

## Increased Intracranial Pressure (ICP)

There are three main components of the brain: blood, cerebral spinal fluid [CSF] and the nerves/brain matter. They are enclosed by the cranium [skull], which provides protection and support for these components. The disadvantage of the cranium is that there is no room for expansion of it's contents.

General sources for an increased volume of one of the major components and therefore increased intracranial pressure include:

- Edema [swelling from trauma or metabolic problems] *increased interstitial fluid volume*
- Tumors- *increased tissue volume*
- Hydrocephalus- *increased CSF volume*
- Hemorrhage or vasodilation - *increased blood volume.*

An increase in one component will force a decrease in the others. For example, a tumor increases the brain matter causing compression of the other components, ie. decreased blood flow or obstruction of the ventricles impeding production or drainage of the CSF, which in turn causes an increase in the pressure within the brain. If the body is not able to compensate for this increase in volume the brain will herniate [push through] the opening in the back of the skull known as the foramen magnum, where the spinal cord is attached. Sudden herniation through the foramen magnum can be fatal if not recognized and treated promptly.

Since there are so many different causes of increased intracranial pressure and you may have cases that involve this issue, we thought it would be helpful to discuss the early and late signs and symptoms of increased intracranial pressure.

**Early signs and symptoms of increased ICP** include:

- Changes in level of consciousness: restlessness, irritability, personality changes, mild confusion, agitation, lower Glasgow Coma Score (GCS)
- Pupil: oval shaped pupil, delayed or sluggish reactivity, change in pupil size on one side
- Vision: blurred, double vision, decreased acuity
- Motor: ptosis [drooped eyelid shows weakness of muscles around eye], pronator drift [shows weakness of arms], decreased grasp, paresis [paralysis]
- Sensory: decreased response to touch or pinprick.
- Headache: early morning with nausea/vomiting
- Speech: slow or slurred
- Memory: slightly impaired
- Appearance of cranial incision: postoperative bulging or swelling
- Vital signs: no change
- Cranial nerves: may or may not show changes initially
- Seizure activity: may or may not occur depending on the cause.

**Late signs and symptoms of increased ICP** include:

- Level of consciousness: difficult to arouse, requires more stimulation, any decrease in the Glasgow Coma Scale.
- Pupils: enlarging pupil on one side, progressing to fixed, dilated "blown pupil," papilledema [swelling of optic nerve], later both pupils become fixed and dilated.
- Motor: weakness, abnormal posturing, flaccid muscles.
- Sensory: may only respond to painful stimuli.
- Headache: worsening with projectile vomiting.
- Speech: may only groan/moan to painful stimuli
- Respiratory: irregular respirations, Cheyne-Stokes pattern progressing to central neurogenic hyperventilation and respiratory arrest.

- Vital signs: rising systolic blood pressure with widening pulse pressure, bradycardia [slow heart rate] followed by tachycardia [rapid heart rate], temperature changes as hypothalamus is compressed, Cushing's response as the pituitary gland is compressed
- Cranial nerves: related to the area of swelling or lesion affecting brainstem reflexes [corneal and gag reflexes]
- Abnormal reflexes: Babinski sign [big toe points to head when bottom of foot is stroked].

Source: *Medical Legal Quick Tips* by Med League Support Services ♦

### TinyTimer: A Timer Program

As a legal professional it is imperative that you keep track of your time for billing purposes. There are many ways to do this and many of you will have a system in place that works for you. Or perhaps you have a built in timer on a software package that your firm uses. If not, you may find TinyTimer just what you need. TinyTimer is a simple freeware program that you can download. It sits on the bottom of your computer on the taskbar, ready for you to open it whenever you need to track your time. All you need to do is open it, click on start and stop for each timed task. ♦

### Legal Nurse Consulting Certification

If you are like most busy law firms, you probably receive information from nurses monthly wanting to help you with your medical cases and you may be wondering how to differentiate one from another. While it is the nurse's experience you are seeking, it is important that they understand legal concepts and how to synthesize complex information, etc. One way to differentiate these nurse consultants is by certification. To obtain the credentials of a Certified Legal Nurse Consultant one must successfully complete a nationally recognized training program developed by the Medical-Legal Consulting Institute, Inc. and master a complex body of specialized knowledge. A written exam is then given to validate the nurses knowledge of legal nurse consulting. The certification is maintained by attending 15 hours of medical-legal related continuing education per year. ***Knowing that your nurse consultant has been certified, gives you the peace of mind that they have demonstrated a level of proficiency and a commitment to continuing education in this specialized field.*** ♦

***Quotable:*** "Courage is not the absence of fear but the mastery of it."

~ Anonymous



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