

# Inadequate Placement of AEDs and Bleeding Control Gear Could Cost You

**AEDs and bleeding control kits can save lives, but only if they are always accessible and staff members know how to use them.**

By Dr. Charles Denham II, William Adcox, Charles Denham III, and Dr. Gregory Botz



**AN EMERGING THREAT** to many organizations is “failure to rescue” children and adults experiencing sudden cardiac arrest or harm due to major trauma, such as active shooter events. The standard of care for these medical emergencies is rapidly evolving, and leaders need to act now to keep up or pay the price of harm to their constituents and the growing liability exposures that often accompany these types of medical emergencies.

The good news is that if a person experiencing cardiac arrest can be resuscitated with an automated external defibrillator (AED) within three minutes, he or she has a much better chance of surviving. If a gunshot victim can be provided treatment to stop their severe bleeding within three minutes, their chances of survival greatly increase as well.

That’s why in our upcoming documentary, *3 Minutes and Counting: Bystanders Care*, we focus on “three minutes from drop to shock” for sudden cardiac arrest and “three minutes from shot to stop” for gunshot wounds to stop severe bleeding. (For more information, visit [MedTacOC.org](http://MedTacOC.org).)

The takeaway – have AEDs and bleeding control gear together AND one minute away from ANY victim or you will lose the fight

against failure to rescue. Bystanders must beat the clock.

Who would have thought in 2019 that we would be citing a *New England Journal of Medicine* article by Valenzuela et al. almost 20 years ago? They reported the evidence of the success generated by placing AEDs in casinos that allowed 3 minutes from drop to shock. Yet we are because this metric has held firm for almost 20 years. It turns out – the house always wins even in cardiac liability.

These measures are becoming the bystander care goals of leading organizations who are closing the gap between when organs start to die without oxygen at 4 minutes and the average response time of professional first responders at 10 minutes. After 3 minutes, we begin counting lives saved or lives lost; our response is key.

However, the majority of lawsuits following out-of-hospital cardiac arrests and deadly force incidents revolve around organizations failing to have accessible emergency supplies and staff properly trained to use them. There are almost no lawsuits alleging improper bystander care or misuse of emergency supplies or AEDs.

Here’s how your campus can address this

emerging threat.

## AED Accessibility a Significant Challenge

Almost 1,000 out-of-hospital sudden cardiac arrests occur every day with 7,000 occurring every year in children and youth -- one-quarter happen on the playing field. When we look through the lens of those we serve, we now have some good metrics for getting the right care at the right time...every time.

There is clear consensus that the most effective way to improve survival of cardiac arrest victims is to strengthen the early links of the survival chain with bystander cardiopulmonary resuscitation and Public Access to Defibrillation (PAD). However, when most organizations review whether they can get CPR care and AEDs to sudden cardiac arrest victims within three minutes 24/7/365, most organizations come up short. Multiple studies show there may be only a one-in-five chance of an AED being near enough to a victim.

Not only are there not enough AEDs located close enough to victims in public places, but those that are nearby are inaccessible more than 50% of the time. They are either in buildings that are locked at night or there are barriers

ers to access them. AEDs also are often without clearly visible signage or are positioned out of reach at schools so those of small stature may not be able to retrieve them in an emergency.



There are other issues as well. Good Samaritans may fear liability, be confused regarding how to perform CPR while under stress and might not be familiar with how an AED works. A recent study found that women are 27% less likely to receive CPR because males are reluctant for fear of sexual harassment allegations when they touch their chest during CPR. They also fear hurting females with vigorous compressions, which underscores the need for training.

## Trauma First Aid Gear Saves Lives

The Stop the Bleed Campaign was developed after 20 first graders and six educators were killed at Sandy Hook Elementary School in 2012. As of September 2019, more than one million people have been trained in bleeding control. Now often called “the new CPR,” it educates bystander laypersons in the use of direct pressure, wound packing and tourniquet use for bleeding.

We believe that the standard of care to mitigate harm from active shooter and major trauma events is the adoption of the Stop the Bleed Campaign methods. This in turn drives the need for placement of major bleeding control supplies at multiple locations. Given that gunshot wound victims can bleed out in five minutes or less, the “3 minutes from shot to stop the bleeding” metric makes sense and speaks to the issue of co-locating AED and resuscita-

tion gear with major bleeding control supplies.

Dr. Peter Antevy, who was interviewed by *60 Minutes* regarding the Parkland High School mass casualty event, shared that although 34 people were shot and 17 were killed, “17 kids are alive today because of the quick action and quick work of those folks who put on tourniquets and chest seals.”

Stop the Bleed methods can also be applied to other types of medical emergencies stemming from other types of incidents, such as stabbings, car crashes and other accidents.

