ITALIA CONI
SCUOLA DELLO SPORT
MARCHE

Un aggiornamento sui protocolli di riabilitazione e sul return-to-play dopo ricostruzione LCA nello sportivo

Ancona, 7 novembre 2020

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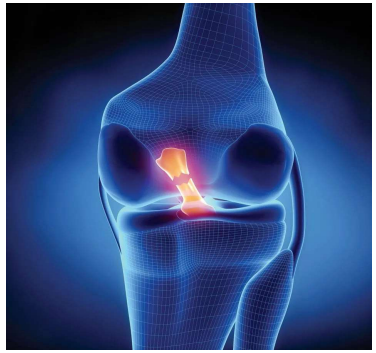


Nuove e vecchie proposte all'interno del programma riabilitativo dopo ricostruzione LCA nello sportivo

Return to Official Italian First Division Soccer Games Within 90 Days After Anterior Cruciate Ligament Reconstruction: A Case Report

Giulio S. Roi, MD[1]
Domenico Creta, MD[2]
Gianni Nanni, MD[3]
Maurilio Marcacci, MD[4]
Stefano Zaffagnini, MD[4]
Lynn Snyder-Mackler, PT, ScD, ATC, SCS, FAPTA[5]

FIGURE 2. The heading drills were performed in the pool in preparation for transition to the rehabilitative soccer field.

CONCLUSIONS

This case report suggests that the surgical technique and progressive rehabilitation program used after ACL reconstruction, including on-field rehabilitation with continuous monitoring of training intensity, allowed the patient to play for 20 minutes in an official First Division soccer game 77 days after surgery and to play a full game 90 days after surgery. Optimal physical fitness before the surgery, a strong psychological determination, an isolated or noncomplicated ACL lesion, a properly placed and tensioned graft, a personalized progression of volume and intensity of exercise loads, and an appropriate density of rehabilitative training, consisting in a mix of gymnasium, pool, and field exercises for a total of about 120 sessions over 12 weeks, may all have contributed to this positive outcome.

While the extent and likely timeline of the rehabilitation provided here is not possible for the average person after ACL reconstruction, we suggest that the concepts of personalization of the program, objectivity of criteria for progression, and maintenance of fitness can be generalized to all patients. In fact, this case represents a perfect progression, rather than a typical timeline, with rapid resolution of impairments and excellent response to added workload.

The fastest possible safe return to competitive games after anterior cruciate ligament (ACL) reconstruction for a professional athlete is the goal of every sports rehabilitation team. While there is no consensus of opinion about timing,[23,26] surgical techniques, and rehabilitative protocols after ACL rupture, several studies demonstrate that early accelerated and progressive protocols of rehabilitation do not adversely affect functional recovery.[12,13,21,22] The timetable for return to full activity after ACL reconstruction has moved from longer than a year in the 1970s to a range of 4 to 9 months today.[11,12,22,24] Information about

“Nuove” proposte

- Perché?
- Quando?
- Come?
- Cosa aggiungono?
- Quali evidenze scientifiche?
- A quale popolazione in particolare?

Recupero del ROM passivo / attivo	Nessuna protezione neL post operatorio . Carico immediato e corretto schema motorio del passo e delle andature	Nessun potenziamento post - operatorio
Stimolazione elettrica neuromuscolare fino a 2 mesi post op.	Home-based rehabilitation	Esercizi a catena cinetica aperta e chiusa in relazione allo step post operatorio
Riabilitazione accelerata nelle lesioni isolate del LCA	Riabilitazione "soft" nelle lesioni complesse o re - lesioni	Riabilitazione pre - operatoria
Prevenzione delle complicanze post operatorie	Prevenzione degli insuccessi e delle re - lesioni	Prevenzione dei cambiamenti degenerativi articolari

Tavola 2. Evidence-based clinical practice Consensus : obbiettivi riabilitazione 2017 - (da van Melick N, et al [24] , modificato da D’Onofrio R. et al.)

Le proposte

- Lavoro in acqua
- Blood flow restriction
- Elettrostimolazioni
- Cross-educational training
- Utilizzo di integratori
- Realtà virtuale
- Situazioni sport-specifiche

Research Report

Comparison of the Effects of Exercise in Water and on Land on the Rehabilitation of Patients With Intra-articular Anterior Cruciate Ligament Reconstructions

Brian J Tovin
Steven L Wolf
Bruce H Greenfield
Jeri Crouse
Blane A Woodfin

Background and Purpose. *Exercises in water have been shown to be effective for improving strength and passive range of motion (PROM). Traditional rehabilitation following intra-articular anterior cruciate ligament (ACL) reconstruction has taken place on land. This study was designed to compare the effects of exercises in water on strength and girth of the thigh musculature, knee PROM, joint laxity, effusion, and functional outcome with the effects of similar exercises on land in subjects following intra-articular reconstruction of the ACL.* ***Subjects.*** *Twenty subjects were randomly assigned to either a group that exercised on land or a group that exercised in water.* ***Methods.*** *Thigh girth, joint effusion, and knee PROM measurements were recorded at 2-week intervals for the first 8 weeks postoperatively. Isokinetic and isometric peak torque measurements for the thigh musculature, knee joint laxity assessments, and Lysholm scores were obtained at the end of 8 weeks.* ***Results.*** *Higher outcome scores were recorded in the water group than in the land group, as measured by Lysholm scales. No differences were noted between groups for knee PROM, thigh girth, or quadriceps femoris muscle performance. In the water group, less joint effusion was noted after the 8 weeks. In the land group, greater peak torque for isokinetic knee flexion was recorded.* ***Conclusion and Discussion.*** *Although exercise in water may not be as effective as exercise on land for regaining maximum muscle performance, rehabilitation in water may minimize the amount of joint effusion and lead to greater self-reports of functional improvement in subjects with intra-articular ACL reconstructions. [Tovin BJ, Wolf SL, Greenfield BH, et al. Comparison of the effects of exercise in water and on land on the rehabilitation of patients with intra-articular anterior cruciate ligament reconstructions. Phys Ther. 1994;74:710–719.]*

