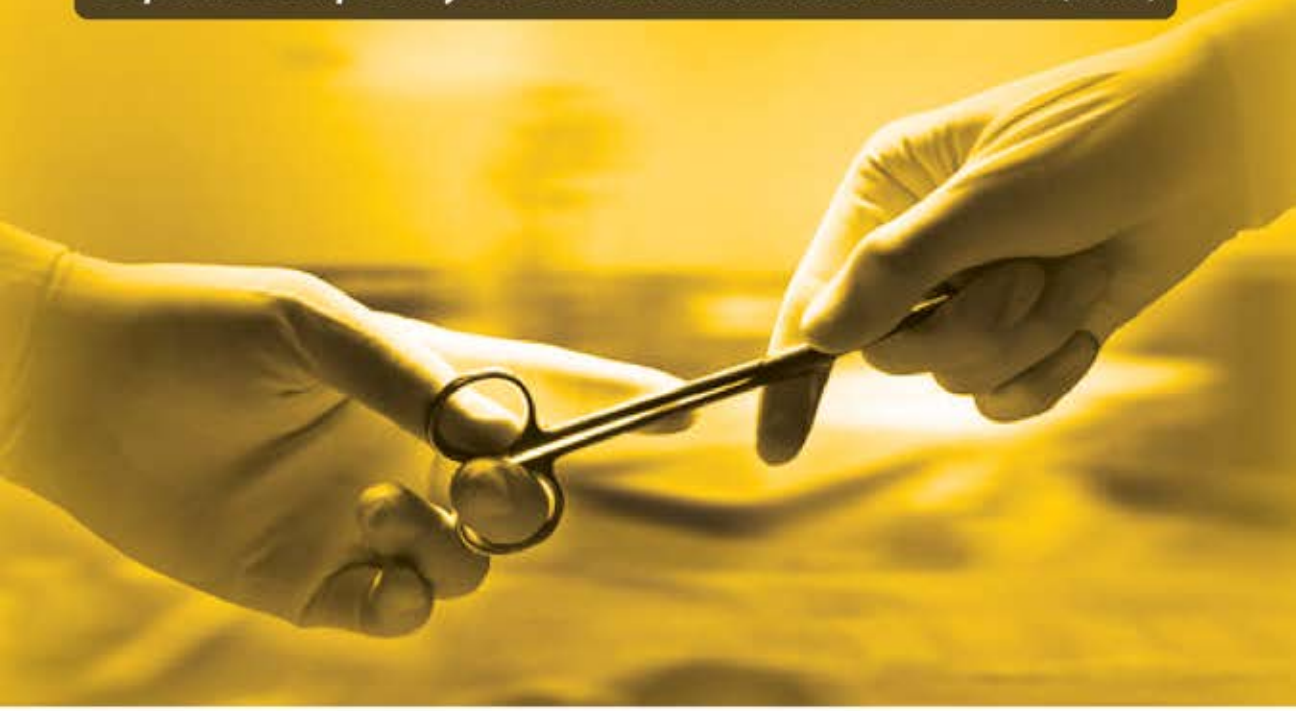
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Golden Notes in Surgery

As per the Competency Based Medical Education Curriculum (NMC)



K Jayarama Shenoy

Forewords
Lt Gen MD Venkatesh
M Vijayakumar
K Ramesh Reddy

JAYPEE

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4 Chapter

Burns

SU4.1	Elicit document and present history in a case of burns and perform physical examination. Describe pathophysiology of burns.
SU4.2	Describe clinical features, diagnose type and extent of burns and plan appropriate treatment.
SU4.3	Discuss the medicolegal aspects in burn injuries.
SU4.4	Communicate and counsel patients and families on the outcome and rehabilitation demonstrating empathy and care. Demonstration

SU4.1: Elicit document and present history in a case of burns and perform physical examination. Describe pathophysiology of burns.

Refer under history taking and clinical evaluation

SU4.2: Describe clinical features, diagnose type and extent of burns and plan appropriate treatment.

Q. Classify burns - according to mechanism, based on depth, thickness, surface area.

MECHANISM OF BURNS

- Thermal injury
  - Dry heat: Contact with hot subjects, heat of combustion, hot gases
  - Wet heat: Hot liquids—water, oil
- Chemical burns: Acid, alkali
- Electrical burns
- Radiation burns: Ionizing radiation, non-ionizing—ultraviolet rays
- Special: Inhalation burns—steam, chemical fumes, smoke.

