

Management of Head Injuries

The key aspects in the management of head injury

- *Accurate clinical assessment of neurological and other injuries.*
- *Determination of the pathological process involved.*
- *Changes in the neurological signs indicate a progression or change in the pathological process.*

The management planned programme

- I. Dealing with the life saving priorities.*
- II. Initial evaluation and examination.*
- III. Necessary investigations.*
- IV. Continuing care and observations.*
- V. Possible need for surgery to evacuate an intracranial haematoma.*

I. The life saving priorities: (ABC)

*1. Protection of the **AIRWAY**.*

*2. Maintenance of adequate **BREATHING**.*

*3. **CIRCULATION**.*

*4. **TWO important NOTES:***

*a. Patients are more likely to die from
airway obstruction.*

*b. The presence of shock in a patient with
a head injury is most likely due to **internal
haemorrhage in the thorax or abdomen**.*

*5. **Secure the neck and spine***

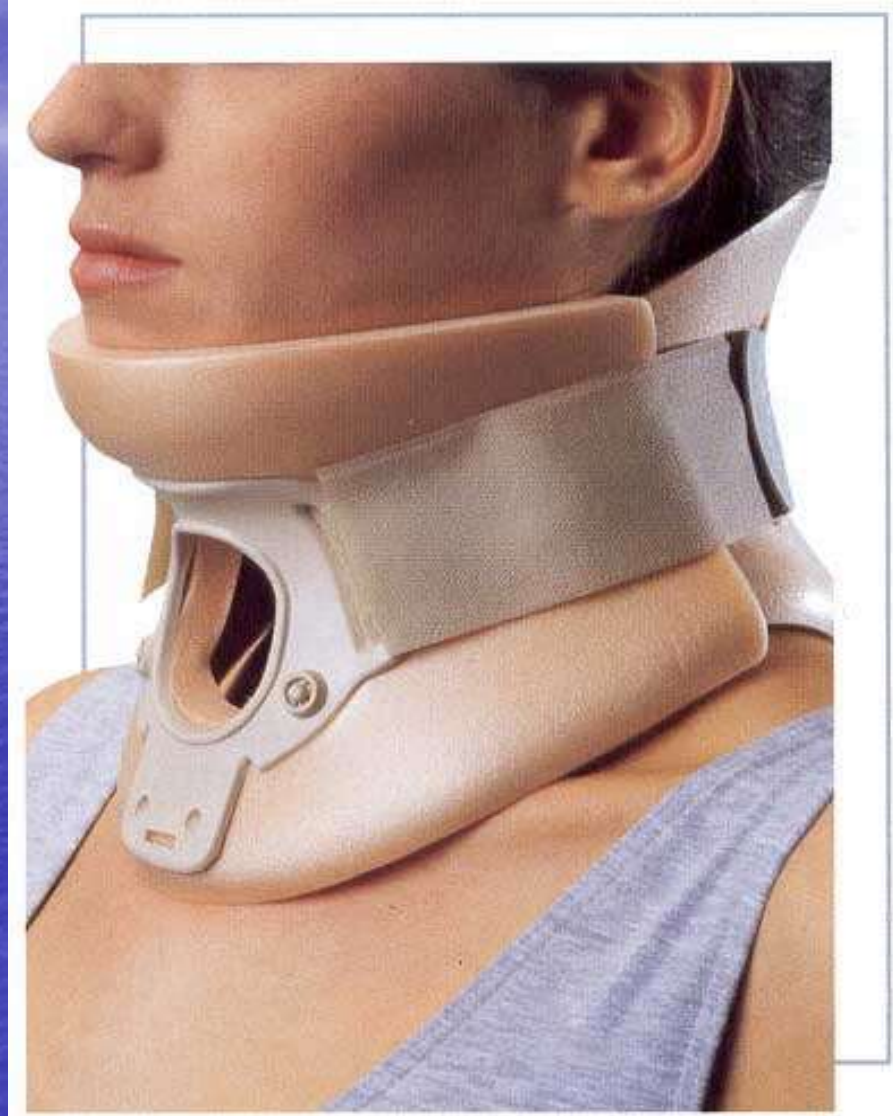
Oropharyngeal Airway



Endotracheal tube



Secure the neck (Rigid Collar)



II. Initial evaluation and examination

A. Important points in the History

B. Initial examination

C. Indications for admission to the hospital

A. Important points in the History

- 1. Period of loss of consciousness.*
- 2. Period of post-traumatic amnesia.*
- 3. Cause, circumstance and mechanism of injury.*
- 4. Presence of headache and vomiting.*
- 5. Seizures.*

