Lecture 12

Subject

Management of Patients with Burn Injury

Theoretical

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Burns

- ✓ Burn injuries, which result from damage to the skin or other tissues from heat, chemicals, electricity, or radiation, most commonly occur in the home or work setting.
- ✓ Globally, they account for approximately 180,000 deaths and significant morbidity each year; however, many are preventable (World Health Organization [WHO], 2018).
- ✓ Majority occurring in middle- to low-income populations.

TABLE 57-2 Pathophysiologic Changes with Severe Burns

Body System	Physiologic Changes
Cardiovascular	Cardiac depression, edema, hypovolemia
Pulmonary	Vasoconstriction, edema
Gastrointestinal	Impaired motility and absorption, vasoconstriction, loss of mucosal barrier function with bacterial translocation, increased pH
Kidney	Vasoconstriction
Other	Altered thermoregulation, immunodepression, hypermetabolism

Adapted from Bielson, C. B., Duethman, N. C., Howard, J. M., et al. (2017). Burns: Pathophysiology of systemic complications and current management. *Journal of Burn Care & Research*, *38*(1), e469–e481.

Signs of the burn

1 localized redness

2 swelling, pain, blister and shock

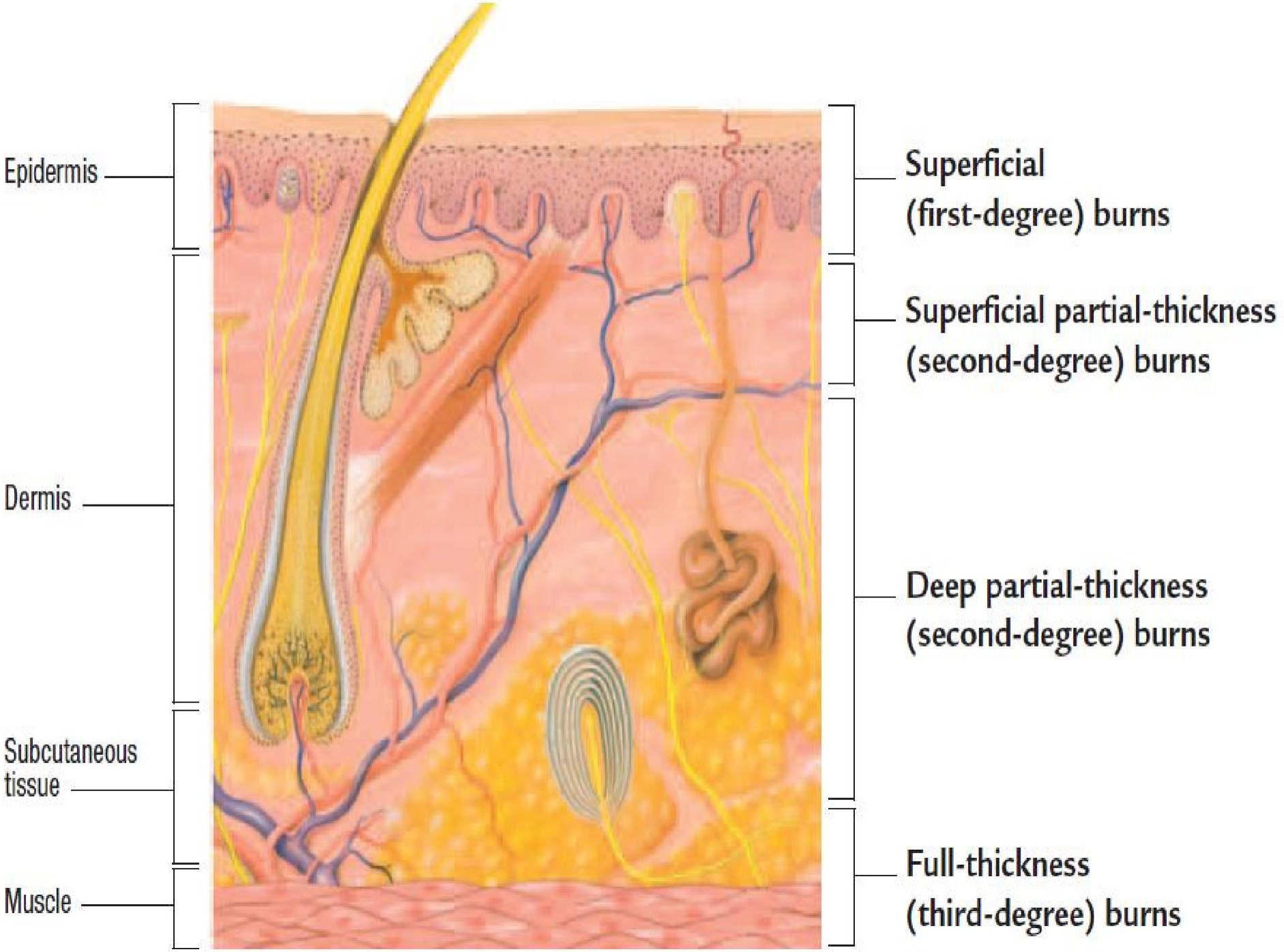
Types of Burn Injury

1. **Thermal**
2. **Chemical**
3. **Electrical**
4. **Radiological**

Classification of Burn Injuries

Burns are classified according to the depth of tissue destruction

A. **First-Degree**
B. **Second-Degree**
C. **Third-Degree**
D. **Fourth Degree**


Epidermis
Dermis
Subcutaneous tissue
Muscle
Superficial (first-degree) burns
Superficial partial-thickness (second-degree) burns
Deep partial-thickness (second-degree) burns