Classification of burns based on depth of burns (as given in **Table 4.1**).

DEPTH OF BURNS (TABLE 4.1)

Table 4.1: Depth of burns.

Degree	*Depth of burns*	*Clinical picture*	*Signs*
Superficial burns Degree 1	Epidermis only	Erythema	Sensation intact, hyperemia
Superficial burns Degree 2	Papillary dermis (superficial partial thickness)	Vesicles, red, painful	Capillary circulation intact Sign of blanching, hyperesthesia
	Reticular dermis (deep partial thickness)	Depigmentation	No capillary blanching Pin prick sensation intact
Deep burns Degree 3	Full thickness of skin Subcutaneous tissue	Necrotic skin	Leathery surface, charred No pain Sensation lost
Degree 4	Deeper muscles and or bone	Full thickness necrosis	

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TYPES OF BURNS

- **Partial thickness burns:** Erythematous, painful, vesicles—**first or second** degree burn.
- **Full thickness burns:** Affects all layers of the skin—charred, insensitive—**third degree** burns

CLASSIFICATION OF BURNS BASED ON BODY SURFACE AREA (BSA)

- **Mild:**
  - Less than 15% of BSA (10% in children)—partial thickness.
  - Or < 2% full thickness.
- **Moderate:**
  - 15–25% BSA—partial thickness burns (10–20% in children).
  - 2–10% BSA of full thickness burns.
- **Severe:**
  - Above 25% BSA in adults and 20% in children—partial thickness.
  - All full thickness burns of over 10%.
  - All inhalation and electrical burns.
  - Burns associated with major fractures and systemic trauma.
  - Burns involving eyes, ears, feet, hands, perineum.

Surface Area of Burns as a Percentage of the Body Surface Area

- Minor burns are calculated with palm as a guide. (The area of palm is taken as 1% of TBSA).
- **Wallace's rule of "9":** Used for the first assessment of the burns **(Table 4.2)**.

Table 4.2: Wallace's rule of nine.

Parts of body	*Adults surface area*	*Children*
Head and neck	9%	18%
Upper limb	9 × 2 = 18%	18%
Lower limb	18 × 2 = 36%	14 × 2 = 28%
Front of chest and abdominal wall	9 × 2 = 18%	18%
Back of chest and abdominal wall Perineum	9 × 2 = 18% 1%	18% together

Q. Describe pathophysiology of burns (Please refer box below for brief answer).

PATHOPHYSIOLOGY OF BURNS

Pathophysiology of burns

Coagulation necrosis of skin and subcutaneous tissues, cell damage and release of intracellular molecules into circulation, evoking an inflammatory response and complex circulatory changes.

Inflammation and circulatory changes—happen first 36 hours after the injury.

- Burns produce an inflammatory reaction causing increased vascular permeability.
- Heat causes alteration of proteins, releases neuropeptides and activate complement, degranulation of mast cells and leukocytes, releasing free radicals, further damage to the tissue.
- Mast cells release cytokines such as tumor necrosis factor alpha (TNF-α). and in turn, the inflammatory cells and secondary cytokines (IL-6).

This results in increased permeability of blood vessels causing:

- A net flow of water, solutes and proteins from the intravascular to the extravascular space.
- This causes—hypovolemia, hypoproteinemia and hypoxemia.
- Burns of over 15% of TBSA and results in shock.
- Circulatory failure—hypovolemia, myocardial depression (burns toxins).
- Renal failure, pulmonary edema due to exudation.
- Shock—hypovolemic and distributive shock.

Immunological changes: Due to inflammatory changes:

- Suppression of cell-mediated immunity. Increased susceptibility to infections.
- Acute lung injury—due to cytokines and added infections.

Changes in the intestines and abdomen: Microvascular damage and ischemia of the gut mucosa - stress (curling) ulcers of stomach. Abdominal compartment syndrome—ileus, and translocation of gut bacteria leading to life threatening septicemia.

Metabolic changes: Hypermetabolism, negative nitrogen balance and metabolic acidosis electrolyte imbalance (hyperkalemia, hyponatremia), SIADH.

Sepsis: In burn patient—from burn site, bowel, lungs, bladder, catheters, venous lines and worsened by comorbidities like diabetes, steroids, and HIV.

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Q. Short notes: Inhalation burns, circumferential burns and eschar.

