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22 Exhibits on file attached

Testimony re SB 1089
March 11, 2009

My name is Jonathan Greenwald. I practice cardiology and internal medicine in Norwalk, and am on the staff of Norwalk Hospital, Department of Medicine, and Section of Cardiology.

I enthusiastically support Senate Bill 1089, which concerns automatic external defibrillators (AED's). Nevertheless, I have strong reason to see the bill amended in one particular respect. With my statement today and the appended, supporting material each of you should receive, I hope you will agree with me and add the appropriate language.

Even without any change SB1089, should it become law, will put Connecticut in the vanguard of legislation enacted by only a few states in the country, and will undoubtedly result in more lives saved. **With** the change I propose, Connecticut will take a step beyond all other states, and properly reflect the most up to date thinking of the leading experts in the field of cardiac resuscitation. Put another way, Connecticut will set an example for the rest of the nation and probably beyond.

There's so much that's worth mentioning and so little time, which is why I have given each of you a folder. In the folder, there are 4 "batches" arranged in the order in which I will refer to them. When you have a relatively quiet period, please review them carefully.

Batch #1 concerns Texas Senate Bill 7, enacted September 1, 2007. The first page lists the essentials of the bill, which has already made a profound difference. The final events which led to its creation were 4 deaths, in 2006, among high school and college athletes in the Houston area, all occurring within 4 weeks. The rest of the batch consists of email correspondence I have had with Laura Friend, of Parent Heart Watch (PHW), of which you have heard or will hear about in connection with SB1089. Connecticut has some very active members of PHW, among them Evelyn and Larry Pontbriant and Joan Papale. The Texas bill does not include colleges: SB1089 **does.**

Even though I don't want to dwell on any of these batches right now, please look at the top page in batch #2. You will immediately note that it shows a stark contrast, left side vs. right. Even though most or all of you have no familiarity with pathology slides, do any of you have any doubt as to which side is chaos and which is normal?

The rest of batch #2 consists of brief accounts of several victims of "sudden cardiac death", only one of whom, Matthew Keene, survived. (I say a few words about Antwoine Key and Nathan Crowell).

The last page contains a quote from the founder of the Hypertrophic Cardiomyopathy Association, which underscores the **current** frustration of using electrocardiograms to weed out the "safe" from the "unsafe" athlete.

On January 18th of last year, Dr. Jonathan Drezner of the University of Washington convened a symposium entitled "Prevention of Sudden Cardiac Death in Young Athletes". Batch #3's first page depicts the cover and the sponsorship behind the symposium. [Please note that PHW was a cosponsor]. What follows that page are slides from the symposium, and excerpts of pertinent literature that show, among other data, that the male, the African American athlete, and both competing and training settings have been the individuals/locales for the overwhelming percentage of sudden cardiac deaths (SCDs). Not mentioned here, but in a personal communication I received from Dr. Drezner is the fact that the majority of all SCDs occur among competitive basketball and football players.

The first page of batch #4 succinctly shows recommendations regarding AED's and amateur competitive athletic programs. This is taken from the 2005 Bethesda Conference on Sudden Cardiac Death, convened every 10 years under the auspices of no less than the American College of Cardiology, of which I am a fellow. The recommendation of a response time of "less than 5 minutes" is woefully inadequate. The Texas Legislature's 2007 law improves slightly on this, but there is more improvement to be made, without doubt. Mehdi Razavi, a research scientist at the Texas Heart Institute, in speaking of the young competitive athlete said, in 2006, "If there isn't an AED on-site, the chances of survival are probably less then 5 percent." Razavi said "By the time the EMT arrives, it's way too late. But if it's on-site and you defibrillate the victim within the first minute of collapse, your chances of bringing (the person) back (are) upwards of 80 to 85 percent."

Batch #4's 2nd and 3rd pages speak to the same point. The 2nd page is from an article written in 1993 (!), and applies to **ALL** victims of SCD. The point is all the **more** imperative in the young competitive athlete.

The few words on page 3 are so important that I will restate them here: **We often don't act adequately on what we know.** The "we", in regard to SB1089, is the medical profession. And that's why I am here today.