Full-thickness (third-degree) burns

First-degree burns are superficial injuries that involve only the outermost layer of skin. These burns are erythematous, only the epidermis is intact; if rubbed, the burned tissue does not separate from the underlying dermis. Complete recovery within view days.

Second-degree burns: involve the entire epidermis and varying portions of the dermis. They are painful and with blister formation. Healing time depends on the depth of dermal injury and typically ranges from 2 to 3 weeks. Hair follicles and skin appendages remain intact.

Third-degree (full-thickness) burns:

1 Destruction of the epidermis and dermis

2 Wound color ranges widely from pale white to red, brown, or charred.

3 The burned area lacks sensation because nerve fibers are damaged.

4 The wound appears leathery; hair follicles and sweat glands are destroyed.

5 The severity of this burn is often deceiving to patients because they have no pain in the injury area.

Figure 62-1 • Third-degree (full-thickness)

Fourth-degree burns (deep burn necrosis) are those injuries that extend into deep tissue, muscle, or bone.

Severity of burn injury

The severity of each burn injury is determined by multiple factors.

1 Age of the patient.

2 Depth of the burn.

3 Amount of surface area of the body that is burned.

4 The presence of inhalation injury; presence of other injuries.

5 Location of the injury in areas such as the face, the perineum, hands, or feet.

6 The presence of a past medical history.

Rule of 9’s

- The “Rule of 9’s” is commonly used to estimate the burned surface area in adults.

- The body is divided into anatomical regions that represent 9% (or multiples of 9%) of the total body surface.

