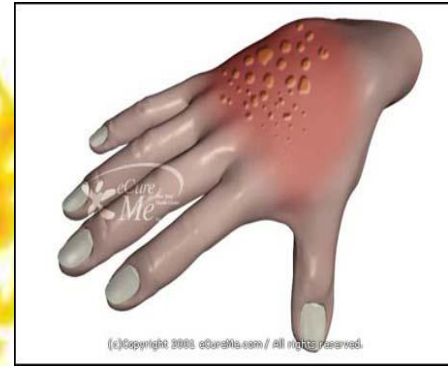


Burn & Sunburn Products



Burns

- Burns are tissue injuries caused by thermal (flame & scalding), electrical (flash & contact) chemical and irradiation contacts
- Burn injury results in: cell death, denaturation of proteins and subsequent cellular dysfunction, vascular permeability with localized edema and cutaneous vasodilation
- Determining the area & degree of burn is not easy even for burn specialists

Etiology of Burns

- **MOSTLY:** burn injuries occur in winter time in those ≤ 17 or ≥ 65 , with low income or < 12 years of education
- **The most common causes of residential fires** (according to research):
 1. Children playing with fire ignition sources such as matches
 2. Faulty or misused heating devices
 3. Faulty or misused electrical devices
 4. Careless smoking

Incidence of Burns

- > 80% of minor burns occur at home
- Most household burns (63%): hands and arms; 34%: face and legs
- Sunburn: the most common minor burn that occurs outside the home
- Most minor burns do not require medical intervention; symptoms may be managed with appropriate care & OTC drug therapy

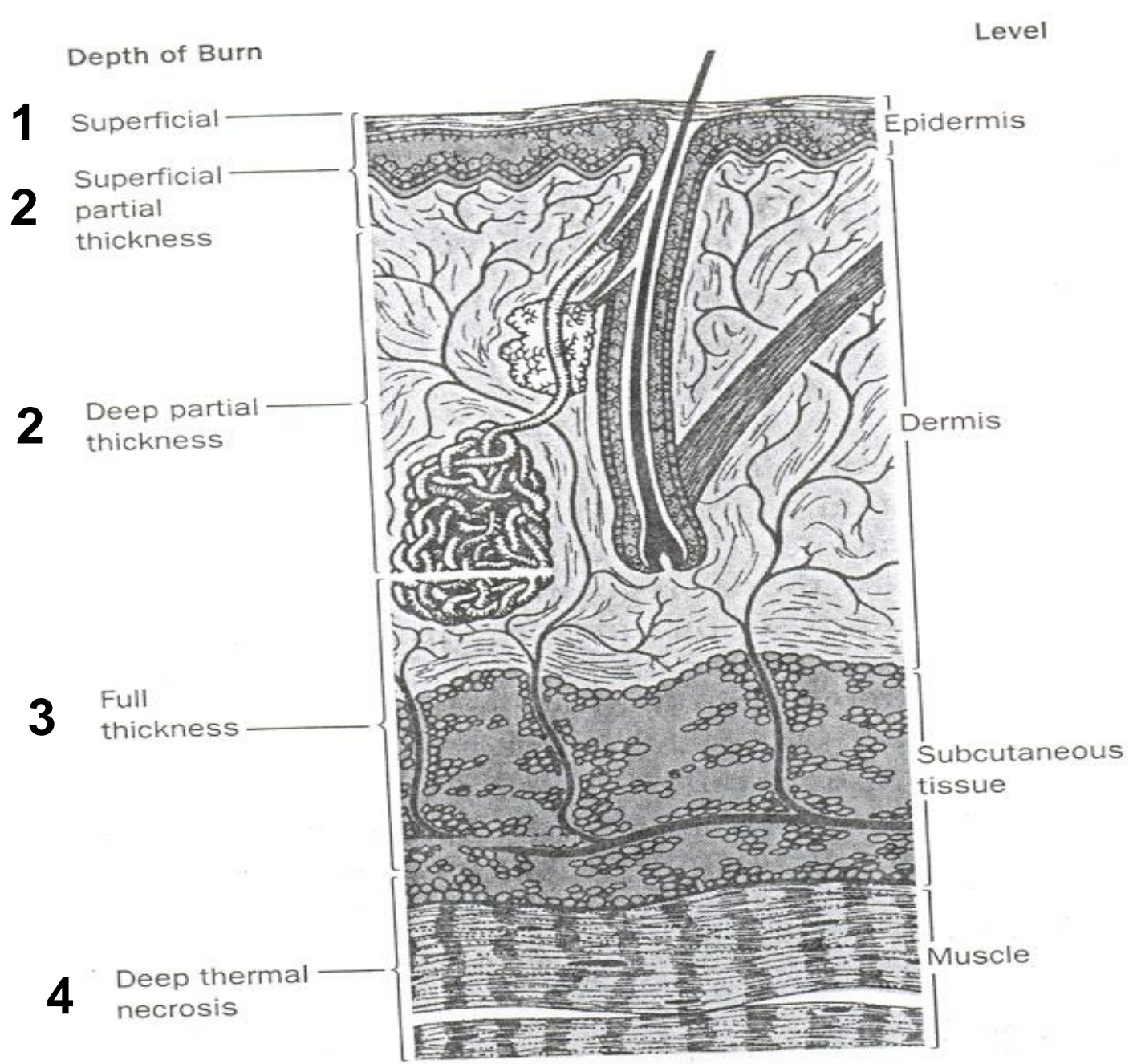
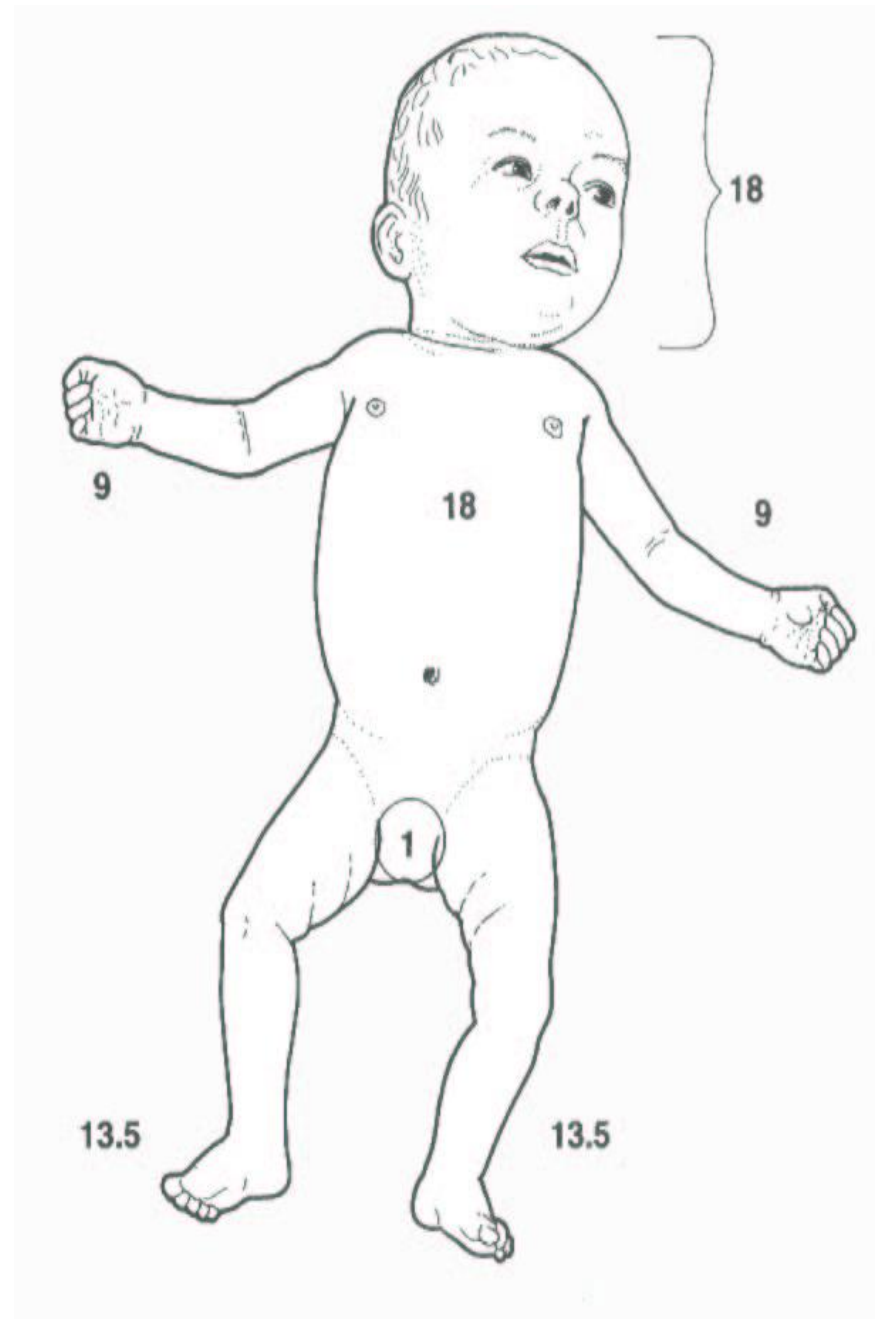
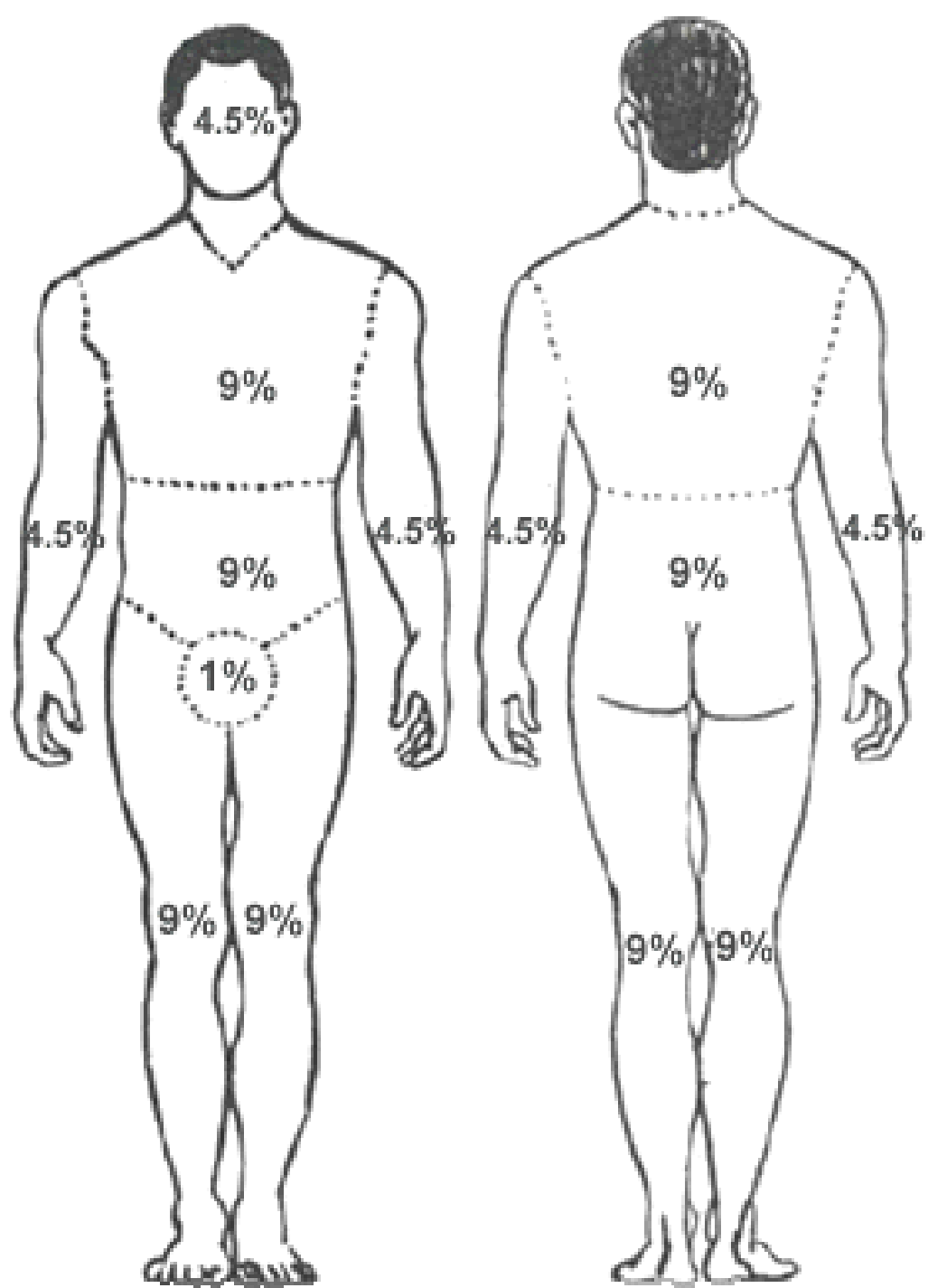


