

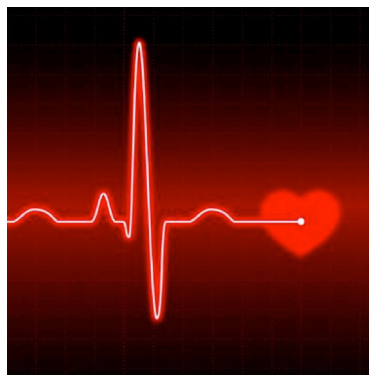


# Heart Safe Community

KLA White Paper Project

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## **Introduction:**

More than 350,000 people in the United States are likely to suffer sudden cardiac arrest this year, many of whom have no known history of heart disease and no other risk factors; 88% of those victims will be at home when the attack occurs. Unfortunately 70% of Americans report that they feel helpless to act due to lack of training (<http://www.heart.org>) "Effective bystander CPR provided immediately after sudden cardiac arrest can double or triple a victim's chance of survival, but only 32% of cardiac arrest victims get CPR from a bystander." (<http://www.heart.org>) Recent statistics suggest that approximately 1,000 people per day will suffer non-traumatic sudden cardiac arrest in 2014. (<http://www.sca.aware.org>) Victims will include men and women of all ages, friends, neighbors, loved ones and children. If someone suffers from cardiac arrest in front of you, you may be that person's best chance of survival. "There are only a few minutes between the time sudden cardiac arrest occurs and when treatment becomes useless. A bystander has the best, and maybe the only chance to help."(<http://www.hsi.com>) Survival rates vary significantly depending on the city in which the person suffers the attack, but aggregate data suggests a survival rate between three and sixteen percent. (*Five Steps To implementing a CPR Quality Program*, White Paper by JEMS, November 2013) Survival rates are directly impacted by the community response to these events. "Cardiac arrest is a treatable condition, and cities should work hard to treat it better..." (<http://health.usnews.com>) According to "Cardiology Today" the out of hospital cardiac arrest survival rates have not changed much over the past thirty years, despite technological advances. (<http://healin.com/cardiology/vascular-medicine/news>) "Focused strategies designed to boost rates of bystander CPR, deliver earlier defibrillation and achieve return of spontaneous circulation before transport are likely to do more to improve aggregate rates of out-of-hospital cardiac arrest survival than interventions applied later in a patient's treatment." (*Circulation: Cardiovascular Quality Outcomes*. Sasson C.)

Multi-Township EMS (MTEMS) has developed the One Heart Foundation to improve out-of-hospital cardiac arrest (OHCA) survival in Kosciusko and Marshall Counties. Statistics collected by MTEMS show that only 25% of the out of hospital cardiac arrest receive bystander CPR prior to Responder arrival. The need for an AED registry has been identified for the purpose of knowing where the AED's are located in the community. AED's are an essential part in the resuscitation of a out of hospital arrest. 2012 MTEMS has a survival rate of 18% for all OHCA, an definition of a survivor is discharged from the hospital neurologically intact. MTEMS has identified several areas that need to be improved to increase the OHCA outcomes.

### **Several areas have been identified as in need of improvement:**

***Recognition of Out of Hospital Cardiac Arrest and early bystander CPR***

***Establishment of an Automatic External Defibrillators (AED) Registry***

***Improvement in dispatcher assisted CPR.***

***Improvement of CPR quality of professional rescuers***

This white paper project seeks to support and further the MTEMS One Heart Foundation by addressing the first two areas identified for improvement. Remarkable improvements in the survival rate may be realized if there is a concentrated focus on resuscitation fundamentals and the availability of AEDs. Some reports show that people who had ventricular fibrillation and were treated by an AED had a survival rate of between 7.7% and 39.9%. (<http://health.usnews.com>) The Sudden Cardiac Arrest Foundation reports that “when bystanders intervene by giving CPR and using an automated external defibrillators (AEDs) before EMS arrives, four out of ten victims survive.” (<http://www.sca.aware.org>)

