

Background – The Need

One of the primary goals in treating brain injured patients in the ICU is to prevent a “secondary insult” to the brain, a second blow to the brain that occurs many times hours to days following the initial damage. Such secondary assault can terminate many times in fatal injury to the brain. Early detection of neurological deterioration is a key point for such prevention, and body & brain monitoring is a critical part in the treatment process of brain injuries.

Pupillary reflex assessment is a fundamental and crucial part of brain injury monitoring and neurological examination.

The pupillary examination is a direct indication of brain stem condition and provides an important diagnostic tool for evaluating its function. Currently, PLR is assessed manually by a hospital staff member, requiring a significant amount of time and effort without achieving optimal accuracy.

The manual pupillary assessment is subject to inaccuracies & inconsistencies and is affected by significant interobserver variability. Assessing pupillary activity in unconscious patients is a complex & a time consuming task. It requires the nurse to open each eyelid and perform the measurements, making it a labor-intensive assessment, which is only performed at routine visits once every hour.

As a result, it is not continuously monitored and changes in pupil size are not detected as they occur, despite immediate medical intervention being critical to patient survival and neurological outcome.

The Need is for a real time, continuous & automatic pupillary reflex monitoring for assessing neurological status of unconscious, patients in Traumatic Brain Injury (TBI), Stroke and Brain Surgery cases.