Comprehensive Research Experience for Medical Students
Summer Research Program 2019

Supervisor/Project Information Form
Due February 20 2019 by email to crems.programs@utoronto.ca

Supervisor Name: Dr. John Byrne

Project Title: Psoas muscle volume as a marker of frailty and a predictor amputation after lower limb revascularization

Hospital/Research Institution: Toronto General Hospital

Email: john.byrne@uhn.ca

Field of Research (2 keywords): Atherosclerosis, amputation

Department: Department of Surgery, Division of Vascular Surgery

School of Graduate Studies Appointment (IMS, LMP, IHPME etc)? Yes/No: No   If YES, please name:

Project Title: Psoas muscle volume as a marker of frailty and a predictor amputation after lower limb revascularization

Brief Project Description (‹300 words):

Patients with critical limb ischemia (rest pain/tissue loss) have a high risk of amputation (10-40%) and a 50% five year mortality. Urgent revascularization is undertaken using endovascular or open surgery to attempt limb salvage. The morbidity and mortality from these procedures is significant, and failure of revascularization is associated with increased risk of major amputation. Psoas muscle volume is a powerful tool to assess frailty. Psoas sarcopenia predicts poor outcomes in patients undergoing pancreatic cancer resections, liver surgery, and Trans Femoral Aortic-valve Implantation (TAVI). We hypothesize that preoperatively measured psoas sarcopenia will predict treatment failure and amputation in patients undergoing lower limb revascularization for peripheral arterial disease. Patients who have undergone lower limb revascularization (endovascular and open) with a minimum of one year follow up will be identified from the Vascular Quality Initiative (VQI) database at Toronto General Hospital. Psoas muscle sarcopenia will be assessed on already existing preoperative CT scans. Psoas area at L4, muscle density, and muscle volume will be measured using imaging software available at Toronto General Hospital. We will correlate psoas muscle measurements with the primary endpoint of major lower limb amputation (below or above knee). Secondary endpoints include failure of revascularization (bypass occlusion, restenosis post angioplasty, or secondary revascularization procedures), and mortality. A data analyst who maintains our VQI database in the division of vascular surgery will aid the student with database composition and analysis, and the student will be trained by a radiology fellow with experience in measuring psoas muscle volumes. The successful student will be first author on this study, complete the image analysis, and data analysis (with full training) with the goal of poster presentation at Society of Vascular Surgery, and first author publication. Previous CREMS students in our division are well supported have been successful in meeting these academic goals.