So, with regard to SB1089, I offer the following as an **addition** to the current text: As of _____ _____, 2009, in Connecticut, an automated external defibrillator (AED) within arms reach of a certified athletic trainer (C.A.T.) or a designee of the C.A.T. who is equally certified to perform cardiac resuscitation and operate an AED, **shall** be on the **home bench** at all **intercollegiate** events which are defined as a contact/collision sport, or a track and field event within a confined area. Additionally, an AED in the immediate proximity of a C.A.T., or a designee of the C.A.T. who is equally

certified to perform cardiac resuscitation and operate an AED, shall be present at all practices and training locations for these sports.

This recommendation should be identified in the final text of SB1089 as an "initial program" ("step" or "phase" are alternatives to "program" if you prefer), keeping in mind that the issue it addresses exists every bit as much in the schools and will – I hope – lead to further legislation in that regard, with the exact parameters I describe. It probably belongs in section 2, but as I am not a legislator I leave it up to you as to the final placing and wording. I earnestly hope that the final wording is true to what I wrote.

I want to thank Vicky Graham, President elect of the Connecticut Certified Athletic Trainers Association, for coming up with the perfectly descriptive phrase "arms length" to emphasize the virtual umbilication of the C.A.T. to the AED at the venues of competition, and who, along with Doug Casa, Director of the C.A.T. training program at UCONN – had an opportunity to review my proposal, as did state Rep Jason Perillo, of whom I made mention earlier in discussing Nathan Crowell.

For now and the foreseeable future, we won't be able to save all of the young athletes who suffer SCD. A few will die, far from the field or the training room. That said, I have no doubt that the mortality rate in this particular subset of competitive teenagers and young adults will decline dramatically. You and other legislators around the country, and eventually the U.S. Congress, will determine how rapidly this will happen.

In regard to this last point, I want to mention Dr. Lance Becker of the University of Pennsylvania, , probably **THE** preeminent researcher in the sudden death field, and who saved the man pictured on the cover of the famous, July 2007, issue of Newsweek. After I read the accompanying story, I sent him an e-mail – in which I asked if my reasoning was sound, and should I pursue it, considering the huge amount of time it would require to bring my concept to fruition. His reply, in toto, was "Pursue, pursue, pursue. You will save lives."

Thank you for your attention.

Respectfully,

Jonathan G. Greenwald, M.D.

Texas Senate Bill 7

September 1, 2007

- **All elementary, middle, high school, charter and private schools will be required to have a PAD program and AED reasonably placed and available (within 3-5 minutes)**
- **Coaches, band and choir directors, and athletic trainers will be required to be CPR/AED trained**
- **High school seniors will require CPR/AED training prior to graduation**

Jonathan G. Greenwald

From: "Laura Friend" <laura@parentheartwatch.org>
To: "'Jonathan G. Greenwald'" <jgghld@optonline.net>
Sent: Friday, March 06, 2009 8:37 PM
Subject: RE: Connecticut AED bill public hearing

Yes. A freshman football player at Univ of Houston was saved and there could be more. I'll go through my database this weekend. Promise.

From: Jonathan G. Greenwald [mailto:jgghld@optonline.net]
Sent: Friday, March 06, 2009 4:39 PM
To: Laura@parentheartwatch.org
Subject: Re: Connecticut AED bill public hearing

well then, the question at this point is: given that most colleges have aed's have you heard of any SAVES as a result?

> ----- Original Message -----
> **From:** Laura Friend
> **To:** 'Jonathan G. Greenwald'
> **Sent:** Friday, March 06, 2009 9:29 AM
> **Subject:** RE: Connecticut AED bill public hearing
>
> Yes 5 losses in college. Right, the colleges are not included in the law. Sad. We had 1 loss in elementary school (11 yr old) and one in high school (17 yr old). I don't have the exact ages of all the saves with me but as I recall they ranged in ages 5 yrs old (Kindergarten collapsed from septal defect) to age 17.
>
> Our colleges do not require aeds but most of them have them. Our college kids that have suffered death collapsed in dorm rooms, rec basketball, on campus.
>
> The two young kids that suffered death at schools, we are not sure what happened. We understand there were aeds but rumors are that battery was dead and unrecognizable sca on the part of the staff.
>
> Hope this helps.

