It is difficult to determine the aerobic capacity of wheelchair athletes by the accepted standards and methods of testing. The levels of disability and the associated functionality of the individual as well as wheelchair design itself impacts the measure of VO\textsubscript{2} peak. VO\textsubscript{2} peak is the maximum volume of O\textsubscript{2} that a person's body can transport to tissue during incremental exercise. At the current time VO\textsubscript{2} peak is the best indicator of physical fitness of an individual.

The purpose of this study was to differentiate the VO\textsubscript{2} peak between the arm crank ergometer and the VO\textsubscript{2} peak obtained for paraplegic subjects while pushing a wheelchair on a treadmill.

The subjects were asked to report to the Exercise Science Research Laboratories on two separate days. The duration on each day ranged from 30 to 90 minutes, depending on the type of testing that was being conducted. Each subject was asked to avoid caffeinated beverage drinks, eat a light meal, wear athletic clothing, and refrain from strenuous exercise on the days prior to the experiment. The subjects sat in their sport chair in front of the arm crank ergometer (ACE) (SciFit Pro 1) wearing a heart rate monitor (Polar T31 Coded Transmitter with Belt, New York) around their chest. A plastic mask fit over the subject’s nose and mouth to collect the exhaled air during the exercise so that the amount of oxygen consumed could be measured to determine the aerobic capacity using a portable VO\textsubscript{2} (K4, b2) (Cardio Pulmonary Diagnostic Equipment, Italy) device strapped around their waist. The subjects warmed up for 2 minutes with light resistance. The ergometer resistance was then set to a level that a person’s body could transport to tissue during incremental exercise. At the current time VO\textsubscript{2} peak is the best indicator of physical fitness of an individual.

The protocol began with a TM speed of 5 mph and an incline of 1\%. The incline was increased by 0.5\% every 2 minutes and subjects were asked to rate the perceived exertion (RPE). This process was continued until the subject could no longer maintain slack in the cable which indicates that the subject has reached their VO\textsubscript{2} peak. To ensure their safety, mats were placed at the foot of the TM and subjects were asked to wear a bicycle helmet during the test. A cable with the U-clamp was hooked onto the TM and wheelchair to prevent subject from falling off the TM. Any of the indicators mentioned above (i.e. slack is lost) the subjects was be deemed to have reached their VO\textsubscript{2} peak and cannot proceed with further testing. In this fashion the integrated of the test counter balanced structure was maintained. Heart rate, VO\textsubscript{2} peak, V\textsubscript{E}(expired minute ventilation) and RPE data was collected. All data collected was statistically analyzed using SPSS ver. 16. Significance was set at p<0.05.*

The results suggest that there are significant differences between the TM testing and the ACE testing for VO\textsubscript{2} peak, V\textsubscript{E}, and HR other than for reported RPE. Future studies should compare both genders on VO\textsubscript{2} peak in ACE and TM in a larger population. Future testing will seek a statistical power of 0.8 to validate the study. This will provide information on the number of subjects required for the test. G-Power statistical software will be used to make the calculation. Currently there are not enough wheelchair athletes on campus to get a statistical power required to meet the 0.8 statistical power.