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# First Aid
## Manual for Nurses

*(Includes Curriculum of First Aid Module)*

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**4th** Edition

CBS Publishers & Distributors Pvt. Ltd.

**Sanju Sira**

# First Aid
## Manual for Nurses

Nursing Knowledge Tree
An Initiative by CBS Nursing Division

**Fourth Edition**

**Sanju Sira** MSc (N), RN, RM
*Nursing Tutor*
Government Institute of Nursing
and Paramedical Sciences
Rupnagar, Punjab

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# First Aid
## Manual for Nurses

**ISBN: 978-93-48426-83-3**



**Fourth Edition: 2026**

**First Edition: 2020**



Published by **Satish Kumar Jain** and produced by **Varun Jain** for

**CBS Publishers & Distributors Pvt Ltd**

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CBS Nursing Knowledge Tree

Extends its Tribute to

# Florence Nightingale

*For glorifying the role of women as nurses,*
*For holding the title of " The Lady with the Lamp,"*
*For working tirelessly for humanity–*
*Florence Nightingale will always be*
*remembered for her*
*selfless and memorable services to the*
*human race.*



Florence Nightingale
(May 1820 – August 1910)

# About the Author

**Sanju Sira**, MSc (N), RN, RM, is presently serving as a Nursing Tutor at the Government Institute of Nursing and Paramedical Sciences, Rupnagar, Punjab. She is a dedicated nurse educator with over 23 years of extensive teaching and clinical experience. She is a graduate of Guru Nanak College of Nursing, Dhahan Kaleran, Punjab and completed her Postgraduation in Nursing from Saraswati Institute of Nursing, Dhianpura, Kurali, Punjab.

Throughout her career, she has combined academic excellence with practical expertise, mentoring generations of nursing students with commitment and passion. She has actively participated in numerous workshops and professional training programs, including orientation training on Health Information Management for medical personnel, GFATM-7 training on strengthening institutional capacity for nursing in HIV/AIDS care in India, NSSK Training and Training of Trainers (TOT) for medical officers and staff nurses, Biomedical Waste Management, Revised GNM Syllabus workshops, Care Companion Program (Noora Health Care, NHM), and specialized programs on empowering nurse educators with innovative teaching-learning methods at PGIMER, Chandigarh. She has also attended workshops on *Nursing Research in the 21st Century: Impact on Nursing Practice,* organized by the National Institute of Nursing Education, PGIMER, Chandigarh, sponsored by the Ministry of Health and Family Welfare.

Ms. Sira is an active member of the **Trained Nurses' Association of India (TNAI)** and remains deeply committed to the professional growth of the Nursing fraternity. She has authored the widely appreciated

textbook "*Textbook of Midwifery and Obstetrics*" and continues to contribute to nursing education through her academic writings, training sessions, and mentorship.

Her professional journey reflects her dedication to empowering nurses with knowledge, skill, and confidence to provide quality healthcare and to uphold the highest standards of the nursing profession.

# Preface to the Fourth Edition

It is with great satisfaction that I present the Fourth Edition of the *First Aid Manual for Nurses*. First aid is the cornerstone of emergency care, and for nurses, it is not only a professional responsibility but also a life-saving skill. Nurses are often the first responders in critical situations, and their ability to provide timely and appropriate first aid can significantly influence patient outcomes.

Building upon the success of the previous editions, this edition has been thoroughly revised and updated to reflect the latest evidence-based practices and international guidelines. Each topic has been reviewed for clarity, accuracy, and relevance to today's nursing education and clinical practice. To make the content more engaging and practical, simplified explanations, updated illustrations, case-based examples, and quick reference tables have been included.

A new feature of this edition is the incorporation of **video demonstrations** for selected first aid procedures. These videos are designed to complement the text, offering step-by-step guidance and visual reinforcement of key skills. With this addition, learners can now read, visualize, and practice, thereby bridging the gap between theory and real-life application.

This book emphasizes not only the 'how' of first aid but also the 'why,' enabling nurses to develop critical judgment alongside technical competence. It is structured to support both classroom learning and bedside application, making it an indispensable resource for nursing students, educators, and practicing professionals alike.

I express my sincere gratitude to my colleagues, students, and healthcare professionals who have shared their insights and encouraged

me throughout this journey. I am specially thankful to the readers of the earlier editions, whose valuable feedback has shaped the improvements in this book.

I hope this edition will serve as a reliable guide, a practical reference, and an empowering tool for all nurses committed to delivering safe, compassionate, and effective first aid whenever and wherever it is needed.

**Sanju Sira**

# Preface to the First Edition

Unpleasant though it may be, the fact remains that accidents happen. If an accident happens, one cannot be a helpless witness, since simply standing by can potentially worsen the situation. This is why it is important to have at least a basic knowledge of first aid. **First aid** is the assistance, given to any person suffering from a sudden illness or injury. The first aid can be provided to preserve life, prevent the condition from worsening, and/or promote recovery. It includes initial intervention in a serious condition prior to professional medical help being available. While everyone can benefit from first aid training, it may be a more necessary requirement for nurses.

With this intention, it gives me immense pleasure to present the book, *First Aid Manual for Nurses, 1st edition* with updates as per the need and wants of nurses. The book includes all topics as enlisted by the INC. It has been written in a simple language and an interactive manner to make it more useful for the readers. The whole book is in fully colored layout for real-time visualization of the images/photographs. Diagrams and images have been selected cautiously to complement the text well and enhance the reading experience with a good retention of facts.

I aspire that this book will serve its purpose of simplifying the concepts and fundamentals of first aid for all the nursing students. I sincerely hope you enjoy reading this book as much as I have enjoyed writing it.

**Sanju Sira**

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# Special Features of the Book

**STEPS TO FOLLOW**

1. Recognize the type of emergency
2. Check the scene
3. Call EMS number
4. Check the victim

This feature guides you through the essential steps to be followed during an emergency for each respective First Aid procedure.



This feature helps readers understand the vital precautions to take during emergencies in respective First Aid procedure.

**Caution**

**Things *not* to attempt:**

- Never put anything into the mouth of an unconscious victim.
- Never move a casualty without first doing the above checks.

**Basic Rules before Applying Dressing**

The basic rules before applying dressing are given as follows (Fig. 7.3):

- Thoroughly wash your hands.
- Avoid touching the wound or any part of the dressing that will come in contact with the wound.
- Do not cough, sneeze or talk over the wound or dressing.

This feature presents basic and essential facts about each First Aid procedure within the relevant topics for quick reference.

A special feature that offers quick emergency tips related to each First Aid procedure, highlighted in an easy-to-read note box.

**Note**

- **Triage full treatment**—it is quick sorting and prioritizing.
- Always **reassess** patients regularly.
- **Ethics in triage:** Focus on saving the maximum number of lives, not "first come, first served".


Fig. 12.6: Position for giving compression to the victim

Well-designed figures visually explain each First Aid procedure, ensuring quick and clear understanding of the concepts.



Tables are provided to support the text and make key information easier to understand.

**TABLE 6.2:** Mnemonic for secondary survey

| Mnemonic | Secondary survey |
|---|---|
| **H**as | **H**ead/skull |
| **M**y | **M**axillofacial |
| **C**ritical | **C**ervical spine |
| **C**are | **C**hest |
| **A**ssessed | **A**bdomen |
| **P**atient's | **P**elvis |
| **P**riorities | **P**erineum |
| **O**r | **O**rifices (PR/PV)* |
| **N**ext | **N**eurological |

# Contents

# 6

# First Aid Assessment: Primary and Secondary Survey

## INTRODUCTION

First aider should perform quick and thorough assessment of the victim and the surroundings to preserve life, prevent further worsening of the condition and promote recovery of the victim.

Ideal assessment should be conducted rapidly but with a calm approach; it should analyze the situation and the casualty.

This would be helpful in prompt diagnosis and immediate treatment of the condition.

- **Assessing the situation:** Thoroughly assess the situation and decide the priority. Assessment of the situation includes the hazards (e.g., fire, road traffic accidents, falls, exposure to gas and fumes, electrical contact, collapsing buildings, etc.) that can pose danger to the human life. Maintaining safety during the assessment is of utmost importance to guard oneself and the victim against casualties.
- **Assessment of the victim:** It includes a thorough examination of breathing difficulties, circulatory compromise, uncontrolled or severe bleeding, open chest or abdominal wounds or any other life-threatening condition.