### ***Recognition of Out of Hospital Cardiac Arrest and early bystander CPR***

#### **BACKGROUND**

Sudden Cardiac Arrest (SCA – or Sudden Cardiac Death) is a leading cause of death in the U.S., striking as many as 350,000 victims annually. Survival rates nationally are around 5%. The most important variable impacting SCA survival rates is the time it takes to deliver a first shock with an Automated External Defibrillator – or AED. Quality of life survival decreases 10% per minute that response is delayed. Brain death begins in 4-6 minutes. Even the best of EMS response systems can't be there that quick. To meet this public health objective, AEDs have been and are still continually being placed in many public settings, including businesses, schools and churches. CPR training is also essential in giving individuals the confidence to perform early CPR. But is it working? Despite the escalation of AED placements in the last 20 years, the national survival rate has barely changed from just fewer than 5% to just over 5%. According to the Cardiac Arrest Registry to Enhance Survival (C.A.R.E.S) Registry\*, AEDs are used less than 5% of the time in a resuscitation attempt. Most citizens do not recognize the need to perform CPR, therefore we must teach the importance of early CPR.

The Challenge-Despite the rapidly growing number of publicly placed AEDs and the need for AEDs to be retrieved and used rapidly 911 dispatches often lack critical information about the presence and location of the life saving devices and knowing how to use them. Get training promoted to maintain or increase the number of individuals trained on CPR, which were 4,800 in 2013.

#### **How to do it:**

##### **A. Recognition of Sudden Cardiac Arrest:**

1. Training/Teaching of lay people CPR training would include AED training and could be done as presentations to groups as well as individual training.
2. Public awareness training:

We would like to start a Community Awareness Campaign, which would include the creation, and expansion of an Automated External Defibrillator (AED) registry will allow Kosciusko County 911 Center to advise callers where the closest AED is located. Multi-Township EMS has started a Database for this purpose; our intent is to urge the companies, schools and churches in our community to have their device in that Database and obtain information regarding their needs for emergency response

training. We have created a script that will be used in calling these individuals to make sure they have a contact name to obtain the information needed. The office of the Multi-Township EMS has been making these phone calls to get a start on the updates for the contact listing. Also making the public aware that there are Home kits available at Multi-Township EMS.

Use of Public Service Announcements, Flyers, Website, Facebook page and MTEMS involvement in events such as First Fridays, etc....

**What the experts say we should do:**

In October, 2007, the Board of Directors of the National Association of EMS Physicians approved a position paper on “Early Defibrillation”. It states:

**The National Association of EMS Physicians® believes that:**

1. Early defibrillation, as part of an emergency response including high-quality bystander CPR, is essential to maximizing survival from cardiac arrest.
2. While there has been increasing attention to the importance of the quality of CPR, early defibrillation is still important. If the arrest is not witnessed and a defibrillator is not immediately available, defibrillation should be preceded by good quality chest compressions.
3. All EMS responders (including police, fire/rescue, and other types of rescuers when serving in a designated first responder role) should be equipped with a defibrillator.
4. Public access defibrillation programs in which non-traditional first responders provide CPR and defibrillation in the first few minutes of cardiac arrest appear to improve survival. Such programs should be integrated with local EMS systems.
5. Good Samaritan laws or similar legislation should hold harmless any person who uses an AED in good faith.

*“Wouldn’t it be amazing if a caller to 911 could be informed that the doorman in the next building had an AED in his building’s lobby and was being called to bring it over?”*

*“I offer this suggestion as one idea for how a community can be creative with AEDs. Clearly AEDs in the community have the potential to save lives. The challenge is to maximize this potential.”*

Community stakeholders who can affect a positive outcome in a project to increase utilization of AEDs and positively impact cardiac arrest survival rates include, but are not limited to:

- Elected Community Officials
- Community Medical Directors
- EMS Fire/Rescue Chiefs
- Police/Public Safety
- Public Access Defibrillation Coordinators

- 9-1-1 Directors
- Hospital Officials – especially cardiac-centric ones
- Community CPR/AED Training officials



***Establishment of an Automatic External Defibrillators (AED) Registry***

**AED Registry:**

1. The importance of the usage of AED's (automated external defibrillators) in the event of an OHCA (out of hospital cardiac arrest).
  - a. According to The American Red Cross, the average response time for the first responders once 911 are called is 8-12 minutes. After approximately three to five minutes in cardiac arrest, irreversible brain / tissue damage may begin to occur. For every minute that a person in cardiac arrest goes without being successfully treated (by defibrillation), the chance of survival decreases by 7% per minute in the first 3 minutes, and decreases by 10% per minute as the time advances beyond 3 minutes. Time is of the essence.
2. Build a database with all of the AED's in the County.
  - a. An up to date registry is an important part of the program. The registry will keep dispatchers and EMS personnel informed as to the location of AED's in their community.
  - b. The data base administrator will also make sure that people are up to date on CPR training.

