Developing a CPR Training Program at the Primary and Secondary Educational Schools Within

the Town of Castle Rock

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Certification Statement

I hereby certify that this paper constitutes my own product, that where the language of others is set forth, quotation marks so indicate, and that appropriate credit is given where I have used the language, ideas, expressions, or writings of another.

Signed_____

Abstract

Death in sudden cardiac arrest (SCA) is recognized as a national problem. Over 350,000 victims experience SCA in the pre-hospital setting yearly in the United States. Sadly, only 1 out of 10 of the victims of SCA will survive with a recognized quality of life. This extremely low survival rate has been shown to correlate with the evidence that less than 30 percent of bystanders, who witness SCA, will provide the life-saving technique of cardiopulmonary resuscitation (CPR). Most bystanders will choose not to perform CPR for a number of reasons ranging from a lack of training to a fear of legal responsibility. CPR training within educational facilities can introduce the practical skills and provide a foundation to the importance of life-saving strategies that follow a student as they develop. Over time, this translates into a larger group of individuals within the community who are more likely to perform a life-saving skill when it is needed. The problem is that the Castle Rock Fire and Rescue Department (CRFD) and the Town of Castle Rock have not taken the opportunity to engage the local primary and secondary educational schools in providing awareness and training on SCA events in an effort to increase the number of SCA victims that survive with quality of life.

The purpose of this project is to work with local primary and secondary educational schools in developing a CPR training program that can be added to the current curriculum, at the appropriate levels, in an effort to increase the number of SCA victims that survive with quality of life within the Town of Castle Rock. This problem was able to be addressed through the following research questions: a) How are other fire departments working with their primary and secondary schools relative to CPR training?, b) What are the primary and secondary schools currently doing to educate students on SCA events and CPR?, c) What organizations and programs could work with CRFD in having CPR training programs in schools?, d) What are the

characteristics and details of a CPR training program best suited for the primary and secondary schools within the Town of Castle Rock?, e) What is the cost associated with implementing a CPR training program in a school?

Using the Action Research Method, standard applied research procedures were followed. By using survey studies, one-on-one interviews, and Internet searches results were found that provided guidance on recommendations. The results found that educational schools should partner with the Mile High Regional Emergency Medical and Trauma Advisory Council (MHRETAC) and implement, the already developed, Student Medical Responder Training (SMART) Program to meet the needs of SCA awareness and CPR training.

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Developing a CPR Training Program at the Primary and Secondary Educational Schools Within the Town of Castle Rock

Lifesaving measures are often thought of as being performed by emergency medical services (EMS) responders and equipment. Often these EMS responders arrive on the scene of an emergency with the most cutting edge equipment and techniques available to save a life. The number one challenge that the EMS responders face upon arrival to an emergency scene is the time that has already passed. For the victims that have succumb to sudden cardiac arrest (SCA), the window between life and death is very short. All too often, EMS responders arrive on scene of a victim in SCA and find that bystanders are not providing cardiopulmonary resuscitation (CPR). The reasons bystanders are reluctant to provide CPR are numerous and typically relate back to recognition, knowledge, and training.

When CPR is delayed until the arrival of EMS responders, the victims chances of survival is greatly reduced and the chance the victim will survive with a "quality of life" is often minimal to none. If communities can increase the amount of citizens with abilities to recognize, respond to, and provide lifesavings skills such as CPR then victims of SCA will likely have an increased chance of survivability with quality of life. A likely place to provide citizens with recognition, knowledge, and training of CPR is within the communities educational system. It is also likely that if this information is provided at the primary and secondary education levels, over time a whole community could be educated on SCA and how they can assist a victim during an event.

The research problem is that the Castle Rock Fire and Rescue Department (CRFD) and the Town of Castle Rock have not taken the opportunity to engage local primary and secondary educational schools in providing awareness and training on SCA events in an effort to increase the number of SCA victims that survive with quality of life. Therefore, the purpose of this project is to work with local primary and secondary educational schools in developing a CPR training program that can be added to the current curriculum, at the appropriate levels, in an effort to increase the number of SCA victims that survive with quality of life within the Town of Castle Rock.

Using the Action Research Method (National Fire Academy [NFA], 2010), the community of Castle Rock will potentially be able to have more citizens who are able to perform the lifesaving technique of CPR. Specifically, the research will answer the following questions: a) How are other fire departments working with their primary and secondary schools relative to CPR training?, b) What are the primary and secondary schools currently doing to educate students on SCA events and CPR?, c) What organizations and programs could work with CRFD in having CPR training programs in schools?, d) What are the characteristics and details of a CPR training program best suited for the primary and secondary schools within the Town of Castle Rock?, e) What is the cost associated with implementing a CPR training program in a school?

