

Based on INC 2021-22

I & II  
Semester



# Textbook of **Nursing Foundations**

for BSc Nursing Students

*As per the Revised INC Syllabus (2021-22) for BSc Nursing*

## Special Features

- Written by senior most faculty with teaching experience of more than 40 years
- Reviewed by 50+ most senior nursing faculties from PAN India
- A thoroughly updated and revised edition
- A Perfect Amalgamation of Theoretical and Clinical Aspects
- 500+ Photographs, Illustrations and Tables covered
- 100+ Skill Procedures with Rationales of Nursing Practices included
- New Chapters added on First Aid and Diagnostic Techniques

**2nd**  
COLORED  
International Edition



CBS Publishers & Distributors Pvt. Ltd.

**Harindarjeet Goyal**



Textbook of

# Nursing Foundations

for BSc Nursing Students

*As per the Revised INC Syllabus (2021-22) for BSc Nursing*

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• **Second Edition** •

**Harindarjeet Goyal** PhD, MPhil, MSc (MSN), BSc (Hons.), RN, RM

*Former Principal*

Rajkumari Amrit Kaur College of Nursing  
New Delhi



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# Preface

Keeping in mind the challenges that today's nurses confront with, it becomes imperative to provide them necessary skills of compassionate nursing care in a variety of health care settings, which they could apply for patients in the various stages of illness. At the same time, there are ample opportunities for health promotion activities for individuals and groups; this is an integral part of providing nursing care.

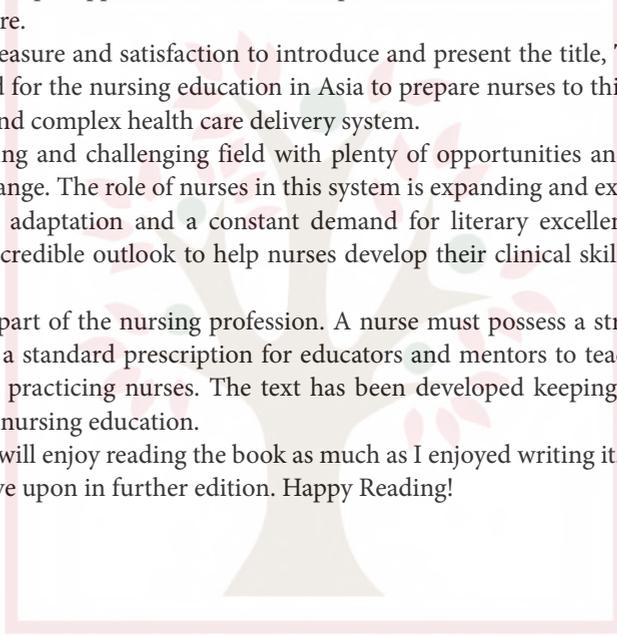
It gives me immense pleasure and satisfaction to introduce and present the title, **Textbook of Nursing Foundations**. The book is specifically designed for the nursing education in Asia to prepare nurses to think critically and practice collaboratively within today's challenging and complex health care delivery system.

Health care is an exciting and challenging field with plenty of opportunities and advancements. The entire health care system reverberates with change. The role of nurses in this system is expanding and extending, hence the process of embracing changes inevitably requires adaptation and a constant demand for literary excellence. This textbook has been developed comprehensively with an incredible outlook to help nurses develop their clinical skills which are the fundamental aspects of nursing care.

Training is an integral part of the nursing profession. A nurse must possess a strong theoretical base as well as practical skills. This book will act as a standard prescription for educators and mentors to teach and demonstrate the clinical nursing procedures to budding and practicing nurses. The text has been developed keeping in mind the clinical requirements of a student nurse at all levels of nursing education.

I hope, as a reader, you will enjoy reading the book as much as I enjoyed writing it. Constructive criticism from the readers is always welcome to improve upon in further edition. Happy Reading!

**Harindarjeet Goyal**

The logo features a stylized tree with a thick trunk and several branches. The leaves are represented by small, light-colored shapes. The entire tree is enclosed within a thin, light-colored rectangular border.

Nursing Knowledge Tree  
An Initiative by CBS Nursing Division

# Special Features of the Book

## LEARNING OBJECTIVES

After completing this chapter, you will be able to:

- Define health and its changing concepts
- Describe the health-illness continuum
- Enumerate the various factors influencing health

Important **Learning Objectives** of every chapter are highlighted in the beginning to help readers understand the purpose of the chapter.

**Chapter Outline** is given in the beginning of every chapter to provide the reader a glimpse of entire chapter.

## CHAPTER OUTLINE

- Concept of Health and Disease
- Changing Concepts of Health
- Health-Illness Continuum
- Factors Influencing Health
- Illness and Illness Behavior
- Dimensions of Health and Illness

## KEY TERMS

- Health
- Biomedical concept
- Ecological concept
- Psychosocial concept
- Holistic concept
- Agent
- Host
- Environment

Important **Key Terms** used in the chapter are presented to familiarize the readers with the important terminologies.

Studded with 300+ fully **Colored Images and Illustrations** for easy grasp of the relevant topic.



**Fig. 4** The human dimension. All of these interdependent parts compose the whole person.

**TABLE 1:** Examples of health promotion activities

Level	Topic
Primary	Weight loss, diet, exercise, smoking cessation alcohol consumption, drugs, seat belts and child safety belts/seats, immunization, safe sex practices
Secondary	Screenings (blood pressure, cholesterol, glaucoma) pap smear, mammogram, testicular examination
Tertiary	Medications, surgical and medical treatment, rehabilitation, physical therapy, occupational therapy

Numerous **Tables** are used to clarify the concept and make the reading enjoyable and informative.

Information **Boxes** have been supplemented throughout the book to facilitate extra knowledge.



**Box 1**

**Health promotion behaviors**

- Wearing seat belts, safety helmets, etc.
- Eating well-balanced diet
- Maintaining ideal body weight
- Refraining from using tobacco, etc.



**Alert:** Never press both carotids at the same time because this can cause a reflex drop in blood pressure or pulse rate.

This extra feature makes the readers aware of Do's and Don'ts in Nursing profession.

100+ skill procedures supplemented with theory for better understanding of their implementation in clinical settings



**SKILL: HAND WASHING**

**Equipment/Articles**

Articles	Rationale
Soap in a soap dish	Soap contains antibacterial agents and has a lasting bacteriostatic effect.
Nail brush	To clean nails
Running water	To rinse soap thoroughly while washing hands
Towel	To dry hands

**BIBLIOGRAPHY**

1. Christensen BL, Kockrow EO. Foundation of Nursing. Mosby; 2003.
2. Perry & Potter, Clinical Nursing Skills & Techniques, 5th edition. Mosby; 2002.

At the end of every chapter, **Bibliography** has been added for further reference to enhance knowledge.

# Syllabus

## Nursing Foundation I

**Placement:** Ist Semester

**Theory:** 6 Credits (120 hours)

**Practicum:** Skill Lab: 2 Credits (80 hours) and Clinical: 2 Credits (160 hours)

**Course description:** This course is designed to help novice nursing students develop knowledge and competencies required to provide evidence-based, comprehensive basic nursing care for adult patients, using nursing process approach.

Unit	Time (Hrs)	Learning outcomes	Content	Teaching/learning activities	Assessment methods
I	5 (T)	Describe the concept of health and illness	<b>Introduction to Health and Illness</b> <ul style="list-style-type: none"> <li>• Concept of Health—Definitions (WHO), Dimensions</li> <li>• Maslow's hierarchy of needs</li> <li>• Health—Illness continuum</li> <li>• Factors influencing health</li> <li>• Causes and risk factors for developing illnesses</li> <li>• Illness—Types, illness behavior</li> <li>• Impact of illness on patient and family</li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Essay</li> <li>• Short answer</li> <li>• Objective type</li> </ul>
II	5 (T)	Describe the levels of illness prevention and care, health care services	<b>Health Care Delivery Systems:</b> <i>Introduction of Basic Concepts &amp; Meanings</i> <ul style="list-style-type: none"> <li>• Levels of illness prevention—primary (health promotion), secondary and tertiary</li> <li>• Levels of care—primary, secondary and tertiary</li> <li>• Types of health care agencies/services—hospitals, clinics, hospice, rehabilitation centers, extended care facilities</li> <li>• Hospitals—types, organization and functions</li> <li>• Health care teams in hospitals—members and their role</li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Essay</li> <li>• Short answer</li> <li>• Objective type</li> </ul>
III	12 (T)	<ul style="list-style-type: none"> <li>• Trace the history of nursing</li> <li>• Explain the concept, nature and scope of nursing</li> </ul>	<b>History of Nursing and Nursing as a Profession</b> <ul style="list-style-type: none"> <li>• History of nursing, history of nursing in India</li> <li>• Contributions of Florence Nightingale</li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Case discussion</li> <li>• Role plays</li> </ul>	<ul style="list-style-type: none"> <li>• Essay</li> <li>• Short answers</li> <li>• Objective type</li> </ul>

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Unit	Time (Hrs)	Learning outcomes	Content	Teaching/learning activities	Assessment methods
		<ul style="list-style-type: none"> <li>Describe values, code of ethics and professional conduct for nurses in India</li> </ul>	<ul style="list-style-type: none"> <li>Nursing—definition—nurse, nursing, concepts, philosophy, objectives, characteristics, nature and scope of nursing/nursing practice, functions of nurse, qualities of a nurse, categories of nursing personnel</li> <li>Nursing as a profession—definition and characteristics/criteria of profession</li> <li>Values—Introduction—meaning and importance</li> <li>Code of ethics and professional conduct for nurses—introduction</li> </ul>		
IV	8 (T) 3 (SL)	<ul style="list-style-type: none"> <li>Describe the process, principles, and types of communication</li> <li>Explain therapeutic, non-therapeutic and professional communication</li> <li>Communicate effectively with patients, their families and team members</li> </ul>	<p><b>Communication and Nurse Patient Relationship</b></p> <ul style="list-style-type: none"> <li>Communication—levels, elements and process, types, modes, factors influencing communication</li> <li>Methods of effective communication/therapeutic communication techniques</li> <li>Barriers to effective communication/non-therapeutic communication techniques</li> <li>Professional communication</li> <li>Helping relationships (nurse patient relationship)—purposes and phases</li> <li>Communicating effectively with patient, families and team members</li> <li>Maintaining effective human relations and communication with vulnerable groups (children, women, physically and mentally challenged and elderly)</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Discussion</li> <li>Role play and video film on therapeutic communication</li> </ul>	<ul style="list-style-type: none"> <li>Essay</li> <li>Short answer</li> <li>Objective type</li> </ul>
V	4 (T) 2 (SL)	<ul style="list-style-type: none"> <li>Describe the purposes, types and techniques of recording and reporting</li> <li>Maintain records and reports accurately</li> </ul>	<p><b>Documentation and Reporting</b></p> <ul style="list-style-type: none"> <li>Documentation—purposes of reports and records</li> <li>Confidentiality</li> <li>Types of client records/common record-keeping forms</li> <li>Methods/systems of documentation/recording</li> <li>Guidelines for documentation</li> <li>Do's and Don'ts of documentation/legal guidelines for documentation/recording</li> <li>Reporting—change of shift reports, transfer reports, incident reports</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Discussion</li> <li>Demonstration</li> </ul>	<ul style="list-style-type: none"> <li>Essay</li> <li>Short answer</li> <li>Objective type</li> </ul>

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Unit	Time (Hrs)	Learning outcomes	Content	Teaching/learning activities	Assessment methods
VI	15 (T) 20 (SL)	<ul style="list-style-type: none"> <li>Describe principles and techniques of monitoring and maintaining vital signs</li> <li>Assess and record vital signs accurately</li> </ul>	<b>Vital Signs</b> <ul style="list-style-type: none"> <li>Guidelines for taking vital signs</li> <li><i>Body temperature</i>— <ul style="list-style-type: none"> <li>Definition, physiology, regulation</li> <li>Factors affecting body temperature</li> <li>Assessment of body temperature—sites, equipment and technique</li> <li>Temperature alterations—hyperthermia, heat cramps, heat exhaustion, heatstroke, hypothermia</li> <li>Fever/pyrexia—definition, causes, stages, types</li> </ul> </li> <li>Nursing management <ul style="list-style-type: none"> <li>Hot and cold applications</li> </ul> </li> <li><i>Pulse</i>: <ul style="list-style-type: none"> <li>Definition, physiology and regulation</li> <li>Characteristics, factors affecting pulse</li> <li>Assessment of pulse—sites, equipment and technique</li> <li>Alterations in pulse</li> </ul> </li> <li><i>Respiration</i>: <ul style="list-style-type: none"> <li>Definition, physiology and regulation, mechanics of breathing, characteristics factors affecting respiration</li> <li>Assessment of respirations—technique</li> <li>Arterial oxygen saturation</li> <li>Alterations in respiration</li> </ul> </li> <li><i>Blood pressure</i>: <ul style="list-style-type: none"> <li>Definition, physiology and regulation characteristics, factors affecting BP</li> <li>Assessment of BP—sites, equipment and technique, common errors in BP assessment</li> <li>Alterations in blood pressure</li> </ul> </li> <li>Documenting vital signs</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Discussion</li> <li>Demonstration and redemonstration</li> </ul>	<ul style="list-style-type: none"> <li>Essay</li> <li>Short answer</li> <li>Objective type</li> <li>Document the given values of temperature, pulse, and respiration in the graphic sheet</li> <li>OSCE</li> </ul>
VII	3 (T)	Maintain equipment and linen	<b>Equipment and Linen</b> <ul style="list-style-type: none"> <li>Types—disposables and reusable <ul style="list-style-type: none"> <li>Linen, rubber goods, glassware, metal, plastics, furniture</li> </ul> </li> <li>Introduction—indent, maintenance, Inventory</li> </ul>		
VIII	10 (T) 3 (SL)	Describe the basic principles and techniques of infection control and biomedical waste management	<b>Introduction to Infection Control in Clinical Setting</b> <ul style="list-style-type: none"> <li>Nature of infection</li> <li>Chain of infection</li> <li>Types of infection</li> <li>Stages of infection</li> <li>Factors increasing susceptibility to infection</li> <li>Body defenses against infection— inflammatory response and immune response</li> <li>Health care associated infection (nosocomial infection)</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Discussion</li> <li>Demonstration</li> <li>Observation of autoclaving and other sterilization techniques</li> <li>Video presentation on medical &amp; surgical asepsis</li> </ul>	<ul style="list-style-type: none"> <li>Essay</li> <li>Short answer</li> <li>Objective type</li> </ul>

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Unit	Time (Hrs)	Learning outcomes	Content	Teaching/learning activities	Assessment methods
			<b>Introductory Concept of Asepsis—Medical and Surgical Asepsis</b> <b>Precautions</b> <ul style="list-style-type: none"> <li>• Hand hygiene (hand washing and use of hand rub)</li> <li>• Use of personal protective equipment (PPE)</li> <li>• Standard precautions</li> </ul> <b>Biomedical Waste Management</b> <ul style="list-style-type: none"> <li>• Types of hospital waste, waste segregation and hazards—introduction</li> </ul>		
IX	15 (T) 15 (SL)	Identify and meet the comfort needs of the patients	<b>Comfort, Rest and Sleep and Pain</b> <ul style="list-style-type: none"> <li>• Comfort <ul style="list-style-type: none"> <li>▪ Factors influencing comfort</li> <li>▪ Types of beds including latest beds, purposes and bed making</li> <li>▪ Therapeutic positions</li> <li>▪ Comfort devices</li> </ul> </li> <li>• Sleep and rest <ul style="list-style-type: none"> <li>▪ Physiology of sleep</li> <li>▪ Factors affecting sleep</li> <li>▪ Promoting rest and sleep</li> <li>▪ Sleep disorders</li> </ul> </li> <li>• Pain (discomfort) <ul style="list-style-type: none"> <li>▪ Physiology</li> <li>▪ Common cause of pain</li> <li>▪ Types</li> <li>▪ Assessment—pain scales and narcotic scales</li> </ul> </li> <li>• Pharmacological and nonpharmacological pain relieving measures—use of narcotics, TENS devices, PCA</li> <li>• Invasive techniques of pain management</li> <li>• Any other newer measures</li> <li>• CAM (Complementary and Alternative Healing Modalities)</li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Demonstration and redemonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Essay</li> <li>• Short answer</li> <li>• Objective type</li> <li>• OSCE</li> </ul>
X	5 (T) 3 (SL)	Describe the concept of patient environment	<b>Promoting Safety in Health Care Environment</b> <ul style="list-style-type: none"> <li>• Physical environment—temperature, humidity, noise, ventilation, light, odor, pest control</li> <li>• Reduction of physical hazards—fire, accidents</li> <li>• Fall risk assessment</li> <li>• Role of nurse in providing safe and clean environment</li> <li>• Safety devices: <ul style="list-style-type: none"> <li>▪ Restraints—types, purposes, indications, legal implications and consent, application of restraints—skill and practice guidelines</li> <li>▪ Other safety devices—side rails, grabbars, ambu alarms, non-skid slippers, etc.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Essay</li> <li>• Short answer</li> <li>• Objective type</li> </ul>