B. Initial examination

- 1. Vital signs.*
- 2. Scalp.*
- 3. Skull.*
- 4. Level of Consciousness: by using “The Glasgow Coma Scale”*
- 5. Pupils: size and reaction to light:*
 - a. Immediately dilated pupil: direct trauma of the orbit or the oculomotor nerve.*
 - b. Pupil dilated later : lateralization due to supratentorial haematoma.*
- 6. Limbs: for any fracture or vascular injury.*
 - ❖ Hemiplegia in the acute phase is more likely due to primary cerebral injury rather than due to a compressing intracranial haematoma.*
- 7. Chest: fractured ribs, pneumothorax or haemothorax.*
- 8. Abdomen: internal haemorrhage or peritonitis.*
- 9. Back: fractures or dislocations.*

Inequality of Pupils



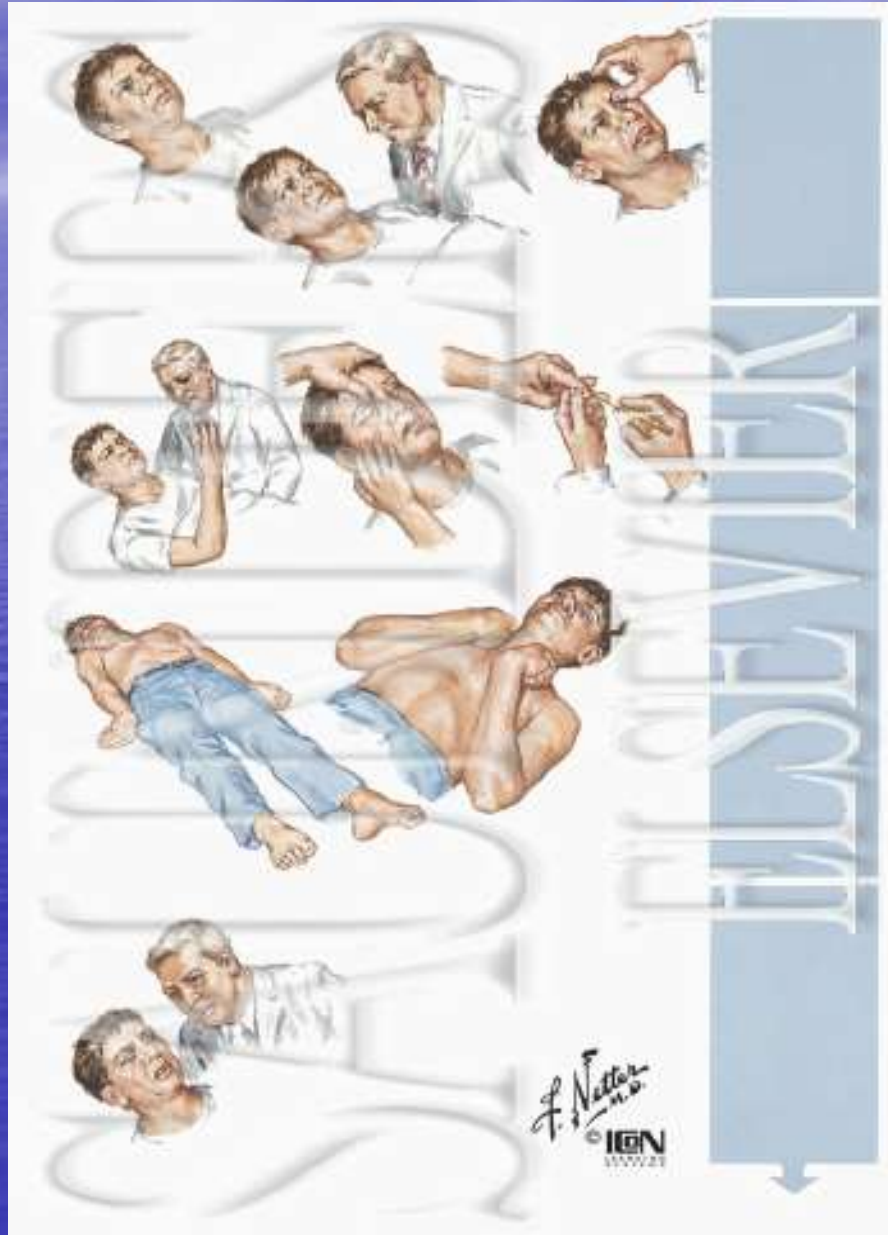
“The Glasgow Coma Scale”

