“Of Course they are an Occupational Group!”
Preventing Injuries Among Professional Baseball Players

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Colorado School of Public Health

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Overview

• Professional athletes as an occupational group

• Partnership between Johns Hopkins University and Major League Baseball

• Describe Baseball Medical Assessment and Research Center (BMARC)

• Present an overview of some of our current and future research
Professional Athletes

• U.S. DOL BLS “Athletes and Sports Competitors”

• Job task: participate in organized, officiated sporting events to entertain spectators

• Work environment: “Athletes and sports competitors often work irregular hours, including evenings, weekends, and holidays. They usually work more than 40 hours a week for several months during their particular sports season. They may be exposed to all weather conditions.”

Professional Athletes

• Very few athletes become paid professional athletes

• “And when they do, professional athletes often have short careers with little job security”

• Athletes who play a contact sport, such as football or hockey, are highly susceptible to injuries

• No mention on BLS site of non-contact sports, little attention in research

JHU/MLB Partnership

• In 2009 MLB referred to JHCIRP

• Relationship building!

• Increased attention to NFL

• Interested in our:
  – Our prior work
  – My work: parallels to occupational injury research (e.g., multiple sites ~ multiple teams)
  – Adjunct faculty with expertise in MLB
MLB Baseball
Medical Assessment and Research Center

For the Safety and Health of the player

Stakeholders

Spectrum of Care
- Prevent Injury, and Illness
- Enhance Performance
- Manage Injury and Illness
- Drug Free
- Healthy after Baseball

Innovation and Research

Players
PA Steven Fealy MD
Doctors
ATCs
Coaches/managers
Sponsors
Public and Media
Teams
Rules and Umpires
BMARC Team

• Office of the Commissioner supports personal time on BMARC
• Lead: Bert Mandelbaum, MD
• Co-lead: Gary Green, MD
• MLBPA: Steven Fealy, MD
• Epi/Stats Core:
  – PI: Keshia Pollack, PhD, MPH
  – Co-I: Frank Curriero, PhD
• Plus many others working on specific projects
Population: U.S. Professional Baseball

- Major and Minor Leagues: 7,500 players; 6,500 active at any given time

- Major Leagues: 30 Clubs, play 162 games in 183 calendar days; 25 active players on the roster for a total of 750 active players

- Minor Leagues – over 200 Clubs, each affiliated with a Major League Club; seasons 80 days for low-levels to 150 days for AAA
Population: U.S. Professional Baseball

- 25-man roster; active roster
  - 25 players who are playing for their Major League team.
  - They are the starting eight position players, pitchers, and reserve players on the team.

- 40-man roster
  - Includes active roster
  - Players who dress in uniform and are the only ones who may take the field in a game at any time
  - Additional 15 players can be optioned to the Minors
Injury Surveillance: Disabled List (DL)

- Teams remove their injured players from the roster in order to summon healthy players; opens up a spot on active roster
- 15-day or the 60-day DL, usually depending on the severity and/or recovery time of the injury
- A player may be shifted from the 15-day to the 60-day DL at any time, but not vice-versa
- The player may not rejoin the team until 15 or 60 days has elapsed; however, a player's time on the DL may exceed the specified number of days
- Limitations
Electronic Medical Records (EMR)

- Implemented in 2010; web-based EMR system, linked to MLBs electronic baseball info system

- Allowing for roster changes to be made automatically, which in turn allows for easy transfer of medical records as players move between and within organizations.

- Entry of data for each player on a Club’s roster by the certified athletic trainers (ATCs) on all injuries, illnesses, and preventative events-baseball and non-baseball events as their medical record
EMR

• These events included any injury and physical complaint sustained by a player that affects or limits participation in any aspect of baseball-related activity (e.g., game, practice, warm up, conditioning, weight training)

• All players provide their consent for their records to be included in the EMR system
HITS

• Health and Injury Tracking System (HITS) is a centralized database containing the de-identified medical data from the EMR system.

• The data available in the HITS system describe only injuries that result in lost time for a player.

• The data items for these injuries consist of information gathered at the time of injury (e.g., diagnosis, body part, activity, location, etc.).
Data Linkage

• Can link deterministically
  – EMR (diagnostic metrics)
  – HITS
  – Performance data (# throws, hits)
  – Exposure data (games played, # times to bat, etc.)

• Studies must be cleared by BMARC, Office of the Commissioner, and the MLBPA

• All human subjects via the Johns Hopkins Bloomberg School of Public Heath IRB
## Injury Surveillance: Overall Data

### Event by Level of Play

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>MLB</td>
<td>6,516</td>
<td>6,992</td>
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<tr>
<td>Minor</td>
<td>22,378</td>
<td>23,343</td>
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</table>

### Event by Type

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury/Accident</td>
<td>13,507</td>
<td>14,714</td>
</tr>
<tr>
<td>Illness</td>
<td>2,803</td>
<td>3,294</td>
</tr>
<tr>
<td>Preventive</td>
<td>12,684</td>
<td>12,394</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>28,994</td>
<td>30,402</td>
</tr>
</tbody>
</table>

*Excludes Unknown Level of Play*
Research Projects

- Organized by body region
  - Descriptive epidemiology
    - Knee
    - Elbow
    - Hip/Groin
    - Hamstring
    - Head (TBI)
  - Prospective cohort study
    - Shoulder and elbow injuries
  - Hamstring intervention study
- Exposure study
Future Research: Exposure Study

• Our Goal: To identify and study health and injury-related issues in baseball, estimate risk, and inform prevention and control strategies.

• For sports injury studies, we use:
  – Number of players
  – Athlete-exposures
  – Games played
  – Innings pitched or pitches thrown
Exposure Study

- Can we do better?
  - Should exposure depend on position and/or activity (batting, fielding, running, other)?
  - What about offensive vs. defensive?
  - Plate appearance vs. at-bats?
  - For pitchers, should we separate starters vs. relievers?

- Objective: get more precise measure of risk
Better assessment of exposure leads to more accurate estimates of risk, which leads to improved assessments of player health.

Baseball is well positioned to study exposure.

The HITS system is in place since 2010.

HITS is linked to diagnostics and performance metrics.

We have the complete population: identify cases and non-cases (controls).
Concluding Thoughts on this Work

• Athletes are workers, albeit a specific subset; questions about external validity
• Good example of an academic-private partnership
• Significant role of the Union
• Research ideas from the Clubs and Unions
• Ability to inform prevention and affect policies, programs, and treatment
Thank you!

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