Webster KE, Nagelli CV, Hewett TE, Feller JA. Factors Associated With Psychological Readiness to Return to Sport After Anterior Cruciate Ligament Reconstruction Surgery. Am J Sports Med. 2018;46(7):1545-1550.

Review Submitted By: Tyler France, PT, DPT, CSCS

Objective: The objective of this study was to identify factors that influence psychological readiness to return to sport following ACLR and to compare patients who had and had not returned to sport.

Methods: A group of 635 individuals who had attended a private orthopedic clinic s/p ACLR between 2011 and 2013 were included in the study. Patients were eligible if they had been active in sports before the injury, had undergone primary hamstring ACLR surgery, and were cleared to return to sport by the surgeon. Patients were invited to participate at their 12-month follow-up visit. Participants completed the Anterior Cruciate Ligament-Return to Sport After Injury (ACL-RSI) scale at an average of 12 months after surgery. Demographics, sport outcomes, surgical timing, laxity, single-limb hop symmetry, and symptoms of pain and function were also reported and analyzed.

Results: Univariate analysis for the entire cohort showed that all of the following had a positive effect on psychological readiness: male sex, younger age (15-19 years had higher readiness), a shorter interval between injury and surgery, a higher frequency of pre-injury sport participation, greater limb symmetry, and higher subjective knee scores. In multivariate analysis, subjective knee scores and age accounted for a large portion of the variance in psychological readiness. The only significant difference between those who had and had not returned to sport was that female sex was a significant contributor in the group who had not returned. Only 158 patients had returned to competitive sport at the time of the study.

Conclusions: Function and self-reported symptoms were most associated with psychological readiness to RTS after ACLR surgery. Male patients who participated frequently in sport pre-injury had higher psychological readiness to return to sport post-injury. Conversely, female patients had a more negative outlook about their readiness to return to sport.

Commentary: The sex differences observed in the current study are consistent with previous research showing that males are more likely than females to return to their pre-injury level of competition. In the current study, the rate of return to competitive sport was only 25% (30% of males and 17% of females). The authors suggest that this number is low because their follow-up time frame ranged from 11 months to 24 months. According to current data, male patients are more psychologically ready to return to sport. However, pain perception research also suggests that male patients are more reluctant to report fears and anxieties about returning to sport. Regardless, any interventions designed to increase psychological readiness should be applied in the early post-operative phase, particularly to female patients. It would be interesting to see whether or not psychological readiness to return to sport correlates with re-injury rates in this population.

Luque-Suarez, Alejandro et al. "Role Of Kinesiophobia On Pain, Disability And Quality Of Life In People Suffering From Chronic Musculoskeletal Pain: A Systematic Review". *British Journal Of Sports Medicine*, 2018, pp. bjsports-2017-098673. *BMJ*, doi:10.1136/bjsports-2017-098673.

Review Submitted by: Katie Long, PT, DPT

Objective: To explore the relationship kinesiophobia has on pain, disability and quality of life on those with chronic musculoskeletal pain (CMP) and to analyze prognostic value of kinesiophobia on pain, disability and quality of life.

Methods: Systematic review of predictive studies, cross-sectional studies and case-control studies that were relevant to address the level of association between kinesiophobia and outcomes related to CMP. PubMed, AMED, CINAHL, PsycINFO, and PubPsych were all utilized for searching relevant literature. Inclusion and exclusion criteria out outlined in accordance to the PECOS (Patient, Exposure, Comparator, Outcome, Study design) framework. Studies included were observational studies exploring the predictive role of kinesiophobia. Studies were included if they were adults experiencing chronic pain over three months. The studies included had to utilize the Tampa Scale for Kinesiophobia (TSK) and had to be written in English. Age, gender and ethnicity were not restricted in the inclusion criteria. Exclusion criteria included studies on acute and subacute pain, studies associated with a psychiatric disorder, studies on CMP involving fracture or related to surgical interventions, studies including post-trauma CMP, studies on the role of kinesiophobia in experimental models of pain, and in vivo studies. Study designs of reviews, clinical studies, case reports, editorials and abstracts were excluded.