From: Jonathan G. Greenwald [mailto:jgghld@optonline.net]
Sent: Thursday, March 05, 2009 10:22 PM
To: laura@parentheartwatch.org
Subject: Re: Connecticut AED bill public hearing

sorry to bother you laura, especially after replying so promptly, but as your first paragraph now reads, i am confused. you mean 5 losses in colleges and NO saves, or do you mean something else? are you saying thst colleges are not included in the law, and therefore they suffered in comparison to schools? also. how many losses in schools, and what were the ages of both the school kids who made it and those who did not?

thanks again, jonathan

> ----- Original Message -----
> **From:** laura@parentheartwatch.org
> **To:** Jonathan G. Greenwald
> **Sent:** Thursday, March 05, 2009 10:07 PM
> **Subject:** Re: Connecticut AED bill public hearing
>
> I am hoping that all the CT legislators will see the light. We had on record 16 deaths of kids at schools in 2005 and the law went into effect June 2007. We've had 13 saves in schools and 5 losses

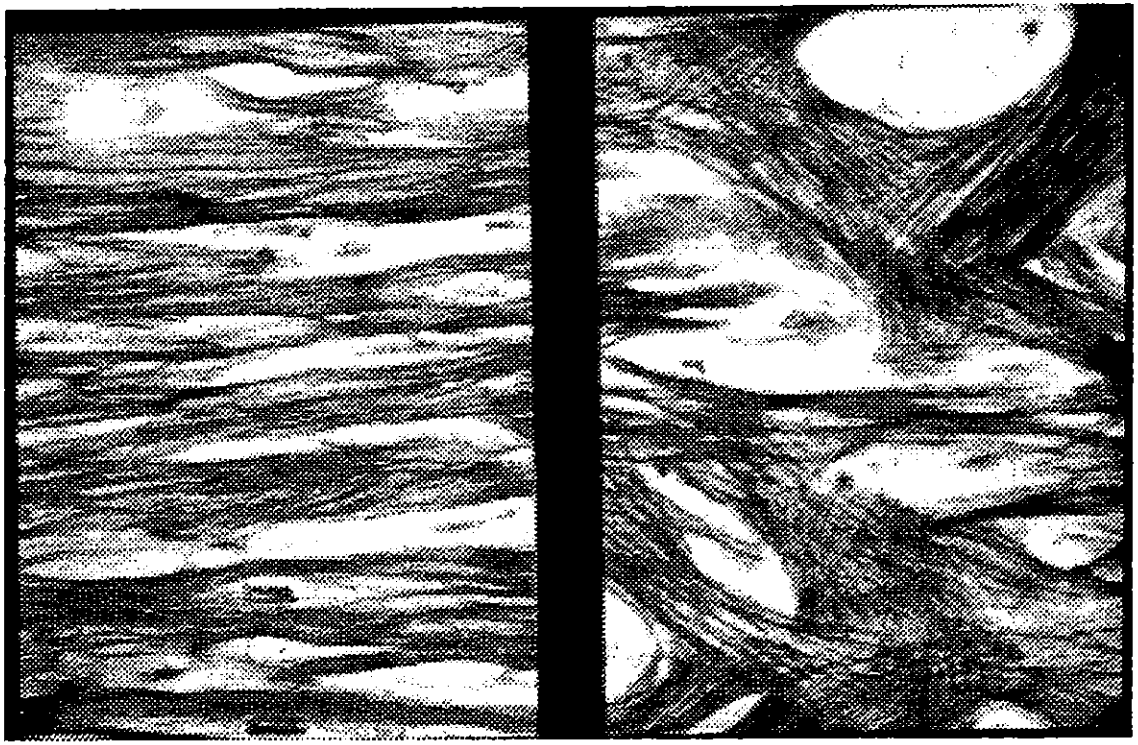
in college since August 2007.

We were losing on average 16 kids at our schools each year.

We are so thrilled with the law!

Keep me posted!
Laura

HYPERTROPHIC CARDIOMYOPATHY



Rx – symptoms, prevent complications

Antwoine Key of MA died on 1/20/05 at the age of 22.

Antwoine A. Key's death after collapsing in the first few minutes of a basketball game last month at Worcester State College was unthinkable. A leader on and off the court, the 22-year-old senior from Eastern Connecticut State University had just scored five of the team's seven points. Five days before, he had broken his own record for the second straight game.

After making a layup he fell to the floor, got up and crumpled again at midcourt while his teammates, coaches and the Worcester team — including three of his friends — watched in confusion that quickly turned to horror. Attempts to revive him were made on the court, in an ambulance and at St. Vincent Hospital at Worcester Medical Center, where he was pronounced dead later that night.