FIGURE 41-1 Cross-section of skin showing depth of burns.

Severity of Burns

- The severity of burns is determined quantitatively by the % of BSA affected and the depth of burn;
- The % of the adult body that has been burned can be estimated by the rule of nines (see figure)
- The total BSA is divided into 11 areas, each accounting for 9% or a multiple of 9 of the BSA plus the perineum area that accounts for 1% of BSA



Changes in the BSA with age (%)

Surface	Birth	1 yr	5yr	10yr	15yr	adult
Head	19	17	13	11	9	7
Neck	2	2	2	2	2	2
Trunk	26	26	26	26	26	26
Thighs	11	13	16	17	18	19
Legs	10	10	11	12	13	14
Feet	7	7	7	7	7	7

Severity of Burns



Classification of burn by depth:

- **First degree;** (Epidermis): superficial, erythematous, local pain, no blistering, *no scarring*. *Little epidermal alteration*. *Heals in 3-10 days*
- The Only treatment required: symptomatic relief of pain & fever and avoidance of additional injury
- *Sunburn is classified most often in this category*

Severity of Burns



Second degree; *superficial partial thickness burn* (Epidermis & the most superficial layer of the dermis):
Erythematous, local pain (more than 1° burn because of the irritation of nerve endings), elevated vesicle (blister) formation, little or no irreversible damage to dermis, depigmentation in some cases. Usually heals fully 3-4 wks with no scarring. Considered a partial-thickness burn

Second degree; *superficial partial thickness burn*

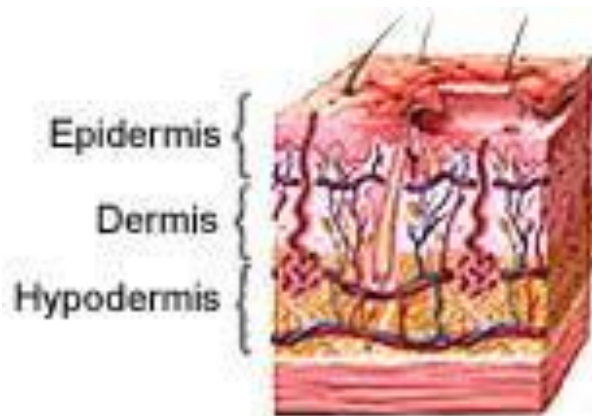
Healing is generally spontaneous, occurring within 2 to 3 weeks, with minimal or no scarring. If this type of burn occurs in a child or in a patient with multiple medical problems, or covers more than 10% BSA, fluid restoration may be required. The patient should be transported to a hospital emergency room. Lesser degrees of superficial partial-thickness burn injuries can often be managed in an ambulatory setting; small burns (1%–2% BSA)

can usually be managed through self-care. All superficial partial-thickness burns that have failed to heal within 2 weeks should be referred to a burn care specialist. Presence of pain, redness, exudate formation, fever, odor, or malaise that persists days or weeks after the initial injury is an indication for referral.⁷

