d information on nursing books, visit our website www.ejaypee.com, for detailed information on nursing books, visit our website www.ejaypee.com,

Complimentary Online Student Resource
MCQs, Flashcards, Various Recent University Exam Papers and
One Stop Resource for All Your Exam Needs only with Genuine Book



2nd Edition

Adult Health Nursing-II

(Medical Surgical Nursing)

With Integrated Pathophysiology Including Geriatric Nursing

(Palliative Care Module)

As per the Revised INC Syllabus for BSc Nursing

Sukhpal Kaur

Genuine?
Scratch, Scan
& Validate

Semester IV



Dr. Wise
Innovative & Genius
AI Chatbot
access code inside

JAYPEE

Contents

Unit I: Nursing Management of Patient with Disorders of Ear, Nose and Throat

1. **Review of Anatomy and Physiology: Ear, Nose and Throat** 3
   Tulika Gupta, Daisy Sahni
2. **Assessment and Diagnostic Evaluation of Ear, Nose and Throat** 9
   Manwinder Singh, Abhishek Singh
3. **Disorders of Ear** 18
   Manwinder Singh, Dia Sharma, Sukhpal Kaur
4. **Upper Airway Infections** 31
   Vivek K Pathak, Pragya Pathak, Pradeepti Nayak
5. **Obstruction and Trauma of the Upper Respiratory Airway** 45
   Vivek K Pathak, Pragya Pathak, Pradeepti Nayak
6. **Speech Defects and Speech Therapy** 59
   Sanjay Munjal, Anuradha Sharma
7. **Deafness and its Management** 69
   Sanjay Munjal, Md Noorain Alam

Unit II: Nursing Management of Patients with Disorders of Eye

8. **Review of Anatomy and Physiology: Eye** 85
   Tulika Gupta, Tanvi Soni, Daisy Sahni
9. **Assessment and Diagnostic Evaluation of Eye** 91
   Anshul Chauhan, Gagandeep Kaur, Priyanka Verma, Lakshya Kumar, Mona Duggal
10. **Ophthalmic Surgical Instruments** 100
    Manpreet Singh, Manpreet Kaur, Aditi Mehta
11. **Ocular Pharmacology and Lasers** 104
    Himanshi Singh, Parul Chawla Gupta, Jagat Ram
12. **Refractive Errors** 107
    Himanshi Singh, Parul Chawla Gupta, Jagat Ram
13. **Cataract** 110
    Ranjan Kumar Behera, Parul Chawla Gupta, Jagat Ram
14. **Disorders of Eyelid and Lacrimal System** 116
    Manu Saini, Tanvi Soni
15. **Orbital Disorders** 122
    Manu Saini, Tanvi Soni
16. **Disorders of Cornea** 126
    Surbhi Khurana, Parul Chawla Gupta, Ranjan Kumar Behera, Jagat Ram
17. **Glaucoma** 132
    Faisal Thattaruthody, Neha Chauhan, Madhuri Akella
18. **Disorders of Conjunctiva** 140
    Surbhi Khurana, Parul Chawla Gupta, Ranjan Kumar Behera, Jagat Ram
19. **Disorders of Retina and Vitreous** 146
    Atul Arora, Reema Bansal, Vishali Gupta
20. **Disorders of Sclera and Uvea** 159
    Atul Arora, Reema Bansal, Vishali Gupta
21. **Neuro-ophthalmology** 165
    Shweta Chaurasia, Kajree Gupta
22. **Strabismus** 194
    Shweta Chaurasia, Shagun Korla, Kiran Kumari
23. **Ocular Injuries** 215
    Surbhi Khurana, Parul Chawla Gupta, Ranjan Kumar Behera, Jagat Ram
24. **Eye Banking, Ocular Prosthesis and Rehabilitation** 221
    Ranjan Kumar Behera, Parul Chawla Gupta, Jagat Ram
25. **Community Ophthalmology** 226
    Mona Duggal, Anshul Chauhan

Unit III: Nursing Management of Patient with Kidney and Urinary Problems

26. **Review of Anatomy and Physiology: Urinary System** 235
    Anjali Aggarwal, Daisy Sahni

27. Assessment and Diagnostic Evaluation of Urinary System 241
Meenal Sharma

28. Urinary Tract Disorders 248
Meenal Sharma

29. Other Common Kidney Disorders (Glomerular Diseases, Renal Tumors) 263
Manju Amit Kumar Rajora, Manisha Mehra

30. Kidney Failure 277
Pragya Pathak, Arunkumar S

Unit IV: Nursing Management of Disorders of Male Reproductive System

31. Review of Anatomy and Physiology: Male Reproductive System 295
Richa Gupta, Daisy Sahni

32. Assessment of Male Reproductive System 300
Neha Handa, Soumitra Ghosh

33. Disorders of Male Sexual Functions 306
Neha Handa, Soumitra Ghosh

34. Disorders of Penis 312
Neha Handa, Soumitra Ghosh

35. Male Inguinoscrotal Disorders 322
Arti Saini, Sravanthi Vutukuru

36. Disorders of Prostate Gland 332
Arti Saini, Neha Pundir

37. Male Breast Disorders 349
Arti Saini, Neha Pundir

Unit V: Nursing Management of Patient with Burns, Reconstructive and Cosmetic Surgery

38. Burns, Reconstructive and Cosmetic Surgery 361
Latika Rohilla, Vithal Malmande

Unit VI: Nursing Management of Patient with Neurological Disorders

39. Review of Anatomy and Physiology: Nervous System 385
Daisy Sahni, Richa Gupta

40. Assessment of Patients with Neurological Disorders 398
Sonali Banerjee

41. Diagnostic Evaluation in Neurological Disorders 413
Sonali Banerjee

42. Management of Common Problems in Neuroscience Patients 425
Pooja Thakur

43. Traumatic Conditions 451
Latika Bajaj

44. Cerebrovascular Disorders 466
Manisha Nagi, Ashok Kumar, Vivek Kumar Garg, Divesh Kumar Munjal, Kapil Goel

45. Neoplasms of the Neurological System 482
Manju Dhandapani

46. Chronic Neurological Problems 498
Vivek Kumar Garg, Manisha Nagi, Ashok Kumar, Jitendra Gairolla, Kapil Goel

47. Neurological Infections 513
Rakesh Sharma, Deepak Goel, Jitender Chaturvedi

48. Nerve and Muscle Disorders 524
Priya Baby, Saraswathi Nashi

49. Movement Disorders 541
Priya Baby, Rohan R Mahale

50. Cranial Nerve Disorders 550
Rakesh Sharma, Deepak Goel, Jitender Chaturvedi

51. Neurodegenerative Diseases 558
Monaliza

Unit VII: Nursing Management of Patients with Immunological Problems

52. Review of Anatomy and Physiology: Lymphatics System 581
Chiman Kumari, Daisy Sahni

53. Common Diagnostic Tests in Immunological Disorders 586
Harshdeep Singh Trehan

54. Autoimmune and Inflammatory Disorders 596
Rita Lakhani, Manasi Mahesh Rahane, Aasif Bagwan

55. Immunologic Alterations 630
Deepa Reddy, Rita Lakhani

Unit VIII: Nursing Management of Patient with Oncological Conditions

56. Cancer 659
Gurpreet Kaur, Latika Rohilla

57. Treatment Modalities of Cancer 669
Maninderdeep Kaur, Divya Dahiya, Pramod Kumar

58. Oncological Emergencies 687
Puneet Kaur, Sukhpal Kaur

59. Palliative Care 699
Sukhpal Kaur, Jyoti Kathwal

Unit IX: Nursing Management of Patient in Emergency and Disaster Situations

60. Principles of Emergency Management 715
Santa De

61. Disaster Management: Nursing Perspective 734
T Samuel Ravi Kumar

Unit X: Geriatric Nursing (Nursing Care of the Elderly)

62. Ageing: Demography, Classification, Myths and Realities, and Theories 751
Sukhpal Kaur, Manjeet Singh

63. Age-related Body System Changes and Common Health Problems in Elderly 762
Manjeet Singh, Alisha Talwar, Sukhpal Kaur

64. Elderly Abuse, Legal and Ethical Issues of the Elderly 790
Nitasha Sharma, Sunita Sharma

65. Provisions and Programs for Elderly 798
Ruchi Saini, Nitasha Sharma, Sukhpal Kaur

66. Care of Elders 805
Sukhpal Kaur, Alisha Talwar

Unit XI: Critical Care Nursing (Nursing Management of Patients in Critical Care Units)

67. Critical Care Nursing: General Concepts 825
Lt Col Lata Mandal

68. Management of Patients in Critical Care Units 840
Shivani Kalra, Jyoti Sharma

Unit XII: Nursing Management of Patients Occupational and Industrial Disorders

69. Occupational and Industrial Disorders (Occupational Hazards Among Nurses) 865
Ravindra Khaiwal, Pooja Parihar, Suman Mor

Unit XIII: Special Topics

70. Patient Safety 875
Arti Saini, Neha Pundir, Pankaj Arora

71. Organ Donation and Transplantation 886
Navdeep Bansal, Sukhpal Kaur

72. Importance of Yoga for Nursing Professionals 895
Tanmya Deswal, Pooja Nadholta, Sadhana Verma

INC Modules 909

Objective Structured Clinical Examination (OSCE) 911

Annexures 919

Appendix 955

Multiple Choice Questions 961

Index *971*

UNIT V

Nursing Management of Patient with Burns, Reconstructive and Cosmetic Surgery

UNIT OUTLINE

38. **Burns, Reconstructive and Cosmetic Surgery**
Latika Rohilla, Vithal Malmande

JAYPEE BROTHERS

JAYPEE BROTHERS

CHAPTER 38

Burns, Reconstructive and Cosmetic Surgery

Latika Rohilla, Vithal Malmande

"I survived because the fire inside me burned brighter than the fire around me."

—A Burn Survivor

Learning Objectives

After going through the chapter, the learner will be able to:

- Enumerate and define various classification systems of the burn injury.
- Describe the pathophysiology and the associated clinical manifestations in terms of both systemic effects and local effects of a burn injury.
- Elaborate various aspects of management, such as diagnostic, medical, surgical and other non-pharmacological modalities.
- Identify the needs of a burn injury patient in all the three phases of burns, formulate the nursing diagnosis and enlist the nursing interventions for each one of them.
- Enumerate the potential complications along with the actions that are necessary to prevent them in a burn patient.
- Describe role of a nurse in various aspects of burn care, such as wound care, diet and nutrition, pain management, topical antimicrobial therapy, reconstructive and cosmetic surgery.

Key Terms

- **Compartment syndrome in burns:** Reduced blood perfusion in underlying tissues due to either excessive fluid collection under the skin or by compression of the burnt tissue acting, such as a tourniquet, leading to necrosis in the closed space, often as a result of circumferential third degree burn or high voltage electric injury.
- **Contracture:** Shrinking of the skin tissues during the healing phase of a burn injury caused by collagen maturation.
- **Debridement:** An aseptic surgical process of removing the burnt and dead tissue from the wounds before dressing.
- **Donor site:** Part of the body from which the graft is taken mostly thighs or trunk.
- **Eschar:** A dark, dry and dead tissue that falls off or sheds from the surface of the skin after a deep burn wound.
- **Fasciotomy:** Surgical procedure of giving an incision in the muscle fascia to release pressure on the lower tissues and organs.
- **Split thickness skin graft (STSG):** A graft used to cover burn wounds (partial thickness), that contains the epidermis along with a portion of dermis. It does not have blood supply of its own and is dependent on the wound bed for graft in growth.
- **Total burn surface area (TBSA):** It is calculated by various methods, such as the rules of nines and the Lund and Browder method. It is used for estimating the fluid resuscitation needs.

INTRODUCTION

Burn injury, unlike other medical surgical conditions, has deep and long-lasting effect on psychology of the patient as patient tends to lose his/her very identity. However, various reconstructive and cosmetic surgeries have emerged today to ease the multiple problems of the burn patient during rehabilitation. This chapter highlights various aspects of burn injury and their management from immediate after injury to long term rehabilitation.

EPIDEMIOLOGY

World

- An estimated 180,000 deaths every year are caused by burns.

JAYPEE BROTHERS

- Burn injuries (non-fatal) are among the leading causes of 'disability-adjusted life-years' (DALY) lost.
- Worldwide, over 10 million people are reported to have burn injuries each year.

India

- In India, over 1 million people are burnt every year.
- Burns are the second most common type of injury after road accidents.
- **Severity:** About 10% of burn injuries are life threatening. Over half of those who get hospitalized, do not survive. Nearly 2 lakh people get permanently disabled due to burns. They need many plastic surgeries and prolonged rehabilitation.
- **Age:** Most of the burn victims are in the age group of 15 to 40 years.
- **Gender:** There is a higher risk for mortality related to burns among females. The burn injuries are related to cooking related injuries (both LPG and kerosene stoves) because of which the loose clothing catch fire very easily.

