Static and dynamic reliability of WIMU PRO? accelerometers according to anatomical placement

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Currently, the use of accelerometry to analyze training and competition is on the increase. Thus, accelerometers must be reliable when calculating different variables from raw data. The purpose of this investigation was to assess the reliability of triaxial accelerometers that contain inertial devices for measuring external loads in sports. Four and eight WIMU PRO? inertial devices (RealTrack Systems, Almeria, Spain) were assessed in laboratory and specific sport conditions, respectively. The laboratory test was performed in static (with and without stress) and dynamic (10 and 30 Hz vibrations) conditions. In addition, two tests were performed during continuous and intermittent activity: (1) an incremental progressive running test on the treadmill and (2) 5 min of a Soccer-Specific Aerobic Field Test (SAFT90), where the devices were placed on ankle, knee, lower back and scapulae. Direct assessment of the accelerometers by calculating a vector magnitude, expressed as total acceleration (AcelT), was used for reliability using bias, ±95% limits of agreement and coefficient of variation. A t-test and Pearson?s r were performed for test?retest reliability. In the laboratory assessments, an excellent within- and between-device static (with and without stress) and dynamic reliability were found (coefficient of variation = 0.23%?0.78%). A very high reliability was also observed in the incremental treadmill test (coefficient of variation = 2.20%) and SAFT90 (coefficient of variation = 2.96%) with a nearly perfect correlation between devices (r = 0.99?1.00). Finally, in the between-sessions reliability analysis, excellent results (p = 0.46?0.98; t = 0.01?0.73) and a very strong correlation (r = 0.86?0.96) was found with p values greater than 0.05 indicating no differences between the tests. In conclusion, the accelerometers of the tested device have shown

excellent results for within- and between-device reliability and in test?retest analysis. Thus, this device can calculate all variables that depend on accelerometry measurement such as PlayerLoad? or impacts in different ranges, and in different anatomical locations. © IMechE 2018.

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