

Analyzing & Predicting Injuries in the NFL



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Problem Statement

- Working on behalf of NFL Executives
 - Team front offices
 - NFL Health and Safety Committee
- Predict NFL players future injury risk based on data collected by the league
- Develop application for NFL teams to access player risk information



PLAYER
HEALTH
& SAFETY

**BUILDING A
BETTER GAME**



Data Sources

- Weekly NFL Injury Reports
 - Frequency
 - Injury Type
- Play by Play data
 - Snapshot of play & game conditions
 - Injury occurrences by play
 - Position(s) involved



TITANS	INJURY	WEDNESDAY	THURSDAY	FRIDAY	GAME STATS
Denico Autry	Foot	Limited	Limited	Limited	Questionable
Luke Gifford	Quad	DNP	DNP	Full	
Derrick Henry	Toe	Limited	DNP	Full	
DeAndre Hopkins	Ankle	Full	Limited	DNP	Questionable
Anthony Kendall	Hip	DNP	DNP	Limited	Questionable
Kearis Jackson	Ankle	--	Limited	DNP	Out
Harold Landry	Hamstring	Limited	Limited	Full	
Peter Skoronski	Abdomen	DNP	DNP	DNP	Out
Teair Tart	Knee	DNP	Limited	Full	

Modeling Data

- Predict injury occurrence in 2022 based on previous 2 years history
 - Determined by missing 1+ week in 2022 for injury
- Injury History
 - Injury counts for each year
 - Injury type
- Player Characteristics
 - Age
 - Position

Model Performance and Improvements

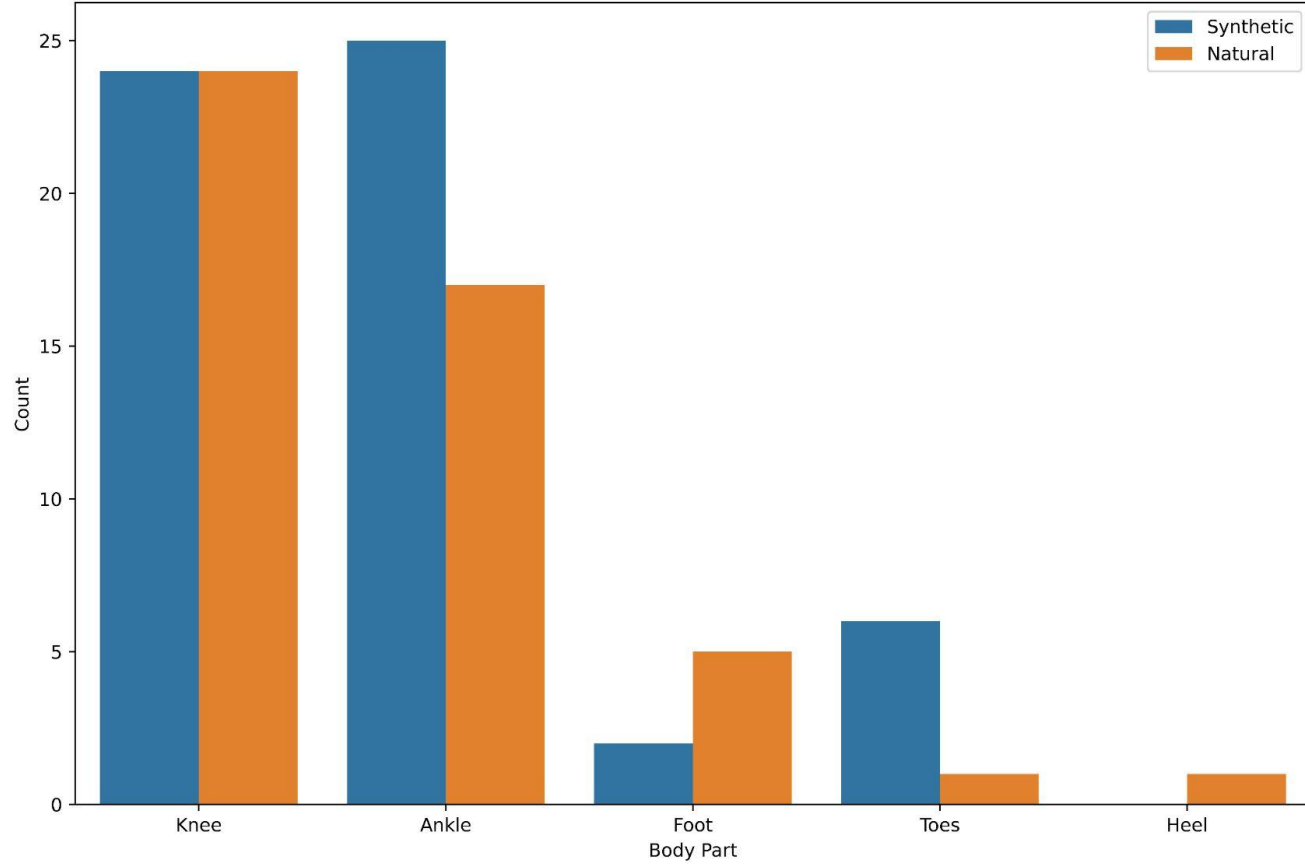
- Performance
 - False Negatives were largest issue
- Improvements
 - Additional data to account for:
 - Player wear and tear
 - On field activity
 - Additional past injury reports