CLASSIFICATION OF BURNS

Burns can be classified by the **mechanism of injury, depth, and extent of burn injury.** A brief description of all the three is given below:

1. **Mechanism of injury:** Burns are classified according to the causative agent and the related mechanism causing injury.

A burn wound may be any one or a combination of the following:

- *Thermal injury (dry heat):* Contact with hot object causes this type of burn. Fire flame injury is also categorized as thermal burns.
- *Electrical injury:* It happens when a person is in contact with electric current for prolonged time. Electricity can affect internal tissues like muscles and the burn may appear on the skin. Electric burns are more injurious inside than they appear on the outside skin. Entry and exit point of the electric current are most severely injured.
- *Scald injury (moist heat):* Contact with hot liquids, such as boiling water, hot beverages, oil or chemicals, such as acids to the skin can cause scald injury. Blisters are most common to appear after a scald burn.
- *Chemical injury:* Any chemical erosion of the internal organs, such as eyes, oral or nasal cavity is termed as chemical injury.
- *Cold injury (frost bite):* Frostbite is caused due to prolonged contact with freezing temperatures. It initially appears cold and red, followed by numbness and pale appearance.
- *Ionizing radiations:* High-energy radiation used during radiotherapy for cancer patients.

2. **Depth of injury:** Burns are classified as first, second, third, and fourth degrees **(Table 38.1)**. The 'second' and 'third degree' wounds are also sometimes referred to as

TABLE 38.1: Classification of burns according to depth.

Degree of burn	*Tissue involved*	*Appearance of wound*	*Examples*
First-degree (superficial) burns	Epidermis only	Red, painful, and dry appearance	Mild sunburn, quick contact with a hot object
Second-degree (partial thickness) burns **(Fig. 38.1A)**	Epidermis, part the dermis	Appears red, blistered, and swollen. They are painful	Hot liquids-water, oil, candle wax, etc., steam, friction burn
Third-degree (full thickness) burns	Complete loss of the epidermis and dermis, reaches the subcutaneous tissue	White or blackened and charred	Contact with hot object for long time, flame from a fire, electric, chemical burns
Fourth-degree burns **(Fig. 38.1B)**	Loss of all layers of the skin, underlying subcutaneous tissue and might involve muscle and bone	• Not painful • Exposed tissue appearance, which may be charred or black	Prolonged contact with fire, deep electric or chemical burns



Figs. 38.1A and B: (A) Second degree (partial thickness burns); (B) Fourth degree burns.

JAYPEE BROTHERS

'partial' and 'complete' thickness respectively according to the thickness of dermis involved.

3. **Extent of injury:** It involves classification of burns according to the total burn surface area (TBSA) of the body involved. It is very important to have accurate assessment of the TBSA as the fluid resuscitation is given according to TBSA and weight of the patient.

CALCULATING TOTAL BURN SURFACE AREA (TBSA)

It is important to calculate the total burn surface area to estimate the volume of fluid resuscitation. There are different methods to assess the TBSA.

- **Rule of nines:** It is the most commonly used method. The rule of nines is a quick and easy method of estimating the burn surface area in the emergency department. It divides the body into multiples of nine **(Fig. 38.2A)**.
- **Lund and Browder (L and B) method:** The L and B method is another method used for estimating TBSA among pediatric population. This takes different proportions of the body parts into account. So, with increasing age decreasing percent of body surface area for the head and increasing percent of body surface area for the legs, leads to a more accurate estimation **(Fig. 38.2B)**.

PATHOPHYSIOLOGY OF BURNS (FLOWCHART 38.1)

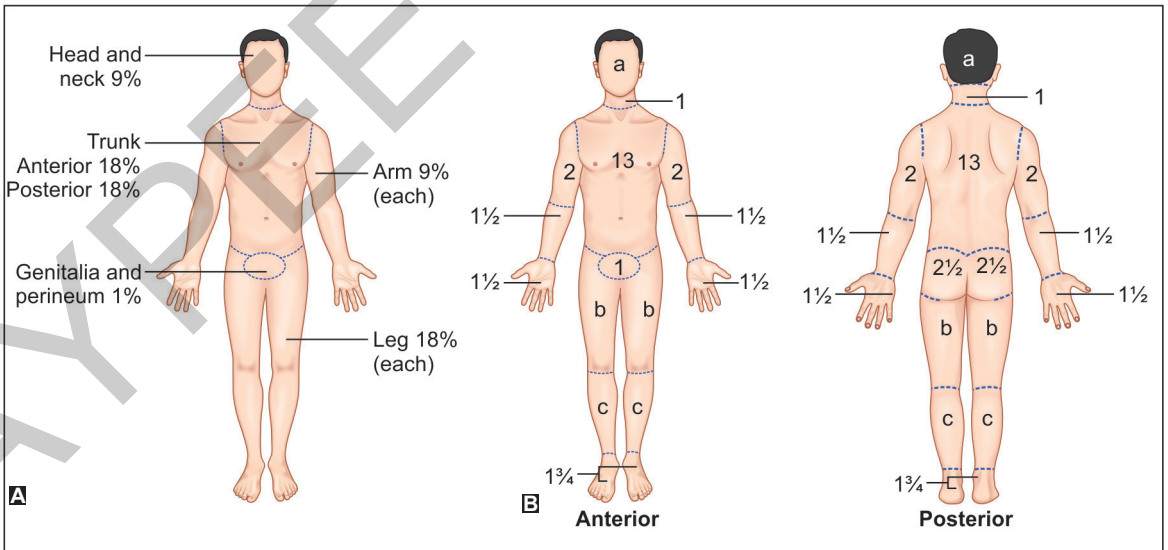
Burn injury affects the body in different ways, all adding up to an acute life-threatening emergency situation. Burn wounds have three zones. These are: (1) 'Coagulation zone,' (2) 'Stasis zone,' and (3) 'Hyperemic zone.'

- **Coagulation zone:** This is the zone of permanently destroyed tissues.
- **Stasis zone:** It is surrounding the coagulation zone, has damaged tissue with decreased perfusion, but it can still recover.
- **Hyperemic zone:** It is the tissue around the stasis zone that has minimal damage and can recover on its own.

The tissues in the zones of 'stasis' and 'hyperemia,' are viable but can be damaged later due to perfusion loss, infection, or inflammation. This can lead to permanent damage to these tissues as well.

- The transfer of heat to the skin tissues leads to altered capillary permeability which causes the third space shift.
- Blisters are formed when plasma from damaged capillaries leaks into the interstitial space due to increased vascular permeability.
- The damaged epidermis then separates from the dermis below it. The high osmolarity of leaked fluid can cause water absorption from underlying tissue into the blister, leading to compartment syndrome. This causes a dual problem of reduced blood volume and increased interstitial pressure.
- Whereas the decreased blood volume leads to a hypovolemic shock that is systemic, compartment syndrome due to the increased pressure beneath the burn tissues especially in electric burns and circumferential deep wounds leads to progressive necrosis of the underlying tissues especially in legs and arms.
- **Skin barrier loss:** This leads to extensive loss of fluid by evaporation. This loss of fluid causes reduction in tissue perfusion and oxygenation. This hypovolemia results in hypoperfusion to all major body organs.

Estimating percent total body surface area in children affected by burns



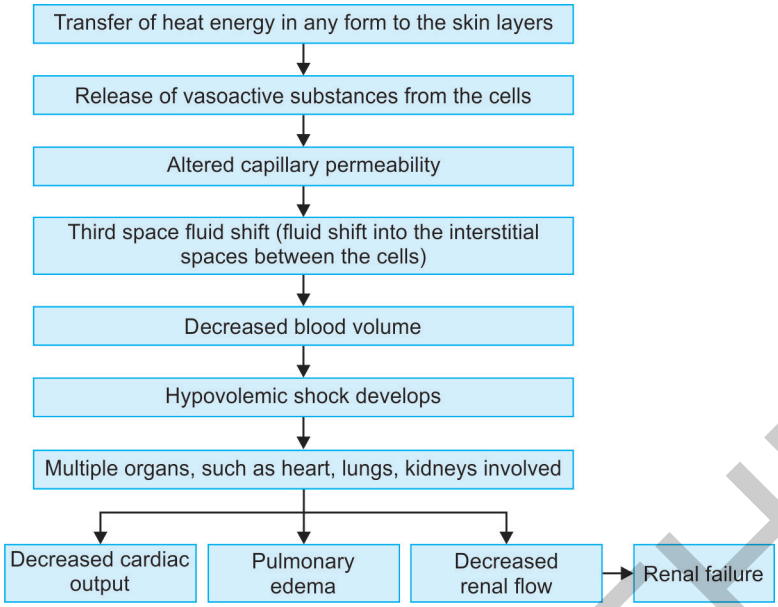
Relative percentage of body surface areas (% BSA) affected by growth

	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	3¾	4	4¼	4½
c—½ of 1 lower leg	2½	2½	2¾	3	3¼

Figs. 38.2A and B: Estimating the total burn surface area (TBSA): (A) Rule of nine; (B) Lund-Browder diagram for estimating extent of burns.

JAYPEE BROTHERS

Flowchart 38.1: Pathophysiology of burns.



- **Multiorgan failure:** Tissues release many inflammatory substances after injury, which cause interstitial edema and multiple organ dysfunction. Multiorgan failure usually develops between the second and eighth week after injury and accounts for one-third of burn-related deaths. Increased age, increased TBSA burned, male sex, and the presence of inhalation injury all are associated with an increased chance of multiorgan failure after burn injury.
- **Systemic infections or sepsis:** Loss of the skin's immunity leads to an increase in susceptibility to infection. Systemic infection results from invasion of bacteria into the body through the burn wound. Immediately following injury, the burned area is sterile, but then bacteria quickly colonize the wound. Then, microorganisms rapidly gain access to the rest of the body through blood.
- **Cardiac effects:** Myocardial function may be depressed immediately after injury, but it improves within 48–72 hours. This is caused by circulating inflammatory agents and persisting hypovolemia. This is followed by a hyperdynamic cardiovascular response with an up-to-two-fold increase in cardiac output.
- **Metabolic changes:** Metabolic changes (e.g., 'metabolic acidosis', 'respiratory alkalosis', and 'electrolyte disturbances') are common. These include a rise in the intracellular concentrations of sodium and calcium and increase in the intravascular levels of potassium.

CLINICAL MANIFESTATIONS

The burn patient mostly reaches the emergency department in a state of shock due to pain and sudden hypovolemia.

Superficial to moderate partial thickness burns are painful, while deep burns involving full thickness are painless due to destroyed nerve endings. Fluid is not actually lost from the body, but it gets 'trapped in the interstitial spaces.' Consciousness is intact except in cases of hypoxia due to 'smoke inhalation,' 'head trauma,' or sedation. The specific signs and symptoms are:

1. **Immediate (within 24 hours):**
   - Pain and burning sensation over burn site
   - Reddening and blistering of the skin
   - Bleeding if skin is broken
   - Necrosis and skin is black in color
   - Lack of sensation (if nerve damage, as in deep wounds)
   - Anxiety
   - Tachycardia, tachypnea
   - Dizziness, particularly during change of position.
   - Fever (as an inflammatory response, not necessary a sign of infection)
   - Inhalation burns may also have breathlessness, stridor and cough
2. **Late manifestations (after 24 hours):**
   - Anasarca (generalized edema)
   - Decreased urine output
   - Bradycardia, bradypnea, hypotension, hypothermia
   - Shock (hypovolemic)
   - Increased thirst (polydipsia)
   - Nausea, vomiting
3. **Signs and symptoms of infection:**
   - Discoloration of the surrounding area around the burnt skin.
   - Purplish discoloration or swelling may also be seen.
   - Increase in thickness or depth of the burn (the burn extends deeper into the skin with infection)
   - Discharge (white to green color) or pus from the wound.
   - Fever

MANAGEMENT OF THE PATIENT

The burn patients have different needs and potential health issues that need to be managed accordingly. Therefore, the management of these patients is discussed under three

JAYPEE BROTHERS

phases according to the time past the burn injury. These phases are:

1. The emergent phase (first 48–72 hours)
2. The acute or healing phase (after 72 hours to 15 days)
3. The rehabilitation phase of burn care (beyond 15 days)

The Emergent Phase (First 48–72 Hours)

This phase initiates with the start of the burn injury. It lasts till the fluid resuscitation is completed. It may be for the first 48 to 72 hours depending upon the severity of the burn injury. During this phase, priority of patient care involves maintaining an adequate airway, resuscitating the fluid and treating the patient for burn shock.