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Unit	Time (Hrs)	Learning outcomes	Content	Teaching/learning activities	Assessment methods
XI	6 (T) 2 (SL)	Explain and perform admission, transfer, and discharge of a patient	<b>Hospital Admission and Discharge</b> <ul style="list-style-type: none"> <li>• Admission to the hospital Unit and preparation of unit <ul style="list-style-type: none"> <li>▪ Admission bed</li> <li>▪ Admission procedure</li> <li>▪ Medico-legal issues</li> <li>▪ Roles and responsibilities of the nurse</li> </ul> </li> <li>• Discharge from the hospital <ul style="list-style-type: none"> <li>▪ Types—planned discharge, LAMA and abscond, referrals and transfers</li> <li>▪ Discharge planning</li> <li>▪ Discharge procedure</li> <li>▪ Medico-legal issues</li> <li>▪ Roles and responsibilities of the nurse</li> <li>▪ Care of the unit after discharge</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Essay</li> <li>• Short answer</li> <li>• Objective type</li> </ul>
XII	8 (T) 10 (SL)	Demonstrate skill in caring for patients with restricted mobility	<b>Mobility and Immobility</b> <ul style="list-style-type: none"> <li>• Elements of normal movement, alignment and posture, joint mobility, balance, coordinated movement</li> <li>• Principles of body mechanics</li> <li>• Factors affecting body alignment and activity</li> <li>• Exercise—types and benefits</li> <li>• Effects of immobility</li> <li>• Maintenance of normal body alignment and activity</li> <li>• Alteration in body alignment and mobility</li> <li>• Nursing interventions for impaired body alignment and mobility—assessment, types, devices used, method <ul style="list-style-type: none"> <li>▪ Range of motion exercises</li> <li>▪ Muscle strengthening exercises</li> <li>▪ Maintaining body alignment—positions</li> <li>▪ Moving</li> <li>▪ Lifting</li> <li>▪ Transferring</li> <li>▪ Walking</li> </ul> </li> <li>• Assisting clients with ambulation</li> <li>• Care of patients with immobility using nursing process approach</li> <li>• Care of patients with casts and splints</li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Demonstration redemonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Essay</li> <li>• Short answer</li> <li>• Objective type</li> <li>• OSCE</li> </ul>
XIII	4 (T) 2 (SL)	Describe the principles and practice of patient education	<b>Patient Education</b> <ul style="list-style-type: none"> <li>• Patient teaching—importance, purposes, process</li> <li>• Integrating nursing process in patient teaching</li> </ul>	<ul style="list-style-type: none"> <li>• Discussion</li> <li>• Role plays</li> </ul>	<ul style="list-style-type: none"> <li>• Essay</li> <li>• Short answer</li> <li>• Objective type</li> </ul>

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Unit	Time (Hrs)	Learning outcomes	Content	Teaching/learning activities	Assessment methods
XIV	20 (T) 20 (SL)	Explain and apply principles of first aid during emergencies	<b>First Aid</b> <ul style="list-style-type: none"> <li>• Definition, basic principles, scope and rules</li> <li>• First aid management <ul style="list-style-type: none"> <li>▪ Wounds, hemorrhage and shock</li> <li>▪ Musculoskeletal injuries—fractures dislocation, muscle injuries</li> <li>▪ Transportation of injured persons</li> <li>▪ Respiratory emergencies and basic CPR</li> <li>▪ Unconsciousness</li> <li>▪ Foreign bodies—skin, eye, ear, nose</li> <li>▪ Throat and stomach</li> <li>▪ Burns and scalds</li> <li>▪ Poisoning, bites and stings</li> <li>▪ Frostbite and effects of heat</li> <li>▪ Community emergencies</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Demonstration and redemonstration</li> <li>• Module completion</li> <li>• National Disaster Management Authority (NDMA)/Indian Red Cross Society (IRCS) First Aid module</li> </ul>	<ul style="list-style-type: none"> <li>• Essay</li> <li>• Short answer</li> <li>• Objective type</li> <li>• OSCE</li> </ul>

\* Mandatory module

Nursing Knowledge Tree  
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## Nursing Foundations II

**Placement:** *IInd Semester*

**Theory:** 6 Credits (120 hours)

**Practicum:** Skill Lab: 3 Credits (120 hours), Clinical: 4 Credits (320 hours)

**Course description:** This course is designed to help novice nursing students develop knowledge and competencies required to provide evidence-based, comprehensive basic nursing care for adult patients, using nursing process approach.

Unit	Time (Hrs)	Learning outcomes	Content	Teaching/learning activities	Assessment methods
I	20 (T) 20 (SL)	Describe the purpose and process of health assessment and perform assessment under supervised clinical practice	<b>Health Assessment</b> <ul style="list-style-type: none"> <li>• Interview techniques</li> <li>• Observation techniques</li> <li>• Purposes of health assessment</li> <li>• Process of health assessment               <ul style="list-style-type: none"> <li>▪ Health history</li> <li>▪ Physical examination:                   <ul style="list-style-type: none"> <li>◆ Methods: Inspection, palpation, percussion, auscultation, olfaction</li> <li>◆ Preparation for examination: Patient and unit</li> <li>◆ General assessment</li> <li>◆ Assessment of each body system</li> <li>◆ Documenting health assessment findings</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Modular learning</li> <li>• <b>*Health Assessment Module</b></li> <li>• Lecture cum discussion</li> <li>• Demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Essay</li> <li>• Short answer</li> <li>• Objective type</li> <li>• OSCE</li> </ul>
II	13 (T) 8 (SL)	Describe assessment, planning, implementation and evaluation of nursing care using nursing process approach	<b>The Nursing Process</b> <ul style="list-style-type: none"> <li>• Critical thinking competencies, attitudes for critical thinking, levels of critical thinking in nursing</li> <li>• Nursing process overview               <ul style="list-style-type: none"> <li>▪ <b>Assessment</b> <ul style="list-style-type: none"> <li>◆ Collection of data: Types, sources, methods</li> <li>◆ Organizing data</li> <li>◆ Validating data</li> <li>◆ Documenting data</li> </ul> </li> <li>▪ <b>Nursing Diagnosis</b> <ul style="list-style-type: none"> <li>◆ Identification of client problems, risks and strengths</li> <li>◆ Nursing diagnosis statement—parts, types, formulating, guidelines for formulating nursing diagnosis</li> <li>◆ NANDA approved diagnoses</li> <li>◆ Difference between medical and nursing diagnosis</li> </ul> </li> <li>▪ <b>Planning</b> <ul style="list-style-type: none"> <li>◆ Types of planning</li> <li>◆ Establishing priorities</li> <li>◆ Establishing goals and expected outcomes—purposes, types, guidelines, components of goals and outcome statements</li> <li>◆ Types of nursing interventions, selecting interventions: Protocols and standing orders</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Demonstration</li> <li>• Supervised clinical practice</li> </ul>	<ul style="list-style-type: none"> <li>• Essay</li> <li>• Short answer</li> <li>• Objective type</li> <li>• Evaluation of care plan</li> </ul>

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Unit	Time (Hrs)	Learning outcomes	Content	Teaching/learning activities	Assessment methods
			<ul style="list-style-type: none"> <li>◆ Introduction to nursing intervention classification and nursing outcome classification</li> <li>◆ Guidelines for writing care plan</li> <li>▪ <b>Implementation</b> <ul style="list-style-type: none"> <li>◆ Process of implementing the plan of care</li> <li>◆ Types of care—direct and indirect</li> </ul> </li> <li>▪ <b>Evaluation</b> <ul style="list-style-type: none"> <li>◆ Evaluation process, documentation and reporting</li> </ul> </li> </ul>		
III	5 (T) 5 (SL)	Identify and meet the nutritional needs of patients	<p><b>Nutritional Needs</b></p> <ul style="list-style-type: none"> <li>• Importance</li> <li>• Factors affecting nutritional needs</li> <li>• Assessment of nutritional status</li> <li>• <i>Review:</i> Special diets—solid, liquid, soft</li> <li>• Review on therapeutic diets</li> <li>• Care of patient with dysphagia, anorexia, nausea, vomiting</li> <li>• Meeting nutritional needs: Principles, equipment, procedure, indications <ul style="list-style-type: none"> <li>▪ Oral</li> <li>▪ Enteral: Nasogastric/Orogastric</li> <li>▪ Introduction to other enteral feeds—types, indications, gastrostomy, jejunostomy</li> <li>▪ Parenteral—TPN (Total Parenteral Nutrition)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Demonstration</li> <li>• Exercise</li> <li>• Supervised clinical practice</li> </ul>	<ul style="list-style-type: none"> <li>• Essay</li> <li>• Short answer</li> <li>• Objective type</li> <li>• Evaluation of nutritional assessment and diet planning</li> </ul>
IV	5 (T) 15 (SL)	Identify and meet the hygienic needs of patients	<p><b>Hygiene</b></p> <ul style="list-style-type: none"> <li>• Factors influencing hygienic practice</li> <li>• Hygienic care: Indications and purposes, effects of neglected care <ul style="list-style-type: none"> <li>▪ Care of the skin—(Bath, feet and nail, hair care) <ul style="list-style-type: none"> <li>▪ Care of pressure points</li> </ul> </li> <li>▪ Assessment of pressure ulcers using Braden Scale and Norton Scale</li> <li>▪ Pressure ulcers—causes, stages and manifestations, care and prevention</li> <li>▪ Perineal care/Meatal care</li> <li>▪ Oral care, care of eyes, ears and nose including assistive devices (eye glasses, contact lens, dentures, hearing aid)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Essay</li> <li>• Short answer</li> <li>• Objective type</li> <li>• OSCE</li> </ul>
V	10 (T) 10 (SL)	Identify and meet the elimination needs of patient	<p><b>Elimination Needs</b></p> <ul style="list-style-type: none"> <li>• Urinary elimination <ul style="list-style-type: none"> <li>▪ Review of physiology of urine elimination, composition and characteristics of urine</li> <li>▪ Factors influencing urination</li> <li>▪ Alteration in urinary elimination</li> <li>▪ Facilitating urine elimination: assessment, types, equipment, procedures and special considerations</li> <li>▪ Providing urinal/bedpan</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Essay</li> <li>• Short answer</li> <li>• Objective type</li> <li>• OSCE</li> </ul>

Contd...

Unit	Time (Hrs)	Learning outcomes	Content	Teaching/learning activities	Assessment methods
			<ul style="list-style-type: none"> <li>▪ Care of patients with               <ul style="list-style-type: none"> <li>◆ Condom drainage</li> <li>◆ Intermittent catheterization</li> <li>◆ Indwelling urinary catheter and urinary drainage</li> <li>◆ Urinary diversions</li> <li>◆ Bladder irrigation</li> </ul> </li> <li>• Bowel elimination               <ul style="list-style-type: none"> <li>▪ Review of physiology of bowel elimination, composition and characteristics of feces</li> <li>▪ Factors affecting bowel elimination</li> <li>▪ Alteration in bowel elimination</li> <li>▪ Facilitating bowel elimination: Assessment, equipment, procedures                   <ul style="list-style-type: none"> <li>◆ Enemas</li> <li>◆ Suppository</li> <li>◆ Bowel wash</li> <li>◆ Digital evacuation of impacted feces</li> <li>◆ Care of patients with ostomies (bowel diversion procedures)</li> </ul> </li> </ul> </li> </ul>		
VI	3 (T) 4 (SL)	<ul style="list-style-type: none"> <li>• Explain various types of specimens and identify normal values of tests</li> <li>• Develop skill in specimen collection, handling and transport</li> </ul>	<b>Diagnostic Testing</b> <ul style="list-style-type: none"> <li>• Phases of diagnostic testing (pre-test, intra-test and post-test) in common investigations and clinical implications               <ul style="list-style-type: none"> <li>▪ Complete blood count</li> <li>▪ Serum electrolytes</li> <li>▪ LFT</li> <li>▪ Lipid/lipoprotein profile</li> <li>▪ Serum glucose—AC, PC, HbA1c</li> <li>▪ Monitoring capillary blood glucose (Glucometer random blood sugar—GRBS)</li> <li>▪ Stool routine examination</li> <li>▪ Urine testing—albumin, acetone, pH, specific gravity</li> <li>▪ Urine culture, routine, timed urine specimen</li> <li>▪ Sputum culture</li> <li>▪ Overview of radiologic and endoscopic procedures</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Essay</li> <li>• Short answer</li> <li>• Objective type</li> </ul>
VII	11 (T) 10 (SL)	Assess patients for oxygenation needs, promote oxygenation and provide care during oxygen therapy	<b>Oxygenation Needs</b> <ul style="list-style-type: none"> <li>• Review of cardiovascular and respiratory physiology</li> <li>• Factors affecting respiratory functioning</li> <li>• Alterations in respiratory functioning</li> <li>• Conditions affecting               <ul style="list-style-type: none"> <li>▪ Airway</li> <li>▪ Movement of air</li> <li>▪ Diffusion</li> <li>▪ Oxygen transport</li> </ul> </li> <li>• Alterations in oxygenation</li> <li>• Nursing interventions to promote oxygenation: assessment, types, equipment used and procedure</li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Demonstration and Redemonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Essay</li> <li>• Short answer</li> <li>• Objective type</li> </ul>

Contd...

Unit	Time (Hrs)	Learning outcomes	Content	Teaching/learning activities	Assessment methods
			<ul style="list-style-type: none"> <li>▪ Maintenance of patent airway</li> <li>▪ Oxygen administration</li> <li>▪ Suctioning—oral, tracheal</li> <li>▪ Chest physiotherapy—percussion, vibration and postural drainage</li> <li>▪ Care of chest drainage—principles and purposes</li> <li>▪ Pulse oximetry—factors affecting measurement of oxygen saturation using pulse oximeter, interpretation</li> <li>• Restorative and continuing care               <ul style="list-style-type: none"> <li>▪ Hydration</li> <li>▪ Humidification</li> <li>▪ Coughing techniques</li> <li>▪ Breathing exercises</li> <li>▪ Incentive spirometry</li> </ul> </li> </ul>		
VIII	5 (T) 10 (SL)	Describe the concept of fluid, electrolyte balance	<p><b>Fluid, Electrolyte, and Acid-base Balances</b></p> <ul style="list-style-type: none"> <li>• Review of physiological regulation of fluid, electrolyte and acid-base balances</li> <li>• Factors affecting fluid, electrolyte and acid-base balances</li> <li>• Disturbances in fluid volume:           <ul style="list-style-type: none"> <li>▪ Deficit               <ul style="list-style-type: none"> <li>◆ Hypovolemia</li> <li>◆ Dehydration</li> </ul> </li> <li>▪ Excess               <ul style="list-style-type: none"> <li>◆ Fluid overload</li> <li>◆ Edema</li> </ul> </li> </ul> </li> <li>• Electrolyte imbalances (hypo and hyper)           <ul style="list-style-type: none"> <li>▪ Acid-base imbalances               <ul style="list-style-type: none"> <li>◆ Metabolic—acidosis and alkalosis</li> <li>◆ Respiratory—acidosis and alkalosis</li> </ul> </li> <li>▪ Intravenous therapy               <ul style="list-style-type: none"> <li>◆ Peripheral venipuncture sites</li> <li>◆ Types of IV fluids</li> <li>◆ Calculation for making IV fluid plan</li> <li>◆ Complications of IV fluid therapy</li> <li>◆ Measuring fluid intake and output</li> <li>◆ Administering blood and blood components</li> <li>◆ Restricting fluid intake</li> <li>◆ Enhancing fluid intake</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Demonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Essay</li> <li>• Short answer</li> <li>• Objective type</li> <li>• Problem solving—calculations</li> </ul>
IX	20 (T) 22 (SL)	<ul style="list-style-type: none"> <li>• Explain the principles, routes, effects of administration of medications</li> <li>• Calculate conversions of drugs and dosages within and between systems of measurements</li> </ul>	<p><b>Administration of Medications</b></p> <ul style="list-style-type: none"> <li>• Introduction—definition of medication, administration of medication, drug nomenclature, effects of drugs, forms of medications, purposes, pharmacodynamics and pharmacokinetics</li> <li>• Factors influencing medication action</li> <li>• Medication orders and prescriptions</li> <li>• Systems of measurement</li> <li>• Medication dose calculation</li> <li>• Principles, 10 rights of medication administration</li> <li>• Errors in medication administration</li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> <li>• Demonstration and redemonstration</li> </ul>	<ul style="list-style-type: none"> <li>• Essay</li> <li>• Short answer</li> <li>• Objective type</li> <li>• OSCE</li> </ul>

