

## Monitoring Intracranial Pressure (ICP)

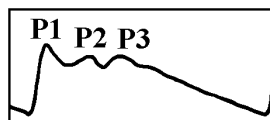
Level the drainage bag from the cm. mark ordered by the physician to the external acoustic meatus. Avoid stimulating the patient before recording an ICP reading. Correlate ICP increases with the patient's clinical condition and with any activity taking place around him. The trend of ICP measurements over time is an important indication of the underlying status of the patient. During nursing interventions the ICP should not rise above 25 mmHg and should return to baseline levels within 5 minutes. When compensatory mechanisms have been exhausted, the rise in ICP may be more dramatic and take longer to return to normal.

Normal intracranial pressure 0 to 15 mmHg

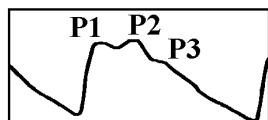
Intracranial hypertension >15 mmHg

Malignant intracranial hypertension >20 mmHg for 15 minutes

Keep ICP <20 mmHg



Normal Compliance



Poor Compliance

## Components of a normal ICP Waveform

P1 the percussion wave

Reflects the ejection of blood from the heart transmitted through the choroid plexus in the ventricles.

P2 the tidal wave

Reflects the venous compartment.

P3 the dicrotic wave

Reflects aortic valve closure.

When P2 is greater than P1 the brain has poor compliance.

How to calculate cerebral perfusion pressure

Mean arterial pressure (MAP) - Intracranial pressure (ICP)

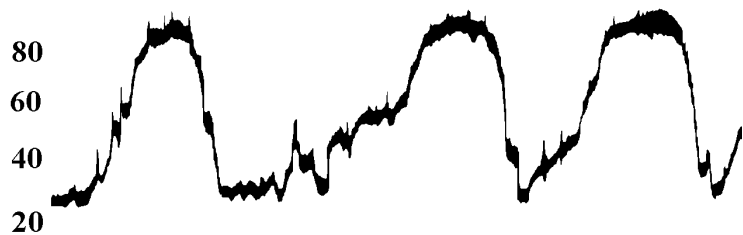
= Cerebral perfusion pressure (CPP)

Goal of therapy >70 mmHg

<=50 mmHg mild ischemia

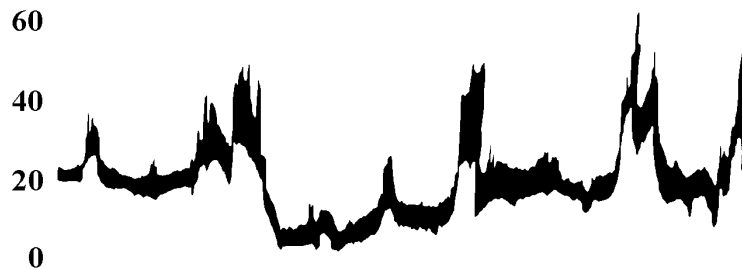
<=30mmHg irreversible ischemia

Cerebral perfusion pressure is a parameter used to monitor the adequacy of blood flow to the brain.



## A Waves

Commonly called plateau waves because of their shape. A Waves may reach an amplitude of 50 to 100 mmHg and last for 5 to 20 minutes. A waves may increase in amplitude and frequency, reflecting cerebral ischemia and brain damage that can occur before signs and symptoms of raised ICP are seen clinically. When they drop suddenly it indicates exhaustion of the compliance mechanisms.



## B Waves

Sharp and rhythmic, with sawtooth pattern, B waves, may occur as frequently as every 1 1/2 to 2 minutes and may reach an amplitude of 50 mmHg. B waves may precede the appearance of A waves. B waves indicate decreased intracranial compliance.



## C Waves

Rapid sharp and rhythmic, but not as sharp as B waves. They usually occur every 4 to 8 minutes and have amplitude of about 20 mmHg. They appear to be related to rhythmic variations of the systemic arterial blood pressure and respirations.