Severity of Burns



- **Third degree; full thickness burn** (Entire depth of dermis & epidermis; may penetrate into subcutaneous tissue): *Extensive and partially irreversible damage to entire depth of skin, leathery/white mottled appearance (patchy white to red area) , too severe to blister.*
- *Pain may be more intense than superficial burns because of the irritation to nerve endings ,although some areas may lack sensation.*
- *Infection is a significant risk.*
- *Heals over several months.*
- Scarring probable, skin grafting maybe necessary to minimize scarring.
- Considered a **full-thickness burn.**



First degree
burn



Second degree
burn




Third degree
burn



Severity of Burns



- **Fourth degree;** (all layers of skin (full-thickness) and underlying tissue, including muscle):
 - charred, dry. Great risk of severe gram-positive or gram negative infection. Takes months to heal. Skin grafting necessary.
- The inflammatory response to a burn injury evolves over the first 24-48 hours, so the initial appearance of the injury can lead to an underestimation of its actual severity



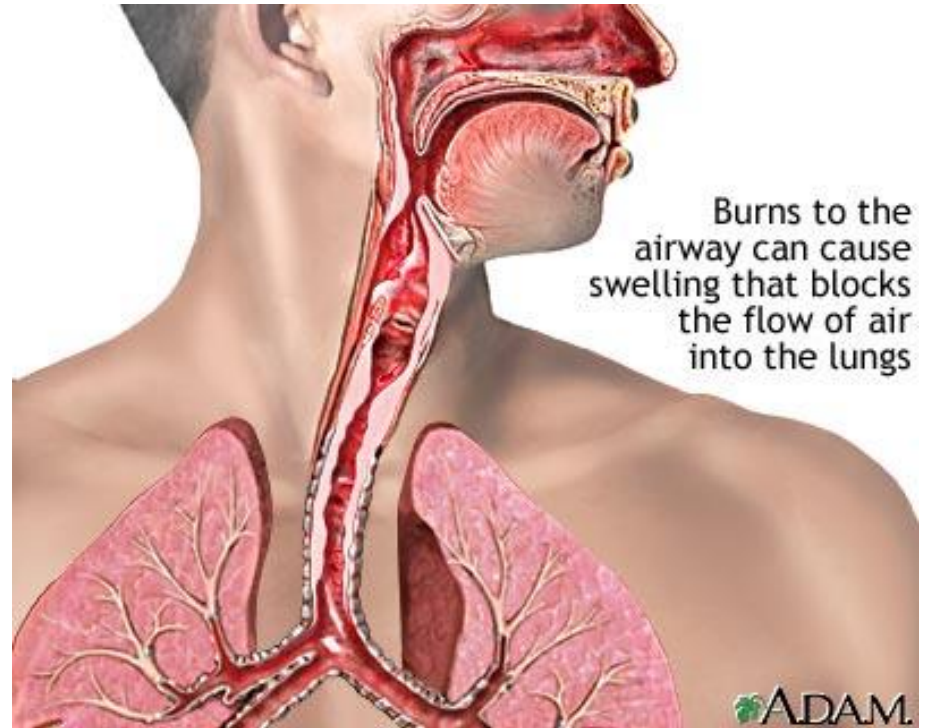
The traditional classification of burns as first, second, or third degree has been replaced by the terms *superficial*, *superficial partial thickness*, *deep partial thickness*, and *full thickness*, which are related to the depth of injury to the skin. Sunburn is discussed separately.



Second degree-blistering



First degree burns cause only reddening of the skin



Burns to the airway can be caused by inhaling smoke, steam, superheated air, or toxic fumes, often in a poorly ventilated space.

Categorization of Burns

TABLE 41-1 American Burn Association Injury Severity Grading System

Type of Burn	Criteria
Minor	<ul style="list-style-type: none">■ 15% BSA superficial and superficial partial-thickness burn in an adult■ 10% BSA superficial and superficial partial-thickness burn in a child■ 2% BSA deep partial-thickness or full-thickness burn in a child or adult not involving the eyes, ears, face, or genitalia
Moderate	<ul style="list-style-type: none">■ 15%–25% BSA superficial partial-thickness burn in an adult■ 10%–20% BSA superficial partial-thickness burn in a child■ 2%–10% BSA deep partial-thickness or full-thickness burn in a child or adult not involving the eyes, ears, face, or genitalia

Categorization of Burns

Major

- 25% BSA superficial partial-thickness burn in an adult
- 20% BSA superficial partial-thickness burn in a child
- All deep partial-thickness or full-thickness burns greater than 10% BSA
- All burns involving the eyes, ears, face, or genitalia
- All inhalation injuries
- Electrical burns
- Complicated burn injuries involving fractures or other major trauma
- All poor-risk patients (preexisting condition such as closed head injury, cerebrovascular accident, psychiatric disability, emphysema or lung disease, cancer, or diabetes)

Complications of Burn Injuries

- **Infection:** dangerous & difficult to treat; may increase depth of injury, delay healing, or invade the host, thereby causing systemic infection
- **Why difficult to treat?**
 1. Burned dead skin serve as growth medium for microorganisms
 2. Diffusion of systemic antimicrobials into avascular eschar is variable and unreliable

Thus, usually use prophylactic topical antibiotics. Systemic antibiotics are usually not used until symptoms warrant

Complications of Burn Injuries

- **Scar contracture:** produces a cosmetically unacceptable rigid scar that can limit functioning
- Can be minimized by: prolonged splinting, range-of-motion exercises (ROM), application of pressure such as the wearing of pressure garments, skin grafting or surgery
- **Hypertrophic scars (keloids):** large fibrous growths caused by an abnormal connective tissue response to injury



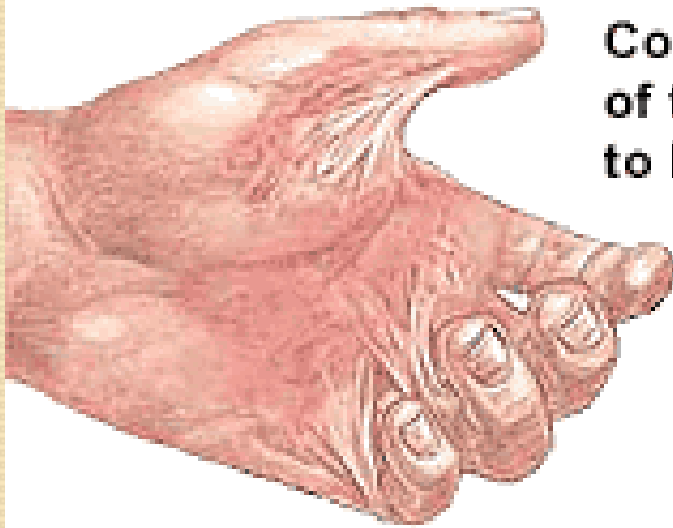


Scar contracture

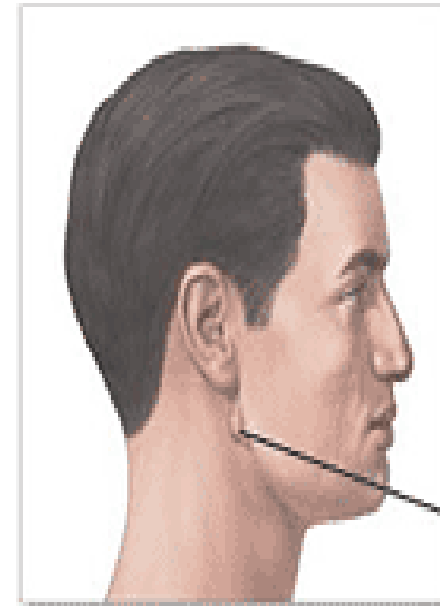


Pressure
garments





**Contracture
of the skin due
to burn injury**



Keloid Scar

Hypertrophic scars are red, thick and raised, however they differ from Keloid scars in that they do not develop beyond the site of injury or incision. Additionally, Hypertrophic scars will improve over time. This time however can be reduced with the help of steroid application or injections.

