

2005-242 Noninvasive Intracranial Pressure Assessment

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Technology description

BACKGROUND

Intracranial pressure (ICP) is the pressure exerted by cerebral spinal fluid in the cranium. Elevated ICP can lead to hypertension and respiratory changes, among other things. Established means of measuring ICP rely on invasive, direct procedures that provide access to intracranial space. Despite the invasiveness, monitoring ICP has proven to be beneficial in the outcomes of brain injury patients. There are many other neurological applications that could benefit from ICP measurements as well, but the invasiveness of the procedure severely limits its use. Although a few non-invasive techniques exist for measuring ICP, they are not widely accepted. Thus there is still a need for a clinically useful, non-invasive approach to monitoring ICP.

INNOVATION

Researchers at UCLA have developed a novel, non-invasive protocol for the measurement of ICP. It makes use of current transcranial Doppler (TCD) devices to measure cerebral blood flow velocity (CBFV). CBF information is gathered and used in conjunction with a database and proprietary algorithm to assess ICP, non-invasively. The algorithm used in the invention improves upon current non-invasive ICP protocols and can potentially complement them as well. Advantageously, existing manufacturing processes for TCD equipment do not need to be altered. A TCD device is simply outfitted with the invention and ultimately can be deployed anywhere. Since CBF labs routinely use TCD machines to measure CBFV, this invention will allow these labs to easily assess ICP. The invention has already been tested and the results compared to other published algorithms for non-invasive ICP assessment. The comparison highly favors the current invention.

Application area

- The invention can be used to non-invasively measure ICP.
- A broader patient community can benefit from ICP information since it can be obtained without invasive surgery.
- The invention can be incorporated into current TCD devices.

Advantages

- A robust system for taking non-invasive ICP measurements has been developed.
- The invention makes use of cerebral blood flow information that is routinely collected with TCD machines.
- Whereas other non-invasive ICP protocols incorporate devices that have not been clinically accepted, TCD machines have been accepted and only need to be retrofitted in order to assess non-invasive ICP.
- The invention improves upon current algorithms used in existing non-invasive ICP methods.

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