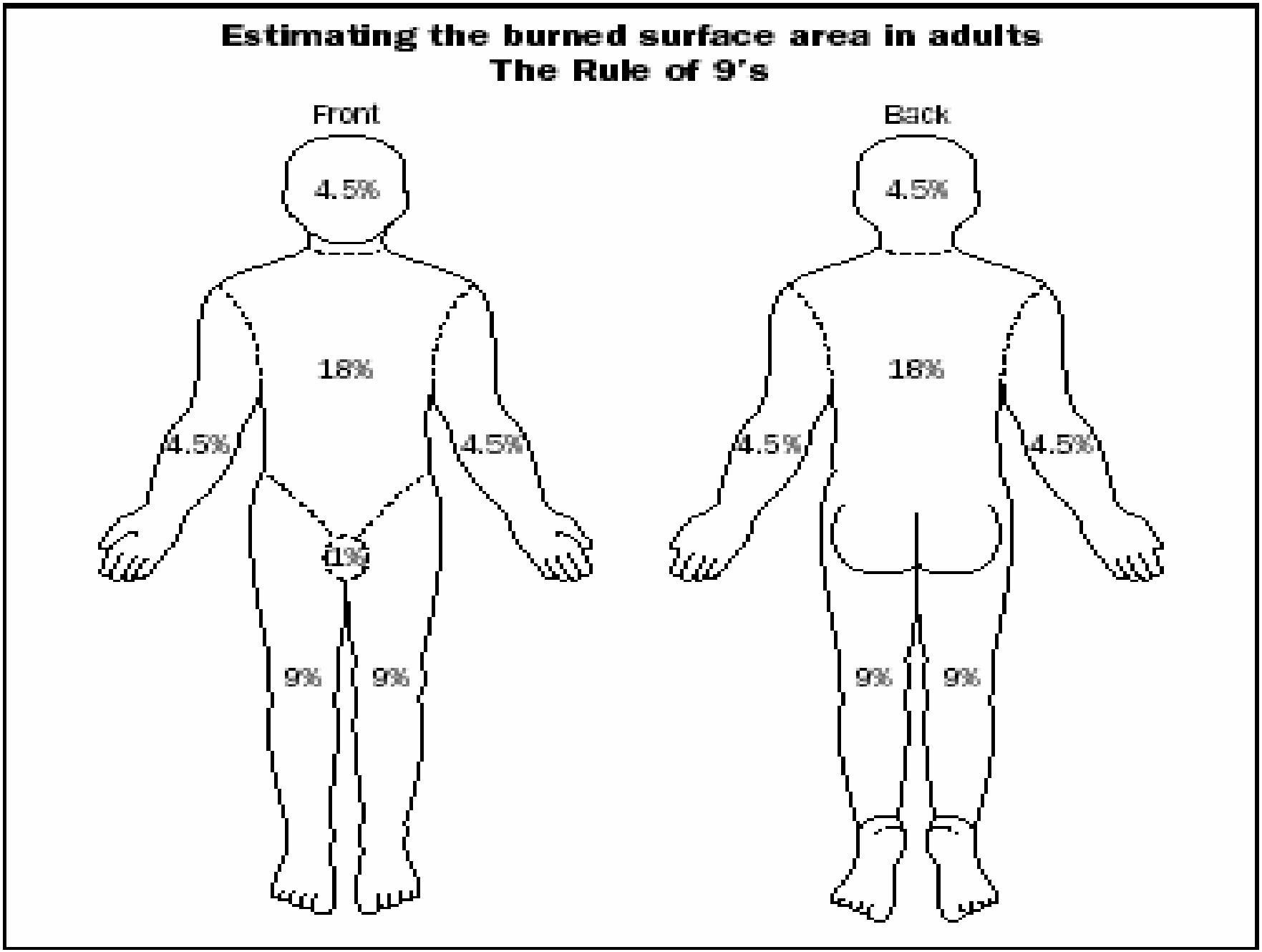
