams

If a pressure ulcer is present record location, size , width, length and depth, culture the exudate, note any oder , and color of exudate. Tx may include wound dressings.

**Table 2**

**Dressings for Pressure Ulcers**

| Type | Indication | MOA | Dosage | Commercially Available Product |
|---|---|---|---|---|
| Skin sealant, film | Stage I ulcers | Acts as a protective coating on the skin | Apply 1-4 times/day | Decubitene, Preppies, Pro-Q |
| Hydrocolloid | Stage II ulcers | Maintains a moist environment; naturally promotes autolytic debridement | Change every 3-7 days | Comfeel Plus, Curaderm, DuoDERM |
| Hydrogel | Ulcers with little to no exudate | Maintains a moist environment; naturally promotes autolytic debridement | 1-4 times/day | AcryDerm, Aquaflo, Aquagauze, Aqua Skin, CarraDres, CarraGauze, CarraSmart Gel, Carrasyn, Carrasyn V, DermaGauze, DermaSyn, FlexiGel, SAF-Gel, SoloSite, Tegagel, TransiGel, Woun'Dres |
| Moist saline gauze | Stage II-IV ulcers | Maintains a moist environment; has antibacterial activity | 3 times/day, as needed | Curasalt, Curity, Dermagran, Kerlix |
| Iodine-solution wet gauze | — | Has broad-spectrum antimicrobial activity | 1-4 times/day | — |
| Alginate | Exudating stage II ulcers; stage III-IV ulcers that are deep | Serves as an absorbent by maintaining a moist environment | 1 time/day, if needed | AlgiCell, AlgiSite M, CarboFlex, CarraGinate, DermaGinate, Kalginate, Kaltostat, Melgisorb, Restore CalciCare, Sorbsan |
| Foam | Exudating stage II ulcers; stage III-IV ulcers that are deep or have moderate drainage | Serves as a repellent for water, bacteria, other contaminants; maintains a moist environment; acts as insulation; reduces odor | 1 time/day, if needed | Allevyn, Biatain, CarraSmart Foam, Curafoam, DermaLevin, Epigard, HydroCell, Lyofoam, Mepilex, Optifoam, Polyderm, PolyMem, Silon, SOF-Foam, Tielle, VigiFOAM |

*MOA: mechanism of action.*
*Source: References 9, 10, 15-17.*

## ***Burn injuries***

- Cell destruction of the layers of the skin caused by heat, friction, electricity, radiation or chemicals

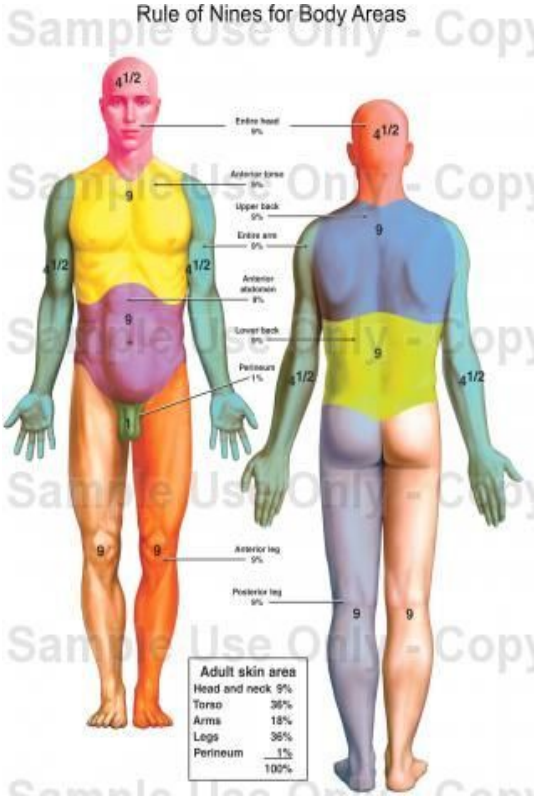
**Burn size**

1. Small burns: the response is localized to the injured area
2. Large extensive burns: 25% or more of the body for an adult 10% of body for children

The response of the the injury is systemic, the burn affects all major systems of the body.

