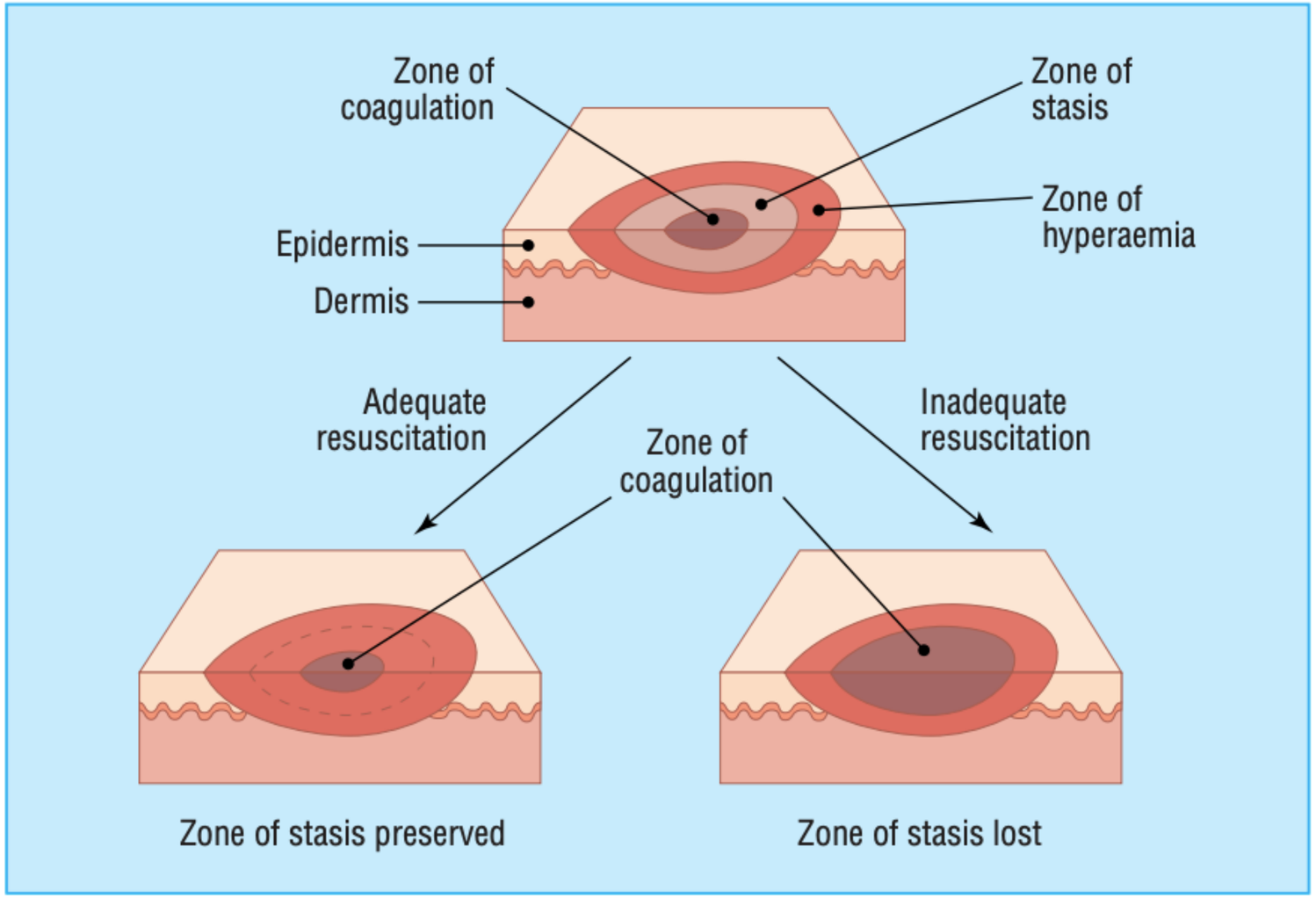
Burn

Thermal Injury
Thermal Trauma


Zone of coagulation
Zone of stasis
Zone of hyperaemia
Epidermis
Dermis
Adequate resuscitation
Zone of coagulation
Inadequate resuscitation
Zone of stasis preserved
Zone of stasis lost

