

## Real-Time Autoregulation\* Monitor – Preclinical Study

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**Introduction:** Cerebral Autoregulation (CA) refers to the mechanism that maintains constant Cerebral Blood Flow (CBF) in view of changes in Mean Arterial Pressure (MAP). CA may be compromised by certain disease states of the brain, ranging from impairment to non-function, leaving the brain unprotected against potentially harmful effects of blood pressure (BP) changes. Real-time assessment of CA mechanism functionality may be critical, as changes in BP when autoregulation is impaired, may lead to adverse outcomes such as cerebral ischemia or hemorrhage. However, till today, no monitor for CA effectiveness exists. We developed a novel device which correlates MAP data with Cerebral Flow Index (CFI) to obtain real-time indication for the autoregulatory state of the patient. We report a preclinical study, testing the ability of a NIR-based monitor to track autoregulation.

**Methods:** Piglets were anesthetized using propofol. MAP was measured using the c-FLOW™ Monitor (Ornim Medical, Israel) via arterial line introduced to the carotid or femoral arteries. CFI was also monitored using the c-FLOW™ Monitor with a non-invasive sensor placed on the animals' forehead. MAP CFI Correlation Index (MCCI) was calculated in real time and presented on the monitor. BP was increased using IV phenylephrine up to a MAP of 180mmHg or double the baseline MAP. BP was decreased using incremental dosage of IV Nitropruside targeting MAP of 30mmHg.

**Results:** MCCI values obtained by c-FLOW™ Monitor for disparate autoregulatory states were statistically different (for low MAP levels the average MCCI was  $0.47 \pm 0.35$ , while for moderate MAP levels MCCI was  $0.23 \pm 0.21$   $p < 0.001$ ), providing evidence that autoregulation and its boundaries were detectable.

**Conclusions:** Results suggest that c-FLOW™ Monitor may be a helpful tool in outlining autoregulation, its reactivity and boundaries. This indicates that the c-FLOW™ Monitor may become a handy tool in clinical practice for individualized management of BP in clinical settings where cerebral autoregulation may be compromised.

*Presented at the NCS 2015 Meeting, October 2015*

*\*The c-FLOW™ Monitor mentioned in this Abstract is not cleared for sale with the Autoregulation indication.*