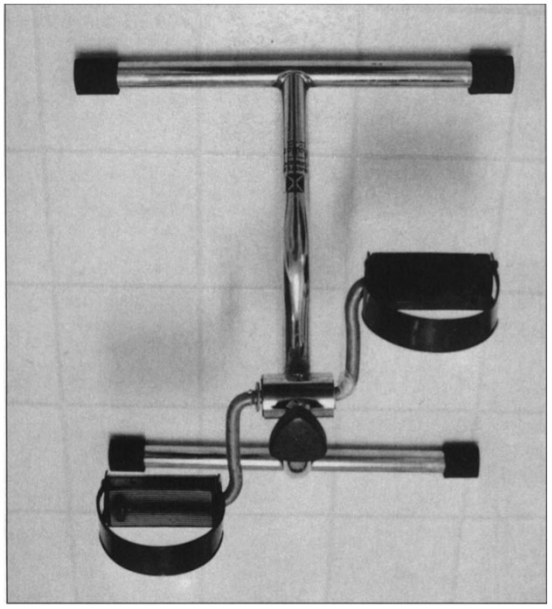
Table 1. *Rehabilitation Programs*

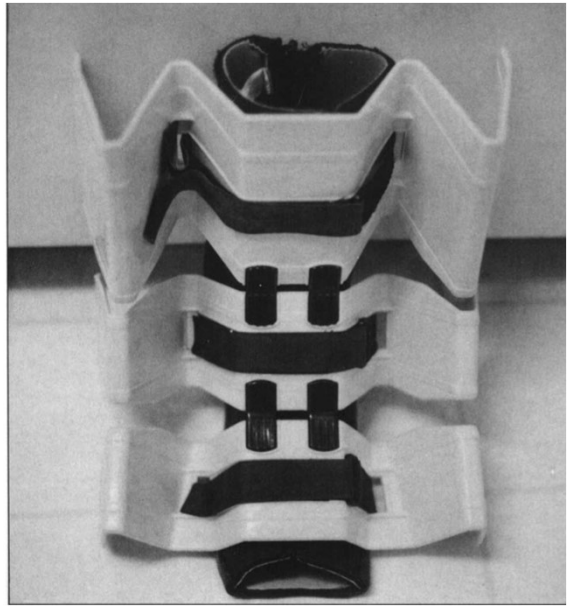
Week 1 and Home Program Exercises (Both Groups)	
1. Wall slides: 25 repetitions	
2. Active-assistive range of motion: 25 repetitions	
3. Passive knee extension: 10 minutes	
4. Hamstring muscle and calf stretching: 10 minutes each	
5. Quadriceps femoris muscle sets	
6. Straight leg raises[a]: 3 sets × 10 repetitions for hip flexion, abduction, adduction, and extension	
7. Active knee flexion[a]: 3 sets × 10 repetitions	
8. Toe raises: 3 sets × 10 repetitions	
9. Partial wall squats (usually added to the home program after first week): 3 sets × 10 repetitions	
Week 2–8 Exercise Programs	
Traditional Rehabilitation Group	**Pool Rehabilitation Group**
1. Stationary cycling: 10 minutes	1. Stationary cycling: 10 minutes[b]
2. Gait training without brace, alternating forward and backward ambulation: 10 min	2. Gait training without brace, alternating forward and backward ambulation: 10 min
3. Side step-ups, front step-ups, step-downs: beginning with 3 sets of 10 repetitions, progressing to 3 sets of 15 repetitions	3. Side step-ups, front step-ups, step-downs: beginning with 3 sets of 10 repetitions, progressing to 3 sets of 15 repetitions[c]
4. Hip flexion, extension, abduction, adduction in standing using a wall pulley with 4.54-kg (10-lb) plates: beginning with 3 sets of 10 repetitions, progressing to 3 sets of 15 repetitions	4. Hip flexion, extension, abduction, adduction in standing using the Hydrotone resistance boot: beginning with 3 sets of 10 repetitions and progressing to 3 sets of 15 repetitions
5. Knee flexion in sitting: 3 sets of 10 repetitions; boot: beginning with 3 sets of 10 repetitions, progressing to 3 sets of 15 repetitions	5. Knee flexion in standing using the Hydrotone resistance boot: beginning with 3 sets of 10 repetitions and progressing to 3 sets of 15 repetitions

[a]Cuff weights were added to straight leg raises and knee flexion in increments of 0.91 kg (2 lb).

[b]Stationary cycling in the pool rehabilitation group used a peddling device (see Fig. 1) rather than a stationary bicycle.

[c]Step-ups in the water were done with 20.32-cm (8-in) and 40.64-cm (16-in) steps.





Nelle 8 settimane post-operatorie

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Riduzione gonfiore

-

Forza muscolare

Prace oryginalne
Original papers

Fizjoterapia 2008, 16, 2, 3-6
ISSN 1230-8323

DOI: 10.2478/v10109-009-0013-z

The significance of water rehabilitation in patients with anterior cruciate ligament reconstruction

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[1] Department of Biomechanics, Medicine and Rehabilitation of the Locomotor Apparatus, Faculty of Medicine of Ribeirão Preto, University of São Paulo
[2] School of Physiotherapy Barão de Mauá
[3] Hospital Santa Casa de Misericórdia of Ribeirão Preto

Outcomes	*Intervention Group*							
	LR				*WR*			
	baseline		*9 Wk postsurgery*		*baseline*		*9 Wk postsurgery*	
	mean	*SD*	*mean*	*SD*	*mean*	*SD*	*mean*	*SD*
Pain	4.2	1.6	1.8	2.4	3.9	2.9	0	0
ROM flexion	78.8	4.38	134.2	5.21	81.4	20.6	133.6	6.65
ROM extension	–12.8	4.8	0.2	0.4	–12	4.9	0.6	0.5
Muscle strength flexion	3.6	0.9	5	0	3.4	0.5	5	0
Muscle strength extension	3.6	0.5	4.8	0.4	3	0.7	4.6	0.5
Circumference swelling	41	1	39.7	1.7	41.6	3.2	39.3	3.8
Circumference muscle mass	60.2	8.3	63.3	8.5	53.1	9.5	56.5	9.5

Conclusion

The rehabilitation programs either on land or in water were well tolerated and allowed the recovery of the pain, range of motion, muscle strenght and swelling of the individuals undergone to an anterior cruciate ligament reconstruction. Besides on the benefits provided by the rehabilitation in both places, we found that the water may provide better condition for an earlier recuperation.

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Riduzione gonfiore
Forza muscolare
Riduzione del dolore

Prime 9 settimane dall'intervento

frontiers in Surgery

ORIGINAL RESEARCH
published: 07 November 2017
doi: 10.3389/fsurg.2017.00061

Comparison of an Innovative Rehabilitation, Combining Reduced Conventional Rehabilitation with Balneotherapy, and a Conventional Rehabilitation after Anterior Cruciate Ligament Reconstruction in Athletes

OPEN ACCESS

*Laetitia Peultier-Celli[1,2], Didier Mainard[3], Frank Wein[4], Nicolas Paris[4], Patrick Boisseau[5], Alexandre Ferry[5], René Gueguen[1], Isabelle Chary-Valckenaere[6,7], Jean Paysant[1,8] and Philippe Perrin[1,2]**

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Dolore
Propriocezione (?)
Mobilità articolare
Trofia

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Forza muscolare
Test camminata 6'
Lateralizzazione

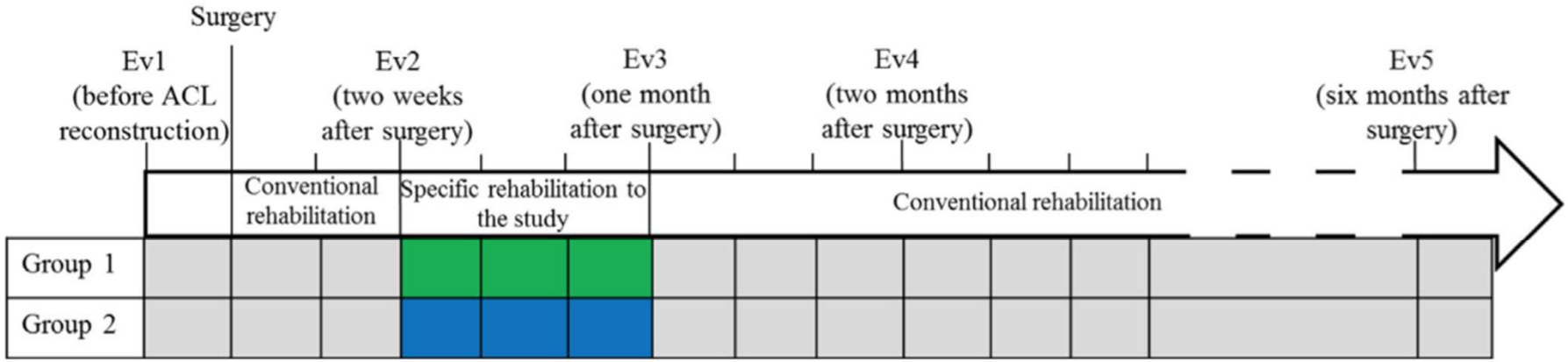
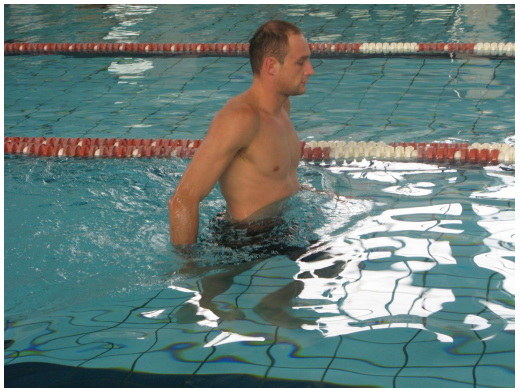
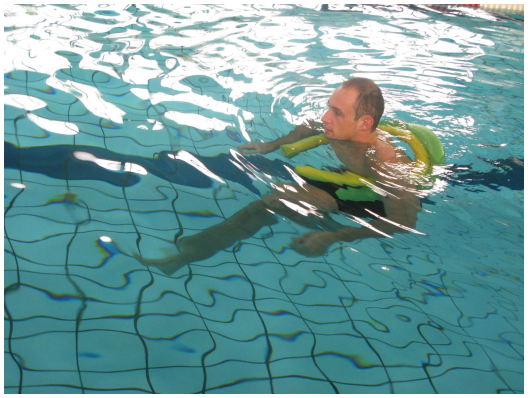


FIGURE 1 | Timeline of the rehabilitation protocol. Phases of conventional rehabilitation and specific rehabilitation to the study. Group 1: conventional rehabilitation group; Group 2: innovative rehabilitation protocol with a conventional part and an aquatic part.