Medical Management

- **History taking**: As burns are a medicolegal emergency, history taking is very crucial step. The incidence should be reported in verbatim with details of the informer. History taking can give important clues to rule out homicidal cases. History taking is explained under the nursing management ahead.
- **Physical examination:** It includes assessment of the ABC (airway, breathing, and circulation) and the vital signs. Other parameters specific to the burn injury, such as the depth, degree and percentage of burn and inhalation injury are also assessed. Severity of burns is determined by:
  - *Is inhalation injury involved?* Inhalation injury requires prompt intubation and generally has a poor prognosis. Signs include: traces of carbon/soot on the face (around the mouth/nose), blisters on face and buccal cavity, or respiratory stridor.
  - *Depth:* Is it a first, second (partial thickness), third degree (full thickness) burn?
  - *Extent:* What is the TBSA?
  - *Age:* Is the patient from the more vulnerable age group? The very young (less than 10 years) and very old have a poor prognosis.
  - *Which area of the body has been burned?* The face, hands, feet, perineum, and circumferential burns need special attention.
  - *Any other injuries along with burns or any illness?* Medical history of the patient.
- **Laboratory investigations:** Later on investigations are performed to assess any complications, such as dehydration, infection, electrolyte imbalance, etc.
  The following blood samples are to be sent immediately at admission:
  - Arterial blood gas values
  - Electrolyte levels (sodium, potassium, chloride levels), blood glucose levels
  - Renal function test (blood urea nitrogen, uric acid, creatinine levels)
  - Liver function tests (ALT, AST)
  - Hematocrit (hemoglobin level, blood cell count)
  - Blood culture has to be sent for microorganism and sensitivity testing.
  - **'Serum lactate'**—helps detect acid-base imbalance.
  - **Blood 'serum creatine-kinase'**—they are released in cases of injuries to internal organs, such as the kidneys or muscles. This can occur with electrical or deep third-degree burns.
  - **Blood type and cross-match**—Sever fluid loss or injury may require blood transfusion.

  Other investigatory tests include:
  - **Electrocardiogram (ECG):** To look for cardiac arrhythmias.
  - **Chest X-ray:** To detect atelectasis infections or pulmonary edema.
- **First aid for burns:**
  - This begins with the burn injury till the completion of fluid resuscitation (period of about the first 24 hours).
  - Maintaining an adequate airway and treating the patient for burn shock are nursing priorities during this time.
  - Stop the burning process and move the patient away from the site of injury.
  - In case of external wounds, wash the wound with tap water by continuous irrigation for 20 minutes. Prevent hypothermia too.
  - Maintain airway, breathing and circulation.
  - In case of fall from height accompanied with high voltage electric injury or fall from height, assess for any fractures or spinal injury. Shift the patient to the nearest medical facility as early as possible.
- **Burn care at hospital**

Airway management:

- Endotracheal intubation or tracheotomy for assisted ventilation may be required immediately to maintain adequate oxygenation.
- Assess arterial blood gas values for respiratory or metabolic acidosis/alkalosis.
- In case of circumferential burns on the chest wall and neck, escharotomy may be needed to relieve respiratory distress. Administration of humidified oxygen in case patient is not intubated.
- Position the patient in high Fowler's position except in spinal cord injuries.
- Encourage patient for coughing and deep breathing exercises, reposition every hour.
- Provide chest physiotherapy and postural drainage.
- Suction secretions when indicated.
- Administration of bronchodilators may be necessary to relieve bronchospasm.

Carbon monoxide poisoning:

- Carbon monoxide has very high affinity for hemoglobin. It combines with hemoglobin in blood to form another chemical called carboxyhemoglobin.
- Carbon monoxide poisoning leads to a vasodilating effect.
- Early intubation and 100% oxygen administration may be needed.

Ensure proper circulation:

Signs of compromised circulation and impending shock are:

- Slow capillary refill (more than 5 seconds)
- Hypotension.
- Reduced urinary output.

JAYPEE BROTHERS

Fluid management:

- In the initial hours after a major burn injury, loss of capillary permeability leads to intravascular fluid to flood into the extracellular space.
- In case of adults having more than 15% TBSA or a child having more than 10% TBSA, require immediately fluid resuscitation.
- Fluid replacement using solutions, such as crystalloids (usually 'Ringer's lactate') or colloids ('albumin'). The steps of fluid management are:
  - Insertion of at least one (and usually two) large bore catheter for administering Intra Venous fluids.
  - In case of large areas of burns vene-section or central line insertion may be necessary.
  - Calculating the TBSA involved.
  - Calculating the fluid needs according to one of the fluid resuscitation formulas **(Box 38.1)**:
    - Assessment of the adequacy of fluid replacement:
      - Urine output 30–50 mL/hour; 75–100 mL/hour for electrical burn patients (with evidence of hemoglobinuria or myoglobinuria).
      - Cardiopulmonary factors: BP (systolic >90 mm Hg), pulse rate <120 beats/minute.
    - After the first 24 hours, the amount of fluid infused is titrated according to the urine output.

Surgical management: Wound care

- Delayed until airway is patent and adequate fluid replacement is established.
- Cleaning and gentle debridement in a shower or at the patient's bed.
- Extensive surgical debridement is performed in an operating room.
- Releasing escharotomies or fasciotomies is done in the emergent phase, by burn physicians (plastic surgeons).
- Wound care is not only demanding on the patient but puts him at risk for heat loss, electrolyte depletion and cross contamination.
- Health care team members should ensure adequate infection control measures.

BOX 38.1: Fluid resuscitation formulas.

"Parkland/Baxter Formula"

- **'Lactated Ringer's solution:** 4 mL × kg body weight × % TBSA burned
- **Day 1:** Half to be given in first 8 hours; half to be given over next 16 hours
- **Day 2:** Varies. Colloid is added.'

"Brooke Army Formula"

- **'Colloids:** 0.5 mL × kg body weight × % TBSA
- **Electrolytes (lactated Ringer's solution):** 1.5 mL × kg body weight × % TBSA
- **Glucose (5% in water):** 2,000 mL for insensible loss
- **Day 1:** Half to be given in first 8 hours; remaining over next 16 hours
- **Day 2:** Half of colloids; half of electrolytes; all of insensible fluid replacement.
- Second- and third-degree (partial- and full-thickness) burns exceeding 50% TBSA are calculated on the basis of 50% TBSA

- Proper disinfection of the environment and the utilities is a must. Use of plastic liners prevents contamination of equipment.
- Face, eyes, fingers, perineum, hands, arms, ears and skin folds require particularly vigilant nursing care.
- Facial care is often performed by open method since dressings can be traumatizing to patients.
- Eye care for corneal burns and edema require antibiotic therapy. Artificial tears can be used to provide comfort. Assure patients that periorbital swelling is temporary.
- Hands and finger should be kept straight and elevated to prevent edema.
- Ears should be kept free of pressure as they have poor vasculature and are more prone to infection.
- Perineum should be kept clean and healthy and an indwelling catheter can prevent contamination of the wound.

Nutrition and dietary supplements

- Burn patients need high calories, high proteins diet to aid recovery. Egg white is most cost effective in our Indian scenario.
- Antioxidant rich fruits and vegetables.
- Reduce refined carbohydrates, white bread, and sugar.
- Caffeine, alcohol and tobacco are prohibited.
- 6–8 glasses water daily.
- A multivitamin to be given daily; containing the antioxidant vitamins A, C, E, the B-complex vitamins and trace minerals such as magnesium, calcium, zinc, and selenium.
- Vitamin C to promote new tissue growth. Vitamin E also promotes healing.
- L-glutamine supplement prevents movement of gut flora into blood capillaries and also supports immunity. These are contraindicated in hepatic encephalopathy, and severe liver disease with confusion.
- Probiotic supplement (which contains '*Lactobacillus acidophilus*'), 5–10 billion CFUs (colony forming units) in a day. Antibiotics upset the normal gut flora (bacteria). Probiotics are used to restore the balance, and also improve gastrointestinal and immune health.

Special Therapies

Pain Management

- Analgesics and sedatives should be started early and preferably using intravenous route.
- Morphine (opioid) is the first drug given for burn pain control, followed by hydromorphone and methadone.
- Anxiety and pain usually occur together in burn patients. The overall burn experience can cause severe anxiety, leading to exacerbation of pain. To mitigate the effect generally sedation with anxiolytic medications namely lorazepam and midazolam are often needed in addition to the usage of opioids.
- Using non-pharmacologic interventions are also effective in the burn pain management. These include relaxation and deep breathing exercises, yoga, cognitive behavioral therapy, guided imagery, hypnosis, therapeutic touch, humor, and music therapy **(Box 38.2)**.

JAYPEE BROTHERS

BOX 38.2: "Rohilla L, Agnihotri M, Kaur S, Sharma RK, Ghai S. Effect of music therapy on pain perception, anxiety, and opioid use during dressing change among patients with burns in India: A quasi-experimental, cross-over pilot study. Ostomy/wound Management. 2018;64(10):40-46. DOI: 10.25270/owm. 2018.10.4046".

Introduction: This study was conducted to assess the effectiveness of music for relief in pain as well as anxiety during change of burn dressing.

Methods: Patients from a burn unit at a tertiary care hospital in North India, participated in this quasi-experimental and cross-over study. aim was assessed using the NRS (numerical rating scale), and anxiety was assessed using the STAT (State Trait Anxiety Test).

Results: Median pain and anxiety scores were significantly lower with music therapy during dressing changes.



NURSING MANAGEMENT DURING THE EMERGENT PHASE

Nursing Assessment

- **History taking should include:**
  - Age, height, weight and BMI of the patient.
  - Causative agent (electricity, fire flame, hot liquids, chemicals, gasoline, coal tar, radiation, etc.)
  - Duration or time of exposure to causative agent.
  - Circumstances around the injury (closed or open spacing, intentional or accidental, or burn to oneself, etc.
  - Initial treatment, first aid, emergency care (including fluids, intubation, etc.), or the care rendered in another health facility.
  - Preexisting medical problems and current medications.
  - Other injuries (e.g., associated fall, explosion, or assaults, etc.)
  - Evidence of inhalation injury (as explained in clinical manifestations above).
- Ongoing hemodynamic and respiratory assessment has to be performed every 6 hourly. This includes signs of infection, such as fever or foul-smelling discharge from wounds, etc.

Nursing Diagnoses

- Impaired gas (oxygen-carbon dioxide) exchange related to carbon monoxide or smoke inhalation, and/or obstruction of the upper airway.
- Risk for excess fluid volume related to fluid resuscitation.
- Ineffective thermoregulation related to reduced thermal regulation by the skin's barrier, hypothalamic response and/or infection.
- Risk for Infection related to altered immune response and lost skin barrier.

Nursing Interventions

Maintenance of adequate tissue oxygenation

- Assess respiratory status (breath sounds, respiratory rate, rhythm, and depth).
- Provide humidified oxygen.
- Observe for the following signs of inhalation injury:
  - Erythema or blistering near mouth and nose
  - Burnt or charred nostrils
  - Burns that involve face, neck/chest
  - Voice hoarseness
  - Soot/carbon in patient's sputum or respiratory secretions
- Monitor for signs of hypoxia (check arterial blood gas reports, pulse oximetry, etc.)
- Report signs of hypoxia, such as dyspnea, decreasing oxygen saturation, etc., immediately.
- Keep intubation and escharotomy tray ready.
- Monitor the mechanically ventilated (patients on ventilator) patients closely.

Facilitation of fluid balance

- Adjust fluid intake as tolerated.
- Maintain an hourly urine output of at least 50 mL. Maintain accurate intake and output charts.
- Check the patients' weight daily.
- Keep a check on the serum electrolytes and replace accordingly in intravenous fluids.
- Observe any signs of fluid overload and administer diuretics accordingly.

Promoting stable body temperature

- Do not expose wounds unnecessarily to minimize heat loss.
- Maintain warm temperature in environment.
- Use blowers/warmers, blankets, etc., to keep the patient warm.
- Keep top layer of dressing always dry to reduce evaporative heat loss.
- Use warm solutions for cleansing and dressing.

Avoiding infection (both local and systemic)

- Practice proper hand washing both before and after patient contact.
- Use barrier nursing (isolation, gown or plastic apron). Cover hair and wear masks.
- Use sterile gloves during dressing changes and all other nursing care activities involving contact with the patient.
- Provide tetanus prophylaxis.
- Change IV tubing and lines as per the hospital infection control protocol.
- Administer antibiotics, as prescribed.
- Assess wounds daily for local signs of infection. (swelling and redness, purulent discharge, discoloration, loss of grafts)
- Maintain personal hygiene of the patient (cleaning of unburned areas, mouth care, hair care, and care of IV and urinary catheter sites).
- Inspect the skin for pressure ulcers and skin breakdown.
- Report all signs of infections local or systemic immediately.

