

## Assessing the Validity and Reliability of Neuromuscular Performance Tests in Professional Basketball Players

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**Abstract :** This study aimed to analyze professional basketball player's neuromuscular behaviour. The main goal was to describe the neuromuscular performance of elite male basketball players and to analyze the validity and reliability of different tests. The tests used were Squat Jump (SJ), Countermovement Free), and 5m, 10m, and 20m sprint tests. All these tests were carried out during the preseason. 100 professional basketball players participated in this study; we used 2 classification variables: performance level (Leb Gold, BBL, and BCL), as well as position (Biggs and Guards). The application of the Kolmogorov-Smirnov test, in conjunction with the Lilliefors test, showed that the sample distribution was normal, linear, and homoscedastic. The relative reliability analysis was carried out by calculating the Intraclass Correlation Index (ICC). We found all variables to have a high validity and reliability. The coefficient of variation (CV) was calculated for raw data and after log-transformed and used as an absolute reliability indicator. The intraclass correlation coefficients (ICC) and coefficient of variation (CV) for the various tests are the following. For the Countermovement Jump (CMJ), the right leg showed an ICC of 0.94 (CV: 7.8%), and the left leg had an ICC of 0.84 (CV: 11.2%). For the sprint tests, the 5m sprint demonstrated excellent reliability with an intraclass correlation coefficient (ICC) of 0.81 and a coefficient of variation (CV) of 3.2%. The 10m sprint exhibited an ICC of 0.91 and a CV of 1.0%, while the 20m sprint achieved the highest reliability with an ICC of 0.92 and a CV of 0.8%. Regarding jump performance, the Squat Jump (SJ) displayed an ICC of 0.96 with a CV of 2.8%, and the Countermovement Jump (CMJ) showed a slightly lower but still strong reliability with an ICC of 0.93 and a CV of 6.7%. Lastly, the "CMJ free" test exhibited an ICC of 0.97 (CV: 5.2%). The tests demonstrated high reliability, with ICC values ranging from 0.81 to 0.97. The 5m, 10m, and 20m sprints, as well as the CMJ and SJ tests, showed strong consistency, particularly the 10m and 20m sprints (ICC 0.91-0.92). Coefficients of variation were low, indicating precise and stable measurements suitable for performance assessment.

**Keywords :** neuromuscular performance, basketball players, validity and reliability, intraclass correlation coefficient, vertical jump, sprint tests

**Conference Title :** ICSS 2025 : International Conference on Sport Science

**Conference Location :** New York, United States

**Conference Dates :** July 10-11, 2025