

# Tennessee AED Drills Leading to Save – Case Presentation

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## BACKGROUND

- 7,037 US children with out of hospital sudden cardiac arrest (SCA) in 2015<sup>1</sup>.
- Sports-related SCA accounts for 39% of SCA in people ≤18 years of age<sup>1</sup>
- Estimated 30-45 million pediatric (age 6-18) athletes<sup>2</sup>.
- Tennessee has legislature in place that mandates AED placement in all public schools, AED/CPR training, and annual AED/CPR drills in public schools.
- The Project ADAM (Automated Defibrillation in Adam's Memory) Tennessee group has been active in providing AED/CPR training to schools and youth sports leagues throughout Tennessee.
- The combination of legislature and access to emergency response/ AED training has been paramount in saving young athletes, as seen in our case.

### AED Placement in Schools

**Tennessee Code – 49-2-122.** Placement of automated external defibrillator devices in schools (most recent amendments to this law are found in **SB1135** and **HB1974**)

- Mandates that all public schools must have at least one AED placed within the school. Gives general placement guidelines.**
- Also outlines the following:**
  - Training, written plan, notification, maintenance and testing of AED, physician endorsement, EMS registration, immunity from civil liability, disciplinary action for students who misuse or abuse the AED*

**Tennessee Code – 49-50-tbd:** AEDs in Private Schools Encouraged

### School Staff CPR/AED Training

**Tennessee Code – 49-2-122.**

- Training shall teach the use of AEDs, inform school personnel of AED locations, the school's response plan and of the members of the school response team**
- Training is to comply with Tennessee Code, 68-140-403.**

### School Cardiac Emergency Response Plans (CERP) and/or AED Drills

**Tennessee Code – 49-6-1208.** (most recent amendments to this law are found in **SB1135** and **HB1974**)

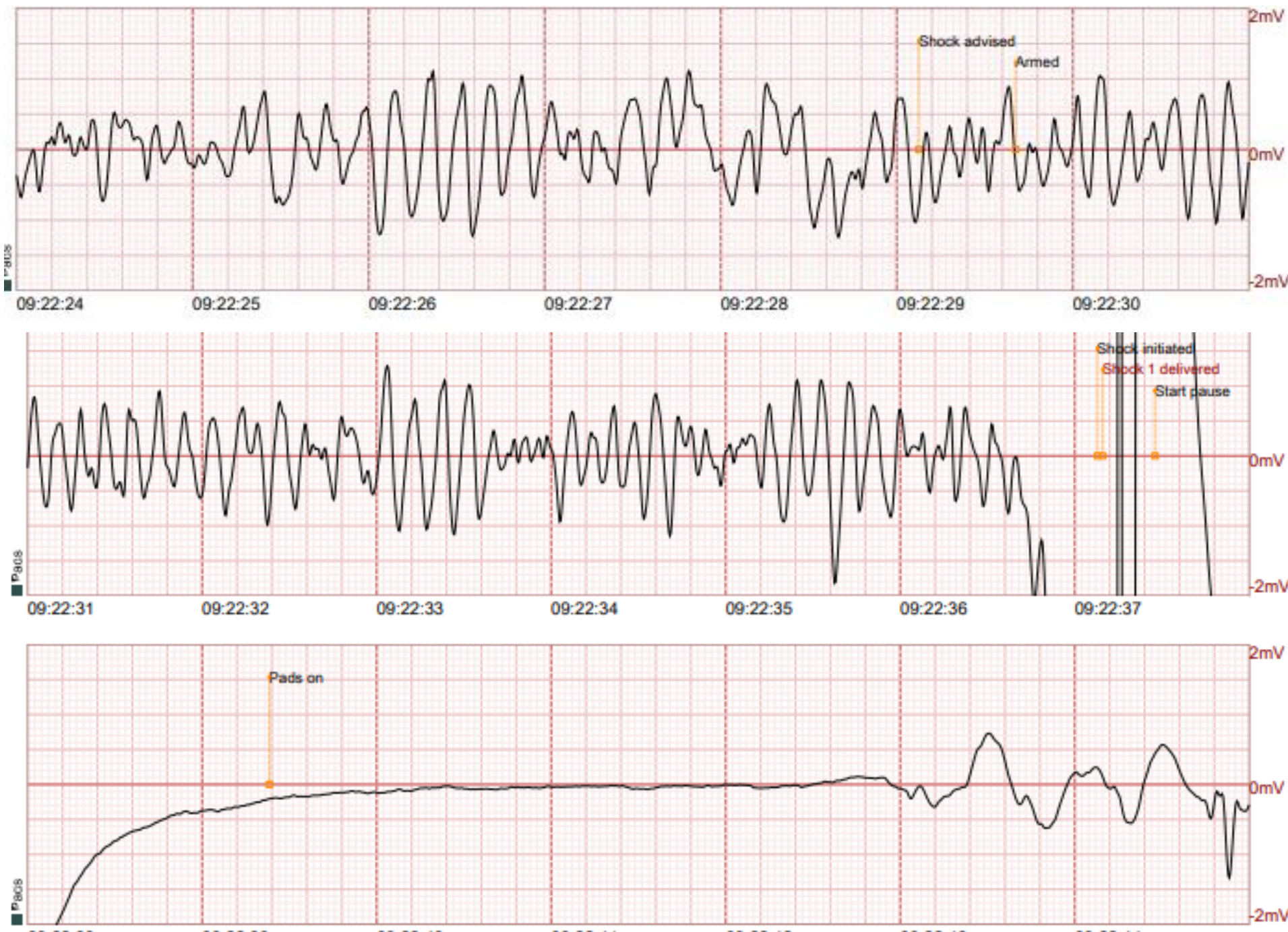
- (c)(1) The program of instruction on CPR must include instruction on the use of an automatic external defibrillator (AED) and the location of each AED in school. The school shall conduct a CPR and AED drill so that the students are aware of the steps that must be taken if an event should occur that requires the use of an AED.**