Potential Complications during Emergent Phase and their Management

- **Acute respiratory failure:**
  - Assess for respiratory distress, dyspnea, etc.
  - Monitor pulse oximetry for oxygen saturation and the arterial blood gas reports regularly (watch for decrease in PO_2 and increase in PCO_2).
  - X-ray examination of chest is needed to assess the status of lungs.
  - Assess for alteration in level of consciousness, confusion or delirium.

JAYPEE BROTHERS

- **Distributive shock:**
  - Assess for decrease in urine output, blood pressure, or increase in pulse.
  - Check for peripheral or pulmonary edema due to third space fluid shifts.
  - Adjust fluid resuscitation accordingly.
- **Acute renal failure:**
  - Monitor urine output and renal function reports regularly.
  - Assess urine for hemoglobin or myoglobin loss.
  - Administer the fluids/diuretics if needed.
- **Compartment syndrome:** If the trunk or any extremity has circumferential burns, the nerves and blood vessels beneath the burn tissue get compressed due to the increase in interstitial fluid. This is called the compartment syndrome as the involved part gets 'compartmentalized' and separate from the whole body. The reduced or blocked blood and nerve supply can quickly progress the area to necrosis and non-viability. In case of delay in management, compartment syndrome can lead to loss of the extremity (amputation). For keeping a check on this, check the,
  - Peripheral pulses every two hours.
  - Warmth, loss of sensation, capillary refill time
  - Movement of extremities every two hours.

The Acute (Healing Phase)

Medical Management

After the first 48 hours, stage of shock resolves and physiological changes start appearing as follows:

- **Airway obstruction** is caused by upper airway edema. Intubation and mechanical ventilation is often needed. Frequent arterial blood gas analysis and continuous oxygen saturation monitoring using a pulse oximeter determines this need.
- **Risk of fluid overload** develops as the capillaries regain integrity and reversal of the third space shift occurs. Inadequate cardiac and renal function can cause congestive heart failure and pulmonary edema. Central venous or peripheral arterial catheters may be needed. (Monitor venous/arterial pressures, pulmonary artery pressures, and cardiac output).
- **Blood loss, anemia and hypoproteinemia** is treated by appropriate administration of blood components.
- **Infection progressing to septic shock** needs to be watched among those who have survived the first few days after a major burn.
- **Immunosuppression** is often seen after a major burn injury. It leads to a higher risk for sepsis. Infection from the burn site spreads quickly through the blood. Elevated body temperature due to septicemia can aggravate metabolic distress and increased oxygen needs of the tissues.

Infection Prevention

- When the burn wound is in the healing phase it needs to be protected from all sources of infection. However, after a severe burn, the gut becomes permeable and the gut flora is able to enter the systemic circulation. So, the source of infection can be either the environment or the patients' intestinal tract itself.
- Commonly, bacteria, such as '*Staphylococcus,' 'Proteus,' 'Pseudomonas,' 'Escherichia coli,'* and '*Klebsiella'* and *f*ungi, such as '*Candida albicans'* can be found in such cases.
- The infection can either be local at the wound site and second at the systemic circulation level.
- Infection slows the burn wound healing as it promotes excessive inflammation and tissue damages. Barrier nursing involves use of sterile cap, gown, gloves and mask at all times while caring for the burn patient.
- Blood and tissue specimens for culture are regularly taken to monitor for colonization of by any microbial organisms. Systemic antibiotics according to the sensitivity of the organism found in the tissue or blood culture report are administered.
- Not just the patient, but the whole burn unit requires frequent check on the microbial flora present there. Samples from surfaces and equipments are sent for bacterial colonization and systematic carbolization should be done daily, fogging of the entire unit should be done every 15 days. Careful attention should be paid to the antibiotic use among burn patients as inappropriate use can affect the microbial flora present in the burn unit significantly.

Antimicrobial Therapy

- Tetanus toxoid is given to the patients as early as possible.
- Systemic antibiotics are not recommended until there are evidences of systemic infections in blood cultures.
- Topical agents are used after the wound is cleansed.
- Topical therapy promotes healing of the wound. Criteria for choosing a topical agent are:
  - Effective for 'gram-negative organisms', *'Pseudomonas aeruginosa'*, '*Staphylococcus aureus'*, and fungi.
  - Not systemically toxic.
  - Cost-effective and acceptable to patient.
  - Should be easy to apply.
  - Commonly used topical agents include silver sulfadiazine (Silvadene), colloidal silver (Megaheal), silver nitrate, etc.

Burn Wound Cleaning and Dressing Procedure

- Wound cleaning is usually performed every alternate day or daily as per the unit's protocol.
- Before the wound cleaning procedure, ensure adequate vital signs, nutrition and pain control as it is a challenging process for the patient.
- Tap water at room temperature is used for burn wound cleansing.
- Active participation of the patient is encouraged during the procedure.
- Unburned areas, including the hair are washed as well.
- During every dressing, the non-viable tissue over the wound is gently removed under aseptic conditions using forceps (mechanical debridement) or hydrogen peroxide (chemical debridement). Additionally, surgical debridement is performed in operation theatre if needed.
- After cleaning, the wound is gently patted with cotton towels/gauze dressing pads.

JAYPEE BROTHERS

- A topical antimicrobial agent is then applied over the wounds.
- The wound is then covered with several layers of gauze and cotton pads and bandaged over.
- To allow for motion, a light dressing is used over joints.
- Circumferential dressings are applied distal to proximal.
- Fingers and toes are wrapped separately to prevent sticking together and promote adequate healing.
- Burns to the face are left open after cleaning and the topical agent is applied.

Burn Wound Grafting

Grafting is the surgical procedure whereby a necrosed burn tissue is removed and a healthy tissue substitute is placed over (or transplanted to) that wound area. If wounds are deep (full thickness) or extensive, grafting is done as spontaneous re-epithelialization is difficult. So, wound grafting is done to:

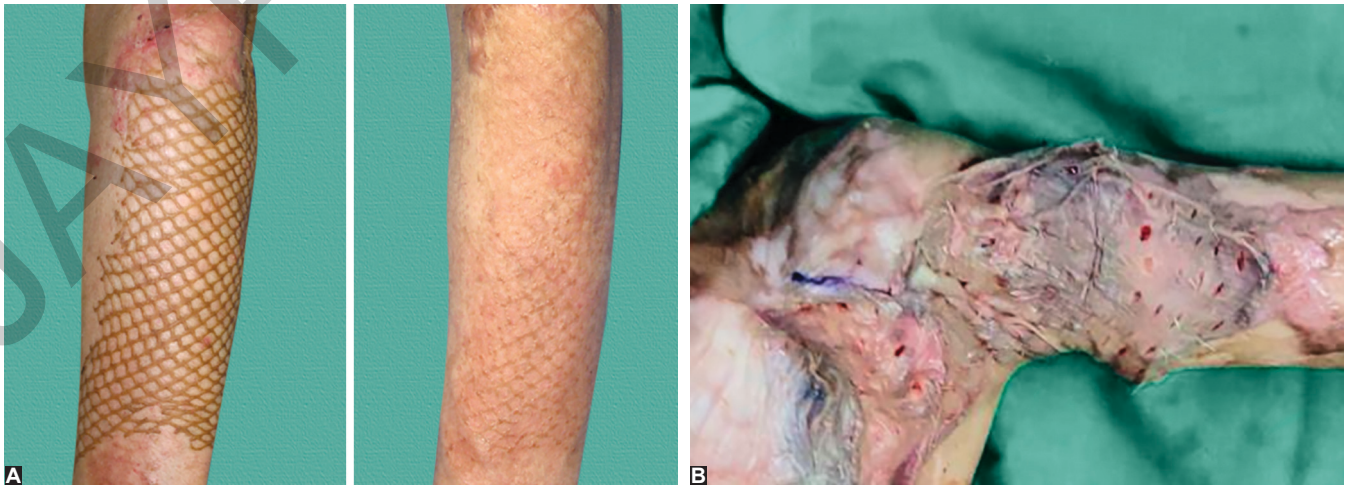
- Reduce infection risk.
- Reduce proteins, fluids, and electrolytes loss.
- Reduce burn surface area to minimize heat loss.
- Permit early functional ability and reduce risk of contractures.

Types of grafts

1. **Biological grafts:** The biological grafts include skin tissues either some recently deceased human or the amniotic membrane of the placenta (homograft), animal skin usually from pigs (xenografts) or the burn patients' skin itself from a non-burn area (autograft) **(Figs. 38.3A and B)**. Autografts can be either split thickness skin graft (STSG) which involves the dermis, and part of dermis or full thickness skin graft (FTSG) which involves the epidermis and whole of the dermis.
   The grafting procedure is always performed under strict sterile conditions in an operation theater. A tool called the 'Dermatome' which looks and functions like a vegetable peeler is used to raise a thin layer of skin from the patient's body which has not burnt. The burn wound is cleaned aggressively to remove all the debris and dead skin before putting the grafted skin. Then the graft is meshed and spread over the burn wound **(Figs. 38.3A and B)**.
2. **Biosynthetic and synthetic:** The biosynthetic and synthetic grafts have the properties of easy availability, sterility, and cost-efficient, e.g., **Biobrane** (nylon or silastic membrane that has collagen). It is semi-transparent, sterile and can be left intact for 3–4 weeks. It is used as an intermediate dressing until an autograft becomes available. Synthetic grafts are costly but very useful for patients who have higher TBSA leaving no possibility to raise an autograft. They are easy to apply. The grafting procedure can be done at the patients' bedside using local anesthesia as well. So, they are also suitable for the patients who are not hemodynamically stable to tolerate general anesthesia in operation theater.
3. **Dermal substitutes:**
   - *Artificial skin (Integra):* It is made up of two layers—epidermal, consisting of silastic, and dermal that is made up of animal collagen (usually cow or shark cartilage). It is used to cover the wound like a protective barrier, and it helps in re-growth of the skin.
   - *Alloderm:* It is a processed kind of dermis made from human cadaver skin. Alloderm grafts have a shelf life of about 2 years when stored in special refrigerators properly. They have very less scarring and post-grafting results are mostly acceptable. In India, allograft use is restricted to major cities and involve high cost.

Care of grafts

1. Blood, serum, or eschar between the wound area and graft, can cause graft loss.
2. Trauma during dressing changes, and infections are other reasons for graft loss.
3. Occlusive dressings are often used to immobilize the grafted area.
4. The grafts on torso or face can be immobilized using skin staples and left open.
5. The dressing after grafting is usually performed after 3–5 days.
6. If the graft gets displaced, apply sterile compresses (saline) to prevent drying.
7. Positioning and turning of the patient are done very carefully to avoid mishandling or pressure on the grafted area.



Figs. 38.3A and B: Split thickness skin graft: (A) An autograft application and after healing; (B) Intraoperative picture of applying a autograft.

JAYPEE BROTHERS



Figs. 38.4A to C: Disorders of burn wound healing: (A) Contractures; (B) Ear deformity; (C) Hypertrophic scarring and permanent mouth and eye deformity.

8. The extremity that has been grafted, should be kept elevated to minimize edema and improve venous return.
9. The patient is advised to begin exercise of the grafted area after 5–7 days of grafting.
10. Hypertrophic scarring, keloid formation and contractures are common disorders of burn wound healing that result from excessive abnormal healing. They are closely monitored for and prevented **(Figs. 38.4A to C)**.

Care of the donor site

- A moist gauze dressing is applied at the donor site immediately during the surgery. This is done to maintain some pressure on it to halt blood or fluid ooze from it. A thrombostatic agent, such as thrombin or adrenaline (epinephrine) is applied using a gauze dipped in it.
- The donor site may be dressed using a gauze with petrolatum, or biosynthetic dressing like 'Biobrane'.
- Donor sites should be kept clean, dry and pressure-free.



NURSING MANAGEMENT DURING THE ACUTE (HEALING) PHASE (AFTER 48 HOURS TO 15 DAYS)

Nursing Assessment

- Detailed respiratory assessment.
- Circulatory status assessment by checking blood pressure, heart rate.
- Strict intake-output monitoring.
- Round the clock temperature assessment for signs of infection.
- Pain assessment.

Nursing Goals

- Continuous assessment and maintenance of all body functions, such as the respiratory, circulatory and gastrointestinal function.
- Preventing infections, burn wound care (as explained previously)
- Analgesics for pain management.
- Nutritional support by means of oral intake, Ryle's tube feed or total parenteral nutrition.