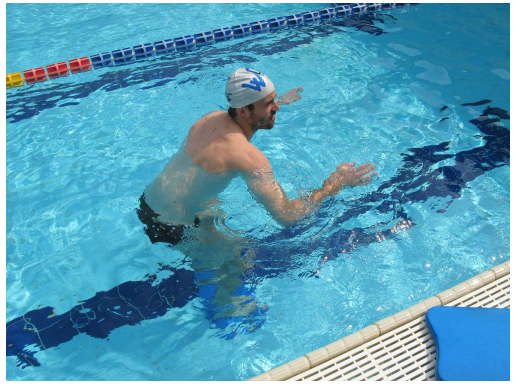



FIGURE 2 | Postural control analysis on a posturography platform (Medicapteurs, Balma, France). Virtual reality goggles (RM Ingénierie, Rodez, France).

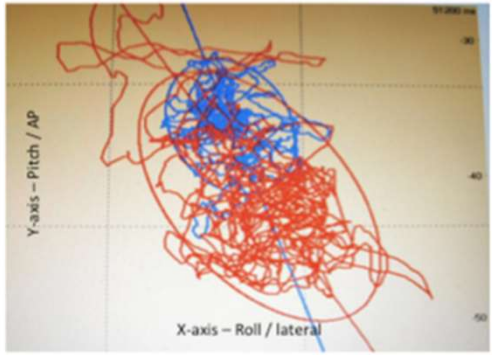


FIGURE 3 | Posturography: statokinesigram, sway path traveled and area covered (confidence ellipse covering 90% of the points) by the center of foot pressure, in eyes open (blue) and eyes closed (red) conditions.

CONCLUSION

This study shows that the innovative rehabilitation protocol (therapy incorporating both a dry and aquatic segment) improves proprioception and limits overcompensation on the limb contralateral to the operated limb. Even if patients undergoing a conventional rehabilitation protocol recover the delay after 6 months of surgery, faster and better recovery of knee functionality, following aquatic rehabilitation would in the short-term prevent injury to the contralateral limb as a result of overcompensation, and serve in the longer term to reduce the risk of osteoarthritis. The effectiveness of such rehabilitation could also enable patients to recover social, physical and professional activities earlier, which would also be of economic benefit, in particular with a reduction in work absence.

Current Reviews in Musculoskeletal Medicine
https://doi.org/10.1007/s12178-020-09610-6

THE USE OF TECHNOLOGY IN ORTHOPAEDIC SURGERY—INTRAOPERATIVE AND POST-OPERATIVE MANAGEMENT (C KRUEGER AND S BINI, SECTION EDITORS)

Check for updates

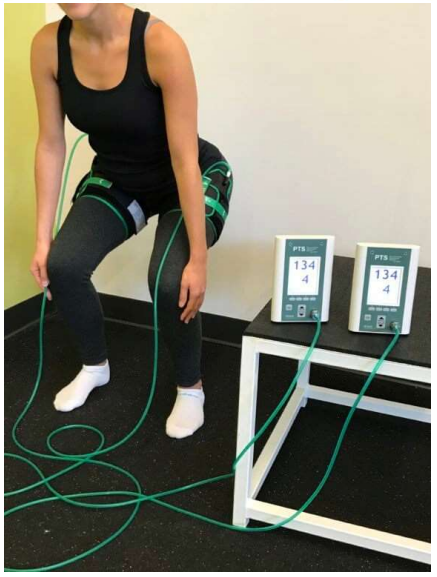
How New Technology Is Improving Physical Therapy

Johnny G Owens[1] · Michelle R Rauzi[2] · Andrew Kittelson[2] · Jeremy Graber[2] · Michael J Bade[2,3] · Julia Johnson[4,5] · Dustin Nabhan[4,5]

Abstract

Purpose of Review As rehabilitation patient volume across the age spectrum increases and reimbursement rates decrease, clinicians are forced to produce favorable outcomes with limited resources and time. The purpose of this review is to highlight new technologies being utilized to improve standardization and outcomes for patients rehabilitating orthopedic injuries ranging from sports medicine to trauma to joint arthroplasty.

atient performing blood flow restriction rehabilitation



[18–20]. Although BFR research has focused primarily on muscle adaptations, recent studies have demonstrated the ability of BFR to improve tendon stiffness and tendon cross-sectional area similar to heavy-load training and reducing bone loss after ACL surgery [21, 22•]. Ongoing and future trials will

2019 AOSSM Specialty Day

Blood Flow Restriction Therapy Preserves Whole Limb Bone and Muscle Following ACL Reconstruction

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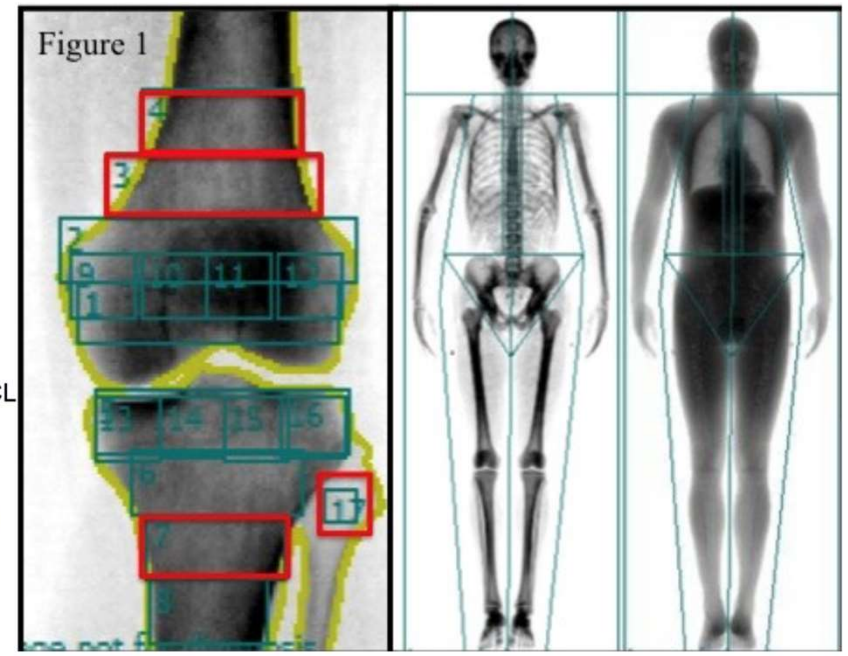
Objectives: Patients often experience atrophy and bone loss immediately following anterior cruciate ligament (ACL) reconstruction. Rehabilitation (rehab) combined with blood flow restriction (BFR) therapy have been shown to mitigate muscle atrophy and reduce timelines for earlier return to function. Little is known about how BFR may impact bone loss. The objectives this study were to determine if BFR provides additional benefits when added to standard rehab in young active patients following ACL reconstruction with regards to preserving bone, recovering muscle, and regaining physical function.

