



Iraq Guidelines of Burn Management 2015

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These Guidelines will help the resident doctors and nurses in ambulance, ER and wards of burn to achieve their goals in management of the burn patients smoothly.

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Chapter One: Pre hospital Care

STOPPING THE BURNING PROCESS

1st: remove the cloths, don't peel off adherent clothing.

2nd: Dry chemicals should be brushed from the wound.

3rd: the wound should be rinsed with copious amount of tap water. Cool burn with cold running tap water for at least 20 minutes with continuing of the management steps:

- Ideal water temperature for cooling is 15°C, range 8°C to 25°C
- cooling is effective up to 3 hours after injury
- Keep the remaining areas dry and warm to avoid hypothermia. If patient's body temperature falls below 35°C then stop cooling.

4th: the patient then should be covered with warm, clean, dry linens to prevent hypothermia.

Chapter One: Pre hospital Care

AIRWAY

How to identify inhalational injuries?

Although larynx protects the subglottic airway from direct thermal injury, the airway is extremely susceptible to obstruction as a consequence of exposure to heat. Airway obstruction may not be obvious immediately; however, signs may be present that could warn the examiner of potential airway obstruction.

The signs to alert the examiner about possible inhalational injuries: requiring transferring to the burn center

Face and/or neck burns

Singeing of the eyebrows and nasal vibrissae

Carbon deposits and acute inflammatory changes in the oropharynx

Carbonaceous sputum

Hoarseness and circumferential burns of the neck: immediate endotracheal intubation

History of impaired mentation and/or confinement in a burning environment

Explosion with burns to head and torso

Carboxyhemoglobin level greater than 10% in patient who are involved in fire

IV ACCESS

Any patient with more than 10 percent of the body surface requires fluid resuscitation. 2 large caliber (at least 16-gauge) IV lines should be introduced immediately in a peripheral vein.

CHAPTER TWO: EMERGENCY DEPARTMENT CARE

ABCDE2

AIRWAY

Reevaluation of airway

Early intubation for any sign of airway burn, swelling, or inhalation injury

BREATHING AND VENTILATION

Administer 100% oxygen

Expose the chest and ensure that chest expansion is adequate and bilaterally equal

Beware circumferential deep dermal or full thickness chest burns – is escharotomy required?

Palpate for crepitus and for rib fractures

Auscultate for breath sound bilaterally

Ventilate via a bag and mask or intubate the patient if necessary.

Monitor respiratory rate – beware if rate <10 or >20 per minute.

Apply pulse oximeter monitor

Consider carbon monoxide poisoning – non burnt skin may be cherry pink in colour in a non-breathing patient (send blood for carboxyhemoglobin)

Bronchoscopy if inhalation injury is a consider

CHAPTER TWO: EMERGENCY DEPARTMENT CARE

CIRCULATION

I. Burn Resuscitation Protocol

A. Document patient's TBSA burn using Lund-Browder diagram (Rule of Nines Diagram). Include only partial and full-thickness burns.

B. Obtain weight or close estimate.

II. First 24 Hours Post Burn

A. TBSA < 20%

Maintenance IVF only,

In adults 75 to 125 ml 1/5 G/S per hour + 20 mEq Potassium

In pediatrics 1st 10 kgs: 100 ml/kg, 2nd 10 kgs: 50 ml/kg, 3rd 10 kg: 20 ml/kg ,until taking adequate oral intake.

B. TBSA > 20% and Weight > 30kg

1. Calculate estimated fluid needs:

a) 2-4cc of LR X kg of body weight X %TBSA burned:

- administer half of calculated amount over the first 8 hours post burn
- administer half of calculated amount over next 16 hours

b) If urine output < ½ cc/kg/hour (goal is 30-50 cc/hour):

- increase LR infusion by 1/3 of the hourly calculated fluid requirement

c) If urine output > 70 cc/hour:

- dip urine to exclude glucosuria
- decrease LR infusion by 1/3 of the hourly calculated fluid requirement

