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POST GRADUATE EDUCATION

Burns Management: A Compendium

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ABSTRACT

Burns are one of the most devastating conditions encountered in medicine and have a catastrophic influence on people in terms of suffering, social life, disability, and financial loss. Burn injuries present difficult, diverse and varied challenge to medical and paramedical staff. The prognosis of a burn essentially depends on prompt and proper management. The ability to accurately evaluate and provide correct management is a must for all the health-care providers. The aim of this article is to provide a comprehensive burn management reference to all physicians and primary health-care providers.

Key words: Burns resuscitation, burns management, Parkland's formula, rule of 9s, electrical burns, chemical burns

Burns Compendium

Evaluation of patient's condition

1 Detailed history regarding cause of burns; date, time and place of burns; history of burns in closed space; mode of dousing fire; and primary treatment taken.
2 Marital status, duration of marriage and concomitant pregnancy in females.
3 History of addiction, alcohol abuse, smoking and associated/mental illnesses.
4 Any current medication and drug allergies to be noted.
5 Detailed general, systemic, local and any other associated injury examination.
6 Status of tetanus immunisation.
7 In paediatric burns, be aware of the possibility of child abuse.
8 Evaluation from medico-legal point of view.

Evaluation of magnitude of the injury

1. Age of patient, weight and general health.
2. Type of burns (thermal/chemical/electrical/radiation).
3. Accurate estimation of the TBSA of a burn is essential to guide management:
   (a) The best-known method, the Wallace's [1] "*rule of nines*," is appropriate for use in all adults and when a quick assessment is needed for a child [Table/Fig 1].
   (b) The Lund and Browder[2] method covers all age groups and is considered the most accurate method to use in paediatric patients ([Table/Fig 2]).
   (c) If *Lund and Browder chart* is not available
      (i) for children <1 year: head = 18%, leg = 14%;
      (ii) for children >1 year, add 0.5% to leg, subtract 1% from head, for each additional year until adult values attained.

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4. Assessment of depth of burns and classification (I°, II° superficial/deep, III°, IV°) [Table/Fig 3].

5. Any associated inhalation injury (history of burned in a confined space or patient found unconscious at the scene; burns to the face affecting nose, lips, mouth and throat; singed eyebrow or nasal hairs; and carbonaceous sputum, hoarseness and stridor).
6. Assessment of co-morbid factors like concomitant diseases such as pre-existing cardiovascular, pulmonary, renal, diabetes, epilepsy and fractures/other associated injuries.
7. The burn wound should never take precedence over potential life-threatening complications.
8. The burn wound should be cooled as soon as possible with cool water (preferably between 8°C and 23°C), but one should be careful of hypothermia.
9. The initiation of resuscitation is a priority. Detailed evaluation of patient's condition and magnitude of injury should be undertaken subsequent to restoring ventilatory and circulatory competence.

The summary of priorities in burns is (ABC approach) [3]:

1. Check airway and breathing
2. Assess the severity of burns (primary survey)
3. Set up a drip and start a fluid regimen
4. Provide analgesia
5. Catheterize the bladder
6. Reassess the burn wound and the patient's general condition (secondary survey).

Table/Fig 1
Rule of nines for establishing extent of body surface burned

Anatomic surface	Total body surface
Head and neck	9%
Anterior trunk	18%
Posterior trunk	18%
Arms, including hands	9% each
Legs, including feet	18% each
Genitalia	1%

- A quick way of estimating the surface area that is affected by a burn.
- In children the head is more than 9% and a good way of estimating burns is that child's palm is 1% of its surface area.
- Conventionally a single hatch is used for partial thickness and cross hatch for full –thickness.

