departments, for the management of Accident (multiple injuries) and Eemergency cases (medical/surgical).

EARLY TRAUMA CARE

Pre-hospital Care (Ambulance Service)

The management of patients with multiple injuries starts right from the site of accident. The ambulance attendants (professional staff members) are to be trained enough to bear the responsibility, until the patient reaches the hospital. The attendants record the site, date, and time of accident; position in which the patient was found, and whether conscious or unconscious, drunk or sober, apprehensive, hostile, or cooperative, and the amount of bleeding observed/assessed (at the site and from soaked clothes). Management of the injured (resuscitation measures) should start immediately in an orderly manner (ABC of trauma management), i.e. airway and cervical spine control, breathing care, control circulation, combat shock, splint fractured limbs. The attendant is responsible for the comfortable transportation of patient to the hospital, is to be trained enough and well versed with the resuscitation measures, that are continued uninterrupted until the patient reaches the A&E department, being informed in advance of the arrival of the injured patient.

TRAUMAS AND ORTHOPEDIC DEPARTMENT

Trauma Team

Preplanning: Usually accident and emergency (A&E) department or the trauma and orthopedic (T&O) receive a trauma call from the ambulance unit prior to arrival of a trauma/polytrauma case. The Accident and Emergency (A&E) and the trauma and orthopedics (T&O) teams consist of dedicated medical and nursing staff trained enough in trauma care and well versed with resuscitation), gets ready to receive the oncoming emergency, in the resuscitation chamber. In case of a polytrauma patient, mostly caused by the high velocity injuries like motor vehicle collisions (RSA), sports injuries, or fall from a height, the orthopedic part of the patient's care is coordinated with other surgical specialties as appropriate usually in the department of A&E. The team leader assigns tasks to the T&O staff, and may obtain help from concerned specialists if required. Care of the patient in the A&E/T&O requires the regular assessment and monitoring especially the trends. This based on physical examination and use of various monitoring equipment. However, the equipment are not a substitute for good clinical skills. In fact trauma and orthoperdics care is labor intensive. Record all the monitoring on a predesigned chart. The decision-making in the T&O should proceed in the continuous manner of evaluation, intervention, and re-evaluation. T&O should have access to well equipped laboratoty facilities. Quick diagnostic tests especially for estimation of glucose. electrolytes, proteins, blood counts, blood grouping, blood gas and cholesterol, etc. should be available. Portable X-ray unit, ultrasonography, and bone densitometry are desirable round the clock. Besides caring for the clinical disorder, proper attention should also be paid towards diet, sedation, and control of infection. Also mandatory to communicate regularly with the relatives/attendants and apprise them of patient's condition.

Assessment of Injured Patient (Primary Survey) (Table 1.2)

Trauma (high velocity) is the commonest cause of death in the developed countries and one of the leading cause of deaths in the developing world; about third of these deaths occur from RSA.

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	Dilated, equal, reacting to light (concussion) Dilated, fixed, not-reacting to light (compression) Pinpoint, fixed, paralytic (hemorrhage). Bleeding: Nose/ear/or mouth (# base of skull) Hemoptysis Temperature: Subnormal (concussion) Rises > 40 degree centigrade (hemorrhage). Rigidity of neck: Due to meningeal irritation (hemorrhage) Cranial nerves: Squint (injury 3rd/4th or 6th); facial palsy (7th nerve) Muscle power of limbs: May be paralyzed Reflexes Local examination: (Shave and clean the head) Wound: Scalp/or head Fracture: Depressed Swelling: Hematoma Rigidity of neck: Due to meningeal irritation (hemorrhage) Cranial nerves: Squint (injury 3rd/4th or 6th); facial palsy (7th nerve) Muscle power of limbs: May be paralyzed Reflexes.
Chest injuries	General physical examination: Position: Lying quite/or restless and gasping Dyspnea/or cyanosis Respiration: Abdominal/or thoracic Chest movements: Any restriction Wound: Penetrating (pneumothorax, surgical emphysema) Swelling: Surgical emphysema Local examination: Local tenderness Percussion: Resonant (surgical emphysema, pneumothorax) Cardiac dullness: Obliterated (pneumothorax) Increased (hemothorax) Crepitus audible.
Abdomen and perineum injuries	General physical examination: Lying quite (peritonitis) Restless (Hemorrhage) Respiration: Air hunger (Hemorrhage) Movements of abdominal wall: Abnormal Local examination: Distension Local tenderness, rigidity, shifting dullness (as per seat of lesion) Liver: Local tenderness, dullness—increased, shifting dullness Spleen: Local ternderness, dullness—persistent over left side of abdomen, shifting dullness—over right side