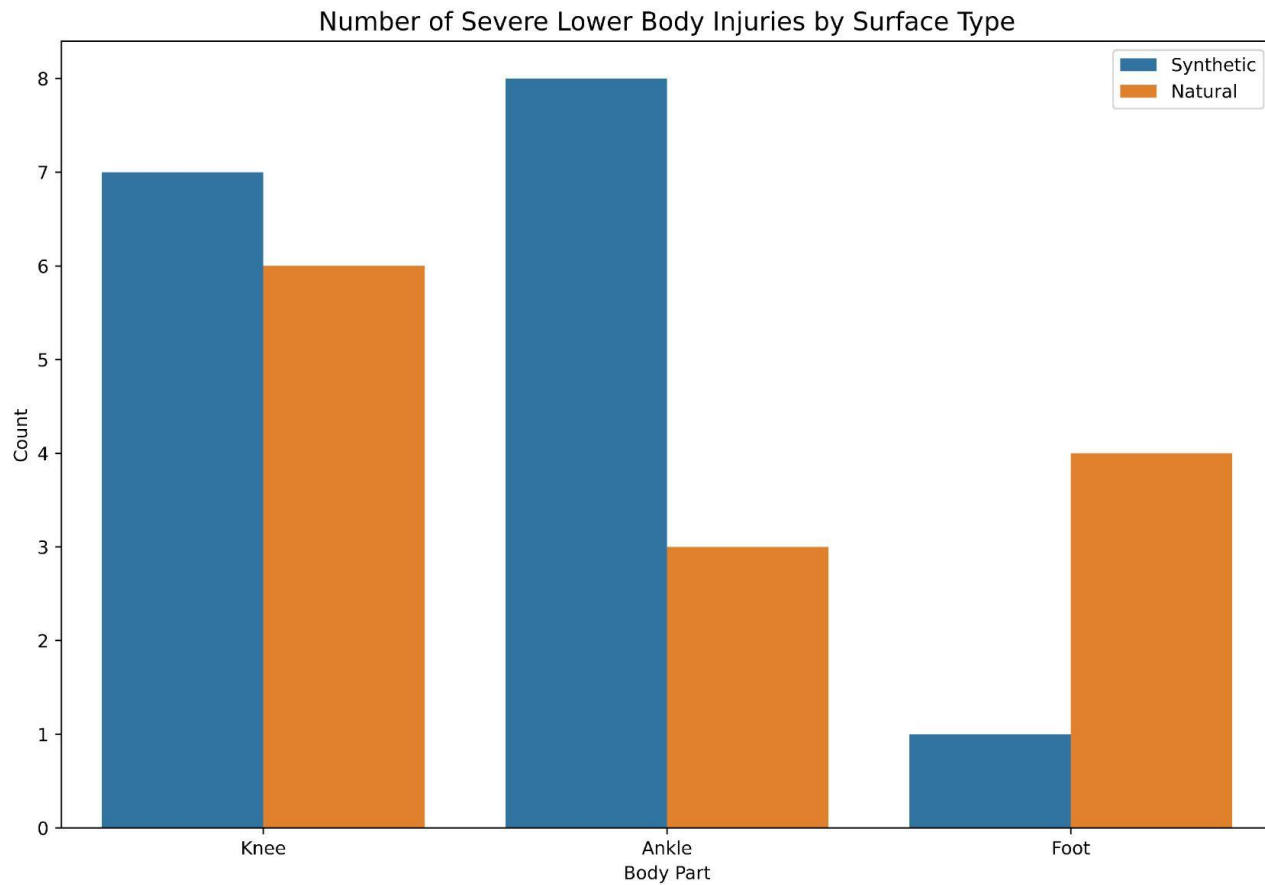


Exploring Injury Occurrence

- What factors are associated with injury occurrence?
- Could we use any of these to strengthen our model for the future?
- Our hypothesis:
 - Field type (Synthetic vs. Natural)
 - Player position
 - Play type (pass, rush, etc.)