Quick and systematic assessment helps in classifying the patients according to their severity and need of care.

It is divided into primary and secondary survey as discussed here:

Primary survey is an approach to the initial evaluation of critically-ill or injured patients, performed in the following order:

- **Airway:** Check if the airway is patent by asking the patient to speak and inspecting the mouth and larynx.

- **Breathing:** Measure pulse oximetry and inspect/auscultate the chest wall.
- **Circulation:** Palpate pulses and measure blood pressure.
- **Disability:** Assess the Glasgow Coma Scale (GCS) and pupillary size.
- **Exposure:** Undress the patient and examine for occult injury; palpate for vertebral tenderness and rectal tone.

## PRIMARY SURVEY

The primary survey is the first step in the treatment of trauma patients. Advanced Trauma Life Support or ATLS, is another name for it. The primary survey consists of five phases (ABCDE method) that must be completed in the correct order.

### 1. Airway Assessment (Cervical Spine Stabilization)

**STEPS TO FOLLOW**

1. The patient has a patent airway if he or she answers questions correctly (at least for the moment).
2. Keep an eye on the patient for any signs of respiratory distress.
3. Examine the patient's mouth and larynx for any injuries or obstructions (e.g., blood, vomit, burns, soot).
4. Assume cervical spine injury in blunt trauma patients until proven otherwise.
5. The chances for intubation are particularly less if the patient is unconscious (and thus unable to guard their airway) or in respiratory distress.
6. Patients with burn injuries and signs of respiratory involvement (e.g., soot in the oropharynx) are frequently intubated as a precaution.
7. Perform a cricothyrotomy, if orotracheal intubation is difficult.

#### *Nursing Assessment*

Tachypnea, use of accessory muscles of respiration and stridor are the signs of respiratory distress.

## 2. Breathing

**STEPS TO FOLLOW**

1. Pulse oximetry can be used to check your oxygenation levels.
2. Examine and listen for injury to the chest wall (e.g., absent breath sounds, asymmetric or paradoxical movement).
3. Do not delay the treatment of a tension pneumothorax or hemothorax in an unstable patient, just for the purpose of imaging.

## 3. Circulation and Hemorrhage Control

**STEPS TO FOLLOW**

1. Palpate central (e.g., carotid, femoral) and peripheral (e.g., radial, popliteal, posterior tibial, dorsalis pedis) pulses to determine circulatory condition.
2. For blood typing and crossmatch, as well as resuscitation, set up two large-bore intravenous lines (at least 16 gauge) (if needed).
3. If placing an intravenous line is impossible or difficult, an intraosseous line should be utilized instead.
4. Manual pressure or tourniquets can be used to stop bleeding that is not stopping.
5. Patients who have recently lost their pulses may require an emergency thoracotomy (especially in patients with stab wounds to the chest).
6. If patient is hypotensive, administer a bolus of intravenous saline.

### *Clinical Consideration*

Transfuse plasma, platelets and red blood cells in a 1:1:1 ratio if there is severe hemorrhage and chronic hemodynamic instability. It treats and prevents coagulopathy associated with massive hemorrhage.

- The Focused Assessment with Sonography for Trauma (FAST) examination is usually conducted, especially on patients who are hemodynamically unstable. In hemodynamically stable patients, it may be done during the secondary survey.

**Note**

**FAST AND eFAST**

In trauma patients, a quick, standardized bedside ultrasonographic test is utilized to screen for free fluid (especially blood). It can be extended FAST (eFAST) to include a pneumothorax examination.

- Remember that blood loss due to hypovolemic shock requires a blood loss up to approximately 1.5 L. Keep in mind the compartments where a lot of blood could end up:
  - Outside (external hemorrhage)
  - Thoracic cavity
  - Pelvic cavity
  - Abdominal cavity
  - Thighs (e.g., multiple femur fractures)

### 4. Disability (Neurological Evaluation)

**STEPS TO FOLLOW**

1. Determine the GCS score of the patient.
2. Intubation is recommended if the GCS score is <8.
3. Examine the size of patient's pupils.
4. Assess motor function and light touch sensation if the patient is cooperative.

### 5. Exposure (Environmental Control)

**STEPS TO FOLLOW**

1. Completely undress the patient.
2. Examine the entire body, especially the patient's back, for evidence of occult injury.
3. Cover the patient with warm blankets and warm intravenous fluids if he or she is hypothermic.
4. Check for spinal injuries and vertebral tenderness and rectal tone by palpating them.

## SECONDARY SURVEY

An assessment is performed in critically ill or injured patients if they are determined to be stable after a primary survey. It includes a focused history, more thorough physical examination, and selected diagnostic studies (e.g., imaging). It can detect commonly missed injuries (e.g., aortic, rectal and ureteral injuries).

- After the primary survey is completed and the patient is stable, this procedure is carried out.
- A complete medical history and a comprehensive physical examination are required.
- Additional diagnostic tests are customized to the patient's residual symptoms, mechanism of injury and comorbidities.
- The main goal is to reduce the number of injuries that remain undetected.

The secondary survey should be completed promptly in the following order:

### History Taking

A detailed history should be collected regarding the event and patient's medical history. The following points should be kept in mind while collecting history from the patient or their caregiver:

- Identify the cause of the incident such as whether it was caused by disease or an accident.
- Inquire about any medications the patient is currently taking.
- Inquire about the medical history. Check to see if there are any ongoing or previous medical conditions.
- Determine whether a person has allergies to medications or latex.
- Check when the person last had something to eat or drink.
- If you see a medical warning bracelet, it could mean you have ongoing medical conditions, such as epilepsy, diabetes or allergies.

## Quick Reminder

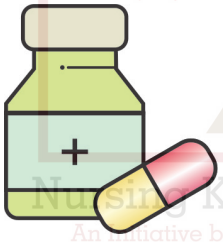
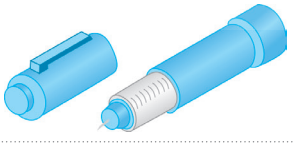
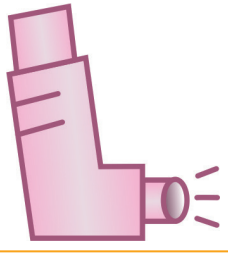
Use the mnemonic **AMPLE** when assessing a casualty to ensure that you have covered all aspects of the casualty's history:

**A**—Allergy—does the person have any allergies?
**M**—Medication—is the person on any medication?
**P**—Previous medical history—do you know of any pre-existing conditions?
**L**—Last meal—when did the person last eat?
**E**—Event history—what happened?

### Physical Examination

**Look for external cues:** Look for various external indicators about a casualty's condition as part of your assessment (Table 6.1).

**TABLE 6.1:** Medical cues along with their descriptions

| Medical cues | Descriptions |
|---|---|
|  | **Medications:** A victim may be carrying medications for his existing disease condition. Such as: anti-inflammatory for arthritis or nitroglycerin for angina. |
|  | **Insulin pen:** This indicates that a person is diabetic. |
|  | **Inhaler/puffer:** This indicates that a casualty has asthma or any restrictive respiratory condition. |

### Head and Face

Inspect the face and scalp. Look for: Bleeding, lacerations, bruising, depressions or irregularities in the skull, Battle's sign (bruising behind the ear indicative of a basilar skull fracture).

Look specifically at the:

- **Eyes:** For foreign bodies, subconjunctival hemorrhage, hyphema, irregular iris, penetrating injuries, contact lenses.
- **Ears:** For bleeding, blood behind the tympanic membrane (suggestive of basilar skull fracture).
- **Nose:** For deformities, bleeding, nasal septal hematoma, CSF leak.
- **Mouth:** For lacerations to the lips, gums, tongue or palate.
- **Teeth:** For subluxed, loose, missing or fractured teeth.
- **Jaw:** For pain, trismus, malocclusion suggestive of a fracture.

Palpate the:

- Bony margins of the orbit, the maxilla, the nose and jaw.
- The scalp and skull looking for evidence of fracture.

Test eye movements, pupillary reflexes, vision and hearing.

### Neck

Inspect the neck—it is necessary to open the collar to do this—while maintaining manual in-line stabilization of the neck. Examine the anterior neck, as per the primary survey, checking for:

- Tracheal deviation
- Wounds/bruising to the neck
- Subcutaneous emphysema
- Laryngeal tenderness
- Distention of the neck veins
- Carotid pulsation and the presence of a hematoma and listen for a bruit

Assess the cervical spine by palpation of the cervical vertebrae.

