

MANAGEMENT OF EXTERNAL VENTRICULAR DRAINAGE SYSTEM

EXTERNAL VENTRICULAR DRAINAGE (EVDs)

EVD - Temporary intervention that allows excessive CSF to drain from lateral ventricles.



CONSIDER:- MUNRO- KELLIE HYPOTHESIS

- (blood/brain/CSF)
- ICP is effected by changes in volume of CSF
 - Change in the rate of production
 - Change in the rate of absorption
 - Obstruction to the flow

production = absorption

All above can cause increased ICP and are indications for external ventricular drainage.

There is approx
150mls of
circulating CSF
at any one time



There is only
(approx) 25mls
of CSF in the
ventricles at
any one time

Important facts to remember

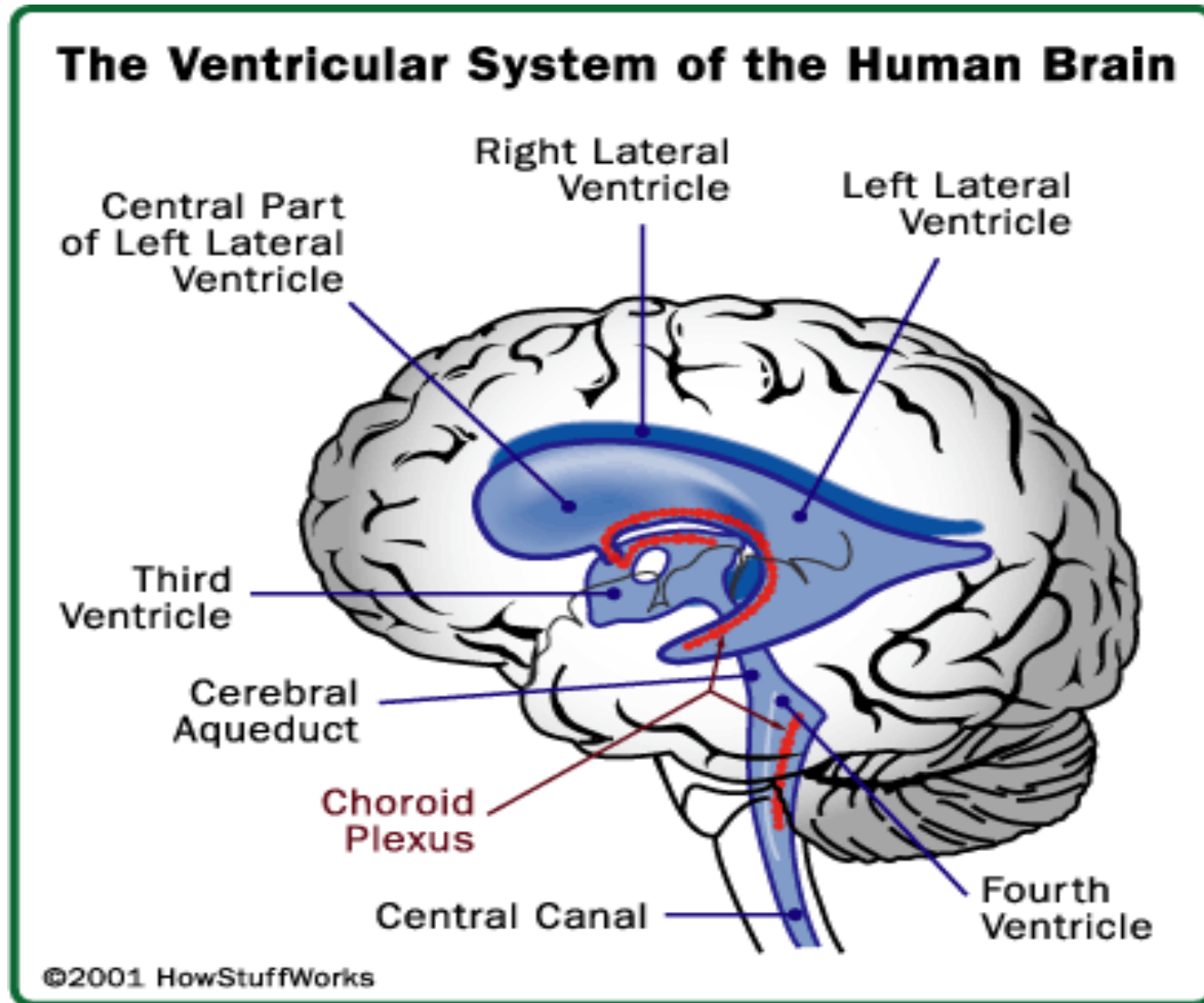
In a normal healthy adult there is.....