Inhalation burns: They pose grave threat to life due to burns and edema of airway tract often with loss of respiratory epithelium - involving face, oronasal apertures, supraglottic and subglottic airway. This leads to respiratory failure and carbon monoxide poisoning.

- Full-thickness burns to the chest can restrict respiratory movements.

Circumferential burns: Cause constricting effect on limb circulation or on chest movement.

Electrical burns: They cause local damage and additional myocardial injury leading to brady-arrhythmias and arrest.

Chemical burns: Acid burns—cause coagulation necrosis and long-term fibrosis.
Alkaline burns—liquefaction necrosis and deeper burns with worse consequences.

Eschar
Formed by the coagulation necrosis of proteins and charring with resultant shrinkage of dermis. It forms a tough protective cover over the burn wound. Infection can occur under the eschar in circumferential burns. The eschar may cause constricting effect on limb circulation or respiratory movements of chest wall.

Q. How do you assess and manage a burns patient?

ASSESSMENT OF BURNS PATIENT AND MANAGEMENT

At the Site of Injury

Pre-hospitalization Care

- Remove from burn source
- Cooling (around 15°C)—15 min upto 1 hour
- Elevation of head in airway burn; elevation of limb in limb burns
- Oxygen
- Fluids started
- Cover wound with sterile (or clean) cloth
- Ensure safety to the rescuer.

Management at First Point of Care

Emergency—primary survey carried out simultaneously with assessment.

History—most important in assessing nature and severity and hence planning treatment.

- Mechanism of burns, nature of burns, identify burn source, duration of exposure and area of contact with heat source, temperature of the source, part of the body exposed.
- Is there an inhalation burn? fumes inhaled?
- Chemical—swallowed or fumes.
- Explosions can cause barotraumas to the eardrums and lungs and may also cause blunt trauma.

Primary Survey

Primary survey—conducted following ATLS principles of ACS.

Burn patient is evaluated and treated like one of multi trauma. Associated injuries are missed in burns due to blasts, fall, industrial accidents.

- **Airway**—assessment and secure.
  - Inhalation injury anticipated.
  - Physical signs—include hoarseness, stridor, facial burns, singed facial hair, expectoration of carbonaceous sputum, and presence of carbon in the oropharynx.
  - Early tracheal intubation in case of facial and neck swelling. Inhalation burns suspected.
- **Breathing**—is evaluated for effort, depth of respiration, and auscultation of breath sounds.
  - Wheezing or rales—(inhalation injury or aspiration of gastric contents).
  - Beware of: Early pulmonary insufficiency and respiratory failure.
  - Oxygen delivered at lower tidal volumes to maintain " permissive hypercapnia".
- **Circulation: Most important step in early burns management.**
  - Aggressive and prompt fluid resuscitation.
  - Full-thickness circumferential burns of extremity or neck burns requires escharotomy (to maintain circulation in the limb).
- **Disability:** Neurological condition—assessed.
- **Exposure- and control of environment:**
  - All clothes removed (to avoid further burns and chemical damage.

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- Irrigation of injuries with water or saline to remove harmful residues.
- Removal of all constricting gadgets and jewellery.

Secondary Survey

Burn-specific secondary survey

- Depth of burn—classified and managed based on depth.
- Percentage of total body surface area (TBSA) estimated . Small areas calculated by hand (as - 1% each) and large areas by "rule of nines"
- To plan fluid resuscitation and decide on transferring the patient a specialized burn center.

Transfer to a Burn Center

Age and TBSA of burn percentage are two most important prognostic factors.

Criteria for Shifting to a Specialized Center

- Partial-thickness burns greater than 10% BSA.
- Any full-thickness burn.
- Burns that involve the face, hands, feet, genitalia, perineum, or major joints.
- Any inhalation, chemical, or electrical injury (including lightning).
- Burn injury in patients medical comorbidities.
- Burns in combination with significant associated polytrauma.
- Burns in patients with psychiatric illness.
- Burns with suspected suicide or homicidal actions.

Fluids—most important to start fluid resuscitation at the earliest.

Management at the Burns Unit

- **Oxygen—humidified oxygen—face mask or after intubation.**
- **Intravenous access—for patients with >15% burns.**
  - Large peripheral venous line (14 g or 16 g)
  - Avoiding lower limb.
- **Fluid resuscitation:**
  - Most important in improving survival—reducing the impact of burns shock.
  - Early and aggressive volume resuscitation must be undertaken in all cases of with burns of over 20% total body surface area (TBSA).
  - Fluid resuscitation is done as per various formulae available.
  - Administered fluids—include crystalloids and colloids.