### Chest

Inspect the chest and observe chest movements. Look in particular for:

- Bruising (from seat belts)

- Asymmetric or paradoxical chest wall movement.
- Penetrating wounds are rare in children, but in cases where there is a stabbing or other assault look for "hidden" wounds—checking areas such as the axilla and back.

Palpate for clavicular and rib tenderness and auscultate the lung fields and heart sounds.

### *Abdomen*

Inspect the abdomen, the perineum and external genitalia. Look in particular for:

- Seat-belt bruising/handlebar injuries.
- Distention and rigidity or tenderness, which could indicate internal bleeding.
- Blood at the urinary meatus/introitus.

Palpate for areas of tenderness, especially over the liver, spleen, kidneys and bladder, and auscultate bowel sounds.

### *Pelvis*

Inspect the pelvis for grazes over the iliac crest. Examine for bruising, deformity, pain or crepitus during movement. Check clothing for any evidence of incontinence, which suggests spinal or bladder injury or bleeding from genital or rectal orifices, which suggests pelvic fracture.

### *Limbs*

Inspect all the limbs and joints, palpate for bony and soft tissue tenderness and check joint movements, stability and muscular power. Examine sensory and motor function of any nerve roots or peripheral nerves that may have been injured.

### *Back*

A log roll should be performed either in the primary survey or in the secondary survey. Inspect the entire length of the back and buttocks.

- Palpate, then percuss, the spine for tenderness. Palpate the scapulae and sacroiliac joints for tenderness.
- Inspect the anus. Digital examination is rarely needed—if it is indicated, it should only be performed once.

## Further Planning and Documentation

- Any injuries discovered during the inspection should be accurately documented.
- Any immediate treatment, such as covering wounds and splinting fractures, should be administered.
- Analgesics, antibiotics or tetanus immunization should be prescribed.
- Following the secondary survey, the priorities for further investigation and treatment should be reviewed, and a definitive care plan formulated.
- The patient may require advanced imaging in computed tomography (CT), as well as transfer to the ward, critical care or theater at this point.

**Caution**

**Things *not* to attempt:**

- Never put anything into the mouth of an unconscious victim.
- Never move a casualty without first doing the above checks.
- Never put anything under the head of a victim who is lying down. The airway may get obstructed as a result of this.
- Never move a victim unless absolutely necessary, as this may result in more injuries.

The secondary survey mnemonic—Has My Critical Care Assessed Patient's Priorities Or Next Management Decision?—has been given in Table 6.2.



**TABLE 6.2:** Mnemonic for secondary survey

| Mnemonic | Secondary survey |
|---|---|
| **H**as | **H**ead/skull |
| **M**y | **M**axillofacial |
| **C**ritical | **C**ervical spine |
| **C**are | **C**hest |
| **A**ssessed | **A**bdomen |
| **P**atient's | **P**elvis |
| **P**riorities | **P**erineum |
| **O**r | **O**rifices (PR/PV)* |
| **N**ext | **N**eurological |
| **M**anagement | **M**usculoskeletal |
| **D**ecision? | **D**iagnostic tests/definitive care |

*Tubes and fingers in every orifice. Include "AMPLE" history.
*Source:* ATLS secondary survey mnemonic: Has My Critical Care Assessed Patient's Priorities Or Next Management Decision? Emerg Med J. 2006;23(8):661-2.

## Monitoring Vital Signs

### *Level of Response*

- Level of response gives an idea about level of consciousness of the patient.
- Assess the level of response using **AVPU scale** to identify any deterioration in the condition of the patient.

**Quick Reminder**

Mnemonic AVPU:
**A**—is the casualty Alert
**V**—does the casualty respond to Voice
**P**—does the casualty respond to Pain
**U**—is the casualty Unresponsive?

### *Breathing*

- Check the breathing rate and listen for any breathing issues or strange noises when checking a casualty's breathing.
  - Rate—Count the number of breaths per minute.
  - Depth—Are the breaths deep or shallow?
  - Ease—Is the breathing easy, difficult or painful?
  - Noise—Is the breathing quiet or noisy, and if noisy, what are the types of noise?



The normal range of respiration is given in Table 6.3.

**TABLE 6.3:** Normal range of respiration

| Age group | Respiration per minute |
|---|---|
| Newborn | 30–80 |
| Infant (age 1 year) | 20–40 |
| Child (3–12 years) | 20–30 |
| Adolescent | 16–20 |
| Healthy adult | 12–20 |
| Elderly | 16–20 |

### *Pulse*

- The pulse can be felt at the wrist (radial pulse) or in the neck if that is not possible (carotid pulse).
- Record the following points.
  - Rate (number of beats/min.)

- Strength (strong or weak)
- Rhythm (regular or irregular)

Refer to Table 6.4 to know the variation in pulse by age.

**TABLE 6.4:** Variation in pulse by age

| Age | Pulse rate per minute |
|---|---|
| Newborn | 120–160 |
| 1 year | 110–120 |
| 5–8 years | 95–100 |
| Adult male | 72–80 |
| Adult female | 76–80 |
| Athletes | 45–60 |

The common peripheral sites for measuring pulse are depicted in Figure 6.1.

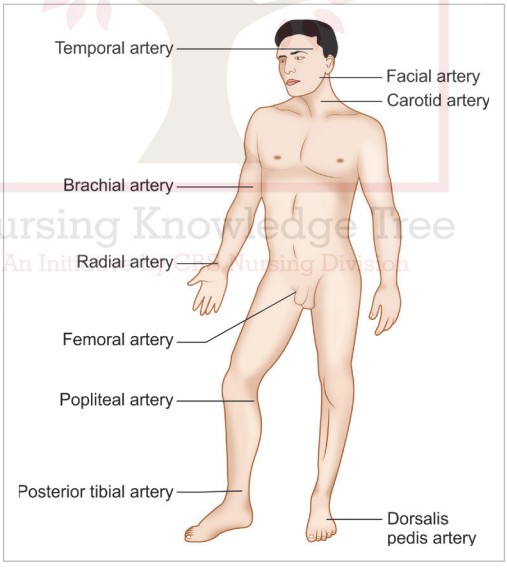



**Fig. 6.1:** Common peripheral sites for measuring pulse

### *Body Temperature*

- A low or high body temperature could be a sign of a life-threatening disease.
- A fever of >100.4°F (38°C) is usually caused by infection, although it can also be the result of heat exhaustion or heatstroke.

The common sites for assessing body temperature are given in Table 6.5.

**TABLE 6.5:** Normal temperature for healthy adults at various sites

| Site of measurement | Celsius (C) | Fahrenheit (F) |
|---|---|---|
| Oral temperature | 37°C | 98.6°F |
| Axillary temperature | 36.5°C | 97.7°F |
| Rectal temperature | 37.5°C | 99.5°F |
| Tympanic temperature | 37.5°C | 99.5°F |
| Forehead temperature | 34.4°C | 94.0°F |

Refer to Table 6.6 for determining thermometer in Celsius and Fahrenheit scales.

**TABLE 6.6:** Reference table for determining thermometer in Celsius and Fahrenheit scales

| Celsius (C) | Fahrenheit (F) |
|---|---|
| 34.0°C | 93.2°F |
| 35.0°C | 95.2°F |
| 36.0°C | 96.8°F |
| 36.8°C | 97.7°F |
| 37.0°C | 98.6°F |
| 37.5°C | 99.5°F |
| 38.0°C | 100.4°F |
| 38.5°C | 101.3°F |
| 39.0°C | 102.2°F |
| 40.0°C | 104.0°F |
| 41.0°C | 105.5°F |
| 42.0°C | 107.2°F |
| 43.0°C | 109.4°F |
| 44.0°C | 111.2°F |



## TRIAGING OF THE TRAUMA PATIENTS

Triage is the process of rapidly assessing and prioritizing patients based on the severity of their injuries and the urgency of treatment required. In trauma situations—such as accidents, disasters or mass casualty incidents—effective triage ensures that limited resources are used to save the greatest number of lives.

## Definition

Triage in trauma care is the sorting of patients according to the seriousness of injury to decide the order and priority of emergency treatment, transport or referral.