Results: A total of 63 observational studies (8 longitudinal studies, 50 cross sectional studies and 5 case control studies) were included for review with a total of 10726 participants. Outcome measures included disability, pain, and quality of life. Kinesiophobia and pain: 38 studies evaluated the association between kinesiophobia and pain, 21 of which found a significant association and 13 of which showing no significant relationship between the two measures. Overall quality of evidence was moderate. The predictive value of kinesiophobia on pain was evaluated in 2 studies with conflicting evidence. Overall quality of evidence was limited. Kinesiophobia and disability: The association between kinesiophobia and disability was evaluated in 46 studies, 30 of which showed a significant association between increased kinesiophobia and increased disability. 11 studies found no significant relationship between kinesiophobia and increased disability. 4 studies showed inconsistent results. Overall quality of evidence was strong. The predictive value of kinesiophobia on disability was examined in 7 studies. The results showed a greater degree of kinesiophobia predicted increased levels of disability, the quality of evidence was deemed moderate. Kinesiophobia and quality of life: 8 studies examined the association between kinesiophobia and quality of life. 3 studies showed a significant association, 1 study found no association, 4 studies found inconsistent results. Overall quality of evidence was moderate. The predictive value of kinesiophobia and quality of life was examined in 2 studies with limited quality of evidence.

Conclusions: There was strong evidence on the association between kinesiophobia and disability and moderate levels of evidence for pain and quality of life measures, with limited quality demonstrated in relation to predictive values. This systematic review shows that increased kinesiophobia is associated with greater pain, disability and quality of life. This study demonstrates the importance of evaluating kinesiophobia on patients with CMP.

Commentary: The authors note that since kinesiophobia is considered a modifiable factor, it is essential to address kinesiophobia in those that have, or may develop, CMP. They emphasize that it is the responsibility of the clinician to identify these individuals prior to the prescription of exercise therapy, as these individuals may need a more specific approach than a standardized rehabilitation approach. The authors also highlight the importance of the biopsychosocial approach with these patients, in order to address all potential barriers to rehab. I think clinically, making a specific effort with these patients to create functional goals and interventions is extremely important for patient buy in and adherence to exercise protocols. Graded exposure and functional training may aid in decreasing patient kinesiophobia during treatment and during integration into PLOF.

Citation:
Luomajoki H, Beltran M, Careddu S, Bauer C. Effectiveness of movement control exercise on patients with non-specific low back pain and movement control impairments: A systematic review and meta-analysis. Musculoskelet Sci Pract. 2018;36:1-11.

Review submitted by: Jennifer M. Boyle

Objective:
The objective of this systematic review and meta- analysis was to determine the effectiveness of movement control exercises (MVCE) compared to alternative interventions in terms of clinically relevant measures, such as disability and pain intensity.

Methods:
A systematic review and meta-analysis were conducted with the use of CINAHL, MEDLINE, PUBMED and PEDro databases. RCT's comparing MVCE treatment with other interventions in patients with NSLBP from review inception to April 2017 were included. Outcome measures included were pain and disability including PSFS, ODI and RMDQ. Authors were contacted to obtain missing data and outcomes. PEDro was used to assess methodological quality of the studies and the grade approach was used to assess the overall quality of evidence Data were combined using a random effects meta-analysis and reported as standardized mean differences (SMD).

Results:
Eleven studies were selected that included 781 patients. Results show ‘very low to moderate quality’ evidence of a positive effect of MVCE on disability, both at the end of treatment and

after 12 months. Pain was improved by MVCE at the end of treatment but not after 12 months

Conclusions:
MVCE treatment was found to be more effective in improving disability in the short term and long term for people with NSLBP compared to other interventions. Pain was reduced in the short term, however failed to reduce pain in the long term.

