

Using Mobile Technology to Activate Citizens and First Responders



PulsePoint

May 2018

Introduction

Each year, approximately 350,000 sudden cardiac arrests occur outside a hospital setting in the United States. Nearly 90 percent of these patients die. With each passing minute without cardiopulmonary resuscitation (CPR), the chance of survival decreases by seven to ten percent. Participation by the general public prior to arrival of fire and emergency services is essential to increasing the patient's chance of survival.

In addition to rapid recognition of cardiac arrest, immediate notification of 911 and early CPR, availability of automated external defibrillators (AEDs) dramatically improves the chance of survival for victims of sudden cardiac arrest (SCA). Many businesses, health clubs, casinos, shopping malls and locations of public gatherings have AEDs available in an effort to increase survival from SCA. The goal of an AED program is to deliver defibrillation within three to five minutes after collapse.¹

In an effort to increase survival from SCA, the technology industry has developed unique solutions to bridge the gap between the cardiac arrest event and rapid arrival of help. One example of this technology is the PulsePoint mobile phone application (app).

PulsePoint is a free app for citizens that matches victims in cardiac arrest with nearby CPR-trained bystanders. Along with the location of the victim, the app also provides the location of the nearest AED. PulsePoint notifications are driven by the local jurisdiction's computer aided dispatch (CAD) system, the same system used to dispatch emergency responders. If a 911 call from a public location leads a dispatcher to believe that a cardiac arrest event has occurred, both emergency responders and citizen responders are notified simultaneously.

Activating Citizen Responders

Citizen responders include CPR trained civilians and medical professionals who voluntarily participate in the program by installing the app on their cell phone. If the citizen responder receives an alert, they can choose to immediately initiate lifesaving treatment prior to the arrival of emergency responders.

Currently, most citizens who provide CPR either witness the event themselves or are directed to do so by a 911 dispatcher. Often, friends and family are reluctant to provide CPR and trained citizens who may be nearby are unaware that help is needed. With implementation of technology such as the PulsePoint app, the likelihood that a sudden cardiac arrest victim will receive CPR from a citizen responder greatly increases.

While most cardiac arrests occur in private residences, for privacy reasons, the public-facing app is restricted to alerting only for events in public locations. To extend lifesaving notification into private locations, PulsePoint utilizes a "verified responder program" for use by off-duty first responders.

¹ http://cpr.heart.org/idc/groups/heart-public/@wcm/@ecc/documents/downloadable/ucm_489135.pdf

Verified Responder Program

Many off-duty firefighters, emergency medical services providers and medical professionals are willing and able to respond to nearby cardiac arrests and other time-sensitive emergencies. Unlike citizen responders, these professionals have experience responding to private locations and, because of their expertise and training, can be vetted and granted “Verified Responder” status in the PulsePoint application. Verified Responders are alerted for all nearby cardiac arrest events whether they occur in public or private locations.

At any given time, approximately 2/3 of fire department personnel are off-duty. The value of having these responders in the system is paramount to the success of the program and having a way to not only identify them, but also notify them of a cardiac arrest event in a private residence serves to considerably expand the reach of early CPR in a community. A Verified Responder program also aids in formalizing the “always in service” dedication of fire department personnel. Some potential concerns with this model include the on-duty versus off-duty status of members.

It is recommended that fire departments considering implementation of a Verified Responder program consult with labor and management prior to implementation. Fire chiefs should consider modeling other successful implementations which have addressed these concerns using best practices.

AED Integration

Early application of an automated external defibrillator (AED) is one of the crucial steps in the chain of survival for a patient who has experienced sudden cardiac arrest. Trained dispatchers will often ask if there is an AED present when the patient’s condition warrants this life-saving device; however, it is entirely plausible that the person on the emergency call is unaware of the location of the closest AED.

To further enhance the public’s capability of deploying an AED on appropriate emergencies, communities should utilize an electronic database to track the location of all AEDs in their respective service areas. Smart device applications could be used to engage the public in reporting the location of AEDs to ensure the registry is current and comprehensive.

