Eccentric Flywheel Training:

Optimizing ACL Rehabilitation

Henderson et al (2022)

Persistent Quadriceps Weakness

Bilateral deficit in muscle activation and therefore persistent quadriceps weakness is a common barrier to rehabilitation after anterior cruciate ligament reconstruction (ACLR), and as a result can lead to abnormal gait, quadricep atrophy, poor knee function and persistent pain, dynamic instability, and/or early onset osteoarthritis.

Eccentric Training

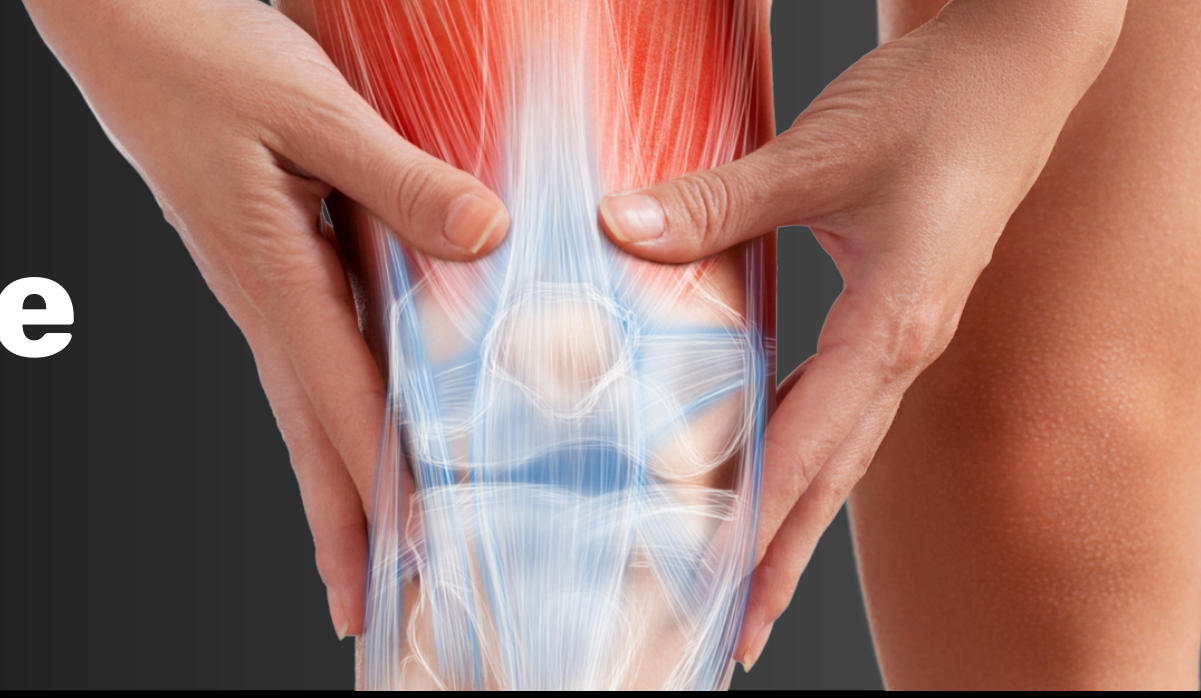
Given the eccentric overload associated with flywheel resistance training (FRT), it was thought that the flywheel eccentric contractions could alter cortical activity and down-regulate inhibitory pathways, thereby enabling high-threshold MU recruitment and muscle strength increases.

Outcomes

One set of deep knee flexion flywheel Bulgarian split squats to exhaustion performed two times per week improved quadriceps deficits (RFD and MVIC) in well-trained athletes with ACLR, particularly those with relatively low quadriceps force production.

Bulgarian Split Squat | 1 Set to failure 2x per week

Take Home Message



Henderson et al (2022) concluded that,

FRT would seem a simple, practical and time efficient mode of resistance training for improving quadriceps deficits in well trained athletes recovering from ACLR.