## Objectives of Triage in Trauma

- Identify critically injured patients quickly.
- Prioritize treatment to those who will benefit most.
- Optimize the use of limited staff, equipment, and time.
- Facilitate safe and rapid evacuation or referral.

## Principles of Trauma Triage

- Assess quickly (within 30–60 seconds per patient).
- Classify based on airway, breathing, circulation, mental status.
- Reassess frequently as patient condition can change.
- Use simple, clear criteria suitable for mass-casualty environments.

## Common Trauma Triage Systems

Common triage systems along with their key features are given in Table 6.7.



**TABLE 6.7:** Triage systems along with their key features

| Systems | Key features |
|---|---|
| **Color-coded triage tags** (most common) | Uses red, yellow, green, black tags to indicate priority. |
| **Simple Triage and Rapid Treatment (START)** | Focuses on ability to walk, breathing rate, perfusion, and mental status. |
| **JumpSTART (for children)** | Modified START for pediatric patients. |

## Color Coding in Trauma Triage

Color coding in trauma triage along with their priority and description is given in Table 6.8.

**TABLE 6.8:** Color coding in trauma triage along with their priority and description

| Color | Priority | Description |
|---|---|---|
| **Red (immediate)** | 1st priority | Life-threatening injuries but high chance of survival with prompt treatment (airway obstruction, severe bleeding, shock). |
| **Yellow (delayed)** | 2nd priority | Serious but not immediately life-threatening injuries (fractures without shock, burns without airway involvement). |
| **Green (minor)** | 3rd priority | Walking wounded, minor injuries requiring minimal treatment. |
| **Black (expectant/ deceased)** | No priority for treatment | Refers to individuals who are either deceased or have injuries so severe that survival is unlikely, given the available resources. |

## Steps in Triage of Trauma Patients

1. **Scene safety:** Ensure area is safe for rescuers.
2. **Initial rapid assessment:** Airway, breathing, circulation, disability, exposure (ABCDE).
3. **Assign triage category:** Based on physiological criteria.
4. **Tag and document:** Attach color-coded tags and record vital data.
5. **Provide immediate life-saving measures:** Only quick interventions (e.g., airway opening, hemorrhage control).
6. **Arrange evacuation/transport:** Send patients to appropriate care area or facility according to priority.

**Note**

- **Triage full treatment**—it is quick sorting and prioritizing.
- Always **reassess** patients regularly.
- **Ethics in triage:** Focus on saving the maximum number of lives, not "first come, first served".

## Conclusion

Triaging trauma patients is a vital skill in emergency and disaster medicine. By rapidly identifying and prioritizing those most in need, healthcare providers can improve survival rates and use limited resources effectively.

# 12

# Basic Life Support

## INTRODUCTION

Basic life support (BLS) is a life-saving skill that depends upon the victim's condition and need. Heart attack is the main cause of death. Apart from this, a few main conditions leading to heart stoppage or cardiac arrest are electrocutions, drug intoxication, drowning and suffocation.

Many victims can be saved if the life-saving skill is performed within time, also called resuscitation. These skills are as follows:

- **Rescue breathing:** This provides the required amount of oxygen into the lungs.
- **Chest compression:** This helps in pumping oxygenated blood to the vital organs.
- **Automated external defibrillator (AED):** This is an electronic device that analyzes the heart rhythm and delivers an electrical shock to the heart of a person in cardiac arrest in an effort to reestablish a heart rhythm that will generate a pulse.
- **Choking care:** It includes chest compression to expel an obstructing object from the airway.

## CARDIAC ARREST

Cardiac arrest refers to a sudden stop in breathing.

or

It is the stoppage of cardiac functions, which may be reversible.

### Causes of Cardiac Arrest

There are a number of causes given as follows:

- Heart attack
- Airway obstruction

- Electrocution
- Traumatic injury like head injury
- Certain medications like cardiac drugs and overdose of depressant drugs
- Drug abuse or overdose
- Drowning
- Myocardial infarction
- Hypothermia
- Electrolyte disorder

### Signs and Symptoms of Cardiac Arrest

- Absence of carotid and femoral pulse
- Apnea
- Dilated pupils
- Unconsciousness
- Cyanosis
- Seizure

## RECOVERY POSITION

Recovery position is used in an unresponsive victim who is breathing when found or after receiving BLS. The aim of putting the victim in this position is as follows:

- Helps to keep the airway open
- Allows fluid to drain from the mouth
- Prevents aspiration in case a victim vomits.



### Recovery Position (Adult or Child) (Figs 12.1A to D)

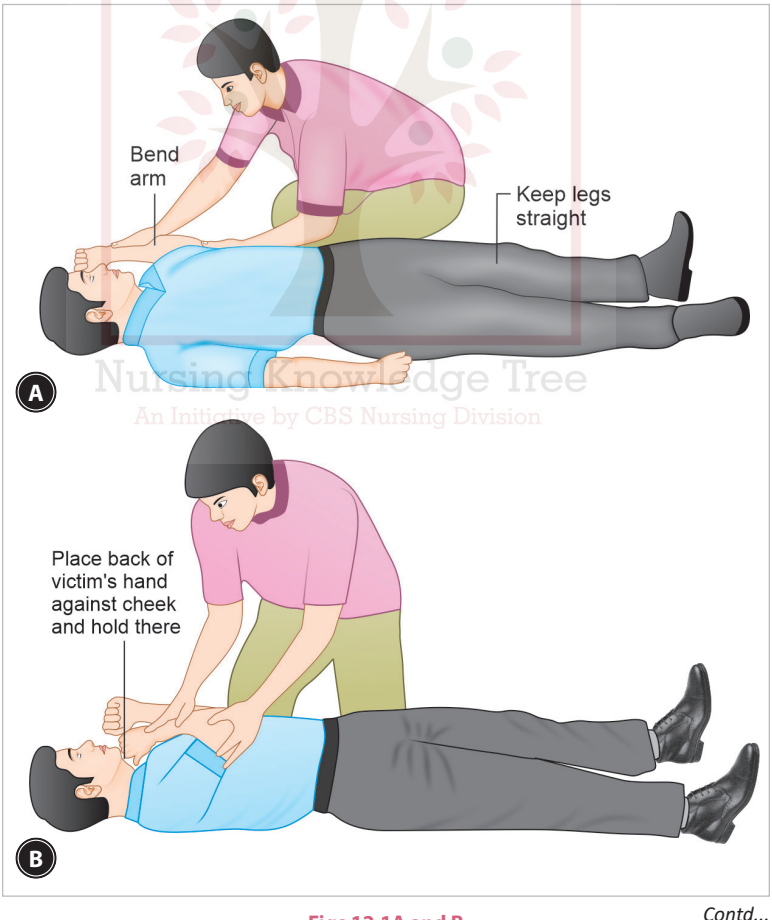
**STEPS TO FOLLOW**

1. Extend the victim's arm that is farther from you above the victim's head (usually left arm).
2. Position the victim's other arm across the chest.
3. Bend the victim's nearer leg at the knee.
4. Put your forearm that is nearer the victim under the victim's nearer shoulder with your hand under the hollow of the neck.
5. Carefully roll the victim away from you by pushing on the victim's flexed knee and lifting your forearm while your hand stabilizes the head and neck. The victim's head is now supported on the raised arm.
6. While supporting the head and neck, place the victim's hand palm-down with fingers under the armpit of the raised arm with forearm flat on the surface at 90° to the body (i.e., tilt on left side).
7. With the victim now in position, check the airway and open the mouth to allow drainage.