Defibrillator device's location unknown on day athlete died

By JOHN MCCLOSKEY

Although an automated external defibrillator was on the junior college campus near Waco where a former area athlete died suddenly during halftime of a basketball game, no one knew where to find it Wednesday night, one school official said.

The potentially lifesaving device was not accessible to student trainers summoned to aid Grayson County College's Mike Ndiribe, who died less than an hour after he collapsed during a game at Hill College.

Paul Brown, the athletic director at the Hillsboro school, said today that the campus had at least one AED, but he did not know where it was located.

CONNPOST.com
CONNECTICUT POST

Student killed during Shelton hockey game

KATE RAMUNNI Staff writer

Article Last Updated: 10/26/2007 11:51:47 PM EDT

SHELTON — A 22-year-old University of New Haven student died Thursday night after he was hit by a puck and collapsed while playing hockey at The Rinks of Shelton on River Road.

Nathan Crowell, of Portsmouth, R.I., was brought to Bridgeport Hospital shortly after 11 p.m. Thursday, where he was pronounced dead, hospital spokesman John Cappiello said Friday.

While it appears that the trauma caused by being hit by the puck caused Crowell to go into cardiac arrest, it's not yet known for sure, officials said.

"They are still trying to determine the exact cause of death," Cappiello said. "It could be a number of things."

Crowell was playing defense on one of the men's league teams at the rink, according to Howard Saffan, one of the owners of the facility. He was trying to block a slapshot by an opposing player when the puck struck him in the chest above padding he was wearing, said Saffan, who also is president of the Bridgeport Sound Tigers, an AHL team.

There was only three seconds left in the game when Crowell was struck, Saffan said.

An emergency room doctor playing in the game immediately began treating Crowell, Saffan said. "The injury was a lot more serious than anyone thought," he said. "If you have a traumatic injury to the chest, it can stop your heart and cause cardiac death," Cappiello said. "It has happened in other sports, especially baseball."

A police investigation into the incident continues, said police Detective Sgt. Kevin Ahern, but "all factors indicate the death was nothing more than a tragic accident."

Echo Hose Ambulance Chief Jason Perillo said when his crew was dispatched to The Rinks, "some of the players and bystanders were giving him CPR."

"Witnesses told us that he had been struck in the chest by a puck," Perillo said.

"It looked like a lot of the folks there tried to help him immediately," he said, "and when we got there we took over his care."

The staff at The Rinks is "devastated" by the death, Saffan said. "Obviously it's very tragic for us. It's a tough day for us.

"You build a rink for the community and to make a positive impact in the community and to have something like this happen is devastating," he said. "It has sent shock waves throughout the facility."

Saffan said he talked to the referee on the ice at the time, who was devastated by the death, as is the player who made the shot.

"He is tormented by what happened," Saffan said.

New Hampshire Athlete Saved by CPR, AED

By DAVID TIRRELL-WYSOCKI
Associated Press Writer

As a football lineman, baseball catcher and hockey goalie, Matthew Keene is used to taking hits and bouncing back.

He's bouncing back again this time because his school was prepared for a hit no one could see coming - a hit that kills healthy athletes across the country every year.

Keene collapsed during football practice Oct. 18 of sudden cardiac arrest. The 17-year-old high school student wasn't breathing and had no pulse when coaches and trainers rushed to his side, performed CPR and shocked his heart into beating with a portable defibrillator.

That was the difference between life and death. Now Keene wants this lifesaving device in all schools.

"I don't want to hear this happen to anyone and have them not survive," he said.

Source: EMS Responder.com 12/05/06

hibitive. "The U.S. health care system does not have the mechanisms to pay for an ECG for every athlete," says Lisa Salberg, who has HCM and founded the Hypertrophic Cardiomyopathy Association. "Nor do we have enough trained professionals to evaluate the results. There would be a lot of athletes placed on alert for no reason, and a lot of missed diagnoses."