Nursing Diagnosis

- Ineffective airway clearance related to inhalation injury and pulmonary edema
- Acute pain related to exposed nerves in burn wound.
- Impaired skin integrity related to burn injury and surgical interventions (donor sites).
- Imbalanced nutrition related to inability to increased metabolic needs and inability to intake orally.
- Impaired physical mobility related to peripheral edema and weakness.

Nursing Interventions

Maintain a patent airway and an adequate airway clearance:

- Maintain a patent airway at all times (Fowler's positioning, suctioning of secretions, and providing oxygen or artificial airway).
- Encourage patient to change positions, and practice deep breathing exercises.
- Incentive spirometry and coughing exercises are useful.

Reducing Pain

- Anticipatory analgesics are given round the clock. Regular pain assessment is done.
- Administer the analgesics before wound care and other procedures which can be painful.
- Oral analgesics should be given 30–45 minutes before the procedure.
- Reduce anxiety by explanations of all nursing procedures.
- Use relaxation techniques, guided imagery, meditation, etc., for pain and anxiety.

Protecting and Re-establishing the Integrity of the Skin

- Clean wounds and assist in dressing changes as per unit protocol. Use soap and water or any antimicrobial solution to wash the wounds. Dry them gently.
- After cleaning, the debridement procedure is performed. Gauze, scissors, or forceps may be used as needed. Debridement of the dead tissue is done for 20–30 minutes as tolerated by the patient.
- Apply topical bacteriostatic agents, such as silver sulfadiazine or colloidal silver as layer (1/8-inch (3-mm) thick).
- Using burn pads, gauze rolls, etc., layers of dressing are put over the wounds. Dressings are held in place using 6-inch rolled gauze.
- For grafted areas, caution is needed while removing dressings; observe for blood or pus discharge. Check the wounds daily and document the wound status as per protocol.

JAYPEE BROTHERS

Maintaining Adequate Nutrition

- Oral fluids are initiated only after the bowel sounds have appeared back.
- Assess the patient's tolerance for fluids first. If tolerated well (no vomiting and or abdominal distention), intake is increased gradually. Progress to a normal diet or to Ryle's tube feeds.
- High proteins and high calories diet is given to these patients. Supplements for vitamin and mineral are given as a routine.
- If giving RT feeds, the volume of residual gastric secretions is checked. Parenteral nutrition may be indicated.
- The patient having anorexia is encouraged to increase food intake gradually.
- The patient's food preferences and pleasant surroundings can encourage food intake.

Promoting Physical Mobility

- Deep breathing exercises and frequent change of positioning are done. They help in preventing atelectasis/pneumonia, peripheral and pedal edema, pressure ulcers and contractures.
- Early sitting and early ambulation are good.
- When the lower extremities are involved in burns, elastic pressure bandages are applied to promote venous return and minimize swelling. Elevate lower limbs while patient is lying down.
- Practice both the passive and active ROM (range-of-motion) exercises daily.
- Use splints over the extremities for contracture control.
- Monitor the splinted areas frequently for any signs of distress (vascular insufficiency or nerve compression).

Rehabilitation Phase of Burn Care

This phase begins immediately after the injury and often continues for years. The main goals to be achieved in this phase are:

- Wound healing
- Restore maximum functional ability of the body in activities of daily living.
- Psychosocial support for enhancing self-image.
- Maintaining good fluid and nutritional status.
- Pre and post nursing care for reconstructive and aesthetic surgeries.



NURSING MANAGEMENT DURING THE REHABILITATION PHASE

Nursing Assessment

1. Patient's self-concept, current mental status.
2. Level of pain and physical discomfort.
3. Education and occupation status.
4. Cultural background.
5. Range of motion, functional ability for ambulation, eating, wound care, etc.

Nursing Diagnosis

- Activity intolerance related to pain, skin and joint contractures.
- Ineffective coping related to disturbed body image.
- Knowledge deficit related to post-discharge care at home.

Nursing Interventions

Promoting ability to perform the activities of daily living (ADLs):

- Encourage the patient to perform all ROM exercises with periods of rest in between.
- Prevent burn contractures by performing ROM exercises. Use pressure garments and splints to support during exercises.
- Position the patient such that adhesions and contractures are prevented.
- Provide pain management.
- Recreational therapy and spending time with loved ones can improve tolerance for physical activity.
- Help the patient achieve adequate sleep through medication and other environmental measures.
- Provide adequate sleep. Reassurance and administration of hypnotic drugs helps to promote sleep.
- Reduce metabolic stress by adequate relieving of pain helps in conserving energy for exercises.

Enhancing Coping Mechanisms

- Assess and respect the patient's current coping mechanisms.
- Listen to the patient. Explore alternate mechanisms with the patient.
- No false assurances should be given.
- Interpret patient behavior with the help of family members.
- Facilitate interaction with other burn survivors in the ward that may be admitted for reconstructive surgeries or during follow-ups.
- Appreciate the improvements made by the patient to improve self-esteem.
- Refer to psychologists, occupational therapists, medical social workers for assistance in enhancing emotional status as well as coping skills.

Preserving Positive Body Image and Self-concept

- Seek information on the patient's pre-burn self-image.
- Encourage the patient to express his concerns, when the patient is ready. Be honest, but positive when talking to the patient.
- Reinforce appropriate and effective coping shown by patient.
- Motivate the patient to talk with other burn survivors who are progressing satisfactorily.

Providing Discharge Teaching

- Stress on the need of regular ROM exercises because the contractures at joints are the most common sequel of burn injury which is easily preventable.
- Instruct the patient to wash the small areas to clean the open wounds and to apply topical agents. Emollients like coconut oil can be applied to the healed wounds to reduce scarring and keep wound soft and protected.
- Pain management and nutritional supplements continue for few months after discharge.
- Explain about when and where to come for follow-up. Also, explain what to expect during the follow-up visits.

JAYPEE BROTHERS

❖ Teach them to recognize danger signs of infection like fever, swelling, discharge or pus in the wounds. Instruct them to report to physician immediately.

GERIATRIC CONSIDERATIONS

Burn injury during old age raises the risk of poor prognosis. It requires an extra attention by the nurse. The following points in each phase of management of burn injury need to be kept in mind.

1. **Emergency phase:**
   - ➢ Particular attention to pulmonary status, any other comorbidity or history of medications.
   - ➢ Cautious fluid resuscitation as risk of fluid overload in much more in the elderly patients. Acute renal failure can result.
   - ➢ Reduced immunological response make them more at risk for infections.
   - ➢ Close monitoring and prompt treatment of complications.
   - ➢ As skin is fragile, they are more prone to develop deep wounds.
2. **Acute phase:**
   - ➢ Aggressive pulmonary care by steam inhalation, breathing exercises and chest physiotherapy.
   - ➢ Early mobilization to prevent complications as well as pressure ulcers in case of prolonged hospitalization.
   - ➢ Along with fever, watch carefully for the other signs of infections locally at the wound area.
3. **Rehabilitation phase:**
   - ➢ Take into account previous limitations in physical activity that can be there like arthritis to plan range of motion activities.
   - ➢ Elderly patients may not be having many family members to provide emotional support during home care. Identify the person closest to the elderly and involve him in care.

RECONSTRUCTIVE PLASTIC SURGERY

Reconstructive plastic surgery is a medical specialty aimed at restoring the form and function of body parts affected by congenital anomalies, trauma, disease, or surgery. Unlike cosmetic surgery, which focuses on enhancing appearance, reconstructive surgery addresses functional and structural issues, restoring vital aspects of health and improving the quality of life.

BREAST RECONSTRUCTION (FIGS. 38.5 AND 38.6)

It is one of the most common procedures performed in reconstructive plastic surgery, particularly after a mastectomy due to breast cancer. The goal is to restore the shape, size, and symmetry of the breast. There are two main approaches: **autologous tissue reconstruction**, where tissue from another part of the patient's body, such as the abdomen or back, is used to create a new breast, and **implant-based reconstruction**, where silicone or saline implants are placed to restore the breast's appearance. In some cases, a combination of both techniques is used to achieve the most natural result. This procedure not only helps restore physical appearance but also plays a significant role in the emotional recovery of patients after cancer treatment.



Fig. 38.5: Breast reconstructive surgery using the abdominal flap transverse rectus abdominis myocutaneous (TRAM) flap.

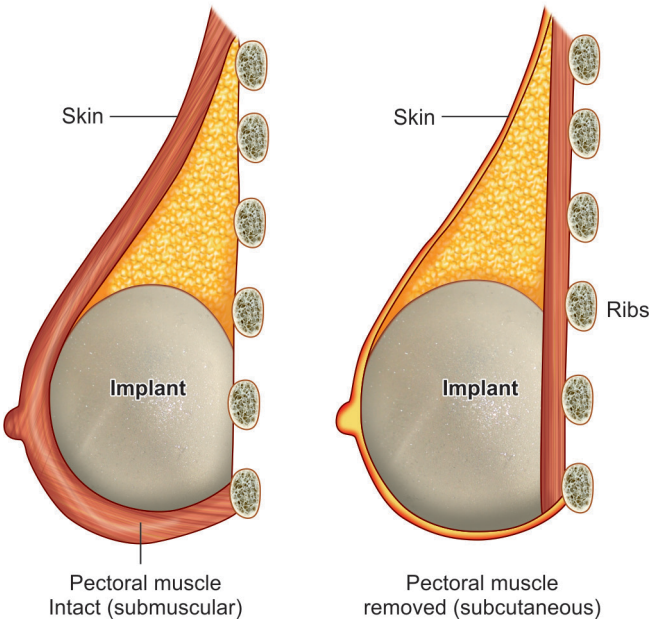


Fig. 38.6: Breast reconstruction using the breast implants.

JAYPEE BROTHERS

CLEFT LIP AND PALATE REPAIR (FIG. 38.7)

These are often performed on infants born with these congenital defects. Cleft lip and palate are openings or gaps in the upper lip and/or roof of the mouth (palate), which can affect feeding, speech, and appearance. The surgical repair is typically performed in two stages: **cleft lip repair**, usually done at 3 to 6 months, and **cleft palate repair**, typically performed between 9 and 18 months. In some cases, secondary surgeries may be required later to improve speech or appearance. The goal of this procedure is to restore normal facial anatomy and improve the function of the lip and palate, allowing for better feeding and speech development **(Figs. 38.8A and B)**.

FACIAL RECONSTRUCTION

It is a critical area of reconstructive plastic surgery, often needed after traumatic injuries, tumor excision, or congenital deformities. Trauma to the face, such as from car accidents or violent assaults, may result in fractures, lacerations, or tissue loss. Reconstruction involves **soft tissue repair**, **bone reconstruction**, and in some cases, **microvascular flap surgery**, where tissue, nerves, and blood vessels are transferred from another part of the body. **Bone grafting** may be used to restore the structure of the facial bones, including the jaw, cheekbones, and orbital bones. The goal of facial reconstruction is not only to restore normal facial features but also to ensure the patient can perform functions such as eating, speaking, and breathing.

HAND AND UPPER LIMB RECONSTRUCTION

It addresses injuries or deformities in the hands, arms, or upper extremities, including **traumatic amputations**, **congenital malformations**, or **nerve injuries**. Procedures such as **replantation**, which involves the reattachment of severed fingers or hands, and **nerve or tendon repair**, are commonly performed. For more complex injuries, **free flap reconstruction** may be necessary to restore both function and appearance. The goal of hand and upper limb reconstruction is to restore the normal function of the hand and arm, enabling patients to perform daily tasks and improving their overall quality of life.

Finally, congenital deformities, such as cleft lip and palate, craniofacial anomalies, or congenital hand deformities, are often addressed through reconstructive surgery. In the case of cleft lip and palate, craniosynostosis (premature fusion of skull bones), or polydactyly (extra fingers or toes), surgery is performed to correct the anatomical deformities and improve function. These surgeries aim to restore normal appearance and function, thus significantly enhancing the patient's health, self-esteem, and overall well-being.