## Recovery Position in Infant

**STEPS TO FOLLOW**

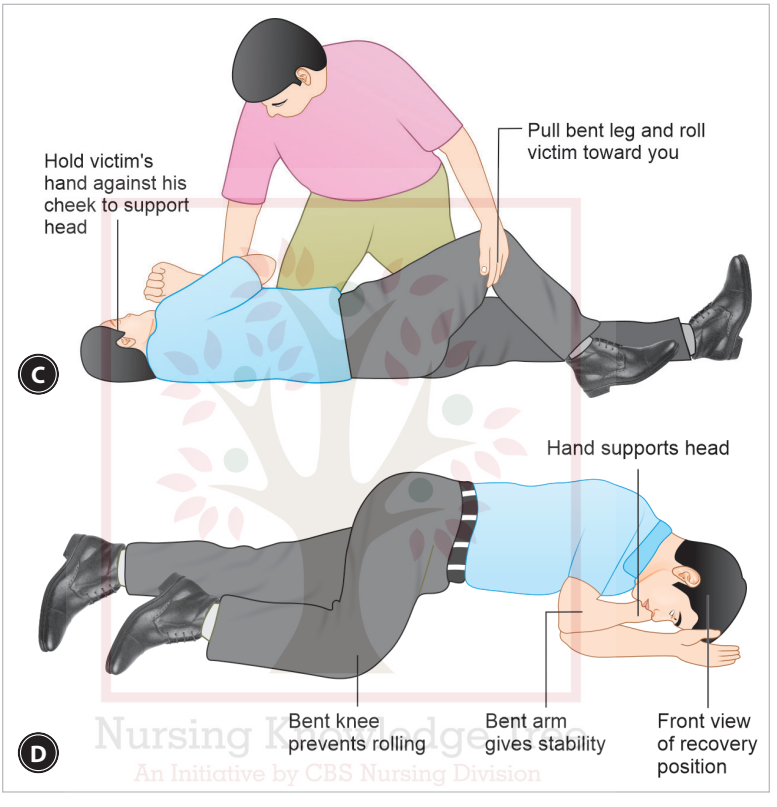
1. Hold the infant face down on your arm with the head slightly lower than the body.
2. Support the head and neck with your hand, keeping the mouth and nose clear.






Figs 12.1A and B

*Contd...*




**Figs 12.1A to D:** Steps involved in moving a person into the recovery position

## RESCUE BREATHING

Before proceeding for rescue breathing, the victim is assessed for whether they are breathing. If the victim is breathing and is unresponsive, put them in recovery position. Since the victim who is not breathing may be in cardiac arrest. So ask someone to call EMS number immediately and if possible arrange for AED.

### Methods for Performing Rescue Breathing

#### *Mouth-to-Mouth Method (Fig. 12.2)*

This method is the simplest, easiest, quickest and effective method in case of an emergency. Pinch the victim nose shut and seal your mouth over

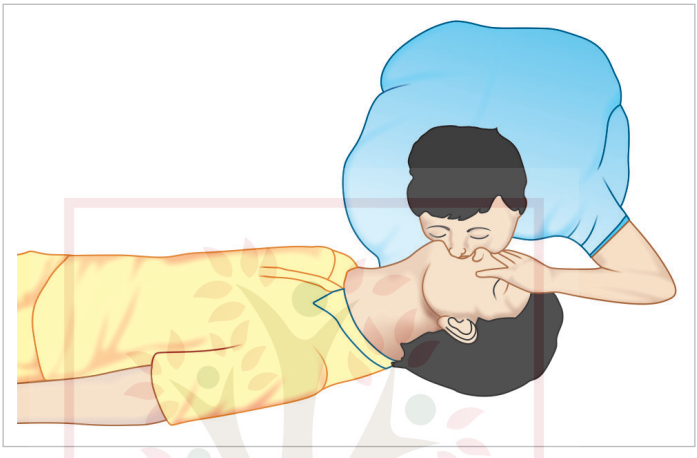


Fig. 12.2: Mouth-to-mouth method

the victim's mouth. Now breathe into the victim's mouth while watching the chest rise confirming air going in.

### *Mouth to Nose*

This method is used in the cases where it is difficult to open the mouth of the patient for example, in certain cases where mouth is injured.

Hold the victim's mouth closed and seal your mouth over the nose in order to breathe in and then let the mouth open to let the air escape.

### *Mouth to Stoma*

This is practiced in cases where patients have had a past illness, injury or other conditions that require them to breathe through a hole in their neck, called stoma. In such cases, to check the ABCs, check this hole to see victim's breathing pattern. Cup your hand over the victim's mouth and nose and seal your barrier device or your mouth over the stoma to deliver rescue breaths.

### *Mouth to Barrier Device (Fig. 12.3)*

A mouth to barrier device is an apparatus that is placed over a victim's face as a safety precaution for the rescuer during rescue breathing. Two types of mouth to barrier devices are used:

1. Masks
2. Face shields.

Fig. 12.3: Mouth to barrier device

## CARDIOPULMONARY RESUSCITATION

Cardiopulmonary resuscitation (CPR) is a life-saving measure that can be used in a number of emergency situations where the heart stops beating or when the victim is not able to breathe normally, i.e., gasping or no breathing at all, e.g., heart attack, near drowning, suffocation, etc., in which someone's breathing or heartbeat has stopped. CPR is a technique of pushing down on a person's chest and breathing into their mouth. This helps move blood to the victim's brain to help prevent brain damage until and unless a medical professional arrives.

The American Heart Association recommends that every individual whether trained or untrained, should be able to begin CPR with chest compressions as it is better to do something than to do nothing. As such an effort of doing something can help to save a precious life.

### Advice from American Heart Association

- **For an untrained person:** If a person is not trained in giving CPR, that person can provide hands-only CPR.

  This is uninterrupted chest compressions of 100–120/min. until the arrival of paramedics. An untrained person need not try any rescue breathing.
- **Trained and ready to go:** In case of a trained person and if the person is confident, check the victim for breathing and presence of pulsation. If there is no breathing or pulse within 10 seconds, begin chest compressions. Start CPR with 30 chest compressions before giving two rescue breaths.

- **Trained but rusty:** If one has received training on CPR previously but is not confident, just deliver chest compressions at the rate of 100–120/min.

  The above advice applies to adults, children and infants requiring CPR but not newborns (infants up to 4 weeks old).

## Importance of Cardiopulmonary Resuscitation

- CPR keeps oxygenated blood flowing to the brain and other vital organs, still definitive medical treatment is provided to restore the normal heart rhythm.
- When the heart stops, the lack of oxygenated blood can cause brain damage in only a few minutes, a person may die within 8–10 minutes.

## Preliminaries (What all to Check before Beginning CPR)

- Safety of the environment for the person.
- The victim for being conscious/unconscious.
- If the victim is unconscious, tap or shake their shoulder and ask loudly "Are you OK?"
- If the person does not respond and there are two rescuers, then:
  i. Have one person call local emergency number and get the AED (if one is available)
  ii. Have the other rescuer begin CPR
- If you are alone and have immediate access to a telephone, call emergency number before beginning CPR. Get the AED (if one is available).
- As soon as an AED is available, deliver one shock, if instructed by the device, begin CPR.

### Steps of Cardiopulmonary Resuscitation

**STEPS TO FOLLOW**

Remember to follow steps given by the American Heart Association, i.e., letters: C-A-B

1. C–Compressions
2. A–Airway
3. B–Breathing

### *Points to be Checked before the Beginning of CPR*

- Check whether the victim is conscious or unconscious.
- If the victim appears unconscious, shake their shoulder ask loudly "Are you OK?" (Fig. 12.4).
- If a person does not respond and you are alone, immediately call the emergency number to seek help (Fig. 12.5).
- Before the beginning of CPR, except in case of drowning when the victim is suffocated, then begin CPR for a minute and then call 108 or local emergency number.
- If there are two rescuers, one should call the emergency number and the other should start the CPR.
- If an AED is immediately available, deliver one shock by the device, if instructed and start CPR.


**Fig. 12.4:** Ask the victim if they are ok

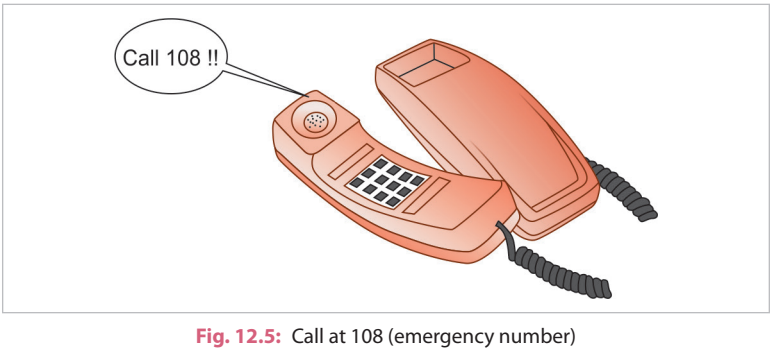



**Fig. 12.5:** Call at 108 (emergency number)

### *Compression*

The aims of compression help in restoring the blood circulation.

