

People recovering from anterior cruciate ligament (ACL) reconstruction (ACLR) frequently are unable to accept weight and attenuate load with their surgical knee during high-intensity tasks such as jumping. Their muscular recruitment patterns are also frequently dysfunctional, displaying high co-contraction that may be a protective response, but increases joint compression. Training to increase knee bending and improve the use of the knee during jumping tasks is generally limited in repetition, due to the possibility of joint damage from the large loads inherent to even the lowest intensity plyometric tasks. The Bodyweight Reduction Instrument to Deliver Graded Exercise (BRIDGE) reduces impact forces during jumping tasks and allows investigation into the effect of higher volume jump training on weight acceptance, knee flexion, and neuromuscular patterns during jump landing. For this prospective, randomized, double-blind clinical trial, 40 individuals with ACLR between 6 and 48 months previously will undergo clinical, electromyographic, and 3-D biomechanical screening for landing faults, defined as 70% side-to-side asymmetry in vertical ground reaction force (VGRF) during double leg landing, or knee joint torque under 2.6 body weights in a single leg land. The International Knee Documentation Committee questionnaire will also document subjective function. An anticipated 16 people will present with landing dysfunction and consent to training. They will be randomly assigned to training at low volumes and high intensity (STANDARD) or high volumes and lowered intensity (BRIDGE). Individual training programs will last 8 weeks twice weekly, and participants will undergo re-testing at 4 weeks (mid-training), 8 weeks (post-training), and 16 weeks (retention). The results of this trial will help elucidate the relative importance of repetition in developing optimal habitual movement patterns following ACLR. Improving the ability of people with ACLR to accept weight and dissipate impact loads through their surgical knee may ameliorate the high rates of early-onset osteoarthritis in this population. This trial is registered at [ClinicalTrials.gov](https://clinicaltrials.gov), # NCT02148172.