## The Solution – Leadership, Practice and Technology Systems

We can reduce vulnerability to threats with prevention, preparedness, protection and performance improvement. Such an approach can be organized by leadership systems, practice systems and technology systems.

**Leadership Systems:** When working with leaders, we like to use our 4 A Checklist:

- **Aware:** We need to make them aware of the performance gaps we are trying to close, as well as the liabilities and full-loaded cost of inaction.
- **Accountable:** We want them to determine who must be personally accountable for the work done to close the gap.
- **Ability:** We define ability as know-how as well as resource allocation, both cash and capacity or worktime (the compensated staff time). Leaders control budgets and new out-of-budget spending.
- **Actions:** These are the line-of-sight activities that, in aggregate, will produce the stated goals. The leaders within an organization need to understand why regulatory-compliant AEDs and appropriate major bleeding control resources need to be purchased and placed so that a bystander or staff member can get to any victim and begin care within three minutes.

Our job as safety and security leaders is to get other leaders onboard to drive these “4 A’s.”

**Practice Systems:** Here, concepts, tools and resources are critical to understanding and becoming competent in the best practices of CPR/AED use and the Stop the Bleed skills and methods.

The first best practice is to undertake an organization-wide assessment to determine the response time performance gap that must be

**3 Minutes & Counting  
Assessment Plan**

**Step 1 Is State Map**

- Create an “Is State” map of all AEDs and Bleeding Control Gear locations on the property.
- Describe access 24/7, location, positioning, and visibility.
- Identify new or better locations to position AEDs and Bleeding Control Gear within 1 minute of any victim.
- Identify population surge needs that typically occur.

**Step 2 Leadership Systems**

- Assess leadership systems of Awareness, Accountability, Ability, and Action issues to pass a 3 minutes to care test.

**Step 3 Practice Systems**

- Assess gaps in practice systems of state-of-the-art training in CPR/AED and Bleeding Control of staff and volunteers. Identify sources for regular practice.
- Define gaps in protocols, procedures, and standard operating procedures mirroring latest guidelines.

**Step 4 Technology Systems**

- Assess existing AED technologies for gaps in compliance, latest recommended algorithms, and condition.
- Determine the number of fixed, portable, and mobile co-located gear packs of AEDs and Bleeding Control gear.
- Identify the specific Bleeding Control gear requirements for placement with AEDs depending on surge and risk profiles of the location.
- Define regular standard of care maintenance programs for leadership, practice, and technology systems.

closed. The actions include determining the location and concentration of the populations you serve and those who serve them (your staff) 24 hours a day, 365 days a year. You must determine where gear needs to be located so that someone walking briskly at four miles per hour can get from a victim to the gear, retrieve it and initiate care within three minutes. Our approach is to place the gear 1 minute away from anywhere on the property. Factor in 30 seconds to assess the victim, 2 minutes to retrieve the gear, and 30 seconds to put the gear to action. Assess location, positioning, visibility and accessibility of the gear. You must consider surge events, such as graduation assemblies where you may need to move portable and mobile AEDs to meet the three minutes-to-care test.

Proper CPR/AED and first aid courses need to be taken from the *American Heart Association*, *American Red Cross*, or other equivalent training organizations. The Stop the Bleed programs are operating in most communities and the courses are free. Our *Med Tac Bystander Care Program*, which incorporates both certifications in addition to covering other leading causes of preventable death, can be reviewed in the November/December 2018 issue of *Campus Safety Magazine* as well as on [CampusSafetyMagazine.com](https://www.campusafetymagazine.com/public/med-tac-training-bystanders/) at <https://www.campusafetymagazine.com/public/med-tac-training-bystanders/>.

Best practices can be organized into prevention (primary prevention means to prevent an event from ever happening and secondary prevention means prevention of harm if an

**AED & Bleeding Control Gear Placement Checklist**

**PROXIMITY:**

- ❑ Existing fixed AEDs should be close enough to allow someone walking 4 miles per hour to retrieve the AED in time to enable 3 minutes from “drop to shock” for any victim.
- ❑ Bleeding Control Gear should be co-located with AEDs to enable 3 minutes from “shot to stop” of major bleeding for gun shot wounds.

**ACCESS:**

- ❑ All AEDs and Bleeding Control Gear supplies co-located so that they are available 24/7/365 and not locked behind closed doors.

**LOCATION:**

- ❑ New AEDs and Bleeding Control Gear may need to be placed close to high traffic and high-risk areas.
- ❑ AEDs and Bleeding Control Gear may need to be provided in portable backpacks or mobile on bicycles, golf carts, or patrol cards to meet the 3-minute-response test.