<i>Points</i>	<i>Best Eye Opening</i>	<i>Best Verbal Response</i>	<i>Best Motor Response</i>
<i>6</i>	<i>-</i>	<i>-</i>	<i>Obeys</i>
<i>5</i>	<i>-</i>	<i>Oriented</i>	<i>Localizes pain</i>
<i>4</i>	<i>Spontaneous</i>	<i>Confused conversation</i>	<i>Withdraws to pain</i>
<i>3</i>	<i>To speech</i>	<i>Inappropriate words</i>	<i>Abnormal flexion (decorticate)</i>
<i>2</i>	<i>To pain</i>	<i>Incomprehensible sounds</i>	<i>Extension response (decerebrate)</i>
<i>1</i>	<i>Nil</i>	<i>Nil</i>	<i>Nil</i>

“The Glasgow Coma Scale”

- *Mild (13-15).*
- *Moderate (9-12).*
- *Sever (score of 8 or less).*

“The Glasgow Coma Scale”



C. Indications for admission to the hospital

- 1. Any depression of level of consciousness (or any history of loss of consciousness for more than 5 minutes).***
- 2. Skull fracture.***
- 3. Focal neurological sign.***
- 4. Persistent headache or vomiting.***
- 5. Patients who are difficult to assess - for example, those who are also intoxicated.***
- 6. Concomitant diseases or medications that pose increased risk (for example, coagulopathies and anticoagulants).***
- 7. Absence of responsible relatives who can observe the patient for the first 24 hours.***