**STEPS TO FOLLOW**

1. Place the victim on their back on a firm surface.
2. Kneel next to the victim's neck and shoulder (Fig. 12.6).

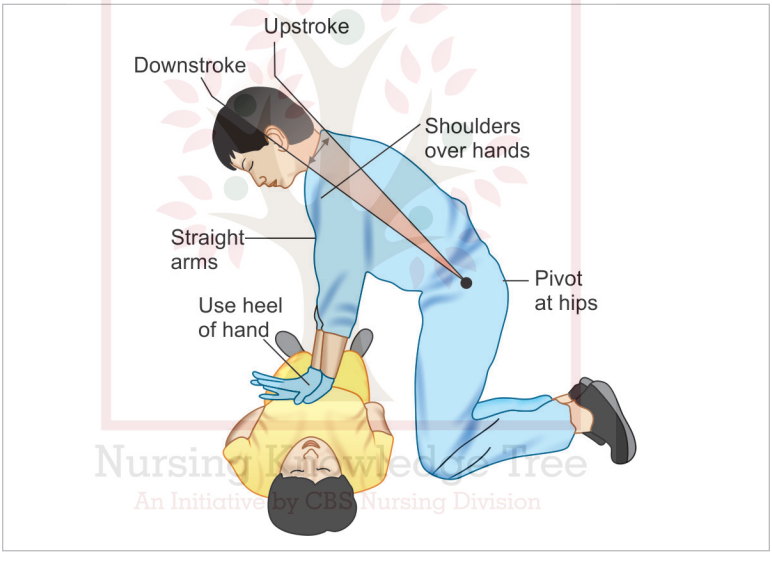





**Fig. 12.6:** Position for giving compression to the victim

3. Place the heel of one hand over the center of the person's chest between the nipples or lower half of breast bone midway between the nipples.
4. Place the other hand on top of the first hand. The elbows should be straight and positioned directly above the hands (Fig. 12.7).
5. Use the upper body weight (not just your arms) as you push straight down on (compress) the chest at least 2 inches (approximately 5 cm) but not >2.4 inches that is (approximately 6 cm). Push hard at a rate of 100–120 compressions per minute (30 compressions and two breaths). If a person (rescuer) is alone, give 15 compressions and one breath.

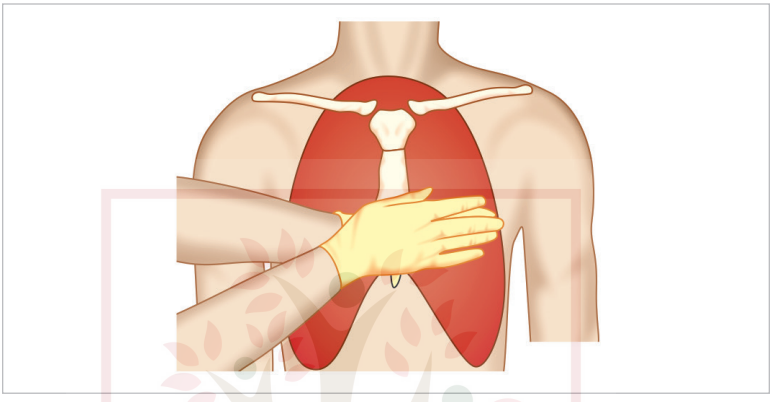


**Fig. 12.7:** Position of hands during compression

6 If you are not trained in CPR, continues chest compression till the signs of movement appear or until emergency medical personnel arrives. Whereas if you are trained in CPR, go on checking the airway and rescue breathing.

### *Airway*

The victim's airway should be patent, for this open the victim's airway using head-tilt, chin-lift maneuver (Fig. 12.8).



**Fig. 12.8:** Head-tilt chin-lift maneuver

**STEPS TO FOLLOW**

1 Put your palm on the person's forehead and gently tilt the head back then with the other hand gently lift the chin forward to open the airway.

2. Check the victim for normal breathing pattern for no >5 or 10 seconds.
3. Look for the chest motion or movement.
4. Listen for normal breathing sound.
5. Feel for the victim's breath on your cheek or ear.
6. If the victim is not breathing normally, begin mouth-to-mouth breathing (if trained in CPR).
7. If the victim is unconscious (may be heart attack) and you are not trained in emergency procedure, skip mouth-to-mouth breathing and continue chest compression.

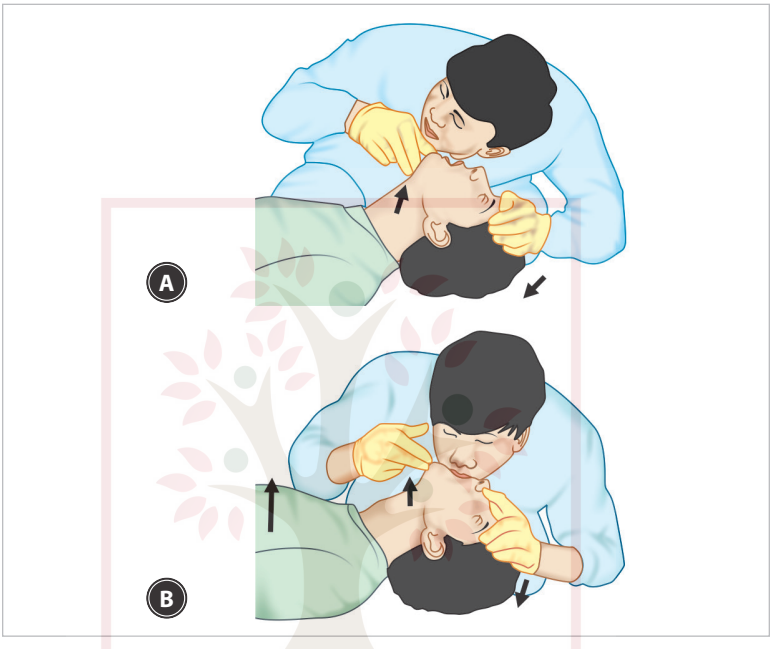
### *Breathing*

The aim of the breathing is to breathe for the victim.

Rescue breathing may be mouth-to-mouth or mouth-to-nose in case the mouth is seriously injured or cannot be opened.

**STEPS TO FOLLOW**

1. Open the airway (head-tilt, chin-lift maneuver). Pinch the nostril shut for the mouth-to-mouth breathing. Cover the victim's mouth with your mouth making a seal (Figs 12.9A and B).
2. Get ready to give oxygen rescue breath.
3. If the chest does not rise with the first rescue breath, give the second breath. If again the chest does not rise, repeat the (head-tilt, chin-lift maneuver) and then give the second breath. 30 chest compressions and two breaths are considered one completed cycle.
4. Resume chest compression to restore circulation.
5. After the completion of the five cycles (about 2 minutes) even if the victim has not begun moving and an automated external defibrillator (AED) is available, apply it (administer one shock).
6. After giving one shock with AED then resume CPR starting with chest compressions for two more minutes before administering a second shock. If one is not trained in using AED, one can seek guidance from emergency medical operator.
7. In case where AED is not available, follow the below written step.
8. Continue giving CPR until the sign of movement appears or emergency medical personnel arrives or take over.




**Figs 12.9A and B:** Rescue breathing



## To Perform CPR on a Child (1–8 Years)

The procedure for giving CPR to a child is the same as for an adult except the steps given as follows:

**STEPS TO FOLLOW**

1. If there is only one rescuer, perform five cycles of compressions and breath to the child. This will take two minutes (Fig. 12.10).
2. Use AED.
3. Call at local emergency number after the first step.
4. In case the rescuer is trained in using AED, even then perform the step one before using AED.
5. Use only one hand to perform chest compression.
6. Breathe more gently.