Unit	Time (Hrs)	Learning outcomes	Content	Teaching/learning activities	Assessment methods
		<ul style="list-style-type: none"> <li>Administer oral and topical medication and document accurately under supervision</li> </ul>	<ul style="list-style-type: none"> <li>Routes of administration</li> <li>Storage and maintenance of drugs and nurses responsibility</li> <li>Terminologies and abbreviations used in prescriptions and medications orders</li> <li>Developmental considerations</li> <li>Oral, sublingual and buccal routes: Equipment, procedure</li> <li>Introduction to parenteral administration of drugs—intramuscular, intravenous, subcutaneous, intradermal: Location of site, advantages and disadvantages of the specific sites, indication and contraindications for the different routes and sites.</li> <li>Equipment—syringes and needles, cannulas, infusion sets—parts, types, sizes</li> <li>Types of vials and ampoules, preparing injectable medicines from vials and ampoules <ul style="list-style-type: none"> <li>Care of equipment: Decontamination and disposal of syringes, needles, infusion sets</li> <li>Prevention of needle-stick injuries</li> </ul> </li> <li>Topical administration: Types, purposes, site, equipment, procedure <ul style="list-style-type: none"> <li>Application to skin and mucous membrane</li> <li>Direct application of liquids, gargle and swabbing the throat</li> <li>Insertion of drug into body cavity: Suppository/medicated packing in rectum/vagina</li> <li>Instillations: Ear, eye, nasal, bladder, and rectal</li> <li>Irrigations: Eye, ear, bladder, vaginal and rectal</li> <li>Spraying: Nose and throat</li> </ul> </li> <li>Inhalation: Nasal, oral, endotracheal/tracheal (steam, oxygen and medications)—purposes, types, equipment, procedure, recording and reporting of medications administered</li> <li>Other parenteral routes: Meaning of epidural, intrathecal, intraosseous, intraperitoneal, intrapleural, intraarterial</li> </ul>		
X	5 (T) 6 (SL)	Provide care to patients with altered functioning of sense organs and unconsciousness in supervised clinical practice	<b>Sensory Needs</b> <ul style="list-style-type: none"> <li>Introduction</li> <li>Components of sensory experience—reception, perception and reaction</li> <li>Arousal mechanism</li> <li>Factors affecting sensory function</li> <li>Assessment of sensory alterations—sensory deficit, deprivation, overload and sensory poverty</li> <li>Management <ul style="list-style-type: none"> <li>Promoting meaningful communication (patients with aphasia, artificial airway and visual and hearing impairment)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Discussion</li> <li>Demonstration</li> </ul>	<ul style="list-style-type: none"> <li>Essay</li> <li>Short answer</li> <li>Objective type</li> </ul>

Contd...

Unit	Time (Hrs)	Learning outcomes	Content	Teaching/learning activities	Assessment methods
			<b>Care of Unconscious Patients</b> <ul style="list-style-type: none"> <li>Unconsciousness: Definition, causes and risk factors, pathophysiology, stages of unconsciousness, clinical manifestations</li> <li>Assessment and nursing management of patient with unconsciousness, complications</li> </ul>		
XI	4 (T) 6 (SL)	Explain loss, death and grief	<b>Care of Terminally Ill, Death and Dying</b> <ul style="list-style-type: none"> <li>Loss—types</li> <li>Grief, bereavement and mourning</li> <li>Types of grief responses</li> <li>Manifestations of grief</li> <li>Factors influencing loss and grief responses</li> <li>Theories of grief and loss—Kubler Ross</li> <li>5 stages of dying</li> <li>The R Process Model (Rando's)</li> <li>Death—definition, meaning, types (brain and circulatory deaths)</li> <li>Signs of impending death</li> <li>Dying patient's bill of rights</li> <li>Care of dying patient</li> <li>Physiological changes occurring after death</li> <li>Death declaration, certification</li> <li>Autopsy</li> <li>Embalming</li> <li>Last office/death care</li> <li>Counseling and supporting grieving relatives</li> <li>Placing body in the mortuary</li> <li>Releasing body from mortuary</li> <li>Overview—medico-legal cases, advance directives, DNI/DNR, organ donation, euthanasia</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Discussion</li> <li>Case discussions</li> <li>Death care/last office</li> </ul>	<ul style="list-style-type: none"> <li>Essay</li> <li>Short answer</li> <li>Objective type</li> </ul>
XII	3 (T)	Develop basic understanding of self-concept	<b>A. Self-concept</b> <ul style="list-style-type: none"> <li>Introduction</li> <li>Components (personal identity, body image, role performance, self-esteem)</li> <li>Factors affecting self-concept</li> <li>Nursing management</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Discussion</li> <li>Demonstration</li> <li>Case discussion/role play</li> </ul>	<ul style="list-style-type: none"> <li>Essay</li> <li>Short answer</li> <li>Objective type</li> </ul>
XIII	2 (T)	Describe sexual development and sexuality	<b>B. Sexuality</b> <ul style="list-style-type: none"> <li>Sexual development throughout life</li> <li>Sexual health</li> <li>Sexual orientation</li> <li>Factors affecting sexuality</li> <li>Prevention of STIs, unwanted pregnancy, avoiding sexual harassment and abuse</li> <li>Dealing with inappropriate sexual behavior</li> </ul>	<ul style="list-style-type: none"> <li>Lecture</li> <li>Discussion</li> </ul>	<ul style="list-style-type: none"> <li>Essay</li> <li>Short answer</li> <li>Objective type</li> </ul>

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Unit	Time (Hrs)	Learning outcomes	Content	Teaching/learning activities	Assessment methods
XIV	2 (T) 4 (SL)	Describe stress and adaptation	<b>C. Stress and Adaptation—Introductory Concepts</b> <ul style="list-style-type: none"> <li>• Introduction</li> <li>• Sources, effects, indicators and types of stress</li> <li>• Types of stressors</li> <li>• Stress adaptation—General Adaptation syndrome (GAS), Local Adaptation syndrome (LAS)</li> <li>• Manifestation of stress—physical and psychological</li> <li>• Coping strategies/mechanisms</li> <li>• Stress management <ul style="list-style-type: none"> <li>▪ Assist with coping and adaptation</li> <li>▪ Creating therapeutic environment</li> </ul> </li> <li>• Recreational and diversion therapies</li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Essay</li> <li>• Short answer</li> <li>• Objective type</li> </ul>
XV	6 (T)	<ul style="list-style-type: none"> <li>• Explain culture and cultural norms</li> <li>• Integrate cultural differences and spiritual needs in providing care to patients under supervision</li> </ul>	<b>D. Concepts of Cultural Diversity and Spirituality</b> <ul style="list-style-type: none"> <li>• Cultural diversity <ul style="list-style-type: none"> <li>▪ Cultural concepts—culture, subculture, multicultural, diversity, race, acculturation, assimilation</li> <li>▪ Transcultural nursing</li> <li>▪ Cultural competence</li> <li>▪ Providing culturally responsive care</li> </ul> </li> <li>• Spirituality <ul style="list-style-type: none"> <li>▪ Concepts—faith, hope, religion, spirituality, spiritual wellbeing</li> <li>▪ Factors affecting spirituality</li> <li>▪ Spiritual problems in acute, chronic, terminal illnesses and near-death experience</li> <li>▪ Dealing with spiritual distress/problems</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Essay</li> <li>• Short answer</li> <li>• Objective type</li> </ul>
XVI	6 (T)	Explain the significance of nursing theories	<b>Nursing Theories: Introduction</b> <ul style="list-style-type: none"> <li>• Meaning and definition, purposes, types of theories with examples, overview of selected nursing theories—Nightingale, Orem, Roy</li> <li>• Use of theories in nursing practice</li> </ul>	<ul style="list-style-type: none"> <li>• Lecture</li> <li>• Discussion</li> </ul>	<ul style="list-style-type: none"> <li>• Essay</li> <li>• Short answer</li> <li>• Objective type</li> </ul>

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Unit  
**XIV**



**FIRST AID**

**UNIT OUTLINE**

Nursing Knowledge Tree

An Initiative by CBS Nursing Division

**Chapter 27** First Aid Nursing

**Chapter 28** Bandaging

# First Aid Nursing

## LEARNING OBJECTIVES

After completing this chapter, you will be able to:

- Identify the qualities of first aider
- Provide first aid in selected conditions given in the text

## CHAPTER OUTLINE

- Objectives of First Aid
- Essential Qualities of a First Aider
- Principles of first Aid
- Scope of First Aid
- Golden Rules of First-aid
- Equipment for First AID—First Aid Kit
- Musculoskeletal Injuries—Fractures, Dislocation, Muscle injuries
- Sprains and Strains
- Dislocation
- Fracture
- Transportation of an Injured Person
- Extremes of Heat
- Extremes of Cold
- Asphyxia
- Wounds and Hemorrhage
- Shock
- Unconsciousness
- Fainting
- Burns and its First Aid Measures
- Bites and Stings
- Foreign Bodies
- Poisoning

## KEY TERMS

- Crepitus
- Ecchymosis
- Asphyxia
- Choking
- Precordial thump
- External cardiac compression
- Epistaxis
- Shock
- Poisoning

An emergency is the unforeseen event which calls for prompt and quick action to save the life of a person or to prevent from further damage. At any moment, you or someone around you could experience an injury or illness. Using basic first aid, you may be able to stop a minor mishap from getting worse. In case of a serious medical emergency, you may even save a life.

## DEFINITION

First aid is an immediate temporary assistance given to a person who is injured or suddenly becomes ill, using facilities or materials available at that time before regular medical help is imparted. First aid includes assessing the victim for life threatening condition, performing appropriate interventions to sustain life and keeping the person in the best possible physical and mental conditions until she/he can enter the emergency or casualty unit in the hospital.

## OBJECTIVES OF FIRST AID

The objectives of first aid are:

- To preserve life.
- To prevent further injury and deterioration of the condition.
- To prevent complications related to injury or illness or conditions.
- To make the victim as comfortable as possible to conserve the strength.
- To put the injured person under professional medical care at the earliest.

## ESSENTIAL QUALITIES OF A FIRST AIDER

The following are the qualities, which a trained first aider, should possess:

- **Prompt and quick:** As soon as an accident or injury takes place, the first aider should be prompt and quick, to render help to the victim, without delay.
- **Calm and controlled:** He should be a calm and controlled sort of person because he has to take immediate action, without any fuss or panic.
- **Wise and intelligent:** He should be intelligent and wise enough to decide the immediate treatment even before a complete diagnosis, especially in case of serious injuries and severe bleeding.
- **Resourceful:** He should be resourceful enough to make available his first aid material at once or get the required things on the spot, for giving immediate relief to the victim.
- **Sweet tempered and sympathetic:** The first aider should use sweet and encouraging words to lessen the victim's distress. He should keep the victim as comfortable as possible and should be able to allay the victim's fears with sympathy.
- **Skillful and tactful:** The first aider should be skillful and tactful to judge the symptom and history of the case without wasting any time. If need be, he should be able to master requisite support from the crowd.
- **Dexterous and clever:** Should be able to help the injured without causing and/or aggravating pain, and to use the appliances and/or procedure efficiently and effectively.
- **Confidence and perseverance:** The first aider should have full faith in his skill to administer whatever assistance the situation demands, even if there is no response initially. He should have perseverance and should not give up. It may take time for the patient to respond to his handling.

Remember, an efficient and resourceful first aider maybe the link between the life and death.

## PRINCIPLES OF FIRST AID

When any person comes across seriously injured person, he should follow the following principles:

- Make sure that victim's airway is not blocked by the tongue, secretions or some foreign body—restore respiration.
- Make sure that the person is breathing. If not, administer artificial respiration—restore respiration.
- Make sure that the patient has a pulse, if no pulse is felt, administer cardiopulmonary resuscitation (CPR)—for restoration of circulation.
- Check for bleeding—take measures to control bleeding.
- Act fast if the victim is bleeding severely or if he has swallowed poison or if the heart or breathing has stopped, every second counts for his survival.
- Arrange without delay for shifting of the victim to hospital for medical attention, although most injured persons can be safely moved. It is very important, not to move a person with serious neck and/or back injuries unless

taking proper measure to ensure him from further complications.

- Keep the victim/patient quiet and make him lie down. Turn the victim on his side to prevent choking if there is no danger about neck injury. Keep him warm with blanket.
- Have someone call for medical assistance while applying first aid. The person who summons help should explain the nature of the emergency and ask what should be done if the arrival of ambulance is pending.
- Examining the victim gently, cut clothing of necessary length.
- Reassure the victim, try to remain calm yourself. Your calmness can allay the victim's fear and panic.
- Do not give fluids to an unconscious or semiconscious victim.
- Do not try to arouse an unconscious person by slapping or shaking.
- Do not allow crowd to gather near the victim so that fresh air is allowed.
- Look for an emergency identification card for medical information related to victim.

## SCOPE OF FIRST AID

The scope of first aid includes the diagnosis, the treatment and the disposal of the case.

### Diagnosis

- For diagnosis, the first aider must first know how the accident or sudden injury has occurred. This can be from the victim or from witnesses
- Watch for symptoms like faintness, bleeding, thirst, pain or shivering
- Watch for abnormal signs like swelling, baldness

### Treatment

Remove the causative agent from the causality, e.g., falling machinery, fire, electrical wire, poison, etc.

### Disposal

- Arrange for the safe transportation of the causality to the care of a doctor or hospital as soon as possible
- Inform the family or relatives at once.

## GOLDEN RULES OF FIRST-AID

- Do first things first, quickly—quietly without fuss or panic
- Reassure the casualty through encouraging words
- Check ABC rule (airway, breathing, circulation)
- Open the airway by tilting the head

- Give artificial respiration if breathing has stopped
  - Perform chest compression if the pulse is not present
  - Stop bleeding if any by direct pressure
  - Treat for shock
  - Do not allow people to crowd around
  - Don't remove clothes unnecessarily
  - Arrange for transportation of the casualty
  - Casualty should be sent to a hospital or doctor by quickest means of transport.
- Always inform police about serious accidents and the relatives.

## EQUIPMENT FOR FIRST AID—FIRST AID KIT

- Wound cleaner/antiseptic (100 mL)
- Swabs for cleaning wounds
- Cotton wool for padding
- Sterile gauze (minimum quantity 10)
- 1 pair of forceps (for splinters)
- 1 pair of scissors
- 1 set of safety pins
- 4 triangular bandages
- 4 roller bandages (75 mm)
- 4 roller bandages (100 mm)
- Crepe bandage
- 1 roll of elastic adhesive (25 mm × 3 m)
- 1 roll of non-allergenic adhesive strip (25 mm × 3 m)
- 1 packet of adhesive dressing strips (10)
- 4 first aid dressing (75 mm × 100 mm)
- 4 first aid dressing (150 mm × 200 mm)
- 2 straight splints
- 2 pairs large and 2 pairs medium sized disposable latex gloves
- 2 CPR mouth pieces or similar devices
- Thermometer
- Bulb syringe
- Sterile eye dressings (at least 2 sterile dressings)

## MUSCULOSKELETAL INJURIES— FRACTURES, DISLOCATION, MUSCLE INJURIES

Any injury that affects the bones, muscles, ligaments, nerves or tendons resulting in pain are considered musculoskeletal injuries.

They are caused by sudden impact, force, vibration and unbalanced positions.

### Causes of Musculoskeletal Injury

Most of people suffer from musculoskeletal injury due to their own lifestyle and age. Few causes are:

- Postural strain

- Repetitive movements
- Prolonged use of computer
- Poor posture
- Trauma
- Uncomfortable working position
- Exerting too much force
- Vibrations
- Working too long without breaks
- Sitting in the same position for extended periods

### Symptoms

- Acute pain
- Swelling, numbness, tingling
- Fatigue
- Sleep disturbances

### Common Affected Areas

Shoulders, wrists, back, hips, legs, knees, feet.

### Types of Musculoskeletal Injuries

- Tendinitis
- Carpal tunnel syndrome
- Osteoarthritis
- Rheumatoid arthritis
- Fibromyalgia
- Bone fractures
- Muscle/tendon strain
- Ligament sprain
- Tension neck syndrome
- Radial tunnel syndrome
- Degenerative disc disease
- Herniated disc

## SPRAINS AND STRAINS

A sprain is an overstretching or tearing of ligaments of a joint and a strain is an overstretching or tearing of muscles or tendons. The sprain is most common in the wrists and ankles.