With an active AED registry available, the use of mobile technology serves as an appropriate tool to alert a citizen or off-duty responder to the location of the closest AED, increasing the likelihood of getting the AED to the patient’s side. Likewise, an electronic AED registry should be linked to the jurisdiction’s communications center to direct 911 callers to the closest AED when determined appropriate for the patient’s condition.

AEDs serve as a critical link in the chain of survival. Modern technology will locate, and alert responders to, the closest AED increasing the likelihood that this life-saving tool can be used on the scene of a cardiac emergency.

911 Integration

Integration with the 911 system is essential for proper coordination of responders. Connecting PulsePoint directly with the local 911 Emergency Communication Center allows immediate alerting using real time incident data. In a 2017 study, use of a smart phone app for citizen CPR alerting was compared to alerting by SMS (text message). Alerting by use of the app connected directly to the computer aided dispatch (CAD) system resulted in a significant response time reduction in arrival by citizens on cardiac arrest scenes (3.5 versus 5.6 minutes) and a significant increase in layperson arrival prior to EMS (70% versus 15%).²

PulsePoint uses interface software that employs live surveillance of data as it is entered into the computer aided dispatch system so that notifications can be sent automatically. Configuration of citizen CPR alerting systems to require activation directly by a call-taker delay citizen response and add additional workload to call-takers during time-life priority incidents. Both delay expeditious care and treatment of the cardiac arrest victim. Integration with the 911 system also allows local authorities having jurisdiction to configure the type and level of data broadcast to responders.

Connecting with Community

PulsePoint allows the opportunity for citizens to observe fire, rescue and medical calls being dispatched and answered in a generic fashion. Optionally, radio feeds can be enabled through the app to provide real time audio feed of dispatch and responding units. The ability for citizens to utilize a cardiac arrest alerting application for other purposes (i.e., to monitor call volume) not only increases familiarity with the app and its operation, but also provides a tremendous public relations and awareness tool on the volume and frequency of responses into the community. As a significant percentage of PulsePoint users are emergency responders and medical personnel, the added benefit of integration with the 911 system is real time tracking of incidents, dispatches, and units assigned. When integrated into the 911 system to provide automatic notifications of incidents, occasional delays that might occur in call taking and dispatch can be offset by earlier notifications through the PulsePoint app, even when such notifications are only seconds apart.

Conclusion

There are many benefits to the use of technology for a citizen response in conjunction with community bystander CPR and AED programs. Ultimately, these programs offer to improve survival from sudden cardiac arrest in both rural and metropolitan communities.

Applications such as PulsePoint offer a unique way to involve the citizens in a local jurisdiction to not only become aware of when others need life or death assistance, but also provide them an avenue to render aid. This not only reflects well on the fire department, but provides the community with a sense of ownership in the program.

² Caputo, Maria Luce, et al. "Lay persons alerted by mobile application system initiate earlier cardio-pulmonary resuscitation: A comparison with SMS-based system notification," <https://doi.org/10.1016/j.resuscitation.2017.03.003>

This white paper was prepared in collaboration between the International Association of Fire Chiefs and the PulsePoint Foundation.

About the PulsePoint Foundation

Pulse Point is a 501(c)(3) non-profit foundation based in the San Francisco Bay Area. Our mission is to make it much easier for citizens who are trained in CPR to use their life saving skills to do just that...save lives! Through the use of modern, location-aware mobile devices PulsePoint is building applications that work with local public safety agencies to improve communications with citizens and empower them to help reduce the millions of annual deaths from Sudden Cardiac Arrest.

About the International Association of Fire Chiefs (IAFC)

The IAFC represents the leadership of firefighters and emergency responders worldwide. IAFC members are the world's leading experts in firefighting, emergency medical services, terrorism response, hazardous response, natural disasters, search and rescue, and public safety legislation. Since 1873, the IAFC has provided a forum for its members to exchange ideas, develop professionally and uncover the latest products and services available to first responders.