Normal ICP
is 7 –
15mmHg in
the horizontal
position

Signs of raised ICP

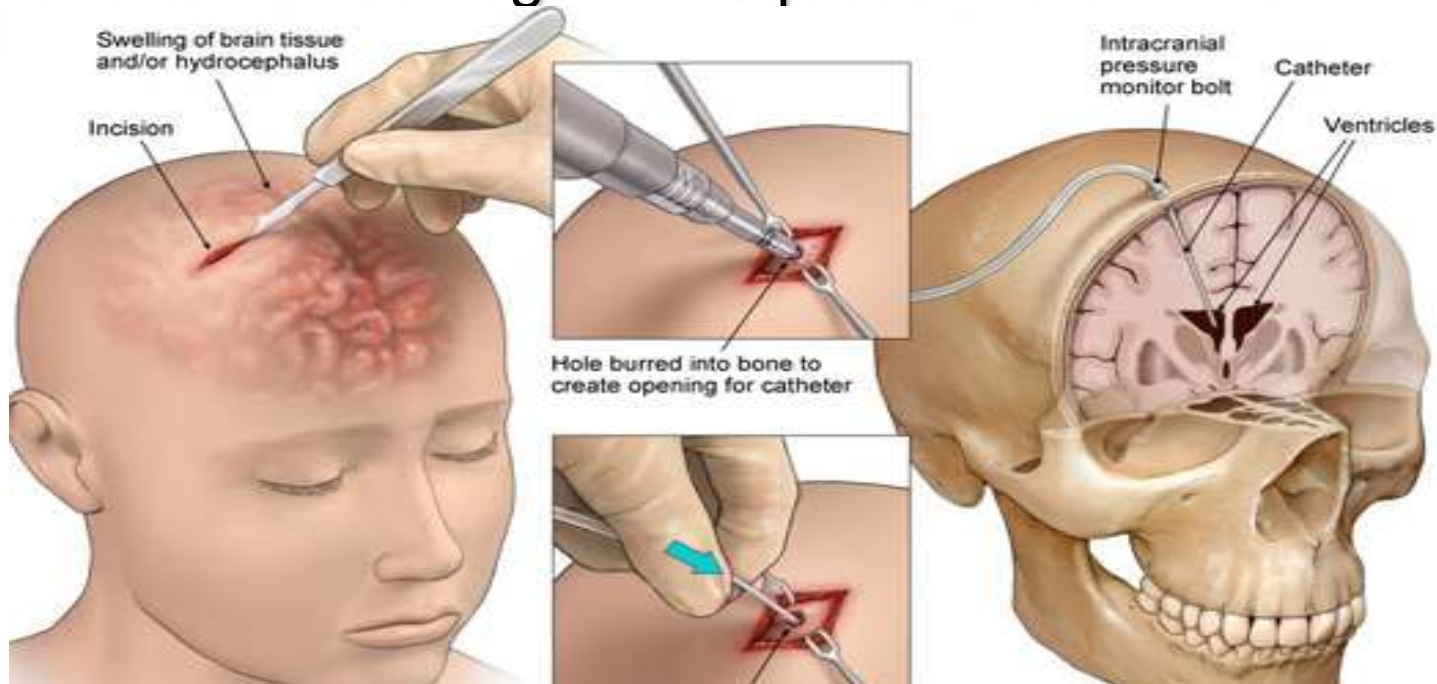
- Vomiting
- Persistent headache
- Visual disturbance
- Respiratory changes
- Hypertension / Bradycardia
- Decreasing GCS or new focal sign
- Seizure activity

THE VENTRICULAR SYSTEM



INSERTION.

- In theatre under sterile conditions by a neurosurgeon.
- Site- 11cm from bridge of nose, 3cm from midline over non dominant hemisphere (Kocher's point)
- Soft catheter inserted into one of the lateral ventricles using a guidewire and through a drilled burrhole.
- In NHS Lothian (DCN) VADs are used – principles are the same but VADs have the advantage of staying in place under the skin to be used again if required in the future.



Reasons for insertion-

Acute hydrocephalus- (as result of either excess production, malabsorbtion or blockage of the flow of CSF.)

Meningitis/encephalitis- Malabsorption of CSF.

Tumour- Compression/blockage of ventricle

Closed head injury – Increased ICP.

Subarachnoid haemorrhage – Malabsorbtion of CSF.

Shunt Malfunction – Infection, blockage,

Getting to know the drain

CARE OF PATIENT WITH EVD

- Check drain and connections are secure.
- Drain should be suspended/ attached to the IV stand by the clamp & adjustable cord. (no other IVs on same stand).
- The amount of drainage depends on gravity – the level of the drain and chamber will determine the amount drained

SAFETY

- ❖ Zero point should equate to the location of the foramen of Munro which is equal to the external auditory meatus (EAM) *****use the spirit level*****
- ❖ Adjust to prescribed level – this creates a pressure gradient and a safety valve.
- ❖ The height of the chamber equates to the ICP – this is the pressure that must be reached before CSF drains.
- ❖ The position of the drain must be maintained if patient's position is changed.

- ❖ Turn off drain if moving patient and re-zero before re – commencing drainage.
- ❖ CSF sampling should be carried out ONLY by trained competent practitioners.
- ❖ Drug administration is ONLY carried out by senior Drs trained and deemed competent and listed on [NHS Lothians Intrathecal Register](#)
- ❖ Drainage systems should be fully changed every 72hours by competent practitioners

OBSERVATIONS

Neurological Assessment

- Vital signs and GCS following insertion,
 - 30mins for 2hrs,
 - 1hrly for 4 hours,
 - 2hrly for 6 hrs
 - 4hourly thereafter,
 - any change in neurological assessment then restart cycle.

Drain Checks

- **Hourly observation of**
 - CSF volume recordings – volume, colour
 - Hourly patency checks - document patency
 - Catheter entry site checks – occlusive dressing should be left intact and only changed if loose or badly soiled.
- Drainage bags changed when $\frac{3}{4}$ full using aseptic technique

COMPLICATIONS

- **Drainage inadequate** due to drain being set too high, tubing kinked, dislodged, blocked or clamped.
- **Excessive drainage** of CSF if drain is set too low, patient changing position, unmonitored drain – leading too collapse of ventricles and potential subdural haemorrhage.
- **Infection** – closed system must be maintained and local / systemic sepsis observed for. (signs of meningitis)