Abstract
Newborn patients often require transport between healthcare facilities in order to receive critical care. These transports may be done by ground, fixed -wing, and rotary-wing ambulances. In the province of Ontario, a standard Neonatal Patient Transport System (NPTS) is used to provide medical care to the patient during these journeys. Elevated vibration levels have been observed by transport teams, motivating an investigation into the physical stressor's patients endure. This research initiative is a collaborative project between Carleton's Applied Dynamics Laboratory (ADL) and the Children's Hospital of Eastern Ontario (CHEO). The project aims to 1) characterize sound and vibration in transport environments, in both ground and air ambulances; 2) replicate the motion of the vehicle and NPTS within a laboratory environment; and 3) develop and evaluate mitigation strategies. Facilities at Carleton University and National Research Council Canada (NRC) are being used to conduct experimental testing, with a focus on replicating the dynamics of the transport environment using various shakers and motion platforms. This presentation will describe the stages of experimentation involved in this study, the methods of data collection and motion profile generation used, and the vibration mitigation approaches that will be supported by this testing.

Keely Gibb is an Aerospace Engineering Ph.D. student at Carleton University, under the supervision of Robert Langlois, Adrian Chan, and James Green. She received her B.Eng. in Aerospace from Carleton in 2020, specializing in space systems design, and since then has joined the Applied Dynamics Laboratory and Neonatal Patient Transport Project. Her research interests include dynamic simulations, vibrational analysis, and laboratory shaker studies, and outside her academic involvement she is active in engineering outreach and women in STEM initiatives.