

Hinton: High-tech research on injuries is reshaping lacrosse

US Lacrosse studies using sensors, video prompt rule changes and better equipment design

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Mouthpieces with tiny sensors to measure head impact, high-speed video analysis to determine the physics of knee injuries, testing of lacrosse sticks on crash-test dummies — they're all part of this year's research agenda for US Lacrosse's Sports Science and Safety Committee.

Recently completed projects include: Effectiveness of the Women's Lacrosse Protective Eyewear Mandate and Mechanisms of Video Incident Analysis of Head Injuries in High School Lacrosse. By providing evidence to guide rule changes, equipment design and education of coaches and officials, research is shaping the game.

A major goal of such efforts is to bring objective information to that decision-making process. Andy Lincoln, research director of MedStar Orthopaedic and Sports Medicine and consultant to US Lacrosse, points out that "personal opinion and experiences are important, but they are not a substitute for scientific evidence in determining health and safety policy for the game."

"Put them in men's helmets and let 'em play." How many times has that been proposed as an answer to head, face and eye injuries in the women's game? Despite their helmets, males have a 50 percent higher rate of concussions than their female counterparts.

"Our research findings suggest that if women lacrosse players were to wear men's helmets and play a game more similar to men's lacrosse, they would experience more injuries overall," Lincoln says.

Research shows us that the answers to problems are rarely as simple as we would like them to be. Risk factors for real-world injuries are complex. A parent reading about the Feb. 7 death of a 12-year-old lacrosse player in upstate New York due to commotio cordis (a rare condition in which blunt contact to the chest causes cardiac arrest) could reasonably ask, "Why aren't all players required to wear chest protectors?"

Unfortunately and somewhat surprisingly, research has not found chest protectors to decrease the risk of this condition. The few lacrosse-related incidents have included goalies who were wearing chest protectors. This is important because rushing out to buy unproven and ineffective equipment might take attention and effort away from more effective interventions, such as having automated external defibrillators and emergency medical plans at all lacrosse events.

The basis of our current lacrosse-specific medical research is formed by injury surveillance studies. Such programs involve the computerized collection of injury and background information on large groups of athletes. These programs provide the answers to who, what, where, when and how injuries occur. Information is being gathered by the NCAA, Datalys Center, Fairfax County (Va.) Public Schools and Columbus Children's Hospital.

US Lacrosse is working with local recreation departments, national youth tournaments and other sports organizations such as USA Football and USA Hockey to develop injury surveillance programs for youth players. These systems include information on tens of thousands of players in game and practice situations. From this data, we know that most injuries occur during transitional play and ground-ball situations, and that injuries are two to three times more likely in games than in practice.

A recent paper by Lincoln and others on the eyewear mandate in women's lacrosse is a great example of the use of such injury surveillance systems. Though taken for granted now, the introduction of mandatory protective eyewear nearly 10 years ago was quite controversial. Would the goggles be effective? Would other injuries increase? Would it lead to a more aggressive style of play? Lincoln's research, which compared injury rates in thousands of high school players before and after the equipment was required, found that eye injuries were virtually eliminated, overall injury rates did not change and other head and face injuries decreased after the mandate was adopted.

Another exciting research approach combines injury surveillance with video analysis and motion sensor devices. Using these tools to understand head injuries in high school players, Lincoln found that boys' concussions were the result of player-to-player contact, with a majority caused by aggressive checking of an opponent unprepared to take the hit. For girls, stick-to-head contact played a larger role in head injuries. This information has been incorporated in rule changes banning takeout hits in the men's game and will have a role in developing game-specific head protection for women's lacrosse.

While US Lacrosse's coaching and officiating programs have incorporated many of these recent findings, you can find the latest information on lacrosse sports medicine research at uslacrosse.org under the "Health and Safety" heading. Medical professionals and game administrators are invited to contact the organization concerning continuing education opportunities, such as the Instructional Course Lecture on Lacrosse Sports Medicine being presented at the annual meeting of the American Orthopaedic Society for Sports Medicine here in Baltimore in July.