Parkland Formula

- Exclusive crystalloid based resuscitation.
- Lactated Ringer solution is the preferred crystalloid
- Volume of fluid to be replaced in the first 24 hours—4 mL per kilogram of body weight per percentage burns.
- Total percentage body surface area × weight (kg) × 4 = volume (mL).
- Half this volume is given in the first 8 hours and the second half in the next 16 hours—infused with adjustments being made as clinical conditions, size and depth of burns evolve.
- Over-resuscitation is avoided to prevent congestive complications such as abdominal compartment syndrome. For children weighing 30 kg or less, 5% dextrose in one-quarter normal saline helps restoration of fluid and glucose reserves.

Colloid-containing Solutions

- Their role is debated.
- Avoided until after the first 24 hours postburn (capillary leak diminishes).
- Some use albumin later in the first 24 hours and in patients with large burns.

Muir and Barclay Colloid-based Formula

- Calculated rations to be given over specified periods.
- 0.5 × percentage body surface area burnt × weight = one ration.
- First 12 hours 3 rations over 12 hrs. One ration of crystalloid per each 4 hour period.

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- Next 12 hours— 2 intervals over next 12 hrs. One ration of crystalloid per each 6 hour period along with colloid (albumin) supplementation.
- Subsequent 12 hours—one ration of crystalloid and albumin.
- Blood transfusions are given, if needed, only after 48 hours.

Monitoring of Resuscitation

Measurement of:

- **Urine output:** Best guide of perfusion (normal urine output is 0.5 to 0.1 mL/kg weight per hour)
  The rate of fluid infusion is increased if the output falls below 0.5 mL/kg/hr.
- Hematocrit—to assess hydration state.
- Acid–base balance—to assess tissue perfusion
- CVP monitoring
- Transesophageal ultrasound—to assess cardiac input.

Relief of Pain

Acute Pain

- Analgesia very important,
- Superficial burns—non-narcotic analgsics—paracetamol and NSAIDs; topical cooling is often soothing.
- Large burns and deep dermal burns: Opiates—intravenous opiates.

Post Acute Phase: In Large Burns

- **Continuous analgesia:** For patients with larger area of burns. Infusions followed by oral tablets—slow-release morphine.
- **For dressing or esharotomy:** General anesthesia or intravenous midazolam and ketamine.

Additional Measures

- **Indwelling Foley catheter**—monitor hourly urine output (index of perfusion)
- **Nasogastric tube**—to tackle paralytic adynamic ileus.
- **Continuous pulse oximetry**—to measure oxygen saturation
- *Note:* Carbon monoxide poisoning can show falsely elevated levels.

Laboratory Evaluation

- Urinalysis—routine, proteinuria, myoglobinuria.
- Complete blood cell count, electrolytes, arterial blood–gas evaluation and renal parameters.
- Arterial carboxyhemoglobin—in inhalation/suspected CO poisoning.
- β-human chorionic gonadotropin—to detect pregnancy.

Electrocardiogram—electrical burns - and in assessing the arrhythmias during fluid replacement.

Tetanus Prophylaxis

- 0.5 mL of tetanus toxoid is given intramuscularly.
- Human tetanus immunoglobulin 250 to 500 units intramuscularly if not immunized previously.

Burns Wound Care

- **Early irrigation and debridement**—using normal saline and sterile instruments to remove all loose epidermal skin layers.
  Blisters: They permit healing in a sterile milieu and protect the underlying dermis too. Blisters are left alone in small superficial burns but are debrided in large and deep partial thickness burns to relieve tension, to remove inflammatory mediators and to prevent infection.
- **Topical antimicrobial agents—mainstay of wound care**
  Burn wound sepsis:
  - Gram-negative organisms: *Pseudomonas aeruginosa* and fungi.
  - Gram-positive organisms: *Staphylococcus aureus* and group A streptococci.

  Diagnosis: Biopsy Eschar—shows organism load of 1 million per gram of tissue.

  Treatment: Excision of infected eschar and topical/systemic antibiotic therapy.

  Topical applications: Silver sulfadiazine cream 1%. 0.5% silver nitrate solution, Mafenide acetate cream.

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- **Dressings**
  - **Biologic dressings**—allograft (cadaver skin) and xenograft (pig skin). These dressings provide the advantages of ease of acquisition and application while providing barrier protection and a biologic bed under which dermis can granulate.
  - **Synthetic dressings** have become an attractive alternative for early wound coverage. Collagen-coated silicone membrane—prevents moisture loss.