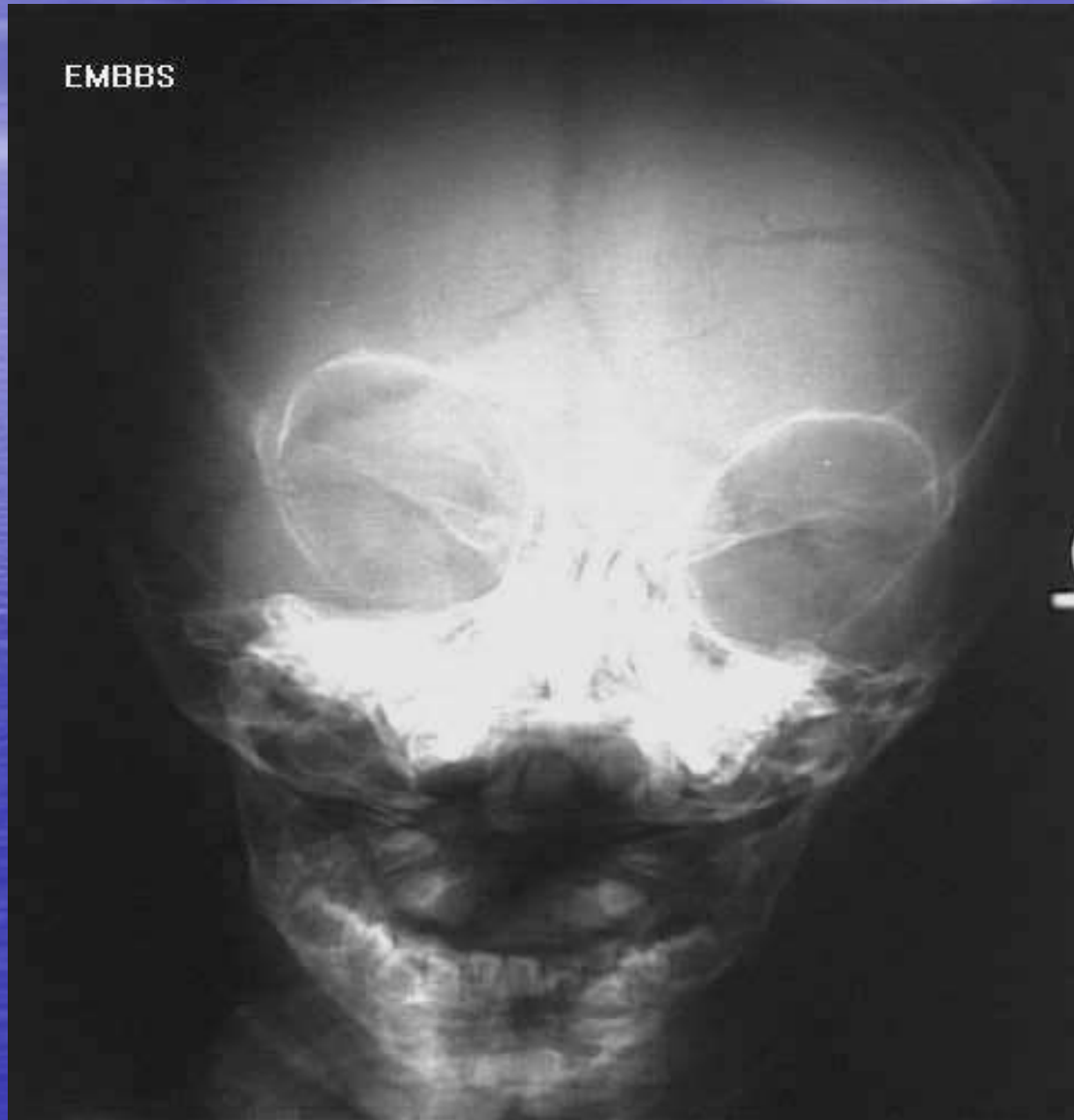
III. INVESTIGATIONS

- *a. Plain skull x-ray:*
- *b. Cervical spinal x-ray*
- *c. CT scan*

a. Plain skull x-ray

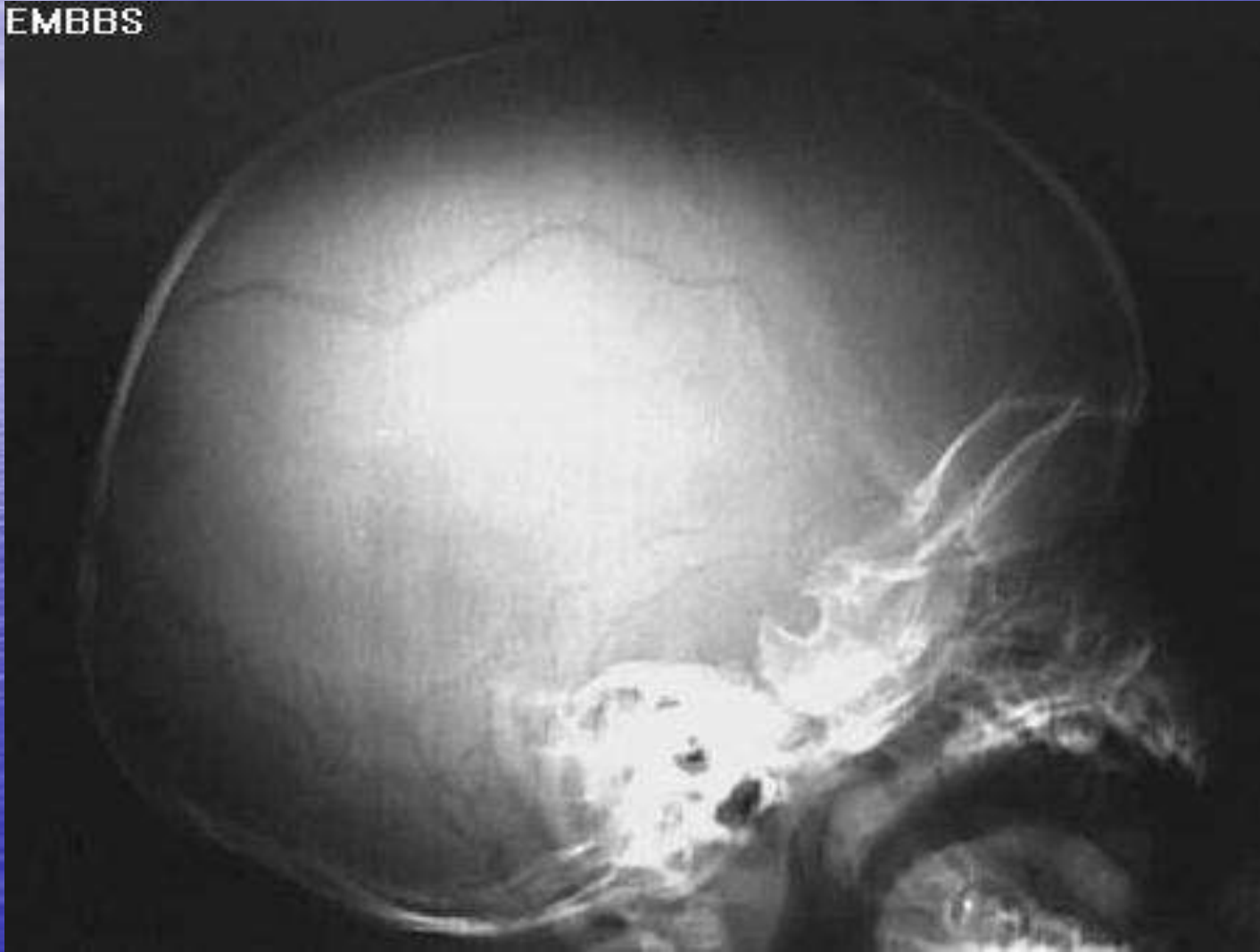
- *1. Can demonstrate the site and type of a skull fracture.*
- *2. A foreign body can also be seen.*

