

Planning, Implementing, and Evaluating Process Evaluations of Complex Interventions in Critical Care: An Interactive Workshop Project Descriptions

CYCLE: Critical Care Cycling To Improve Lower Extremity Strength **Principal Investigator: Dr. Michelle Kho**

Patients who survive critical illness usually experience long-lasting physical and psychological impairments, which are often debilitating. Rehabilitation interventions started in the ICU may reduce this morbidity. In-bed cycling, which uses a special bicycle that attaches to the hospital bed, allows critically ill patients who are mechanically ventilated (MV) to gently exercise their legs while in the ICU. The main goal of this study is to determine whether critically ill MV adults recover faster if they receive early in-bed cycling than if they do not. Another objective is to determine whether in-bed cycling is a cost-effective intervention. 360 patients admitted to the ICU and receiving MV will be enrolled in the study. Following informed consent, patients will be randomized to either (1) early in-bed cycling and routine physiotherapy or (2) routine physiotherapy alone. Patients' strength and physical function will be measured throughout the study. If early in-bed cycling during critical illness improves short-term physical and functional outcomes, it could accelerate recovery and reduce long-term disability in ICU survivors.



PICU Liber8: Early Rehabilitation in Critically Ill Children - The PICU Liber8 Study **Principal Investigator: Dr. Karen Choong**

The PICU Liber8 study is a pilot quality improvement implementation study that will measure the impact of a rehabilitation bundle implementation on the outcomes of interest. Advancements in the care provided in Pediatric Intensive Care Units (PICUs) have led to fewer deaths in children. These improvements are unfortunately countered by the emergence of side effects of critical illness, known as PICU-acquired complications (PACs). Delirium, muscle weakness, drug dependency and withdrawal are increasingly common. PACs occur because children are often over-sedated and experience long periods of immobilization. PACs delay recovery, increase disability and worsen long-term function and quality-of-life. Although they are preventable, PACs are very common and frequently overlooked by clinicians. This study aims to "liberate" children from critical illness and improve their recovery and functioning after discharge, through an innovative rehabilitation bundle of 8 complementary steps (PICU Liber8) to reduce sedation, allow children to awaken and breathe comfortably, encourage early mobilization, and engage families in their child's care.



CCRN: The Canadian Clinical Research Network

Principal Investigator: Dr. Francois Lamontagne

Conducting high quality and efficient clinical research is essential for improving the health care available to Canadians; it is also a vector for innovation and discovery. The mission of the Canadian Clinical Research Network (CCRN) is to improve clinical research capacity and coordination across Canada with the overarching objectives of simultaneously increasing 1) the production of clinical research evidence that will inform healthcare decisions and 2) the wealth of data and biological specimens available for translational research. By describing current clinical research infrastructure and clinical research activity, we aim to increase Canada's clinical research capacity. This is an early step toward better integration of research into clinical practice. This initiative is supported by the Fonds de Recherche du Québec - Santé, Sepsis Canada, and the COVID-19 Network of Clinical Trials Networks.



ICU Follow-up Clinic

Principal Investigator: Dr. Gordon Boyd

As mortality rates from critical illness continue to decline, we are gaining an appreciation of the constellation of symptoms experienced by ICU survivors. Individuals who survive their ICU stay experience a combination of cognitive, functional and psychiatric disorders, collectively known as the Post-ICU syndrome (PICS). PICS is associated with poor quality of life and decreased employability. At Kingston Health Sciences Centre, we run a post-ICU clinic designed to support individuals with PICS. Patients at high risk for PICS (>4 days mechanical ventilation, tracheostomy, delirium for >50% of ICU stay, no primary care provider) are eligible for the clinic. Prior to the appointment date, pen-and-paper screening tools for various elements of PICS are mailed to the patient. This includes the Hospital Anxiety Depression Scale, PTSS-14 and the SF-36. During the clinic visit, patients undergo screening for cognitive impairment with the Montreal Cognitive Assessment. The clinic is co-led by our ICU social worker who provides counselling and support for patients and their caregivers. Issues arising during clinic typically prompt outpatient referrals. Patients are seen typically 1-3 times in clinic.

Interventions to Address Frailty in Adult ICU Patients

Principal Investigator: Dr. John Muscedere

Dr. Muscedere's team is planning on developing a complex intervention to address frailty in patients 50+ patients that are admitted to ICU. The intervention will be multi-factorial, multi-disciplinary, and occur from ICU to Ward, to return home.