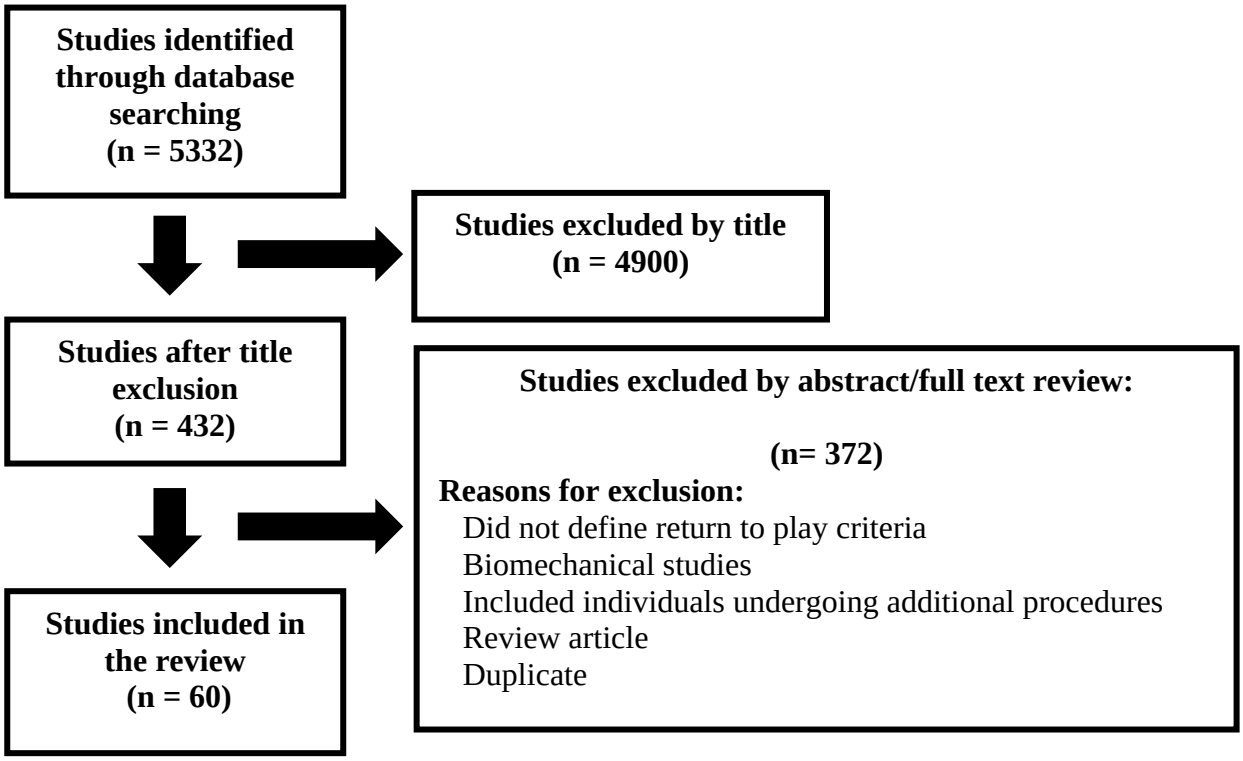
Supplemental Material 1: Systematic Review

Identification of Studies for Inclusion in the Systematic Review

We performed a literature search of English language clinical trials and systematic reviews using PubMed from January 1994 through December 2014. Search criteria included the terms: "ACL reconstruction rehabilitation," "ACL reconstruction and rehabilitation," "ACL injury and rehabilitation" and "ACL reconstruction." All references from selected studies were reviewed to identify any additional papers that may have been overlooked or were not indexed in the electronic databases. Studies that included individuals with multi-ligament knee tears, knee dislocations, or those undergoing ACL revision were excluded from our review.

Data Extraction

Data were collected according to a predetermined form. Information collected for each study included reconstruction technique, graft choice, objective outcome assessment tool and any stated threshold for RTP. Measures identified included, but were not limited to, duration of recovery, absence of effusion, absence of pain, absence of "giving away," questionnaires, range of motion (ROM), muscle strength similarity including isokinetic device measurement (Cybex, Biodex, Kintrex, Kincom), hop tests, thigh circumference, KT-1000, proprioception tests or other sport-specific agility and functional testing. Information was organized by study and objective outcome measure in order to draw conclusions about the types of tools currently employed to assess RTP after ACLR.



PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) chart outlining the review of articles from the search

Studies included in the systematic review

Author	Year	Title	n	Measures
Akoto et al.[1]	2012	Anterior cruciate ligament (ACL) reconstruction with quadriceps tendon autograft and press-fit fixation using an anteromedial portal technique	30	IsoK*
Anderson et al[2]	1994	Anterior cruciate ligament reconstruction using the semitendinosus and gracilis tendons augmented by the losee iliotibial band tenodesis	70	IsoK*
Ardern et al.[4]	2013	Psychological Response Matter in Returning to Preinjury Level of Sport After Anterior Cruciate Ligament Reconstruction Surgery	187	PE†, Fx‡
Aune et al[6]	2001	Four-Strand Hamstring Tendon Autograft Compared with Patellar Tendon-Bone Autograft for Anterior Cruciate Ligament Reconstruction	72	PE†, Fx‡
Barrett et al[9]	2010	Allograft Anterior Cruciate Ligament Reconstruction in the Young Active Patient: Tegner Activity Level and Failure Rate	111	PE†, Hop (SLHD[a]), Fx‡, TC[g]
Beynnon et al[11]	2002	Anterior cruciate ligament replacement: comparison of bone-patellar tendon-bone grafts with two-strand hamstring grafts.	56	PE†, IsoK*
Colombet et al[15]	2006	Two-bundle, four-tunnel anterior cruciate ligament reconstruction	33	IsoK*
Drogest et al.[21]	2002	Anterior cruciate ligament reconstruction with and without a ligament augmentation device	115	IsoK*, Fx‡
Drogset et al[22]	2006	Comparison of In Vitro and In Vivo Complement Activation by Metal and Bioabsorbable Screws Used in Anterior Cruciate Ligament Reconstruction	41	IsoK*, Fx‡
Drogset et al[23]	2006	Magnetic Resonance Imaging Analysis of Bioabsorbable Interference Screws Used for Fixation of Bone–Patellar Tendon–Bone Autografts in Endoscopic Reconstruction of the Anterior Cruciate Ligament	19	IsoK*, Fx‡
Drogset et al[24]	2005	Endoscopic Reconstruction of the Anterior Cruciate Ligament Using Bone–Patellar Tendon–Bone Grafts Fixed With Bioabsorbable or Metal Interference Screws	41	IsoK*, Fx‡
Drogset et al[25]	2010	Autologous patellar tendon and quadrupled hamstring grafts in anterior cruciate ligament reconstruction: a prospective randomized multicenter review of different fixation methods	100	IsoK*, Fx‡
Eriksson et al[26]	2001	There are differences in early morbidity after ACL reconstruction when comparing patellar tendon and semitendinosus graft	107	Hop (SLHD[a])
Giannotti et al[27]	1996	The Predictive Value of Intraoperative KT-1000 Arthrometer Measurements in Single Incision Anterior Cruciate Ligament Reconstruction	28	PE†, Hop (SLHD[a])
Goradia et al[29]	2006	Factors Associated With Decreased Muscle Strength After Anterior Cruciate Ligament Reconstruction With Hamstring Tendon Grafts	85	IsoK*