- c. The data base administrator will also make sure that the AED is checked bi annually to make sure that it is functioning properly.
3. Have a group of people locate the AED's.
  - a. A group of people (probably volunteers) would begin the process under the guidance of Multi-Township EMS by calling all of the businesses, churches, schools, service organizations etc. To obtain the name of a contact that would be the person or persons responsible for the safety concerns of their respective businesses, etc. That list would then be turned over to Multi-Township EMS. They would make the call to register the AED's in place along with soliciting interest from those who do not have AED's on hand.
4. Future: Smart phone app for the response to an OHCA in the public places.
  - a. A smart phone app called Pulsepoint has been developed by professional rescuers to aid them as to where someone has suffered an OHCA in a public place. This would allow rescuers professional and layperson to be notified by a text message that someone needs CPR and where the closest AED is located.

### ***Improvement in dispatcher assisted CPR.***

#### **Dispatcher Assisted CPR Facts**

The rate of bystander CPR in King County, WA, increased from 32% (1976 through 1981) to 54% (1982 through 1988) after implementation of the dispatcher assisted telephone CPR program.<sup>1</sup> Bystander CPR is currently performed on 49% of all cardiac arrests in King County, Washington. Multi-Township EMS has Partnered up with Kosciusko Central Dispatch to measure and improve the dispatched assisted CPR program for the citizens of Kosciusko County. MTEMS is currently collecting data that will be used to measure quality and improve on the processes.

#### **Frequently Asked Questions (FAQs)**

*Can dispatchers do harm to a person in cardiac arrest by giving instructions over the phone?*

If the patient is in cardiac arrest he/she is clinically dead and no further harm can be done to this person. Any attempt at CPR is more helpful than no attempt at all. A 2009 study in King County, WA, showed that even when the patient was not in cardiac arrest and the dispatcher instructed the bystander to do CPR, the chance of injury was very minimal. Of 247 patients who received CPR but were not in cardiac arrest, only 6 had potentially serious complications.

*Should dispatchers be trained in CPR?*

Yes, learning to perform CPR will help them provide DA CPR instructions, but this training is not required and is not a part of the EMD training curriculum. You may choose to make CPR training a pre-requisite to EMD training. All citizens should be trained to perform CPR regardless of their occupation.

*What if the caller does not want to do CPR?*

If the caller does not want to do CPR with dispatcher assistance then let them know that responders have been notified and ask them to lay the patient on their side in order to avoid any aspiration or further issues with the patient's airway. The caller should not be made to feel guilty about their refusal however sometimes potential rescuers don't understand that the dispatcher will guide them through the tasks and it is only to help the patient until the responders arrive.

*What if the caller already knows how to perform CPR or is already doing it?*

If you are comfortable that they can proceed without assistance you can have them keep the line open and proceed with the CPR. We find that often callers still want some reassurance with their CPR or we need to adjust their rate of compressions because they are not going fast enough.

*What if the caller cannot get the patient into the correct position to do DA CPR?*

Undoubtedly, dispatchers may receive calls where the patient is wedged or in a position where the potential rescuer cannot move them. There might also be times where it would not be safe for the rescuer to attempt to move the patient due to his or her own safety issues. In each of these instances, it is best to have the caller attempt to open the airway of the patient and prepare for the responders arrival (opening front door, placing dogs in area that will not inhibit the rescue attempt, etc.). Placing the caller in a position where they are at risk of injury is not an option.

However, basic training will include options for callers faced with patients in a recliner, on a bed, at the dining table, in a bathtub etc. Dispatchers should use their knowledge and skills from training to make every attempt to get a patient flat on their back on the floor and begin compressions. Training should include a component on the importance of positioning as well as some ways to overcome some of those issues.

*Most patients in cardiac arrest die anyway or never regain full function and health, so why bother putting the work and effort into such a complex program?*

Although many patients who experience cardiac arrest die, in many areas, including Kosciusko County, survival rates can approach or exceed 50%. Even if the survival rate in your area is lower, every patient saved by DA CPR is someone's father, mother, daughter, son, or other family member. Saving even one patient can be a highlight of a dispatcher's career and a life-altering event for the patient's family.