PAUL SAKUMA/AP (TREADMILL); JENNI GI

Prevention of Sudden Cardiac Death in Young Athletes

Friday
January 18, 2008

Benaroya Hall
200 University Street
Seattle, WA

Sponsored by:

The University of Washington School of Medicine
- *Department of Family Medicine*
- *Office of Continuing Medical Education*

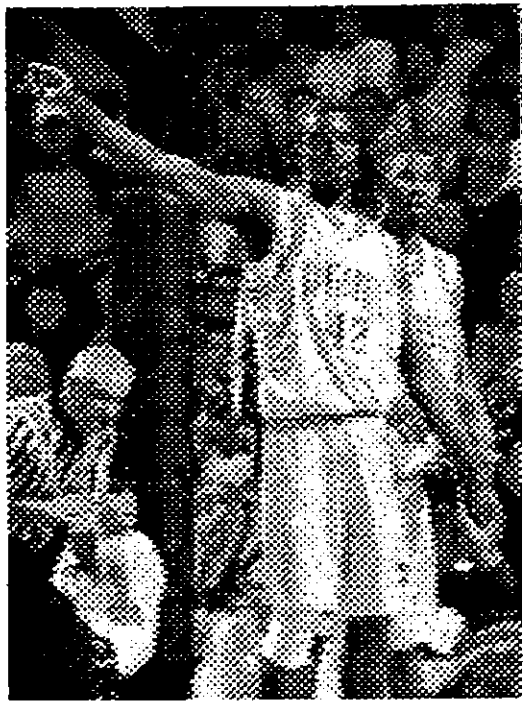
In Collaboration with:
- *Parent Heart Watch*

UW Medicine
SCHOOL OF MEDICINE

Parent Heart Watch
PROTECTING KIDS FROM SUDDEN CARDIAC ARREST

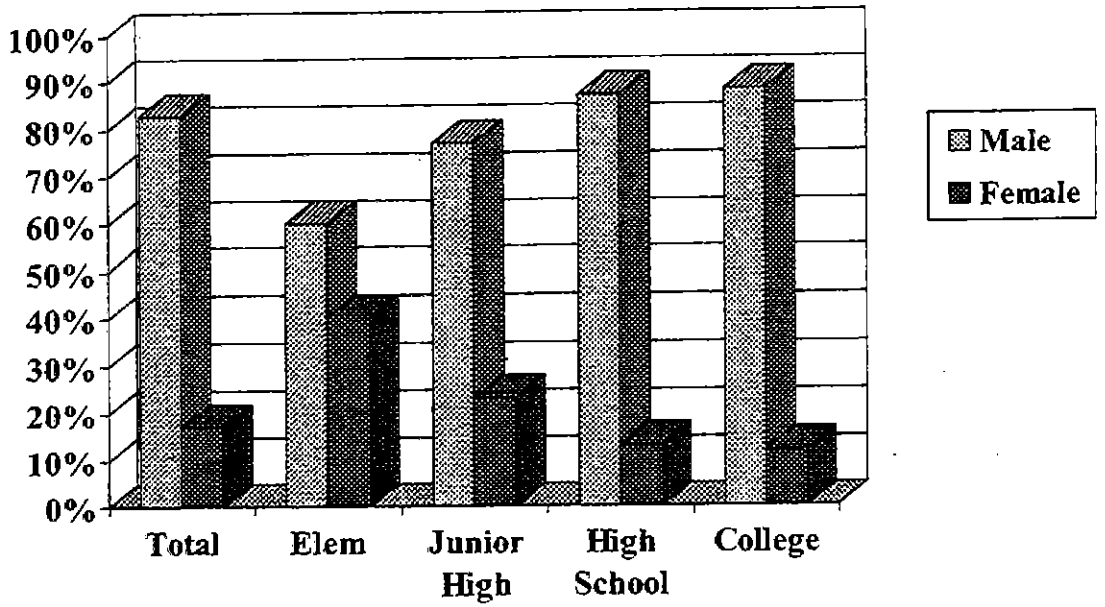
SCA in Athletes

- **Vigorous exercise is a trigger for lethal arrhythmias**
  - **90% of SCD occurs during training or competition**
    Maron; *NEJM* 2003



Gender Differences in Exercise-related SCA

[5:1 male to female]



60% of SCD in athletes affects basketball and football alone. This is from Barry Maron's registry over the last 15-20 years, and this trend has held. Some argue that 60% of cases are in basketball and football because they are the most popular sports played with the most athletes.

This may be true, but I think those sports also may have an at risk group of athletes. As you know SCD is 5-9 times higher in males and disproportionately higher in African Americans.

Jonathan Drezner, MD Personal Communication 8/27/08

In the US one competitive young athlete dies **at least every three days** from an unrecognized cardiovascular disorder. Also, death is the **first clinical manifestation** of cardiac disease in up to 60-80% of young competitive athletes with SCD.

