



# Incidence of Musculoskeletal Injuries in University Rugby-7s: A 6-Year Prospective Epidemiological Investigation

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# Disclosure

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The Rugby Research and Injury Prevention Group, Inc. (RRIPG)

To Improve American Rugby Players' Welfare and Safety Through Innovative Evidence-Based Research



# Background

## American University Population:

- Rugby-7s is gaining popularity across the U.S. since its introduction into the Olympics in 2016  
(Engebretsen & Steffen)<sup>1</sup> (Tucker)<sup>2</sup>
- As of 2021, there were 57,592 active rugby players\* in the United States  
World Rugby<sup>3</sup>
- Rugby has 19 men's and 24 women's varsity programs at U.S. universities
- Rugby classified as NCAA "emerging sport" for women
- Over 900 university teams registered with USA Rugby College Rugby<sup>4</sup>



\*active players defined by World Rugby as those individuals who are members of recognized team playing in organized games on a regular basis

## Limited Knowledge on University Athletes:

- A lack of research has been conducted on the university playing population, especially in the U.S.
- Safety protocol development and inter-study comparisons are difficult to develop due to the limited knowledge



# Objectives

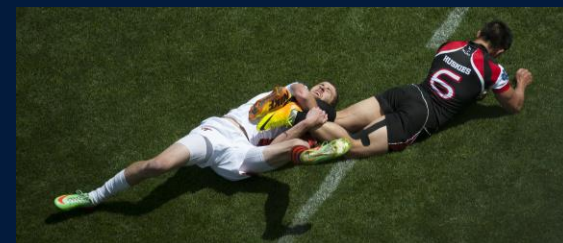
To analyze and compare musculoskeletal injury incidence in U.S. male and female university rugby-7s populations.

**All definitions and procedures in this study comply with the World Rugby consensus statement** Fuller et al<sup>7</sup>



# Methodology & Design

- 6-year prospective epidemiological of university USA Rugby-sanctioned 7-a-side events (2011-2016)
  - N = 4,458 (Men = 3,411; Women = 1,047)
  - Exposure of 3,117 playing hours (ph)
- Tournament-sanctioned healthcare providers diagnosed player injuries
- Research Data Collectors (RDCs) used Rugby Injury Survey and Evaluation (RISE) Report surveillance tool to collect data onsite
  - Follow-ups were conducted within 6 months



# Definitions

- **Injury**: “any physical complaint caused by transfer of energy that exceeded the body’s ability to maintain its structural and/or functional integrity, sustained by a player during a rugby match.”
- **Time-Loss Injury**: “an injury that resulted in a player being unable to take part of a full rugby match.”
- **Medical-Attention Injury**: “an injury that resulted in a player that was evaluated and returned to match play.”