### Symptoms in Sprain

- Pain
- Swelling
- Bruising
- Partial loss of function in the joint

### First Aid for Sprain and Strain

Apply the principle RICER; REST, ICE, COMPRESSION, ELEVATION, REFERRAL

- Rest the casualty, raise the injured part
- Apply a compression bandage to injured part

- Apply ice pack to the area—apply for 20 minutes every 2 hours
- Seek medical advice

## DISLOCATION

A dislocation is a separation of bones at a joint. Most common joint that can dislocate are shoulder, knees, jaw, thumb and finger joints.

### Causes

- Sudden twist
- Fall
- Accident
- Contact sports injuries
- Muscle weakness

### Signs and Symptoms

- Severe pain
- Unnatural movement
- Swelling
- Bruising
- Deformity at the joint

### First Aid for Dislocation

Management of dislocation is very similar to that of a fracture and involves:

- Immobilization and support of injured part by use of slings or simple support measures.
- Apply ice or cold compress to the injured part to help reduce pain and swelling.
- Transport injured person to nearby hospital at earliest.

## FRACTURE

### Types of Fractures

- **Simple or closed fracture:** This is simply, a clean break or crack in a bone. The broken ends of the bone do not cut open the skin nor are visible outside.
- **Compound or open fracture:** This is accompanied by a wound, the skin is broken and the bone may be exposed to contamination from the skin surface.
- **Comminuted fracture:** The bone is broken into several small pieces, which surrounds the main break.
- **Impacted fracture:** Broken ends of the bone are driven or forcibly embedded into one another.
- **Depressed fracture:** Broken parts of the bone are driven inward, e.g., in cases of fracture of skull.

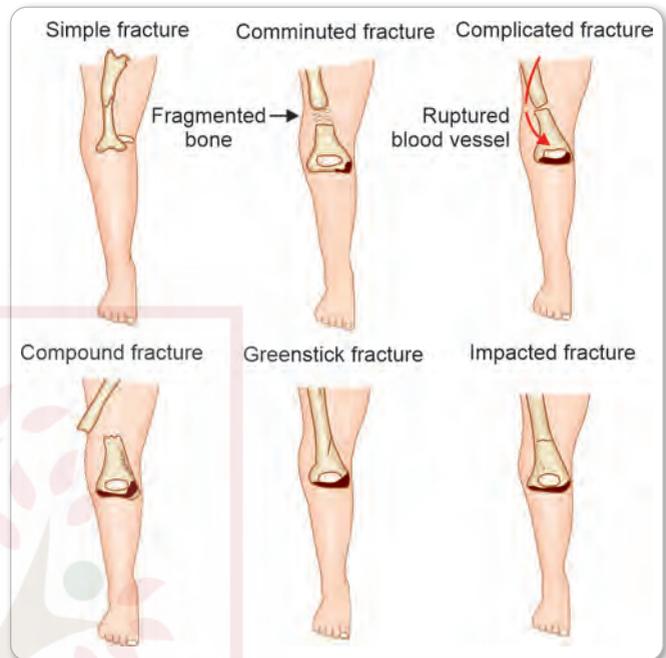


Fig. 1 Types of fractures

- **Greenstick fracture:** Bone is partially broken or bent, common in children due to incomplete calcification of bone.
- **Pathological fracture:** The pathological changes or carcinoma of the bone make the bone weak and brittle; it breaks spontaneously without or with little force common in old age.
- **Complicated fracture:** Along with the fracture there is associated injury to some internal structure like brain, spinal cord, liver, lungs, spleen, kidney, etc. (Fig. 1).

### Signs and Symptoms of Fractures

- Pain and tenderness at the point of a fracture especially on movement.
- Deformity of the part: alteration in its shape, length.
- Irregularity of the bone often felt by passing of the hand over the skin, especially when it is near the skin.
- Limitation of loss of power or function of the part and unnatural mobility.
- **Crepitus:** A crackling sound is heard or a sensation of grating is felt when the ends of broken bone are moved against each other.
- **Ecchymosis:** Occurs when blood leaks from a broken capillary into surrounding tissue under the skin measuring 1 cm.

However, the presence of these signs vary with the site of fracture and the bone broken, e.g., pain may be absent in simple fracture of small bones. Toes can be moved in case of fracture of tibia and fingers in case of Colles' fracture. Fracture of bones like fibula will hardly impair function of the leg if it is broken.

## First Aid Measures for the Fractures

When bones are broken, a good rule to follow is "Do not permit motion of the broken ends or of the joints near the injury." This prevents pain and further damage.

- For closed or simple fracture, place the limb in as natural position as possible without causing discomfort to the victim. Handle very gently; avoid all unnecessary movements of the injured part.
- Since the danger of infection is great in compound or open fractures, it is always better to get help from a doctor. In caring for the injury, clean the wound and apply dressing.
- If there is an excessive bleeding from open fracture, apply pressure dressing to control it. Transfer the patient to hospital.
- Never try to reduce the fracture, i.e., bringing bones to normal position (alignment).
- Before trying to move or carry a person with a broken bone, immobilize the broken ends with splints.
- Send the patient for medical aid as soon as possible.

## Immobilization of the Fractured Part

The important thing to remember is to immobilize the fracture site and the joints or both sides of fracture. This can be done by using bandages and using splints. The uninjured limb or body of the patient is used as splint. In case of upper limb fractures, the body is used as a splint; while in lower limb fractures, the other uninjured limb is used as a splint keeping the injured part steady and avoiding all unnecessary movements, bandaging should be done with broad bandages, towels or a big size cloth. Never apply bandage over the area of fracture. Apply knots on the sound side.

Splints must be long enough to extend beyond the joints above and below the fracture site. Wide splints are always better than narrow ones. Any firm material can be used—board, pole, metal rod, walking stick, a book or an umbrella or even thick magazines or thick folded newspaper. Use clothing or other soft material to pad splints to prevent skin injury. Fasten splints with bandages or cloth at maximum three sites: below joint below break, above joint above break and the level of break. The bandaging should be firm but not too tight to stop the circulation of blood in the area. Always place padding material like cotton, socks, handkerchief or

small towel between the natural hollows like ankles and knees, if a splint is to be tied over them. After the fracture ends have been stabilized, do not waste time and arrange for quick transportation to a nearby hospital or doctor.

### Slings are used for:

- Supporting an injured arm or wrist.
- Immobilizing fractures.
- Elevating to control external bleeding.

### How to Apply an Upper Arm Sling

This sling is used for injuries to the upper arm, including the collarbone, shoulder or ribs.

- Position the arm across the body with the hand near the opposite shoulder.
- Place the triangular bandage under the arm with the apex at the elbow.
- Fold the lower half of the bandage over the arm.
- Twist the bandage firmly at the elbow and bring the twisted bandage around the back.
- Twist the bandage around the hand and over the uninjured shoulder and tie the ends together using a reef knot on opposite side of the injury and place a pad under the knot.
- Check the bandaged arm for circulation.

### How to Apply a Lower Arm Sling

- This sling is used for injuries to the lower arm, including the wrist and hand.
- Place the arm across the chest and slightly raised.
- Place the triangular bandage between the arm and the body with the apex pointing towards the injured elbow.
- Bring the lower half of the bandage up and over the injured arm.
- Tie the ends together with a reef knot on the uninjured side and place a pad under the knot.
- Tie the tape or pin at the elbow.
- Check the injured arm for circulation.
- Ensure the arm is not sloping downwards as this will increase swelling and pressure.

### How to Apply a Collar and Cuff Sling

This sling can be used for dislocated shoulder, fractured ribs, or a fracture of the upper arm.

- Make a clove hitch using a narrow fold bandage.
- Put the loops over the wrist of the injured arm.
- Gently elevate the injured arm against the casualty's chest.
- Tie the bandage ends together around the neck on the uninjured side, using a reef knot, place a pad under the knot.

- For extra support, apply a broad bandage below the fracture site over the arm and around the body.

### How to Fold a Triangular Bandage

Triangular bandages are used for slings, pads or bandaging:

- Fold the triangular bandage in half, and this makes a broad fold bandage.
- Fold the triangular bandage in half again and this is called a narrow fold bandage.

### Facial Fractures

Common injuries to the face include a broken nose, cheekbone or jaw. The main danger is obstruction of the airway, either by swollen, displaced or lacerated tissue, by loose teeth or by blood and saliva. There may be damage to brain, skull or neck. There may be bleeding from the nose or mouth.

- **Cheekbone and nose fractures:** This may block the air passage in the nose. Apply a cold compress and transfer the casualty to hospital.
- **Lower jaw fractures:** Are usually the result of direct force, such as heavy blow. A blow on one side of the jaw can sometimes cause a fracture on the other side. A fall on the point of chin can fracture both sides.

### Signs and Symptoms

- Pain which is increased by jaw movement and swallowing.
- Swelling, tenderness and bruising of mouth.

### First Aid Measures

- Ask the casualty not to speak.
- For a conscious casualty, who is not seriously injured, help him to sit up with head forward, to allow any blood, mucus and saliva to drain away.
- If the casualty vomits, support his jaw and head and gently clean his mouth.
- Ask the casualty to hold a soft pad firmly in place to support the jaw.
- If the patient is conscious, transfer to hospital with his face leaning forward and downward in sitting position. If the patient is unconscious, send the patient to hospital on a stretcher with the face place downwards.

### Collar Bone Fracture

The two collar bones (clavicles) can be broken by indirect force such as fall on to the outstretched hand or impact at the shoulder.

### Signs and Symptoms

- Pain and tenderness at the site of injury increased by movement.
- Casualty may support the arm at the elbow, and incline the head to the injured side.

### First Aid Measures

- Make the casualty sit down and place the arm on his injured side across his chest.
- Support the arm in an elevation sling.
- Secure the arm to his chest with the broad fold bandage over the sling.
- Send casualty to hospital in sitting position.

### Upper Arm Fracture

The upper arm bone (humerus) may be fractured across its shaft by the direct blow, common among elderly. The casualty may walk around for some time with this fracture and without seeking medical advice, because it is a stable injury.

### Signs and Symptoms

- Pain which is increased by movement.
- Tenderness over the fracture site.
- Rapid swelling and bruising which develop slowly.

### First Aid Measures

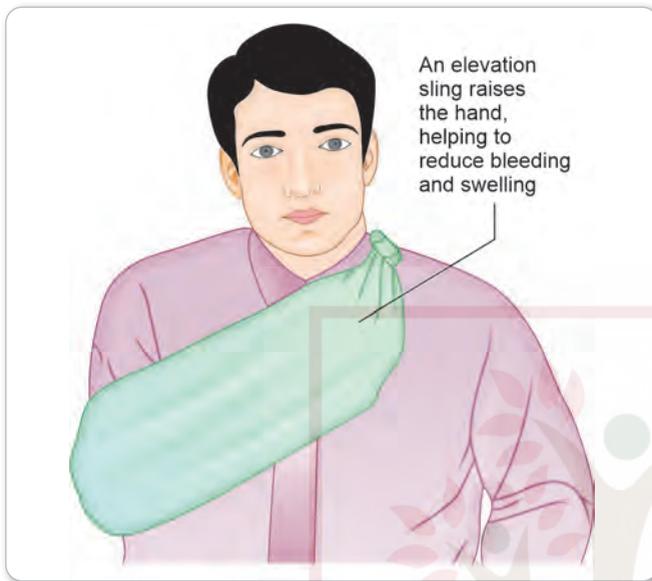
- Make the casualty sit.
- Gently place the injured arm across his chest in the position that is most comfortable.
- Support the arm in arm sling, and secure the limb to his chest by placing soft padding between the arm and chest and tie a broad fold bandage around the chest over the sling.
- Transport the casualty to hospital in sitting position (Fig. 2A).

### Elbow Fracture

Fracture at the elbow joint are common by a fall on to hand. A fracture to the hand of the radius is characterized by a stiff elbow that cannot be fully straightened.

### Signs and Symptoms

- Pain increases by movement.
- Tenderness over the fracture site.
- Possible swelling and bruising.
- In case of stiff elbow which could be due to fracture of head of radius.



**Fig. 2A** First aid for fracture elbow

### First Aid Measures

- Lay the casualty down, and place the injured limb on the trunk.
- Do not attempt to forcibly bend or straighten elbow.
- Insert soft padding between the injured limb and the trunk.
- Bandage the injured limb to the trunk, first at the wrist and then above and below the elbow.
- Check the pulse at the wrist every 10 minutes.
- Treat as for the fracture of upper arm.
- Transfer the casualty to hospital.

### Fracture of the Forearm and Wrist

The bones of the forearm (the radius and ulna) may be fractured across their shafts by a heavy blow. They are often associated with a wound. The most common fracture around the wrist is a Colles' fracture, occurs while falling on an outstretched hand.

### First Aid Measures

- Make the casualty sit down.
- Gently support the injured forearm across his chest.
- Support the arm in an arm sling. Secure the limb to chest using a broad fold bandage tied over the sling close to the elbow.
- Tie the knot in front of the uninjured side.
- Send the casualty to hospital in sitting position.

### Fracture of the Hand and Fingers

The hand is made up of many small bones with movable joints, and any of which may be injured by direct or indirect force.

Multiple fractures affecting all of the hand are usually caused by crush injury, and there may be severe bleeding and swelling. The most common injury is the fracture of the knuckle between the little finger and the hand.

Dislocations and sprains may affect any of the fingers. The thumb is particularly prone to dislocation caused by a fall on to the hand.

### First Aid Measures

- Protect the injured hand by surrounding it in folds of soft padding.
- Gently support the affected arm in an elevation sling.
- If necessary, secure the arm to the chest by applying a broad fold bandage over the sling.
- Tie the knot in front of the uninjured side.
- Send the casualty to hospital in sitting position.

### Fracture of the Rib Cage

Rib fractures may be caused by direct force by a blow, fall on to chest or by indirect force produced by crush injury. If the fracture is complicated by a penetrating wound or a "flail chest" injury, breathing may be impaired.

### Flail Chest Injuries

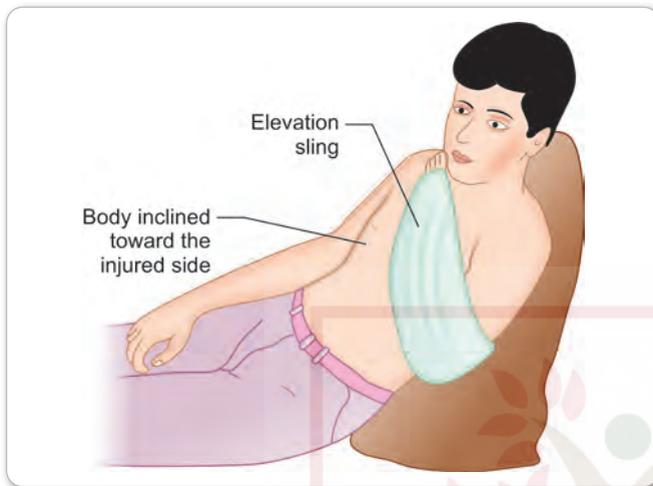
If multiple rib fractures isolate a portion of the chest wall, the portion will move out when casualty breathes in and the portion will move out when the person breathes out. This is opposite of the normal chest movement. This state of "Paradoxical breathing" produces severe respiratory difficulties.

### Signs and Symptoms

- Sharp pain at the site of fracture.
- Pain on taking a deep breath in order to reduce pain. Casualty may be having shallow breathing.
- Paradoxical breathing.
- An open wound over the fracture through which you might hear air being sucked into the chest cavity.

### First Aid Measures

- In case of fractured rib, support the limb on the injured side in an arm sling and send casualty to the hospital.
- In case of open or multiple fractures, immediately cover and seal any wound on the chest wall.
- Have the casualty in a half-sitting position, with head and shoulders leaned and body inclined towards the injured side.



**Fig. 2B** Fracture rib cage

- Support the limb or the injured side in an elevation sling (Fig. 2B).
- Call for medical aid.
- If the casualty becomes unconscious or breathing becomes difficult, place him in the recovery position, uninjured side uppermost.

## Fracture of Backbone/Spine

Injuries to the back include fractures of the bones of the spine, a displaced intervertebral disc, muscle strains and ligament sprains. The main danger with any back injury is the injury to spinal cord or nerves.

The spine is made up of a column of small bones, called vertebra. The spine supports the trunk and head, surrounds the spinal cord and protect it. The spinal column is supported by many strong ligaments and the muscles of the trunk. The spinal cord is delicate and if damaged, loss of power or sensation can occur in parts of the body below the injured area, temporary damage can be caused if cord or peripheral nerves are pinched by displaced disc or bone fragments, permanent damage, will result if the cord is partially or completely severed. Fractures of the vertebrae can be caused by both direct and indirect force. The most vulnerable parts of the spine are the bones in the neck and in the lower back. Always, suspect spinal injury if the casualty complains of any disturbance of feeling or movement. The history of the injury is most important indicator.