Q. Enlist principles of surgical procedures in burns.

SURGERY IN ACUTE BURNS

- **Escharotomy—to divide constricting eschar.** In full-thickness circumferential burns of the neck, extremities to restore tissue ischemia due to constricting effect and edema. Or to release restriction of respiratory movements in the chest.
- **Early tangential excision of burn eschar—for deep dermal burns (deep 2nd degree)** to the level of bleeding capillaries done after the resuscitation phase.
- **Early excision and grafting—for all full thickness burns**
  - **All necrotic tissue excised and wound cover given: Temporary or permanent** benefits survival,blood loss, incidence of sepsis, and length of stay
  - **Split-thickness skin grafts (autografts):** For very large wounds, split-thickness skin grafts can be meshed up to 4:1.

  Temporary: Synthetic grafts or heterologous grafts (xenograft).
- **Delayed reconstruction—for full thickness burns.**
- **Scar management: Reconstruction after division or excision**

  Early intervention against contractures:
  - Eyes—grafting to prevent exposure keratitis.
  - Contracture over joints
  - Burn alopecia—unburnt skin expansion done.

Techniques

- Z-plasty
- A transposition flap—for wider scars
- A full-thickness graft or vascularized tissue as in a free flap—for large scars
- Split skin graft.

Keloids

- Pressure dressings—worn for a period of 6–18 months.
- Silicone patches—to speed up the scar maturation.

Q. How do you manage the nutritional requirement in burns patient.

NUTRITION IN BURNS

It is a hypermetabolic state (upto 200% of normal) proportionate to the size of the burn. The daily estimated metabolic requirement (EMR)—is calculated from the *Curreri formula*:

EMR = 25 kcal × body weight (kg) + (40 kcal × %BSA).

Protein losses in burn patients replaced by administering 1.5 to 2 g/kg of protein per day.

- **Enteral feeding**—the preferred route when tolerated
  - It is administered through an enteral feeding tube, started within first 24 hours. It shortens the hospital stay by reducing the risk of infection and catabolic response.
- **Total parenteral nutrition**—only if the patient is unable to tolerate enteral feeding. Initiated after fluid resuscitation
  - **Daily vitamin supplementation:** Vitamin C, thiamine, Riboflavin, nicotinamide 500 mg and zinc.

Prophylaxis Against Complications

- **Gastroduodenal stress ulcers:** Proton-pump inhibitors (pantoprazole or esomeprazole) or H-2 blockers—ranitidine/famotidine).
- **Venous thromboembolism (VTE):** Heparin or low molecular weight heparin (dalteparin or enoxaparin).

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Sepsis

- **Prophylactic antibiotics**—(piperacillin tazobactam) against infection in wound, respiratory tract and urine.
- Fluid resuscitation with crystalloids.
- Vasopressors for hemodynamic support.
- Transfusion - for hemoglobin levels below.
- Ventilatory support - as needed
- Maintenance of blood glucose less than 180 mg/dL.
- Psychological and psychiatric consultation—counseling.

Physiotherapy: Limbs, chest.

Management of Special Circumstances

Age

- Infants and elderly individuals—highest risk patient
- Age is a major determinant on outcome.
- Infants—common form of child abuse.
- Elderly patients usually have comorbid medical problems and decreased physiologic reserve.

INHALATION BURNS INJURIES

Q. Describe inhalation burns injuries.

Also refer Pathophysiology of burns along with this section.

Management

- **Minor inhalation injury**—humidified oxygen is delivered.
- **Major injuries**
  - Endotracheal intubation for airway protection.
  - Pulmonary toilet of viscous secretions.
  - Bronchodilators can be given to treat bronchospasm whereas nebulized heparin and N-acetylcysteine can limit cast formation.
  - Extubation at the earliest possible.

Carbon Monoxide Poisoning

- Suspected by a history of exposure in a confined space,
- Nausea, vomiting, headache, mental status changes, and cherry-red lips.
- Carbon monoxide binds to hemoglobin with an affinity 240 times greater than that of oxygen, resulting in extremely slow dissociation
- Arterial carboxyhemoglobin level >5% in nonsmokers >10% in smokers is taken as high. The patient is started on oxygen—100% oxygen via non-rebreathing mask, continued until normal levels are achieved. Hyperbaric oxygen treatment is used as adjunct to oxygen in CO poisonings and burns.