J. Drezner, editorial, BMJ July 08

CPR/AED Ineffective in SCD in Athletes?

- 9 intercollegiate athletes with SCA and witnessed collapse
  - 4 basketball; 2 football; 2 lacrosse; 1 swimming
  - 7 occurred during practice, 1 competition, 1 weight training
- CPR initiated with 30 seconds in 6 and by 1 minute in 2 additional
- AED applied in all 9 (7 VF had AED shock within an average of 3.1 minutes
- 8 of 9 died
- 5 had HCM; 2 commotio cordis; 1 MI
  - Survivor had no SHD detected

Drezner JA, Rogers KJ. Heart Rhythm 2006;3:755-759

Survival trends in the United States following exercise-related sudden cardiac arrest in the youth: 2000–2006

Jonathan A. Drezner, MD, Jordan S.D.Y. Chun, MD, Kimberly G. Harmon, MD, Linette Derminer

From the Department of Family Medicine, University of Washington, Seattle, Washington and Parent Heart Watch, Geneva, Ohio.

BACKGROUND Sudden cardiac arrest is the leading cause of death in young athletes. However, limited studies have examined survival rates after exercise-related sudden cardiac arrest in the youth.

OBJECTIVE The Purpose of this study was to monitor exercise-related sudden death in the United States and to assess survival trends following exercise-related sudden cardiac arrest in the youth.

METHODS From January 1, 2000, through December 31, 2006, exercise-related sudden death events in young individuals were identified through a systematic search of public media reports. Media reports were reviewed to clarify case circumstances and relation to exercise, cause of death, outcome, and use of a defibrillator. The study used an observational cohort design with weekly searches and updates to the database.

RESULTS During the 7-year period from 2000–2006, 486 total cases of exercise-related sudden cardiac arrest were identified in elementary school (age 5–11 years), middle school (age 11–14 years), high school (age 14–18 years), and college (age 18–22 years) individuals in the United States, with an average of 69 cases per year (range 48–96 years). Eighty-three percent (405/486) of victims were male and 17% (81/486) were female, with a male-to-female ratio of 5:1. Overall survival during this time period was 11% (55/486), with a range of 4% to 21% survival per year. There was a statistically significant trend toward improved survival in recent years ($P = .035$). Females were more likely to survive sudden cardiac arrest than were males (21% vs 9%, $P = .001$).

CONCLUSION Survival following exercise-related sudden cardiac arrest in the youth has been universally poor over the last 7 years in the United States, despite a recent trend toward improved survival. Improved reporting systems are needed to accurately monitor these events, and strategies to improve outcomes from exercise-related sudden cardiac arrest in the youth, such as improved emergency response planning and public access defibrillation programs, should be considered.

KEYWORDS Sudden cardiac death; Sudden cardiac arrest; Survival; Athlete; Sports; Defibrillator

(Heart Rhythm 2008;5:794–799)

Introduction

Exercise-related sudden death in young individuals is a catastrophic event with far-reaching emotional and social impact on communities.[1–3] The vast majority of these sudden deaths are due to a variety of structural cardiovascular abnormalities (i.e., cardiomyopathies) and primary electrical diseases (i.e., channelopathies) that go undetected in otherwise healthy appearing athletes.[1–9] Although such cardiac events are reported to be uncommon, the true incidence of exercise-related sudden cardiac arrest (SCA) is unknown.[2,10,11] In the United States, evaluation of SCA in young athletes is limited by the lack of a mandatory reporting system for juvenile sudden death. Studies to date have relied on survey or nonmandatory reporting systems that likely underestimate the true incidence of SCA in athletes.[2,3,7] Available studies have estimated the annual incidence of sudden cardiac death in high school-aged athletes to be 1:100,000 to 1:300,000 and 1:65,000 to 1:69,000 in college-aged athletes.[2,4,10–12] More recently, intensive search of public media reports and other electronic databases has identified a larger number of cases of SCA in athletes than previously established. The Sudden Death in Young Athletes Registry in the United States has identified approximately 115 cases of SCA per year in young competitive athletes, or about one case of sudden death every 3 days in the United States in organized youth sports.[13] Thus, with approximately five million competitive high school athletes and 500,000 competitive collegiate athletes, a more accurate estimate of the annual incidence of SCA in young athletes is approximately 1:50,000 athletes.