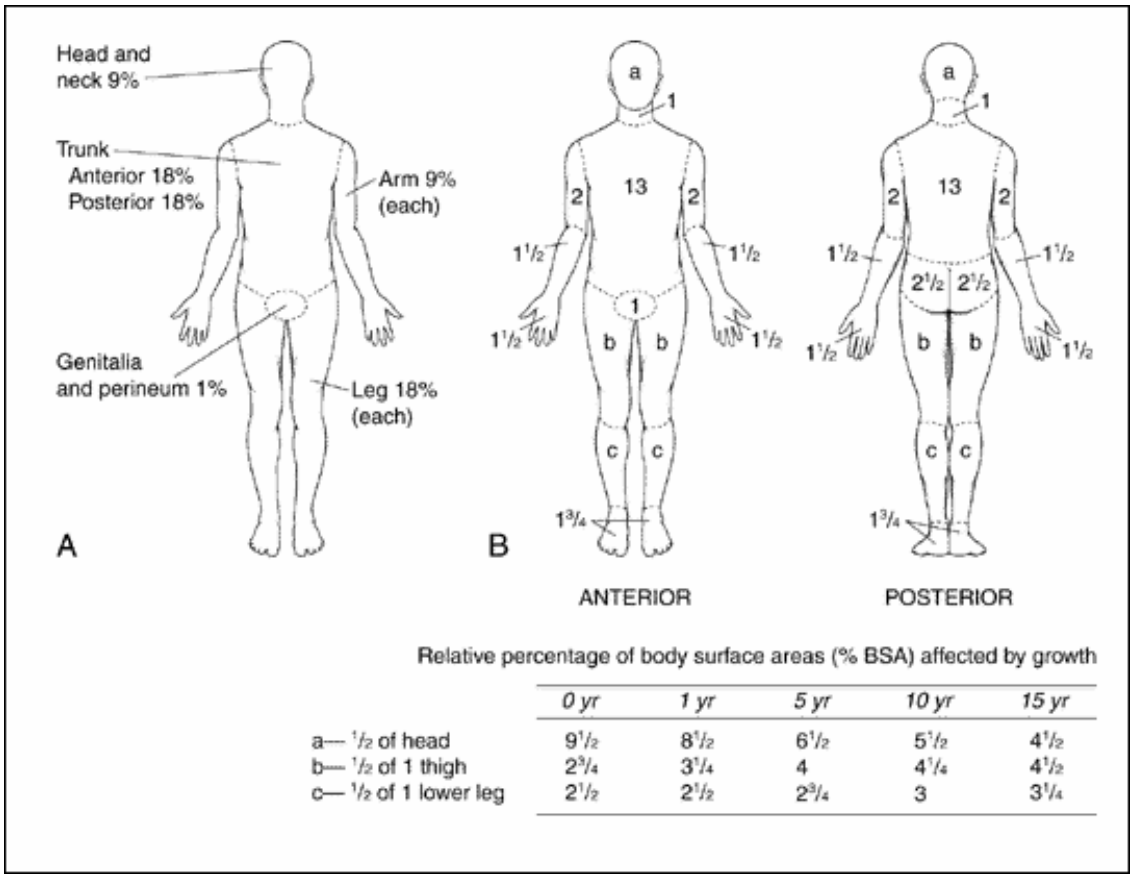
Criteria for admission

1. Second-degree burns more than 15% body surface area (BSA) in adults or more than 10% BSA in children.
2. Third-degree burn more than 2% BSA.
3. Burns complicated by inhalation injury.
4. Burns associated with co-morbid factors.
5. Electrical/chemical burns.
6. Third-degree burn involving critical areas (hand, face and feet).
7.

Outpatient management

1. First-degree burn.
2. Second-degree burn less than 15% in adults or less than 10% burn in children.
3. Third-degree burn less than 2% BSA.

Table/Fig 2



Relative percentage of body surface areas (% BSA) affected by growth

	0 yr	*1 yr*	*5 yr*	*10 yr*	*15 yr*
a— ½ of head	9½	8½	6½	5½	4½
b— ½ of 1 thigh	2¾	3¼	4	4¼	4½
c— ½ of 1 lower leg	2½	2½	2¾	3	3¼

Lund and Browder's chart. Estimating percent total body surface area in children affected by burns.