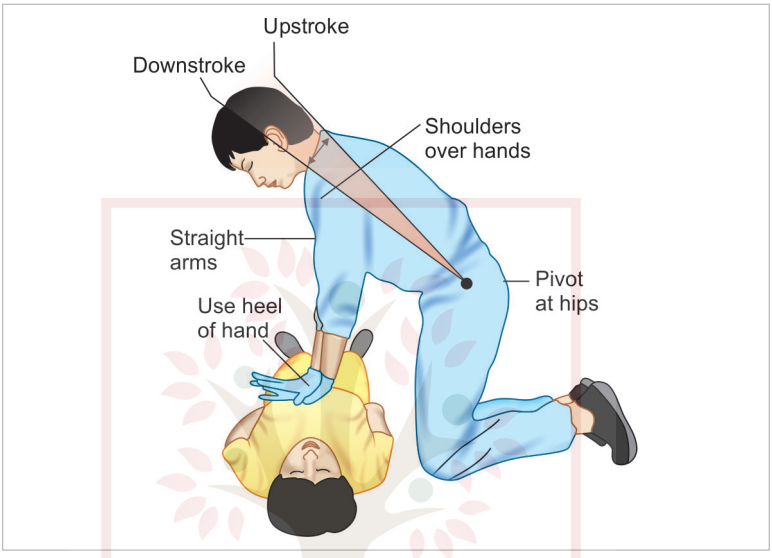



**Fig. 12.10:** Give five cycles of compressions

7. Use the same ratio of compression and breaths as for adults, i.e., 30 compressions followed by two breaths. This will be completing one cycle.
8. After providing the two breaths at once, begin the next cycle of compressions and breaths.
9. After completing five cycles (about 5 minutes) of CPR if there is no response and there is the availability of AED, apply it. In case of children, pediatric pads are used.
10. Never use AED for infants (children younger than the age of one year).
11. Administer one shock then start CPR beginning with chest compression for two more minutes before administering.
12. If the first aider is not aware of how to use AED, they should do it under the guidance of emergency medical operator.
13. Continue until the child moves or help arrives.



### To Perform CPR on Infant (0–1 Year)

The cause of cardiac arrest in babies is usually due to lack of oxygen from drowning or choking.

- If you know that the infant has an airway obstruction, perform first aid for choking.

- If the cause of the infant's inability to breathe is not known, immediately perform CPR.

## STEPS TO FOLLOW

1. Check the scene.
2. Examine the situation.
3. Stroke the baby and watch for a response (Fig. 12.11).
4. Never shake the infant.
5. If the infant does not respond, follow airways, breathing, compression (ABC).
6. If you are only one rescuer and CPR is required, perform it for 2 minutes, i.e., five completed cycles before calling local emergency numbers (Fig. 12.12).
7. If another rescuer is with you, ask him to call the local emergency contact number while you attend the infant.

**Fig. 12.11:** Stroke the baby



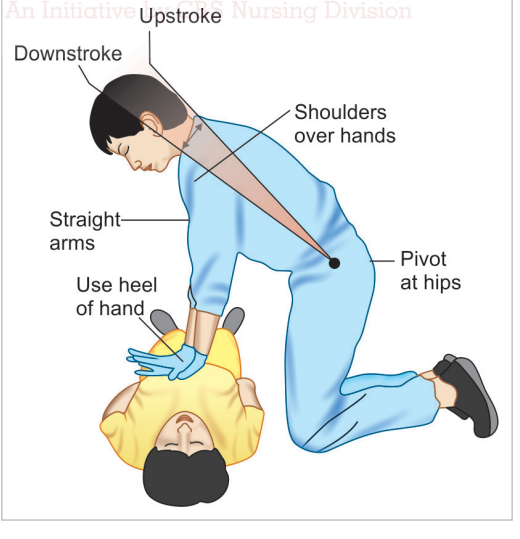



**Fig. 12.12:** Give five completed cycles of cardiopulmonary resuscitation

### *Compression in Case of Infant*

The aim of compression in case of infant is to restore the blood circulation.

**STEPS TO FOLLOW**

1. Put the baby on its back on a firm, flat surface. It can be on the floor, ground or table.
2. Imagine a horizontal line drawn between the baby's nipple. Place two fingers of one hand just below this line in the center of the chest (Fig. 12.13).
3. Compress the chest gently about 1.5 inches (4 cm) and compressions are to be given at a rate of 100–120 compressions per minute.



**Fig. 12.13:** Compress the chest

### Airway

**STEPS TO FOLLOW**

1. Victim's airway should be patent, for this open the victim's airway using head-tilt, chin-lift maneuver.
2. Check for breathing within 10 seconds by placing your ear near the baby's mouth. Look for chest movements, listen for breathing sounds and feel for breath on your cheek and ear (Fig. 12.14).

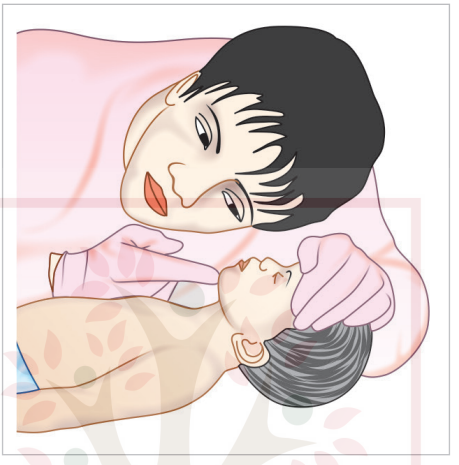


**Fig. 12.14:** Listen for breath sounds

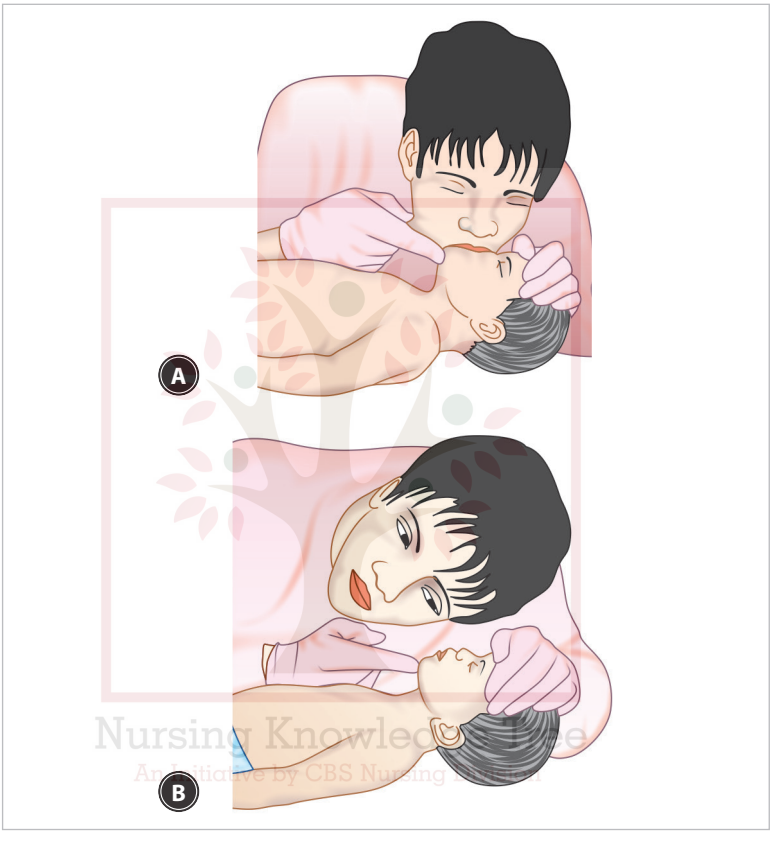
## Breathing

**STEPS TO FOLLOW**

1. With your mouth seal the baby's mouth and nose.
2. Give two rescue breaths. With the strength of your cheeks to deliver gentle puff of air (rather than deep breaths from your lungs) and to slowly breathe into the baby's mouth one time, take one second for the breath. Watch to see if the baby's chest rises. If it does, give a second rescue breath. If the chest does not rise, repeat the head-tilt, chin-lift maneuver and then give the second breath (Figs 12.15A and B).
3. If still the infant's chest does not rise, check immediately for any foreign material.