Sunburn



- It is an acute dermatologic reaction that results from excessive exposure to sunlight (especially those rays between 290 & 320 nm i.e. UVB)
- Several endogenous vasoactive mediators are responsible, especially prostaglandins & leukocytes
- UV light is filtered somehow by window glass, smoke and smog but readily passes through light clouds, fog and clear water
- Exposure to UV rays maybe enhanced by reflections off snow and sand

How does sunburn occur?

- Epidermis thickens and melanin production increases when a skin is exposed to sunlight (a normal protective response)
- People vary tremendously in their individual responses to such exposure
- Signs and symptoms of sunburn are seen in 1-24 hours after exposure

Symptoms of sunburn

- Mild exposure: erythema, with subsequent scaling and exfoliation of the skin. Pain & low grade fever may occur
- More prolonged exposure: pain, edema, skin tenderness and possibly blistering
- Systemic symptoms (similar to those of thermal burn): fever, chills, weakness & shock maybe seen in those in whom a large portion of BSA has been affected
- Following exfoliation and for several weeks thereafter, the skin will be more susceptible than normal to burning

Treatment of Burns

The pharmacist should feel confident to recommend treatment for:

- Minor 1° burns that do not cover an extensive area;
- Minor 2° burns that covers <1% of the BSA
- Burns do not involve the eyes, ears, face, feet, or perineum

Generally, all burns greater than 1°, or if the degree of the burn is difficult to determine should be evaluated by a doctor to prevent complications, particularly infections

Treatment of Burns

Exclusions for Self-Treatment

- Burn to BSA of 2% or more
- Burns involving eyes, ears, face, hands, feet, or perineum
- Chemical burns (use first-aid measures then seek medical attention)
- Electrical or inhalation burns
- Persons of advanced age
- Patients with DM or multiple medical disorders
- Immunocompromised patients

Self-treatment of minor burns

The goals in treating 1° & 2° burns are to:

1. Relieve pain associated with burn
2. Avoid maceration of the tissue
3. Prevent dryness
4. Provide a favorable environment for healing that minimizes the chances of infection and scarring

Thermal burns

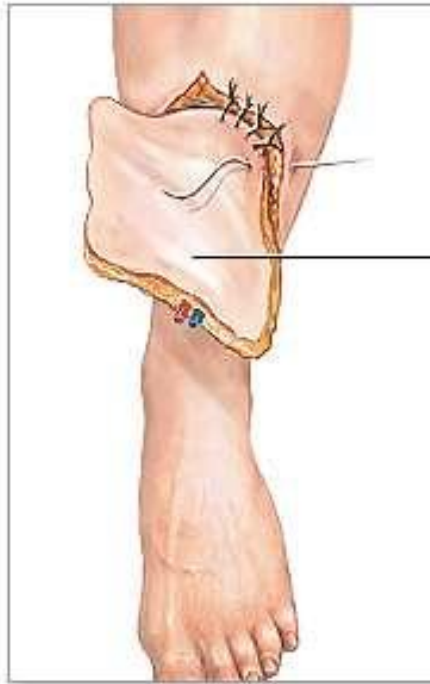
Include: flame, heat, sun and scald burns

1. Cool the affected area in cool tap water (no ice) for 10-30 minutes (prevent vasodilation → reduce redness and edema)
2. If depth & extent is serious → immersion is useful;
3. If blister formed → refer to doctor
4. Give analgesics for pain: aspirin, paracetamol, ibuprofen, naproxen or ketoprofen

Electrical Burns



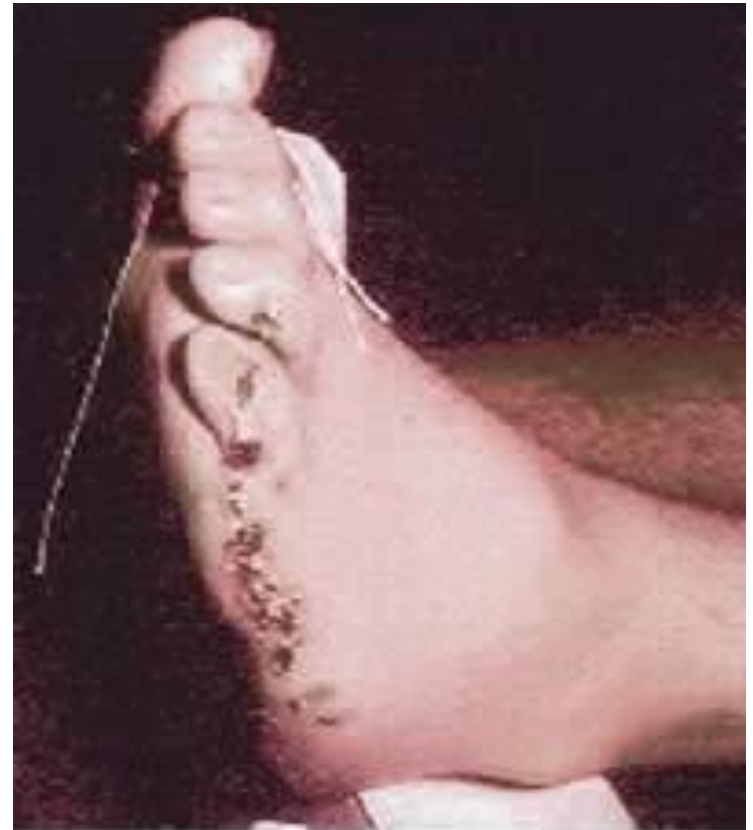
- Electrical burns should be referred to doctor unless very mild
- The only visible signs maybe the points of entrance and exit
- Some electrical burns are actually flash burns, in which no electricity has passed through the victim's body
- A flash burn is treated the same way as the thermal burn



Full thickness
skin graft with
artery and vein

adam.com

Skin grafting



**Arcing electrical burns
through the victim's shoe and
around the rubber sole.**

Chemical Burns

1. Any clothing on or near the affected area should be removed
2. Wash the affected area with tap water 15 mins-2 hrs until offending agent is removed
3. If eye is involved: eyelid should be pulled back and eye irrigated with tap water for at least 15-30 min (the irrigation fluid should flow from the nasal side of the eye to the outside corner to prevent washing the contaminants into the other eye) → then immediately refer to doctor
4. If offending agent is identified → contact poison information centre
5. No attempts should be made to antagonize or neutralize a chemical burn (may produce a thermogenic chemical reaction)

Sunburn

- Get out of the sunlight and avoid further exposure
- Minor sunburn can be relieved to some extent with cool compresses or cool bath
- Administration of analgesics (paracetamol, aspirin, ibuprofen etc) is recommended
- In case of heat stroke: patient exhibiting hyperpyrexia, confusion, weakness or convulsions should be referred to doctor

Sunburn

The extent of thermal injury to the skin is a function of the temperature generated and the duration of exposure. The skin can tolerate temperatures up to 104°F (40°C) for relatively long periods of time before injury. Temperatures above this produce a logarithmic increase in tissue destruction. Cell damage occurs as a result of protein denaturation. This damage is reversible unless temperatures exceed 113°F (45°C). At this temperature, protein denaturation exceeds the capacity for cellular repair.

