

Editorial: Functional testing in the assessment of return to sports after anterior cruciate ligament reconstruction

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Abstract: The paper entitled “Functional testing differences in anterior cruciate ligament (ACL) reconstruction patients released versus not released to return to sport” published in the *American Journal of Sports Medicine (AJSM)* assessed Functional Movement Screen (FMS) and the Lower Quarter Y Balance Test (YBT-LQ) as possible objective tools for evaluating a patient’s readiness to return to sports after ACL reconstruction. The results suggest that many patients clinically cleared continue to have measurable function deficits and that both FMS and YBT-LQ may be used as additional tools for return to sports clearance.

Keywords: Anterior cruciate ligament (ACL); reconstruction; functional test

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The goal of anterior cruciate ligament (ACL) reconstruction is often to aid patients in returning to high level activities. No objective criteria exists in assessing a patient’s readiness to return to play after ACL reconstruction, so clearance is still largely dependent on the clinical encounter and physical examination. The most frequently used criterion for return to sport is time from surgery (60%) (1,2). Usually, athletes are cleared to return to sport between 6 and 12 months after ACL reconstruction (1,3,4).

A recent *American Journal of Sports Medicine (AJSM)* paper entitled “Functional testing differences in anterior cruciate ligament reconstruction patients released versus not released to return to sport” compared the performance of such patients with regards to two functional tests—FMS and YBT-LQ. A total of 98 patients were included in this study. Clinical examinations were performed between 5 and 9 months postoperatively. Pain scores, presence of an effusion, range of motion, Lachman and pivot-shift test were recorded. Additionally, graft laxity and isokinetic quadriceps strength was tested. FMS and the YBT-LQ functional tests were then administered. The FMS testing included the deep squat, hurdle step, in-line lunge, shoulder mobility, active straight leg raise, trunk stability/push up, and rotary

stability tests (5,6). The whole score and the number of asymmetries between the operative and nonoperative leg were calculated. YBT-LQ testing data were recorded for anterior, posteromedial, and posterolateral reaches for both the operative and nonoperative legs (7). The average normalized reach score for each leg was calculated as well as the reach symmetry for each reach direction.

All patients were grouped based on whether they had been cleared to return to sports. This was determined by the treating surgeon and was based on both clinical and objective measures. If patients had progressed through the standard rehabilitation program and had no effusion, range of motion within 5 of the contralateral leg, a Lachman test with less than 5 mm of translation and a firm endpoint, a negative pivot-shift test, a KT-1000 arthrometer test within 5 mm of the contralateral limb, and isokinetic testing demonstrating no or mild quadriceps strength deficits, they were cleared to return to sports.

This study showed that results on the FMS test and YBT-LQ tests were not statistically different between patients cleared for athletics and those who were not. This suggests that current return to sport criterion does not clearly identify patients with poor neuromuscular function

and may place them at risk of future injury.

The retrospective nature of the study introduces inherent bias. There was significant heterogeneity in the decision process due to three treating surgeons and multiple therapists. The difference in age between the cleared and noncleared group, with the cleared group being older, contrary to currently accepted clinical impression, is another limitation.

Recent research has identified functional tests that may assist in identifying athletes at risk for future injury. Postural stability, flexibility, and neuromuscular control are all key components of ACL rehabilitation (8,9). The traditional return-to-sport criterion that focuses only on the Lachman, pivot-shift, KT-1000 test and isokinetic testing is inadequate and will lead to higher reinjury risk. Patients' neuromuscular control and lower extremity function should also be assessed before returning to athletics. Besides the FMS and YBT-LQ tests, there are other tests for neuromuscular control evaluation such as the single-leg squat test, gait analysis or other core strength measures that can also be used (10,11).

In our opinion, there is currently no "in office" test or examination that can accurately "clear" an athlete to return safely to sports. Parameters that we use to assess readiness include ROM within 5 degrees, no effusion, good stability, and thigh circumference measured 15 cm above patella that is within 2 cm of the contralateral side. Next, static strength testing should be at least 90% of opposite side. However, the best testing is "dynamic" or "functional" testing, in which an athlete is asked to perform sports specific activities/maneuvers and his/her mechanics and performance is assessed. In addition, different sports/positions typically return athletes at different times. While some football players can return safely at 6 months with a brace, many basketball players (who don't like to wear braces) often take 8-10 months.

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Footnote

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