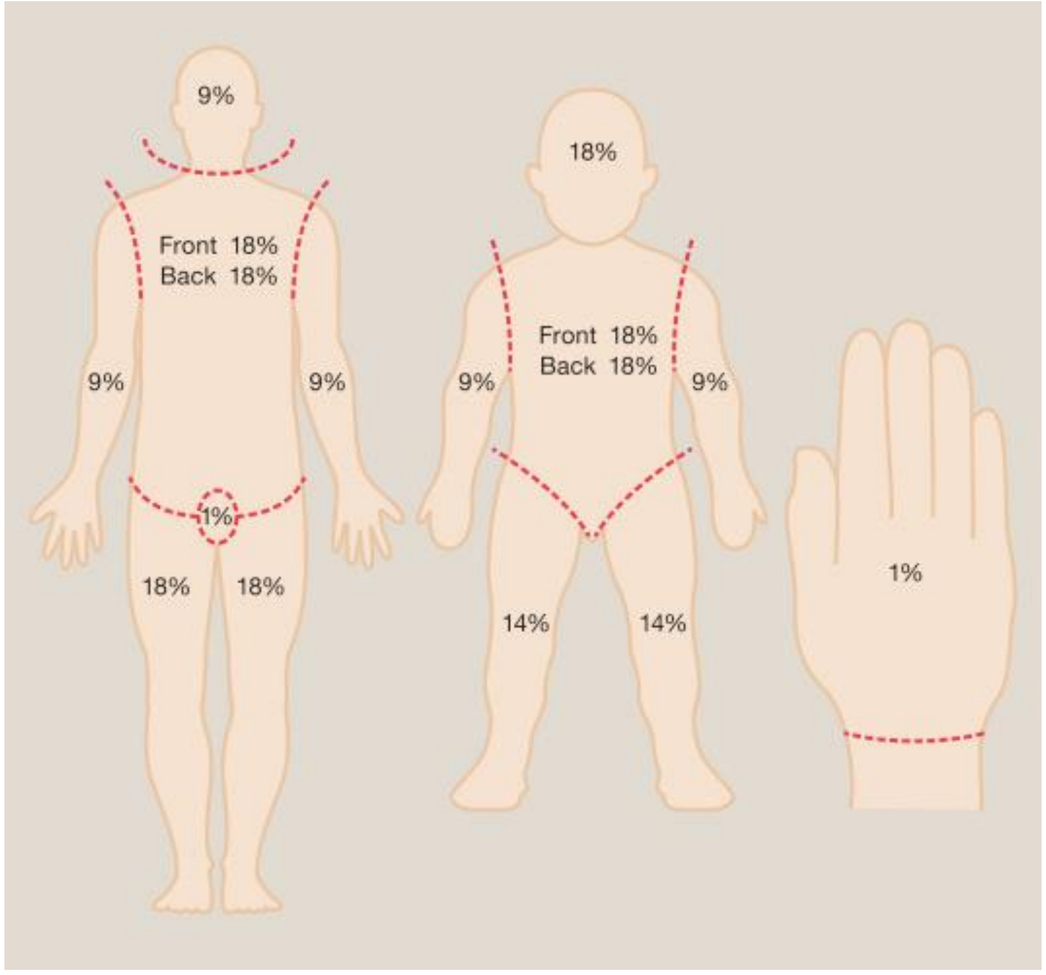
Primary survey
secondary survey

Depth of burn

Percentage of body surface area (BSA) estimation

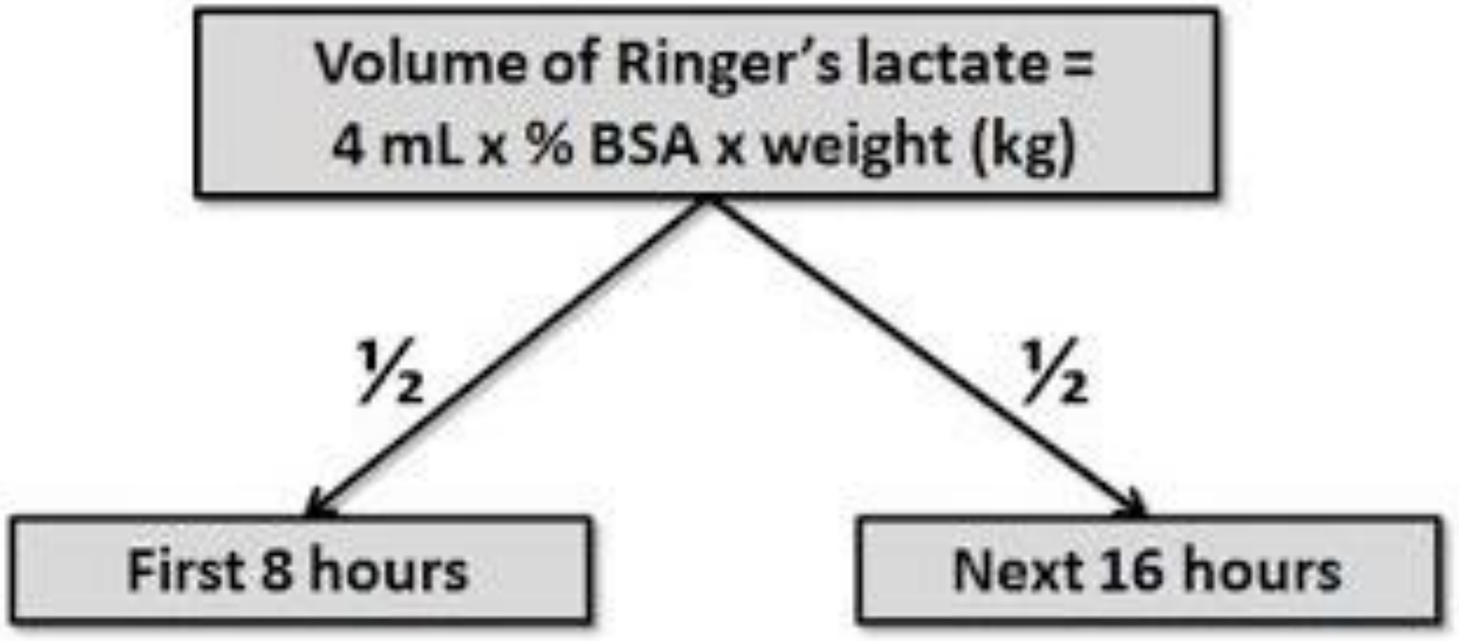
1. Partial-thickness burns greater than 10% BSA.
2. Any full-thickness burn.
3. Burns that involve the face, hands, feet, genitalia, perineum, or major joints.
4. Any inhalation, chemical, or electrical injury (including lightning).
5. Burn injury in patients with pre-existing medical conditions
6. Burns in combination with significant associated mechanical trauma.
7. Burned children in hospitals without qualified personnel or equipment for the care of children.
8. Patients requiring specialized rehabilitation, psychological support, or social services (including suspected neglect or child abuse).