### Causes of Spinal Injury

- Falling from a height.
- Falling awkwardly while doing gymnastics.
- Diving into a shallow pool.
- Being thrown from a horse or from a motor bike.

- Sudden deceleration in a motor vehicle (a head on crash).
- A heavy object falling across the back.
- Injury to the head or face.

### Signs and Symptoms in Spinal Injury

- **When only the spinal column is damaged:**
  - Pain in the neck or back at the level of injury.
  - Falling awkwardly while doing gymnastics.
  - Diving into a shallow pool.
  - Being thrown from a horse or from a motor bike.
  - Sudden deceleration in a motor vehicle (a head on crash).
  - A heavy object falling across the back.
  - Injury to the head or face.
- **When the spinal cord has also been damaged:**
  - Loss of control over limbs. Movement may be weak or absent.
  - Loss of sensation.
  - Abnormal sensations—burning or tingling.
  - The limbs may feel stiff, heavy, or clumsy.
  - Difficulty in breathing.

### First Aid Measures (For Conscious Victim)

- Do not move the casualty from the position found unless there is danger.
- Reassure the casualty and tell not to move.
- Support the head in the neutral position by placing your hands over the ears.
- If neck injury is suspected, get helper to place rolled blankets/sheets around the casualty's neck and shoulder.
- Remove the casualty in ambulance but continue to hold the head and neck till the collar is applied.

### For Unconscious Victim

- Check breathing pulse and place the casualty in recovery position.
- Clear the airway by tilting the head and chin and lift gently so that the head and neck remain in neutral position.
- Check breathing and pulse again, if not present, give artificial ventilation with chest compression till help arrives.
- If you have to turn the casualty on to her back to resuscitate, you should keep head, trunk and toes in a straight line, while you maintain support at the neck, ask helpers, (usually five) to gently straighten the casualty's limbs, and 'log roll' her over.
- Steady and support the casualty's head by placing your hands over his ears. Be prepared to maintain this support throughout, until help arrives.
- Ask your helper to straighten the casualty's legs and bring the arm nearest to him, elbow bent, palm uppermost, at right angles of the body.

- Your helper grasps the casualty's thigh, drawing up the knee; then bringing the other arm of casualty across the chest, grasps the far shoulder.
- As he pulls the casualty towards him, you control the neutral position of the head and neck.
- Do not pull the neck.
- Once the casualty is fully turned on to his side both you and, if possible, your helper should support the casualty in this position till help arrives.
- If injury is to the neck, a collar may be applied for further support.

### Fracture of Pelvis

Injuries to the pelvis are usually caused by crushing, or by indirect force, that might occur in a car crash. The impact of car dashboard on a knee can force the head of thigh bone through the hip socket. Pelvic injuries may be complicated by injury to internal tissues and organs, particularly the bladder and urinary passages, which the pelvis protects.

#### Signs and Symptoms

- Inability to walk or even stand.
- Pain and tenderness in the region of the hip, groin or back, increased when the casualty moves.
- Blood at the urinary orifice, especially in males. The casualty may not be able to pass urine.
- Signs of internal bleeding and shock.

#### First Aid Measures

- Help the casualty to lie on her back with her legs straight or if it is more comfortable, bend knees slightly and support them.
- Immobilize the legs by bandaging together; placing padding between bony points.
- Dial for ambulance, treat the casualty for shock.
- Do not bandage the legs together, if this causes intolerable pain.

### Fracture of Hip and Thigh

Fractures of the neck of the thigh bone (femur) at the hip joint are common in the elderly and more frequent in women, whose bones become more porous and brittle as they age. This can be a stable injury, the casualty may be able to walk around for some time before the fracture is discovered. The hip may also, more rarely, be dislocated.

It takes considerable force (such as on road accidents, or falls from heights) to fracture the shaft of the thigh bone. This is a serious injury because in most cases, a large volume of blood is lost from the tissues. This may cause shock to develop.

#### Signs and Symptoms

- Pain at the site of the injury.
- Inability to walk.
- Signs of shock.
- Shortening of the thigh, a powerful muscle pull, broken bone ends together.
- A turning outwards of the knee and foot.

#### First Aid Measures

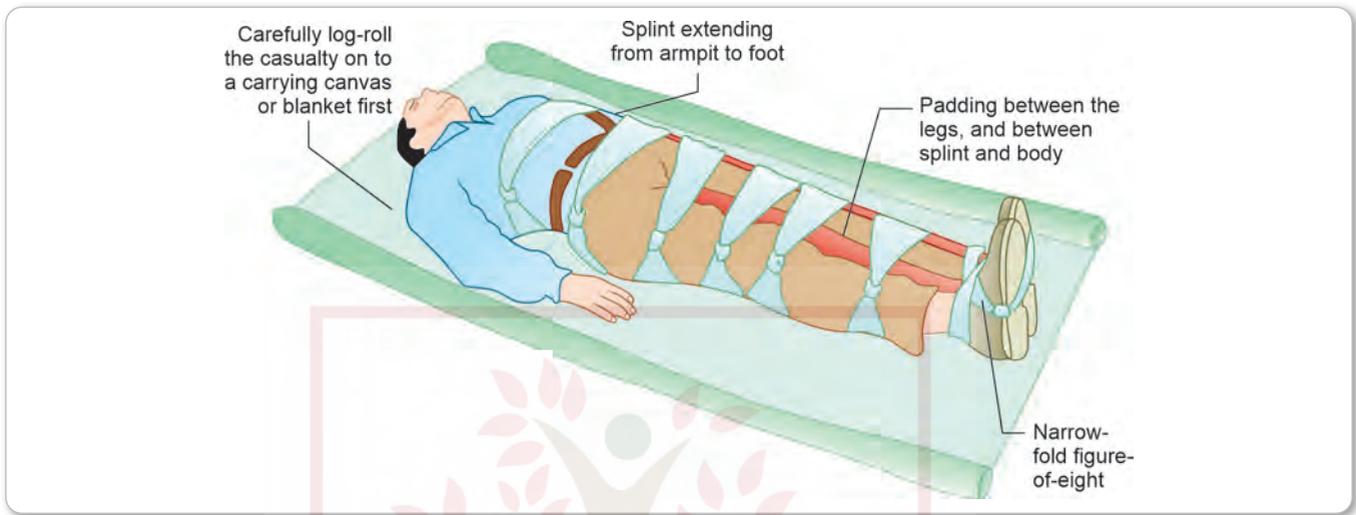
- Lay the casualty down. Ask a helper to steady and support the limb by holding it above and below the injury.
- Gently straighten the lower leg and apply traction at the ankle, pulling steadily in the line of the limb.
- Call for an ambulance. If the ambulance arrives quickly, support the leg with your hands, until it arrives.
- Keep casualty warm. Treat for shock.
- If the ambulance is delayed, immobilize the limb by splinting it to the uninjured limb.
- Gently bring the casualty's sound limb alongside the injured one.
- Maintaining traction at the ankle, gently slide two bandages under the knees. Ease them into position above and below the fracture by sliding them backwards and forward. Position another bandage at the knees and one at the ankles.
- Insert padding between the thighs, knees and ankles, to prevent displacing the broken bone.
- Tie the bandages around his ankles and knees. Then tie the bandages below and above the fracture site.
- To transport the casualty over a distance, place a wooden leg splint, reaching from the armpit to the foot, against the injured side. Pad between the legs, and between the splint and body. Secure the splint with broad fold bandages, at the chest and pelvis, and then at the legs. Do not bandage directly over the fracture. During transport, keep the foot of the stretcher raised to minimize swelling and shock (Fig. 3).

### Fracture of the Knee Joint

The knee is the joint between the thigh bone (femur) and shin bone (Tibia). It is a hinge joint which allows bending, straightening, and in the bent position, slight rotation. The knee joint is supported by strong muscles and ligaments and protected in front by a disc of bone, the knee cap (Patella). Any of these structures may be damaged by direct blows, violent twists and strains.

#### Signs and Symptoms

- History of a recent twist or blow to the knees.



**Fig. 3** Method of transporting the casualty over a distance

- Pain, spreading from the injury to become deep seated in the joint.
- If the bent knee has 'locked, acute pain on attempting to straighten the leg.
- Rapid swelling of the knee joint.

### First Aid Measures

- Help the casualty to lie down, supporting her leg and knee in the most comfortable position.
- Wrap soft padding around the joint, and bandage it carefully in place.
- Send the casualty to hospital, transporting as a stretcher case.
- Do not attempt to force the knee straight. Displaced cartilage or internal bleeding may make the joint impossible to straighten safely.
- Do not let the casualty walk.
- Do not give anything to eat or drink to casualty as the anesthetic may be needed.

### First Aid Measures

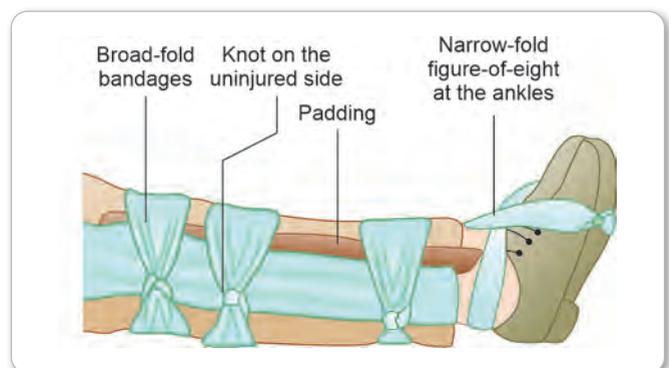
- Help the casualty to lie down.
- Straighten the leg using traction, pulling gently in the line of the shin.
- Call an ambulance, till then support the leg with your hands until it arrives.
- If there is delay in arrival of ambulance, splint the injured limb to the unaffected limb.
- Gently bring the unaffected limb alongside the injured one.
- Maintaining support at the ankle, gently slide bandages under the knees and ankles, one above and one below the fracture and at knees and ankles.
- Insert padding between the knees and ankles and between the calves.
- Tie the bandages around the ankles and knees, then above and below the fracture.
- Bandage firmly and avoid jerky movements (Fig. 4).

## Fracture of the Lower Leg

The shin bone (Tibia) of the lower leg usually requires a heavy blow to break, e.g., from the bumper of a moving vehicle. The thinner splint bone (fibula) can be broken by the type of twisting injury that sprains the ankle. Because the load bearing shin bone remains intact, the casualty may be able to walk, and may be unaware that a fracture has occurred.

### Signs and Symptoms

- Localized pain.
- Inability to walk.
- An open wound.



**Fig. 4** First aid in fracture of the lower leg

## TRANSPORTATION OF AN INJURED PERSON

For a first aider, transportation of an injured person to a hospital is a vital step of action. Before transportation, it is important to check:

- Casualty respiration is normal
- Pulse rate normal
- Any bleeding—should be arrested
- Injured part is well supported and immobilized
- Keeping the casualty warm
- Transportation must be done in a way so that no further injury occurs.

### General Principles of Handling Injured before Transportation

- Don't move unnecessarily till assistance is available
- Reassure the injured casualty/victim
- Always explain injured about, what is going to be done, for full support and cooperation
- While moving a casualty, maintain proper body mechanics, never put own safety in danger
- Move casualty to safe area with the help of assistant
- Command should be given only by one person
- Make arrangements for transport for sending casualty to the hospital as soon as possible

### Methods of Transportation

- Manual lifting—by one first aider and by two first aider
- Carry chair
- Stretchers
- Rescue by: Air helicopter  
Land—ambulance  
Water—boat

### Manual Lifting

Manual lifting is the safe method for victim as well as for the first aider. General rules to be kept in mind while using manual lift:

- Always use strongest muscles of body parts, i.e., shoulder, thigh and hip muscles
- Keep feet wide apart to keep the body well balanced
- Keep back straight to prevent strain on back
- Hold with your entire hand
- Hold the victim as close as feasible
- In case of imbalance, bring down the victim and begin lifting again

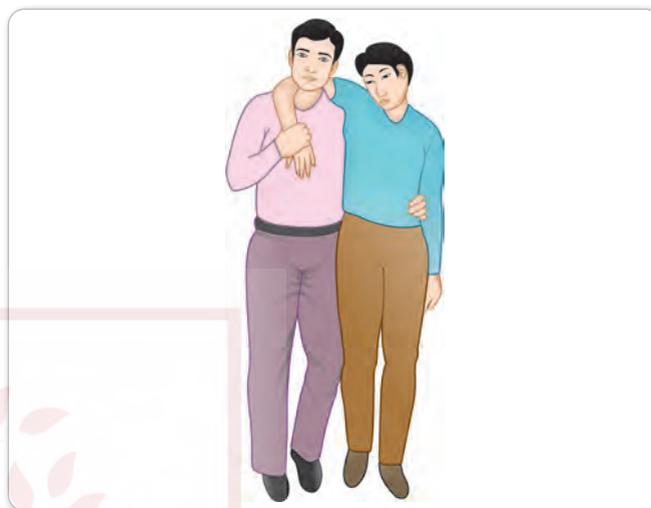


Fig. 5 Human crutch

### Manual Lift by One First—Aider

Casualty is carried by one first aider using human crutch, drag method, cradle method, pick a back and fireman's lift and carry method.

- **Human crutch:** The rescuer acts as crutch to the injured. This method is used when the casualty is in a position to help them. The rescuer stands and assists the injured to place their arm around the shoulder. This is called "Human crutch." This method is useful if one of the legs of the victim is injured (Fig. 5).
- **Drag method:** This method is used when injured person required to move immediately from the source of danger, and when victim is not able to move. Steps of drag method are:
  - Reassure the victim
  - Keep victim arms across his chest
  - Crouch at the head end of the victim
  - Hold the armpit and support the victim's head on first aider's forearms
  - Drag the victim along with ground without lifting
- **Cradle method:** This method is used for injured child. Steps are:
  - Place one arm under victim's knees or thighs
  - Place another hand around trunk or above waist
  - Lift the victim and transfer him
- **Pick a back:** In this method victim is carried on first aiders back (Fig. 6).  
It is used when victim is small, light, oriented and able to hold arm. Steps are:
  - First aider stands in front of the victim. First aider lowers down oneself and brings the arms of victim on shoulders and lifts the victim

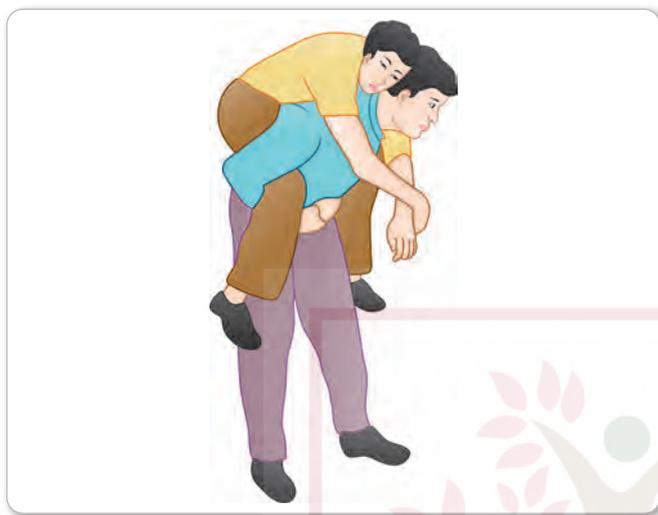


Fig. 6 Pick a back



Fig. 7 Fireman's lift

- Victim's hips and body literally drapes across the rescuer's back
- Raise the victim trunk by passing your hand under victim armpits
- Hold his own wrist on the injured chest
- Lift the injured person and walk in step
- **Fireman's lift:** This method is used when the injured person is light weight (Fig. 7). Steps are:
  - Assist victim to raise in upright position. Victim and first aider are face to face
  - Hold the victim right wrist with left hand
  - Bend downward with first aider's head below victim's extended right arm
  - With dominant hand (right hand) support the body of victim
  - Allow the victim's body lean on the right shoulder of first aider
  - While lifting up the victim, first aider should stand straight. Wrap around the arm of victim across first aider's chest
  - Keep your left side hand free.



Fig. 8 Two handed seat

### Manual Lifting by Two First Aiders

This can be done by two handed seat, four handed seat and fore and aft method.

