Head Injuries
Head injuries constitute 10% of the work load in an emergency room.
1- Head injuries constitute 10% of the work load in an emergency room.

2- Mild injuries constitute 80%, moderate 10% and serious injuries 10%.
3- The **aims** of patient management are:

* To prevent or treat any complication that can cause secondary brain damage e.g. hypoxia and increased intracranial tension.

* To provide the best conditions for recovery from any brain damage already sustained.
4- The role of the Emergency Room team in management of head injury is:

a) Resuscitation, diagnosis, and recording.

b) Detection or exclusion of other injuries.

c) Request and interpret radiography and initial investigations.

d) Decide if admission or transfer is needed.
e) Contact neurosurgeons for serious cases.

f) Ensure adequate arrangement for observation and transfer.

g) Observation of patients with minor injuries who will stay for short time.

h) Plan adequate arrangements for follow up.
Deceleration injury to the head
Management of head injuries

* All patients require repeated recording of conscious level using Glasgow Coma Scale (GCS).
# GLASGOW COMA SCALE

## 1- EYE OPENING
- Spontaneous: 4
- To voice: 3
- To pain: 2
- None: 1

## 2- VERBAL RESPONSE
- Oriented: 5
- Confused: 4
- Inappropriate words: 3
- Incomprehensible words: 2
- None: 1

## 3- MOTOR RESPONSE
- Obey command: 6
- Localized (pain): 5
- Withdraw (pain): 4
- Flexion (pain): 3
- Extension (pain): 2
- None: 1

**TOTAL SCORE (1 + 2 + 3) (3-15)**
* Other criteria to look for:

- Pupil diameter and reaction to light.

- Pulse and blood pressure.

- Temperature and respiration.

- Movement of all limbs.
* Careful history taking, from the patient or attendants, including:

- Mechanism of injury.
- Duration of amnesia after trauma.
- Previous surgical and medical history.
- Previous intake of drugs or alcohol.
* In patients who cannot talk, follow the classic ABCs:

- **Airway** and cervical spine control.

- **Breathing**, analysis of blood gas tensions, accepted levels are PaO\(_2\) > 13 kPa (100 mm Hg), and PaCo\(_2\) < 5.3 kPa (40 mm Hg).

- **Circulation**, restore hemodynamic stability.
- **Dysfunction of CNS, Glasgow Coma Score, Pupils and limb movements.**

- **Exposure and radiographs,** Examine the patient "head to toe", ask for skull, chest and cervical spine X-rays.
Hospital Admission

Indications for hospital admission

1- Confusion or any other depression of consciousness at the time of examination.

2- Skull fractures

3- Absence of responsible adult to observe the patient at home.
4- Difficulty of assessment due to:

- Drug or alcohol intake.
- Epilepsy.
- Other medical conditions that cloud the consciousness.
- In some children.
"Head injury warning Card"

The patient should be returned to the hospital if any of the following is observed:

- Drowsiness or excessive sleeping.
- Confusion or disorientation.
- Severe headache, vomiting or fever.
- Weakness of any limb or double vision.
- Convulsions, seizures or passing out.
- Discharge of blood or fluid from the ears or nose.
Aim of hospital admission

1- To provide optimal conditions for recovery of the brain.

2- To detect and treat complications before they cause secondary brain damage.

3- Neurological observation should be done every hour for the first 24 hours.
Consultation with a neurosurgeon

1- Fractured skull with confusion, fits, focal, or any neurological symptom or signs.

2- Coma continuing after resuscitation, (i.e. GCS <8).

3- Deterioration of conscious level or new neurological signs.
4- Persistence of confusion or any neurological signs for more than 6 hours with or without skull fracture.

5- Compound or open depressed fractures of the vault of the skull.

6- Leakage of CSF, mastoid hematoma or penetrating injuries; e.g. bullets.
X-ray skull showing multiple linear fractures.
Computed tomography

CT scanning is available in certain centers; however the interpretation of the film should be done by a neurosurgeon.
**Computed tomography**

**Indication of CT in head injury:**
- GCS < 15 at any point since injury.
- GCS < 13 at two hours after injury.
- Suspected open or depressed skull fracture.
- Any sign of basal skull fracture.
- More than one episode of vomiting in patients > 12 years.
- Amnesia > 30 min before accident.
- Focal neurological defect.
Extradural Hematoma

Shift of mid-line structures
Extradural Hematoma
Interhospital transfer

If the transfer to another hospital is decided, the following points should be fulfilled:

1- No delay in arranging the transfer.

2- Proper communication with the receiving hospital and with the neurosurgeon accepted the patient there.
3- Insure adequate resuscitation before transfer. Follow the ABCs.

4- Insure adequate preparation for the journey.

5- Establish adequate care during the ambulance journey.

6- Send full documents and keep copies.
Outcome after severe head injury

1- The Important prognostic factors in patients with head injury are:

- Coma Scale score at admission.
- Age.
- Pupillary state.
- Raised intracranial tension.
- The presence or absence of hypoxia or ischemia.
2- About 40% of patients who are in coma after initial resuscitation and beyond 6 hours after injury will die.

3- Prognosis should not be estimated too soon as resuscitation and stabilization may change the patient's condition dramatically.