**Priority nursing actions**

1. *Assess airway*
2. *Administer 02*
3. *Obtain vitals*
4. *Initiate IV line and begin fluid*
5. *Elevate extremeties if no fractures are obvious, keep the client warm and NPO status*




# Burn depth

**Superficial thickness**

- Injury to the epidermis, blood supply to the dermis is still intact
- Mild to severe redness, no blister, skin blances with pressure
- Burn is painful , tingles, pain eased by cooling, discomfrot 48 hours, heals 3-6 days
- No scarring, no skin graft needed

***Superficial partial thickness***

-involves injury deeper into the dermis, blood supply reduced, large blisters mau cover an extensive area, edema is present

- mottled pink to red base and broken dermis, wet shiney, weeping surface, painful and sesnitive to cold air.

-heals 10-21 days, no scar, minor pigment change, graft may be used in prolong healing process.

**Deep partial thickness**

-extends deeper into skin dermis, no blister, too much dead tissue that sticks to undelyinf dermis, wound surface is red, dry, with white areas in deeper parts

-may or may not blanch, edema is moderate, can convert to full thickness if tissue damage increased with infection, hypoxia, ischemia,

-heals 3-6 weeks, scar formation results,skin graft may be needed.

**Full thickness burn**

-injury and destruction of the epidermis, wound will not heal by reepitheealialization, grafts may be required.

-dry, hard, leathery eschar ( must be removed for healing to occur) , appears waxy, white, yellow , brown or black, injured surface appears dry, edema present under eschar

- reduced senation, healing takes weeks to months depending on reestablishing blood supply,

-requires removal of eschar, split or full thickness grafting, scaring and wound contracture are likely.

**Deep full thickness burn**

- Injury extends beyond skin to underlying fascia and tissue. Muscle and bone/ tendons are damaged
- Injured area appears black, abesent sensation, eschar is hard and nonelastic, no pain due to destroyed nerve endings
- Healinf takes months and grafts are required.

***Age and general health***

Mortality rates are higher for children younger than 4 especially from birth to 1, and clients older than 65.
-debilitaing disorders cardiac, respiratory, endocrine, and renal disorders negativly influance tx response and causes increased risk of death

***Location***

- Burns of the chest,head, or neck can cause respiratory issues
- Burns of the face are assoicated with corneal abraison
- Burns of the ear cause auricular chondritis
- Hands and jointd require therepy
- Perineal area can cause autocontamination of urine and feces
- Burns on extremeties can (circumfrential) can produce vascular comprmise ( compartment syndrome)
- Circumfrentail thorax burns lead to inadequate chest wall expansion and pulmonary insufficancy.

## ***Patho of burns***

Vasoactive substance is released from site of injury, direct injury increases capillary permeability, (decreases 18-36 hours after)

- Extensive burns results in generalized body edema
- -fluid loss equates to decreased organ perfusion
- Heart rate increases, cardiac output decrease, risk for hypovolemic shock
- Hematacrit level increased, body will shunt blood to vital organs, causing oliguria, and diuresis of excess fluids
- Blood flow to the GI tract is diminished , immune systm is depressed, pulmonary HTNcan develop

**Management of patients with burn injuries**

- Pre hospital: begins at scene and ends at the hospital , remove victim from the source of the burn
- Assess ABC's , assess for associated trauma including inhailation injury, cover burn with sterile or clean clothes, remove jewelry and clothing, insert IV acess
- ER: is a continuation of care administered in the field/ scene of injury.

**Major burns**

Elevate to degree and extent of the burn and treat life threatening conditions
-ensure patent airway, and administer 02, monitor for respiratory distress, and assess need for intubation
- ABG's , carboxy hemaglobin, assess oropharynx for blisters
-initiate IV acess, assess for hypovolemia, monitor vitals, insert foley, miantain NPO, insert NG tube, tetnus prophylaxis, administer pain meds as prescribed.
***Urinary output is the most reliable noninvasive measure for cardiac output and tissue perfusion.***

**Minor burns**

- Pain meds, tetanus prophylaxis, wound care as prescribed( cleaning debriding,) instruct the client on follow up care

