

ACL reconstruction. How to get your athlete back (safe) on the field

An injury to the anterior cruciate ligament (ACL) has profound effects for an athlete, given the time lost from sport and its inherent physical and psychological effects as well as the long-term sequelae associated with common pathologies such as meniscal injury or osteoarthritis. Most athletes who want to continue sports after an ACL injury are recommended to undergo an ACL-reconstruction.

Deciding when an athlete is cleared to return to sports is difficult and challenging for clinicians as due to the multifactorial nature. Despite the development of the return to sport guidelines in recent years, there still more questions than answers to the optimal return to sports criteria after ACL reconstruction. The absence of a scientific consensus on the criteria used to release an athlete to unrestricted sports activity - return to play - after ACL reconstruction, may contribute to increased risk of recurrence as return may be premature.

Return to sports should be considered as a continuum as a process all the way up to when an injured athlete has reached a level of return to performance. During this course, a critical assessment of the current return to sport and performance after ACL-reconstruction will be presented.

Return to Sports starts already after the ACL injury and the subsequent pre-rehabilitation before the surgery. Subsequently the rehabilitation after the ACL reconstruction should be time and criterion based.

Possibilities for optimizations based on current trends in the literature are presented and practiced.

At the end of this 2-day course, you will be able to plan and implement an evidence-based rehabilitation program phasing in towards RTP of the athlete. Furthermore, you will learn how to contribute in the shared decision making process for the return to play of an injured athlete. All these aspects allow for an optimal return to play with taking into account secondary ACL prevention.

This course has about 70% practice including demonstrations by dr. Gokeler, practicing these skills by participants and using case studies so that participants can apply the knowledge obtained.

Course objectives

At the end of the course you can:

- Plan and implement an individual evidence-based rehabilitation program
- Use a comprehensive spectrum of sensorimotor and biomechanical assessments
- Recognise that return to play is a continuum rather than a fixed moment in time
- Contribute to the return to sport shared decision making

ACL RTP		Day 1
9:00-9:30		Key components of ACL rehabilitation
9:30-11:00		Pre-habilitation
11:00-11:30		Break
11:30-13:00		Acute phase rehabilitation 1 Evidence-based Rehabilitation practice with consideration to create optimal conditions for motor learning) Discussion
13:00-14:00		Lunch
14:00-15:30		Acute phase rehabilitation 2 Participants will work in groups to apply the knowledge to case studies. Groups will present to other groups to stimulate exchange of learning from each other
15:30-16:00		Pause
16:00-17:00		Intermediate phase Practice - enhanced neuromuscular control - strengthening - starting running - Initial changes of direction
		Day 2
9:00-9:30		FAQ Day 1
9:30-11:00		Intermediate phase rehabilitation 2 Participants will work in groups to apply the knowledge to case studies. Groups will present to other groups to stimulate exchange of learning from each other
11:00-11:30		Pause
11:30-13:00		RTP tests - strength - Hop tests - Agility - On field training - Qualitative and quantitative analysis
13:00-14:00		Pause
14:00-15:30		RTP Tests II (Anticipation, Reaction, sport-specific elements and demands) in context of secondary ACL prevention Participants will work in groups to practice RTP tests Group discussion RTP Tests

ACL RTP	Day 1
15:30-16:00	Pause
16:00-17:00	Summary and Q&A

A selection of literature used for course ACL Return to Play (Performance)

1. Adams D, Logerstedt DS, Hunter-Giordano A, Axe MJ, Snyder-Mackler L (2012) Current concepts for anterior cruciate ligament reconstruction: a criterion-based rehabilitation progression. *J Orthop Sport Phys Ther* 42:601-614
2. Arden CL, Glasgow P, Schneiders A, Witvrouw E, Clarsen B, Cools A, et al. (2016) 2016 Consensus statement on return to sport from the First World Congress in Sport Physical Therapy, Bern. *Br J Sport Med*;10.1136/bjSport-2016-096278
3. Dingenen B, Gokeler A (2017) Optimization of the Return-to-Sport Paradigm After Anterior Cruciate Ligament Reconstruction: A Critical Step Back to Move Forward. *Sport Med*;10.1007/s40279-017-0674-6
4. Gokeler A, Benjaminse A, Hewett TE, Lephart SM, Engebretsen L, Ageberg E, et al. (2012) Proprioceptive deficits after ACL injury: are they clinically relevant? *Br J Sport Med* 46:180-192
5. Gokeler A, Benjaminse A, Hewett TE, Paterno MV, Ford KR, Otten E, et al. (2013) Feedback Techniques to Target Functional Deficits Following Anterior Cruciate Ligament Reconstruction: Implications for Motor Control and Reduction of Second Injury Risk. *Sport Med*;10.1007/s40279-013-0095-0
6. Gokeler A, Benjaminse A, van Eck CF, Webster KE, Schot L, Otten E (2013) Return of normal gait as an outcome measurement in ACL-reconstructed patients. A systematic review. *Int J Sport Phys Ther* 8:441-451
7. Gokeler A, Benjaminse A, Welling W, Alferink M, Eppinga P, Otten B (2015) The effects of attentional focus on jump performance and knee joint kinematics in patients after ACL reconstruction. *Phys Ther Sport* 16:114-120
8. Gokeler A, Eppinga P, Dijkstra PU, Welling W, Padua DA, Otten E, et al. (2014) Effect of fatigue on landing performance assessed with the landing error scoring system (less) in patients after ACL reconstruction. A pilot study. *Int J Sport Phys Ther* 9:302-311
9. Gokeler A, Welling W, Zaffagnini S, Seil R, Padua D (2016) Development of a test battery to enhance safe return to Sport after anterior cruciate ligament reconstruction. *Knee Surg Spo Traumatol Arthrosc*;10.1007/s00167-016-4246-3
10. van Grinsven S, van Cingel REH, Holla CJM, van Loon CJM (2010) Evidence-based rehabilitation following anterior cruciate ligament reconstruction. *Knee Surgery, Sport Traumatology, Arthroscopy* 18:1128-1144
11. van Melick N, van Cingel RE, Brooijmans F, Neeter C, van Tienen T, Hullegie W, et al. (2016) Evidence-based clinical practice update: practice guidelines for anterior cruciate ligament rehabilitation based on a systematic review and multidisciplinary consensus. *Br J Sport Med*;10.1136/bjSport-2015-095898