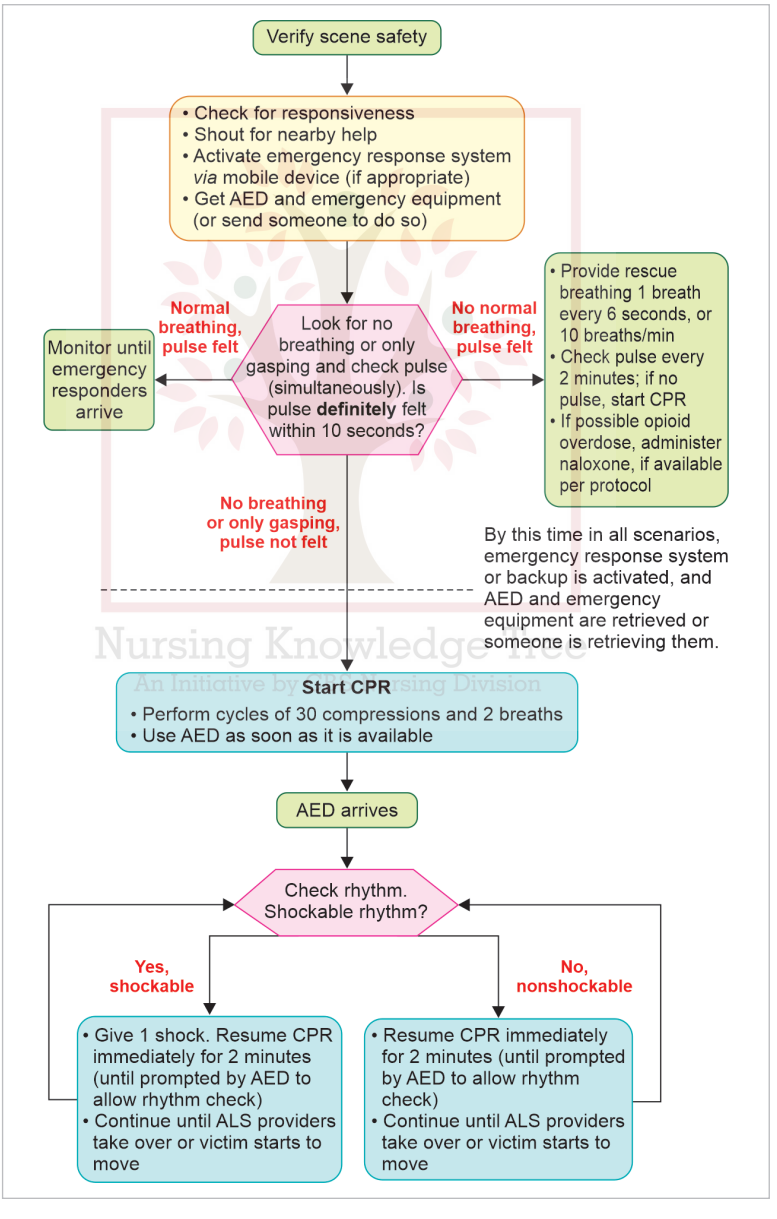
*If an object is present, sweep it out with your finger. If the airway seems to be blocked, perform first aid for a choking baby.*

1. Give two breaths after every 30 compressions.
2. Perform CPR for 2 minutes before calling for help. Continue CPR till there are signs of life or medical help arrives.




**Figs 12.15A and B:** **A.** Give two rescue breaths; **B.** Perform head-tilt, chin-lift maneuver

## ADULT BASIC LIFE SUPPORT ALGORITHM FOR HEALTHCARE PROVIDERS



## BASIC LIFE SUPPORT FOR HEALTHCARE PROFESSIONALS

### CABs of CPR

| CPR | Adult and Older Child (puberty and older) | Child (1 year to signs of puberty) | Infant (up to 1-year-old) |
|---|---|---|---|
| **Verify scene safety** | Do not enter an unsafe environment. Call 112 | | |
| **Check victim's responsiveness** | If victim is unresponsive, shout for help. Call 112 with mobile device, if available. Send someone to find an AED. | | |
| **Activate 112** | If you are alone and do not have a mobile device, leave the victim to call 112 first, then look for an AED. Return to perform CPR. | If you are alone and **WITNESS THE COLLAPSE** Leave the victim to call 112 first, and look for an AED. Return to perform CPR. | |
| **Determine if victim is breathing and has a pulse** | Simultaneously check or breathing and pulse for no >10 seconds. Note: Agonal breaths are not considered signs of breathing. For children and infants, a pulse rate of <60 beats/min. is treated as no pulse. | | |
| | Check carotid artery on your side of the victim's neck. | Check brachial artery on inside of the victim's upper arm near the armpit. | |
| **Rescue breathing** If victim **has** a DEFINITE detectable pulse, but is not breathing | 1 breath every 5–6 seconds. Check pulse every 2 minutes. | 1 breath every 5–6 seconds. Check pulse again every 2 minutes. If pulse <60 beats/min. or perfusion. Remains poor, add compressions. | |
| | For suspected opioid overdose, administer naloxone, if available | | |
| If victim has **No** detectable pulse: **Begin CPR** Minimize interruptions | **1 rescuer:** 30 compressions: 2 breaths **2+ rescuers:** 30 compressions: 2 breaths Use AED as soon as it arrives | **1 rescuer:** 30 compressions: 2 breaths **2+ rescuers:** 15 compressions: 2 breaths Use the AED as soon as it arrives | |
| **Compression rate** | 100–120 compressions per minute | | |
| **Hand placement** | 2 hands on lower half of breastbone | 1 hand or 2 hands on lower half of breastbone | 1 rescuer: 2 fingers 2+ rescuers: 2 thumbs on center of chest, just below nipple line |
| **Compression depth** | 2–2.4 inches (5–6 cm) | 1/3rd the depth of the chest—about 2 inches (5 cm) | 1/3rd the depth of the chest- about 1.5 inches (4 cm) |
| **Chest recoil** | Allow for full chest recoil after each compression | | |
| **Minimize interruptions** | Limit interruptions in chest compressions to not >10 seconds | | |
| **Use the AED as soon as it arrives** | Turn on AED and follow instructions. Never remove the AED. | | |

# First Aid

## Manual for Nurses

## Salient Features

- The book covers in-depth topics not only from the casualty but also from the day-to-day life experiences at work, home, school, road side, etc., which are found to be of great use for the nursing students as well as for the common people.
- Cautions in First Aid procedures have been added at the respective places for providing good clinical practice in real-time situations.
- Important points have been highlighted in separate boxes to help readers focus more on them.
- The book includes simple steps to understand basic life support, which if learnt properly, can save many precious lives.
- Last but not least, the book also puts emphasis on system-wise emergencies along with disaster management and preparedness.

This feature guides you through the essential steps to be followed during an emergency for each respective First Aid procedure.

**STEPS TO FOLLOW**

1. Recognize the type of emergency
2. Check the scene
3. Call EMS number
4. Check the victim

A special feature that offers quick emergency tips related to each First Aid procedure, highlighted in an easy-to-read note box.

**Note**

- **Triage full treatment**—it is quick sorting and prioritizing.
- Always **reassess** patients regularly.
- **Ethics in triage:** Focus on saving the maximum number of lives, not "first come, first served".

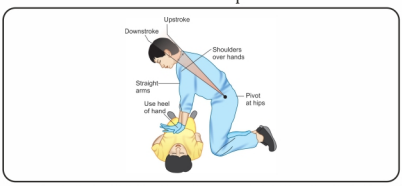
This feature helps readers understand the vital precautions to take during emergencies in respective First Aid procedure.

**Caution**

**Things *not* to attempt:**

- Never put anything into the mouth of an unconscious victim.
- Never move a casualty without first doing the above checks.

Well-designed figures visually explain each First Aid procedure, ensuring quick and clear understanding of the concepts.




This feature presents basic and essential facts about each First Aid procedure within the relevant topics for quick reference.

**Basic Rules before Applying Dressing**

The basic rules before applying dressing are given as follows (Fig. 7.3):

- Thoroughly wash your hands.
- Avoid touching the wound or any part of the dressing that will come in contact with the wound.

Tables are provided to support the text and make key information easier to understand.

**TABLE 6.2:** Mnemonic for secondary survey

| Mnemonic | Secondary survey |
|---|---|
| **H**as | **H**ead/skull |
| **M**y | **M**axillofacial |
| **C**ritical | **C**ervical spine |
| **C**are | **C**hest |
| **A**ssessed | **A**bdomen |
| **P**atient's | **P**elvis |
| **P**riorities | **P**erineum |

## About the Author

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**CBS Publishers & Distributors** Pvt. Ltd.
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**E-mail:** feedback@cbspd.com, **Website:** www.cbspd.com
New Delhi | Bengaluru | Chennai | Kochi | Kolkata | Lucknow | Mumbai
Hyderabad | Jharkhand | Nagpur | Patna | Pune | Uttarakhand

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CBS Catalogue
2025-26

ISBN: 978-93-48426-83-3
9 789348 426833