Background and Significance

The CRFD is an all-hazards response department for the Town of Castle Rock and Castle Rock Fire Protection District. The response area covered is seventy-five square miles within the central Douglas County in the state of Colorado. The Town of Castle Rock is located between Denver and Colorado springs along the Interstate 25. As of January 2012, the estimated population of the Town of Castle Rock is 50,028 (Town of Castle Rock, 2012). The Town of Castle Rock is considered a bedroom community that has often been a location for young to middle-aged families. Recently the area has seen an increase of retirement population likely related to the middle-aged citizens moving their parents near them to assist them as they age. In 2012, the Town of Castle Rock was ranked number seventeen out of one hundred of the "best places to live" by CNN Money Magazine ("CNN Money," 2012).

As a combination fire department seventy-eight personnel are full-time paid. Sixty-six of the personnel are line staff assigned to responding to calls for service out of four fire stations on three different shifts. The CRFD responded to over 4,300 calls for services during the 2012-year. This call volume is an increase of over 300 calls from the 2011-year. The department has seen a trending increase in calls for service since its first career staff joined the department in 1997. Like most fire departments, the majority of calls for service are emergency medical services (EMS) related at 63%. Fires, alarms, hazardous materials, and all other hazards represent the remaining 37%. In 2012, the CRFD responded to 39 SCA events with less than 30 percent of the victims receiving bystander provided CPR and near 40 percent surviving the event with a quality of life (FireManager, 2013).

The CRFD requires that all personnel are medically trained at a minimum of emergency medical technician (EMT) and with a tiered response system every call for service will have a paramedic on scene to perform advanced life support (ALS). Ambulance transport is provided by CRFD as the sole provider for the Town of Castle Rock. Each piece of apparatus out of every station is paramedic equipped and staffed. The department maintains arrivals to calls within 7 minutes and 30 seconds 80% of the time. Dispatch for CRFD is provided through the Douglas County Sheriff's Office (DCSO) and the Public Safety Answering Point (PSAP) for the Town of Castle Rock is routed through the Castle Rock Police Department (CRPD) dispatch. The DCSO dispatch center is equipped to provide callers with pre-arrival medical instructions through emergency medical dispatchers (EMD). For transport considerations the CRFD has a Level III

Trauma center located within 10 minutes of the northern boundary and in the near future will have a community hospital located in the Town of Castle Rock.

Within the CRFD, the organization has taken a direct approach to patient care through a robust and extensive performance improvement program (PIP). The program was developed by the CRFD's medical direction oversight, Sky Ridge Medical Center a Health One facility, at the direction of the fire chief. The PIP provides a peer review process for 100% of EMS calls ran by the department. The review process is not only objective through protocol adherence, but also subjective through the eyes of the reviewer. The process also involves a tiered approach where medical direction can weigh in on the subjective thought processes of the reviewer during monthly PIP team meetings. Further, the provider is continually part of the process through direct contact with the reviewer and medical direction as needed. The PIP provides opportunity for the improvement of patient care at any level from dispatch to hospital admittance.

It is well known that CPR is a lifesaving technique. With CPR a victim of SCA can have increased survivability rates of two to three times of those without. The CRFD has been fortunate in the departments SCA success rate, which at 40 percent can be compared to those national leaders such as Seattle, Washington. With SCA events, the challenge is supplying the brain with oxygenated blood in a short period of time, within 4-8 minutes depending on the study used. The CRFD has good response times, but is still challenged with arriving at a patient's side within 8 minutes. Further, many SCA events are dispatched to CRFD with the dispatcher advising that bystander CPR is being refused. Since the CRFD cannot be at every SCA event to provide the lifesaving technique of CPR in less than 8 minutes, it makes sense that teaching CPR to those who maybe witness to a SCA event be the focus.

Currently, the CRFD has a community CPR program that it provides by request. This translates into less than 100 people being certified in CPR a year at the direction of the CRFD. While this is a great benefit to the community, the number is too low to make a recognizable impact when the community suffers a SCA event. Studies have shown that school children can achieve high levels of CPR skills in very short periods of time. The Town of Castle Rock has two middle schools, two high schools, almost a dozen elementary schools, and other alternative educational schooling avenues. This presents an opportunity for the CRFD to work directly with the educational system to teach students the skills of CPR and how to respond to a SCA event while providing a trickle down effect of CPR education that will ultimately make the community a safer place to live.