C. TBSA > 20% and Weight < 30kg

1. Calculate estimated fluid needs:

a) 3-4 cc of LR X kg of body weight X % TBSA burned

- administer half of calculated amount over the first 8 hours post burn
- administer half of calculated amount over next 16 hours

b) In addition to burn fluid requirements, also infuse maintenance IVF (calculated total for 24 hours):

- 100 cc X first 10 kg of body weight
- 50 cc X next 10 kg of body weight
- 20 cc X next 10 kg of body weight

c) If urine output < 1 cc/kg/hour:

- increase LR infusion by 1/3 of the hourly calculated fluid requirement

d) If urine output > 1 cc/kg/hour:

- decrease LR infusion y 1/3 of the hourly calculated fluid requirement

CHAPTER TWO: EMERGENCY DEPARTMENT CARE

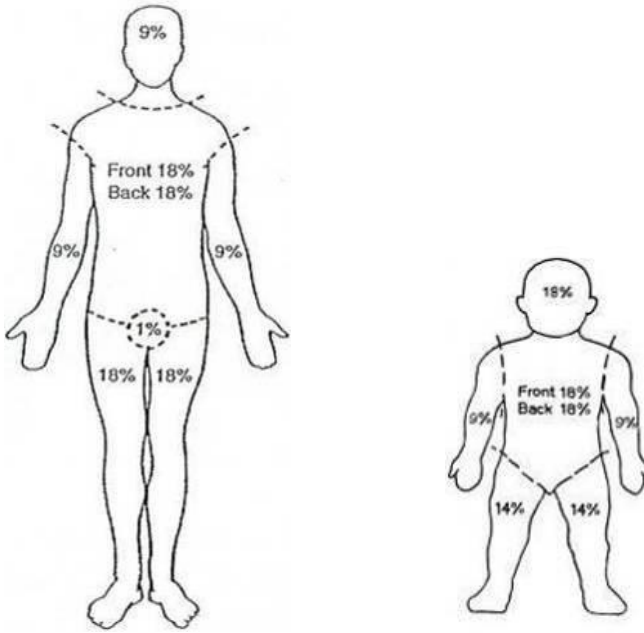


Fig 1: Rule of Nine

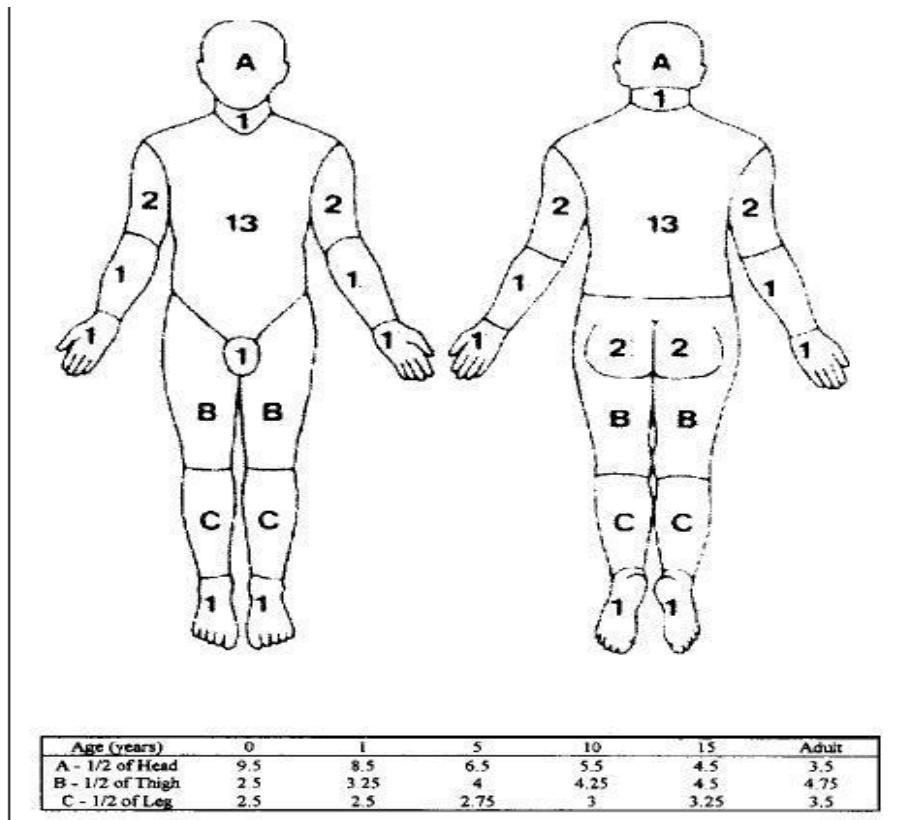


Fig. 2 Estimation of burn size—Lund and Browder Chart.

CHAPTER TWO: EMERGENCY DEPARTMENT CARE

DISABILITY: Neurological Status

Glasgow Coma Scale for All Age Groups

* Patient with GCS<8 is to be intubated.

	4 y to Adult	Child <4 y	Infant
Eye opening			
4	Spontaneous	Spontaneous	Spontaneous
3	To speech	To speech	To speech
2	To pain	To pain	To pain
1	No response	No response	No response
Verbal response			
5	Alert and oriented	Oriented, social, speaks, interacts	Coos, babbles
4	Disoriented conversation	Confused speech, disoriented, consolable, aware	Irritable cry
3	Speaking but nonsensical	Inappropriate words, inconsolable, unaware	Cries to pain
2	Moans or unintelligible sounds	Incomprehensible, agitated, restless, unaware	Moans to pain
1	No response	No response	No response
Motor response			
6	Follows commands	Normal, spontaneous movements	Normal, spontaneous movements
5	Localizes pain	Localizes pain	Withdraws to touch
4	Moves or withdraws to pain	Withdraws to pain	Withdraws to pain
3	Decorticate flexion	Decorticate flexion	Decorticate flexion
2	Decerebrate extension	Decerebrate extension	Decerebrate extension