Values = Means +/- SEM (Change from Pre-Surgery). Sig: #=diff from pre-surgery, $=diff between group

GROUP:	BFR		CONTROL	
Independent Variable	wk6	wk12	wk6	wk12
Total Lean Mass (kg)	-1.07 ± 0.60 (-1.94 ± 1.22%) #	-0.01 ± 0.87 (-0.06 ± 1.77%)	-1.31 ± 0.80 (-2.39 ± 1.32%) #	-1.14 ± 0.59 (-2.23 ± 0.98%) #
Leg Lean Mass (kg)	-0.19 ± 0.09 (-2.31 ± 1.19%)	-0.11 ± 0.17 (-1.53 ± 1.65%)	-0.72 ± 0.31 (-7.69 ± 3.03%) #	-0.48 ± 0.21 (-5.5 ± 2.29%) #
Thigh Lean Mass (kg)	-0.13 ± 0.03 (-4.45± 1.31%) #	-0.03 ± 0.05 (-1.26 ± 1.72%)	-0.26 ± 0.10 (-7.72 ± 2.57%) #	-0.16 ± 0.05 (-5.21 ± 1.62%) #$
Leg Bone Mass (g)	-8.05 ± 3.40 (-1.29 ± 0.56%)	-11.97 ± 4.39 (-1.92 ± 0.72%) #	-13.40 ± 3.29 (-2.43 ± 0.52%) #	-16.26 ± 3.03 (-3.01 ± 0.52%) #
Distal Femur BMD (g/cm^2)	-0.06 ± 0.03 (-4.55 ± 2.22%)	-0.09 ± 0.03 (-7.41 ± 2.54%)	-0.09 ± 0.03 (-7.83 ± 1.95%)	-0.12 ± 0.02 (-10.35 ± 1.78%) #
Proximal Tibia BMD (g/cm^2)	-0.05 ± 0.02 (-3.55 ± 1.14%)	-0.03 ± 0.05 (-1.68 ± 3.61%)	-0.06 ± 0.07 (-3.42 ± 4.90%)	-0.15 ± 0.02 (-10.35 ± 1.57%) #$
Proximal Fibula BMD (g/cm^2)	-0.02 ± 0.02 (-4.35 ± 4.05%)	+0.01 ± 0.02 (+1.66 ± 5.81%)	-0.07 ± 0.03 (-13.49 ± 5.47%) #$	-0.08 ± 0.02 (-15.9% ± 3.14%) #$



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Massa muscolare

Tessuto osseo

12 settimane dopo 10gg post-intervento

Thi

Exercise with Blood Flow Restriction to Improve Quadriceps Function Long After ACL Reconstruction

Authors
Matthew A. Kilgas[1, 2], Lydia L.M. Lytle[1, 3], Scott N. Drum[2], Steven J. Elmer[1]

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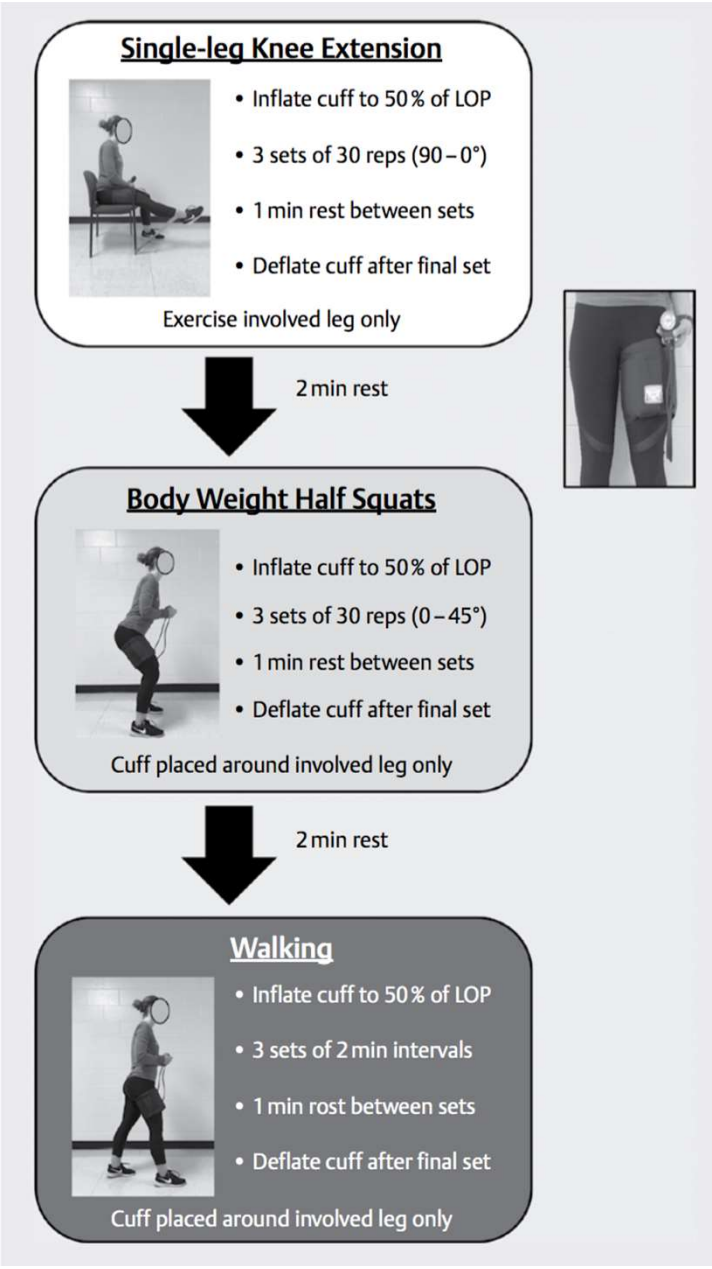
ABSTRACT

Quadriceps atrophy and weakness can persist for years after anterior cruciate ligament reconstruction (ACLR). We evaluated the effectiveness of a home-based blood flow restriction (BFR) exercise program to increase quadriceps size and strength several years after ACLR. Nine adults with ACLR (5 ± 2 yrs post-



Knee. 2015 June ; 22(3): 270–277. doi:10.1016/j.knee.2014.11.013.

Combination of Eccentric Exercise and Neuromuscular Electrical Stimulation to Improve Quadriceps Function Post-ACL Reconstruction

Lindsey K. Lepley, PhD, ATC[1,3], **Edward M. Wojtys, MD**[2], and **Riann M. Palmieri-Smith, PhD, ATC**[2,3]

Combination of Eccentric Exercise and Neuromuscular Electrical Stimulation to Improve Biomechanical Limb Symmetry After Anterior Cruciate Ligament Reconstruction

Lindsey K. Lepley, PhD, ATC[1,3], **Edward M. Wojtys, MD**[2,3], and **Riann M. Palmieri-Smith, PhD, ATC**[1,2,3]

Conclusion

Eccentric exercise post-ACL reconstruction was found to positively improve quadriceps activation and strength. Changes in quadriceps activation were positively related to changes in quadriceps strength, suggesting that by removing QAF, quadriceps strength should improve. NMES was not found to improve QAF or strength post-reconstruction. The inability of NMES to improve quadriceps muscle function may be the result of an inability to generate powerful muscle actions due to device limitations and post-operative pain. Importantly, when compared to healthy individuals, patients that were exposed to eccentric exercise were capable of restoring healthy levels of quadriceps activation and strength, whereas deficits in these measures still persisted for individuals not exposed to eccentric exercise.

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Forza quadricipite
Attivazione quadricipite
Simmetria biomeccanica degli arti inferiori

6 settimane post-intervento

Manuscript Highlights

- Combined neuromuscular electrical stimulation and eccentric exercise intervention was capable of restoring biomechanical symmetry that was most similar to healthy individuals at 7 months following ACL reconstruction.
- Longer eccentric intervention may be beneficial, as this therapy was found to be the driving factor behind strength gains in our previous work, and greater quadriceps symmetry were able to demonstrate greater biomechanical limb symmetry.
- This study helps to provide preliminary evidence of therapies that positively affect influence movement post-ACL reconstruction. However, to determine the true clinical effect, larger sample sizes and patient randomization is needed.

