

Study: Cycling in Bed Safe and Feasible for ICU Patients



ICU patients on mechanical ventilation can use an in-bed cycle safely and early in their stay, according to research from McMaster University and St. Joseph's Healthcare Hamilton, published in *PLOS One*.

"We know that if patients start in-bed cycling two weeks into their ICU stay, they will walk farther at hospital discharge," said the study's lead author Michelle Kho, an assistant professor with the School of Rehabilitation Science at McMaster University and physiotherapist at St. Joseph's Healthcare Hamilton. "Our TryCYCLE study builds on this previous work and finds it is safe and feasible to systematically start in-bed cycling within the first four days of mechanical ventilation and continue throughout a patient's ICU stay."

See Also: [Early Mobilisation in ICU: From Concept to Reality - Four Steps to Change Patient Outcomes](#)

"Patients' abilities to cycle during critical illness exceeded our expectations," commented Kho. In an email to ICU Management & Practice Dr. Kho added: "Anecdotally, patients and families enjoyed the cycling. We believe that offering patients and their families a rehabilitation study so early in their ICU stay provides hope in a stressful situation."

The clinical trial [TryCYCLE: A Pilot Study of Early In-bed Leg Cycle Ergometry in Mechanically Ventilated Patients](#) set out to study safety and feasibility of in-bed cycling, to inform a future randomised controlled trial.

Over a year, Kho and colleagues conducted a study of 33 ICU patients at St. Joseph's Healthcare Hamilton. Patients were 18 years of age or older, receiving mechanical ventilation, and walking independently before their ICU admission. Patients were treated with 30 minutes of supine cycling using a motorised stationary bicycle affixed to the bed, six days a week, in addition to routine physiotherapy - the cycling could be passive, or active with low resistance. The mean age of the patients was 65.8 and APACHE II score was 24.3. Cycling began a median of 3 days after ICU admission. During the cycling sessions, 73.1% of the patients were receiving MV, 2.9% vasopressors, 37.6% sedation or analgesia and 2% dialysis.

Only 2% of cycling sessions were ended for safety reasons. Patients cycled about 9 km on average during their ICU stay. Active cycling was observed in 80% of the sessions.

Of note was the high consent rate (92%). The researchers write that one of the strengths of the study was a highly collaborative PT department and strong interprofessional critical care research culture. Kho commented "We are really proud of the research coordinator who screened patients, and received informed consent, and our physiotherapists who implemented cycling so quickly."

Next Steps

TryCYCLE is the first of a series of studies that will determine the effects of early in-bed cycling with critically ill patients. The next step is to have several hospital ICUs start the in-bed cycling study in a pilot randomised trial.

Image: Dr. Michelle Kho's research uses the RT-300 supine bicycle – which allows patients to work on strengthening their legs while they are in their hospital bed. The screen shows an avatar of a person on a bike, and displays the patient's cycling cadence, power output, and distance covered. The equipment can also show whether a patient is actively contributing to cycling, over and above the cycle motor.

Sources: [St. Joseph's Healthcare Hamilton](#); [McMaster University](#); Michelle Kho
Image credit: Marta Hewson/Photography

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