

## The Impact of Increased Intracranial Pressure on Pupillometry: A Replication Study

*Sameer Al-Obaidi, BDS MPH, Folefac Atem, PhD, Sonja Stutzman, PhD,  
and DaiWaiM. Olson, PhDRN*

University of Texas Southwestern Medical Center, O'Donnell Brain Institute

### Introduction

Pupillometry assessment of the pupillary light reflex (PLR) is gradually replacing manual PLR assessment. This new technology has led to a recent increase in clinical research and subsequent need to validate those results. McNett et al. recently investigated the association between intracranial pressure (ICP) and serial pupillometer values and found that pupillometry readings are different significantly in the setting of increased ICP. This is a replication of the McNett study in a larger multicenter cohort to explore these findings.

### Methods

Data from the Establishing Normative Data for Pupillometer Assessments in Neuroscience Intensive Care (END-PANIC) Registry include over 3,000 patients with a neurological condition. 273 subjects with documented ICP readings provided 16,221 observations (daily mean ICP values) which were included in this analysis. Statistical analysis (SAS v9.4) included descriptive statistics and to examine the differences (t test) among various PLR metrics across ICP readings (ICP

### Results

Subject mean age was 53 years, 52% were female and 76.6% were Caucasian. Student t-test analysis was used to explore for differences. Excepting latency and right eye NPi, lower PLR values were associated with higher ICP (compared to low or normal ICP) for all mean pupillometer/PLR variables for both left and right eyes (t range [-9.78 to 33.67]; p-value range [

### Conclusions

The findings confirm and extend those of McNett. Patients with increased ICP tend to have lower pupillometer readings. Automated pupillometer is a non-invasive method that provides prediction of the ICP trends which can help neurocritical care professionals in assessing patients with neurological conditions.