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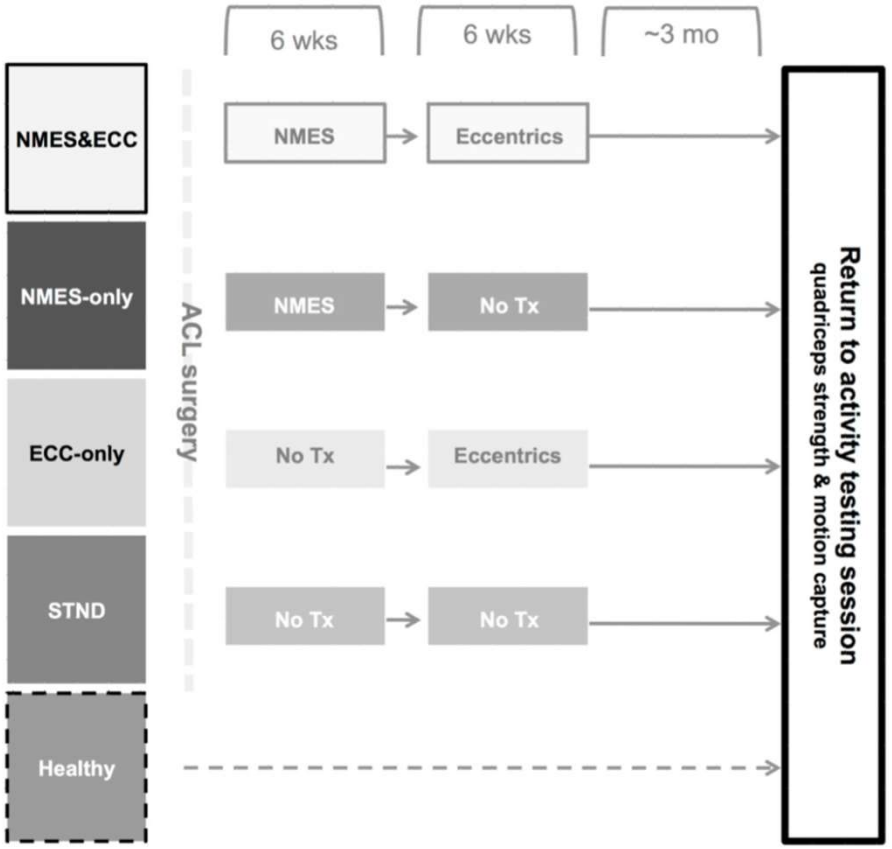
Simmetria biomeccanica Arti inferiori

12 settimane post-intervento



Combination of Eccentric Exercise and Neuromuscular Electrical Stimulation to Improve Biomechanical Limb Symmetry After Anterior Cruciate Ligament Reconstruction

Lindsey K. Lepley, PhD, ATC[1,3], **Edward M. Wojtys, MD**[2,3], and **Riann M. Palmieri-Smith, PhD, ATC**[1,2,3]

2018 Feb;26(2):399-410.
doi: 10.1007/s00167-017-4669-5. Epub 2017 Aug 17.

Neuromuscular electrical stimulation is effective in strengthening the quadriceps muscle after anterior cruciate ligament surgery

Annette V Hauger [1], M P Reiman [2], J M Bjordal [3 4], C Sheets [5], L Ledbetter [6], A P Goode [2 7 8]

Conclusion: NMES in addition to standard physical therapy appears to significantly improve quadriceps strength and physical function in the early post-operative period compared to standard physical therapy alone.

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Forza muscolare

4-12 settimane post-intervento

Moran *et al. Journal of NeuroEngineering and Rehabilitation* (2019) 16:89
https://doi.org/10.1186/s12984-019-0566-0

Journal of NeuroEngineering and Rehabilitation

RESEARCH Open Access

Functional electrical stimulation following anterior cruciate ligament reconstruction: a randomized controlled pilot study

Uria Moran[1,2], Uri Gottlieb[1,2], Arnon Gam[1] and Shmuel Springer[2*]

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Forza quadricipite

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Velocitò e simmetria cammino

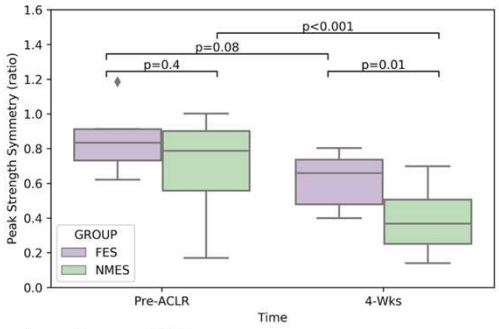


Fig. 3 Peak strength symmetry (operated/non-operated limb)

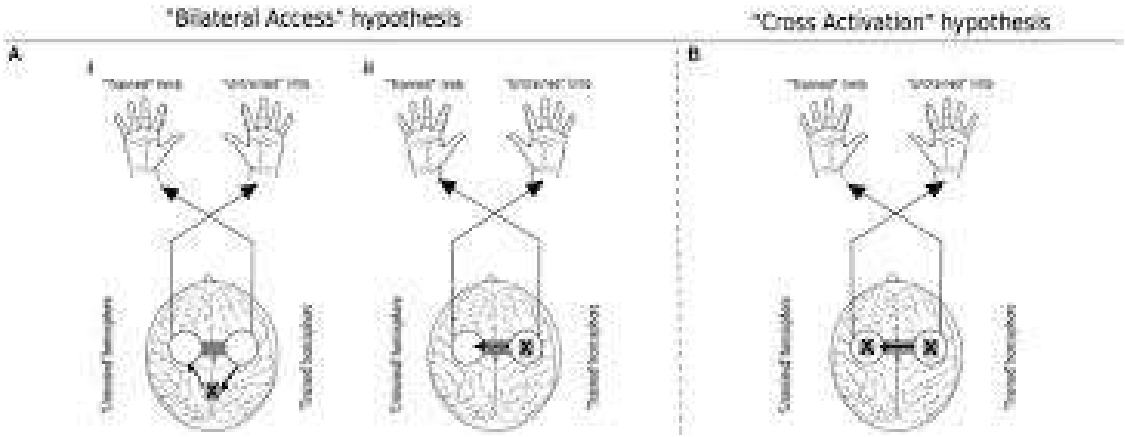
4 settimane post-intervento

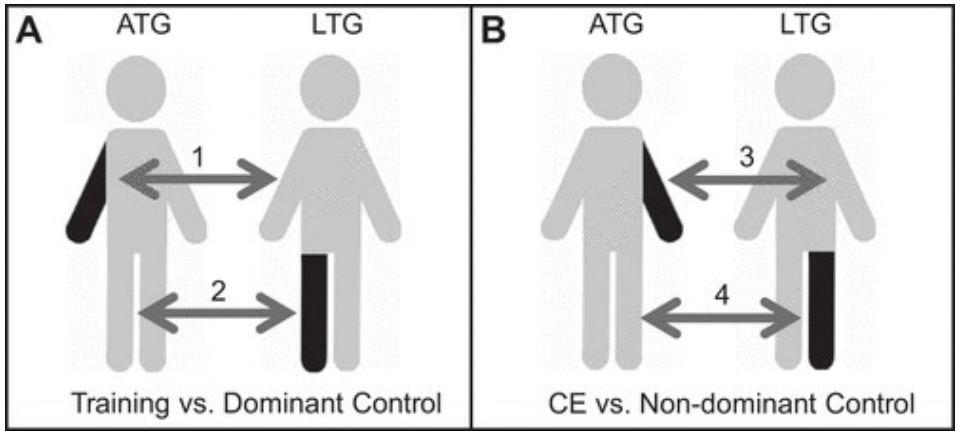
Fig. 2 The electrical stimulation system used in the study

