

**Rashmin Hira – University of Calgary**

Project: Assessment of Autonomic Nervous System Function in Post-Acute Sequelae of COVID-19 (PASC) and Characterization of the Patient Experience



**Background**

The COVID-19 pandemic has had a devastating impact worldwide. There are numerous reports of patients suffering from chronic symptoms several months after resolution of the acute illness. These ongoing symptoms have been termed “Post-Acute Sequelae of COVID-19” (PASC) or “Long-COVID”, and include tachycardia/palpitation, fatigue, light-headedness, and dyspnea, which are relieved only by recumbence.

PASC phenotypically resembles autonomic disorders like Postural Orthostatic Tachycardia Syndrome (POTS), in which autonomic nerves fail to control heart rate (HR) and blood pressure (BP). Patients with POTS have symptoms on standing such as light-headedness, tachycardia/palpitations, dyspnea, and fatigue that are also only relieved by recumbence. These symptoms last >3 months (similar to PASC) and may start with a viral-like illness. We have previously found that 73% of patients with PASC meet the hemodynamic criteria of at least one autonomic disorder. We do not know if this prevalence differs between patients and healthy volunteers, whether these abnormalities persist over time, or if PASC physiology differs by sex.

Further, there are no data on the patient experience living with PASC. The prevalence of autonomic dysfunction amongst patients with PASC compared to healthy controls,

sex-differences in PASC physiology, the remission of PASC, and impact of PASC on quality of life are unknown.

Along with the current autonomic function testing, we will 1) define differences in autonomic physiology between patients with PASC and healthy controls; 2) assess whether autonomic deficits improve over time or persist; 3) explore sex-differences in PASC physiology; and 4) understand the patient experience living with PASC through focus groups and compare these experiences to patients with POTS.

Aim#1 will compare HR and BP regulation between patients with PASC and healthy volunteers, with HR/BP as the primary outcomes. Aim#2 will assess differences in PASC physiology over time, with prevalence as our primary outcome. Aim#3 will explore sex-differences in PASC physiology, and our primary outcome will be comparisons between males and females. Aim #4 will characterize the patient perspective of living with PASC and compare with POTS. Our primary outcome will be the themes of quality of life described by patients with PASC.

If we understand underlying PASC pathophysiology, we can develop specific targeted treatments.