Commentary:
As stated by this article, low back pain is a common condition that affects people at some point on their life. It can result in significant health and socioeconomic problems. I feel like adding options to my toolbox such as MVCE can make a huge difference in the patients I see. Low back pain is always one of the more challenging diagnoses for me. I feel that having additional techniques and research is always a great tool for myself and creates an opportune educational point with patients. This article provides eleven studies worth of potential interventions that seemed to have worked in lowering pain (in the short term) and decreasing disability in the short and long term.

Sigward SM, Chan MM, Lin PE, Almansouri SY, Pratt KA. Compensatory Strategies That Reduce Knee Extensor Demand During a Bilateral Squat Change From 3 to 5 Months Following Anterior Cruciate Ligament Reconstruction. J Orthop Sports Phys Ther. 2018 Jun 12:1-18. doi: 10.2519/jospt.2018.7977. [Epub ahead of print].

Review Submitted by: Sarah Bosserman, PT, DPT, CSCS

Objective: 1. Assess loading during a bilateral squat task in patients follow ACLr at 3 and 5 months post-ACL reconstruction. 2. Determine how both inter- and intra-limb compensations contribute to decreased knee extensor moments (KEM) at both 3 and 5 months.

Methods: Participants aged 14-40 years old, status-post ACLr and currently participating in physical therapy were included. Exclusion criteria included current injury to contralateral limb that may influence function or a concurrent knee pathology that limited their weight-bearing status. Patients were all recruited from the same PT clinic, however, specific interventions were not controlled for. Participants were assessed longitudinally at 3 and 5 months after surgery. During a repetitive squatting task, kinematic and kinetic data were collected in a laboratory setting.

Results: Eleven participants, 7 female and 4 male, were included in this longitudinal study. There was significant heterogeneity between participants, including the use of three different graft types with surgeries performed by four different surgeons. Further, most patients had concurrent injuries that were not treated surgically (i.e. meniscal tear and MCL injury). Compared to the non-surgical limb, the surgical limb demonstrated less peak knee flexion angle (2.4$\pm$2.6°; P=0.013), less peak KEM (0.367±0.18Nm/kg; P<0.001), less peak vGRF (0.090±0.06N/kg; P<0.001), and greater hip/knee ratios (0.677±0.55; P=0.002). At 3 months, smaller vGRF ratios predicted smaller knee extensor ratio moment

ratios and larger hip/knee extensor moment ratios predicted smaller KEM ratios. At 5 months, only larger hip/knee extensor moment ratios predicted smaller KEM ratios.

Conclusions: Deficits in knee extensor moments in the surgical limb are present at 3 and 5 months post-ACLr during a squat against body weight resistance. These deficits did not improve between 3 to 5 months, but compensatory strategies did change over time. At 3 months, compensations were seen with shifting weight to the other limb while also shifting the demand to the hip extensors within the surgical limb (with patients relying more on an inter-limb strategy). At 5 months, compensations were driven by an intra-limb shift to the hip extensors.

Commentary: This study highlights the important and challenging task rehabilitation professionals have status post ACLr. Patients are often cleared for higher level activities around this time, however, they continue to demonstrate unresolved deficits that persist through 5 months post op. Clinicians need to find strategies during early rehabilitation to help restore symmetrical weight bearing with focus on sagittal plane knee loading without compensations (as indicated by underloading strategies seen in this study). There were several major limitations to this study, including a very small sample size and two participants who had previous contralateral ACLr that may have influenced that ratio calculations due to unresolved impairments. Furthermore, the wide variety of surgeons, reconstruction techniques, and physical therapists make it impossible to determine any affect of type of surgery or rehabilitation on compensatory strategies.

Return-to-Play and Performance Outcomes of Professional Athletes in North America After Hip Arthroscopy From 1999 to 2016. Schallmo MS, et al. AJSM. 2018; 46(8):1959–1969.
Review submitted by: Justin Pretlow, DPT, OCS

Objective: The purpose of this study was to evaluate return-to-play (RTP) rates and performance-based outcomes following hip arthroscopy for players of 4 major North American professional sports. Secondarily, RTP rates have not been previously reported for NBA players.

