

Commotio Cordis

What Parents & Coaches Should Know

What is Commotio Cordis? A potentially fatal heart rhythm disturbance that occurs when there is a sudden, often innocent-appearing blow to the chest, disrupting the electrical rhythm of an otherwise normal heart. It is one of the leading causes of sudden cardiac death in young athletes, with 250 reported cases in the United States over the past 16 years. This alone is more deaths from all sports-related concussion and other head injuries combined.

When does Commotio Cordis occur? When a firm projectile, such as a baseball, lacrosse ball or hockey puck strikes the chest, but can also occur with air-filled soccer balls, or from blows delivered from a fist or from head-to-chest contact. The speed, density and shape of the object delivering the blow each contribute to the risk. Also, the blow must occur at a precise moment of the heart's normal electrical cycle and in the wrong location - usually just to the left of the breastbone.

Who is affected? Commotio cordis is more common in young athletes, whose chest walls are less rigid, and more easily transmit force from a blow directly to the heart. Ninety percent of commotio cordis events occur in people under the age of 25. It is the leading cause of death in youth baseball in the United States.

How can you prevent commotio cordis? The heart rhythm disturbance that is caused by commotio cordis can be normalized if electrical shock from an automated external defibrillator (AED) is **quickly** applied to the athlete's chest, in association with CPR. If a shock is delivered within three minutes, there is a 40% chance of survival. If use of an AED is delayed more than three minutes, survival rates drop to 5%. The National Commotio Cordis Registry states that the overall survival rate is 28%.

Softer baseballs in youth leagues have been shown to reduce the rate of commotio cordis, where the average speed of a pitched ball is in the velocity range where commotio is most likely to occur. Recent studies that have looked at different types of athletic chest protectors have not shown that they reduce the rate of commotio cordis. In fact, 38% of all fatal episodes in athletes occurred when chest protection was in place.



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Ways to Reduce the Risk of Commotio Cordis:

1. Increase availability of AEDs at youth sporting venues, which can now be purchased for less than \$1,000. Since timing is so critical to reverse commotio cordis, the location of the AED is nearly as important as having it in the first place, and time of transport to a downed athlete should be taken into account when deciding where an AED should be stored. **Once an athlete is down, you have three minutes to make a difference. That's less than one minute to get the AED, less than one minute to get back to the athlete and less than one minute to use it -- Think 1 + 1 + 1).**
2. Increase the availability of medical personnel such as licensed and/or certified athletic trainers at youth sporting venues.
3. Formulate and routinely review an emergency action plan for each school, with consideration of commotio cordis as a part of that plan.
4. As much as possible, avoid direct blows to the left side of the chest.

All suspected episodes of commotio cordis should be reported to the National Commotio Cordis Registry. Information about an event should be forwarded to bmaron@mhif.org.