1	No response	No response	No response

CHAPTER TWO: EMERGENCY DEPARTMENT CARE

EXPOSURE:

Remove all clothing and jewelry.

Keep patient warm.

Hypothermia can have detrimental effects on the patient. It is important to ensure that the patient is kept warm, especially during first aid cooling periods.

Log roll patient, remove wet sheets and examine posterior surfaces for burns and other injuries.

ESCHARATOMY

Indications Circumferential full thickness & deep dermal burns of the chest or limbs with circulatory or respiratory compromise

Limb

- Loss of circulation
 - o Pallor, cyanosed
 - o Reduced or absent capillary return related to capillary return in non-burned areas
 - o Coolness
 - o Loss of palpable pulses (late sign)
 - o Decrease pulse pressures as measured by Doppler ultrasound
- Numbness
- Decreased oxygen saturation as detected by pulse oximetry

Chest

- Circumferential full thickness burns of the thorax and abdomen.
- Restricted movement of the chest wall or abdomen
- Reduced air entry bilaterally
- Shallow respiratory effort
- Tachypnoea
- Hypoxemia
- In paediatric patients burns to the abdomen may compromise respiratory function due to their abdominal breathing pattern.

CHAPTER TWO: EMERGENCY DEPARTMENT CARE



Plan where incision to be made



incision by diathermy or knife



Checking adequacy of incision



complete separation



Dressing of incision with calcium alginate

Escharotomy Procedure

CHAPTER TWO: EMERGENCY DEPARTMENT CARE

Estimation of Burn Depth

Depth	Color	Blister	Capillary refill	Healing	Scarring
epidermal	Red	Non	Brisk 1-2 sec	7 days	Non
Superficial dermal	Red/ pale pink	Small	Brisk 1-2 sec	14 days	Non
Mid dermal	Dark pink	Present	Sluggish >2 sec	2-3 weeks may require graft	Yes (if healing >3weeks)
Deep dermal	Blotchy red/ white	+/-	Sluggish >2 sec/ absent	Grafting required	Yes
Full thickness	White/ black/ deep red/ brown	No	absent	Grafting required	Yes

CHAPTER TWO: EMERGENCY DEPARTMENT CARE

Criteria of Admission

Large size:

