

# **Epidemiology of Concussion in Boys' and Girls' High School Lacrosse Players**

## **Investigators**

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## **Background**

Lacrosse, having a large player population at the high school level, is among the fastest growing team sports in the United States. The prevention of mild traumatic brain injury (MTBI) is recognized by US Lacrosse, the sport's governing body, as a priority issue. Our recent publication describing the epidemiology of boys' high school lacrosse injuries identified MTBI events as the second most prevalent injury scenario, with 44% of cases resulting from legal body/object contact and 23% from illegal contact. (Hinton et al., 2005) MTBI events ranked as the fifth most prevalent injury scenario among girls. What remains unknown are the specific play scenarios associated with MTBI, and the location and direction of these impacts. A better understanding of these event characteristics is required to develop appropriate interventions and treatment recommendations for the boys' and girls' high school lacrosse populations.

## **Goals & Aims**

The aims of this study are to:

1. Identify common hazard scenarios (player and team activity, mechanism of injury) associated with MTBI among male and female high school lacrosse players using a computerized injury surveillance system.
2. Document the characteristics of MTBI events, specifically contact location about the skull and direction of impact, using video incident analysis.
3. Assess whether there is a positive association between the number of fouls called and the frequency of MTBI events per game.
4. Identify differences in mechanism of MTBI, player activity, team activity, and contact location between girls and boys.

## **Methods**

This prospective study followed male and female high school lacrosse players in Fairfax County (Va.) Public Schools (FCPS) over 2 years (5000 player-seasons) during 2008-2009. Injury surveillance data was collected by FCPS certified athletic trainers using a computer-based injury management system. Videotapes of concussive events in game situations were reviewed to document the scenario characteristics associated with MTBI. Study findings will inform clinicians, sport officials, scientists, and policy makers of the actual mechanisms most often resulting in game-related MTBI in boys' and girls' high school lacrosse. Such information is critical for appropriate establishment of standards that target MTBI.

## Data Analysis

- Injury video clips are being analyzed to determine the following elements of each event:
  - Primary mechanism of injury
  - Precipitatory mechanism of injury
  - Player activity at time of injury
  - Game play at time of injury
  - Fouls associated with injury and whether a penalty was called
- Additional information will be added from the ATC injury report to provide as complete as possible description of how the injury occurred.
- Head injuries will be the primary focus of the first analysis. However, future analyses are planned for the data for other injuries that were captured on video.

## Preliminary Findings

| mTBI injury video captured | Boys | Girls | Total |
|----------------------------|------|-------|-------|
| 2008                       | 22   | 10    | 32    |
| 2009                       | 35   | 13    | 48    |
| Total                      | 57   | 23    | 80    |

- Data collection is complete. Two seasons of boys' and girls' high school junior varsity and varsity lacrosse games have been recorded on video and the injuries have been cataloged.
- All injuries, including mTBIs, reported to the schools' ATC were captured.
- In 2008 there were 32 mTBI reported during the games to the ATC and identifiable on the video tape.
- In 2009 there were 48 mTBI reported during the games to the ATC and identifiable on the video tape.

## Publication/Presentations

- Oral presentation on the methodology (video analysis) present to SAVIR (Society for the advancement of violence and injury research) conference in Atlanta in March 2009.
- Oral presentation was made at the American Public Health Association (Injury section) annual meeting in November 2009.
- Poster presentation will be made at the American College of Sports Medicine annual meeting in June 2010.

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