Citation for published version:

Seminati, E, Cazzola, D, Preatoni, E, Williams, S, Stokes, K & Trewartha, G 2017, 'Tackle direction and dominant side affect upper body loading during rugby tackles', *British Journal of Sports Medicine*, vol. 51, no. 4, pp. 386. <https://doi.org/10.1136/bjsports-2016-097372.259>

DOI:

[10.1136/bjsports-2016-097372.259](https://doi.org/10.1136/bjsports-2016-097372.259)

Publication date:

2017

Document Version

Peer reviewed version

[Link to publication](#)

The final publication is available at BMJ 'Journal of Sports Medicine' via <http://dx.doi.org/10.1136/bjsports-2016-097372.259>

University of Bath

Alternative formats

If you require this document in an alternative format, please contact:
openaccess@bath.ac.uk

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Tackle direction and dominant side affect upper body loading during rugby tackles

ELENA SEMINATI¹, DARIO CAZZOLA¹, EZIO PREATONI¹, KEITH STOKES¹, SEAN WILLIAMS¹ & GRANT TREWARTHA¹.

¹ Department for Health, University of Bath, Bath UK

Background: Approximately 25% of Rugby Union injuries occur to players executing a tackle and they mostly involve upper-body regions.

Objective: To investigate how upper-body biomechanical loading changes depending on the tackle characteristics, such as side of body used and direction of approach.

Design: A repeated-measures study where a group of Rugby Union players performed full tackling trials against a bespoke tackle simulator. Two conditions (both within-group factors) were analysed: laterality (left/right shoulder) and direction (front/diagonal/lateral) of the tackler's approach.

Setting: A laboratory-based study.

Patients (or Participants): Six male players (26.7 ± 7.6 years, 1.82 ± 0.09 m, 95.7 ± 14.0 kg), all right-side dominant.

Interventions (or Assessment of Risk Factors): Participants completed up to 2 dynamic tackles in each of the 6 testing conditions. A 40 kg punch-bag was accelerated manually to simulate the ball carrier and the tackler executed a full tackling movement bringing the punch-bag to the ground.

Main Outcome Measurements: Peak shoulder impact forces and head linear accelerations were measured through pressure sensors and inertial measurement units. Linear mixed models and magnitude-based inferences were used to assess differences between conditions.

Results: Dominant (right) shoulder tackles in the frontal direction generated the highest impact forces (5.3 ± 1.0 kN), and overall they were substantially higher (by 15%) than non-dominant (left) shoulder tackles. Impact load decreased going from frontal to diagonal (-3%) and lateral tackling (-10%). The lowest peak head accelerations (substantially lower [-5%] compared to frontal tackles) were recorded during diagonal tackles, with the right shoulder (9.1 ± 3.5 g).

Conclusions: Both laterality (dominant side) and tackle direction have a substantial effect on the loads applied to the upper-body. Where feasible, the tackler should approach from a

slightly offset angle from frontal and coaching should aim to reduce the deficiencies in tackling technique on the non-dominant side.