The CRFD and Town of Castle Rock have set very high expectations as evident in the vision, mission, and values of the organization. The Towns vision statement includes a provision for "outstanding community services" (Town of Castle Rock, 2012), a mission to "achieve the vision through excellence, dedication, and service" (Town of Castle Rock, 2012), and values that include "exceptional public service" (Town of Castle Rock, 2012). The CRFD's vision statement is, "To be the best at providing emergency and prevention services" ("CRFD Vision," 2008), and the mission statement is, "High customer satisfaction through quality preparation and excellent service" ("CRFD Vision," 2008). The department's values are "strength, honor, integrity, excellence, leadership, dedication, and service", which forms acronym "S.H.I.E.L.D.S' ("CRFD Vision," 2008). It can be seen that these organizational beliefs do not support losing even one victim to SCA. Therefore, it is important for the Town of Castle Rock and the CRFD to work directly with the community and develop an ongoing program that can increase the

likelihood that a victim of SCA will receive the lifesaving technique of CPR prior to arrival of EMS.

One of the goals of the Executive Analysis of Community Risk Reduction (EACRR) course is to provide students with a guide on reducing risk within their community. The researcher will be able to utilize the Community Risk-Reduction Model to guide the research process of educating school children in the Town of Castle Rock on SCA and CPR. By following the step-by-step process of the model (development, assessment, intervention strategies, implementation, and evaluation) the researcher will be able to provide for a safer community (EACRR, 2012). Further, by using the Action Research Method (Applied Research Self-Study Guide, 2010), this research will determine the best plan of developing a CPR program with the DCSD. Lastly, one of the United States Fire Administration (USFA) Strategic Plan goals is to "reduce risk at the local level through prevention and mitigation" (USFA Strategic Plan, 2010, p.13). By researching this process of SCA awareness the CRFD and Town of Castle Rock will be actively reducing the risk of the community through a mitigation process.

Literature Review

With SCA being the number one cause of death in the United States, it can be understood why figuring out a way to prevent or mitigate the problem is needed (American Heart Association [AHA], 2011, p. 2). Every year, over 380,000 SCA events occur in the pre-hospital setting. Most of these events are occurring in the work place, crowded public locations, and most often at home. Unfortunately, when an SCA event does occur only about 20-30 percent of the victims will receive bystander CPR. This translates into less than 10 percent survival of the victims of SCA events ("CPR," 2011).

SCA is a life-changing event that is caused when the ventricles of the heart cease to beat in the rhythmic fashion that they normally do. This will in turn cause the blood output to become minimal or even cease to exist. The person experiencing the SCA event may or may not have organized electrical impulses being generated in the heart. Over a period of 4 to 6 minutes after SCA, the brain cells of a person begin to die from lack of oxygen and sugar. If left untreated, the person whom has experienced SCA will go through three phases and ultimately end with death. Electrical is the first phase and is typically seen for up to four minutes after SCA. In the electrical phase there is still a supply of oxygen and sugar. Although the heart is not pumping on its own CPR is the most effective in this phase and artificially pumps the sugar and oxygen through the body. Circulatory is the second phase and is typically happening after 4 minutes and up to 10 minutes. During this phase the blood is now lacking oxygen and sugar and acid is starting to produce. CPR in this phase is extremely important due to the need to exchange oxygen and glucose so the heart can be revived. The third and final phase is metabolic. During the metabolic phase, after 10 minutes, the buildup of acid has become to great to correct and the cells die. While CPR maybe helpful in the metabolic phase, the chances of recovery and a quality of life for a patient suffering an SCA event after 10 minutes of no treatment are minimal (Mistovich, Karren, Werman, & Hafen, 2010, p. 508-509).

Most pre-hospital systems are seeing response times averaging in the 5-8 minute area (Waseem, 2011, para. 1). With these types of response times it can easily be seen why bystander intervention in the form of CPR is a critical piece of survival in SCA. The American Heart Association has been educating responder, professional and layperson alike, on the term chain of survival. This term is used to help people remember the steps needed to improve chances of survival in situations such as SCA (Griesser & Boyle, 2010, p. 7). The phases are: recognition of

a SCA event and activation of emergency response, CPR, defibrillation, advanced life support, and post-arrest care and treatment ("Chain," 2013). Bystanders play a pivotal role in the early stages of SCA events. Without recognition of the event and activation of the emergency response the events time clock would never stop ticking and death of the SCA victim would be immanent. There has been a big push to educate the public on heart attacks and recognition of emergencies related to the cardiovascular system over the past decade. This, along with the ease of communicating with emergency response through 911, has given bystanders the tools and education to complete the first phase in the chain of survival. However, recognition and activation are not enough when it comes to the SCA victim. The chain of survival needs the bystander to continue the active response of CPR and defibrillation, if available, to increase the likelihood of survival (Bergmann, 2013).

