

# POSITION PAPER – COMMOTIO CORDIS

## BACKGROUND

Commotio Cordis is a rare but potentially catastrophic phenomenon that can result in sudden cardiac arrest. Commotio Cordis can occur when a blunt, but often relatively mild blow to the area of the chest directly over the heart occurs during a precise moment of the heart's cycle, leading to sudden cardiac arrest. Examples of the blunt object may include: baseball, lacrosse ball, hockey puck, fist, shoulder or knee.

The heart responds to the blow with an interruption of the electrical impulse, thus sending the heart into ventricular fibrillation. This causes insufficient blood flow, loss of oxygen to tissues and may result in death. The location of the blow (directly over the left ventricle of the heart) timing of the blow in the cardiac cycle (10 – 30 milliseconds prior to the peak of the T wave) and the force of the blow (most commonly at 35 – 40 mph) all contribute to a Commotio Cordis incident.

Recent studies have shown promising results for the use of chest protection technology in preventing Commotio Cordis, however, quick recognition of Commotio Cordis and responsive action are still critical to survival. US Lacrosse is committed to educating the national lacrosse community about the potential dangers of commotio cordis, as well as the life-saving value of having AEDs available during lacrosse games and practices.

## RECOGNITION OF COMMOTIO CORDIS AND APPROPRIATE ACTION

Recognition of Commotio Cordis occurring right in front of someone is unlikely. The scenario presents as the athlete sustains a blow to the center of the chest, may collapse immediately or walk a couple steps and then collapse. The first key to survival is the recognition of that collapse and entry into an Emergency Action Plan.

Observers must quickly take action by checking breathing and pulse, activating the EMS system (call 911), sending for the AED, and initiating CPR, if necessary. As soon as the AED arrives, apply the electrodes to assist in monitoring the athlete. It will be unclear the actual cause of the sudden cardiac arrest (SCA) until the athlete is evaluated by a cardiologist.

According to the American Heart Association, each minute of delay in delivering a defibrillation shock to a cardiac arrest victim reduces the chances of survival by 10 percent.

Other facts are:

- The average response time nationally for emergency medical personnel equipped with defibrillators is 10 minutes, making access to defibrillators on-site or in first-responder vehicles (police cars, fire trucks, etc.) extremely important.
- Even in the hospital setting, traditional resuscitation procedures many times result in significant delays before an SCA victim receives defibrillation therapy; consequently, survival averages from in-hospital sudden cardiac arrests are only 15%.
- Resuscitation (CPR) works to temporarily circulate blood to vital organs; however, CPR cannot restore a patient's heart to a healthy rhythm. The AHA states that the definitive survival treatment for an SCA victim is a defibrillation shock.
- Published studies have proven that early defibrillation, within the first few minutes of SCA, can save up to 74 percent of victims.

## **RECOMMENDATIONS**

USA Lacrosse recommends that, along with CPR and AED training for all team personnel, the following steps should be taken in order to best prepare for the rare but potentially catastrophic Commotio Cordis incident:

1. Establish an emergency action plan, including the training of all coaches and team personnel in CPR with AED;
2. Provide quick and easy access to an AED;
3. Teach athletes to avoid being hit directly in the chest by a shot;
4. Educate all team personnel to recognize the mechanisms of Commotio Cordis;
5. Educate all team personnel in the need for IMMEDIATE CPR if Commotio Cordis is suspected. The longer the delay in beginning CPR and AED treatment, the greater the likelihood of loss of life;
6. Understand that the current chest protection models, although useful in preventing traumatic injury, do not completely eliminate the threat of Commotio Cordis;
7. Require all protective athletic equipment to meet all appropriate safety standards, if they exist. NOCSAE, ASTM, HECC, PECC are such appropriate bodies.