Impact of Patient- and Sport-Specific Factors on Time to Lower Extremity Musculoskeletal Injury Among Collegiate Student-Athletes

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INTRODUCTION

- Post-concussion neuromuscular control deficits may persist beyond clinical recovery and predispose patients to further injury.
- Previous studies demonstrate a relationship between concussion and subsequent lower extremity musculoskeletal injury (LEMSKI).
- This investigation aims to characterize this risk profile by exploring the impact of patient- and sport-specific factors on time to LEMSKI among collegiate student-athletes.
- **Hypothesis:** Student-athletes with concussion experience decreased latency to LEMSKI compared to student-athletes without concussion.

METHODS

- 3-year retrospective case-control investigation using the Pac-12 HAP, a standardized and deidentified sports injury database.
- Time period of study: 2017-2020
- Variables characterized:
  - Biologic sex
  - Injury type/body part
  - Injury sport
  - Playing surface
  - Sport contact status
  - Time elapsed from concussion to LEMSKI
- Statistical analysis performed using mixed linear models with contrasts.

RESULTS

- 33,432 lower extremity injuries and 1,177 student-athletes across 34 sports identified.
- **Playing surface:** Student-athletes sustained a subsequent LEMSKI on synthetic surfaces a mean of 14.5 days sooner than on constructed surfaces ($p=0.045$) and 23.5 days sooner than on organic surfaces ($p<0.001$).
- **Sport contact status:** Contact sport student-athletes sustained a subsequent LEMSKI a mean of 52.1 days sooner compared to collision sport student-athletes ($p<0.001$); limited contact sport student-athletes sustained a subsequent LEMSKI a mean of 42.29 days sooner compared to collision sport student-athletes ($p<0.001$).
- **Prior concussion/biologic sex:** No observed effect of prior concussion ($p=0.846$) or biologic sex ($p=0.438$) on time to LEMSKI overall.

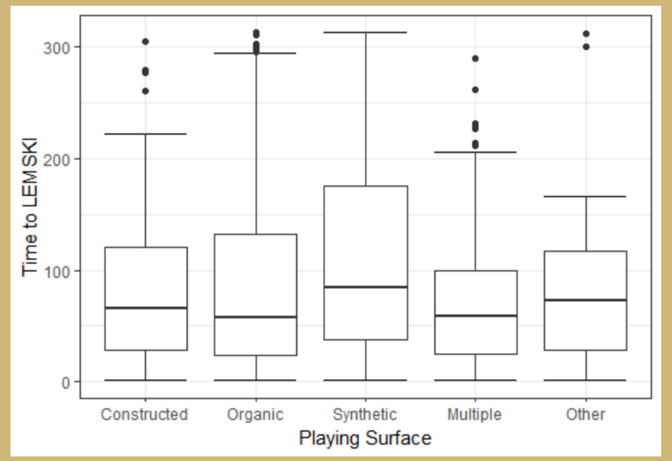

Figure 1. Time to LEMSKI by Playing surface

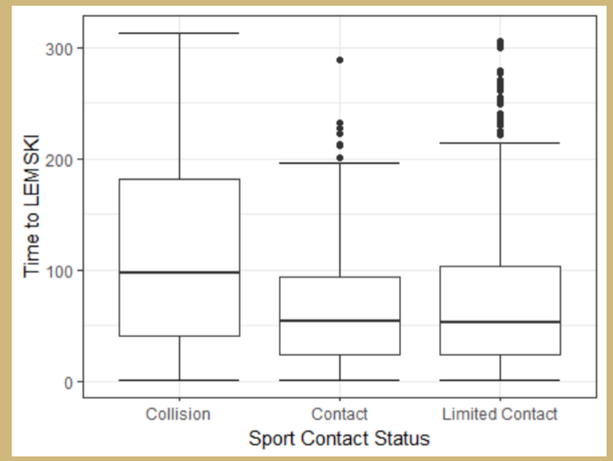

Figure 2. Time to LEMSKI by Sport contact status

CONCLUSIONS

- Student-athletes who compete in contact and limited contact sports or play on synthetic surfaces may be at increased risk of earlier LEMSKI compared to those who compete in collision sports or play on other surfaces.
- Further exploration into the factors contributing to any protective effect of sport contact status and playing surface on time to LEMSKI may elucidate injury risks, inform injury prevention strategies, and improve student-athlete health.
- **Limitations:** External validity limited by injured patient population; group size differences; inter-institution documentation variability.

REFERENCES

- Full reference list available upon request.

FUNDING/CONFLICTS/ ACKNOWLEGEMENTS

- This project was funded by the CUSOM Research Track
- The authors have no disclosures or conflicts of interest.
- Thank you to the Pac-12 and the CU Department of Orthopedics for supporting this work.