

## Performance Function Tests in Healthy Athletes

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**Introduction/Purpose:** A challenge for physicians is determining when an injured athlete is ready to return to competition. While a wide variety of ankle strength and fitness tests have been described, there are no norms or minimum performance thresholds for any of them. In this study, healthy athletes were given a series of functional tests to complete. We propose that there will be a minimum performance level for each of the tests that all athletes can complete. We also propose, for tests which assess the right and left legs independently, that performance of the right leg will consistently be within 10% of the left. Finally, we propose that performance on one of the functional tests will be predictive of function on all of the tests.

**Methods:** Healthy college athletes were put through a testing protocol, beginning with simple range of motion assessment and progressing through a series of functional ankle tests of increasing difficulty. The athlete began with the dorsiflexion lunge test, and then progressed to single leg heel raising, single leg hopping, side hopping, front-back hopping, functional hop test, and finally 180 degree rotational jump. Right and left legs were recorded separately for the first five tests. For each test, means, ranges, and standard deviations were calculated.

**Results:** Eighty-one athletes (male and female from different sports) completed the protocol; no athlete was unable to finish the testing sequence. There was a wide variation in performance ability between athletes; the standard deviation for any of the individual tests was too high to determine a minimum threshold of normal performance. However, when comparing right to left leg in any one athlete, the difference in performance testing was always less than 10%. Furthermore, performance on any of the hopping tests was predictive of performance on all of them.

**Conclusion:** Ideally, an athlete could be deemed ready to return to sports activity if he or she performed above a certain threshold on a performance test. Unfortunately, athletes had such a wide range of performance that it is not possible to define a minimum threshold for any of these tests. However, right and left leg performance was always within 10% of each other. For an athlete with a single leg injury, we propose that performance on a functional hopping test less than 10% different from the uninjured leg should be the standard.

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