Measures to be taken during outpatient treatment

1. Prompt pain control by suitable analgesics.
2. Closed dressing (tulle) with silver sulphadiazine/bacitracin/suitable preparation after cleaning the wound with saline. Usually daily dressing change is enough.
3. Facial burns to be treated by exposure method. Face to be cleansed with moist compresses and soframycin/neosporin/suitable cream may be applied.
4. Tetanus prophylaxis in non-immunised patients or patients with unknown immunisation status (0.5 ml). Patients with more than 50% of the body surface burned should receive tetanus immune globulin (250–500 U, IM).
5. Antibiotics to be started, depending upon culture and sensitivity report.
6. During outpatient treatment, if significant infection develops/superficial wound becomes deep/wound refuses to heal in 3 weeks, patient to be admitted and accordingly treated.
7. High-calorie protein diet with adequate vitamins as necessary.
8. Dietary and other consultations/referrals as necessary.
9. Suitable surgical interventions as and when required.

Management of hospitalised patients

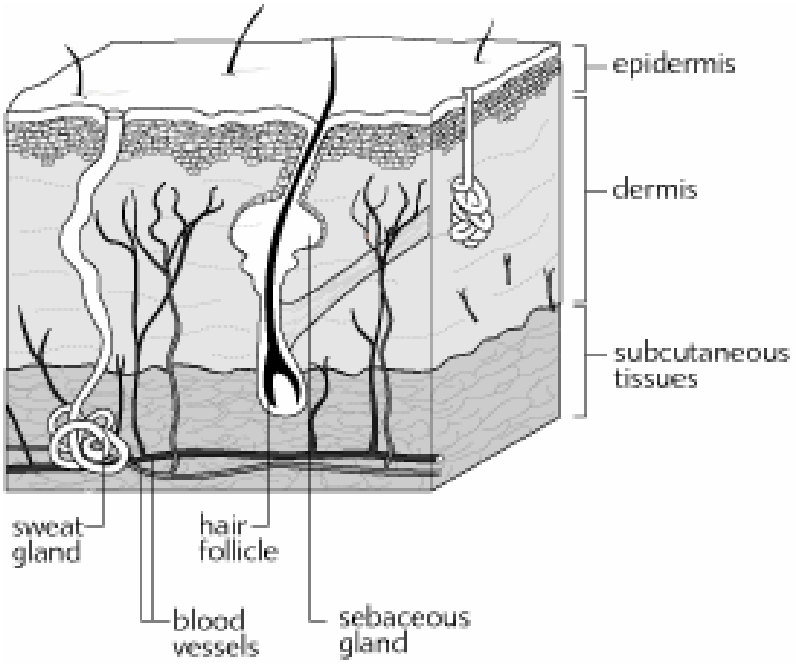
1. **Maintenance of adequate airway**:

(a) Head end of the burn victim to be raised.
(b) SOS intubation and ventilation with 100% oxygen (to be done for upper-airway obstruction due to oedema or in patients with inhalation injury requiring ventilatory support).

Criteria and Value
PaO_2 (mmHg) - <60
$PaCO_2$ (mmHg) - >50 (acutely)
PaO_2/FiO_2 ratio - <200
Respiratory/ventilatory failure - Impending
Upper-airway oedema - Severe

The ventilator settings may need to be adjusted to slightly higher respiratory rates (16–20 breaths/min) and smaller tidal volumes (7–8 ml/kg) in respiratory burns.
(c) Patients who have elevated COHb levels with a pH of less than 7.4 should be treated with hyperbaric oxygenation.
(d) In presence of facial bone fractures, airway to be cleaned and fractures to be stabilised, SOS intubation.
(e) Oxygen inhalation to be started by nasal prongs or masks as required (humidified oxygen at a rate of 4 l/min and 10–12 l/min in respiratory burns).
(f) Steroids have no proven role in respiratory burns [4].

