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Introduction
Australian football (AF) allows considerable physical contact between players and tackling is considered an important performance indicator in the sport. Despite increases in the speed of the game (Wisbey et al., 2010), the frequency of collisions and the number of shoulder and soft tissue injuries in AF (Orchard & Seward, 2010), no data is available to describe the nature and impact forces associated with tackling. This study categorised tackles into low, medium and high intensity using video technology as a criterion measure and then described and compared speed and accelerometer data between tackle groups.

Methods
Data was collected from twenty professional AF players during four in-season games. All tackles made by the player and those against the player were coded and time stamped at the point of contact (Sportscode v8.4, Sportstec, Australia) and then categorised into low, medium and high intensity impact groups based on defined criteria before further analysis of the data. Peak and mean GPS and accelerometer data (MinimaxX S4, Catapult Innovations, Australia) were collected at the point of contact and during a 3 s tackle zone (from 1 s before to 2 s after impact), respectively. Two-way analysis of variance was used to assess differences (p < 0.05) between tackle type (made and against) and tackle intensity.

Results
A total of 173 tackles made (low = 68, medium = 100, high = 5) and 179 tackles against (low = 47, medium = 118, high = 14) were recorded, with an average of 88 tackles per game and 7 tackles per player per game. No significant differences were observed between tackles made and against. Significant differences were found between all tackle intensity groups for peak and mean accelerometer g force (forwards, sideways, upwards and their resultant [3D load]) and velocity data. Peak velocity was significantly greater in high (mean ± SD; 18.2 ± 4.8 km/h) compared to medium (13.9 ± 5.3 km/h) and low intensity (10.1 ± 3.3 km/h) tackles. Peak 3D load was significantly greater in high (7.8 ± 1.3 g) compared to medium (4.9 ± 1.4 g) and low intensity (4.1 ± 1.3 g) tackles.

Discussion
High intensity tackles, although less frequent in AF, are significantly greater in speed of movement at contact and in the force of impact compared to tackles of lower intensity. Differences in accelerometer forces between tackles observed to be progressively greater in intensity suggest a level of environmental validity and provide preliminary support for the use of accelerometers to assess player load in field team sports.

References