- >10% TBSA in children (>5% in children younger than 1 year)
- >15% TBSA in adults

All full thickness burns in any age group and any extent

Deep dermal burns >5% TBSA in adults and all deep dermal burns in children

Mechanism of injury:

- All chemical and electrical burns
- Exposure to ionising radiation
- High-pressure steam injury
- Suspected non-accidental injury

Age (<10 or >49 years)

Site of injury (there are no absolute criteria, but the following should be considered):

- Face, hands, genitals or perineum
- Any flexural surface such as neck, axilla, front of elbows OR back of the knee

Circumferential deep burns in any age group

Associated injuries (fractures, head injury or crush injuries)

Septic burn wounds

Burn patients who require special social, emotional or long-term rehabilitation support

Burns with a suspicion of inhalation injury

Co-existing conditions that could complicate burn management, prolong recovery or affect mortality

CHAPTER THREE: DRESSING

ADVANCED DRESSINGS

Type : advanced dressings	Action	Indication	Contraindication/ precaution
Alginate e.g. Biatain Alginate	Absorb fluid Promote autolytic debridement Moisture control Conformability wound bed	Moderate to high exuding wounds Special cavity presentations in the form of rope or ribbon Combined presentation with silver for antimicrobial activity	Do not use on dry/necrotic wounds Use with caution on friable tissue (may cause bleeding) Do not pack cavity wounds tightly
Foam e.g. Biatain	Absorb fluid Moisture control Conformability wound bed	Moderate to high exuding wounds Special cavity presentations in the form of strips or ribbon Low adherent versions available for patients with fragile skin Combined presentation with silver or PHMB for antimicrobial activity	Do not use on dry/necrotic wounds or those with minimal exudate
Hydrocolloid e.g. Comfeel Ulcer and Comfeel Trans , Firocol Plus	Absorb fluid Promote autolytic debridement	Clean, low to moderate exuding wounds Combined presentation with silver for antimicrobial activity	Do not use on dry/necrotic wounds or high exuding wounds May encourage overgranulation May cause maceration
Hydrogels e.g. Purilon,	Rehydrate wound bed Moisture control Promote autolytic debridement Cooling	Dry/low to moderate exuding wounds Combined presentation with silver for antimicrobial activity	Do not use on highly exuding wounds or where anaerobic infection is suspected May cause maceration
Silver e.g. Biatain Ag and Biatain Alginate Ag Physiotule Ag, Silver Gel	Antimicrobial action	Critically colonised wounds or clinical signs of infection Low to high exuding wounds Combined presentation with foam and alginates/ CMC for increased absorbency. Also in paste form	Some may cause discolouration Known sensitivity Discontinue after 2 weeks if no improvement and re-evaluate
Polyurethane film e.g. Comfeel and Biatain	Moisture control Breathable bacterial barrier Transparent (allow visualisation of wound)	Primary dressing over superficial low exuding wounds Secondary dressing over alginate or hydrogel for rehydration of wound bed	Do not use on patients with fragile/ compromised periwound skin Do not use on moderate to high exuding wounds

CHAPTER THREE: DRESSING

TRADITIONAL DRESSINGS

Flamazine (Silver Sulphadiazine) Cream

How does it work?

Flamazine cream contains the active ingredient silver sulfadiazine, which is an antibacterial that is active against a wide range of bacteria. It is commonly used to treat and prevent infections at the site of burns.

Silver sulfadiazine has also been used in other skin conditions, such as leg ulcers or pressure sores, where infection may prevent healing and for the prevention of infection in skin grafting.

What is it used for?

- Prevention and treatment of infections in burn wounds.
- Short-term treatment of infected leg ulcers and pressure sores.
- To prevent infection in areas of skin graft, extensive abrasions or finger tip injuries such as loss of nail.

How do I use it?