Table/Fig 3



Burns classification. Illustration shows a cross-section of the three layers of skin. Burns are divided into four categories, depending on the depth of the injury:

1. In second-degree burns, the point of injury extends into the dermis, with some residual dermis remaining viable. (Superficial first-degree injury localised to the epidermis.)
2. Second-degree injury to epidermis and superficial dermis, deep second-degree injury to epidermis and deep dermis.
3. Third-degree, or full-thickness, burns involve destruction of the entire dermis characterised by lack of sensation in the burned skin, a leathery dermis, leaving only subcutaneous tissue exposed. It is texture, and no capillary refill.
4. Fourth-degree burn: burns extend beyond the subcutaneous tissue, involving the muscle, fascia and bone.

2. **Fluid resuscitation**:

(a) Intravenous fluid resuscitation to be given for all burn victims, with more than 15% burn in adults and more than 10% burn in children.
(b) Establish intravenous drip (large-bore peripheral line)/venesection/central line as necessary. Swan-Ganz catheters should not be used routinely (useful in geriatric patients and in patients with poor underlying cardiac function). Rotation of the intravenous line after 3–5 days should be considered.
(c) Venous access in small children may be difficult .The saphenous vein cut down or an interosseous line may be considered for short term.

(d) ***Adult resuscitation protocols***:

i Only second-degree burns or greater should be included in the TBSA determination for burn fluid calculations.
ii Multiple formulas exist with variations in both the volumes per weight suggested and the types of crystalloid or crystalloid–colloid combinations administered.
iii No single recommendation has been established as the most successful approach. Resuscitation formulas are just a guide for initiating resuscitation.
iv Fluids should be calculated from time of burns.
v RL is most commonly used crystalloid as resuscitation fluid.
vi In case of more than 50% burns, amount of fluid required for resuscitation is calculated for only 50%.
vii Parameters for judgement of adequacy of fluid resuscitation:
- *Non-invasive*: Urine output, heart rate, BP, state of mind, blood pH and PCV.
- *Invasive*: *PCWP* (18–20 mmHg desirable), cardiac output and CVP (7–15 cm of water adequate).

viii *Parkland formula* (Baxter) [5]: Amount of IV fluid in first 24 hours = weight in kg × 4 ml × % BSA burned; colloid in first 24 hours – none; free water in first 24 hours – none; crystalloid in second 24 hours: 20–60% estimated plasma volume; colloid in second 24 hours: titrated to urinary output of 30 ml/hr (administer one-half of the calculated fluid during the first 8 hours and one-half of the calculated fluid in the subsequent 16 hours).
ix *Brooke* [6]: Amount of IV fluid in first 24 hours = RL at 1.5 ml/kg per percentage burn; colloid at 0.5 ml/kg per percentage burn, and 2000 ml D5W; crystalloid in second 24 hours: 50% of first 24-hour volume plus 2000 mL D5W; colloid in second 24 hours: titrated to urinary output of 30 ml/hr.

(e) ***Paediatric resuscitation protocols*** [7]:
(i) Shriners Burn Institute – 4 ml/kg per percentage burn plus 1500 ml/m^2 BSA (first 8 hours – RL solution with 50 mEq sodium bicarbonate per litre, second 8 hours – RL solution, and third 8 hours – RL solution plus 12.5 g of 25% albumin solution per litre.
(ii) Galveston – 5000 ml/m^2 TBSA burn plus 2000 ml/m^2 BSA, colloid in first 24 hours – none, and free water in first 24 hours –none.
The *BSA* can be calculated from one of the following formulas:
BSA = [87(*H* (cm) + *W* (kg) – 2600]/10,000
Or
BSA (cm^2) = *W* (0.425 kg) × H (0.725 cm) × 71.84

(f) ***Resuscitation with oral fluids***:
(i) Burns <10% BSA in children/<15% BSA in adults.
(ii) Various ORS/Moyer's solution: 4 g NaCl + 1.5 g $NaHCO_3$ per litre. (Prepared by mixing 1 l of 0.9% NS + 1 l of tap water + 100 ml of isotonic (1.26%) sodium bicarbonate solution).