Skull Fracture



Skull Fracture

EMBBS



Indications for skull x-ray in head injury

- 1. Impaired consciousness or neurological signs.*
- 2. History of loss of consciousness, amnesia, or fits.*
- 3. High speed injury or suspected penetrating injury.*
- 4. Scalp laceration to bone, large haematoma, or suspected fracture on palpation.*
- 5. Persisting vomiting or headache.*
- 6. Loss of cerebrospinal fluid or blood from ear or nose.*
- 7. Difficulty in assessing the patient (children, drug or alcohol intoxication).*

b. Cervical spinal x-ray

- *To exclude fracture or dislocation of spines*

c. CT scan

- *Done immediately and sometimes need to be repeated.*

Indications for immediate CT scan in head injury

- 1. Persistent coma after resuscitation.*
- 2. There is neurological deterioration.*
- 3. There are focal neurological signs.*
- 4. Skull fracture if associated with impaired consciousness, fits or neurological symptoms or signs.*
- 5. Open skull fractures (including clinical evidence of base of skull fractures).*
- 6. Associated injuries are present.*

Indications to repeat CT scanning

- 1. Delayed deterioration in the mental state.*
- 2. A persistent rise in intracranial pressure (ICP).*
- 3. Failure to improve over 24 hours.*

IV. Continuing Care and Observations

❖ The aims of conservative treatment are:

- 1. To give the patient the maximum care until spontaneous recovery occurs.*
- 2. To detect at the earliest possible moment the development of complications that may need surgical interference.*

a. Continuous care

- 1. Attention to the airway.*
- 2. A Foley's catheter: to facilitate the nursing care and to estimate the urine output.*
- 3. Frequent change of posture to avoid bed sores.*
- 4. Physiotherapy of the joints and massage to the muscles.*
- 5. Intravenous isotonic maintenance fluids should be given (crystalloids) until nasogastric feeding.*
- 6. Nasogastric tube feeding.*

a. Continuous care

7. Measures to decrease the intracranial pressure, pay good attention to the following points:

- Before Mannitol is given it is essential to exclude an intracranial haematoma and to check that the renal function is satisfactory.*
- As Mannitol reduces normal brain volume, it will increase the size of extradural haematoma and so it will increase the mass effect.*
- Corticosteroids: there is no clear evidence that they reduce the cerebral oedema, or improve the outcome in patients with severe head injury.*

b. Repeated observations

- 1. Level of consciousness using the Glasgow Coma Scale.*
- 2. Pulse, blood pressure, and temperature.*
- 3. Respiration.*
- 4. Pupils.*
- 5. Reflexes.*

*c. Causes of **DETERIORATION** of the patient:*

- 1. BRAIN OEDEMA .*
- 2. Airway obstruction and/or hypoventilation leading to brain swelling .*
- 3. Intracranial haematoma.*
- 4. FEVER due to respiratory infection or meningitis.*
- 5. Overtransfusion by hypotonic fluid or dehydration.*
- 6. Epilepsy*

V. Surgery to evacuate an acute intracranial haematoma

- *Once the clinical picture of the patient deteriorates, the possibility of an intracranial haematoma is raised and it is so important to exclude or verify this because surgical interference at this stage can save the patient, otherwise progressive deterioration and fatal herniation of the cerebellar tonsils and medulla through the foramen magnum will occur.*

Delayed Effects Of Head Injury

- 1. Post-traumatic epilepsy.*
- 2. Cerebrospinal fluid (CSF) fistula.*
- 3. Post-concussion syndrome: is a complex of symptoms persisting months after head injury and consist of various combinations of headache, irritability, depression, lassitude and vertigo.*
- 4. Cumulative brain damage.*
- 5. Neurological and neuropsychological deficits.*
- 6. Neuroendocrine and metabolic disorders.*

Head injury - DON'T FORGET

- *Changes in the Glasgow coma score are often of more importance than the absolute score - monitor regularly.*
- *Beware associated injuries - manage severe head injuries as multiply injured patients until other injuries are excluded.*
- *Stabilize the neck.*
- *Beware intoxication with alcohol or drugs.*
- *Record keeping beyond reproach.*
- *If in doubt, ADMIT.*

THANK

YOU