



NOCSAE®

National Operating Committee on
Standards for Athletic Equipment

Commissioning research and establishing standards for athletic equipment, where feasible, and encouraging dissemination of research findings on athletic equipment and sports injuries

Performance Standard for Commotio Cordis

May 2019

NOCSAE researched and developed the world's first performance standard to protect against commotio cordis, one of the leading causes of sudden cardiac death in young athletes. The standard applies to either baseball or lacrosse, and a current list of products that meet these standards is available through the [Safety Equipment Institute](#).

US Lacrosse is the first governing body to take action to mandate this standard. Beginning in 2021, US Lacrosse will require that all goalies in girls' and boys' lacrosse wear protectors that meet the new NOCSAE commotio cordis performance standard. This requirement will extend to all field players in boys' lacrosse beginning in 2022. Visit [US Lacrosse](#) for more information about requirements for this standard.

With the support of US Lacrosse and the National Federation of State High School Associations (NFHS), NOCSAE believes that compliance with the standard will enhance player safety and effectively address what is often a catastrophic injury.



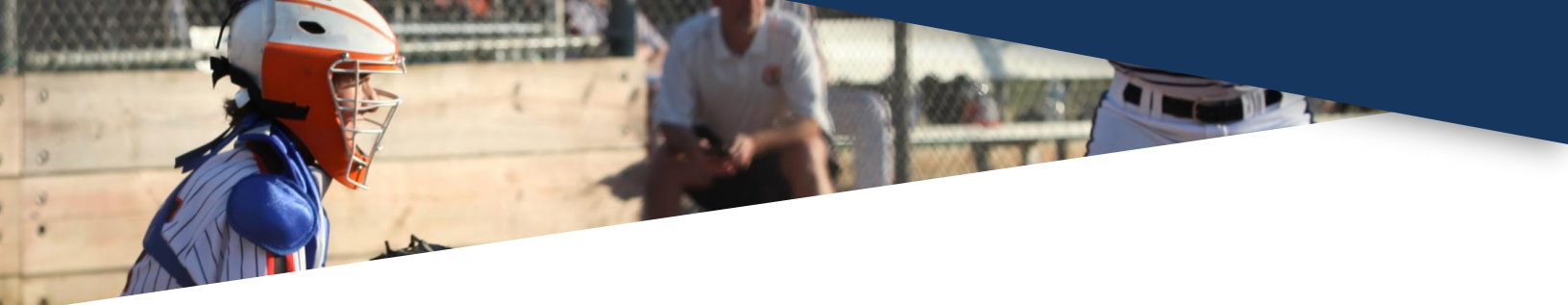
Visit Safety Equipment Institute for a current list of products that meet these standards.



Visit US Lacrosse for more information about requirements for this standard.

About Commotio Cordis

Commotio cordis, a heart rhythm disruption caused by a blow to the chest, is one of the leading causes of sudden cardiac death in athletes. The condition is an episode of ventricular fibrillation induced by a direct blow to the chest over the heart during a specific portion of the heart's electrical cycle. This can be caused by a direct hit from an object such as a baseball or lacrosse ball, a lacrosse stick or even a collision with another player. The impact doesn't have to be hard or high velocity. It's estimated that approximately 15 to 25 athletes die every year from this event. Most of these deaths are males under the age of 18, many of whom were wearing a form of chest protection when they were hit. Commotio cordis deaths have been recorded in baseball, lacrosse, football, soccer, martial arts and other recreational activities.



NOCSAE's Role

NOCSAE
FUNDED OVER
\$1.1M
IN RESEARCH

In conjunction with research efforts by the [Louis J. Acompora Memorial Foundation](#), NOCSAE funded more than \$1.1 million in research to discover the precise cause of commotio cordis and then determine how to protect against it. Through a series of NOCSAE funded studies, Dr. Mark Link, M.D, was able to pinpoint the exact cause of commotio cordis, including the critical moment of occurrence in the cardiac cycle. With funding from NOCSAE, research engineers Cynthia Bir, Ph.D, and Nathan Dau, Ph.D, at Wayne State University were able to develop a mechanical chest surrogate that mimics the response of the human chest and heart to testing impacts.

Availability of products that meet the NOCSAE standard

The new NOCSAE standard to protect against commotio cordis is based on a scientific breakthrough in understanding the cause and prevention of commotio cordis.

Currently, there are several protectors on the market that have been certified to the standard for baseball and lacrosse. Certified products can include a traditional style chest protector but may also include smaller products such as compression shirts and coverings more suited for positions that traditionally do not wear a chest protector.

For a complete list of current products that meet the standard, visit [Safety Equipment Institute](#), which is the only entity that certifies equipment to NOCSAE standards.

With the identification of an injury prevention threshold by Dr. Link and laboratory validation of the mechanical chest surrogate, NOCSAE was able to develop the world's first performance standard to protect against commotio cordis. Equipment certified to this new standard is expected to significantly reduce the risk of injury and death from commotio cordis.

Importance of AED's

Even the best protective equipment cannot prevent all such injuries, so it is important for coaches, parents, players and bystanders to be able to recognize the danger if an athlete is struck in the chest and collapses. Without immediate efforts to resuscitate the victim with an automated external defibrillator (AED), death can occur within just a few minutes. Commotio cordis can be fatal, and it is not related to an existing heart condition.

Younger athletes, typically males 18 and under, are more vulnerable to commotio cordis. Coaches, parents and athletes who have access to an AED and training in CPR will help prevent tragic outcomes from commotio cordis. When an AED is used within three minutes of a collapse, survival rates are as high as 89 percent.

RESOURCES FOR COMMOTIO CORDIS



[Louis J. Acompora
Memorial Foundation](#)



[US Lacrosse](#)



[American Heart Association
Dr. Mark S. Link:
Commotio Cordis](#)



[American Heart
Association/American College of
Cardiology Scientific Statement](#)



[Korey Stringer
Institute](#)