- **Two handed seat:** This method is used when injured persons are not able to help first aider (Fig. 8). Steps are:
  - Both first aiders squat facing each other on either side of the victim
  - Reach under the victim's shoulders and under their knees
  - First aiders grasp each other's wrists
- **Four handed seat:** This method is used when victim is able to support first aider by using one or both arm in which the victim is conscious (Fig. 9). Steps are:
  - First aiders stand facing each other
  - Both first aiders make seat by holding own left wrist by own right hand
  - With free hand first aiders hold each other's wrist
  - Guide victim to put an arm around neck of first aiders
  - Lift together by keeping back straight, walk together in same pace

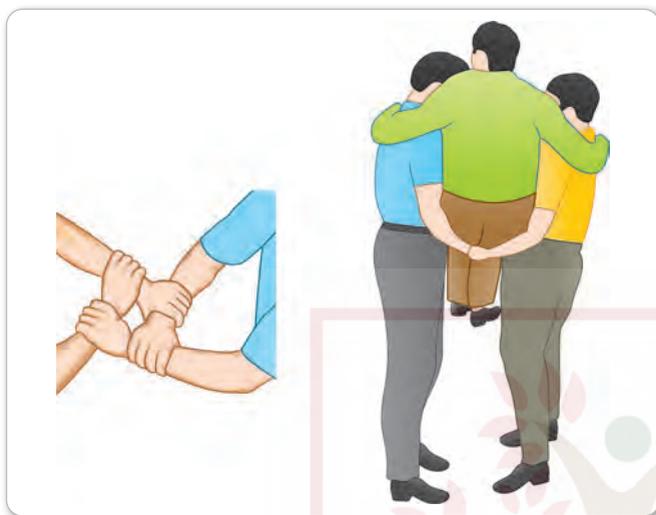


Fig. 9 Four handed seat

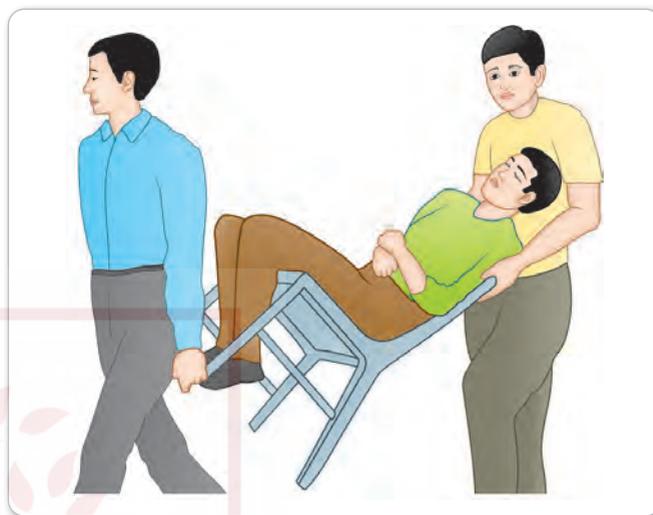


Fig. 11 Carry chair



Fig. 10 Fore and aft method

- **Fore and aft method:** This method is used to put an unconscious victim on stretcher or a carry chair (Fig. 10). Steps to be followed are:
  - First put the victim arms over his abdomen
  - Squat at backside of victim and slide arms below armpits, then hold the wrist
  - Command other person (first aider) to squat between legs of victim, and hold the victim below knees
  - Lift together by keeping your back straight, walk together in same pace
- **Carry chair:** This is commonly known as chair method (Fig. 11). It is used for those people who are not with serious injury and conscious. It is used to take victim

upstairs or downstairs and victim can be seated on a simple chair. Chair need to be strong enough to carry victim. Steps are:

- Help the victim to sit on chair and secure the victim with the help of bandages
- Stand one in front and other one behind the victim
- Support backside of chair and victim†
- Second person holds chair from front legs
- To secure victim tilt chair backward slowly
- Raise victim in the chair and move together in same pace

- **Stretchers:** This method is used to take away seriously injured person, so that further risk of injury can be minimized. It is also used to carry injured person to ambulance or to the shelter. The principles of using stretcher are:

- Check the stretcher to make sure that it is in working condition
- Assess the stretcher that it is strong enough to bear the weight of injured person
- Always explain and reassure the injured person before putting victim over the stretcher
- Secure the victim with straps

## EXTREMES OF HEAT

Individuals with certain health problems are at high risk. Patients cardiovascular disease, obesity, diabetes mellitus, malnutrition, alcoholism are more vulnerable to heat related problems. Farmers, athletes, infants and elderly are also at high risk.

There are three heat related problems which include heat stroke, heat exhaustion and heat cramp.

## Heat Stroke/Sun Stroke

Both these conditions are similar and can prove dangerous. Sunstroke is caused by too high temperature in atmosphere by the sun rays. While heat stroke may be caused by high temperatures in factories, furnaces, or high fever. In both conditions, the heat regulating mechanism of the body fails and body rapidly becomes dangerously overheated.

### Signs and Symptoms

- Headache, dizziness and discomfort.
- Restlessness and confusion.
- Hot, flushed dry skin.
- Slow and rapid pulse.
- Rapid unconsciousness.
- The body temperature rises up to 104°F or more.

### First Aid Measures

- Remove the patient to a dry and shady place, loosen collar and any tight clothes.
- Raise the head and sprinkle cool water on his body or wrap him in a thin wet sheet and fan him.
- Check temperature every 10 minutes.
- Do not allow the body temperature fall below 103°F.
- After this, wrap him in a dry sheet and keep fanning so that the temperature does not rise again.
- If the casualty is conscious, cool water mixed with salt and glucose can be given for drinking.
- Remove the casualty to hospital.

## Heat Exhaustion

It is caused by too high temperature in the atmosphere directly by the sun or due to hard work and confinement in a close, hot atmosphere like factories, etc. Excessive sweating with loss of body water and salts result in this condition.

### Signs and Symptoms

- Headache, dizziness, nausea, vomiting, abdominal cramps and cramps in limbs.
- Pale face and cold sweat.
- Pulse is weak.
- Shallow breathing.
- Temperature is normal or slightly elevated.
- Sometimes there is unconsciousness.
- Person may be in shock.
- Loss of appetite.

### First Aid Measures

- Remove the casualty to a cool place.
- Place him flat on his back.
- Give him plenty of fluids with added salt or fruit juice.

## Heat Cramps

These are intermittent, painful contractions of skeletal muscles. These cramps often occur in individuals who replace the fluid lost in sweat by drinking water, but do not replace sodium. The sodium depletion is believed to be responsible for the cramps. Heat cramps usually occur in muscle that have been involved in strenuous activity and most often of the legs. The cramps last a few minutes and disappear spontaneously. With heat cramps, the body temperature is normal and serum sodium may be normal or low.

The treatment is to replace sodium with electrolyte solution. In severe cases, intravenous salt solutions may be required.

### Preventing Extreme Heat Condition

- Limiting the strenuous activities in the hot weather.
- Gradually exposing to hot weather to get acclimatized to extreme heat.
- Stay indoors and wear a minimum of clothing during heat waves.
- Wear clothes that are loose fitting, light in color, and covering the body properly when outdoors.
- Lose weight if obese.
- Use measures to improve ventilation and reduce heat by shades.
- Eating more salts but with increased amounts of fluids.

## EXTREMES OF COLD

Effects of excessive cold are common in persons who live or work in a climate where temperature falls below 32°F or are in high altitudes. Extent of the injury caused depends on the degree of the temperature and the period of exposure to cold.

### Frost Bite

During very cold weather, especially if there is also a strong wind, frost bite is liable to occur on nose, chin, ears, fingers, toes. After being painfully cold, the affected parts become waxy white in appearance and feel quite numb. Whiteness and numbness are danger signals which must not be overlooked because prolonged freezing will do irreparable damage.

### Signs and Symptoms

- The exposed part becomes cold, painful and ultimately numb.
- Color first is red then becomes white, which may later lead to gangrene.
- The parts feel waxy and has no feeling while it is frozen.

## First Aid Measures

- Remove all wet or tight clothing from the frost bitten area.
- Carry the casualty to a closed room without a fire and undress him carefully.
- Remove tight gloves, boots, socks, rings, etc.
- Do not rub the frozen part with a snow.
- Cover the casualty with a dry sheet.
- Give him warm drinks.
- The hands and feet need to be wrapped in a blanket.
- Do not use hot water bottles or heat lamps.
- Do not allow the victim to walk, if the feet are affected.
- Do not allow the victim to smoke because the nicotine in tobacco may further constrict blood vessels.
- Send for the physician immediately.

## Preventive Measures for Extreme Cold

- Plan activities carefully to minimize exposure.
- Dress for the weather. Protection is more important than fashion.
- Always let someone know where you are and when to expect you back.
- Apply protective cream to the face prior to exposure.
- Use hand protection. Mittens are generally more effective than gloves.
- Avoid alcohol and cigarettes.
- Avoid using excessive heat to cold freezing tissues.

## ASPHYXIA

Asphyxia is a deficiency of oxygen in the blood and an increase of carbon dioxide in blood and tissues. It occurs due to an interruption in the normal exchange of oxygen and carbon dioxide between the lungs and atmospheric air. If this condition continues for some minutes, breathing and heart action stops and death occurs.

**Causes of asphyxia** are drowning, electric shock, foreign body in the air passages (choking), inhalation of smoke and poisonous gases, hanging and strangulation, etc.

## Signs and Symptoms of Asphyxia

### First Stage

- Rate of breathing increases.
- Breathing gets shorter.
- Neck veins become swollen.
- Face, lips, nails, fingers and toes turn blue.
- Pulse gets faster and feeble.

### Second Stage

- Consciousness is lost totally or partially.
- Froth may appear at the mouth and nostrils.
- Fits may occur – If this occurs, then place the casualty on his back. Support the nape of the neck on your palm and press the head backwards. This will extend the neck and open the airway. Check if breathing is restored, if not, give mouth to mouth breathing.
- Keep the casualty covered.
- Call doctor and ambulance.

## Drowning

- Water may enter the respiratory passage and cause asphyxia.
- Immediately, put the victim in prone position (face down) and make sure that his air passage is not obstructed.
- Pull tongue forward and remove any foreign material.
- Raise the middle part of the body with your hands to cause water to drain out of the lungs.
- Remove wet clothing, keep body warm and continue artificial breathing until breathing comes back.
- Seek medical assistance.

## Choking

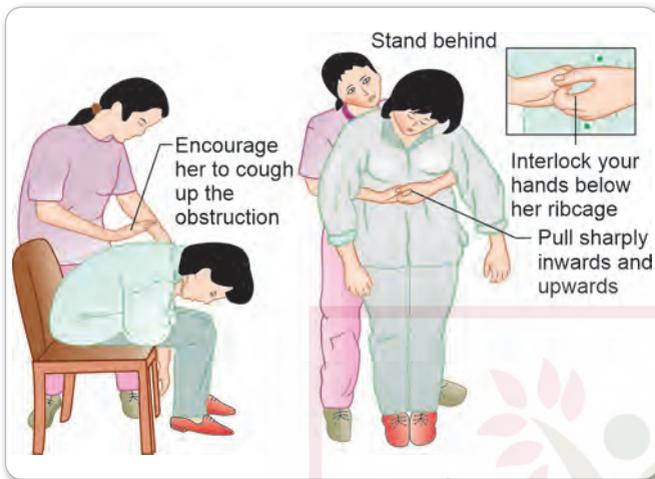
Choking occurs due to blockage of the throat by foreign object. There is difficulty in speaking and breathing.

### First Aid Measures (For Adult)

- Reassure the casualty, bend her forward so that his head is lower than the chest.
- Give up to five sharp blows to her back between the shoulder blades, with the palm of your hand.
- If back slaps fail, try abdominal thrust. The sudden pull up against the diaphragm compress the chest, and may expel the obstruction.
- For abdominal thrust:
  - Stand behind the victim.
  - Wrap your arms around the waist.
  - Make a first, clasp fist with free hand.
  - Press in with quick inward and upward thrust.
- If this does not free the blockage, try again four times, then alternate five back blows with five thrusts (Fig. 12).

### First Aid Measures (For Child)

- Place the child over your knee, head down, slap him between the shoulder blades using less force than for an adult.



**Fig. 12** Choking measures: Sharp blows on back and Abdominal thrust

- If back blow fails, use the abdominal thrust only if you have been trained to do on a child—otherwise, begin resuscitation.

### First Aid Measures (For Baby)

- Lay the baby along your forearm.
- Slap the baby between the shoulder blades, using less force than for a child.
- If the baby becomes unconscious, begin resuscitation and do not use abdominal thrust.

### Inhalation of Fumes and Gases

The inhalation of smoke, gases or toxic fumes can be dangerous. Two types of gases, carbon monoxide and carbon dioxide are common.

Carbon monoxide is lighter than air and is present in car-exhaust fumes, burning coal, coal mines, during fire, etc. Carbon dioxide is heavier than air and is found in coal mines, and sewerage.

### First Aid Measures

- Before attempting to rescue a person, always open door and windows for proper ventilation.
- Pull out the casualty quickly while holding your breath.
- Crawl along the floor if the gas (CO) is lighter than air.
- Enter in upright position if poisonous gas is heavier than air, i.e., carbon dioxide.
- After bringing out the casualty in fresh air, if there is breathing difficulty, give artificial respiration.
- Send the casualty for medical assistance.

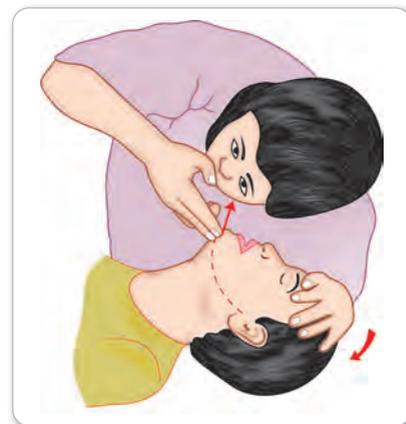
### Artificial Respiration (Resuscitation Technique)

#### Step 1

- Open the airway, unless you suspect neck injury. Place the victim on his back.
- Wipe any foreign substance—solid or liquid—out of his mouth with the cloth.
- Place the palm of one hand on the forehead and tilt the head back, place the fingers of the other hand under the chin and lift to bring it forward. This position prevents obstruction of airway by the tongue (Fig. 13).
- Opening the airway may start the person's breathing again. Watch the chest rise and fall, listen to the sound of breathing by placing your cheek close to the victim's mouth and nose, to feel any exhaled air. If there is none, take step 2 at once (Fig. 14).



**Fig. 13** Head tilt and Chin lift



**Fig. 14** Listen for breathing, watch chest, feel any exhaled air

### Step 2

- Pinch the nostril closed. Use the thumb and index finger of the hand that is on the victim's head to exert the necessary pressure and maintain proper tilt.
- Place your mouth over the victim's mouth, and give two full breaths, each ventilation should cause the victim's chest to rise and fall.
- If this fails, suspect an obstruction of the airway (choking).
- When you are able to ventilate the victim quietly take step 3 (Fig. 15).

### Step 3

- Feel the carotid pulse in the neck, if there is no pulse, give cardiopulmonary resuscitation (CPR). If there is pulse but still no breathing, begin step 4 (Fig. 16).

### Step 4

- With victim's head tilted as in step 1, and his nose pinched shut, place your mouth over the victim's and blow hard.



Fig. 15 Pinching nostrils and blowing into open mouth

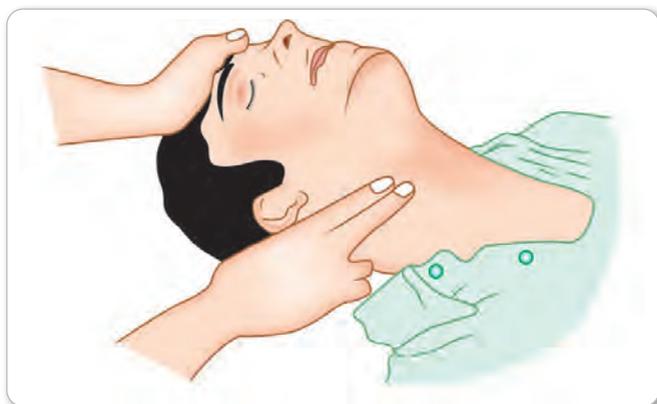


Fig. 16 Feeling carotid pulse

- Remove your mouth and allow the victim to exhale and you take another deep breath.
- Watch for the rise and fall of the chest and listen for the sounds of inhaled air.
- Then blow again. Repeat the procedure, giving one vigorous breath every second until the victim starts to breathe spontaneously or help arrives.

## Cardiopulmonary Resuscitation

Cardiopulmonary resuscitation (CPR) is a life-saving technique to be performed with skill and practice. When you come across a person with cardiac arrest, the quicker you start CPR, the better are the chances of survival.

### Signs of Cardiopulmonary Arrest

- Immediate loss of consciousness.
- Absence of carotid pulse.
- Cessation of perceptible respirations.
- Dilation of pupils.