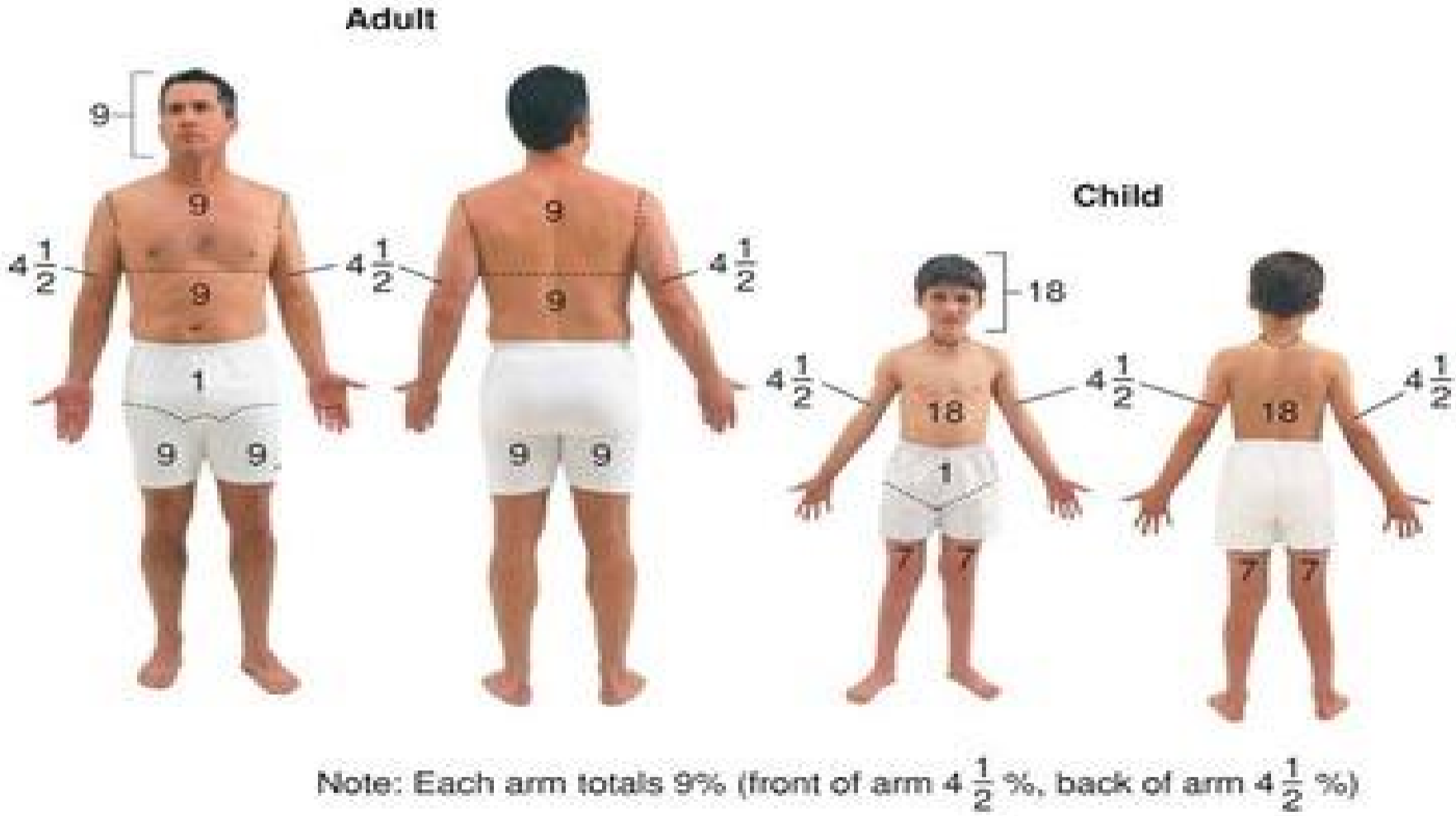