Dr. Drezner is on the Medical Advisory Board for Parent Heart Watch, the Medical and Scientific Advisory Board for the Sudden Cardiac Arrest Association, and the Scientific Advisory Board for Heart Screen America, for which he also is a partial stockholder. Dr. Drezner is the Director of the National Registry for AED Use in Sports and has received grant funding from the National Operating Committee on Standards for Athletic Equipment to study emergency planning and sudden cardiac arrest in the athletic setting. Mrs. Derminer is the Executive Director of Parent Heart Watch.

Address reprint requests and correspondence: Dr. Jonathan A. Drezner, Department of Family Medicine, University of Washington, Box 354775, Seattle, Washington 98015. E-mail address: jdrezner@fammed.washington.edu. (Received October 20, 2007; accepted March 1, 2008.)

1547-5271/$ -see front matter doi:10.1016/j.hrthm.2008.03.001

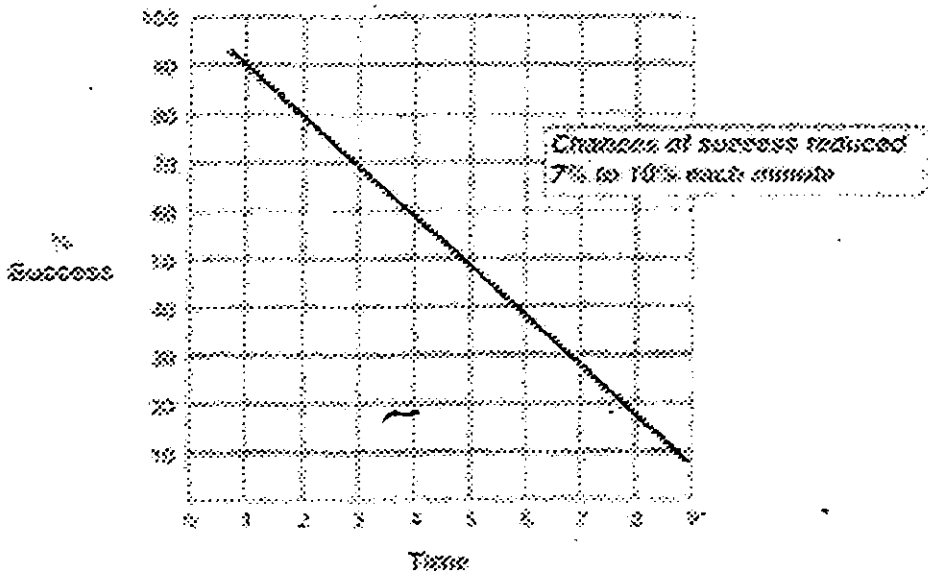
Recommendations:

1. The AEDs should be available at educational facilities that have competitive athletic programs (including intramural sports and conditioning classes), stadiums, arenas, and training sites, with trained responders identified among the permanent staff. Devices should be deployed so as to provide a response time of less than 5 min.
2. The initial response to a suspected or identified cardiac arrest should be to contact emergency medical services (e.g., 9-1-1), followed immediately by, or concomitant with, initiating CPR and deploying the AED.

doi:10.1016/j.jacc.2005.02.017

Source: JACC Vol. 45, No. 8, 2005
April 19, 2005:1369-71
Myerburg *et al.* Task Force 10

Time to Defibrillation:
Every Second Counts



Larsen; *Ann Emerg Med* 1993

Probability of successful defibrillation for VF SCA diminishes rapidly over time.

WE OFTEN DON'T ACT ADEQUATELY ON WHAT WE KNOW.

Barbara Kellerman,
Center for Public Leadership,
Harvard Kennedy School

Additionally, an AED in the immediate proximity of a C.A.T., or a designee of the C.A.T. who is equally certified to perform cardiac resuscitation and operate an AED, shall be present at all practices and training locations for these sports.

As of _____ ___, 2009, in Connecticut, an automated external defibrillator (AED) within arms reach of a certified athletic trainer (C.A.T.) or a designee of the C.A.T. who is equally certified to perform cardiac resuscitation and operate an AED, shall be on the **home bench** at all **intercollegiate** events which are defined as a contact/collision sport, or a track and field event within a confined area.

AED's –

- $1,295 (one)
- $1,195 (two – twenty three)
- $1,095 (24 or >)
- In major bulk $900-$925
- 7 year warranty from most manufacturers