Cleansing of Burns

- Cleansing the burn once or twice daily to remove dead skin is recommended
 1. Clean burn gently with water and bland soap, such as baby-wash (avoid alcohol-containing products: painful and drying)
 2. After cleansing: a non-adherent hypoallergenic dressing maybe applied if area is small
 3. If burn is extensive or area cannot be dressed easily, apply a skin protectant/lubricant (Allantoin, cocoa butter, petrolatum, shark liver oil, white petrolatum) may be applied
 4. If burn is weeping, soaking burn in warm tap water 3-6 times daily for 15-30 min will provide a soothing effect & diminish weeping

Dressings for Burns



- **Wound heal faster if they are not allowed to dry:**
 - I. First: a primary non-adherent layer of sterile fine-mesh gauze lightly impregnated with sterile petrolatum is applied over the skin. Petrolatum gauze does not stick to the wound & allows the burn exudates to flow freely through the dressing, thus avoiding tissue maceration
- Cotton or non-lubricated products should not be applied directly to the burn because they often stick to the burn & are painful and difficult to remove

Dressings for Burns

2. Secondly, an absorbent intermediate layer of piled-up gauze is applied over the petrolatum gauze. This layer draws and stores exudates away from the wound, protecting against maceration. This layer should be applied loosely to accommodate edema, should it occur;
3. Finally, a supportive layer of rolled gauze bandage should be applied over the primary & intermediate gauze layers to hold these layers in place & mildly restrict movement. Elastic or other expandable bandages that tighten should not be used as they could restrict circulation if edema develops

Dressings for Burns

- Dressing should be changed every 24-48 hours
- **What to do if dressing sticks to wound?**
- **How to know the wound is infected?**
- If affected skin begins to become macerated (i.e. if it feels or looks wet, wrinkled or macerated), dressing should be discontinued and the wound should be exposed to air
- Once pain subsides and wounds begin to heal (usually 4-10 days), wound dressing may be discontinued

Pharmacologic agents

- Skin protectants
- Analgesics
- Local anesthetics
- Topical hydrocortisone
- Antimicrobials
- Vitamins
- Counterirritants
- Miscellaneous Agents

Skin Protectants

- Provide only symptomatic relief, make the wound area less painful by protecting against mechanical irritation caused by friction and rubbing & by preventing drying of stratum corneum
- The patient with minor burn may apply skin protectants as often as needed
- **FDA has recognized:** Allantoin, cocoa butter, petrolatum, shark liver oil and white petrolatum as safe and effective for temporary protection of minor burns and sunburns

Analgesics

- Help to alleviate pain associated with minor burns. NSAIDs also may decrease erythema and edema
- The use of various systemic NSAIDs has been shown to decrease inflammation caused by exposure to UV radiation. However, this effect has been shown to last only for 24 hours, (**WHY?**)
- Paracetamol can be used (weak prostaglandin inhibitor, not anti-inflammatory agent, for patients who cannot tolerate NSAIDs)

Local Anesthetics

- **FDA approved safe & effective for use in minor burns:** benzocaine, butamben picrate, dibucaine HCL, Pramoxine HCL, Dyclonine HCL, Lidocaine HCL, Tetracaine HCL
- The higher concentrations of LA are appropriate for burns in which the skin is intact, the lower concentrations are better for skin that has been broken
- Should be applied no more than 3-4 times daily. Since their duration of action is short (15-45 min), continuous pain relief can't be obtained with these agents. If used more often, this will increase the risk of hypersensitivity reactions and systemic toxicity due to enhanced absorption
- Should be applied only to small areas to avoid systemic toxicity.
- Should never be used to treat serious burns **(WHY?)**

Topical Hydrocortisone

- Although not FDA approved for treatment of minor burns, 1% topical hydrocortisone is often used in the first aid treatment of minor burns covering small areas
- Should be used with caution if skin is broken → as it may allow infections to develop
- Topical HC with high potency has been shown to decrease collagen synthesis & reepithelialization in dermal wounds, while low potency (1%) does not interfere with skin resurfacing

Antimicrobials

- Crucial in major burns. May be used in minor burns in which the skin has been broken (dicloxacillin, erythromycin, cephalexin, trimethoprim-sulfamethoxazole)
- Prophylactic application of a double or triple antibiotics to minor burns should be done with caution (**WHY?**)

Antimicrobials

Silver sulfadiazine (SSD) has been the gold standard agent used traditionally for the outpatient management of minor or partial-thickness burns. Recent studies have questioned the appropriateness of this practice owing to a lack of superiority demonstrated in trials comparing SSD to honey and membrane-like dressings.¹⁷ Recent findings also suggest that SSD may delay wound healing and may have cytotoxic activity on host cells.¹⁸ However, for minor burns, nonprescription first-aid antibiotic or antiseptic products are of limited value, especially on burns in which the skin is intact. These preparations may be used on minor burns when the skin has been broken. Chapter 42 dis-

Vitamins

- The benefits of vitamins for minor burns are not known
- Vitamin C plays a key role in wound healing because it is required for collagen synthesis. Since it is not stored in the body, it is given in a dose up to 2 g daily from time of injury until healing is complete;
- Individuals with good nutritional status may not benefit from vitamin or mineral supplementation
- However, those persons whose dietary intake is suboptimal could benefit from temporary supplementation of multivitamin/mineral preparations

Vitamins

Animal studies indicate that vitamin A enhances healing in a variety of wounds. Following serious injury, the patient may have an increased requirement for vitamin A. In addition, deficiency states are associated with increased infections. Because vitamin A is stored in large amounts in the liver, supplemental vitamin A should not be used for long periods. Minor burn injuries will probably not benefit from supplemental oral vitamin A, but topical vitamin A (fish or shark liver oil-based products) may be helpful.

Counterirritants

- Although currently approved by FDA for use in minor burns, camphor, menthol and icthamol are still being evaluated for such use
- Although they do reduce pain by stimulating sensory nerve fibers, they also increase blood flow to the area, causing further development of edema in the area
- They also further irritate the already sensitized & damaged skin

Miscellaneous

- **Neosporin ointment (what is it?)**
- **benzoyl peroxide lotion 10% & 20%**
- **Topical forms of aloe vera and vitamin E;**
- **Silver sulfadiazine cream**

have all been shown to increase the rate of healing

Product selection guidelines

If a topical anesthetic or hydrocortisone is to be used, the clinician should recommend the most appropriate product formulation. Such products are available as ointments, creams, solutions (lotions), and sprays (aerosols).

Ointments are oleaginous-based preparations. They provide a protective film to impede the evaporation of water from the wound area, which helps keep the skin from drying. However, if the skin is broken, an ointment may not be appropriate because of its impermeability. The presence of excessive moisture trapped beneath the application may promote bacterial growth or maceration of the skin, thereby delaying healing. Ointments are more appropriate for minor burns in which the skin is intact. Creams are emulsions that allow some fluid to pass through the film and are best for broken skin. Generally, creams are easier to apply and remove than are ointments. To prevent contamination of the preparation, the patient should not apply ointments and creams directly onto the burn from the container.

Moist Exposed Burn Ointment (MEBO)

Medicinal components: b-sitosterol, bacailin, berberine,

- having analgesic, anti-inflammatory, anti-infection effects on burn wound and capable of minimizing scar formation after healing.

Nutritional components: amino acids, fatty acids and amylose,

- providing nutrition for the regeneration and repair of burned skin.

http://www.medbc.com/annals/review/vol_15/num_3/text/vol15n3p120.asp

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THE EFFECT OF MOIST EXPOSED BURN OINTME...