Depth	Level of Injury	Clinical Features	Result/Treatment
Superficial (first degree)	Epidermis	Dry, red; blanches; painful	Healing time 3–6 days, no scarring
Superficial partial thickness (superficial second degree)	Papillary dermis	Blisters; moist, red, weeping; blanches; severe pain to touch	Cleaning; topical agent; sterile dressing; healing time 7–21 days; hypertrophic scar rare; return of full function
Deep partial thickness (deep second degree)	Reticular dermis; most skin appendages destroyed	Blisters; wet or waxy dry; reduced blanching: decreased pain sensation to touch, pain present to deep pressure	Cleaning; topical agent; sterile dressing; possible surgical excision and grafting; scarring common if not surgically excised and grafted; earlier return of function with surgery
Full thickness (third degree)	Epidermis and dermis; all skin appendages destroyed	Waxy white to leathery dry and inelastic; does not blanch; absent pain sensation; pain present to deep pressure: pain present in surrounding areas of second-degree burn	Treatment as for deep partial-thickness burns plus surgical excision and grafting at earliest possible time; scarring and functional limitation more common if not grafted
Fourth degree	Involves fascia and muscle and/or bone	Pain to deep pressure, in the area of burn; increased pain in surrounding areas of second-degree burn	Healing requires surgical intervention


9%
Front 18%
Back 18%
9%
9%
1%
18%
18%
18%
Front 18%
Back 18%
9%
9%
14%
14%
1%

MANAGEMENT

Resuscitation


Volume of Ringer's lactate =
4 mL x % BSA x weight (kg)
½
½
First 8 hours
Next 16 hours

Wound Care

Early irrigation and debridement
Topical antimicrobial agents

Dressings

Biologic dressings include allograft (cadaver skin) and xenograft

Synthetic dressings

Biobrane

Trancyte

Integra

Antimicrobial agent	Coverage	Advantages	Disadvantages
Silver sulfadiazine	Broad spectrum especially *Pseudomonas*	Soothing, no metabolic complication	Poor eschar penetration May impede epithelial cell migration (post-burn neutropenia)
Mafenide acetate	Broad spectrum including *Clostridium*	Good eschar penetration, excellent for both treatment and prophylaxis	Carbonic anhydrase inhibition with secondary metabolic acidosis, painful
Silver nitrate	Broad spectrum (gram positive and negative)	Excellent prophylaxis	Poor eschar penetration, hyponatremia, methemoglobinemia, black staining
Bacitracin	Gram-positive bacteria	Good for shallow facial burns	Expensive
Mupirocin	Methicillin-resistant *Staphylococcus*	Excellent for methicillin-resistant *Staphylococcus*	Very expensive
Acticoat	Broad coverage	Good for shallow burns, grafts and donor sites	Hides wound, non-adhesive and slips from wound

Operative Management

Escharotomy
tangential excision of burn eschar
excision and grafting

Inhalation burn

Electrical burn

Chemical Burns

Compartment Syndrome

Care related complications

. Pneumonia:

- Sepsis
- Gastrointestinal complications: Ileus and ulceration
- Renal failure: Acute tubular necrosis (ATN) from hypoperfusion
- Shock: Inadequate end-organ perfusion

Surgical

- Graft loss
- Burn scar contracture