### Resuscitation for Adults

When the victim appears unconscious, carry out the assessment as quickly as possible following these four steps:

1. **Check for consciousness:** By shaking shoulders and asking him his name.
2. **Open the airway (A):** By removing blockages and lifting chin.
3. **Check for breathing (B):** By looking for chest movements. Listening for sounds of breathing and feeling for breathe for 5 seconds.
4. **Check for circulation (C):** By feeling for the carotid pulse for 5 seconds.

### Airway

To clear the airway, remove obstructing substance from the mouth with finger.

- Use first finger as a hook to dislodge any material causing obstruction.
- Hyperextend the neck to open the airway.
- Place one hand under nape of neck.
- Place other hand on forehead and tilt head backward.
- Lift chin up gently without closing mouth.
- Check if breathing is restored.
- If not, start mouth to mouth breathing (Fig. 17).

### Breathing

You are expected to act quickly and restore breathing by giving mouth-to-mouth resuscitation as follows:



**Fig. 17** Use of finger to remove obstructing material and hyper-extending the neck

- Pinch and compress nose to close nostrils.
- Take deep breaths.
- Place your mouth around victim's mouth, make an airtight seal.
- Quickly breathe into victim's mouth four times.
- Refill your lungs by inhaling deep.
- Watch victim's chest movements for rise and fall of chest
- Allow patient to exhale.

### Circulation

You are expected to act quickly and restore circulation by pericardial thump and/or external cardiac compression.

#### Precordial Thump

- Strike upper left chest forcibly in midsternum region with closed fist (except for patients with myocardial disease).
- This may result in resumption of normal heart beat, e.g., in electric shock cases.

#### External Cardiac Compression

This is also known as external cardiac massage, that can be carried out by one or two individuals.

- Place victim on hard surface.
- Kneel at victim's side.
- Locate xiphoid process, measure 1–2 inches above xiphoid process.
- Place heel of one hand at this point on the sternum.
- Place the other hand on top of it.
- Interlock fingers to keep them off the victim's ribs.
- Keep elbows straight and lean forward.
- Make full use of your body weight when delivering downward compression (Figs 18A and B).
- Apply steady smooth pressure to depress victim's sternum 1½–2 inches.
- Relax pressure completely but do not let your hand leave victim's chest so that correct position is not lost.
- Perform CPR for 1 minute as follows:
  - After 30 chest compressions, give 2 quick lung inflations by mouth to mouth breathing.



**Figs 18A and B** A. Rescuers position for external compression; B. External cardiac compression

- In a minute, the victim should receive:
  - 100–120 chest compressions.
  - 8 lung inflations.

After breathing has been restored, treat the victim as follows:

- To promote warmth and circulation, start rubbing the limbs upwards.
- Promote the warmth by giving blanket.
- If the victim can swallow, small quantities of tea or coffee can be given.
- The victim is rushed to hospital for further care. The CPR bridges the gap between the arrival of ambulance and casualty's collapse.

## WOUNDS AND HEMORRHAGE

### Wound

A wound is an injury in which the skin is cut or penetrated. If wound is deep, severe bleeding may occur, depending on how they are caused, e.g., by blunt force, sharp weapon or firearm. They are classified as:

- **Abrasion (scratches):** An abrasion is a superficial injury involving only the outer layers of the skin. It is caused by friction or pressure of some rough object. It bleeds very slightly.
- **Bruise (contusions):** A bruise is caused by blunt force, i.e., stick, stone or fist. There is infiltration of blood into the tissues following rupture of vessels, hence it appears red.
- **Lacerated wound:** These are wounds in which the skin and underlying tissues are torn as a result of application of blunt force. These wounds have irregular and torn edges and bleed less. They are usually caused by industrial accidents, falling on rough surfaces, pieces of shells and claws of animals.
- **Incised wound:** An incised wound is an injury caused by a weapon with a sharp cutting edge, e.g., knife, razor, etc. It leads to more bleeding.
- **Punctured wound:** Is an injury caused by a pointed weapon, when it is driven in through the skin. Such wounds are caused by needle, arrow, scissors, ice pick, etc. They have small openings but may be very deep.
- **Indirect pressure:** If direct pressure is not possible to apply, then indirect pressure may be applied to a “pressure point” where a main artery runs close to a bone. It must not be applied for longer than 10 minutes.
- For a wound of the scalp, compress the temporal artery (Fig. 19).
- For bleeding over lower face (below the eyes), apply pressure to the facial artery along the lower border of the mandible.
- For a neck wound, compress the wound site. Do not compress the carotid artery, as this could cause stroke.
- For a shoulder wound or hemorrhage of the upper arm, compress the subclavian artery against the clavicle.
- For a wound of the lower part of the upper arm or of the elbow, press the brachial artery against the humerus.
- For foot wounds, compress the entire network of arteries in the ankle.

## Hemorrhage

Bleeding means the escape of blood from the blood vessels. It may be classified as external or internal hemorrhage.

### External Hemorrhage

- **Arterial bleeding:** The blood, richly oxygenated is bright red and under pressure from the pumping heart, spurts from the wound in line with the heartbeat.
- **Venous bleeding:** Venous blood is dark red in color. It is under less pressure than arterial blood.
- **Capillary bleeding:** This type of bleeding characterized as oozing, occurs at the site of all wounds. Blood loss is generally negligible.

### First Aid Management of Wounds

The main principles are to control bleeding and prevent infection.

#### Control of Bleeding

- **Rest:** Make the casualty lie down still, so that amount of blood loss is less.
- **Elevation:** Elevate the wounded arm, or leg, above the level of the heart.
- **Direct pressure:** Apply firm pressure directly on the wound. Pressure is applied through a dressing which is bandaged firmly on the wound. The dressing should be thick and compressible to facilitate the application of even pressure over the whole wound area. It compresses all blood vessels leading into the wound and so lessens blood flow.

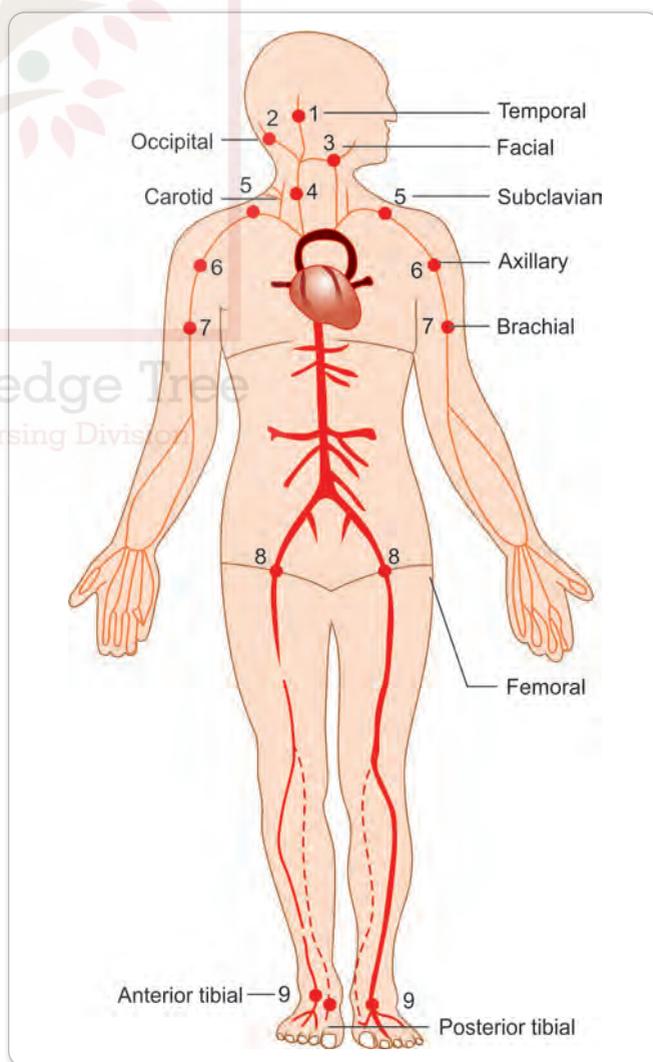


Fig. 19 Pressure points of artery

- For a wound of the lower arm, press the ulnar and radial arteries at the antecubital fossa.
- For thigh wounds, apply great pressure to the femoral artery against the femur.
- For wounds of the lower leg, apply pressure to the popliteal artery, behind the knee.

Immediately, the victim should be shifted where facility to save victim are available.

### Prevention of Wound Infection

#### Applying the Dressing

- If possible, wash your hands carefully.
- Wash off the skin around the wound with soap and water.

#### While Applying Dressing

- Do not breathe, talk, cough or sneeze into or over the wound.
- Cover the wound as quickly as possible with a sterile or clean dressing.
- After bandaging, keep the injured part in a position of comfort.

### Internal Hemorrhage

This is the bleeding within one of the cavities of the body, which is not visible, such as cerebral hemorrhage, or bleeding in peritoneal chest cavity. This is due to head injuries, accidents, falls or collapse of building. Initially, there are no signs of internal bleeding but slowly a large amount of blood may be lost from the circulation, resulting into shock.

#### Signs and Symptoms of Internal Hemorrhage

- The skin is cold and clammy.
- Subnormal temperature.
- Eyes sunken.
- Breathing deep and sighing.
- Pulse rapid, weak and irregular.
- Low blood pressure.
- Victim feels thirsty, anxious.
- Fainting and dizziness occur.

#### First Aid Measures

- Reassure the casualty.
- Place the casualty in flat position with feet raised.
- Keep the casualty warm and at complete rest.
- Check vital signs every 10 minutes.
- Do not give anything by mouth.
- Transport the casualty to hospital as quickly as possible.

### Nose Bleed (Epistaxis)

Nose bleeds may be dangerous if blood loss is excessive. If nose bleed follows a head injury, the blood may appear thin

and watery which is serious as it indicates that cerebrospinal fluid is present.

#### Causes of Nose Bleeding

- Picking out crusts and hair.
- Blowing the nose forcefully.
- High blood pressure.
- Bleeding disorders like leukemia.
- In summer due to excessive heat.
- Injury to the bones of the nose, skull.
- Common cold and other infections.

#### First Aid Measures

- Let the person sit up, with head slightly bent forward.
- Press the nostrils together for several minutes and let him breathe through mouth.
- Apply a wet towel with ice over nose.
- Loosen clothing at neck.
- Do not let the person talk, cough, laugh, or blow the nose.
- Immediately, take a narrow gauze and plug in nose for several hours and when bleeding has stopped, remove it carefully.
- Send the casualty for medical help.

## SHOCK

Shock results from the failure of the cardiovascular system to provide sufficient blood circulation to all parts of the body.

### Causes of Shock

- Severe loss of blood
- Intense pain
- Extensive trauma
- Burns
- Poisoning
- Emotional stress or intense emotion
- Extreme heat and cold
- Electrical shock
- Allergic reactions
- A sudden or severe illness

### Types of Shock

- **Hypovolemic:** It is also known as hemorrhagic shock. It is caused by decrease in fluid volume from bleeding, prolonged vomiting, diarrhea or loss of blood during surgery or trauma.
- **Cardiogenic shock:** It results from poor heart pumping function and is caused by various cardiovascular abnormalities. The heart is not able to provide sufficient amount of blood to all parts of body.

- **Neurogenic shock:** It is caused by the failure of the nervous system to maintain a normal contraction of the blood vessels.
- **Septic shock:** It results from the severe infection.
- **Psychogenic shock:** It is caused by nervous system reactions to an emotional stimulus. The blood vessels dilate temporarily, decreasing blood flow to brain which result in syncope.
- **Anaphylactic shock:** It results from a sudden severe allergic body reaction to a foreign substance.

### Signs and Symptoms

- Change in level of consciousness.
- Skin becomes pale, cold to touch, later cyanosis develops over lips and nail beds.
- Decrease in blood pressure.
- Pulse rate is increased but becomes weak and thready.
- Respiratory rate is increased, it may be shallow, labored or irregular.
- Urine output is decreased.
- Decreased oxygen to the tissues result in weakness and/or tremors of the arms and legs.
- Victim may complain of thirst, nausea, vomiting and dry mucous membranes may be present.

### First Aid Measures

- Take measures to establish airway.
- Take steps to control bleeding if it is present.
- Take steps to reduce pain.
- Appropriate positioning of the victim in shock which is determined by the type and extent of injury.
  - The victim should lie flat with the head slightly lower than the rest of the body unless the victim has sustained head and chest injuries.
  - If victim is unconscious, position on the side to keep airway patent and encourage drainage.
  - If victim has difficulty in breathing, the head and shoulders should be elevated.
  - If neck or spinal injuries are suspected, do not move the victim to prevent further injury.
- Maintain the victim's body temperature by keeping him dry and warm.
- Take measures to relieve pain.
- Give emotional support and reassurance.
- Do not let crowd gather around the patient.
- Arrange for transportation.

### Anaphylactic Shock

This is a severe body response to allergic substance or protein. Allergic substance on its introduction into the body causes

sudden release of histamine into the blood stream and allows blood plasma to flow through capillary walls, thus decreasing blood flow to the heart, giving rise to circulatory failure. Its onset is sudden.

### Causes

- Pollen
- Particular food, e.g., mushroom, milk, eggs, fish, etc.
- Wasp sting, bee sting.
- Drugs like penicillin, sulpha, iron, serum, etc.

### Signs and Symptoms

- Nausea, vomiting
- Diarrhea
- Anxiety
- Widespread red, blotchy skin eruption, hives
- Urticaria
- Swelling of the face and neck
- Rapid pulse
- Wheezing and gasping for air
- Itchy, red watery eyes

### First Aid Management

A person stands good chances of survival if he receives treatment within 20 minutes of its onset.

- The person urgently needs oxygen and a life-saving injection of adrenaline. There is no particular first-aid measure, except assisting in breathing and minimizing shock till the doctor arrives.
- Remove the allergen if possible and call for assistance.
- Keep the person cool and loosen any constrictive clothing.
- Reassure the person, stay with him until emergency aid arrives.
- Help the person for easy breathing by making him sit up and leaning forward a little.
- If the person stops breathing, administer CPR.

## UNCONSCIOUSNESS

Unconsciousness is the state in which a person is unable to respond to stimuli and appears to be asleep. Person may be unconscious for a few seconds as in fainting or for longer periods of time.

People who become unconscious do not respond to loud sounds or shaking. They may even stop breathing or their pulse may become faint. This calls for immediate emergency attention. The sooner the person receives emergency first aid, the better their outlook will be.

## Causes of Unconsciousness

Unconsciousness can be brought on by a major illness or injury, or complications from drug use or alcohol misuse.

Common causes of unconsciousness include:

- A car accident
- Severe blood loss
- A blow to the chest or head
- A drug overdose
- Alcohol poisoning

A person may become temporarily unconscious, or faint, when sudden changes occur within the body. Common causes of temporary unconsciousness include:

- Cardiac arrest
- Low blood sugar
- Low blood pressure
- Syncope or loss of consciousness due to lack of blood flow to the brain (fainting)
- Neurologic syncope, or loss of consciousness caused by a seizure, stroke, or transient ischemic attacks (TIA)
- Dehydration
- Problems with heart rhythm
- Straining
- Hyperventilating

**Note:** Any sudden loss of consciousness is a medical emergency, bystanders should call for medical help immediately.

Symptoms that may indicate that unconsciousness is about to occur include:

- Sudden inability to respond
- Slurred speech
- A rapid heart rate
- Confusion
- Dizziness or lightheadedness

## First Aid Measures

If person is breathing:

- Place him in recovery position, this will help to maintain a clear airway and decrease the risk of choking.
- For providing recovery position, follow the instructions listed below:
  - Kneel on the floor next to him.
  - Take the arm that is closest to you and position it so that it is perpendicular to his body, forming a right angle. The head should be facing upward.
  - Take his other hand and position it so that the back of the hand is pressed against the cheek that is closest to you.
  - With your free hand, bend his knee that is farthest from you. His foot should be resting flat against the floor.

- Help him get onto his side by pulling on the bent knee. After you roll him over, ensure that his top arm is still helping to support his head.
- Tilt his head back and lift his chin. This helps open airway.
- Make sure there is no obstruction in the airway.
- Keep an eye on his condition, and remain with him until emergency personnel arrives.

If person is not breathing:

- Call for help immediately and begin CPR.

## Other First Aid Measures

- Do not try to arouse an unconscious person. Let him lie quiet.
- Do not move the casualty unnecessarily, because of the possibility of spinal injury. Never attempt to make an unconscious person sit or stand.
- Do not let people gather around, give him fresh air.
- Loosen clothing at neck, chest and waist.
- Never give water to an unconscious person to drink, it might get into his windpipe.
- Apply specific treatment for the cause of unconsciousness.