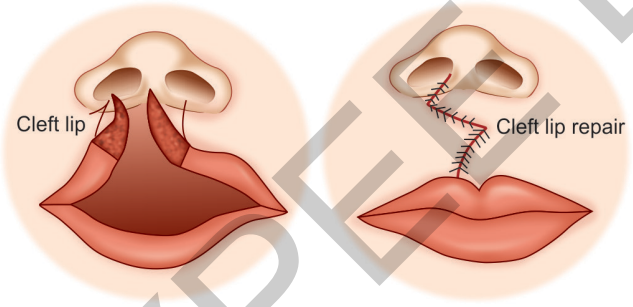
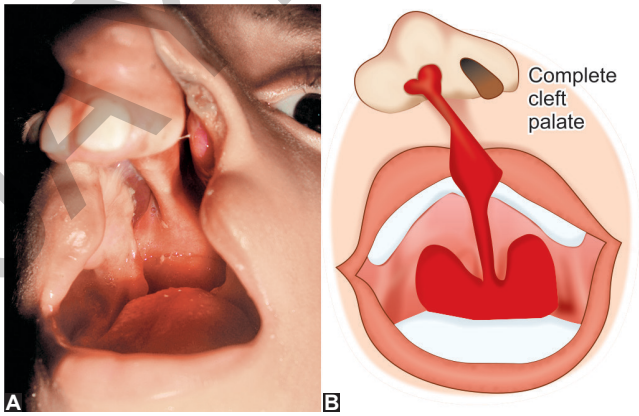


Fig. 38.7: Steps of cleft lip repair.



Figs. 38.8A and B: (A) Cleft palate with cleft lip in a child; (B) Complete cleft palate Type I.

COSMETIC SURGERY

Cosmetic surgery, also known as aesthetic surgery, focuses on enhancing or altering a person's appearance to meet their desires or aesthetic goals. Unlike reconstructive surgery, which is often necessary for medical or functional reasons, cosmetic surgery is typically performed to improve appearance, boost self-esteem, and enhance quality of life. These procedures are often elective and can target almost any area of the body.

FACIAL COSMETIC SURGERY

Facial cosmetic surgery is among the most popular and diverse fields in aesthetic surgery. It includes various procedures designed to improve or rejuvenate facial features, such as:

- **Rhinoplasty (nose job) (Figs. 38.9 and 38.10):** Rhinoplasty is a surgical procedure to reshape or resize the nose. It can correct functional issues like breathing problems caused by nasal obstruction or aesthetic concerns such as a bump on the nose or a wide nasal tip.
- **Facelift (rhytidectomy) (Fig. 38.11):** A facelift targets sagging skin, wrinkles, and volume loss in the face and neck. It tightens the skin and underlying tissues, resulting in a more youthful appearance. A facelift can be combined with other procedures, such as eyelid surgery or brow lifts, for comprehensive facial rejuvenation.
- **Blepharoplasty (eyelid surgery) (Figs. 38.12A and B):** This procedure addresses droopy eyelids, puffiness, and under-eye bags. It can be performed on the upper eyelids, lower eyelids, or both, enhancing the appearance of the eyes and improving vision in cases of severe eyelid sagging.
- **Chin augmentation (mentoplasty)(Fig. 38.13):** Chin augmentation involves the use of implants or bone reshaping to enhance the chin's appearance. This procedure is often combined with a facelift or rhinoplasty to improve overall facial harmony.

JAYPEE BROTHERS

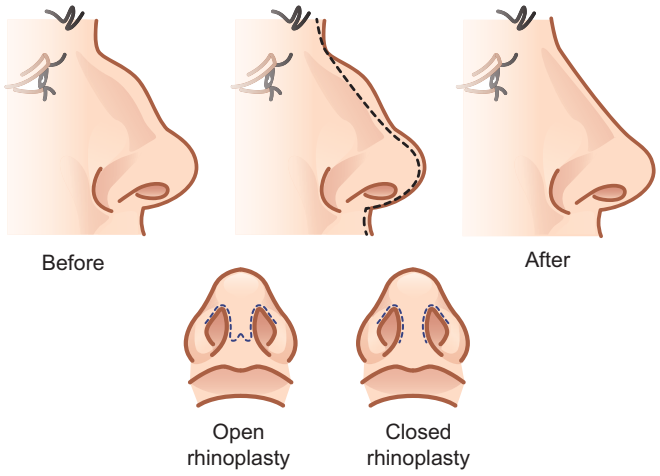


Fig. 38.9: Rhinoplasty.



Fig. 38.10: Before and after rhinoplasty.



Fig. 38.11: Before and after rhytidectomy.

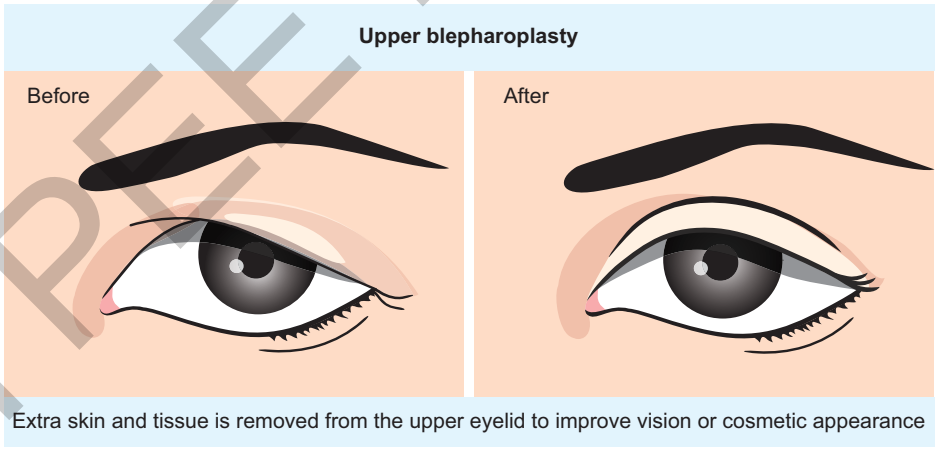


Fig. 38.12A: Illustration of blepharoplasty.

BODY CONTOURING SURGERY

Body contouring procedures are aimed at shaping and reshaping the body, often by removing excess fat, skin, or tissue to enhance the body's overall appearance.

- **Liposuction (Fig. 38.14):** Liposuction removes excess fat from various parts of the body, such as the abdomen, thighs, hips, or arms, improving body proportions. It is particularly effective for stubborn fat that does not respond to diet or exercise. Newer techniques, like laser liposuction, use heat to melt fat before removal.
- **Tummy tuck (abdominoplasty) (Fig. 38.15):** A tummy tuck removes excess skin and fat from the abdomen while tightening the underlying muscles. This procedure is often sought after significant weight loss or pregnancy when the skin has become stretched and sagging.
- **Body lift:** A body lift is often performed after substantial weight loss to remove excess skin from the abdomen,

JAYPEE BROTHERS



Fig. 38.12B: Before and after blepharoplasty.

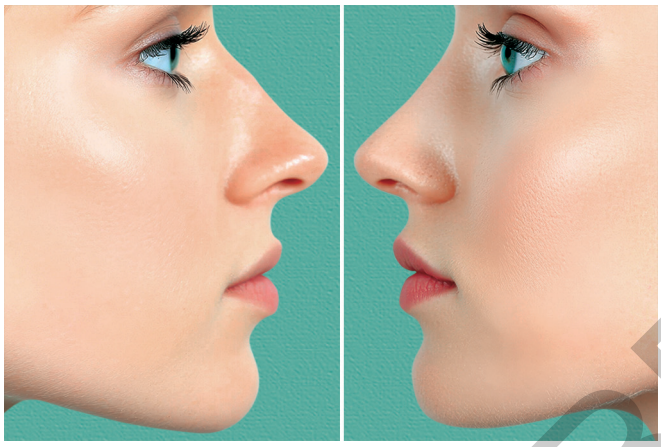


Fig. 38.13: Before and after mentoplasty.

thighs, buttocks, or arms. The goal is to tighten and lift the remaining skin, improving the overall body shape.

- **Buttock augmentation (Brazilian Butt Lift):** This procedure involves liposuction to remove fat from one area of the body (such as the abdomen or thighs) and transferring it to the buttocks to create a fuller, more youthful appearance. In some cases, silicone implants are used.

BREAST SURGERY

Breast cosmetic surgery is focused on enhancing or altering the size, shape, and symmetry of the breasts. Procedures are often done for aesthetic purposes or to correct asymmetry.

- **Breast augmentation (augmentation mammoplasty) (Figs. 38.16 and 38.17):** This procedure involves the placement of silicone or saline implants to increase breast size. It can be used for women looking to enhance their natural breast volume or restore volume after pregnancy or weight loss.
- **Breast lift (mastopexy) (Fig. 38.18):** A breast lift tightens and raises sagging breasts. It may be performed alone or in combination with breast augmentation to enhance breast shape, firmness, and position, especially after aging or pregnancy.
- **Breast reduction (reduction mammoplasty):** This surgery reduces the size of overly large breasts by removing excess tissue and skin, relieving discomfort, improving posture, and achieving a more proportional body shape.
- **Male breast reduction (gynecomastia surgery):** This procedure is for men with enlarged breast tissue. It removes excess fat and glandular tissue to create a flatter, more masculine chest contour.

NONSURGICAL COSMETIC PROCEDURES

Advances in medical technology have led to a wide array of nonsurgical cosmetic treatments that provide results with minimal downtime and less risk than traditional surgeries.

- **Botox (Fig. 38.19):** Botox is a neurotoxin that temporarily paralyzes facial muscles, reducing the appearance of wrinkles, particularly around the eyes and forehead. It is commonly used for frown lines, crow's feet, and forehead lines.

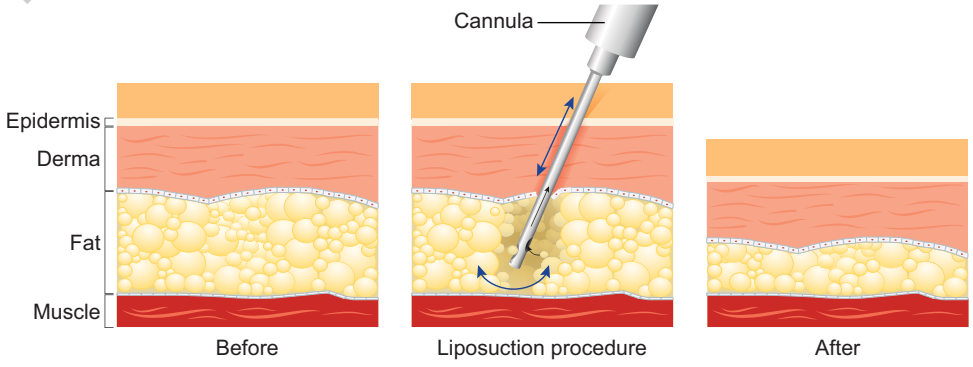


Fig. 38.14: Illustration of liposuction.

JAYPEE BROTHERS

- **Dermal fillers (Figs. 38.20A and B):** Fillers are used to restore volume to areas of the face that have lost fat due to aging, such as the cheeks, lips, and under-eye area. Common fillers include hyaluronic acid-based products like Juvederm and Restylane.

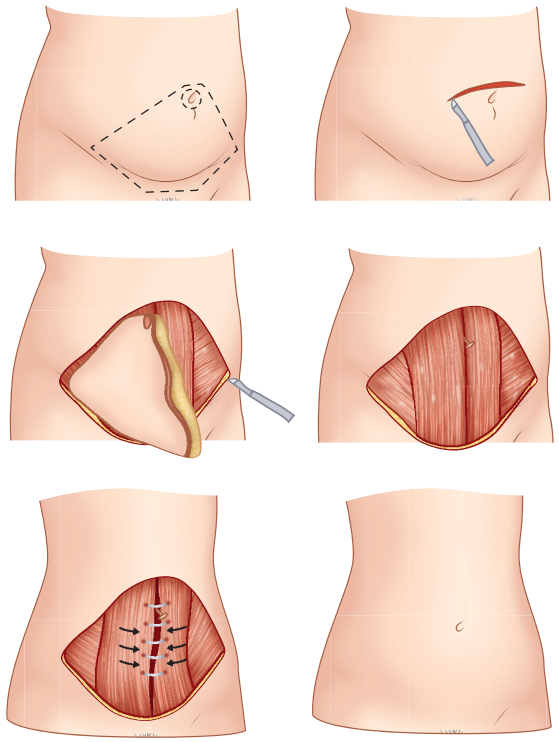


Fig. 38.15: Illustration of abdominoplasty.

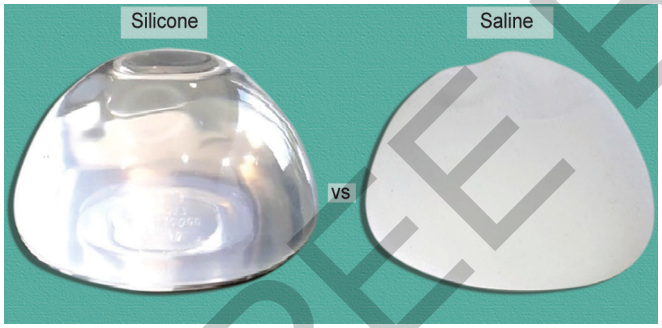


Fig. 38.16: Silicone and saline breast implants.

