

# RESTORING KNEE EXTENSOR STRENGTH AFTER ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION: A CLINICAL COMMENTARY

Matthew Buckthorpe, PhD<sup>1,2</sup>

Giovanni La Rosa, MSc<sup>1</sup>

Francesco Della Villa, MD<sup>1</sup>

## ABSTRACT

One of the main priorities of rehabilitation after anterior cruciate ligament reconstruction (ACLR) surgery is the restoration of knee extensor muscle strength. Residual deficits in knee extensor muscle size and strength after injury are linked to poor biomechanics, reduced knee function, increased knee osteoarthritis risk, as well as heightened risk of re-injury upon return to sport. Most studies indicate that knee extensor muscle strength is typically not resolved prior to return to sport. This clinical commentary discusses strategies to optimize and accelerate the recovery of knee extensor strength post-surgery, with the purpose to support the clinician with evidence-based strategies to implement into clinical practice. Principally, two strategies exist to normalize quadriceps strength after surgery, 1) limiting strength loss after injury and surgery and 2) maximizing and accelerating the recovery of strength after surgery. Optimal preparation for surgery and a focused attempt to resolve arthrogenic muscle inhibition are essential in the pre and post-operative period prior to the inclusion of a periodized strength training program. Often voluntary strengthening alone is insufficient to fully restore knee extensor muscle strength and the use of electrical stimulation and where necessary the use of blood flow restriction training with low loads can support strength recovery, particularly in patients who are significantly load compromised and experience pain during exercise. Resistance training should employ all contraction modes, utilize open and closed kinetic chain exercise of both limbs, and progress from isolated to functional strength training, as part of a periodized approach to restoring neuromuscular function. Furthermore, thinking beyond the knee musculature and correcting core and hip dysfunction is also important to ensure an optimal knee extension strengthening program. The purpose of this clinical commentary is to provide a series of evidenced based strategies which can be implemented by clinicians responsible for the rehabilitation of patients after ACLR.

**Level of evidence:** 5

**Key words:** Anterior cruciate ligament reconstruction, functional recovery, injury prevention, rehabilitation, sports medicine

## CORRESPONDING AUTHOR

Matthew Buckthorpe

Isokinetic Medical Group

11 Harley Street

London,

WG1 9PF

Tel - 0207 486 5733

E-mail: M.Buckthorpe@isokinetic.com

<sup>1</sup> Isokinetic Medical Group, FIFA Medical Centre of Excellence, Education & Research Department, Bologna, Italy

<sup>2</sup> Isokinetic Medical Group, FIFA Medical Centre of Excellence, London, UK

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