(g) The formula for the estimate for colloid (5% albumin) infusion is as follows:
0.5 ml/kg per percentage burn = ml albumin for 24 hours.

(h) The formula for the free water estimate (evaporative fluid loss) is as follows:
(i) *Adult*: (25 + percentage BSA burn) × TBSA (m^2) = ml/hr of free water required.
(ii) *Paediatric*: (<20 kg): (35 + % TBSA burn) × (BSA) = ml/hr
(i) Insensible loss from skin, respiratory tract = 12 ml/kg/day
(j) In patients with inhalation injuries do not overload. Urinary output in the range of 0.3–0.5 ml/kg/hr is acceptable.
(k) A low-dose dopamine infusion (3–5 μg/kg/min) and mannitol [8] (1 g/kg as a 20% solution given over 30 minutes) is often beneficial in patients with major burn injury.
(l) Maintenance fluid rate = Basal requirements + evaporative losses
(m) Basal fluid rates (for 24 hours):
(i) Adult basal fluid rate = 1500 × BSA.
(ii) Paediatric basal fluid rate (<20 kg) = 2000 × BSA.

3. **Analgesics and sedation**:
(a) Upon arrival, patient can be given Entonox (nitrous oxide/oxygen mixture) to inhale.
(b) Emergency pain relief: Morphine is the best agent for pain relief.
(i) Morphine PCA* – PCA dose: 0.01–0.015 mg/kg
(ii) Meperidine PCA – PCA dose: 0.15–0.2 mg/kg
(iii) Morphine continuous infusion via PCA pump:
- Infusion dose: 0.015 mg/kg/hr and/or
- Self/administered bolus: 0.05 mg/kg

(*patient-controlled analgesia)
(c) Chlorpromazine 0.5 mg/kg compliment and potentate opiate effect.
(d) Later, analgesics (acetaminophen, dose = 15 mg/kg/dose PO q4h), Ibuprofen (dose = 10 mg/kg PO q4h)], sedatives (diazepam, dose = 0.1 mg/kg/dose q8-12h) and anxiolytics (Alprazolam 0.25–0.5 mg) as required.
(e) Procedural pain medication for dressing changes:
(i) Acetaminophen 15 mg/kg/dose may be used if patient does not require opiate therapy.
(ii) Morphine dose for procedural pain:
- PO Morphine dose: 0.3–0.6 mg/kg/dose (if >15 kg)
- IV Morphine dose: 0.05–0.1 mg/kg/dose (if >15 kg)
- Fentanyl Oralet dose: 10 μg/kg/dose rounded to nearest hundred.

(f) Deep sedation and analgesia for major invasive procedures:
(i) Children:
- IV ketamine dose: 1–2 mg/kg/dose. May repeat dose every 20 minutes if child vocalises pain.
- IM ketamine dose: 3–7 mg/kg/dose. Give only when there is no peripheral IV access.
- PO ketamine dose: 6–10 mg/kg/dose.

(ii) Adults:
- For patients who are >16 years of age and >50 kg in weight.
- IV ketamine dose: 1–2 mg/kg/dose; titrate to effect.
- IM ketamine dose: 3–8 mg/kg.

(Protocol: Galveston Shriners Burns Hospital and the University of Texas Medical Branch Blocker Burn Unit.)

4. **Burn wound care**:
(a) Daily dressings are enough. Twice-daily dressing changes are indicated in patients with infected wounds or excessive exudating wounds.
(b) Closed dressing with 1% silver sulphadiazine/8.5% and 10% Mafenide acetate (especially for ear burns, to prevent chondritis)/0.5% silver nitrate/povidone iodine 5%/collagen dressings/bacitracin/suitable preparation after cleaning the wound with saline.
(c) The easy way to dress a burn wound: Clean the wound with saline → silver sulphadiazine → plain tulle dressing (jelonet)/medicated tulle dressing (sofratulle/inadine/bactigras) → Gauze pieces → Gamgee → bandage → Splint (SOS).