Number of Lower Body Injuries by Surface Type

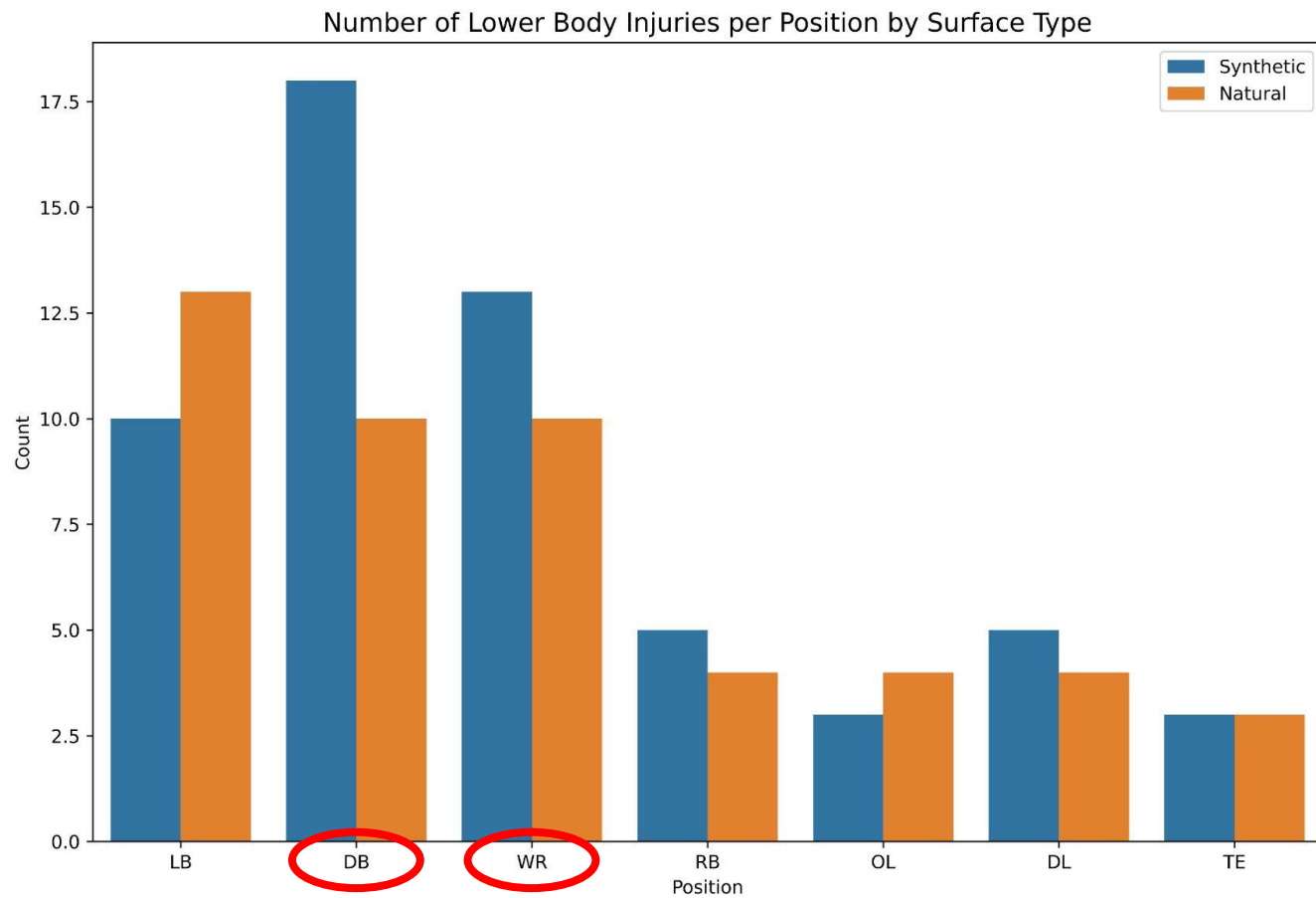


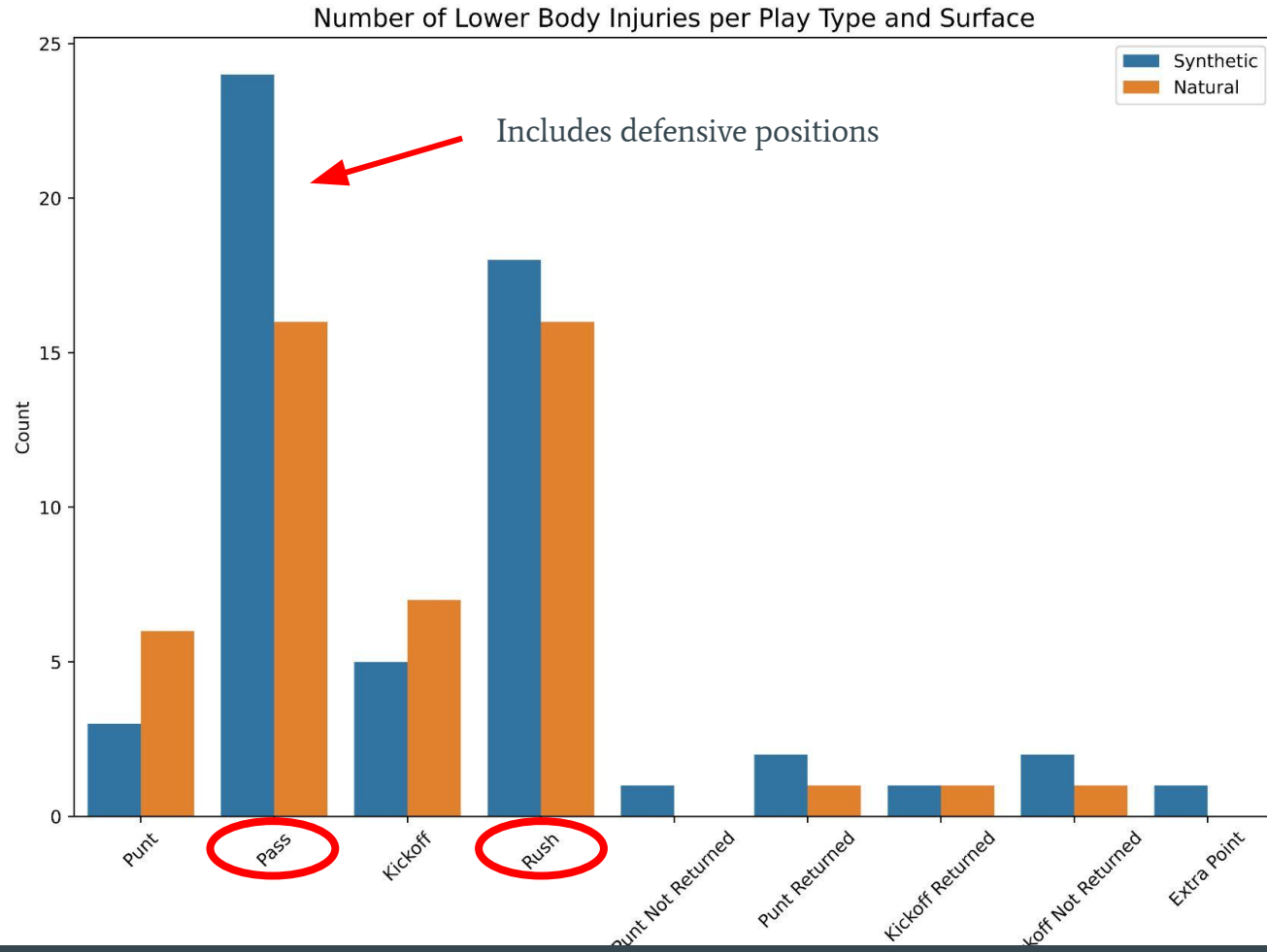


Severe Injuries -
players missed 6
weeks or more

Is player position a factor?

- All injuries are lower body related
- Clear indication that synthetic fields are associated with higher frequency of injury
- Understanding player position differences
- Positions requiring more ground coverage per play more prone to injury on synthetic fields?
 - Defense: Cornerbacks, Safeties
 - Offense: Wide Receivers, Running Backs





Recommendations for the NFL

- Team Executives
 - Consider injury risk when evaluating player contracts
 - Extra rehab and injury prevention resources for high risk players
- NFL Health and Safety Committee
 - Mandatory natural grass
 - Additional safety precautions for kickoffs



Player Database Application

- Linked to modeling data
 - Roster Information for profile
 - Modeling predictions for injury consideration
- Insights
 - Players injury risk
 - Weekly schedule highlights




Streamlit

Select a team

BAL ▼

Select a player

Daryl Worley ▼



Daryl Worley

Choose a Page

Player Info and Prediction ▼

Any Questions?

Explore our Application!