Fuller et al<sup>5</sup>



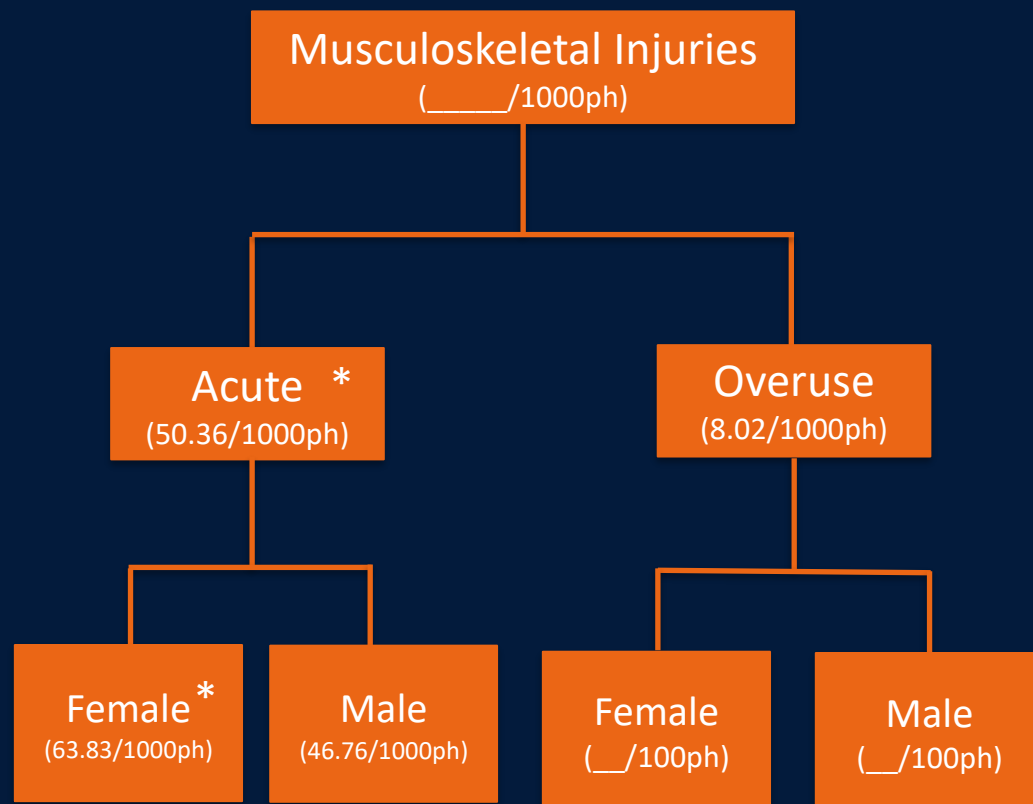
# Results

- Overall incidence of injury was 94.95/1000 ph (n=296)
- Total **musculoskeletal** injury incidence was 58.70/1000ph (n=183)
  - Male = 56.11/1000ph (n=138)
  - Female = 68.39/1000ph (n=45)
- **Knee** musculoskeletal injury incidence was 11.23/1000ph (n=35)
  - Males = 9.76/1000ph
  - Females = 16.72/1000ph (P=0.15)
- **Ankle** musculoskeletal injury incidence was 8.02/1000ph (n=25)
  - Males = 7.73/1000ph
  - Females = 9.12/1000ph (P=0.70)



# Results: Musculoskeletal Differences by Sex

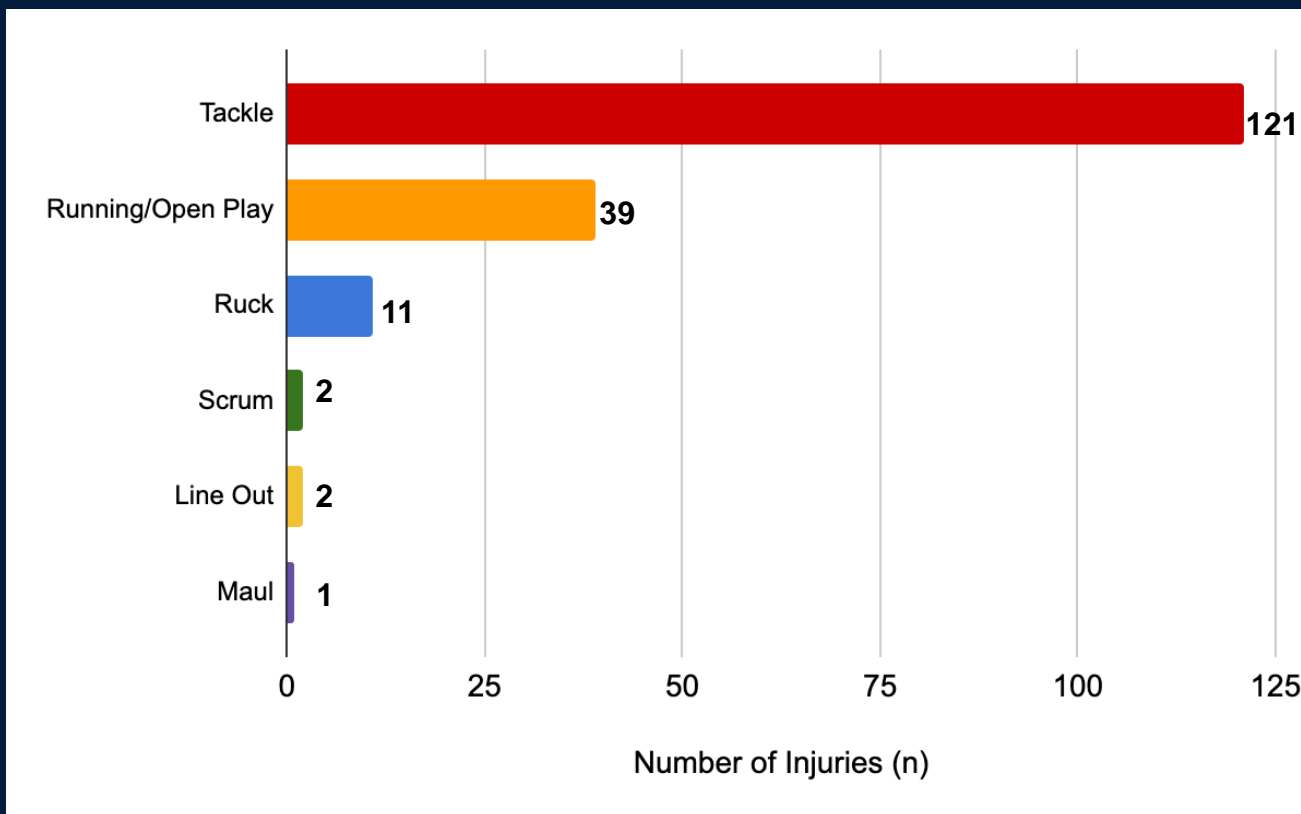
- Sprains and ligament injuries were the most common injury type in both sexes (25.66/1000ph) (n=80)
  - Male = 22.77/1000ph
  - Female = 36.47/1000ph (P=0.06)
- New injuries (41.06/1000ph) > recurrent injuries (16.68/1000ph) in both sexes (P<0.01)\*
- **Acute** injuries (50.36/1000ph) v. overuse injuries (8.02/1000ph) (P<0.01)\*
- Acute injuries were more common in women than men (P=0.09)
- Men had an increase in injuries from the first half (n=52) to the second half (n=73)
- Women had a decrease in injuries from the first half (n=21) to the second half (n=18)