- This preparation is for external use only.
- For the treatment of burns Flamazine cream needs to be applied to the affected area using a sterile gloved hand or a sterile spatula. The layer of cream should be at least three to five millimetres thick. The cream should be re-applied every 24 hours or more frequently if the burns has got lots of discharge.
- For the treatment of leg ulcers and pressure sores, The wound must be cleaned and any discharge from the wound cleared. The cream must be applied into the cavity of the ulcer/sore, the cream should not be used on leg ulcers or pressure sore that are producing a lot of discharge.

Use with caution in

- Allergy to any sulphonamide medicine and pigmentation, so fluidic acid (fucidin) is used instead of it in burns above the clavicle
- Decreased kidney function.
- Decreased liver function.
- People with a deficiency in glucose-6-phosphate dehydrogenase (G6PD deficiency).

Not to be used in

- Babies less than one month old (neonates).
- Premature infants.
- Heavily weeping leg ulcer or pressure sore.
- Third trimester of pregnancy.

This medicine should not be used if you are allergic to any of its ingredients.

Side effects

Medicines and their possible side effects can affect individual people in different ways. The following are some of the side effects that are known to be associated with this medicine. Just because a side effect is stated here, it does not mean that all people using this medicine will experience that or any side effect.

- Itching (pruritus).
- Burning sensation.
- Rash.
- Allergy to active ingredients (hypersensitivity).
- Decrease in the number of white blood cells in the blood (leucopenia).

The side effects listed above may not include all of the side effects reported by the medicine's manufacturer.

CHAPTER FOUR: NUTRITION

CURRERI FORMULA For all patients:

(25kcal/kg actual BW + 40kcal/%TBSA burn)

Protein: High protein delivery of 1.5-3.0 g/kg ideal body weight/day or 20-25% of total energy is required for burn patients. Non-protein calorie to nitrogen ratio should be maintained between 150:1 and 100:1 whilst in the Burn Unit, according to the percentage TBSA and each stage of injury, as follows:

% of burn	Protein in gm/kg/day
<15	1-1.5
15-30	1.5
31-49	1.5-2
>50	2-2.3

Carbohydrate Glucose infusion or delivery should be no more than 5-7 mg/kg/min (about 50% CHO as energy).

Fat: Fat should constitute no more than 25-30% as energy, but in fact 15-20% of non-protein energy as fat is optimal

Provision of at least the RDI of nutrients that are known to be beneficial for wound healing (zinc, vitamins A and C) has been suggested

CHAPTER FIVE: MONITORING

Patient Monitoring:	
Parameter	PRN: as needed
Fluid Balance	Suggested Frequency
Blood Glucose Levels	Daily while Acute then PRN
Observations (T/RR/HR/BP)	Daily while Acute then PRN
Gastric Residuals	Daily while Acute then PRN
Bowels	Daily while Acute then PRN
Healing rate	Daily while Acute then PRN
Functional parameters	Daily while Acute then PRN
Nutrient intake (enteral, parenteral & oral)	Daily while Acute then PRN
Weight	Weekly(without dressing)

Biochemical Monitoring:	
Parameter	Suggested Frequency
Urea & Electrolytes	Daily
Serum Ca, PO ₄ , Mg	Every second Day
ABG's	Every second Day
Nutritional Markers- ie pre-albumin	Twice Weekly
Inflammatory markers (CRP)	Twice Weekly
LFT's	Twice Weekly

CHAPTER SIX: PHYSIOTHERAPY

RANGE OF MOTION

Emphasis is placed on the movements that oppose the development of contractures.

The choice of exercise should be tailored to the individual needs of the patient.

Active ROM is preferred to passive ROM (PROM); however, if patients are unable to achieve full ROM or participate with maximum effort, active-assisted movement or passive movement of the hand needs to be implemented. Alert patients can be taught self-range to ensure full combined tissue elongation.



ROM should be performed for maximum elongation of the healing skin or developing scar. (A) This can be achieved with active ROM in motivated alert patients. (B) Note blanching over thumb joints as opposition to the tip of the fifth digit is achieved, indicating maximum elongation of the scar. (C) It is difficult to obtain a full palmar expansion actively in the presence of developed scar. (D) Because this is a frequent injury in children, it is essential to instruct the child's parent/caregiver in appropriate techniques for passive ROM.

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