EVD and ICP Monitor at the Bedside

Parts of the drain, leveling and zeroing, drain height, draining vs monitoring, hourly checks, moves and alarms

ICU Basics
icubasics.com · checked Nov 2026

WHAT YOU WILL DO

- Check the whole system at the start of the shift: catheter to bag, every clamp and stopcock, the ordered height.
- Level and zero the transducer, and keep the drip chamber at the ordered height.
- Each hour: ICP, CPP, waveform, CSF amount and color, dressing, neuro exam and pupils.
- Clamp before any move, re-level, then reopen as ordered.
- Keep the system closed and sterile; report changes early.

PARTS OF THE SYSTEM

PART	WHAT IT DOES
Ventricular catheter	Sits in a lateral ventricle; carries CSF out and pressure to the transducer
Drip chamber on a pressure scale	CSF drips in only when ICP is higher than the chamber height (cm H_2O)
Collection bag	Holds drained CSF; empty it with sterile technique per policy
Transducer	Turns CSF pressure into the ICP number and waveform
Stopcocks and clamps	Open or close the path to drainage, the transducer and the sampling port
Intraparenchymal monitor (bolt)	Sensor in brain tissue: measures ICP, cannot drain, cannot be re-zeroed

LEVEL, ZERO AND SET THE HEIGHT

1. Find the zero point: the tragus or external auditory meatus (a stand-in for the foramen of Monro), as your unit standard says.
2. Use a laser level or carpenter level to line up the transducer zero and the scale zero with that point.
3. Zero: close the transducer to the patient, open it to air, press zero, then close it to air and confirm the waveform returns.
4. Set the drip chamber at the ordered height in cm H_2O above zero.
5. Re-level after every position or bed-height change and at least each shift.

EXAM TIP Drain height is in cm H_2O; ICP is in mm Hg. 1 mm Hg = 1.36 cm H_2O, so a drain at 15 cm H_2O opens at about 11 mm Hg.

DRAINING VS MONITORING VS CLAMPED

Stopcock designs differ: learn which way your brand turns before the first shift.

POSITION	CSF DRAINS?	ICP NUMBER
Open to drain	Yes, above the set height	Not accurate: it mostly reflects chamber height
Closed to drain, open to transducer	No	Accurate ICP and waveform
Clamped for a move	No	Per your setup; watch the patient

To read ICP on an open drain, close it to drainage, let the number settle, record it, then reopen as ordered.

HOURLY CHECKS AND TARGETS

ICP and CPP thresholds: Brain Trauma Foundation 4th ed. Your orders set the triggers.

CHECK	LOOK FOR
ICP	Adult normal up to about 15 mm Hg lying flat; severe TBI: treat above 22
CPP = MAP – ICP	Severe TBI target 60–70 mm Hg
Waveform	P1 > P2 > P3; P2 above P1 means poor compliance
CSF output	Volume this hour; empty chamber to bag as policy says
CSF color	Clear or the expected tint; any new change
Dressing and line	Dry, intact, no leak, no kinks, all caps on
Neuro exam	GCS, pupils, new weakness

SAFETY Clamp before the head of bed moves, the patient turns or sits up, or transport. An open drain left too low can overdrain in seconds; a forgotten clamp lets ICP climb.

CALL FOR HELP WHEN

- No CSF output plus a flat or damped waveform when the drain should be open.
- Sudden high output, or output above your ordered limit.
- New cloudy, bloody or bright-red CSF.
- ICP above the ordered threshold, or CPP below goal.
- Waveform lost, or P2 newly above P1.
- New pupil change or GCS drop.
- Leak, wet dressing, disconnection or a dislodged catheter: clamp, cover sterilely, call now.

CHECK YOUR UNIT POLICY

Check your unit's policy for the zero landmark, how long to clamp before reading ICP, who may flush or sample, dressing and bag-change intervals, output and ICP triggers, and whether the arterial transducer sits at the tragus or the phlebostatic axis for CPP.

Sources (6) are listed with links at icubasics.com/sheets/evd-icp-setup.html. For education and exam preparation only. Not medical advice; follow current guidelines and your institution's protocols. ICU Basics is an independent study aid not affiliated with any certifying body.