

## 2019-2020 Lorne Phenix Graduate Award Recipient

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### **Hemodynamic Parameters During Rest and Exercise in an Obese and Overweight Population**

Patients with obesity demonstrate a higher prevalence of co-morbid conditions including heart failure (HF). HF with preserved ejection fraction (HFpEF) represents 50% of HF cases and exhibits a greater predilection for women than men. HFpEF is diagnosed if there is clear evidence of HF, in the presence of a normal left ventricular ejection fraction (50-70%). Increased diastolic stiffness and abnormal relaxation of the ventricle are commonly present at rest, or revealed by stressors including exercise. Currently, hemodynamic assessment by right heart catheterization (RHC) with exercise testing is emerging as a potential gold standard for the diagnosis of HFpEF.

Conditions that increase the risk of HFpEF, and that are more highly prevalent in the HFpEF population, include hypertension, old age, and obesity. Recent evidence suggests that obesity may be associated with a pre-HFpEF physiology in a sex dependent manner. Relationships between body mass index and HFpEF are more prevalent in women than men. Further, in response to obesity, women are observed to have a stronger association with hypertension, a greater LV mass, and wall thickness. However, sex differences with respect to the effect of obesity on central hemodynamics are unclear.

We will recruit a population of uncomplicated overweight and obese post-menopausal women and similarly aged men in equal proportions from the community to evaluate their hemodynamic response at rest and during exercise using RHC. The sex hormone, estrogen, has a cardioprotective effect on pre-menopausal women, thus, we will recruit post-menopausal women to compare hemodynamic measurements between women and men. This study will provide an in-depth understanding of the intra-cardiac pressures of an obese and overweight population to identify hemodynamic reference ranges in men and women in the absence of comorbidities. This information may help to better understand the effects of obesity on HFpEF diagnosis and risk in males and females.