2022 Critical Care SCN Undergraduate Summer Studentships

Funded Projects

Student (Supervisor; Institution): Riley Fedoruk (Dr. Brent W. Winston and Dr. Chel Hee Lee; University of Calgary)
$ Awarded (Length of Time): $7,500 (4 months)
Project Title: Discovery of metabolomic signature for sTBI diagnosis
Summary: Severe traumatic brain injury (sTBI) is a neurologic injury resulting from an external mechanical force. Patients with sTBI are likely to have long-term disability and poor quality of life. For polytrauma patients, sTBI diagnostic is complex since sedation and analgesia interfere with the clinical assessment. Recent studies have shown that metabolomics could be more reliable biomarkers of sTBI than clinical observations alone. This project aims to evaluate whether serum metabolites in sTBI have reasonably good power for diagnosis and risk stratification and to see if metabolomics can reveal pathophysiological mechanisms of primary and secondary brain injury in sTBI.

Student (Supervisor; Institution): Geoffrey McKinnon (Dr. Carmel Montgomery; University of Alberta)
$ Awarded (Length of Time): $7,500 (4 months)
Project Title: Functional ability and health-related quality of life outcomes in survivors of ECMO
Summary: Information available on post-discharge outcomes of patients treated with ECMO is limited in Canada. Health-related quality of life (HRQL) and functional status are important outcomes for patients surviving ECMO. While survival has been the primary outcome of interest in trials evaluating the effectiveness of ECMO, HRQL and functional status of survivors is inadequately characterized and evaluated. Evaluating patient-centred outcomes is an essential part of providing high quality, high-value care. We will contact survivors of ECMO therapy to evaluate key patient-centred outcomes (i.e., patient-reported function and HRQL). Results will be incorporated into clinical pathways within the ECMO program to optimize survivor outcomes. This project will provide a foundation from which we characterize the current ECMO program, identify care gaps and quality improvement opportunities.

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Student (Supervisor; Institution): Muhammed Saahim Salam (Dr. Brent W. Winston and Dr. Chel Hee Lee; University of Calgary)
$ Awarded (Length of Time): $7,500 (4 months)
Project Title: Machine learning approach in identifying metabolomic biomarkers of ARDS
Summary: Acute respiratory distress syndrome (ARDS) is a serious health problem that causes fluid and inflammatory material to build up in the lungs, decreasing blood oxygen levels affecting the whole body. ARDS does not have reliable diagnostic tests agreed upon and is a heterogeneous disease. Therefore, diagnosis relying on only clinical observations may result in higher cases of delayed diagnosis and misdiagnosis, especially in mild ADRS, which is important if one is to treat ARDS early and potentially prevent rapid progression of ARDS. Metabolomics is an emerging field of study that accurately reflects metabolites and metabolic pathways that occur within the human body at a particular moment in time. The main objective of this study is to identify a metabolomic diagnostic biopattern (biomarker) of ARDS using a machine learning approach that may improve early diagnosis and identify early progression in the ICU.