## Table: phases of burn care

| Phase | Duration | Priorities |
|---|---|---|
| Emergent or immediate resuscitative | From onset of injury to completion of fluid resuscitation | • First aid<br>• Prevention of shock<br>• Prevention of respiratory distress<br>• Detection and treatment of concomitant injuries<br>• Wound assessment and initial care |
| Acute | From beginning of diuresis to near completion of wound closure | • Wound care and closure<br>• Prevention or treatment of complications, including infection<br>• Nutritional support |
| Rehabilitation | From major wound closure to return to individual's optimal level of physical and psychosocial adjustment | • Prevention of scars and contractures<br>• Physical, occupational, and vocational rehabilitation<br>• Functional and cosmetic reconstruction<br>• Psychosocial counseling |

-

**Interventions**

- Monitor for tracheal and laryngeal edema, administer respiratory tx as prescribed.
- Monitor pulse ox, prepare for ABG, elevate HOB 30* initiate ECG monitoring, monitor temp, initiate protecive isolation
- Clip body hair around wound margins, monitor daily weight and I&O expect a gain of 15-20 lbs in 72 hours
- Monitor gastric output, administer antacids, auscultate bowel sounds, monitor stools, monitor IV fluids hourly, monitor pulse and capilliary refill, prepare for chest xray,
- Keep room warm, administer opioids as prescribed , avoid giving meds PO, avoid IM and subq injections.

**Nutrition**

-bmr is 40-100x higher than normal w/ burn injuries, maintain NPO until bowel sounds return
Nutrition may be provided via enteral feeding, provide a high protien , carbohydrate, fats, and vitamin diet, monitor calorie intake.

**Escharotomy**

- A lengthwise inscion is made through the birn eschar to relive constriction and pressure to improve circulation

**Fasciotomy**

Insicion made through the the subq tissue of the fascia. Perfromed in the OR

**Acute phase:**

- Continue with isolation
- Provide wound care
- Provide adequate nutrition
- Prepare for rehab

## ***Inhailation injuries***

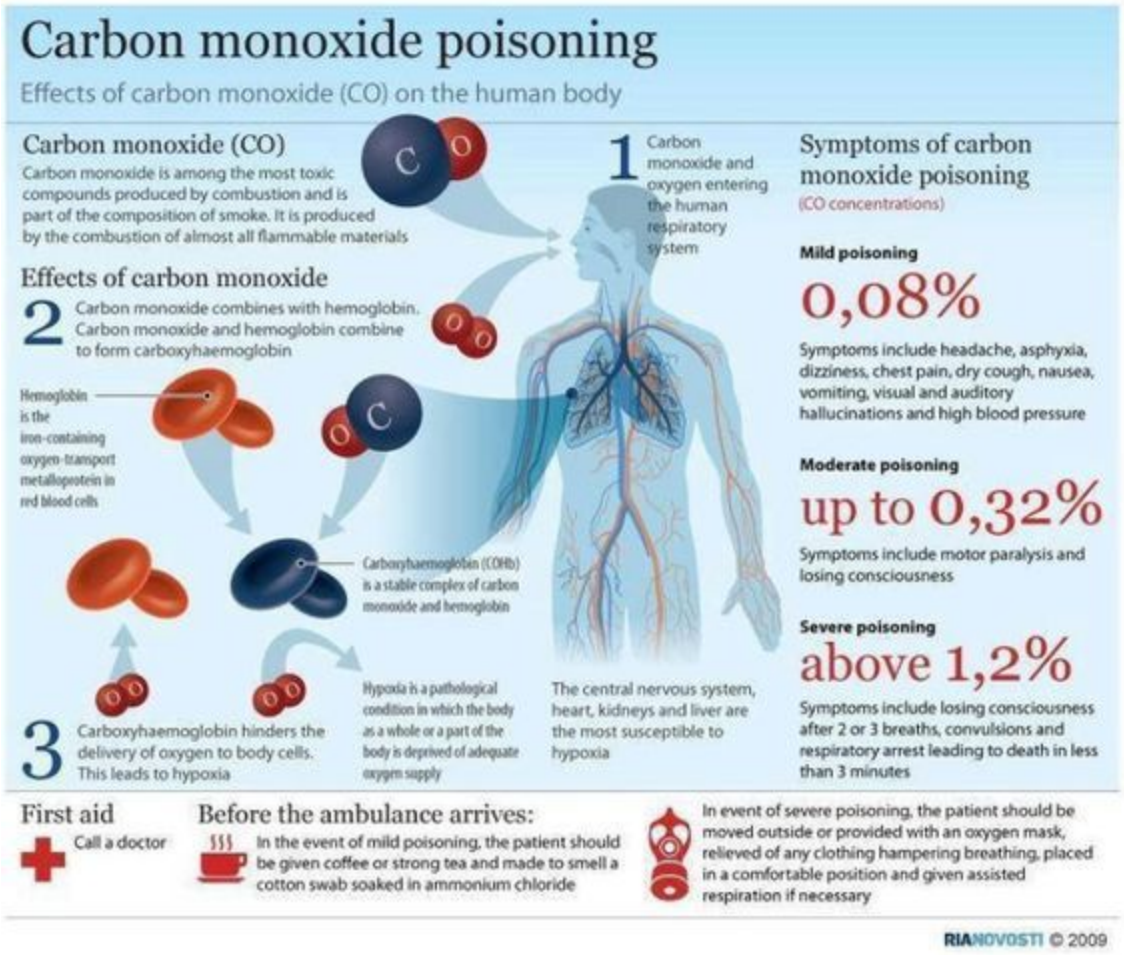
Smoke inhailation : respiratory injury that occurs when rge victim inhails products of combustion during a fire.**!! The airway is a priority concern!!!**

