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Implementation of Open and Closed Kinetic Chain Quadriceps Strengthening Exercises After Anterior Cruciate Ligament Reconstruction

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Abstract

When working with athletes that have recently undergone anterior cruciate ligament (ACL) reconstructive surgery, a common goal of athletic trainers, strength and conditioning coaches, physicians, and physical therapists is to restore quadriceps strength while protecting the reconstructed ACL and patellofemoral joint from unnecessary stresses. Quadriceps strengthening exercises are often referred to as occurring in the open kinetic chain (OKC) or closed kinetic chain (CKC). Currently, there is little agreement in the literature as to whether only CKC exercises or a combination of OKC and CKC exercise should be performed after ACL reconstruction to strengthen the quadriceps. We believe that a combination of OKC and CKC exercises can be used to effectively and safely strengthen the quadriceps after ACL reconstruction. The purposes of this review are to examine the scientific literature currently available for the effects of OKC and CKC exercise on ACL strain and patellofemoral joint stress, and to present a sound rationale for using a combination of OKC and CKC exercises for quadriceps strengthening after ACL reconstruction. On the basis of our review, both OKC and CKC exercises can be modified and implemented for quadriceps strengthening after ACL reconstruction without causing excessive ACL strain or patellofemoral joint stress.

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