Types of fillers:

- *Hyaluronic acid fillers:* The most common type, such as Restylane, Juvederm, and Belotero, which add volume and hydrate the skin.
- *Calcium hydroxylapatite (radiesse):* A thicker filler used for deeper wrinkles or volume restoration.
- *Poly-L-lactic acid (sculptra):* Stimulates collagen production and can provide longer-lasting results.
- *Autologous fat injections:* Fat taken from another area of the body is injected to add volume, such as in cheek enhancement or lip augmentation.

- **Laser skin resurfacing:** Laser treatments use focused light to treat skin issues such as pigmentation, fine lines, acne scars, and sun damage. The treatment stimulates collagen production, which leads to smoother, tighter skin over time.
- **CoolSculpting (Fig. 38.21):** This noninvasive treatment uses cryolipolysis (fat freezing) to target and eliminate fat cells, particularly in areas such as the abdomen, thighs, and flanks, without the need for surgery.

HAIR RESTORATION SURGERY

Hair restoration surgery is performed to address thinning or balding hair, most commonly in men but also for women with significant hair loss.

- **Hair transplantation (FUE and FUT) (Fig. 38.22):** In hair transplantation, healthy hair follicles are harvested from areas of the scalp that have thicker hair and implanted into balding or thinning areas. The two most common techniques are **follicular unit extraction (FUE)** and **follicular unit transplantation (FUT)**, with FUE being less invasive and leaving minimal scarring.
- **Scalp reduction:** This procedure involves removing areas of bald scalp and stretching the remaining hair-bearing skin to cover the bald areas, though it is less commonly used today due to the popularity of hair transplants.

COSMETIC GENITAL SURGERY (FIG. 38.23)

- **Labiaplasty:** This is a procedure to reduce or reshape the labia minora, often done for aesthetic or functional reasons, such as discomfort during physical activity or sexual intercourse.



Fig. 38.17: Before and after breast implants.

JAYPEE BROTHERS

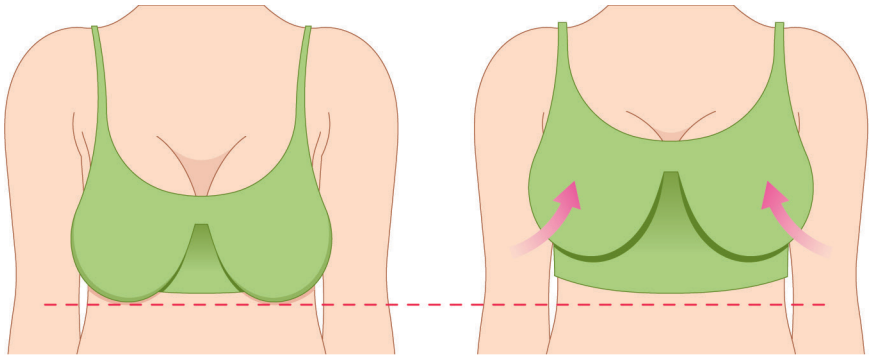


Fig. 38.18: Before and after Mastopexy.



Fig. 38.19: Administration of Botox.



Fig. 38.20A: Administration of dermal fillers.

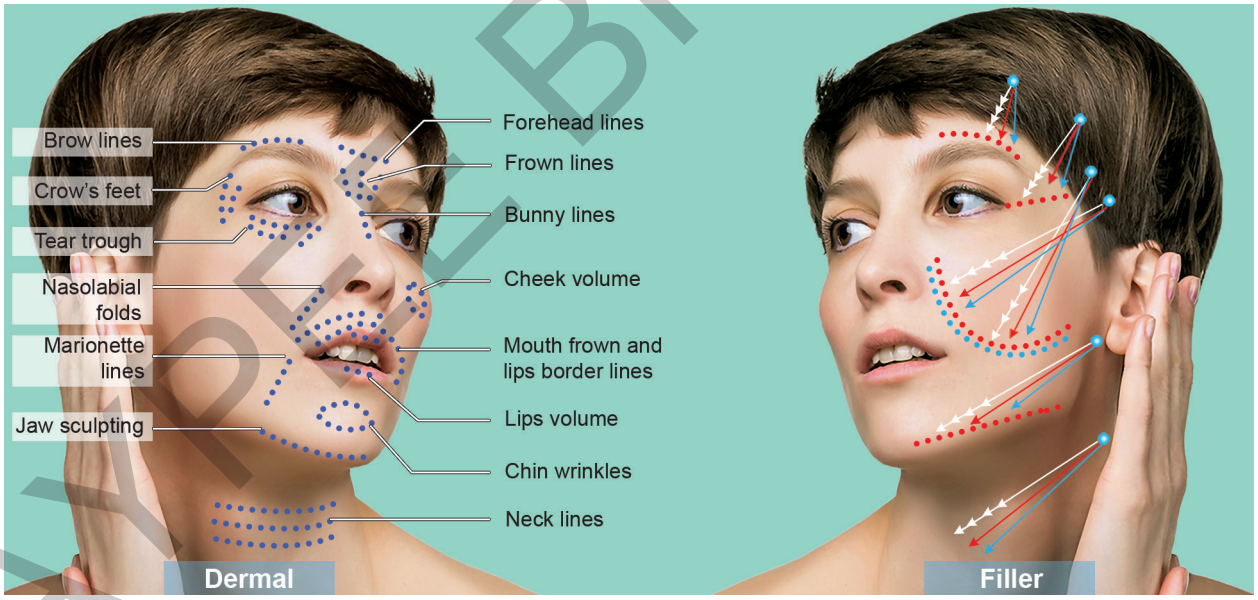


Fig. 38.20B: Areas of dermal fillers.

- **Vaginal rejuvenation:** Also known as **vaginoplasty**, this surgery tightens the vaginal canal, which can be performed after childbirth or as an aesthetic choice to restore the vaginal appearance.

SKIN REJUVENATION AND ANTI-AGING PROCEDURES

Skin rejuvenation procedures are designed to reduce signs of aging and enhance skin tone and texture.

- **Microneedling (Fig. 38.24):** Microneedling uses tiny needles to create micro-injuries in the skin, stimulating collagen production and improving skin texture, tone, and elasticity.
- **Platelet-rich plasma (PRP) therapy (Fig. 38.25):** PRP therapy involves drawing a patient's blood, processing it to concentrate platelets, and injecting it into the skin to stimulate collagen and improve skin appearance.

JAYPEE BROTHERS



Fig. 38.21: CoolSculpting.



Fig. 38.22: Before and after of hair transplantation.

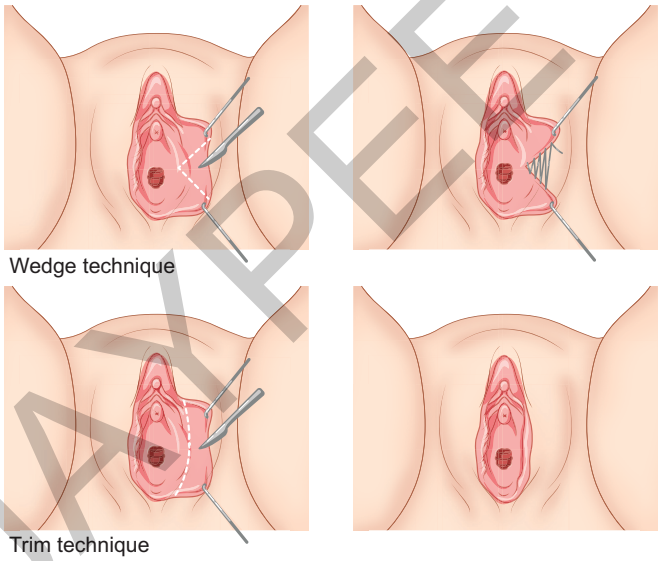


Fig. 38.23: Illustration of labioplasty and vaginoplasty.

GENDER REASSIGNMENT

Gender reassignment, also referred to as gender confirmation surgery (GCS) or sex reassignment surgery (SRS), involves a set of medical procedures aimed at aligning an individual's physical characteristics with their gender identity. This process is often part of a broader transition for individuals who experience gender dysphoria—a psychological condition where a person's gender identity differs from the sex they were assigned at birth.

Gender reassignment encompasses not only surgical interventions but also hormonal treatments and other aspects of medical care. It is an integral part of the transition for many transgender individuals and may include various steps to help individuals physically match their gender identity. Gender reassignment surgery is not always mandatory for transition, as some people may only seek hormonal therapy or social changes to affirm their gender identity.



Fig. 38.24: Microneedling procedure.



Fig. 38.25: PRP procedure.

GENDER REASSIGNMENT SURGERY (GRS)

Gender reassignment surgery can be classified into two broad categories: **Male-to-Female (MTF)** and **Female-to-Male (FTM)** surgeries. These surgeries are performed by highly skilled specialists in transgender care and are customized to meet each individual's needs and desired outcomes.

Male-to-Female (MTF) Surgeries

These surgeries aim to transform male genitalia into female genitalia and may include:

- **Penile inversion vaginoplasty:** This is the most common surgery for male-to-female gender confirmation. The

JAYPEE BROTHERS

surgeon inverts the penile skin to create a neovagina. The clitoris is constructed from the glans penis, and the urethra is shortened or reconstructed.

- **Scrotal orchiectomy:** This involves the removal of the testes, which is often done as a stand-alone procedure for male-to-female individuals before full genital reconstruction.
- **Breast augmentation:** Some MTF individuals may choose to undergo breast augmentation using implants to increase breast size, especially if hormone therapy (estrogen) hasn't led to satisfactory breast development.
- **Facial feminization surgery (FFS):** This includes a range of procedures to make the face appear more feminine, such as brow lifts, rhinoplasty (nose reshaping), jaw reshaping, and chin augmentation.
- **Voice feminization surgery:** Some MTF individuals opt for surgery to raise the pitch of the voice, making it sound more feminine. This can be done through procedures like cricothyroid approximation (CTA) or vocal cord surgery.

Female-to-Male (FTM) Surgeries

Female-to-male gender reassignment surgery focuses on creating male genitalia and may include:

- **Chest masculinization (top surgery):** This is one of the most common surgeries for FTM individuals, where excess breast tissue is removed to create a flatter, more masculine chest. The procedure may involve nipple repositioning for a more natural appearance.
- **Phalloplasty:** Phalloplasty is the construction of a neophallus (new penis) using tissue from another part of the body, often the forearm, thigh, or abdomen. This procedure can include urethral lengthening to allow for urination while standing. Phalloplasty is a more complex surgery and is usually done in stages.
- **Metoidioplasty:** This procedure involves the release of the hormonally enlarged clitoris to create a neophallus. It can result in a smaller penis than phalloplasty but requires fewer stages and is often preferred for those who do not want a more complex surgery.
- **Scrotoplasty:** This is the creation of a scrotum, often using labial tissue, to house prosthetic testicles (implants) in FTM patients who have undergone phalloplasty or metoidioplasty.
- **Hysterectomy and oophorectomy:** Many FTM individuals may also choose to undergo the removal of the uterus and ovaries as part of their gender reassignment process to remove female reproductive organs and eliminate menstrual cycles.

HORMONE REPLACEMENT THERAPY

Hormone replacement therapy (HRT) is a crucial step in the gender transition process. It involves the use of **estrogen** or **testosterone** to induce physical changes in the body that align with a person's gender identity. Hormonal therapy is often used alongside surgery, although some transgender individuals may choose not to undergo surgery.

- **Male-to-Female (MTF) HRT:** Involves the administration of **estrogen** (to promote breast development, fat redistribution, and softer skin) and **anti-androgens** (to block male hormones like testosterone). This helps reduce body hair, lower the voice pitch, and promote more feminine features.
- **Female-to-Male (FTM) HRT:** Involves the administration of **testosterone**, which induces male secondary sex characteristics such as facial and body hair growth, a deepening voice, increased muscle mass, and the cessation of menstruation.

Hormone therapy plays a critical role in achieving physical changes that enhance the individual's gender expression, often before or after surgical interventions.

PSYCHOLOGICAL AND SUPPORTIVE CARE

While gender reassignment surgery and hormonal therapy are the most visible aspects of transitioning, psychological and emotional support are also integral to the transition process. Mental health care, including counseling or therapy with professionals experienced in gender issues, is often recommended before and after surgery. This ensures that individuals receive emotional support, manage the psychological effects of transition, and address any mental health concerns, such as gender dysphoria, anxiety, or depression.

Support groups, online communities, and resources from transgender organizations can also be beneficial for individuals navigating their transition.