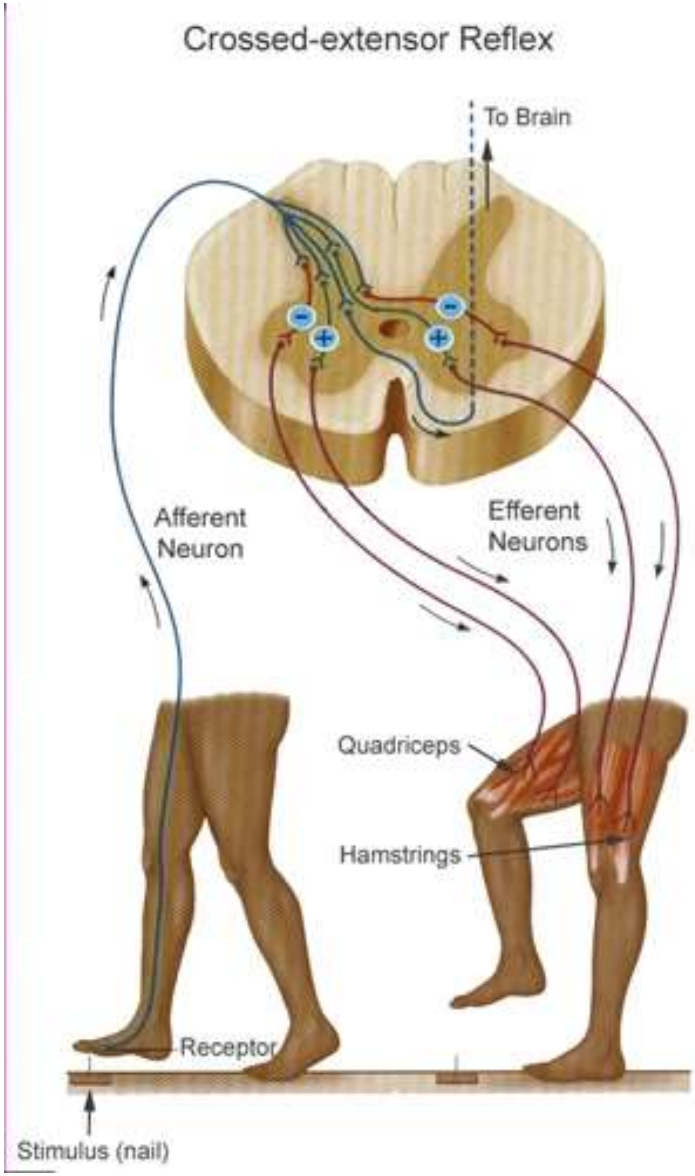
Review

Cross education and immobilisation: Mechanisms and implications for injury rehabilitation

Author links open overlay panelAshlee M.Hendy[a]MichaelSpittle[a]Dawson J.Kidgell[b]







European Journal of Applied Physiology (2018) 118:1609–1623
https://doi.org/10.1007/s00421-018-3892-1

ORIGINAL ARTICLE

Cross-education does not accelerate the rehabilitation of neuromuscular functions after ACL reconstruction: a randomized controlled clinical trial

Tjerk Zult[1,2] · Alli Gokeler[1] · Jos J. A. M. van Raay[3] · Reinoud W. Brouwer[3] · Inge Zijdewind[4] · Jonathan P. Farthing[5] · Tibor Hortobágyi[1]

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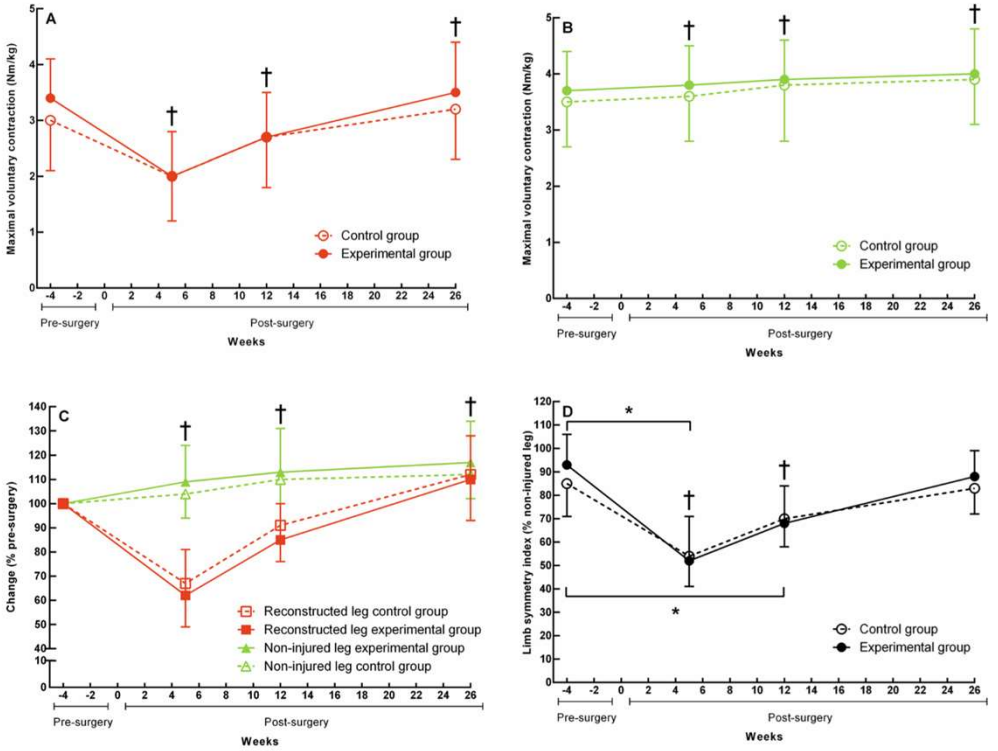
Forza massimale quadricipite
Controllo neuromuscolare
Equilibrio dinamico



12 settimane post-intervento chirurgico

Conclusion Standard rehabilitation improved maximal quadriceps strength, force control, and dynamic balance in both legs relative to pre-surgery but adding cross-education did not accelerate recovery following ACL reconstruction.

Rehabilitation and nutrition protocols for optimising return to play from traditional ACL reconstruction in elite rugby union players: A case study

Gregory Shaw,Ben Serpell &Keith Baar

Pages 1794-1803 | Accepted 26 Feb 2019, Published online: 09 Apr 2019

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Composizione corporea (massa magra)
Forza muscolare arto inf

24 settimane

Idrolizzato biologico di Collagene

Current nutrition and exercise focus during rehabilitation periods has been on reducing muscle atrophy associated with immobilisation. This case report outlines a best practice anterior cruciate ligament (ACL) rehabilitation programme undertaken by two professional rugby athletes, with the addition of an evidence-based supplementation (gelatine and vitamin C) and exercise protocol focused on collagenous tissue. Both players ruptured their left ACL and were repaired with a traditional hamstring graft. Players undertook a structured rehabilitation programme for 34 weeks before being clinically assessed ready to play. Players saw minimal changes in body composition in the early rehabilitation period (P1 – 0.8 kg; P2 – 0.4 kg). Leg lean mass reduced in both legs of Player 1 (Injured – 0.8 kg, Non-injured – 0.6 kg) at 17 weeks, with Player 2 only experiencing a loss of 0.3 kg of lean tissue in the injured leg. Both players returned to baseline body compositions after 24 weeks. Leg strength returned to a maximum at 24 and 15 weeks, respectively, with knee function returning to baseline by 30 weeks. This case report provides evidence that nutrition and rehabilitation programmes targeted at minimising the effects

