Why are cardiac conditions so important?

Sudden cardiac arrest (SCA) is the leading cause of death amongst youth athletes during sport. Preparation for cardiac emergencies, through proper planning and other policies can aid in the ability to save a cardiac victim.

Epidemiology:

- Estimated 110 young athletes die per year from SCA
  - Equates to 1 death every 3 days in the USA
- Higher rates among male and African-American athletes
- Automated External Defibrillator (AED) application within 3-5 minutes of collapse has been shown to increase survival rates
What does the research say?

Cardiac Causes of Sudden Death in Sports

⇒ Hypertrophic Cardiomyopathy
⇒ Coronary Artery Anomalies
  ⇒ Myocarditis
⇒ Arrhythmogenic Right Ventricular Cardiomyopathy
  ⇒ Marfan Syndrome
⇒ Valvular Heart Disease
⇒ Dilated Cardiomyopathy
⇒ Atherosclerotic Coronary Artery Disease
  ⇒ Long QT Syndrome
⇒ Wolff-Parkinson-White Syndrome

Survival rates over 80% in student-athletes with SCA have been reported if bystander CPR is provided and defibrillation occurs within 3 to 5 minutes of collapse.

Prompt recognition of SCA, early activation of EMS, the presence of a trained rescuer to initiate CPR, and access to early defibrillation are critical in the management of SCA.

Relation of collapse to CPR and defibrillation to survival

Survival rates decline 7% - 10% per minute for every minute that defibrillation is delayed.

When bystander CPR is initiated, survival declines only 3% - 4% per minute for every minute that defibrillation is delayed.

References


### Evidence-Based Best Practice Recommendations

<table>
<thead>
<tr>
<th>Evidence-Based Best Practice Recommendations</th>
<th>Meets Best Recommended Policy</th>
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<tbody>
<tr>
<td>1. <strong>Immediate recognition of SCA is the first step to effective management</strong></td>
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<tr>
<td>2. <strong>All athletic trainers, coaches, administrators, school nurses, and physical education teachers should have access to an AED on school property and at all school sanctioned athletic events/activities.</strong></td>
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<td>3. <strong>Institutions sponsoring athletic events should have an AED on site or access to one at each athletic venue for practices, games, or other athletic events.</strong></td>
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<td>4. <strong>Coaches should be certified in CPR and AED use.</strong></td>
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<td>5. <strong>The location of an AED should be well marked, publicized, and known among all school staff.</strong></td>
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<td>6. <strong>The AED should be applied as soon as possible to a collapsed and unresponsive student-athlete while the EMS system is being activated.</strong></td>
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<tr>
<td>7. <strong>AEDs should be inspected regularly per manufacturer recommendations to ensure proper working order. This includes making sure the batteries are charged, and wires and electrodes are in good working condition.</strong></td>
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### Notes:
Immediate recognition of SCA is the first step to effective management?

- Prompt CPR provides critical blood flow to the heart, brain and other vital organs while awaiting use of an AED
- Ideally coaches and other individuals responsible for student-athletes are trained in CPR and AED use prior to the beginning of a season
- Any bystander responding to a cardiac emergency can apply an AED through voice and visual instructions

All athletic trainers, coaches, administrators, school nurses, and physical education teachers should have access to an AED on school property and at all school sanctioned athletic events/activities?

Access to early defibrillation is essential. A goal of less than 3 minutes from the time of collapse to delivery of the first shock is strongly recommended.

The location of an AED should be safe, well-marked, publicized, and known among all staff?

- AEDs can be stored safely inside or outside in appropriate weather resistant boxes
- AEDs should be publicly available and never locked in an office or cabinet which could make them inaccessible at the time of needed
- Signs posted to inform bystanders of where the AED is will assist in quick retrieval
The AED should be applied as soon as possible to a collapsed and unresponsive student-athlete while the EMS system is being activated?

- Immediate placement of an AED is necessary to provide the highest chance of survival
- EMS also should be notified as soon as possible to provide further emergency care

Frequently inspect AEDs to ensure proper working condition of batteries, wires and electrodes?

- Like any other piece of technology, AEDs also must be inspected to ensure working order
- Most AEDs have a readiness indicator for quick checks
- It is important to follow manufacturer recommendations to check
  - Battery life
  - Expiration of pads

Pre-participation examinations include a comprehensive standardized history form with the potential to identify athletes at-risk for SCA?

- Pre-participation screenings are one strategy to prevent SCA
- Up to 80% of patients with SCA may be asymptomatic until sudden cardiac death occurs, emphasizing the need for proper emergency preparedness and access to AEDs
- Special attention should be made to episodes of passing out with exercise, chest pain, a family history of sudden death, or new exercise intolerance
Key Personnel

- Athletic Trainers
- Trained physicians
- Other medical personnel trained in CPR/AED
- Coaches
- Parents
- Administrators
- Facility Managers

Equipment

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
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<tbody>
<tr>
<td>AED</td>
<td>$1,600</td>
</tr>
<tr>
<td>EAPs</td>
<td>$0</td>
</tr>
<tr>
<td>Razor</td>
<td>$1</td>
</tr>
<tr>
<td>Towel</td>
<td>$1</td>
</tr>
<tr>
<td>Anti-perspirant</td>
<td>$1</td>
</tr>
<tr>
<td>Scissors</td>
<td>$3</td>
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<tr>
<td>Extra pads</td>
<td>$50</td>
</tr>
<tr>
<td>Stethoscope</td>
<td>$35</td>
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<tr>
<td>CPR Mask</td>
<td>$15</td>
</tr>
<tr>
<td>Supplemental Oxygen</td>
<td>$300</td>
</tr>
<tr>
<td>Cell phone</td>
<td>$varies</td>
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<tr>
<td>Blood-pressure cuff</td>
<td>$70</td>
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Implementation Sequence

<table>
<thead>
<tr>
<th>Implementation Sequence</th>
<th>Complete</th>
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<tbody>
<tr>
<td>List what your organization does well</td>
<td></td>
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<tr>
<td>List what your organization can improve upon</td>
<td></td>
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<tr>
<td>Review example documents</td>
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<tr>
<td>Determine if a policy or suggestion is warranted for your organization</td>
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<tr>
<td>Draft a general cardiac treatment policy</td>
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<tr>
<td>Have medical professionals review and revise your policy</td>
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<tr>
<td>Create a final cardiac policy</td>
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<tr>
<td>Obtain an AED</td>
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<tr>
<td>Place the AED in a secure, weather proof, location yet easily accessible during athletic events.</td>
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Potential Barriers and Solutions

**Problem:** Coaches or league leaders are not trained in CPR/First Aid.

**Solutions:**
- American Red Cross offers CPR and First aid training
- Explore group CPR, AED, and First Aid classes
- Explore certification options through full-time job workplaces

**Problem:** AED’s cost a lot of money, how can I afford one when we cannot even afford new sporting equipment?

**Solutions:**
- There are additional grants to aid in the cost of these AEDs online
- Work with your local PTA to raise funds to aid in purchasing an AED

**Problem:** AED not located on site.

**Solutions:**
- Identify AED response time if stored in a different location
- Call EMS and determine response time to site

**Problem:** No medical staff present at practices or games

**Solutions:**
- Coaches should be trained in CPR and AED use
- In the event of a cardiac event, contact EMS IMMEDIATELY
  - Follow appropriate EAP

**Problem:** No place to store the AED or concerned about theft?

**Solutions:**
- Identify persons responsible for AED transport to facility
  - Identify storage locker or location
- Consider an alarmed cabinet to deter theft (AEDs should not be locked)