## REFERENCES

- Virani SS, et al; American Heart Association Council on Epidemiology and Prevention Statistics Committee and Stroke Statistics Subcommittee. Heart Disease and Stroke Statistics-2020 Update: A Report From the American Heart Association. Circulation. 2020 Mar 3;141(9):e139-e596. doi: 10.1161/CIR.0000000000000757. Epub 2020 Jan 29. PMID: 31992061.
- Joel S. Brenner, and the Council on Sports Medicine and Fitness; Overuse Injuries, Overtraining, and Burnout in Child and Adolescent Athletes. *Pediatrics* June 2007; 119 (6): 1242–1245. 10.1542/peds.2007-0887

## CASE PRESENTATION

- 16 y/o previously healthy male, conditioned cross-country athlete with no significant cardiac family history.
- While training at his school in the summer of 2020, he suddenly felt dizzy and collapsed on the field. Bystanders noted that he was pulseless and initiated CPR. Within 5 minutes of initiating CPR, an AED was obtained and applied which detected a shockable rhythm (on review rhythm was consistent with TdP/VF as seen in the strips). Within 8 seconds of the AED detecting and arming, a shock was delivered with subsequent return of sinus rhythm.
- By the time EMS arrived, he was back to baseline. He was treated at Vanderbilt Children's Hospital and recovered well with no neurological sequelae.
- Initial work-up, including echocardiogram, cMRI, exercise stress test, and EP study, was normal.
- He was diagnosed with idiopathic ventricular fibrillation and had an S-ICD placed.
- Since his S-ICD placement he has had one episode of atrial fibrillation which was terminated with a shock from his device, and one episode of non-treated VT. He is on Sotalol therapy with a stable rhythm and is continuing to follow with EP.



Rhythm strip obtained from AED showing TdP/VF with return to sinus rhythm after shock delivery (first sinus beat seen at the end of the strip).

♥ = at least one Heart Safe School in county    ♥ = Project ADAM Heart Safe School District  
♥ = Special School District within county



## DISCUSSION

- Key factors leading to our case's good outcome: 1) early recognition of arrest, 2) initiation of CPR by non-medically trained bystanders, 3) access to and early implementation of an AED, 4) appropriate use of AED to deliver shock.
- The quick and effective action taken by the prepared school staff was paramount to his outcome.
- In order to support and prepare schools for these types of events, Tennessee has key legislature in place to ensure that schools have access to an AED and conduct regular cardiac emergency response drills.
- Our patient's school underwent a cardiac emergency response training with the help of Project ADAM two weeks prior to his arrest, which the school staff cited as pivotal in their readiness to react appropriately.



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