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ARTIGOS ORIGINAIS

SUPLEMENTAÇÃO COM ÔMEGA-3 PÓS-RECONSTRUÇÃO DO LIGAMENTO CRUZADO ANTERIOR

+

Effetto protettivo sulla modulazione dei markers di stress ossidativo

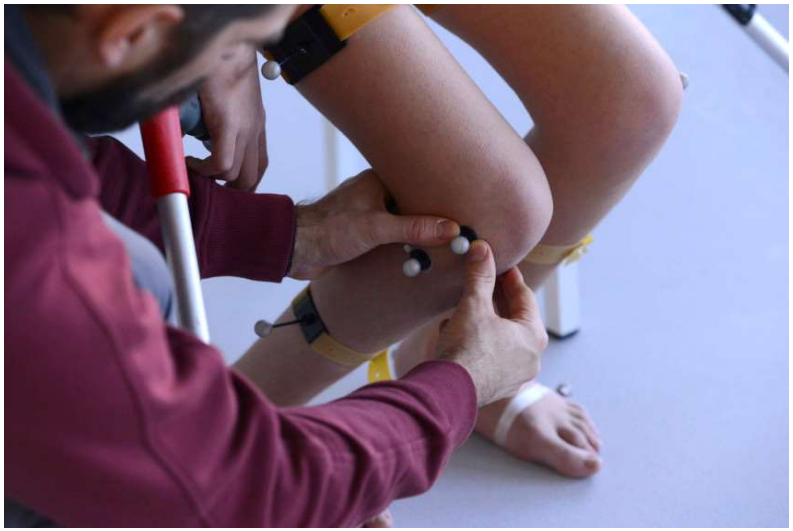
4 settimane post-intervento

2016 Jul;24(7):2280-6.
doi: 10.1007/s00167-014-3374-x. Epub 2014 Oct 14.

Immersive virtual reality improves movement patterns in patients after ACL reconstruction: implications for enhanced criteria-based return-to-sport rehabilitation

Alli Gokeler[1], Marsha Bisschop[2], Gregory D Myer[3], Anne Benjaminse[2 4], Pieter U Dijkstra[5], Helco G van Keeken[2], Jos J A M van Raay[6], Johannes G M Burgerhof[7], Egbert Otten[2]

Conclusion: Patients after ACLR immersed in virtual reality environment demonstrated knee joint biomechanics that approximate those of CTRL. The results of this study indicate that a realistic virtual reality scenario may distract patients after ACLR from conscious motor control. Application of clinically available technology may aid in current rehabilitation programmes to target altered movement patterns after ACLR.



[CLINICAL COMMENTARY]

ERIC WATERS, MS, ATC/L, CES, CSCS[1]

Suggestions From the Field for Return to Sports Participation Following Anterior Cruciate Ligament Reconstruction: Basketball

Riatletizzazione / Return to sport

CONCLUSION

FUNCTIONAL REHABILITATION FOLlowing ACL reconstruction surgery for a basketball athlete poses a unique challenge for the athlete and the physical therapist. The amount of high-speed cutting, pivoting, and, most notably, explosive jumping (and landing) from full sprints may place the athlete in compromising positions. Preparing a basketball player for an effective return to play requires that the final and most functional phase of the rehabilitation program encompass a thorough protocol based on exercises that maintain proper lower extremity alignment throughout all the conceivable scenarios of a basketball game. To achieve this goal, a successful rehabilitation program must take into account these unique movements, fitness level, player positions, and even gender.[32] It should also contain basketball-related exercises and progressions that specifically address these movements. Examples include drills that challenge the player in different phases of the game of basketball, such as dribbling, passing, and catching a ball while running, cutting, and jumping, as well as reacting to ball and player movement. It is the role of the clinician to provide these unique challenges during the functional aspect of the rehabilitation process and to supply feedback to the player to ensure that proper lower-body strength, power, and stability are achieved for a successful return to play.

FIGURE 1. Rotational squat, starting position.

FIGURE 2. Rotational squat, finishing position.

and strength, while providing a base for neuromuscular coordination and endurance exercises. Phase 3 seeks to progress the athlete from the beginning of functional work at the end of phase 2 to final

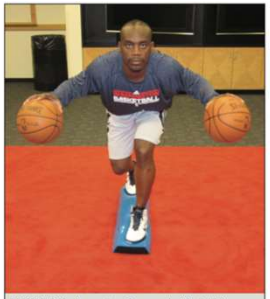


FIGURE 3. Split squat on foam pad with dribbling.

FIGURE 4. Double-leg tilt board squat with dribble.

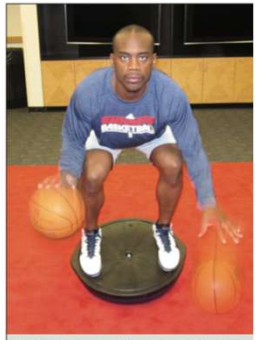


FIGURE 5. Double-leg BOSU ball squat with dribble.

signed to develop strength through fun
tional movements and power and for
attenuation skills from low-intensi
jumping and landing drills.[18]

Functional Strength Functional streng
enhancement is accomplished wi
weight-bearing (closed-kinetic-chai
exercises, progressively increasing tl
amount of weight the athlete can mov
while concurrently maintaining prop
lower extremity alignment.[8] The role
the rehabilitation clinician is to constru
exercises that address existing defici
and to provide feedback to the patie
that will allow the patient to mainta
suitable alignment during the exerci

FIGURE 14. Close-out drill. With elastic resistance added to aid in increasing eccentric load, the player accelerates to and decelerates to close out on an offensive player in a controlled manner.

FIGURE 15. Low-post drill. Player with ball attempts to score in the low-post area while being resisted. Player may switch roles to be the resistance provider.

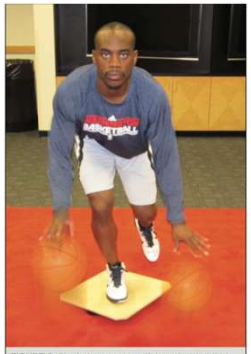


FIGURE 6. Single-leg squat on tilt board with dribble.

FIGURE 7. Double-leg squat on BOSU, with ball catching and passing.

FIGURE 9. Double-leg ball catches on a tilt board, while clinician provides external perturbations.

FIGURE 10. Single-leg ball catches on a tilt board, while clinician provides external perturbations.

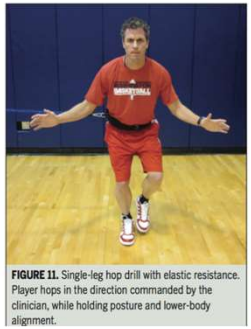
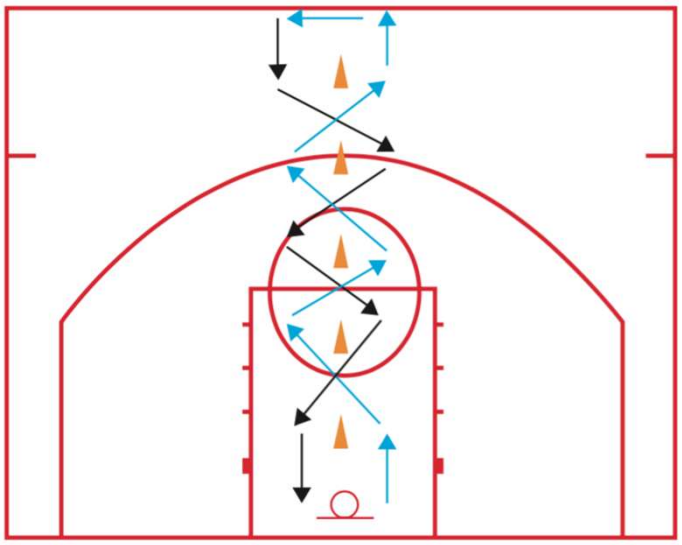
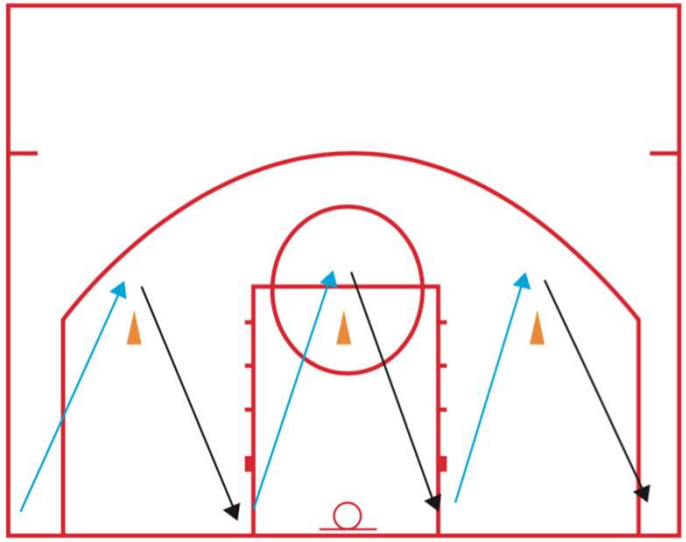


