South East of Scotland
Major Trauma Centre Training and Education

SCOTTISH TRAUMA NETWORK SOUTH EAST

ICU Trauma
Head Trauma – Intracranial pressure

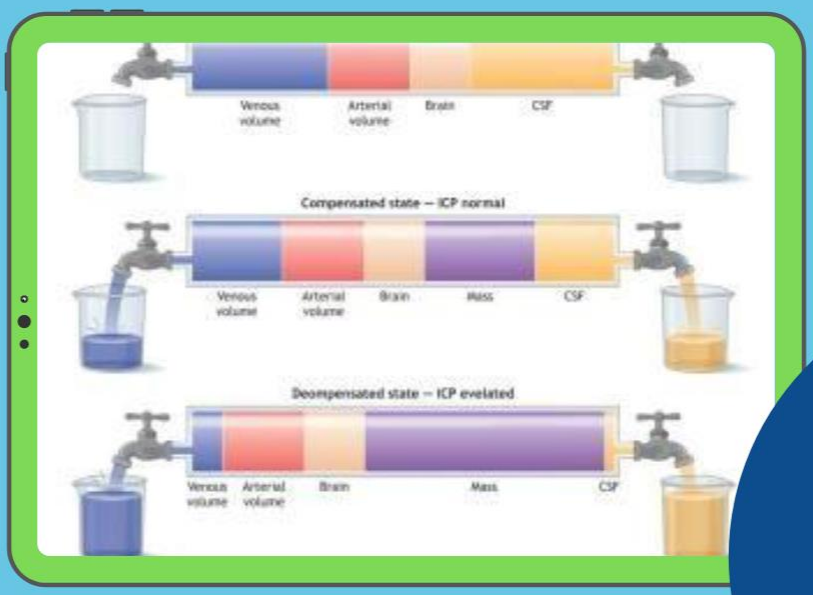
Intracranial Pressure (ICP) is normally– between 7mmHg – 15 mmHg in resting adult

Raised ICP >20mmHg due to head injury can cause brain to be squashed and intracranial structures to be damaged

Can lead to cerebral hypoperfusion, brain herniation and death

Monro-Kellie hypothesis

- Cranial compartment is a rigid container with fixed a volume
- Contents of skull (brain, blood, CFS) exist in state of equilibrium – when increase in volume of one component, there must be decrease in volume of another component



Damage from TBI is described as FOCAL or DIFFUSE

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Focal Injuries

- Often a result of direct force to the head. Symptoms are related to the area of the brain which has been damaged

Injuries include:

Cerebral contusion:
Bruising of the brain tissue – contact of the brain with the inside of the skull

Cerebral laceration:
When pia matter and arachnoid matter are torn

Epidural haemorrhage:
Bleeding between skull and dura mater

Subdural haemorrhage:
Bleeding between dura mater and arachnoid mater

Subarachnoid haemorrhage:
Bleeding between arachnoid mater and pia mater

Intracerebral haemorrhage:
Bleeding into brain tissue

Intraventricular haemorrhage:
Bleeding into ventricles

Diffuse Injuries

DIFFUSE BRAIN INJURIES:

- Hypoxia and vascular brain damage

In a trauma patient, diffuse injuries can be a result of acceleration, deceleration or rotational forces. For example a diffuse axonal injury occurs when the brain rapidly shifts inside the skull. The long connecting fibres (axons) are sheared as the brain rapidly accelerates and ecelerates inside the hard bone of the skull.

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