**Assessment**

-facial burns, erythmea, swelling of the oropharynx and nasoparynx, singed nasal hairs, flairinf nostrils, stridor, wheezing, dyspnea

- hoarse voice, sooty sputum, tachycardia, agitation and anxiety

Carbon monoxide poisioning: colorless ordorless tasteless gas that binds to hemaglobin 200x greater than o2, o2 is displaced, tissue hypoxia occurs,




**Direct thermal burns**
Heat injury that occurs in the lower respiratory tact by inhailation of steam or explosive gas, or aspiration of scolding liquids
-injury can occur to the upper airway that can appear erythmateous and edemateous w/ mucosal blisters, can lead to upper airway obstruction especially in the first 24-48 hours

## ***Wound care***

**Hydrotherapy:** wounds are cleansed by immersion for 30 mins or less to prevent increased sodium loss. Client should be pre medicated prior. Client must be hemodynamically stable.

***Debridement : removal of eschar or necrotic tissue***
Mechanical : use of wash cloths during hydrotehrapy
Ezymatic : use of topical anzymatic oinments (santyl)
Surgical: excision of eschar or necrotic tissue

Tangenital : very thin layers of eschar are removed until bleeding occurs.
Fascial : excised to superficial fascia, for ddep extensive burns.

**Wound closure**

Prevents infection and loss of fluid, promotes healing, prevents contractures, usually perfromed on day 5-21 following injury.

## Wound coverings

**Autograft** : permanent wound coverage, surgical removal of pts own skin to cover injured area, perfromed in the OR, monitor for bleeding, immobilize following surgery for 3-7 days,

- Avoid weigh bearing
- Monitor for foul smell and signs of infection,
- Avoid fabric softeners, instruct the client to lubricate using healing agents prescribed to them
- Protect area from sun
- Use splints to support the area

**Care of the donor site**

- Non adherent gauze dressing may be prescribed, HCP may prescribe gauze with petrolatum, or biosynthetiz dressing.
- Keep donor site clean, dry, free from pressure
- Healing usually occurs within 7-14 days , site can then be used

**Physical therapy**

Exercise, splinting, abulation, and ADL"s are implemented early on in the acute phase

- Perform ROM to reduce edema and increase joint fx
- Apply splints as prescribed, scarring is controlled by elastic wraps and bandages.
- Antiburn scar support garment are usually are usually prescribed to be worn 23 hours a day. For 18-24 months.

**Rehabilitaion**

Final phase of burn care

- Goals :
- 1. Promote wound healing
- 2. Minimize deformaties
- 3. Increase strength and fx
- Provide emotional support

-