Page Tools

Annals of Burns and Fire Disasters - vol. XV - n. 3 - September 2002

THE EFFECT OF MOIST EXPOSED BURN OINTMENT ON MAINTAINING A PHYSIOLOGICAL MOIST ENVIRONMENT IN TREATING BURN WOUND

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SUMMARY. Objective: To investigate the effect of moist exposed burn ointment (MEBO) on the maintenance of a physiological moist environment in burn wound treatment. Method: A rabbit model with deep-second degree burn wound was used in this study. Observations were conducted at 0 hours (before burn), at 0.5, 6, 24, 48, 72 hours and 7 days post-burn, and after wound healing. Water evaporation, gross appearance, pathological changes, and the healing time of burn wounds treated with MEBO were studied, and the findings were compared with those of burn wounds treated respectively with either Vaseline or conventional dry exposed therapy. Results: It was found that water evaporation in MEBO-treated wounds was similar to that in normal skin and significantly less than that in wounds treated with dry exposed therapy ($p < 0.01$). MEBO did not obstruct proper water evaporation from wound as Vaseline did ($p < 0.01$). MEBO-treated wounds retained good breathing properties and adequate drainage and healed faster than dry exposed wounds. The difference was statistically very significant ($p < 0.01$). Conclusion: MEBO provided burn wounds with a physiological moist environment that promoted tissue regeneration and wound repair.

Introduction

Many controlled studies have confirmed that wounds heal more readily in a moist, physiological environment. Maintenance of a moist wound environment facilitates the wound-healing process.^{1,2} In contrast, prevention of dehydration results in a marked delay in the healing of partial-thickness burn wounds. Moist exposed burn therapy (MEBT) was developed in China by Professor Rong-xiang Xu. The essential purpose of MEBT is to keep the burn wound in an optimal physiological moist environment by using a specially designed ointment, i.e. moist exposed burn ointment (MEBO). Composed of natural plant extracts dissolved in refined sesame oil as base with beeswax as preservative, MEBO ointment is topically used for burn treatment, promoting the discharge and removal of debris

and new proliferated capillaries. In contrast, dry exposed therapy treated wounds healed with capillary proliferation and incomplete regeneration of the epidermis, dermis, and skin appendages.

The results of our study indicated that MEBO effectively prevented excessive loss of body fluid from wound evaporation throughout the course of burn wound treatment. It was beneficial to shock resuscitation and the prevention of hypertonic dehydration after thermal injury. The unique dosage form and pharmacokinetic features of MEBO are considered to be responsible for its moisture-maintaining effect. The following aspects may account for the mechanism of its action:

1. MEBO has a unique dosage form with a frame structure; when applied to a wound, it warms up and creates an equilibrium of two phases, liquid and semi-solid. The ointment layer isolates the wound from external irritation and prevents excessive water evaporation from the wound surface.
2. The MEBO base contains hydrophilic and lipophilic groups and has high surface activity. It has a higher affinity to the wound tissues than water and thus forms a strong adsorptive film on the wound surface, protecting it from maceration and dehydration.^{10,13}

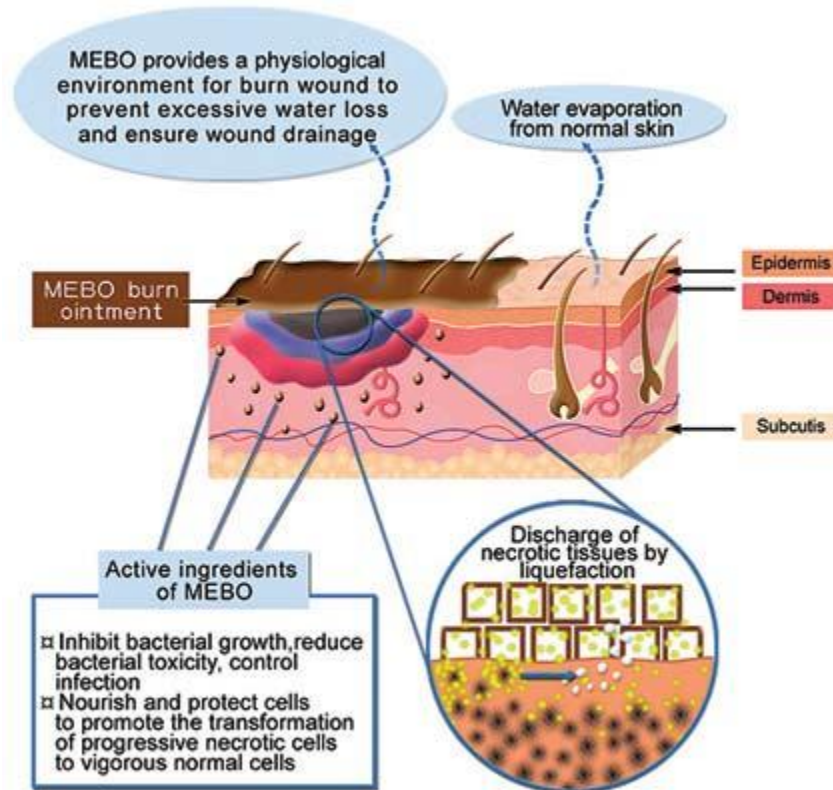
Conclusions

This study showed that burn wounds treated with MEBO had markedly less water evaporation than burns treated with conventional dry exposed therapy, while wound water evaporation was nearly the same as that of normal skin. Unlike Vaseline, MEBO offered good air permeability and allowed active drainage. Excess water and exudate can thus evaporate or be removed. MEBO can provide a moist physiological environment that is favourable to wound healing.

RESUME. But: Les Auteurs se sont proposés d'investiguer l'effet d'un onguent pour les brûlures exposées humides (sigle anglais, MEBO: moist exposed burn ointment) sur la maintenance d'un environnement physiologique humide dans le traitement des brûlures. Méthode: Un modèle de lapins atteints de brûlures de deuxième degré a été utilisé dans cette étude. Les observations ont été conduites à 0 heures (avant la brûlure), à 0,5, 6, 24, 48 et 72 heures et 7 jours après la brûlure, et après la guérison. L'évaporation hydrique, l'aspect macroscopique, les modifications pathologiques et le temps de guérison des brûlures traitées avec le MEBO ont été étudiés, et les résultats ont été comparés aux résultats du traitement des brûlures traitées avec la Vaseline ou la thérapie conventionnelle exposée sèche. Résultats: Les Auteurs ont trouvé que l'évaporation hydrique dans les lésions traitées avec le MEBO était semblable à celle de la peau normale et était significativement mineure par rapport aux lésions traitées avec la thérapie exposée sèche ($p < 0.01$). Le MEBO n'obstruait pas l'évaporation hydrique normale de la lésion comme le faisait la Vaseline ($p < 0.01$). Les lésions traitées avec le MEBO conservaient de bonnes propriétés de respiration et un drainage suffisant et guérissaient plus rapidement que les lésions exposées sèches. La différence était statistiquement très significative ($p < 0.01$). Conclusion: Le MEBO fournit un environnement physiologique

Therapeutic Effects

- 1) Relieve wound pain
- 2) Prevent progressive necrosis of wound tissues
- 3) Discharge necrotic tissues by liquefaction without causing secondary injury while the residual viable tissues are in the process of regeneration
- 4) Create a physiologically moist environment for physiological repairing of residual skin tissues To realize skin regeneration in compliance with the mode of histological regeneration
- 5) Control infections by non-bactericidal way
- 6) Initiate PRCs and stem cells in vivo and in situ to heal wounds physiologically and with minimized scars
- 7) Minimize the need for skin grafting







EMU OIL



EMU OIL

Reference:

1. Qiu XW, Wang JH, Fang XW, Gong ZY, Li ZQ, Yi ZH. Anti-inflammatory activity and healing-promoting effects of topical application of emu oil on wound in scalded rats. *Di Yi Jun Yi Da Xue Xue Bao*. 2005 Apr;25(4):407-10. [Chinese].
2. S. O'Banion, J. Griswold . "Evaluation of Emu Oil in Lubrication and Treatment of Healed Burn Wounds. Texas Tech University Health Sciences Center, Lubbock, Texas. American Burn Association, March 18, 1998, Chicago, Illinois.