Author	Year	Title	n	Measures
Grindem et al.[30]	2012	A Pair-Matched Comparison of Return to Pivoting Sports at 1 Year in Anterior Cruciate Ligament–Injured Patients After a Nonoperative Versus an Operative Treatment Course	138	IsoK*, Hop (SLHD[a], SLTH[b], TH[c], Cr[d])
Hartigan et al.[31]	2010	Time line for noncopers to pass return-to-sports criteria after anterior cruciate ligament reconstruction	49	Survey, IsoK*, Hop (SLHDA, SLTH[b], TH[c], Cr[d])
Henriksson et al.[32]	2002	Range of motion training in brace vs. plaster immobilization after anterior cruciate ligament reconstruction: a prospective randomized comparison with a 2-year follow-up.	50	IsoK*, Fx‡?
Higuchi et al[36]	2003	The relation between static and dynamic knee stability after ACL reconstruction	49	PE†, IsoK*
Higuchi et al[37]	2002	Characteristics of anterior tibial translation with active and isokinetic knee extension exercise before and after ACL reconstruction	49	PE†, IsoK*
Isberg et al[40]	2011	Will early reconstruction prevent abnormal kinematics after ACL injury? Two-year follow-up using dynamic radiostereometry in 14 patients operated with hamstring autografts	14	IsoK*
Isberg et al[39]	2006	Early active extension after anterior cruciate ligament reconstruction does not result in increased laxity of the knee	22	IsoK*
Jenkins et al[41]	1998	Knee Joint Accessory Motion Following Anterior Cruciate Ligament Allograft Reconstruction: A Preliminary Report	5	PE†, Fx‡, Arth[f]
Jorgensen et al.[42]	2000	Behavior of the graft within the bone tunnels following anterior cruciate ligament reconstruction, studied by cinematic magnetic resonance imaging	23	PE†, IsoK*
Kamien et al.[43]	2013	Age, Graft Size, and Tegner Activity Level as Predictors of Failure in Anterior Cruciate Ligament Reconstruction With Hamstring Autograft	98	Fx‡, TC[g]
Keays et al[44]	2003	The relationship between knee strength and functional stability before and after anterior cruciate ligament reconstruction	31	IsoK*, Hop (SLHD[a], TH[c])
Kobayashi et al[47]	2003	Muscle performance after anterior cruciate ligament reconstruction	36	PE†, IsoK*
Landes et al.[49]	2010	Knee flexor strength after ACL reconstruction: comparison between hamstring autograft, tibialis anterior allograft, and non-injured controls	60	IsoK*, Hop (SLHD[a])
Larkin et al.[50]	1998	The effect of injury chronicity and progressive rehabilitation on single-incision arthroscopic anterior cruciate ligament reconstruction	42	IsoK*
Lee et al[52]	2004	Outcome of Anterior Cruciate Ligament Reconstruction Quadriceps Tendon Autograft	67	IsoK*

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Lee et al[51]	2010	Comparison of Clinical Results and Second-Look Arthroscopy Findings After Arthroscopic Anterior Cruciate Ligament Reconstruction Using 3 Different Types of Grafts	338	IsoK*
Lentz et al.[53]	2012	Return to Preinjury Sports Participation Following Anterior Cruciate Ligament Reconstruction: Contributions of Demographics, Knee Impairment and Self-report Measures	94	PE†, IsoK*, Fx‡
MacDonald et al.[55]	1995	Effects of an Accelerated Rehabilitation Program after Anterior Cruciate Ligament Reconstruction with Combined Semitendinosus-Gracilis Autograft and a Ligament Augmentation Device	40	PE†, IsoK*
Marcacci et al[58]	2009	Anterior Cruciate Ligament Reconstruction Associated With Extra-articular Tenodesis	54	Hop (SLHD[a]), TC[g]
Mascarenhas et al.[59]	2010	Patellar Tendon Anterior Cruciate Ligament Reconstruction in the High-Demand Patient: Evaluation of Autograft Versus Allograft Reconstruction	38	PE†, IsoK*, Hop (SLHD[a], VH[e])
Mascarenhas et al.[60]	2012	Bone-patellar tendon-bone autograft versus hamstring autograft anterior cruciate ligament reconstruction in the young athlete: a retrospective matched analysis with 2–10 year follow-up	46	PE†, IsoK*, Hop(SLHD[a], VH[e])
McHugh et al[62]	2002	Electromyographic predictors of residual quadriceps muscle weakness after anterior cruciate ligament reconstruction	37	IsoK*
Moller et al[63]	2001	Bracing versus nonbracing in rehabilitation after anterior cruciate ligament reconstruction: a randomized prospective study with 2-year follow-up	62	IsoK*, Hop (SLHD[a])
Muneta et al[64]	1999	Two-bundle reconstruction of the anterior cruciate ligament using semitendinosus tendon with endobuttons: operative technique and preliminary results	54	IsoK*
Noyes et. al.[68]	1997	Anterior cruciate ligament reconstruction with autogenous patellar tendon graft in patients with articular cartilage damage	53	PE†, IsoK*
Noyes et al.[69]	1997	A comparison of results of arthroscopic-assisted anterior cruciate ligament reconstruction between workers' compensation and noncompensation patients	38	PE†, IsoK*
Noyes et al.[67]	1996	Reconstruction of the anterior cruciate ligament with human allograft. Comparison of early and later results	68	IsoK*
Poehling et al.[74]	2005	Analysis of outcomes of anterior cruciate ligament repair with 5-year follow-up: allograft versus autograft	159	IsoK*. Fx‡
Sajovic et al.[77]	2006	A Prospective, Randomized Comparison of Semitendinosus and Gracilis Tendon Versus Patellar Tendon Autografts for Anterior Cruciate Ligament Reconstruction	64	PE†, IsoK*
Siebold et al.[84]	2006	Anterior cruciate ligament reconstruction in females: a comparison of hamstring tendon and patellar tendon autografts	65	PE†, IsoK*

