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Validity and Interunit Reliability of Catapult Vector S7 10Hz Global Navigation Satellite System Units for Assessing Athlete Movement Patterns in Hockey

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INTRODUCTION:

Global Navigation Satellite System (GNSS) receivers, most commonly Global Positioning System (GPS) receivers, are frequently used to monitor external training load, which informs training decisions, substitutions, and athlete recovery in elite-level hockey. Since no peer-reviewed research has considered Catapult Sports' newest GNSS device, the Vector S7 10 Hz, the aim of this study was to determine the validity and interunit reliability of this device for tracking athlete movement patterns in hockey. METHODS:

A repeated measures and validation design was utilized with 10 national level hockey athletes (5 male, 5 female) completing 14 laps of a 487 m sport simulation circuit designed to mirror movement patterns in a hockey match. Each participant wore two Vector S7 GNSS units, and, during each lap, completed 4 short shuttles with change of direction (COD). The primary outcomes for validation and reliability were speed and distance, measured via the GNSS units and criterion measures (timing gates, stopwatch, and measuring tape). Validity was evaluated via t-tests, percent standard error of the estimate (%SEE), and Pearson correlations, and interunit reliability was assessed via paired sample t-tests, coefficient of variation (CV) and interclass correlations. RESULTS:

The Vector S7 units had an overall mean bias of 2.8% (p<0.001), which increased to 14.3% on a 13 m T-shaped shuttle. Percent SEE was < 2.25% for all but the shortest two (13 m T-shaped and 8.5m V-shaped) COD shuttles where %SEE increased to 7.0% and 10.3%, respectively. Interunit reliability was very good, with an overall CV of 0.3% and all CV values < 3.1%.

CONCLUSION:

The mean bias of the Vector S7 units was larger than that measured in previous Catapult devices; however, bias over the shuttles and %SEE was comparable to previous results. The interunit reliability was notably better than earlier models. As the Vector S7's bias was very consistent, it could be easily corrected for, with a multiplicative factor of 1.0286, making these devices a valid and reliable measure of athlete movement patterns in hockey.

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