**POSITIONING:**

- ❑ The positioning above the ground should match the local requirements. Students of small stature may have to retrieve the gear to support bystander care.
- ❑ AEDs and Bleeding Control Gear should be placed following local regulatory statutes that evolve.

**VISIBILITY:**

- ❑ Signage must be clearly visible and the addition of Bleeding Control Gear to AED locations will require new signage.
- ❑ Signage must be visible from all directions to allow bystanders under stress to find the supplies.

event does happen), preparedness (in case of an event), protection (when an event occurs) and performance improvement (learning from other events to improve all the other activities).

**Technology Systems:** We define “technology” as the products, services and information technologies that will support our best practices and performance improvement. AEDs need to be assessed for regulatory compliance and be using the latest approved algorithms. Make sure you are following the manufacturers’ guidelines for inspections and readiness, battery replacement and recalls.

Ask the following questions:

- Are you following the evolving state regulatory statutes and guidelines?
- Do you have the proper protocols for reporting when an AED is used?
- Have you looked at the new product features of WiFi-enabled readiness-check systems and CPR coaching features, such as metronome commands for frequency of chest compressions?
- Do you have AEDs that are the best device for your operating environment, which might have unique weather or moisture issues? For example, we place AEDs and bleeding control kits in waterproof cases for our Adopt a Cove program in Southern California. <https://www.medtacoc.org/adopt-a-cove/>
- Have you considered outsourcing the management of your AED inspections and services that will provide loaner

AEDs if yours are used or damaged?

As for trauma and bleeding control supplies, the same issues of fixed, portable, and mobile deployment of this gear should be addressed. Ideally, AEDs and trauma gear should be together in the same location.

Once you have mapped the concentration of those you serve and those who serve over time, you must decide how much gear you might put in theaters and assembly halls. The good news

is that trauma gear has a very long shelf life and maintenance requires little extra effort if the gear is in the right location and accessible.

**Make Your Upgrades Now**

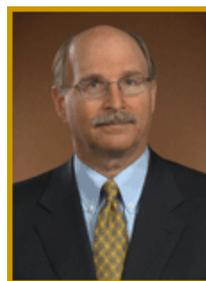
The emerging threat of lagging behind the rapidly evolving standard of care for training and technology is one you can tackle now. There is no better time to do it.

**TIMELINE OF AED FIRSTS**

- **1775:** Danish doctor proved that the hearts could be restarted by electricity.
- **1889:** Two Swiss physicians discovered electricity could stop fibrillation.
- **1928:** William Bennett Kouwenhoven, an American electrical engineer who later created CPR, applied electricity to restart hearts. This was developed to resuscitate power company workers after accidental electrocution.
- **1947:** The first life saved was of a 14-year-old youth during surgery.
- **1956:** First closed chest defibrillation was undertaken.
- **1966:** The first portable defibrillator was invented by Professor Frank Pantridge in Belfast and weighed 110 pounds and used a car battery.
- **1978:** Modern AED developed with sensors automatically detecting ventricular fibrillation and administering shock.
- **1972:** President Lyndon B. Johnson was saved by a portable defibrillator.
- **Early 1990s:** American Heart Association initiated a public access program for AEDs nationally.
- **2000:** In the *New England Journal of Medicine* article entitled Outcomes Of Rapid Defibrillation By Security Officers After Cardiac Arrest In Casinos, Valenzuela et al. reported optimal outcomes if victims defibrillated within 3 minutes.
- **2002:** In the *New England Journal of Medicine* article entitled Public Use Of Automated External Defibrillators Caffrey et al. reported that bystanders will respond if airports placed AEDs next to fire extinguishers. The long-term survival rate with a good neurologic outcome among all 18 patients with ventricular fibrillation was 56 percent (regardless of the location of cardiac arrest), and it was 67 percent among the 12 patients who underwent defibrillation within five minutes.

**About the Authors:**

**Dr. Charles Denham II**



Chairman of TMIT, a non-profit medical research organization, he leads development of the Med Tac Bystander Care Program and R&D initiatives. He founded *CareUniversity*®.

**Charles Denham III**



A middle school student, he is a co-founder of the Med Tac Bystander Care Program, and helps lead the Med Tac Lifeguard Surf Program and Scout Program as a Junior Med Tac Instructor.

**William Adcox**



Chief Security Officer and Chief of Police of the University Health Science Center at the MD Anderson Cancer Center, he is one of the pioneers of Threat Safety Science.

**Dr. Gregory Botz**



Professor of Anesthesiology and Critical Care at the University of Texas MD Anderson Cancer Center, he is also an adjunct faculty member at the Stanford School of Medicine.