# Results: Phase of Play



**Tackles** resulted in more injuries than all other phases of play combined (38.82/1000ph v. 17.64/1000ph) ( $P < 0.01$ )\*



# Conclusions

- Musculoskeletal injuries are the majority of injuries experienced by collegiate rugby-7s athletes
- Females have a higher incidence of sprain and ligament injuries
  - Attention should be directed to strengthening and proprioceptive exercise to increase joint stability
- Warm-up regiments with sufficient stretching and dynamic elements should be introduced to reduce acute injuries
  - Particularly among female athletes
- Technique should be emphasized during fatigue to target higher incidences of musculoskeletal injury in the second half
  - Particularly among male athletes

# Thank You!



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Orthopaedic Sports Medicine



1. **Engebretsen & Steffen** (2010). Rugby in Rio in 2016! *Br J Sports Med.* 44(3):157.
  2. **Tucker** (2016). Rugby Sevens: Olympic debutante and research catalyst. *Br J Sports Med.* 50:638-639.
  3. **World Rugby** [Internet] Year in Review (2021) [cited 2023 March 10].
  4. **College Rugby** [Internet] Wikipedia [cited 2023 March 10].
  5. **Fuller, C. W., Molloy, M. G., Bagate, C., Bahr, R., Brooks, J. H., Donson, H., . . . Wiley, P.** (2007). Consensus statement on injury definitions and data collection procedures for studies of injuries in rugby union. *Br J Sports Med*, 41(5), 328-331. doi:10.1136/bjism.2006.033282
- 
1. **Chadwick S, Semens A, Schwarz E, Zhang D.** Economic impact report on global Rugby part III: Strategic and emerging markets. *Center for the International Business of Sport, Coventry University: Coventry, UK.* 2010.
  2. **Fuller CW, Molloy MG, Bagate C, et al.** Consensus statement on injury definitions and data collection procedures for studies of injuries in rugby union. *Br J Sports Med.* 2007;41(5):328- 331.
  3. **Fuller CW, Laborde F, Leather RJ, Molloy MG.** International Rugby Board Rugby World Cup 2007 injury surveillance study. *Br J Sports Med.* 2008;42(6):452-459.
  4. **Lopez V Jr, Galano GJ, Black CM, Gupta AT, James DE, Kelleher KM, et al.** Profile of an American amateur rugby union sevens series. *Am J Sports Med.* 2012;40(1):179–84.
  5. **Fuller CW, Taylor A, Molloy MG.** Epidemiological study of injuries in international Rugby Sevens. *Clin J Sport Med.* 2010;20(3):179-84.
  6. **Lopez V, Ma R, Weinstein MG, Chen JL, Black CM, Gupta AT, et al.** An American Experience with a New Olympic Collision Sport: Rugby Sevens. *Orthop J Sports Med.* 2014;2(2 Suppl).
  7. **Lopez V Jr, Ma R, Weinstein MG, Cantu RC, Myers LS, Nadkar NS, et al.** The Epidemiology of Concussive Injuries in Rugby-7s: An American Experience. *Med Sci Sports Exerc.* 2016;48(7):1320—30.
  8. **Fuller CW, Ashton T, Brooks JH, Cancea RJ, Hall J, Kemp SP.** Injury risks associated with tackling in rugby union. *Br J Sports Med.* 2010;44(3):159-167.





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