***Improvement of CPR quality of professional rescuers***

**Improved CPR for Professional Rescuers:**

Research indicates that HP CPR can save lives. In order to create an environment of sustained HP CPR, everyone must be on board. EMTs first on scene must take responsibility or "OWN" the CPR portion of the

resuscitation. When paramedics arrive, they will perform the advanced life support measures of the resuscitation and work in coordination with ongoing CPR. For systems in which an EMT/paramedic team arrives first at the scene the EMT must assume responsibility for CPR while the paramedic assumes responsibilities for ALS. The goal is for additional resuscitation care such as defibrillation, medication therapies, or airway management to compliment CPR. CPR should be the default action at all times. In order to have effective HP CPR ALL involved must work as a team, not as separate entities. In order to achieve this goal, HP CPR must start at the top and be endorsed by the EMS Chief and Medical Director. The value of HP CPR must be communicated to the men and women who actually perform the resuscitation.

The priority of the resuscitation team needs to be HP CPR. In many systems the EMT is directed to provide CPR. The EMT needs to provide CPR with the appreciation that it is their primary responsibility. Even though the EMT is providing CPR, paramedics need to recognize its critical importance and work to integrate ALS care in a way that enables the EMT to achieve consistent CPR. This partnership between EMTs and paramedics will provide the basis to achieve HP CPR and in turn improve the chances of successful resuscitation.

#### **10 principles of High Performance CPR**

1. EMTs own CPR
2. Minimize interruptions in CPR *at all times*
3. Ensure proper depth of compressions (>2 inches)
4. Ensure full chest recoil/decompression
5. Ensure proper chest compression rate (100-120/min)
6. Rotate compressors every 2 minutes
7. Hover hands over chest during shock administration and be ready to compress as soon as patient is cleared
8. Intubate or place advanced airway with ongoing CPR
9. Place IV or IO with ongoing CPR
10. Coordination and teamwork between EMTs and paramedic

#### **Training**

Depending on the size of the agency, responders might participate in one resuscitation a week or one a year. It is important that they are well prepared no matter how many times they perform CPR throughout the year. Training responders on the key principals of HP CPR on a regular basis will keep skills sharp and lead to more successful resuscitation attempts. Here are many different forms of training and recertification for EMTs and paramedics. The most effective form is a hands-on approach. Understanding what 100 compressions/minute feels like and being in the middle of a well-choreographed resuscitation will give responders a better understanding of the different roles people play and how all of these different roles fit together. **The most effective training is simple, realistic, scenario driven, and completely hands on.** Other training options include combinations of paper, video, and hands-on models. It is incredibly difficult to learn psychomotor skills without hands-on practice; power points



and lectures alone will not suffice. At 3 o'clock in the morning at the scene of a resuscitation, responders will remember what they last practiced, but won't necessarily remember a power point slide. Education in the form of lectures, videos, and articles is valuable in gaining a better understanding of *why* high performance CPR is necessary, but it is the hands-on training that will give them the *how*.

HP CPR Training Module: Demonstrate, practice, practice, and more practice, and then evaluate. Simplicity is essential for training EMTs and first responders. Get the tools out, explain the scenario, place the manikins on the floor, and **“practice like you play.”** Remember this type of training can become ineffective by trying to overcomplicate the core concepts. In addition to technique, timing is also a very important aspect of HP CPR training. Yearly evaluations, bi-annual and monthly trainings, and timely training updates are effective in making sure staff is ready for the next call.