Q. Write a short notes on electrical burns.

ELECTRICAL BURNS

They cause local tissue damage and myocardial damage in addition.

Complications

- Cardiopulmonary arrest (more common with alternating current)
- Thrombosis, sudden fall and fractures
- Rhabdomyolysis—release of myoglobin from injured cells of deep tissues to cause acute renal failure. Dark urine is seen first.

Treatment

- Intravenous lactated Ringer solution is used to maintain a urine output of at least 2 mL/kg/hr.
- Monitoring for bradycardia and arrest which may happen days after the injury.
- May need administration of atropine round the clock.

Chemical Injury

Alkali or acid or organic (petroleum) compounds.

Treatment

Immediate removal of the offending agent.

- Irrigation with abundant water for 30 minutes or more.
- Alkali burns penetrate more deeply than acid burns and require longer periods of irrigation.
- Neutralizing the chemicals is not preferred as the reaction generates heat.

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Q. Write a short note on cold injuries.

COLD INJURIES

Hypothermia

- A core body temperature less than 35°C.
- Mild 32° to 35°C; moderate is 32°C - 30°C; and severe is less than 30°C.

Signs of Hypothermia

- Skin—cold, pale or cyanotic.
- Lower level of consciousness, dysrhythmias (asystole happens below 28°C).

Management

- Cardiac monitoring, resuscitation, rewarming
- Cardiopulmonary resuscitation maintained until rewarming the patient to 36°C.

Rewarming Methods

- Passive rewarming—blankets to cover the body and head (warming rate-0.5° and 2°C hourly).
- Active external warming includes the use of heating blankets or a heated forced-air system, which can increase rewarming rates by 1 °C per hour
- Active internal rewarming—fluids and oxygen, (warming rate of 1° to 2°C per hour).
- Active invasive rewarming methods warm -faster at a rate 1° to 4°C per hour, e.g., warmed peritoneal lavage, thoracostomy lavage, and bladder lavage.
- Extracorporeal rewarming of blood—rapid rewarming—1–2 degree every 5 minutes.
  - Heated hemodialysis or via a continuous venovenous bypass circuit.

Q. What is frostbite? How do you manage the same? Short notes.

FROSTBITE

- Formation of intracellular ice crystals and microvascular occlusion.
- Factors affecting severity: Temperature,duration of exposure, conditions promoting rapid heat loss such as wind velocity, moisture, open wounds
- The fingers, toes, nose and ears are most vulnerable.

Classification

- **First degree:** Hyperemia and edema, without skin necrosis.
- **Second degree:** Superficial vesicle formation.
- **Third degree:** Hemorrhagic bullae and full-thickness necrosis.
- **Fourth degree:** Gangrene with full-thickness involvement of skin, muscle, and bone.

Treatment

- Rapid rewarming in a warm water bath between 40° and 42°C until the tissue perfusion returns.
- Elevation of part—to reduce edema.
- Escharotomy for severe injury.
- Amputation—only for gangrene; late recoveries often happen and hence early amputation has no role.

RADIATION BURNS (GOOD TO KNOW)

- Localised radiation damage
- Lethal dose—desquamation of skin—slow death.
- Non-lethal radiation—observe for effects.
  - Local effect—may be ulcer.
  - Systemic effects—GI tract—ulcers, diarrhea, hematochezia.
  - Immuno suppression.

Local treatment—for ulcers (ulcer excision and a vasculrized graft).

Systemic—supportive treatment—fluids, calories, symptomatic therapy against vomiting, diarrhea.
Management of infection.

SU4.3: Discuss the medico-legal aspects in burn injuries.

MEDICO-LEGAL ASPECTS IN BURN INJURIES

Burn injuries inflict severe systemic trauma, mortality, short and long-term morbidity among survivors, along with the economic, social, psychological and emotional impact on the victim.

The burns trauma often raises suspicion of a background of crime or unnatural act as the cause.

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The health care provider is obliged to inform the legal authority of all the information on these accidents.

- A large percentage of accidental burn injuries are preventable.
- Burns in domestic and industrial environments are often due to negligence.
- Burns injuries also happen among psychiatric patients, intoxication (alcohol or drug addicts)
- Suicidal burns are most common, especially women and children.
- Child abuse and domestic violence are frequently the cause of burns.
- Social crimes (sexual abuse, riots and violence) frequently involve homicidal burns.