Conclusion:

Emu oil has topical anti-inflammatory activity in rats with superficial II degree scald, possibly in association with decreased levels of the proinflammatory cytokines in the tissues and can promote wound healing by inhibiting local secondary inflammation.

EMU OIL

Emu oil composition:

- 100% monounsaturated fatty acids (oleic acid, linoelic acid)
- Does not contain phospholipids

This will facilitate penetration thorough the skin

Characteristics of emu oil:

- anti-bacterial (bacteriostatic)
- anti-inflammatory (oleic acid, linoleic acid)
- non-comedogenic (will not clog pores).
- Non-irritating
- enhances growth of skin and hair follicles
- has a natural SPF that enhances sunscreens
- can be taken orally, ingested and injected



Emu oil

- penetrate through and condition multiple layers of skin,
- reduce swelling and muscle soreness
heal burns, wounds, injuries, minor cuts and scratches
- prevent and reduce scarring by enhancing the skin's re-epithelialization,
- improve condition and rate of growth of hair, skin and nails,
- soothe discomfort from sunburns, insect bites, acne, eczema and rashes

Patient education and counseling

PATIENT EDUCATION FOR Minor Burns and Sunburn

The objectives of self-treatment are to (1) relieve the pain and swelling, (2) protect the burned area from further physical injury, and (3) avoid infection and scarring of the burned area. For most patients, carefully following product instructions and the self-care measures listed here will help ensure optimal therapeutic outcomes.

Nondrug Measures

- Treat superficial burns with no blistering as follows:
 - Immerse the affected area in cool tap water for 10–30 minutes.

PATIENT EDUCATION FOR Minor Burns and Sunburn *(continued)*





- Cleanse the area with water and a mild soap.
- Apply a nonadherent dressing or skin protectant to the burn.
- For small burns with minor blistering, follow the first two steps above, but use a hydrocolloid dressing to protect the burn.
- If possible, avoid rupturing blisters.
- For sunburns, avoid further sun exposure and follow the previous procedures according to whether blistering is present.


Nonprescription Medications

- For superficial burns (including sunburn) with unbroken skin, treat the affected area with thin applications of skin protectants or topical anesthetics using a tissue to reduce the risk of infection from the fingertips.
- If the skin is broken, use topical antibiotics to prevent infection.
- If nutritional status is poor, take supplements for vitamins A, B, and C.
- Do not apply camphor, menthol, or ichthammol to the burn.

- For temporary relief of pain, take aspirin, acetaminophen, ibuprofen, or naproxen (see Chapter 5 for dosage guidelines and safety considerations).

 If a skin rash, weight gain, swelling, or blood in the stool occurs while taking pain relievers, report these side effects to a primary care provider.

 Report immediately to a primary care provider any redness, pain, or swelling that extends beyond the boundaries of the original injury.

 If the burn seems to worsen or is not healed significantly in 7 days, see a primary care provider for further treatment.

Evaluation of patient outcomes

Burn wounds should be reassessed after 24 to 48 hours, because the full extent of skin damage may not be initially apparent. If the burn has progressed or worsened, the patient should be referred to an appropriate health care professional for further evaluation.

The burn wound should exhibit decreased redness during healing. Signs of cellulitis or tissue infection, such as increasing redness, pain, and swelling that extend beyond the boundaries of the original wound, or signs of contact dermatitis from topical treatment suggest the need for further evaluation.

Burned skin is more susceptible to sunburn for several weeks after initial injury, so avoiding sun exposure and using sunscreen agents during this period are recommended.

Key points for minor burns

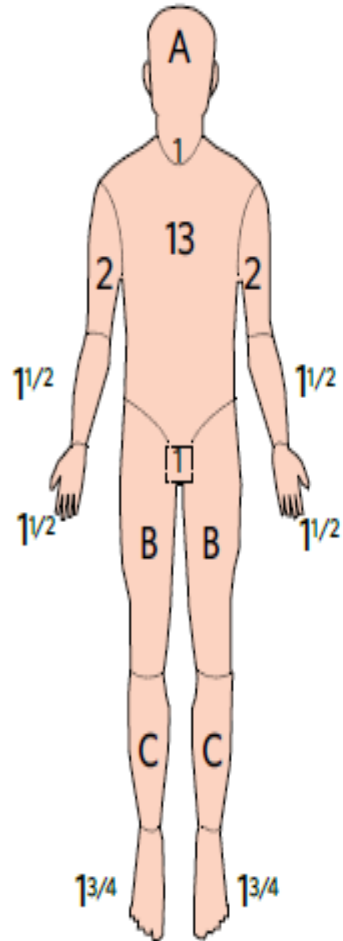
- Minor burns and sunburn can often be treated with self-care. However, deeper burn injuries or burns affecting more than 1% to 2% of BSA require medical attention.
- Burn injuries may increase in severity over the first 24 to 48 hours, so reassessment is always necessary.
- Patient complaints usually focus on pain. Skin protectants and dressings should be recommended, and aspirin or NSAIDs are often helpful. The type of dressing or skin protectant used depends on whether the wound is dry or weeping. Blisters should not be ruptured. Topical hydrocortisone or anesthetics may provide additional relief in some patients but should be used sparingly on broken skin. Counterirritants should be avoided.
- Vitamins, whether systemic or topical, are generally of no value unless the patient is malnourished.
- Photosensitization reactions can often be assessed by history and must be distinguished from ordinary sunburns.

Case based approach

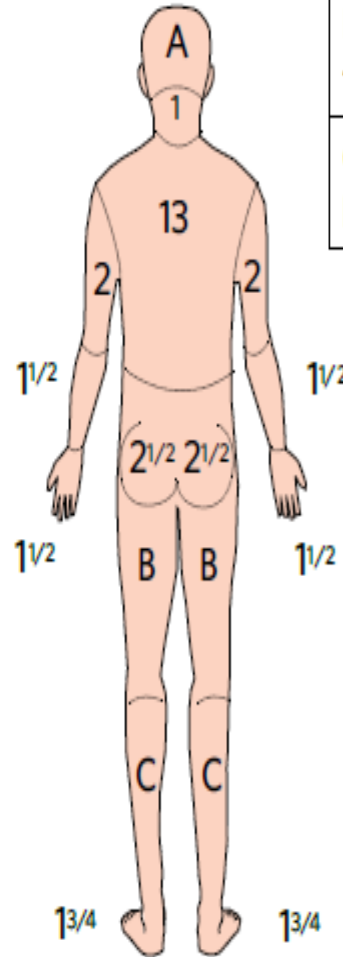
- **See case 41-1 from handbook of non prescription drugs (16th edition)**

FIGURE 16: Lund and Browder chart

% Total body surface area burn



Region	%	
	PTL	FTL
Head		
Neck		
Ant. trunk		
Post. trunk		
Right arm		
Left arm		
Buttocks		
Genitalia		
Right leg		
Left leg		
Total burn		



Area	Age 0	1	5	10	15	Adult
A= 1/2 of head	9 1/2	8 1/2	6 1/2	5 1/2	4 1/2	3 1/2
B= 1/2 of one thigh	2 3/4	3 1/4	4	4 1/2	4 1/2	4 3/4
C= 1/2 of one lower leg	2 1/2	2 1/2	2 3/4	3	3 1/4	3 1/2