(d) Variety of biologic dressings (human skin allograft, amnion, porcine xenograft, cultured epidermal keratinocytes)/synthetic dressings (hydrocolloid dressings, collagen sheets, Biobrane, Integra) [9–11] are also available. They are expensive and should judiciously be used.
(e) If the patient is allergic to sulfa, alternative agents like neosporin, bacitracin and bactroban are preferred.
(f) Dressing to be changed as required under aseptic precautions in ward/minor OT. Analgesics/sedation/short GA (as discussed earlier) may be given.
(g) Face wounds may be treated by exposure method. Face to be cleaned with moist compresses and neosprin/soframycin/bacitracin/suitable cream may be applied.
(h) Suitable eye preparations as and when required may be applied.
(i) Chemical burns and electrical burns need specialised attention.
(j) In patients with circumferential burns beware of the risk of developing a compartment syndrome and keep a close observation.(abnormal compartment pressure >30 mmHg).
(k) The main differences between children and adults when treating the child with burns are
  (i) the difference in weight to BSA;
  (ii) proportionately higher metabolic rate than an adult;
  (iii) the thickness of the skin;
  (iv) the differences in psychological status.
(l) Clinical signs of burn wound sepsis [12]:
  (i) Sudden colour change in the wound to black, dark brown or red violet.
  (ii) Haemorrhage of the subeschar fat.
  (iii) Seeming conversion of partial- to full-thickness injury or sudden breakdown of healed second-degree burn to a new eschar.
  (iv) Premature eschar separation.
  (v) Appearance of purple or black eruptions in unburned skin.
  (vi) Sudden development of hypotension, ileus and hypothermia.

5. **Investigations**:
(a) Haemoglobin, PCV, complete blood count, haematocrit, blood urea, sugar, serum creatinine, serum protein, serum electrolytes and arterial blood gas analysis.
(b) Blood grouping.
(c) Urine routine and microscopy.
(d) HIV (after pre-test counselling), HbsAg, HCV on selective basis.
(e) ECG (in all patients >40 years, in all electrical burns).
(f) Chest X-ray as required (mandatory if inhalation injury is suspected).
(g) Wound swab culture and sensitivity to be done on third post-burn day and then to be repeated weekly.
(h) Fibre-optic bronchoscopy, blood gas determinations, chest radiographs, and carboxyhaemoglobin levels (maintain at <7%) in inhalation injuries.
(i) Other necessary investigations/repetition of investigations as required.

6. **Antibiotic therapy**:
(a) Prophylactic systemic antibiotics are not recommended. However, antibiotics may be started empirically if situation warrants (ampicillin + gentamicin/amoxicillin and clavulanic acid + gentamicin/other suitable preparation).
(b) If infection is suspected any time, antibiotics may be started depending upon culture and sensitivity report.

7. **Catheterisation**: Urine output is the standard criterion for gauging appropriate intra-vascular volume and hydration status.
(a) Foley's catheter to be inserted to record initial quantity and colour of urine.
(b) Hourly urine output to be measured to judge the adequacy of fluid therapy.
(c) Maintain urine output at 1.0 ml/kg/hr (30–50 ml/hr in thermal burn and 100–150 ml/hr in electric burn). In younger children (<30 kg), maintain a urine output of 1.0–1.5 ml/kg/hr (10–20 ml/hr) [13].

8. **Nutritional therapy**:

a. Suitable individualized dietary plan for all burn patients.In patients with more than 20% BSA burn: nil per oral and SOS nasogastric tube suction to be done hourly.After second or third day when normal bowel sounds appear gradually liquid to semisolid and solid diet to be started.

b. Empirical formulae for estimation of Energy requirements(to be used as a guide only):

Curreri's formula[14]:(25 kcal/kg+40 kcal/% TBSA)
Sutherland's formulae [15]:

i) For adults: Calories:20 kcal/kg body wt+70 kcal/% TBSA burn ; Protein:1g/kg body wt+3 g/%TBSA burn
ii) For Children: Calories:60 kcal/kg body wt+35 kcal/% TBSA burn ; Protein:3g/kg body wt+1 g/%TBSA burn

c. First priority to the carbohydrates.After one week high calorie protein diet (1-2 g/kg/day of protein) with adequate vitamins to be started. In children, 3-4 g/kg per day;Calorie Nitrogen ratio to be 100:1 to 200:1.

d. Weekly weight recording may be done to assess nutritional status.