Q. What are the responsibilities of a doctor in management of burns? (Short notes)

Summary of Medico-legal Issues in Burns Management (the Doctor's Responsibilities):

- Informing the police
- Issuing death certificates—cause of death after getting a medicolegal post mortem.
- Dealing with a burns injury in a female—married or unmarried (dowry problem and death); suicide or homicide.
- Disability and disfigurement—for award of compensation by authorities.
- Quantifying the permanent physical Impairment and issuing authenticated certificate
  - Assessing and quantifying impairment (not disability).
  - Obligation to testify; in a court of law on the degree of physical impairment.
- Plight and rights of burns survivor—physical, economic, emotional and vocational loss entitles them to compensation.
- Also spouses are entitled to compensation for loss of consortium.
- Workmen's compensation for industrial and insurance claims.

Details

Information to the Police

Legal and civic duty (as per IPC): Code of Criminal Procedures in section 39—mandates every citizen (includes the doctor) to inform the police of any incidence harmful to human beings.

- The police must be informed at the time of first visit of the patient for treatment or got admitted.
- Inform and notify police of all burns injuries with suspicion of unnatural cause:
  - All major burns when received
  - Unexplained severity, not matching with the history or circumstances
  - Patients received after several days of burns or patients received without proper treatment
  - Patients in moribund state—likely to die of burns.
  - Patients received dead
  - Mass casualties.(industrial accidents, natural disasters)
- Death certificate in burns injuries
  - Cause of death—is ensured by—hence a medico-legal postmortem is a must.
  - Police Officer in charge of the case, writes down a report on the dead body—panchnama. Fills an inquest for a medico-legal post mortem. Later, the body is taken to nearby health establishment equipped with postmortem facilities. Or the body is shifted to a morgue for later postmortem, the next day morn ing.

Burn Injuries in a Married Female

Domestic Violence

- **Dowry problem:** Police suspect—a dowry related issue in all burns with circumstantial evidences and investigations are done under a senior officer of the rank of DCP.
- **Death:** Governed by section 304B of IPC (specifies dowry deaths and punishment).

Disability and Disfigurement

Burn survivors suffer from disfigurement, emotional stress, loss of self-esteem, long-term injury due to burn injury or repeated corrective surgical procedures like skin grafting or correction of deformities.

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Q. Enumerate the guidelines in deciding compensation for disability in a burns victim.

LEGALITIES OF THE AWARD OF DISABILITY BY VARIOUS COMPETENT AUTHORITIES

Workmen's Compensation Act of 1923 and the Motor Vehicle Insurance Act—applied. Physical impairment may cause limitations of functional capacity of the patient—limitations may be termed as "disability to sustain" or "disability to earn livelihood".

The following terms are from the definitions adopted by the World Health Organization (WHO).

IMPAIRMENT AND DISABILITY

Physical impairment and functional limitations lead to disability.

Physical Impairment

- Permanent or temporary, reversible
- Psychological or anatomical loss—paralysis amputation, diabetic retinopathy
- Burn disfigurement or contracture.

Functional Limitations

- Partial or total inability to perform motor, sensory or mental functions.
- The doctor has to quantify and classify them as regressive or progressive.

Disability

- Deficiency in performing any activity. "Activities" in accordance with the age, gender and essential parts of daily living such as self-care, social and economic activity.
- Disability may be permanent, long-term or short-term.

Permanent Physical Impairment (PPI) and Permanent Disability

- There are physical, social, psychological and vocational effects to disability as well.
- A medical person thus needs to evaluate permanent physical impairment and to testify in a court of law, if called as an expert witness.
- Physical impairment certificates—issued by registered doctors (MCI Act 1956 or NMC 2020)
- Medical doctors must restrict to evaluating and certifying physical impairment and not certify disability, which is not purely a medical condition.
- If burn injury occurs as a workplace accident, the Workmen's Compensation Act is applicable.

Disability

Disability divided into three periods:

1. **Permanent disability:** Certified only after quantifying permanent physical disability.
2. **Temporary total disability:** Certified during the period of treating the individual who is totally physically impaired.
3. **Temporary partial disability:** The period after recovering from total physical impairment.

Ultimate legal compensation may be awarded usually for the permanent physical impairment, leading to permanent disability.

Plight and Rights of Burns Survivor

Suffering of the earning member affects economic strength and morale of the entire family. The management of burns is long, painful and costly.