- Mesentery laceration: Resection of lacerated portion
- Liver: Repair of the liver tear by mattress sutures parallel to tear
- Kidney rupture:
  - Repair of the perforation
  - Nephrectomy: Indicated in severely damaged kidney, provided the contralateral kidney is healthy
- Ureter rupture:
  - Ureteroureteric anastomosis for injury of one ureter
  - Nephrostomy (bilateral) for bilateral injury

Spleen rupture:
- Repair of perforation
- Spleenectomy.

Buttock rupture: That may occur due to turning of the seriously injured patient.
- Debidement: To be undertaken first, in order to avoid hypotension

Refer: The patient to the surgical team.

Shock

It is the effect of a threat to existence, is a clinical state characterized by a sudden fall in the systolic blood pressure below 90 mm Hg.

Etiology and mechanism:

Variable, while the most important and consistent abnormality is the decreased circulating blood volume due to:
- External blood loss
- Internal hemorrhage into body cavities
- Extravasation of blood or plasma into damaged tissue due to trauma.

Pathogenesis

Hemorrhagic shock:
- Vasodilatation (loss of blood volume; low cardiac output; hypotension; impaired perfusion pressure of oxygen into tissues esp. brain and heart): followed by protective:
- Vasoconstriction (Nature's first aid): To maintain peripheral vascular resistance, arterial pressure, and the oxygen perfusion of the vital organs; persisting threat (unchecked or untreated) leading to anoxic brainstem and cardiac muscle; multiple organs failure; death.

Diagnosis

Restlessness
Respiration: Deep sighing (air hunger)
Skin: Cold, pale, sweating, empty veins
Thirst
Tinnitus
Eyes: Blindness
Pulse: Rate increased
Hypotension
Unconsciousness
Convulsions
Cardiac arrest
Death.

Management

Top priority (ASAP).
Aim: Removal of cause and replacement of blood volume (loss).

	• Homicidal: Wounds of greater severity, inflicted by on the neck, chest, abdomen or head.
PM findings	• Hemorrhage: External and internal • Wound: Notoriously deceptive. Penetrating wounds of the abdomen may be symptomless until internal hemorrhage or peritonitis reveals injured blood vessels or viscera. • Edges: Clean-cut or ragged and inverted at entrance and everted at exit site • Tissues: Torn and not cut as in incised wounds • Bruises or contusions of adjacent parts
Medicolegal aspect	• That whether the wounds are penetrating or punctured one? • That whether the wounds are accidental, suicidal or homicidal?

CONTUSED WOUNDS

Etiology	RSA
MOI	Direct trauma: Striking RSA Industrial accidents Fall from a height
Types	• Accidental: Inflicted by fall from a height, RSA, on any part of the body esp. back and buttocks, hands and fingers • Suicidal: Wounds very rare, self-inflicted by jumping from a height, on the accessible parts of the body, e.g. wrists, throat, abdomen and chest • Homicidal: Wounds of greater severity, inflicted by on the neck, chest, abdomen or head
PM findings	• Hemorrhage • Wound: May be symptomless until internal hemorrhage or peritonitis reveals injured blood vessels, muscles or viscera. • Edges: Ragged and everted • Tissues: Pressed • Bruises or contusions of adjacent parts
Medicolegal aspect	• That whether the wounds are contused one? • That whether the wounds are accidental, suicidal or homicidal?

POISONED WOUNDS

Etiology	Inflicted by bites of wasps or bees, dog, cat, horse, camel, jackal, snake or human beings.
Types	• Accidental: Common amongst picknickers inflicted by bites of wasps or bees, dog, cat, horse, camel, jackal, snake or human beings, on the exposed parts, e.g. face, neck, arms, legs • Suicidal: Self-inflicted by handling (disturbing) wasps, bees, dog, cat, horse, camel on the accessible (exposed) parts of the body, e.g. hands, fingers, arms, legs, face and neck • Homicidal: Inflicted by exposing (forcing) to poisonous snakes, scorpions, wasps, bees, ferocious dogs.