Estimating the burned surface area in adults
The Rule of 9's
Front
4.5%
18%
4.5%
4.5%
1%
9%
9%
Back
4.5%
18%
4.5%
4.5%
9%
9%

Figure 7

The Rule of Nines



Note: Each arm totals 9% (front of arm $4\frac{1}{2}$ %, back of arm $4\frac{1}{2}$ %)

The Parkland formula

The ABA (2018) fluid resuscitation formula for adults within 24 hours post thermal or chemical burn is as follows:

2 mL LR × patient's weight in kilograms × %TBSA

For adults with electrical burns:

4 mL LR × patient's weight in kilograms × %TBSA

- **So:** 50% given in first 8 hours;
- 50% given in next 16 hours.

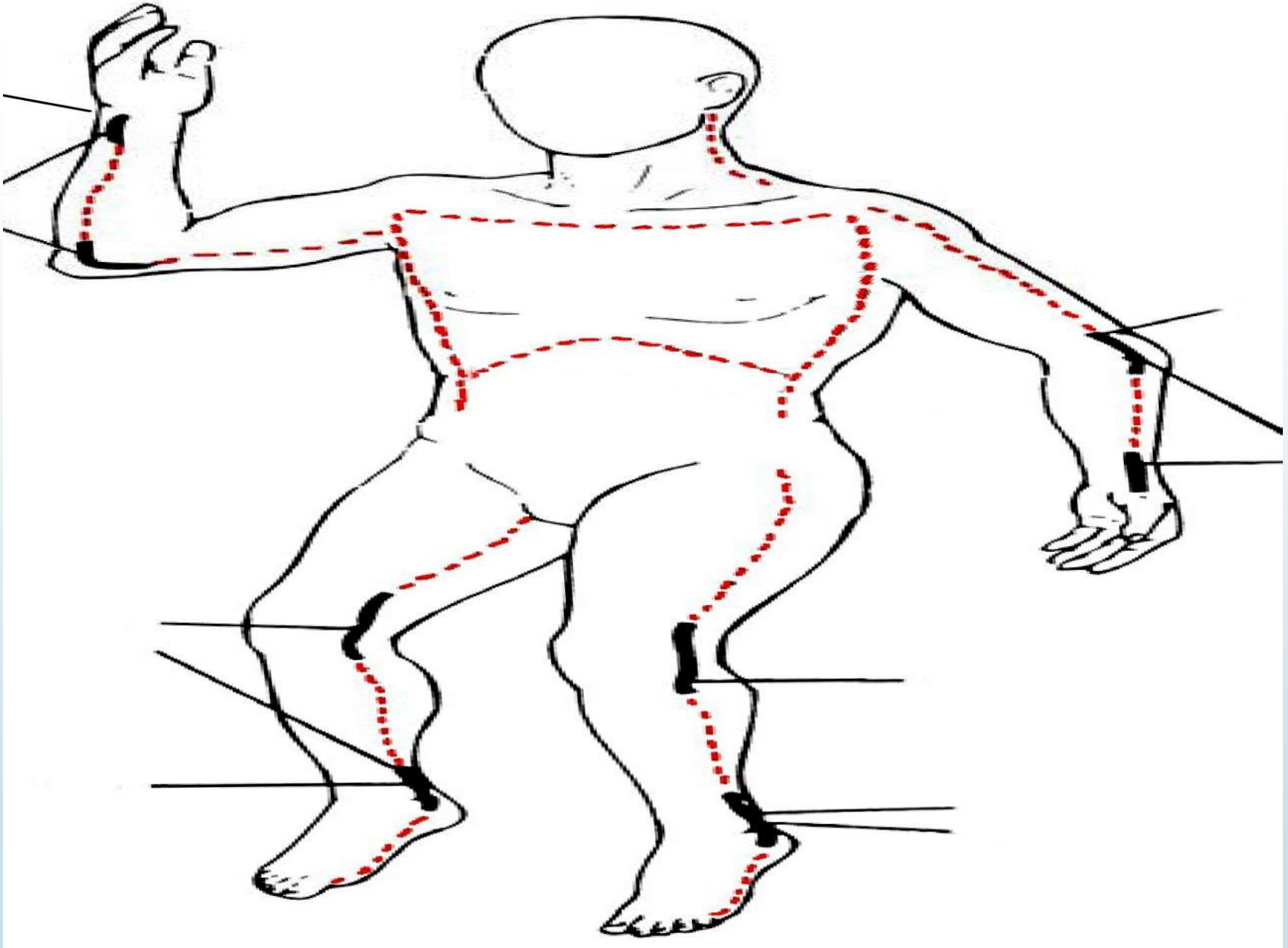
❖Escharotomy

Incision to release rigid and inelastic skin (eschar) to allow:

