Partnerships & Innovation | University of Manitoba

TECHNOLOGY LICENCING OPPORTUNITY

Fully Automated and Continuous Derivation of Individualized Intracranial Pressure Targets

Technology Details

University of Manitoba researchers have created a novel software program that fully automated and continuously derives individualized intracranial pressure (iICP) (leveraging processed ICP, Arterial Blood Pressure (ABP) and Cerebral Autoregulation (CA) signals in live time), with a high degree of accuracy over a given data recording period, including curve fit characteristics. The invention provides computational rationale for the CA threshold selection for iICP calculations, based on substantial quantitative analysis. The invention demonstrates the feasibility of the iICP concept with CA metrics other than PRx, providing expanded accessibility to iICP derivation based on end-user preference in CA measure.

Applications

Human Medicine: This innovation is positioned to change the way ICP monitoring and ICP-based intervention is conducted in both health and veterinary sciences. It is the first continuously updating and personalized ICP target/threshold in the literature and will facilitate transition to true personalized medicine in many neurological conditions reliant on ICP monitoring technology (traumatic brain injury, stroke, cerebrovascular disease, etc.). As such, any company in the neuro-monitoring sphere would be interested in acquiring this Intellectual Property.

Technology Benefits

This system solves the following issues related to existing platforms:

1. We are able to derive iICP continuously in a live-time fashion, such that a continuously updating personalized iICP value could be provided at the bedside to guide treatment.
2. The novel concept does not require manual visual inspection of boxplots of the ICP vs. CA metric relationships to identify and report the iICP threshold value. This makes it feasible for live time use in any setting.
3. Unlike other models, our technology does not use a single arbitrary PRx (CA metric) threshold of +2.0 to derive iICP. Our technology uses several other CA metrics, aside from PRx, to derive iICP more accurately.
4. Previous iICP derivation models did not provide a “curve fit” characteristic assessment, with many curves displaying multiple potential iICP points from the ICP vs. PRx relationship but only reporting the first value as the iICP. This leaves a degree of uncertainty, which our technology overcomes with a high degree of accuracy. We have built custom curve fit reporting characteristics for both the function intersection (ie. iICP derivation) and the CA ~ ICP function. These characteristics provide qualitative feedback to the end-user on curve type.

Development Stage

Technology Readiness Level: TRL 6. The novel software program (developed using R) is legally and beneficially owned by the University, including copyright and moral rights as they are defined in the Copyright Act (R.S.C., 1985, c. C-42), Canada.

PRINCIPAL INVENTOR

Dr. Zeiler
Professor | Dept of Surgery | Rady Faculty of Health Sciences
Professor (Adjunct-Cross) | Dept of Biomedical Engineering | Price Faculty of Engineering
University of Manitoba

CONTACT

Dr. Jody Dexter
Technology Transfer Manager
E-mail: jody.dexter@umanitoba.ca
Phone: (204) 292-2357