## FAINTING

This occurs most frequently in healthy young people, especially during hot weather, and while standing for long periods. People who are hungry, tired, emotionally upset, fearful may faint even though they are in good health. The cause is insufficient supply of blood to the brain.

## Signs and Symptoms of Fainting

- The person feels giddy, looks pale and collapse on the ground
- Pulse is weak and slow
- Skin is cold and clammy
- Breathing becomes less deep

## First Aid Measures

- Keep the victim lying flat, and raise the legs to improve the blood flow to the brain.
- Loosen tight clothing at neck.
- Do not let the crowd gather and let there be plenty of fresh air.
- Consciousness will return in one or two minutes.
- After he recovers consciousness, a cup of tea or coffee may be given.
- If the victim does not recover, medical help is advised.

## BURNS AND ITS FIRST AID MEASURES

Burns are due to dry heat including friction, whereas scalds are due to wet heat. Burns and scalds are considered together as they produce the severe type of injury.

### Causes of Burns and Scalds

- **Dry heat:** Fire, explosions, contact with hot object.
- **Moist heat:** Boiling water, steam, hot tea or coffee, oil.
- **Friction:** Contact with moving wheel, rope, wire.
- **Chemical:** Strong acids and alkalis.
- **Electrical:** Contact with live wire, electric pole.

The person who has sustained a major burn is critically ill. The body systems are threatened not only from physiologic and psychological effects of burn, but also from other physical trauma that may occur simultaneously. The extent of injury caused by burns and scalds depends on following factors:

- The duration of contact between the skin and the substance causing injury.
- The strength of the substance, this is particularly important when chemicals and electrical current are the cause of injury.

### Characteristics of Burn Injuries

Severity of a burn injury is determined by following five factors:

1. Surface area of body burnt.
2. Depth of tissue damage.
3. Age of casualty.
4. Past medical history.
5. Part of body burnt.

### Body Surface Area Burnt

A quick approximate estimate of the percentage of body surface area may be made using Rule of Nine. The rule of nine, is useful for adult patients only. This system is based on anatomic regions, each representing approximately 9% of the TBSA (total burnt surface area) (Fig. 20).

### Depth of Burn

- First degree or superficial partial thickness burn—involves total destruction of the epidermis. Healing usually occurs within 7–10 days.
- Second degree or deep partial thickness burn—involves total destruction of the epidermis and major involvement of the upper dermal layers only. Lower dermal layers remain intact. Healing occurs within 14–21 days.
- Third degree of full thickness burn—involves total damage to the epidermis and major damage to both upper

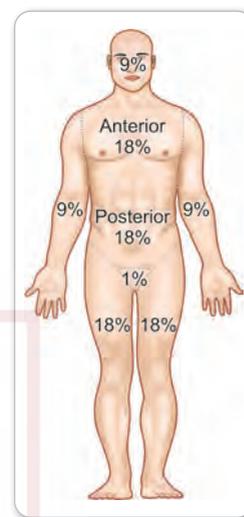


Fig. 20 Rule of Nine

and lower dermal layers, subcutaneous tissue, muscle and bone may also be involved.

### Age of Casualty

Persons younger than 2 years and older than 50 years have the highest incidence of morbidity and mortality. The severity of the burn increases with age.

### Part of the Body Burnt

Burns of the face, eyes, ears, neck, hands or feet and genitals are major. Damage to the tracheobronchial tree through heat, and smoke inhalation is also a major problem.

## Management of Burns

### Goals of Burns Management

- Stopping the burning process.
- Reduce pain.
- Providing life support—oxygenation, fluids, etc.
- Preventing complications.
- Restoration of functions.
- For stopping the burning process, do not allow the person to run about, as it increases the severity. Lay him flat on the ground, put any thick clothing which is available like blanket, carpet, shawl, etc. over the victim to extinguish flames. Do not try to remove the burning clothes.
- Immediately, immerse the burnt area under cool running water or cool moistened towels can be applied. This reduces pain and decrease the effect of transmission through the tissues.
- Assess airway breathing and circulation.
- Blisters should not be touched.

- All articles like bangles, belt, boot should be removed.
- Cover the burnt area with clean sheet over which blanket can be placed to maintain heat and prevent hypothermia.
- Give warm fluids to drink if casualty can take it and restrict the movement.
- In case of extensive burns, person may go into shock, then the first aid for shock is given and victim is rushed to a nearby hospital.
- **In acid burns:**
  - Cool area with stream of plain water.
  - Remove acid soaked clothing.
  - Bathe affected part with alkaline solution of 1 table spoon of baking soda and 1 L of water.
  - Cover with clean linen.
  - Give analgesics for pain.
- **In alkali burns:**
  - Flood burnt area with stream of plain water.
  - Remove alkali soaked clothing.
  - Bathe affected part with weak solution of vinegar and water in equal parts.
  - Cover with clean linen material only.
  - Give analgesics for pain.
- **In electrical burns:**
  - The passage of electrical current through the body may cause breathing problem and even heart to stop. A person while indoors may receive an electric shock, by touching a bare electric wire and the danger is greater if the floor is wet or one's body is wet.
  - **Outdoors:** One may be electrocuted by touching an electric wire or by flying a kite having a damp or metal string that touches an electric wire. Contact with high voltage current found in power lines and overhead high tension cables is usually fatal result and severe burns. The power must be cut off before the casualty is approached.

### Signs and Symptoms

- Burns—superficial or deep, depends on the strength of the electric current.
- Cardiac arrest.
- Sudden stoppage of breathing due to paralysis of muscles used in breathing.

### First Aid Measures

- Free the victim from the circuit immediately.
- Remove the victim from contact with the wire by taking a dry wooden stick, dry towel.
- Stand on dry insulating material—wooden, rubber or plastic mat or thick pile of newspapers.
- Call the fire department for outdoors electrocution.

- Start artificial respiration and continue till natural breathing is restored.

## BITES AND STINGS

Animal bites always require medical attention, because germs are harbored in the mouths of all animals. Bites from sharp, pointed teeth cause deep puncture wounds that carry germs to the tissues. They require prompt first aid followed by medical attention.

### Snake Bite

Commonly two types of snakes Colubrine and Viper. Colubrine snakes are quite long and very poisonous. The common varieties are King cobra, common krait and striped krait. The vipers are found in the form of pit viper and Russell's viper. The snakes living in water are also poisonous.

### Signs and Symptoms

- Cobra bite very quickly affects the nervous system and causes severe pain in the bitten area, uneasiness, giddiness and sometimes vomiting. Muscles get affected causing weakness of hands and legs, loss of sensation, watering of mouth, slow respiration and weak pulse rate. There is constriction of pupils of eye. If first aid is not given on time, death occurs.
- Viper snake has effect on the blood vessels of the bitten area. The blood clotting process is disturbed due to the effect of viper snakes. There is excessive bleeding from the bitten area and the bitten area appears swollen. With the absorption of poison in the body, there is uneasiness, giddiness, vomiting, weakness and slow pulse rate.

### First Aid Measures

- Make the person lie down comfortably and reassure the casualty.
- Tie handkerchief or tourniquet at a distance away from the bitten area to avoid the venous blood flow toward the heart. Do not tie the tourniquet very tightly so that the blood flow to the organ is inhibited. Put an inch long cut over the snake bitten area and start sucking/removing out the blood mixed liquid coming out from the wound. Send the casualty for medical help.

### Scorpion Bite

Scorpion bite rarely leads to a serious condition but there is severe burning, intolerable increasing pain in the bitten area. Sometimes person complains of giddiness, vomiting and can become unconscious.

### First Aid Measures

- Casualty should be made to lie comfortably and soothing cream should be applied.
- Pain should subside within an hour if it does not and the victim complains of feeling of unconsciousness call for medical help.

### Dog Bite

Domestic dogs which are not immunized against rabies and come in contact with stray dogs/wild animals, have a chance to contract the rabies virus and become rabid. Rabies virus is commonly found in dogs but can be carried by any animal like cats, rats, foxes, wolves, bats and monkeys. Saliva of infected animal can get injected into human being even by licking if there is a break in the skin.

### Signs and Symptoms

- Headache, malaise, fever
- Hydrophobia
- Aerophobia

### First Aid Measures

- Thorough washing of the bitten area with soap and water for 5–10 minutes under running water.
- Dress the wound with clean sterile gauze and let wound bleed of suspected rabid dog.
- Victim should be immediately referred to doctor.
- The dog should be kept under observation for 10 days. If the dog remains healthy then there is no risk, but if the dog gets mad, then it should be killed.

### Bees and Wasp Bites

Their sting causes local pain, itching and severe swelling because their sting has one type of poison which is little in quantity. Some people are very sensitive to this poison, they may have anaphylactic shock and may require immediate treatment in the hospital.

If the sting is visible, it can be taken out by slightly scrubbing the skin. So, that poison can come out easily. If swelling and pain is severe, then keep wet bandage.

## FOREIGN BODIES

### Foreign Bodies in the Skin

Small foreign bodies (wood splinters, pieces of glass) usually cause minor puncture wounds with little or no bleeding. If a small portion of the object protrudes from the skin, it can be

taken out. Foreign bodies may get deeply embedded in the skin, should not be removed by first aider. Doctor should be consulted.

### Foreign Bodies in the Eye

Dust, sand particles, glass pieces, coal, insect may enter the eye. These particles usually are found under the eyelids or eyeball.

### Signs and Symptoms

- Watering from the eyes.
- Pain, irritation in eye.
- Photophobia–Difficulty in opening eye in the light.
- Blurred vision or loss of vision in the affected eye.

### First Aid Measures

- Do not allow the casualty to rub the eyes. Because by doing so, it can cause further injury.
- Wash your hands before touching the eyes of victim.
- Do not try to take out foreign body by using means like matchstick, etc.
- Do not try to take out the embedded foreign body in eye. In such cases, immediately consult to doctor.
- If foreign body is visible, wet the corner of a soft handkerchief, and take out foreign body with the help of a pointed end.
- If foreign body is sticking on the inner portion of the lower eyelid, slide the lower eyelid under the upper one and open the eye. The foreign body sometimes comes out when the hairs of the upper eyelid get rubbed.
- If foreign body does not come out, close the eye, put eye pad and person should be sent to hospital.

### Foreign Body in the Ear

This usually occurs in children. They may insert buttons or peas inside the ear. Substances like seeds absorb moisture, swell up and obstruct the ear. Flies, mosquitoes or bed bugs can also enter the ear.

### Signs and Symptoms

- Pain
- Infection
- Hearing loss

### First Aid Measures

- Do not probe the ear with a tool such as a cotton swab or matchstick. There is a risk of pushing the object further in and damaging the ear.

- Remove the object if possible. If the object is clearly visible, and can be grasped easily with tweezers, gently remove it.
- Try using gravity. Tilt the head to the affected side to try to dislodge the object.
- Use oil for an insect. If the foreign object is an insect, tilt the person's head so that the ear with the insect is upward. Try to float the insect out by pouring mineral oil, olive oil or baby oil into the ear. The oil should be warm but not hot.
- Try washing the object out. Use a rubber bulb syringe and warm water to irrigate the object out of the canal.
- Do not pour water if any seed is suspected, to be obstructing the ear canal. It may swell up the seed and further block the ear canal.

### Foreign Body in the Nose

Foreign bodies in nose like pieces of betel nut, grains or peas or other seeds, crayon, etc. may be put by children in nose while playing.

#### First Aid Measures

- Do not probe at the object with a cotton swab or other tool.
- Don't try to inhale the object by forcefully breathing in. Instead, breathe through your mouth until the object is removed.
- Blow out of your nose gently to try to free the object but don't blow hard or repeatedly. If only one nostril is affected, close the opposite nostril by applying gentle pressure and then blow out gently through the affected nostril.
- Gently remove the object if it is visible and you can easily grasp it with tweezers. Don't try to remove an object that is not visible or easily grasped.
- Call for emergency medical assistance, if these methods fail.

### Foreign Body in the Throat

A foreign body in the throat or upper part of the respiratory tract can cause choking and is a medical emergency that needs immediate attention. The foreign body may be pieces of food, small bones of fish, coins or artificial teeth.

#### First Aid Measures

- If the person is able to cough forcefully, the person should keep coughing. If the person is choking and cannot talk, cry or laugh forcefully, then the Red Cross recommends "five and five" approach in delivering first aid.
- Give 5 back blows. Stand to the side and just behind a choking adult. Place one arm across the person's chest

for support. Bend the person over at the waist so that the upper body is parallel with the ground. Deliver five back blows between the person's shoulder blades with the heel of your hand.

- Give 5 abdominal thrusts. Perform five abdominal thrusts. Abdominal thrusts have been described in detail in first aid in asphyxia (also known as the Heimlich maneuver).
- Alternate between 5 blows and 5 thrusts until the blockage is dislodged.
- Call for help while you are performing first aid.

### Foreign Bodies in the Stomach

Foreign bodies into the stomach are commonly found in children. They put object into the mouth while playing and it slips into the stomach. Common things which can enter into the stomach are coins, buttons, seeds of fruit, safety pins, etc. These may be accidentally or intentionally swallowed.

- Ingested objects can pass through the digestive tract naturally and without any complications, but some patients may need assistance to remove the foreign body, if larger objects or sharp ones, such as tooth picks, chicken or fish bones, may get stuck in the esophagus or stomach.
- It can cause cramps, bloating, abdominal pain, nausea and vomiting.
- If sharp object pierces the esophagus, consequences may be serious; perforation may occur. It is a medical emergency.

## POISONING

Poisoning is a condition caused by introduction of harmful substances or chemicals into the body either by injection, inhalation or ingestion. A poison (or toxin) is a substance, which if taken into the body in sufficient quantity, can cause temporary or permanent damage. Once in the body, poisons may work their way into the blood stream. Signs and symptoms vary depending on the poison and the method of entry.

### First Aid for Poisoning

If the poison is swallowed:

- **If the person is alert:** Do not induce vomiting (in case of acid or alkali). Immediately rinse the mouth. Keep the product or medicine container handy for sending to lab.

On the skin:

- Carefully remove contaminated clothing and wash exposed areas with copious amounts of water.

In the eye:

- Rinse eyes with a slow gentle stream of water for 10 to 15 minutes. Allow the stream of water to flow from the inner corner across the eye to the outer corner.

Inhaled:

- Get the person to fresh air, without placing yourself at risk.
- Loosen any tight clothing at the neck.
- Avoid breathing fumes as you may become a victim yourself.

### When to Suspect Poisoning

Poisoning signs and symptoms can mimic other conditions, such as seizure, alcohol intoxication, stroke, insulin reaction.

### Signs and Symptoms

- Burns or redness around the mouth and lips.
- Breath that smells like chemicals such as gasoline or paint thinner.

- Vomiting.
- Difficulty in breathing.
- Drowsiness.
- Confusion or other altered mental status.

If you suspect poisoning, be alert for cues such as empty pill bottles or packages, scattered pills, burns, stains and odor on a person or nearby objects.

### When to Call for Help

Call for help immediately, if the person is:

- Drowsy or unconscious.
- Having difficulty in breathing or has stopped breathing.
- Uncontrollably restless or agitated.
- Having seizures.
- Known to have taken medications or any other substance, intentionally or accidentally overdosed.
- Immediately send the casualty for medical assistance.



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# Textbook of Nursing Foundations

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## About the Author

**Harindarjeet Goyal** (PhD, MPhil, MSc (MSN), BSc (Hons.), RN and RM), is a former Principal at Rajkumari Amrit Kaur College of Nursing, New Delhi. She held numerous positions, viz. Clinical Instructor, Tutor, Assistant Professor, Associate Professor, Professor-cum-Vice Principal and Officiating Principal, during her illustrious career spanning over 44 years.

She received her BSc (Hons.) degree from Rajkumari Amrit Kaur College of Nursing affiliated to University of Delhi in the year 1975. Thereafter, she taught Nursing Foundations and Medical Surgical Nursing to undergraduate students. She pursued her MSc (Nursing) from the same college and continued as faculty member.

Her interest and experience in nursing education resulted in her obtaining MPhil and PhD degrees in Nursing from Delhi University in 2008. She was offered WHO Fellowship on Critical Care Nursing for 3 months at Baltimore, University of Maryland Medical System, USA in the year 1994. In the year 2004, she was offered another WHO Fellowship on ART for AIDS at Thailand, Bangkok for 4-weeks' duration.

The author has written many learning modules for Distance Education Learning Program for Post-basic BSc nursing students. She has also actively participated in curriculum revision of Baccalaureate and Master of Nursing programs. Besides, she has presented many papers at national and international levels on the topics related to nursing education. She is a member of nursing associations, such as TNAI, NRSI, etc. The author is also involved in guiding PhD students enrolled under INC consortium affiliated to Rajiv Gandhi University of Health Sciences, Bengaluru, Karnataka.



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