1. Circulation (in a limb)
2. Breathing (when chest involved)

❖PROCEDURE

3. Limbs – release both medial and lateral sides
4. Chest – release entire breast plate



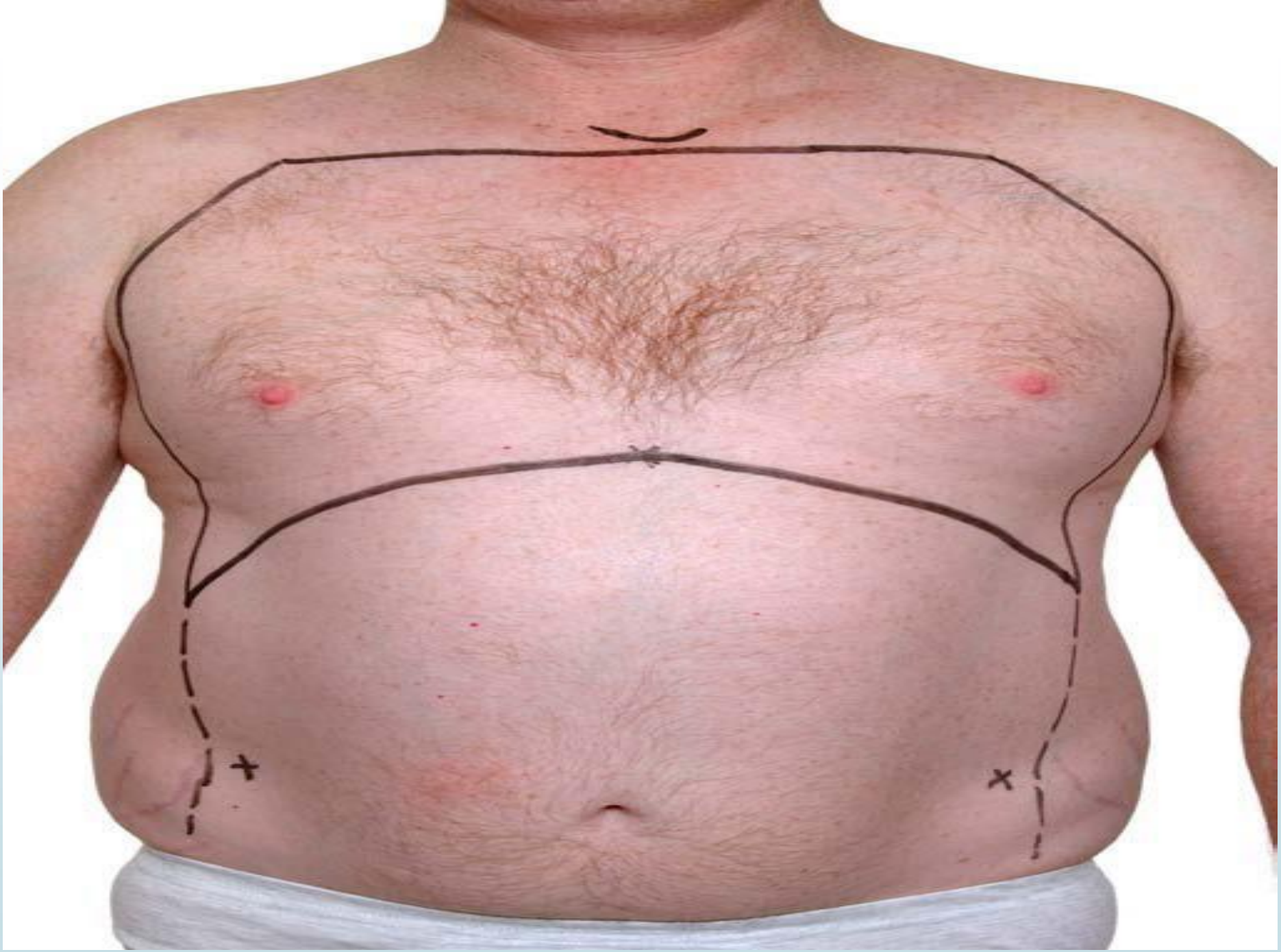


Figure 62-5 • Escharotomy of forearm.

➨Complications

1. Pneumonia was the most common,
2. Urinary tract infections. Other
3. Respiratory failure, septicemia, cellulitis,
4. Wound infection, kidney injury, arrhythmias,
5. Sepsis
6. Scars.
7. Deformity and contracture of muscle.
8. Death

Management of Burns

Essential management points:

1. Stop the burning
2. ABC
3. Determine the percentage area of burn (Rule of 9’s)
4. Good IV access and early fluid replacement

Initial treatment

1. Initially, burns are sterile
2. Administer tetanus prophylaxis
3. Gently cleanse the burn
4. Remove the loose necrotic tissue
5. Dress the burn
6. Patient’s energy and protein requirements will be extremely high due to the catabolism of trauma, heat loss, infection and demands of tissue regeneration

Skin graft meshing

A skin graft may be meshed to provide coverage of a greater surface area at the recipient site

Figure 62-7 • Split-thickness sheet graft.

Figure 62-8 • Split-thickness meshed graft.

THANK YOU