9. **Supportive measures**:

(a) Physical therapy for joint motion and maintenance of muscle tone to be started from the day of admission. Necessary splints and pressure garments to be given.
(b) Chest physiotherapy is mandatory.
(c) The interactive multidisciplinary team has proven to be the most efficient method of treating major burn injury (internal medicine/paediatrician, psychiatrist, ophthalmologist, gynaecologists, pulmonologist, anaesthesiologists/intensivist, pathologist, dietician or other consultations/referrals to be obtained as necessary).
(d) Antacids (Gaviscon, Digene, 2–4 teaspoonfuls qid), H2 blockers cimetidine 300 mg qid/400 mg bd, ranitidine (150 mg bd) and sucralfate (bd/qid) to be given to prevent stress ulcerations. A nasogastric tube is indicated for more than 15% burns due to anticipated ileus.
(e) High protein supplements (Proteinex/GRD/Threptin/other prep), multivitamins, vitamin C (1–2 g/day) and trace elements to be given.
(f) Haematinics, blood transfusion and PPF to be given as required.
(g) Steroids are not indicated in burn management.
(h) Antiemetics, antidiarrhoeal, and laxatives to be given whenever indicated.
(i) Remove rings from the finger and remove all yellow and white metal objects from the patient and handover to the attendants after obtaining sign from them.
(j) In a case of freshly burned MLC patients, seal all the burnt clothes and handover to the police and obtain sign from them.
(k) Other appropriate therapeutic measures, including counselling, to be instituted on an individual basis.

10. **Appropriate surgical intervention**:

(a) Acute (tracheotomy, fasciotomy, tangential excision/grafting, early excision/grafting [II° deep, III°], escharotomy).
(b) Delayed/late surgical intervention (skin grafting/flap/other appropriate procedure).
Escharotomy (can be done bed side, electrocautery incision):
(i) *The limbs* compartment syndrome: medial and lateral incisions
(ii) *The chest* compartment syndrome: mid-axillary line, horizontally across chest/abdominal (form an H)/checkerboard.

11. Follow-up care

(a) After healing of the burn wounds, patient should massage the healed area with coconut

oil/moisturising cream.

(b) All the patients should receive pressure garments (25–40 mmHg) after the burn wound healing, to prevent hypertrophic scarring. They should be continued for 6 months or until the scar becomes pale and supple.

(c) Silicone gel sheeting to prevent hypertrophic scarring.

(d) Intralesional steroids 40 mg 3 weekly × 4–6 times for hypertrophic scarring.

12. Rehabilitation

(a) The objective of rehabilitation is to achieve optimal long-term function.

(b) The physical and occupational therapists play an essential role in the management of burns.

(c) The role involves exercises, passive ranging, splinting and antideformity positioning, maximising range of motion of all joints, specific postoperative therapy after reconstructive operations and reintegration to daily and professional activities.