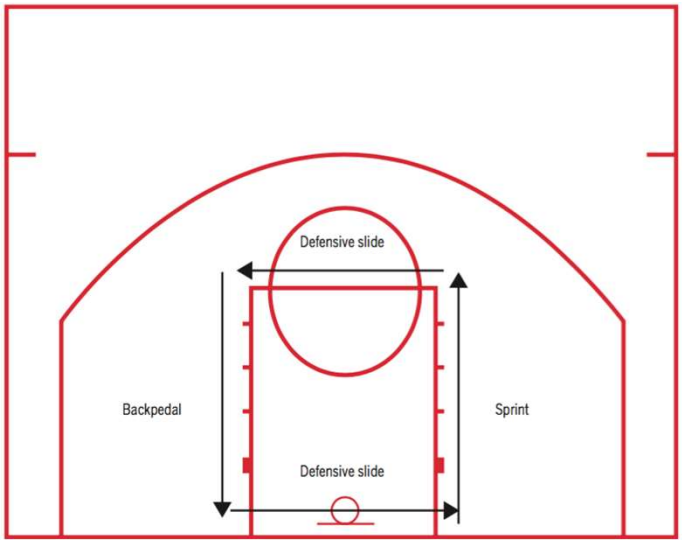
FIGURE 11. Single-leg hop drill with elastic resistance. Player hops in the direction commanded by the clinician, while holding posture and lower-body alignment.

FIGURE 12. Crab dribble drill with elastic resistance. Player slides back and forth between 2 points while dribbling.

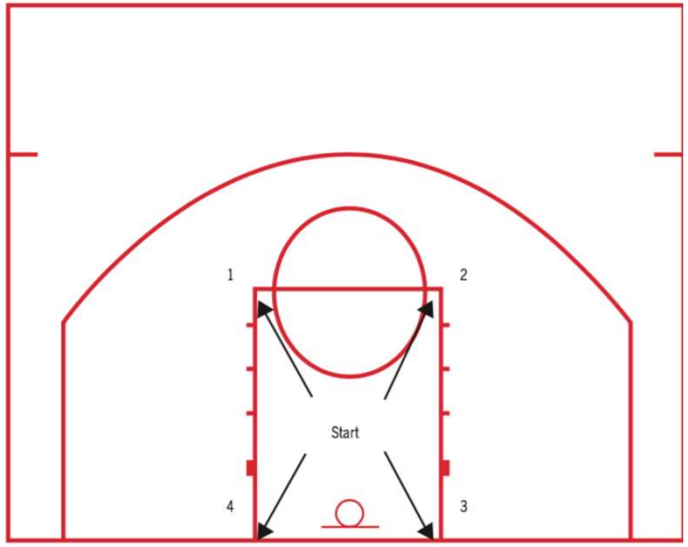
FIGURE 13. Defensive slides with elastic resistance. The player executes defensive slides around an arc, while maintaining posture and distance from clinician.

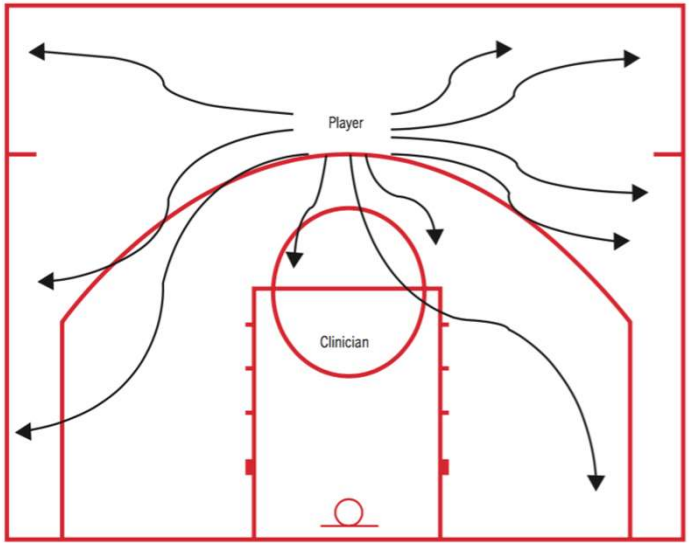


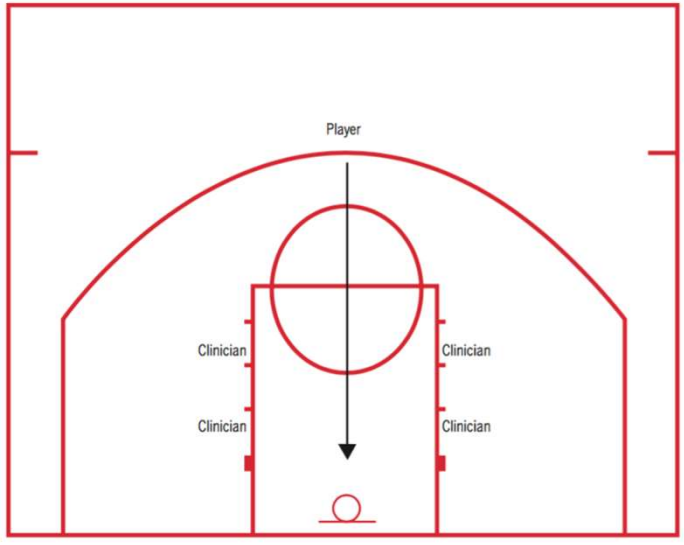




Backpedal Sprint







Ambiente acquatico (sport-specifico)
Stile rana
Difficoltà nell'applcazione di protocolli tradizionali

Scozzoli: So che tornerò ma non chiedetemi quando

Al Settecolli di Roma solo 13° in batteria nei 100 rana dopo l'infortunio di 9 mesi fa. "Europei? Difficile, non mi vedo a non lottare per una medaglia"

Sono passati nove mesi da quando il ginocchio di Fabio Scozzoli ha fatto crack. Il 4 settembre 2013, durante un allenamento a secco, si è rotto il legamento crociato anteriore del ginocchio destro. Una riabilitazione lunga, sei mesi senza fare la gambata a rana e tanta forza di volontà per tornare a grandi livelli. Ma il cammino non è ancora compiuto. Ieri Scozzoli ha nuotato le batterie dei 100 rana al Settecolli chiudendo con il 13° tempo (1'02"69). «Il cronometro è solo un riferimento - ha detto -. Certe sensazioni sono ancora lontane. Non ci sono precedenti nel nuoto per calcolare i tempi di recupero di un infortunio come questo. Fossi stato un calciatore sarebbe stato diverso».

Conclusioni

- Nel percorso riabilitativo dopo ricostruzione LCA vi sono diverse opzioni a disposizione del team riabilitativo.
- Ogni ulteriore proposta deve essere valutata in rapporto alla situazione specifica (età, sesso, livello di qualificazione, obiettivi, contesto, trattamenti in corso, etc.) verificando il rapporto costo/beneficio, tenendo conto delle evidenze scientifiche, valutando il “quando e come” e verificando costantemente i risultati
- I componenti del team riabilitativo devono aggiornarsi e confrontarsi per valutare in maniera coordinata e razionale l’introduzione nel programma generale di interventi più o meno innovativi

GRAZIE!