LEGAL AND SOCIAL TRANSITION

In addition to medical procedures, gender reassignment often involves social and legal transitions. Social transition refers to adopting a new name, pronouns, gender expression, and presentation in day-to-day life. Legal transition may involve changing gender markers on official documents such as passports, driver's licenses, and birth certificates to reflect the individual's gender identity.

The legal process for gender marker changes varies from region to region and often requires documentation from medical professionals confirming the individual's transition.

RISKS AND CONSIDERATIONS

As with any major surgery, gender reassignment surgery comes with potential risks, including:

- Infection and bleeding
- Scarring and complications with wound healing
- Urinary complications (especially with phalloplasty or vaginoplasty)
- Anesthesia risks associated with major surgeries
- Psychological effects, including post-surgical depression or adjustment difficulties

It is crucial for individuals considering gender reassignment to consult with qualified surgeons, endocrinologists, and mental health professionals to understand the benefits, risks, and possible outcomes of each procedure. Comprehensive care is essential for a successful transition.

JAYPEE BROTHERS

SPECIAL THERAPIES

LASER ASSISTED DRUG DELIVERY

Laser-assisted drug delivery (LAD) is a cutting-edge treatment that utilizes laser technology to enhance the absorption of medications into the skin. The laser creates microscopic channels or micropores in the skin, allowing topical drugs or medications to penetrate deeper layers and be absorbed more effectively. This technique is often used in dermatology and cosmetic surgery to treat various skin conditions, including:

- Topical treatments for acne, pigmentation, and skin aging.
- Anti-inflammatory medications for conditions like psoriasis or eczema.
- Growth factors to promote collagen production and skin rejuvenation.

Mechanism

- A noninvasive laser is applied to the skin, which causes slight disruption to the skin's surface, temporarily increasing permeability.
- **Drugs or topical treatments** are applied immediately after the laser session for enhanced penetration and effectiveness.

Benefits

- **Improved drug delivery:** Enhanced penetration allows for more effective treatment with lower concentrations of active ingredients.
- **Noninvasive:** There's no need for needles or injections, making it a less invasive alternative for delivering drugs.
- **Skin rejuvenation:** It can also stimulate collagen production, improving skin texture.

Uses

Anti-aging, **scar treatments**, **stretch mark reduction**, **wound healing**, and **pigmentation correction**.

VACUUMED DRESSING

Vacuumed dressing [also known as negative pressure wound therapy (NPWT)] is a therapeutic technique used to promote wound healing by applying controlled negative pressure to a wound through a sealed dressing.

Mechanism

- A vacuum pump is used to apply negative pressure to the wound site, drawing fluid from the wound and promoting the formation of granulation tissue.
- The therapy helps improve blood flow to the wound, reducing edema and enhancing tissue oxygenation, which accelerates the healing process.

Benefits

- **Accelerates wound healing:** Helps stimulate the growth of new tissue, reducing wound size.
- **Reduces infection risk:** Removes exudate and bacteria from the wound bed.
- **Pain reduction:** Can reduce the sensation of pain in some cases by drawing the wound edges together and promoting closure.

Uses

- Treatment of **chronic wounds** such as **pressure ulcers**, **diabetic foot ulcers**, **surgical wounds**, and **trauma wounds**.
- **Burns** and **skin grafts** healing.

LASER TREATMENTS

Laser treatments are widely used in both dermatology and cosmetic surgery to address various skin concerns. Different types of lasers are used for a variety of skin rejuvenation and treatment purposes, such as:

- **Laser resurfacing:** Targets wrinkles, sun damage, and skin texture issues. Lasers like CO2 or Er:YAG are used to remove the outer layers of the skin, stimulating collagen production and improving skin tone and texture.
- **Fractional lasers:** A type of laser resurfacing that creates microthermal zones in the skin, which stimulates the healing process without damaging the entire surface. It can treat scarring, fine lines, and pigmentation issues.
- **Laser hair removal:** Uses concentrated light to target and damage hair follicles, leading to long-term hair reduction.
- **Laser for pigmentation:** Lasers like Q-switched or picosecond lasers can target melanin in the skin, effectively treating hyperpigmentation, freckles, and age spots.

Benefits

- **Noninvasive:** Most laser treatments are minimally invasive, with little to no downtime.
- **Precision:** Allows for targeted treatment of specific skin issues with minimal damage to surrounding tissue.
- **Versatile:** Can treat a wide range of skin conditions, including aging signs, acne scars, pigmentation, and hair removal.

Uses

Skin resurfacing for anti-aging, scar removal, acne treatment, vascular lesions, and tattoo removal.

CONCLUSION

A burn injury is a life-threatening injury. It always requires a timely intervention to manage the patient well. Fluid resuscitation forms the most important part of management at hospital. Barrier nursing is advocated in burn units as the patients are highly vulnerable to infections due to loss of protective skin accompanied by lowered immunity. Thus, the nurses working in the burn unit need to be very vigilant. Also, the burn pain is continuous and very severe. As a nurse, we should understand and able to interpret the pain level to provide relief to the patient accordingly.

Reconstructive plastic surgery plays a vital role in the restoration of function and appearance, helping patients regain their quality of life after injuries, surgeries, or congenital conditions. Surgeons use a combination of advanced techniques, such as **microvascular surgery, skin**

JAYPEE BROTHERS

grafting, and **tissue expansion**, to achieve the best outcomes, both functionally and aesthetically. The ultimate goal is to improve patients' physical health, self-esteem, and overall well-being.

Cosmetic surgery offers a variety of procedures designed to enhance a person's appearance and in many cases, improve their self-confidence. Whether it's a **rhinoplasty, facelift, breast augmentation**, or **liposuction**, the goal is to help individuals feel more comfortable in their bodies and achieve the aesthetic look they desire. While cosmetic surgery can produce remarkable results, it's important for patients to have realistic expectations and consult with experienced surgeons to understand the potential risks and benefits of each procedure. Nonsurgical procedures are also widely popular, offering less invasive options for those seeking improvements with minimal recovery time.

Case Scenarios

1. A woman carrying a pot of boiling water lost her balance and spilled the water on her right hand. How will you classify the burn? What will be the acute management for her?
2. A patient with 30% TBSA has just returned from the operation theater after "Debridement and grafting" surgery. What will be the special nursing considerations?
3. A female aged 25 years has reached the ER department with a history of stove blast? Is it a medicolegal case? If yes, what all should be noted and recorded immediately about the patients' condition?
4. A 55-year-old male patient with 90% TBSA including facial burns succumbed to the burn injuries and died. What are the special nursing considerations to be vigilant about?

CLINICAL VIGNETTE

Mr R, a 30-year-old factory worker, was admitted to the emergency unit after sustaining flame burns when his shirt caught fire at work. On arrival, he was conscious but in severe pain. Examination revealed deep partial-thickness burns involving the chest, abdomen, and both upper limbs, covering approximately 35% of total body surface area. His vital signs showed tachycardia and low blood pressure, indicating hypovolemic shock. Nursing problems identified included risk of fluid volume deficit, acute pain, risk of infection due to exposed tissues, impaired physical mobility, and anxiety. Nursing interventions focused on airway management, initiating fluid resuscitation using the Parkland formula, providing adequate analgesia, maintaining strict aseptic technique during wound care, monitoring urine output as an indicator of renal perfusion, and providing psychological support. Education was given about the importance of nutrition for wound healing. Expected outcomes included restoration of fluid balance, effective pain control, prevention of infection, gradual wound healing, and reduced anxiety.

SUMMARY

Any damage to the body's tissues which is most often caused by direct heat, chemicals, or electricity is called burn injury. There are four types of burns:

1. **First-degree burns:** Damage the outermost layer of skin, the epidermis.
2. **Second-degree burns:** Damage the epidermis and part of dermis.
3. **Third-degree burns:** Destroy both epidermis and dermis, reaches the subcutaneous tissue.
4. **Fourth degree burn** damages all layers of the skin, deeper tissues beneath, muscles and bones.

Burns can lead to blisters, lifelong scars, shock, or death. They can be a source of systemic infections. Treatment for burns depends on the cause, depth and TBSA involved. Antibiotic creams are used to prevent and treat infections of the burn wound. For major burns, treatment involves regular cleaning of the wound, replacing the skin with grafts, and making sure that the patient has adequate nutrition and fluids. Rehabilitation after the burn injury is as important as the acute phase management as the burns leave a devastating effect on the mind and body of a person. Emotional support is required in every phase of the burn management.

SUGGESTED READING

1. Hauser SL, Longo DL, Jameson JL, Kasper DL, Fauci AS, Braunwald E. Harrison's Principles of Internal Medicine,16th edition. USA: McGraw-Hill Companies; 2005. pp. 122-254.
2. Higashimori T, Kono T, Sakurai H, Nakazawa H, Groff W. Treatment of Mesh Skin Grafted Scars Using a Plasma Skin Regeneration System. Plastic Surgery International; 2010. pp. 1-4. doi:10.1155/2010/874348
3. Initial assessment and management of burn patients. In: Strauss S, Gillespie GL (eds). American Nurse Today. 2018;13(6):15-19.
4. Jong AEE, Middlekoop E, Faber AW, Loey NEE. Non pharmacological nursing interventions for procedural pain relief in adults with burns: A systematic review. Burns. 2007;33:811-27.
5. Nettina SM, Mills EJ, Lippincott Manual of Nursing Practice,10th Edition. Philadelphia: Lippincott Williams & Wilkins: 2013:1121-37.
6. Rohilla L, Agnihotri M, Kaur S, Sharma RK, Ghai S. Effect of music therapy on pain perception, anxiety, and opioid use during dressing change among patients with burns in India: A quasi-experimental, cross-over pilot study. Ostomy/wound Management. 2018;64(10):40-6. doi: 10.25270/owm.2018.10.4046.
7. Smeltzer SC, Bare B. Brunner and Suddarth's Textbook of Medical-Surgical Nursing, 12th edition. Philadelphia: Lippincott Williams and Wilkins; 2010. pp. 1704-39.
8. Smolle C, Cambiaso-Daniel J, Forbes AA, Wurzer P, Hundeshagen G, Branski LK, et al. Recent trends in burn epidemiology worldwide: A systematic review. Burns. 2017;43(2):249-57. doi:10.1016/j.burns.2016.08.013.
9. Teague H, Swencki SA, Tang A. The Burned Patient: Assessment, Diagnosis, and Management in the ED. Trauma Reports; 2005. [Assessed on March 26, 2021]. Assessed from https://www.reliasmedia.com/articles/84953-the-burned-patient-assessment-diagnosis-and-management-in-the-ed

JAYPEE BROTHERS

for detailed information on nursing books, visit our website www.ejaypee.com, for detailed information on nursing books, visit our website www.ejaypee

Adult Health Nursing-II
(Medical Surgical Nursing)

Salient Features

- The book, written as per the new INC syllabus for undergraduate nursing students, is a comprehensive guide for them.
- Each chapter starts with learning objectives and the key terms along with their definitions.
- The contents of the book have been reviewed by eminent nursing experts.
- Highly experienced and qualified authors have put their heads together to bring out their best regarding the subject to help the students achieve excellent academic orientation.
- Throughout the book, the text is supported with numerous illustrations, figures, and images.
- Simple and understandable language; the diagrams and the flowcharts at the appropriate places make the book easy to use and comprehend.
- Geriatric considerations are given due importance in each chapter.
- A summary of the main concepts is given at the end of each chapter.
- Each chapter ends with case scenarios and numerous multiple choice questions (MCQs).
- New topics, OSCEs, appendices, annexures and INC modules have been incorporated in this textbook.

Sukhpal Kaur PhD PGDS FNRSI is Professor-cum-Principal at the National Institute of Nursing Education, PGIMER, Chandigarh, India. She has 35 years of clinical and teaching experience. She has a number of awards and honors to her credit. She is member of the editorial board of various national and international journals. She has around 300 publications in reputed national and international journals and has contributed a vast number of chapters in various other textbooks. She has written 25 books for patient education and edited 8 textbooks. She has keen interest in research, geriatric care, palliative care, chronic illnesses, and women's health. She has successfully led multiple research projects as principal investigator funded by ICMR, DST, and DBT, focusing on underserved populations, including the elderly, cancer patients, and rural communities. She was recognized globally as one of the top 10 finalists for the prestigious Aster Guardians Global Nursing Award 2025. She was also awarded Bharat Ratna Award 2024 and the Maharani Ahilyabai Holkar Award 2024 for exemplary contribution to a greater social cause and women's leadership.

Scan for more nursing titles...

Buy from ejaypee

JAYPEE BROTHERS

ISBN 978-93-6616-469-4

9 789366 164694