



HEART DISEASE IN STUDENT-ATHLETES

Athletes are seen as one of the healthiest segments of our society. Sudden cardiac death in a young athlete is always shocking and profoundly impacts the family, team, school and community in which it occurs. Hypertrophic cardiomyopathy (HCM) in the general population may occur in as many as one in every 500 individuals. Even though many people with HCM live a normal life and do not experience health-related problems, it is the leading cause of sudden cardiac death in student-athletes. HCM is a disease that affects the heart muscle, causing the muscle to enlarge. Adding other heart conditions known to cause sudden cardiac death, the prevalence of serious underlying heart disorders may approach three in every 1,000 student-athletes.

» Sudden Cardiac Death

Sudden death from a heart condition is the leading medical cause of death in NCAA athletes, and represents 75 percent of all sudden death that occurs during exercise, training or competition. Intense physical exertion can trigger sudden collapse on the athletic field in individuals with an underlying heart disorder. The first sign of a heart problem may be a life-threatening collapse during exercise, though athletes may have ignored some warning symptoms. Even during collapse, an athlete in sudden cardiac arrest (SCA) can have jerking or twitching muscles and labored breaths such as gurgling, gasping or snorting.

» Does Race, Ethnicity or Gender play a role in Sudden Cardiac Death (SCD)?

In a five-year review of sudden deaths involving NCAA student-athletes, the incidence of sudden cardiac death in the NCAA was roughly one in every 40,000 student-athletes per year. Caucasians had an incidence of SCD of one per 58,000 athletes per year and in African-Americans SCD was one per 17,000 per year. The incidence of SCD in male student-athletes was one per 33,000 per year; female student-athletes was one in 76,000 per year. It is important to note that the reasons for these disparities is unknown and more study is needed before risk for SCD is understood.

- **Three in every 1,000 athletes may have an underlying heart disorder.**
- **One in 40,000 college athletes dies each year from a cardiac emergency.**
- **The average EMS response time is 8-10 minutes.**
- **The chance of survival decreases 10 percent every minute after collapse.**

» Warning Signs and Symptoms of a Heart Condition

Consult a physician or athletic trainer if you or someone you know has one or more of these signs or symptoms. For emergencies, call 911.



- Fainting (syncope) or seizure during or after exercise.
- Fainting (syncope) or seizure resulting from emotional excitement, emotional distress or being startled (e.g., diving into a pool).
- Chest pain during exercise.
- Unexplained fainting or seizures.
- Unusual shortness of breath during exercise.
- Unusual fatigue/tiredness during exercise.
- A racing heartbeat.
- Dizziness/lightheadedness during or after exercise.

The NCAA has taken steps to minimize the risk of sudden cardiac death and enhance the emergency response to sudden collapse through education, policy, legislation and financial assistance.

» Mandatory Medical Examinations

The NCAA requires all student-athletes beginning their initial season of eligibility and students who are trying out for a team to undergo a medical examination before engaging in any physical activity with the team. Each subsequent year, an updated medical history is administered.

The NCAA's Sports Medicine Handbook supports the recommendations set forth by the American Heart Association for a cardiovascular screening upon a student-athlete's entrance into the athletics program and then every two years during a college athlete's career. The screening includes a comprehensive personal and family medical history, and physical examination. These findings would provide physicians with information from which they would decide if additional diagnostic testing is warranted. Some NCAA institutions also offer an electrocardiogram (ECG) or echocardiogram (echo) as part of an athlete's heart screen.

Medical History

Do you drive? no yes If yes, do you have visual difficulty when driving? no yes If yes, describe: _____

Do you use tobacco products? no yes If yes, type/amount/how long: _____

Do you drink alcohol? no yes If yes, type/amount/how long: _____

Do you use illegal drugs? no yes If yes, type/amount/how long: _____

Have you ever been exposed to or infected with: Gonorrhea Hepatitis HIV _____

Review of Systems
Do you currently, or have you ever had any problems in the following areas:

SYSTEM	NO	YES	?
CONSTITUTIONAL Fever, Weight Loss/Gain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
INTEGUMENTARY (Skin)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NEUROLOGICAL Headaches Migraines Seizures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EYES Loss of Vision Blurred Vision Distorted Vision/Halos Loss of Side Vision Double Vision Dryness Mucous Discharge Redness Sandy or Gritty Feeling Itching Burning Foreign Body Sensation Excess Tearing/Watering Pain or Soreness Infection of Eye or Lid Sudden Blazing Flashes Floaters in Vision Tired Eyes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ENDOCRINE Thyroid/Other Glands	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EARS, NOSE, MOUTH, THROAT Allergies/Hay Fever Sinus Congestion Runny Nose Post-Nasal Drip Chronic Cough Dry Throat/Mouth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RESPIRATORY Asthma Chronic Bronchitis Emphysema	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VASCULAR / CARDIOVASCULAR Diabetes Heart Pain High Blood Pressure Vascular Disease	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
GASTROINTESTINAL Diarrhea Constipation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
GENITOURINARY Genitals/Kidney/Bladder	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
BONES / JOINTS / MUSCLES Rheumatoid Arthritis Muscle Pain Joint Pain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LYMPHATIC / HEMATOLOGIC Anemia Bleeding Problems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ALLERGIC / IMMUNOLOGIC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PSYCHIATRIC	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you answered YES to any of the above or have a condition not listed, please explain & list medications:

Doctor's Signature _____



» Coaches Sports Safety Training: First Aid, CPR and AED

NCAA legislation requires that each head coach (Divisions II and III) and all other coaches who are employed full time at the institution (Division II) maintain current certification in first aid, cardiopulmonary resuscitation (CPR) and automatic external defibrillator (AED) use. Strength and conditioning professionals and certified athletic trainers are often required to maintain CPR and First Aid Certification as part of their professional credentials. The NCAA Sports Medicine Handbook guidelines recommend that certification in CPR and first aid should be required for all athletics personnel associated with physical activity in student-athletes.

ICD Sports Safety Registry

Some athletes elect to continue participating in sport activities with internal cardiac defibrillators (ICD), despite current guidelines that recommend against competitive sports for patients with ICDs. Athletes with ICDs can enroll in a study at www.icdsports.org to examine the outcomes of their daily lives.

Screening with ECG/EKG

Most athletes with underlying heart conditions do not have symptoms or detectable abnormalities on physical examination. Thus, detection of athletes at risk can be limited using a history and physical examination. Screening athletes with an electrocardiogram (ECG or EKG) and/or echocardiogram (echo) can help to detect some conditions in athletes that predispose them to sudden cardiac death.

An ECG measures electrical activity in the heart. An echo takes moving pictures of the heart with an ultrasound machine. Even with these tools, some conditions may go undetected.

Abnormal ECGs require additional evaluation to confirm or exclude the presence of a heart condition. Similarities between a highly trained athlete's heart and cardiac disease can make it challenging to distinguish an otherwise normal heart from abnormal conditions on an ECG. Thus, screening using an ECG can result in false positive examinations. This can lead to additional (and expensive) secondary evaluations. If employed, ECG screening should be guided by contemporary standards for ECG interpretation that help differentiate abnormal findings from normal adaptations of the "athletic heart." Talk with your sports medicine physicians for more information.

» Emergency Planning

Most cardiac arrest victims did not know they were at risk, so ask your coaches if they know what to do when someone collapses.

Every institution that sponsors athletics activities should have an emergency action plan (EAP) for sudden cardiac arrest (SCA) with written policies and procedures to ensure an efficient and structured response to an emergency. The following elements are recommended in the development of a comprehensive EAP for SCA in athletics. Actual requirements and implementation may vary depending on the location, school or institution.

Development of an Emergency Action Plan

1. Emergency Communication: to call 9-1-1 and activate local response team.
2. Emergency Personnel: training of anticipated responders in CPR and AED use.
3. Emergency Equipment: access to early defibrillation (less than three minutes from collapse to shock)
4. Emergency Transportation: identified routes for responding EMS
5. Practice and Review the Emergency Action Plan
6. Postevent Catastrophic Incident Guidelines

» Placement and Access to AEDs



The NCAA Sports Medicine Handbook guideline on emergency care recommends planned access to early defibrillation. Access to AEDs can aid in the emergency care of athletes, athletics staff, officials and fans. AEDs should be placed to optimize their availability throughout the athletics fields and facilities. A goal of less than three minutes from call-to-shock delivery (time it takes to notify designated responders, access the AED, reach the victim, apply the electrodes and deliver the first shock) is recommended by the American Heart Association.

Most universities may require access to several AEDs to adequately equip their athletics fields and facilities. However, a centrally located AED can be brought to the site of sudden cardiac arrest through activation of the emergency action plan. Appropriate maintenance and testing of the equipment should occur according to the manufacturer's directions and be regularly documented. AED readiness should be confirmed before events.

AEDs should be accessible during all hours the building/facility is open and activity is taking place on the fields. The device should NOT be locked up. AEDs should be visible, well marked and easily accessible. Some institutions use their campus police and emergency response teams for adequate access to AEDs.

An AED can be used on any person suspected of being in cardiac arrest. A high suspicion for cardiac arrest should be maintained in any collapsed athlete or individual that is also unresponsive, especially with ball or puck striking the chest.

» AED Use in Sports Registry

Report all new incidents of AED use or cases of sudden cardiac arrest that involve student-athletes, fans, officials or athletics staff at NCAA institutions online at www.aedsports.com.



Cardiac 3-Minute Drill

1. Recognize Sudden Cardiac Arrest:
 - High suspicion of SCA with a blow to the chest.
 - Collapsed and unresponsive.
 - Gasping, gurgling, snorting, moaning or labored breathing
 - Seizure-like activity.
2. If you are alone, call 9-1-1 and get an AED (if one is available) before you begin CPR.
3. Immediately begin CPR — chest compressions 100 per minute in the center of the chest (push hard, push fast).
4. Use an AED as soon as possible to shock the heart back into a normal rhythm.
5. Continue CPR and AED use until EMS arrives.