Special categories of burns

Management of chemical burn

- Result from exposure to acids, alkalis or petroleum products.
- The severity of burn depends on the kind of chemical, length of exposure and amount of tissue involved.
- Injury is due to a chemical reaction, rather than thermal injury.
- Alkali burns tend to be deeper and more serious than acid burns.
- Most acids produce a coagulation necrosis by denaturing proteins and form a coagulum (eschar) that limits the further penetration of the acid (hydrofluoric acid – liquefaction necrosis).
- Bases typically produce a more severe injury known as liquefaction necrosis, which involves denaturing of proteins as well as saponification of fats, which does not limit tissue penetration.
- The key principles include removal of the chemical, copious irrigation, limited use of antidotes, correct estimation of the extent of injury and identification of systemic toxicity.
- Water is the antidote to the vast majority of agents. One should immediately flush away the chemical with large amounts of water for at least 20–30 minutes (longer for alkali burns).
- The exceptions to the use of water irrigation include chemical burns induced by dry lime, phenol, hydrochloric acid and sulphuric acid.
- In general, dilution, not neutralisation, is the key to management.
- The specific antidotes for various burns are as follows:

Chemical burns and their Antidote

HF - Topical 2.5% calcium gluconate gel, S/C injection of 10% calcium gluconate (0.5 ml/cm^2)
Phenol - 50% polyethylene glycol (PEG)
Chromic acid - Topical use of 10% calcium EDTA ointment, 5–10% sodium citrate; lactate- or tartrate-soaked dressings
White phosphorus - Copper sulphate
Tar - Neosporin ointment/butter/vegetable oil (for removal)

Management of electrical burns

1. The severity of these types of burns depends on the intensity of the electrical current and the duration of exposure.
2. Cardiac monitoring and ECG should always to be done to detect rhythmic disturbance.
3. Often more serious than they appear on the surface. They have high risk of renal failure with methaemoglobinuria due to underlying muscle necrosis; therefore, one needs a urine output of at least 1 cm^3/kg/hr.
4. Fluid infusion should be increased to ensure a urinary output of at least 100 ml/hr in the adult (SOS mannitol).
5. Alkalinise the urine by adding sodium bicarbonate (50 mEq/l).

7. Have low threshold for escharotomy and fasciotomy in high-voltage injury.
8. Types of electrical burns:
   (a)
   (i) Alternating current (AC): low-voltage home injury:
   - AC is three times more dangerous than DC at same voltage.
   - May result in tetanic muscle spasms.
   - May result in ventricular fibrillations.
   - May result in fixation of the victim to the current source, fractures, and cardiac and respiratory arrest.

   (ii) Direct current (DC): high-voltage occupational injury:
   - Direct current of low voltage causes superficial burns.
   - May throw patient from jolt of energy.
   - May result in blunt injury in addition to burns.

   (iii) Arc injury:
   - Patient part of arc of current between two objects.
   - Severe blunt trauma may result.
   - Temperature may exceed 2500°C (4532°F).

   (b)
   (i) High-voltage injury (>1000 V):
   - Types: flash, direct contact or arc.
   - Entrance and exit wounds: usually less than 10–15% TBSA.
   - Produce deep tissue injury along the path of the current (analogous to massive crush injury).
   - Electrical current can jump (arc) 1 inch from a power source or line for every 10,000 V being carried, so that a person does not actually have to touch the source to sustain injury.
   - Full trauma work-up is essential.

   (ii) Low voltage (<1000 V):
   - Types: flash, true high tension (direct contact or arc).
   - Can be locally destructive without systemic sequelae.
   - Current not sufficient to cause tissue damage along course except at contact site.
   - Cardiac problems (ventricular fibrillations) are common.

Management of hand burns:
(i) Elevating the limbs above the heart level.
(ii) Frequent pulse checks/Doppler devices are necessary in the first 24–48 hours.
(iii) SOS fasciotomy/escharotomy (fascia not opened).
(iv) Positioning of the limbs and splinting is important.
(v) Splint hand in a position of function: the metacarpophalangeal joints at 70–90°, interphalangeal joints in extension, first web space open and wrist at 20° of extension.
(vi) Early involvement of the physiotherapist is mandatory.

Management of burns in pregnancy [16]:
(i) Involvement of gynaecologist/obstetrician is mandatory from the onset
(ii) First trimester – spontaneous abortion is probable.
(iii) Second trimester – no proper guidelines, wait and close observation/MTP (SOS).
(iv) Third trimester – premature labour is likely and delivery should take place at the earliest (induction/caesarean).

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