The question is, why don't bystanders react and continue the chain of survival if so much information if available to support it. Most often bystanders report that they feel panicked, not educated on the proper way to do CPR, have a fear that they may cause increased or further harm, and/or feel that there might be legal challenges related if something goes wrong (Burdick, Panczyk, & Bobrow, 2012, p. 53). These fears and concerns are all valid and bystanders thrown into a SCA event are challenge both emotionally and physically. Changing the way bystanders look at a SCA event is the first step in creating a society where a person can feel more comfortable performing CPR and continuing the chain of survival in a SCA event. To do this, society must be trained to react.

So where does change start? There are many areas where change can be influenced and mitigation of the problem begun. This should start with a deeper look at the chain of survival. Recognition is an area that is receiving lots of attention and has many people reacting to a SCA

event in the form of calling for emergency response, 911. Although bystanders are recognizing a problem, they are sometimes challenged in recognizing the need for further action other than calling 911. In SCA events, the victims may not always present with absent respirations but more of abnormal or agonal breathing pattern (Burdick et al., 2012, p. 52). This can confuse bystanders and cause them to delay further interventions. One way this confusion is being combated is through more aggressive campaigns such as "hands-only CPR" and providing CPR when bystanders witness an adult collapse after activating emergency response (Muldoon, 2013, para. 14-16). Another active way for a community to be involved with increasing bystander CPR is through dispatcher assistance. Bystanders know that calling 911 is the way they reach emergency services. This is taught at a very young age and there are many documented cases where children, young and older, have contacted 911 when they have witnessed an adult collapse or become unresponsive. Dispatchers can be a continued benefit to bystanders by providing them with pre-arrival instructions such as how to recognize a victim in SCA and how to perform CPR prior to the arrival emergency services. This provides the opportunity for bystanders to continue the chain of survival in a SCA event and increase the likelihood of victim survival with quality of life (Burdick et al., 2012, p. 53). Campaigns such as hands-only CPR and dispatcher pre-arrival instructions are good ways to help improve survivability is SCA, but is it enough? Hands-only CPR campaigns might help with a bystander's fear of performing the action of CPR, but will it alleviate the panic or legal responsibility they feel? Dispatchers are able to correctly provide pre-arrival CPR instructions to a bystander, but does this take away the fear of hurting the victim in SCA? The challenge is to look at deeper ways to mitigate the fears and concerns that bystanders feel when faced with having to perform CPR on a SCA victim. The idea that

needs to be embraced is that of "building a generation of lifesavers" giving them the tools to react without the fears and concerns (Crowley, 2012, para. 5).

To build a new generation of lifesavers, organizations need to look outside of the proverbial box and consider new approaches. Over the past few decades emergency services have focused their CPR training and education on the community in general. This has lead organizations to put together CPR training opportunities that are provided on an as needed basis or at other times during mass community events. The problem with this type of approach is that it doesn't have sustainability or even may not directly affect a specific group of people every time the opportunity is provided. This approach, while necessary, is often leaving gaps and holes in the overall goal of educating and training a community (Struck, 2013).

In an effort to close those gaps, a change needs to be made to introduce lifesaving skills and education to a specific group at specific times. To affect change with specific groups at specific times it has been recommended that CPR be incorporated into schools and developed into the curriculum that children and young adults learn (American Heart Association [AHA], 2001, para. 15). In the primary and secondary educational schools children have certain set curriculum that is followed. This is typically overseen by the state. Even if children aren't involved in the traditional schooling system, they are typically held to the same standards and teaching requirements of the traditional school system. Schools come in different shapes and sizes, but the one thing that is specific is that most children, in the United States, attend primary and secondary educational schools. This provides a specific group of people that can be influenced to become the next generation of lifesavers. Children are inherently adept to retaining knowledge and skills, especially those that are reinforced over a period of time. Furthermore, the long-term effects of teaching school aged children is that they continue to produce a force of

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bystanders that will be more skilled, educated, and therefore willing to provide needed lifesaving skills to those victims that may be experiencing a SCA event (AHA, 2011, p. 2).

