

### **Summary abstract in lay language**

Up to 80% of adults are physically inactive after lumbar spine surgery. Physical inactivity can lead to adverse health outcomes and increase risk for all-cause mortality. The ongoing COVID-19 pandemic underscores the necessity for accessible telehealth rehabilitation interventions that can be offered to older adult patients at high risk and target an important outcome of physical activity that is not currently addressed in conventional physical therapy. The primary purpose of this study is to determine the feasibility, preliminary efficacy, and acceptability of postoperative physical therapist-delivered telehealth intervention aimed at improving physical activity in patients undergoing lumbar spine surgery. To answer this purpose, randomized controlled feasibility trial will be conducted. Specifically, 60 patients undergoing spine surgery for a degenerative lumbar condition will be enrolled from a single academic medical center. Participants will be randomized at 2 weeks after surgery to receive an 8-session postoperative telehealth physical activity intervention (n = 30) or usual postoperative care (n = 30). The telehealth intervention will be delivered by a trained physical therapist through a password-protected Zoom platform and recorded for fidelity monitoring. Feasibility will be assessed through recruitment, adherence to intervention, and retention rates. Our primary efficacy outcome is objective physical activity, i.e., steps per day (accelerometry). Secondary outcomes are patient-reported physical function (PROMIS Physical Function), disability (Oswestry Disability Index), and pain intensity (Numeric Rating Scale). Outcomes will be assessed prior to surgery, at 2 weeks (baseline), and at 3 and 6 months after surgery by study personnel blinded to group assignment. Semi-structured interviews and a satisfaction survey will be used to obtain acceptability feedback from intervention participants (n=30) regarding the one-on-one telehealth format, intervention components, and relevance to post-surgical concerns. In this evolving healthcare climate, our long-term goal is to establish effective physical therapist-delivered telehealth interventions to promote physical activity.