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Title	Profiling head accelerations using triaxial accelerometry during 'bodies in front' training play: A preliminary study of the sport of rugby league
Type	Article
URL	https://clock.uclan.ac.uk/id/eprint/18538/
DOI	https://doi.org/10.1136/bjsports-2016-097270.19
Date	2017
Citation	Atkins, Stephen, Bentley, Ian, Hurst, Howard Thomas, Richardson, Cassandra and Sinclair, Jonathan Kenneth (2017) Profiling head accelerations using triaxial accelerometry during 'bodies in front' training play: A preliminary study of the sport of rugby league. British Journal of Sports Medicine. ISSN 0306-3674
Creators	Atkins, Stephen, Bentley, Ian, Hurst, Howard Thomas, Richardson, Cassandra and Sinclair, Jonathan Kenneth

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<https://doi.org/10.1136/bjsports-2016-097270.19>

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**PROFILING HEAD ACCELERATIONS USING TRIAXIAL ACCELEROMETRY DURING ‘BODIES IN FRONT’
TRAINING PLAY: A PRELIMINARY STUDY OF THE SPORT OF RUGBY LEAGUE**

1 Stephen J Atkins, 2 Ian Bentley, 2 Howard T Hurst, 2 Mark E Mark E, 3 Cassandra Richardson, 2 Jonathan K Sinclair.*

1 School of Health Sciences, University of Salford, England; 2 Centre for Applied Sport and Exercise Sciences, University of Central Lancashire, England; 3 School of Psychology, University of Central Lancashire, England

10.1136/bjsports-2016-097270.19

Objective; To provide unique descriptive information on head accelerations, both linear and rotational, during ‘bodies in front’ training play.

Design A convenience sample were tested using a cross-sectional design. Players wore a triaxial accelerometer (XPatch, X2 Biosystems, Seattle) during two sessions of training gameplay (session duration 142 ± 26 min). Accelerometers were affixed on the left side of the head, at a point approximate to the external occipital protuberance. Setting Testing was undertaken at an elite performance training centre.

Participants 20 elite, professional, rugby league players.

Main outcome measures; Minimum recordable accelerations were set at 10 g (linear acceleration) and 25 rads s⁻² (rotational acceleration).

Results; A total of 1256 recorded ‘hits’ were analysed, excluding evident artefacts. No player was reported to have suffered a concussion. Player ‘loading’ was 46 ± 33 hits per session (range 7– 170). Average linear (14.9 ± 8.8 g) and rotational (532 ± 347 rads s⁻²) accelerations were not significantly different between training sessions ($P > 0.05$). Frequency of hits are summarised in the table below

Linear acceleration (g)	Cumulative%	Rotational acceleration (rads s ⁻²)	Cumulative%
10–20	92.6	25–500	64.7
21–40	5.4	501–1000	27.5
41–60	0.7	1001–2000	5.4
61–80	0.5	2001–3000	1.6
81–100	0.4	3001–4000	0.8
>101	0.4	>4001	0

Conclusions; The majority of head accelerations occurred within lower ‘sub-concussive’ zones. This confirms existing research findings from other sports. Whilst few accelerations occurred in higher zones, there were a number of very high loading impacts observed in ‘hit up forward’ positions. Our research confirms the suitability of using portable accelerometers in determining head accelerations in full-contact, ‘armourless’, invasion games. Competing interests None.