Methods: Major League Baseball (MLB), National Basketball Association (NBA), National Football League (NFL), and National Hockey League (NHL) athletes who underwent arthroscopic hip surgery were identified through a previously reported algorithmic protocol based on public sources. A database of players from each sport who underwent hip arthroscopy was compiled through use of LexisNexis Academic search engine with the following search terms: ‘‘[Professional league] arthroscopic hip surgery’’, ‘‘[Professional league] hip labral tear’’, and ‘‘[Professional league] hip impingement’’. Successful Return to Play (RTP) was defined as returning for at least 1 professional regular season game after surgery. Two statistical time points were used after hip arthroscopy: postoperative season 1 and an average of postoperative seasons 2 and 3. Each player served as his own control, with the season prior to surgery (index season) used as baseline.

Results: In total, 227 arthroscopic hip procedures (59 MLB, 28 NBA, 67 NFL, 73 NHL) performed on 180 professional players (47 MLB, 24 NBA, 54 NFL, 55 NHL) between 1999 and 2016 were identified. Labral repair was reported in 73.1% (166/227) of the cases identified. Successful RTP was achieved in 84.6% (192/227) of the procedures. NFL offensive linemen returned at a significantly lower rate than all other

athletes (61.1%, P = .010). NHL athletes returned at a significantly higher rate than all other athletes (91.8%, P = .048). RTP rate for NBA players (85.7%) was similar to other professional athletes. Average RTP time was 209 +/- 132 days, with NHL players returning significantly sooner than players in all other sports combined. NHL players' performance scores decreased significantly in the first season played post surgery(-35.1). NBA, MLB, and NFL players performance scores decreased in season 1 post op but not enough to be deemed significant. The authors found no statistically significant difference in RTP rates between players who underwent hip arthroscopy with and without microfracture, which is consistent with the findings of previous retrospective studies involving elite athletes.

Conclusions: Significant differences were found in RTP rates based on sport, with NHL players returning at a significantly higher rate and significantly sooner than all other players. The results are partially consistent with previous studies, which reported that players in contact sports (eg, football, ice hockey) did not have an increased risk of not returning to their sport after hip arthroscopy. However, the results suggest that NFL offensive linemen specifically may be at an increased risk of not returning. The optimal return time following hip arthroscopy is likely highly individualized and dependent on a number of factors, including extent of hip injury, time from injury to surgery, type of arthroscopic procedures performed, sport, position, and the ability of a player to perform and/or modify sport-specific tasks and maneuvers as necessary upon returning.

Commentary: I found it interesting that NHL players returned nearly 7 weeks faster on average but also had the only significant decline in performance season one after surgery. There are too many variables involved to correlate their quicker return time to decreased performance, but it is intriguing. Professional athletes across all 4 sports experienced decreased numbers in games played season 1 post-op, with all but the NBA players experiencing a significant decrease in number of games played. The authors cite numerous limitations inherent in a retrospective study, including their reliance on public sources. To avoid error and omissions, they extensively screened each case and excluded all cases for which a surgical procedure could not be confirmed or may have involved secondary procedures that could not be confirmed. The authors acknowledge that it would be ideal to compare subjects to age-matched and position-matched control subjects who did not undergo surgery. However, record keeping on injuries is not specific enough at this time to make such comparisons. The tables and graphs regarding RTP, performance scores, games played in post-surgery seasons, and adjusted career length are interesting and worth a look. I think this study can be helpful when it comes to educating athletes and managing their expectations. I find some of my patients still seem surprised when we talk about the length of recovery following hip arthroscopy. I like having an article like this readily available for some quick stats when trying to help an athlete come to an understanding about setting realistic goals and timelines post-surgery.