The challenges for the burn survivor:

- Physical and emotional trauma
- An injury that leaves one in pain
- Disfigurement
- Organ damage
- Metabolic and biochemical damage
- Sensitivity to temperature change.

Q. What are the legal rights of burns survivors.

LEGAL RIGHTS OF BURNS SURVIVORS FOR COMPENSATION

Compensation can be claimed by the burn victim depending on the cause of the burn injury.

Compensatory Damages

- For current medical expenses—hospitalization, surgeries emergency, reconstructive and cosmetic counseling, physical therapy, occupational therapy.

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- Lost wages—actual and anticipated future loss
- Anticipated future medical expenses.
- Mental or emotional pain and suffering (past and anticipated in the future).
- Disfigurement, any physical or mental impairment or disability.
- Loss of consortium—compensation payable to spouse of a burns victim due to the injury destroying the spousal relations.

Indian Legal Enforcements

- Persons with Disabilities Act 1995 for compensation from the state.
- Mental retardation and Multiple Disabilities Act, 1999.
- Disability means "a person suffering from not less than forty percent of any disability as certified by a medical authority—include blindness, low vision, hearing impairment, locomotor disability or cerebral palsy, mental retardation, mental illness and persons cured of leprosy.

The Rehabilitation Council of India Act, 1992

The Rehabilitation Council of India (RCI) was set up by the Government of India in 1986 to regulate and standardise.

- To standardize training courses and prescribe standards of education for professionals dealing with people with disabilities.
- To regulate these standards in all training institutions uniformly throughout the country
- To promote research in rehabilitation and special education
- To maintain Central Rehabilitation Register for registration of professionals.

SU4.4: Communicate and counsel patients and families on the outcome and rehabilitation demonstrating empathy and care. DOAP session.

Only key principles given.

After evaluation and emergency measures, the treating doctor shares the details with responsible family members. The patient's morale should be boosted by talking to him about the positive progress made during treatment and encouraging him to communicate freely.

It is not an easy job to share a gloomy picture with the patient of family.

To the patient in presence of his family. He is explained that he is ill for a short period and he is improving. If there is a significant impairment of function, he may be told that he would be entitled to compensation and his job is secure, he is assured of relief from pain and symptoms. Show him pictures and recorded success stories. He is also assured that he is not alone and he would get his life back and his cooperation is sought for.

To the family only: One's concerns are shared fully with them including the worst possible scenario, explaining all the existing and anticipated complications. But the same should be done with empathy. They are reassured of one's cooperation in settling the financial entitlements, legal issues and rehabilitation of the patient.

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- It is helpful for Junior Residents in surgery (MS/DNB) to learn the basic concepts and apply their knowledge.
- Inspires Junior Faculty (Assistant Professors) in streamlining teaching sessions like theory classes, small group learning or self-directed learning (SDL).

K Jayarama Shenoy is a Professor and *Former* Head of Surgery at Kasturba Medical College (KMC), Mangaluru, Karnataka, India, a unit of Manipal Academy of Higher Education. He completed MBBS from Government Medical College, Mysuru in 1979 and MS from KMC, Mangaluru in 1983. Post MS degree, he worked under Dr TM Joseph, in cardiothoracic surgery at Kochi. He joined KMC, Mangaluru as a Lecturer in September in 1984, and worked as an Honorary Surgeon in the teaching unit at Government Wenlock Hospital, Mangaluru. He was a member of the Board of Studies of MAHE, Manipal. He has trained hundreds of his postgraduate students, who have scaled great heights in India and abroad in their respective specialties of surgery and also as famous teachers and authors. He took keen interest in standardizing pancreatic surgery, consolidating esophageal, colorectal, and head and neck oncosurgery in the basic set up of the government hospital and popularized open preperitoneal repair for hernias since 1993. He is a practicing Surgeon at Mangaluru, with focus on digestive tract, surgical oncology and herniology. He is an active member of the Association of Surgeons of India. He was the winner of debate at ASICON 2014, Hyderabad. He delivered Dr KN Udupa Endowment Lecture in ASICON 2015, Gurugram; Dr Das Mohapatra Oration at ASICON 2021-virtual platform; Dr MP Pai Oration at KSC ASICON 2012 and also invited faculty lectures at ASICONS at Hyderabad and Mysuru. He was the Convener of Major Symposium at KSC ASICON 2020, Bengaluru. He has presented and actively encouraged his juniors to present and publish innumerable clinical research papers. He organized many CMEs at Mangaluru and has been a resource person at others.

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