

Return to Sport Testing Quantifying Balance, Agility, Speed and Strength is Not Predictive of Return to Sport nor Protective against Second ACL Injury

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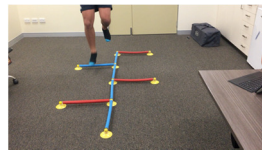


INTRODUCTION:

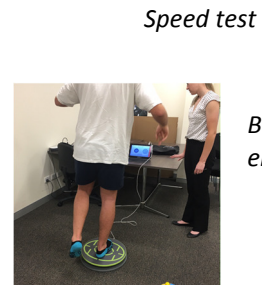
Following anterior cruciate ligament (ACL) reconstruction, ACL graft rupture and contralateral ACL (CACL) injury rates are high, particularly in the young, active population. The return to sport process after ACL reconstruction is difficult and a premature return, in a subject with functional deficits, may contribute to ACL re-injury. The Back in Action system was designed in Austria to evaluate the readiness to return to sport through the quantitative evaluation of the performance of the lower limbs after ACLR in terms of balance, agility, speed and strength (BASS). The aim of this study was to assess if performance on a quantified assessment of BASS is predictive of return to sport (RTS) and second ACL injury in a young, sporting population after ACL reconstruction (ACLR).

METHODS:

123 subjects aged 25 or less underwent completed the BASS test using inertial sensors, accelerometers and electronic tilt board with the Back in Action Tool (CoRehab, Trento, Italy). The test battery consisted of double and single leg stability



Agility test



Speed test



Balance test using electronic tilt board



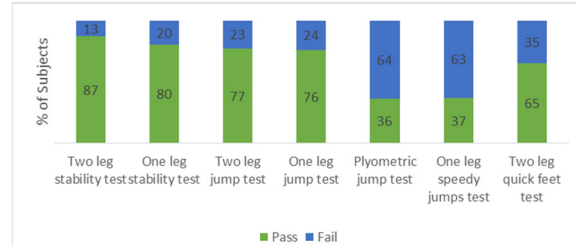
Strength test using accelerometer

tests, double and single countermovement jump tests, double and single plyometric jump tests, single leg speedy jump test and double leg quick feet test. The IKDC questionnaire was also completed at 6, 12 and 24 months. Return to sport and further injuries to either knee were also assessed at 24 months.

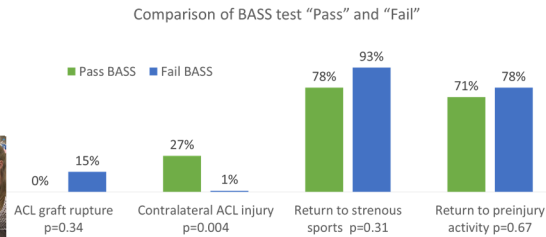
RESULTS: Only 4 subjects (5%) passed all criteria on the BASS test at 6 months, and 11

subjects (11%) at 12 months. There was no significant difference between subjects who passed or failed all components the BASS test in the rate of participation in strenuous sports ($p=0.306$) or return to pre-injury level of activity ($p=0.663$) at 24 months after ACLR.

There was no significant difference in the rate of ACL graft rupture between those who passed and failed all components of



the BASS test at 12 months (0% compared to 15%) ($p=0.34$). However, those who passed the 12 month quick feet test ($N=43/52$, 83%) were more likely to return to their pre-injury level of activity, compared to those who did not pass ($N=15/29$, 52%) ($p=0.003$), and more likely to sustain an ACL graft rupture ($N=12/65$, 19%) compared to those who failed



($n=1/35$, 3%) ($p=0.27$). Those who passed all components of the BASS criteria at 12 months had a significantly higher rate of contralateral ACL (CACL) rupture compared to those who failed (27% compared to 1%) ($p=0.004$).

CONCLUSION:

This study is the first to assess performance on the BASS test at 6 and 12 months after ACLR and its utility as a tool for RTS and second ACL injury outcomes. Few subjects who underwent BASS testing at 6 and 12 months after ACLR meet all criteria to pass. Passing all components of the BASS test was not predictive of RTS or ACL graft rupture, but was predictive of sustaining a CACL rupture. Passing the quick feet test was predictive of return to sport and graft rupture. These results do not support the use of this testing battery to clear athletes to return to unrestricted sporting activities after ACLR.