FIGURE 18: Palmar surface



The hand area (palm and digits) approximates to 1% of the total body surface area⁴⁴

TABLE 2: Characteristics of burn types according to depth

Burn type	Appearance	Blisters	Capillary refill/ blanching on pressure	Sensation	Treatment
Superficial epidermal (superficial/first degree)	Red and glistening (moist)	Not present	Brisk	Painful	Usually heals within 7 days with conservative treatment No scarring
Superficial dermal (superficial partial thickness)	Red/pale pink	Large blisters	Brisk, but with slower return	Painful	Usually heals within 14 days with conservative treatment No scarring
Deep dermal (deep partial thickness)	Dry, blotchy/mottled and cherry red/stained appearance	May be present	Absent	Variable	Although can heal with conservative treatment, complex burns may require surgical intervention Possible scarring
Full thickness (third degree)	Dry, leathery, white or black (charred). Eschar may be present	Not present	Absent	Absent	Complex full thickness wounds seldom heal with conservative treatment. Usually requires surgical intervention

TABLE 3: Common dressing types for non-complex burns

Type	Description	Actions	Indications/use	Precautions/contra-indications
Alginate/ carboxy- methyl cellulose (CMC)	Alginates are a natural wound dressing derived from algae and seaweed These may be combined with CMC gelling fibres Dressings made from CMC alone are known as Hydrofiber	Absorbs fluid Promotes autolytic debridement Moisture control Conforms to wound bed	Moderate to high exudate	Do not use on dry wounds Use with caution on friable tissue (may cause bleeding)
Foam	Generally made from a hydrophilic polyurethane foam	Absorbs fluid Moisture control Conforms to wound bed	Moderate to high exudate May be left in place for 2-3 days	Do not use on burn wounds with minimal exudate
Honey	Wound dressing incorporating medical-grade honey	Antimicrobial	Sloughy, low to moderate exudate wounds and/or evidence of local infection	May cause 'drawing' pain (osmotic effect) Known sensitivity
Hydrocolloid	Opaque dressing made of gel-forming components. Dressings are biodegradable, non-breathable (occlusive) and adhere to the skin	Absorbs fluid Promotes autolytic debridement	'Difficult-to-dress areas', such as digits, heel, elbow, sacrum	Do not use on highly exuding burns May cause maceration May cause hypergranulation
Hydrogels	Hydrophilic polymer dressing	Moisture control Promotes autolytic debridement Cooling	Sloughy wounds	Do not use on highly exuding wounds or where anaerobic infection is suspected May cause maceration
Low-adherent	Wound contact layer or dressing with silicone or lipo-colloid matrix	Protects new tissue growth Atraumatic to periwound skin Conformable to body contours	Low or minimal exudate	Known sensitivity to silicone

TABLE 3: Common dressing types for non-complex burns

Type	Description	Actions	Indications/use	Precautions/contra-indications
Polyhexanide (PHMB)	Antiseptic impregnated dressing	Antimicrobial	Low to high exuding wounds Clinical signs of local infection	Known sensitivity to PHMB
Polyurethane film	Semi-permeable dressing	Moisture control Breathable bacterial barrier Transparent (allows visualisation of wound)	Low exudate May be left in place for 2-3 days	Should not be used in infected or heavily exuding burns
Silver	Topical preparations including SSD cream, impregnated dressings and paste Combined presentation with foam and alginates/CMC for increased absorbency	Antimicrobial	Clinical signs of local infection Low to high exudate	Some may cause discolouration Known sensitivity Discontinue after 2 weeks if no improvement and re-evaluate

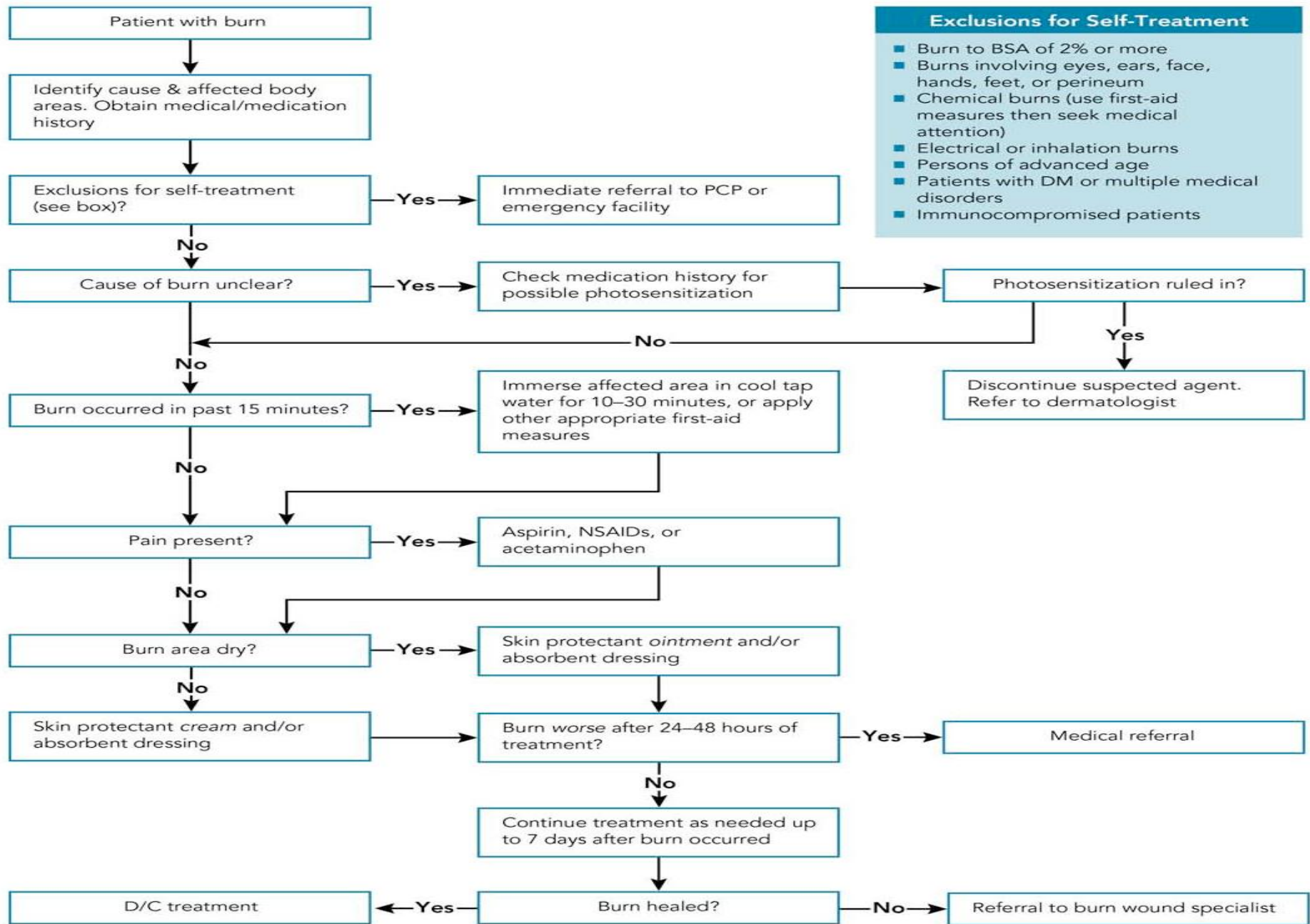


FIGURE 41-2 Self-care of minor burns and sunburn. Key: BSA, body surface area; D/C, discontinue; DM, diabetes mellitus; NSAID, nonsteroidal anti-inflammatory drug; PCP, primary care provider.