

the bolt is not adjusted by anyone except the neurosurgeon who placed the device.

### **Nursing Alert**

If the external ventricular drain is unclamped for CSF drainage, carefully monitor the level of the collection container. If the container is too low, improper CSF decompression could lower ICP too rapidly, causing bleeding and pain.

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With the bolt method, the bolt is stabilized with dressings, and these are not changed or disturbed, even to check the site.

An epidural sensor can be placed between the dura and the skull through a burr hole and connected to a stopcock assembly and transducer, which provides a readout of the pressure. Although less invasive, ICP measurements may be inconsistent. In infants, a fontanel transducer can be used to detect impulses from a pressure sensor and convert them to electrical energy. The electrical energy is then converted to visible waves or numeric readings on an oscilloscope. ICP measurement from the anterior fontanel is noninvasive but may prove to be inaccurate if the equipment is poorly placed or inconsistently recalibrated.

ICP can be increased by direct instillation of solutions; therefore, antibiotics are administered systemically if a positive CSF culture is obtained. However, ICP monitoring rarely causes infection. CSF is a body fluid; therefore, standard precautions are implemented according to hospital policy (see [Chapter 20](#)).

Nurses caring for patients with intracranial monitoring devices must be acquainted with the system, assist with insertion, interpret the monitor readings, and be able to distinguish between danger signals and mechanical dysfunction. Because systematic blood pressure, ICP, and therefore cerebral perfusion pressure (CPP) are normally lower in children, the child's age must be taken into account when deciding what constitutes abnormally high ICP or abnormally low CPP.

Several medical measures are available to treat increased ICP resulting from cerebral edema. These include sedation, CSF