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Shelbourne et al.[82]	1995	Ligament Stability Two to Six Years After Anterior Cruciate Ligament Reconstruction with Autogenous Patellar Tendon Graft and Participation in Accelerated Rehabilitation Program	209	IsoK*
Shelbourne et al.[81]	1995	Timing of Surgery in Acute Anterior Cruciate Ligament Tears on the Return of Quadriceps Muscle Strength After Reconstruction Using an Autogenous Patellar Tendon Graft	143	IsoK*
Shelbourne et al.[83]	1997	Anterior Cruciate Ligament Reconstruction with Autogenous Patellar Tendon Graft Followed by Accelerated Rehabilitation	1057	IsoK*
Shelbourne et al.[80]	2014	Return to Sports and Subsequent Injury Rates After Revision Anterior Cruciate Ligament Reconstruction With Patellar Tendon Autograft	84	IsoK*
Sterling et al.[87]	1995	Allograft Failure in Cruciate Ligament Reconstruction	18	IsoK*
Smith et al.[85]	2008	High Failure Rate for Electrothermal Shrinkage of the Lax Anterior Cruciate Ligament: A Multicenter Follow-up Past 2 Years	64	PE†, IsoK*
Tashiro et al[89]	2003	Influence of medial hamstring tendon harvest on knee flexor strength after anterior cruciate ligament reconstruction	90	IsoK*
Timm et al.[90]	1997	The clinical and cost-effectiveness of two different programs for rehabilitation following ACL reconstruction	60	IsoK*, Arth[f], Hop (SLHD[a], SLTH[b], VH[e])
Wagner et al.[92]	2005	Hamstring Tendon Versus Patellar Tendon Anterior Cruciate Ligament Reconstruction Using Biodegradable Interference Fit Fixation	356	PE†, Hop (SLHD[a])
Weiler et al.[94]	2007	Primary Versus Single-Stage Revision Anterior Cruciate Ligament Reconstruction Using Autologous Hamstring Tendon Grafts A Prospective Matched-Group Analysis	351	PE†, IsoK*
Yoon et al.[96]	2009	Standard anterior cruciate ligament reconstruction versus isolated single-bundle augmentation with hamstring autograft	164	IsoK*
Zaffagnini et al.[100]	2006	Prospective and randomized evaluation of ACL reconstruction with three techniques: a clinical and radiographic evaluation at 5 years follow-up	75	TC[g], Hop (SLHD[a])
Zaffagnini et al.[99]	2008	ST/G ACL reconstruction: double strand plus extra-articular sling vs double bundle, randomized study at 3-year follow-up	72	PE†, IsoK*
Zaffagnini et al.[98]	2011	Single-bundle patellar tendon versus non-anatomical double-bundle hamstrings ACL reconstruction: a prospective randomized study at 8-year minimum follow-up	79	PE†, IsoK*, Hop (SLHD[a]), TC[g]
Zaffagnini et al.[97]	2013	The Videoinsight method: improving rehabilitation following anterior cruciate ligament reconstruction - a preliminary study	106	PE†, IsoK*, Hop (SLHD[a]), TC[g]