### Maintaining successful HP CPR

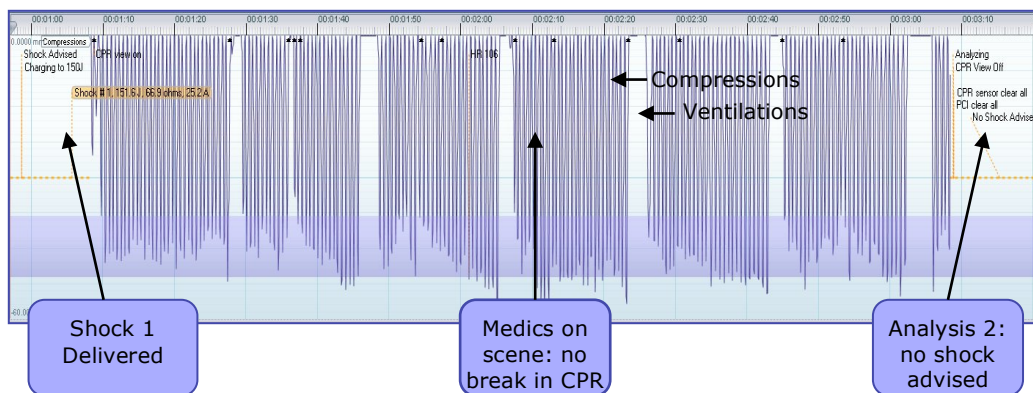
#### Maintenance

In order to ensure that patients are receiving the best resuscitation possible, each EMS system **must** have a way to measure the performance of their responders. Many tools are available for this specific purpose, from training tools to tools used in the field.

For example:

- Manikins which measure cadence, depth, recoil
- CPR performance tools
- Defibrillators which record ECG, compressions, and audio

These devices can measure the quality of chest compressions, the ability of ALS and BLS to coordinate, the amount of time chest compressions were not being performed and the reason for the lack of compressions. Some of these devices may require software updates or new hardware, but will prove invaluable in improving CPR.



\*(30:2 CPR-MRX machine

**Feedback**

Responders want to know how they performed. By quantifying performance measures such as compression rate and time spent on rhythm analysis, they will have a solid marker to improve upon or try to maintain. Many agencies see it as a sort of competition, which can increase resuscitation performance as well as increase buy-in from responders.

Feedback is necessary to improve performance. How will a responder know what to improve upon during the next resuscitation if there is no feedback as to their performance on previous resuscitations?

There are many different options for providing feedback. Letters, short forms, and spreadsheets are just a few ways to provide the feedback. Additionally, options for timing and depth of feedback are also available. Individual feedback is key, but some agencies also choose to provide agency-wide feedback on a regular basis.

**Who will manage and maintain the AED registry?**

Multi-Township EMS will manage and maintain the registry. The Registry will be accessible by Kosciusko County Central Dispatch via a shared Drop Box cloud storage. Every time there is a change to the registry both agencies will collaborate and update the Computer Aided Dispatch council.

**Training Partnerships:**

Multi-Township EMS has partnered with Kosciusko Community Hospital and the American Heart Association. The Kosciusko 21<sup>st</sup> Century Foundation has awarded a grant for MTEMS to purchase multiple training mannequins, and training materials. Kosciusko REMC operation Round-Up has also awarded MTEMS with funds to purchase training materials.

**Sustainability of Project:**

The sustainability of this project is very important to the residence of Kosciusko County because of the life safety that it brings to the community. Multi-Township EMS will provide the funding through community donations and revenue from CPR courses that are provided.

**Project Proud:**

Our group would donate the winnings of project proud to MTEMS One Heart Foundation to help with training of bystanders and professionals in CPR.

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## **Dispatcher-Assisted Cardiopulmonary Resuscitation Risks for Patients Not in Cardiac Arrest**

Lindsay White, MPH; Joseph Rogers, MS; Megan Bloomingdale; Carol Fahrenbruch, MSPH; Linda Culley, BA; Cleo Subido, RPL; Mickey Eisenberg, MD, PhD; Thomas Rea, MD, MPH

Hi, my name is \_\_\_\_\_.

I'm calling as a current participant in the Kosciusko Leadership Academy (KLA).

Our white paper project, called "Heart Safe" is to assist the Multi-Township EMS in gathering contact information from local businesses/churches/service organizations/etc. for the purpose of later reaching out to those identified contacts in order to obtain information regarding their needs for emergency response training and AED accessibility.

The end goal of our project is to increase awareness and availability of emergency response training such as CPR and to create a data base or directory of AED's available in the county.

When the Multi-Township EMS reaches out to your "agency" who would be the suggested contact person?



# AED Registry

Multi-Township EMS is creating an AED Registry as a part of its One Heart "Hands Helping Hearts" Foundation. The AED registry will be added to Kosciusko County Dispatch Center. The 911 Operator will alert the caller where the closest AED is if there is a Sudden Cardiac Arrest at your facility. To register your AED please go to [www.mtems.com](http://www.mtems.com) and click on the "One Heart" tab and go to AED registry or contact Tony Doyle at 574-269-1975 or e-mail [tdoyle@mtems.com](mailto:tdoyle@mtems.com). MTEMS also offers CPR / First Training. Please contact for pricing.



