

## NOCSAE Chest Protector Standard for Commotio Cordis

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In January 2017, NOCSAE officially finalized the world's first performance standard for chest protection from commotio cordis. Two versions of this standard have been developed for baseball and lacrosse and both are scheduled to become effective in June 2018. The various sport governing bodies will make their own decision whether to include compliance with these standards in their rules of play and when those rule changes will become effective.

### 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. Approximately five to 15 athletes die every year from this event. Most of these deaths are males under the age of 14, many of whom were wearing a form of chest protection when they were hit. Commotio cordis deaths have been recorded in baseball, lacrosse, football, and soccer, as well as in other recreational activities.

### NOCSAE's Role

In conjunction with research efforts by the [Louis J. Acompora Memorial Foundation](#), NOCSAE has 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 precise 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. 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 chest protection standard specific for commotio cordis. Equipment certified to this new standard is expected to significantly reduce the risk of injury and death from commotio cordis.

### Availability of chest protectors that meet the standard

The new NOCSAE chest protector standard for commotio cordis is based on a scientific breakthrough in understanding the cause and prevention of commotio cordis. The standard will become effective in June 2018 and manufacturers are currently working to develop chest protectors that meet the criteria. As of November 2017, there are no chest protectors that meet the standard, but NOCSAE is excited about the potential for products in development.

For updates on products that meet the standard, visit [www.seinet.org](http://www.seinet.org)

The new standards currently are specific to baseball and lacrosse only, but plans are being developed to include other sports.

### Next Steps

The chest protector performance standard is scheduled to become effective in June 2018. The new standard is a recommendation for manufacturers, but with support from US Lacrosse and the NFHS, NOCSAE is hopeful that compliance with the standard will be part of the rules of play in both sports very soon.

### Prevention

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 14 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](#)
- [American Heart Association, Dr. Mark S. Link: Commotio Cordis](#)
- [American Heart Association/American College of Cardiology Scientific Statement](#)
- [Korey Stringer Institute](#)
- [US Lacrosse](#)