It has been shown, that by teaching school aged children about SCA and CPR there is an inherent increase in bystander awareness and ability. The potential impacts of these types of programs have both short and long-term effects. Short-term effects include a confidence boost for bystanders to perform CPR and an increased knowledge of the skills performance of CPR. A recent study was completed that surveyed students in a New Mexico middle school. The findings showed that, as a group, the students felt they had a higher level in confidence to provide CPR after being taught the necessary skills. The group also showed a marked increase in their ability to correctly answer written test questions on the specific ways CPR is performed. The questions included information on hand placement, compression rates, and assisting choking victims (Bearce, 2013, p. 28-29). A long-term study completed in the United Kingdom found that school aged children, between the ages of 10-11 years old, were capable of performing effective CPR 2 months after initial training (Hill et al, 2009, p. 96). In another long-term study completed in Denmark, it was found that children between the ages of 12-14 years old underperformed in comparison to adult's ages 22-51 years old 3 months after initial training. However, in this study the children performed significantly better than the adults in the total amount of compressions given over the test period. Further, the children also outperformed the adults in how much overall time they spent giving compressions during the test period. The study also states that although the children "did not perform as well as adults, the hope is that school taught CPR will further prepare the children for subsequent lifesaving skills" (Isbye et al, 2007, p. 299-301). Both the short and long-term studies described above show positive support for teaching school aged children about SCA and the skills to perform CPR. This also supports

the overall goal of increasing the amount of bystanders in any given community that are trained and willing to perform lifesaving measures when the opportunity to do so arises.

While the skill of CPR has been defined and the acceptance of an appropriate way to perform the skill has been agreed upon, the delivery of said skills can be provided through a variety of ways depending on depth of knowledge and skills ability. The American Heart Association (AHA) has recognized a need for community CPR and a call for bystanders to react when faced with an emergency situation. As part of the AHA evolvement, the organization has developed a tiered approach to community CPR education and psychomotor skills development (AHA, 2011, p. 6). This approach includes development of "Hands-Only CPR" for bystanders. The hands-only approach endorses the two-step technique of "calling 911 and pushing hard and fast in the center of the chest until 911 arrives" ("CPR," 2011, para. 5). This technique can be taught in minutes to a layperson through the use of videos and manikins. The hands-only approach is the least time consuming and most cost effective approach to teaching CPR with the only out of pocket cost coming from reusable manikins, if providing skills practice is desired. Many foundations, such as the British Heart Foundation and Sudden Cardiac Arrest Foundation, have encouraged campaigns to assist communities in getting the message of hands-only CPR out. This type of program, while educational, does not require skills practice and does not test/certify the student. Another more detailed approach that the AHA offers is the "CPR Anytime". With this program the information can be taught in less than 2 hours, costs anywhere from \$11-25 per student, provides the opportunity for skills practice, and does not test/certify the student. The "CPR Anytime" incorporates the hands-only approach and adds additional skills and information to the program. A third approach would be the "Heartsaver CPR" program. This program is taught anywhere from 2-4 hours (depending on optional modules), costs anywhere from \$20-60

per student, provides skill practice, and tests/certifies the student (AHA, 2011, p. 6). From the hands-only CPR method through the Heartsaver CPR, the ability to build upon the knowledge of SCA and the skills of CPR in school aged children is possible.

It can be seen that providing a framework of teaching about SCA and CPR is important for the school aged child. Not providing too much information at one time will allow the child to absorb the information, process it's meaning, and give them a foundation to draw from as they proceed to add basic life saving skills to their abilities. Current evidence shows that lifesaving skills and knowledge should begin at an early age, as early as first grade. The information and skill ability should be age appropriate, regular reinforcement should be provided over time, and the complexity of training should be developed as the student develops in both knowledge and age (Plant et al, 2013, p.419). In a study published in Norway, the authors determined that lifetime first aid education was the key to seeing better results in children recognizing first aid as a "normal thing to do, not an extraordinary thing" (Bollig et al, 2009, p.691). Bollig et al (2009), suggested a four-step model of first aid education for the lifetime lifesaver. The first step is basic first aid, which would be provided to primary school children starting in the first grade and repeated once a year through age 10. Step two is "life support first aid", would include CPR and all "lifesaving first aid measures", and would be provided to children from age 10-15. The third step would include all that is in step two, would extend the first aid training to other situations not necessarily life threatening, and would be provided to those 15 and older. In the fourth step the student would repeat the third step on an every two-year basis to reinforce skills and knowledge. This tiered approach is not far from the AHA approach to gradually providing CPR knowledge and skills at age appropriate times to primary and secondary school aged children in the educational setting.

While recognizing the need for lifesaving skills and knowledge is one step, getting the information to matter is another step and often the more difficult one. When discussing educating children in school systems on SCA and CPR the state educational curriculums and legislation speak of its importance. Currently only six states make CPR skills practice mandatory for graduation from high school. Thirty of the United States refer to teaching CPR in the school system, but don't elaborate on the depth of knowledge or requirement of skill sets. The other fourteen states make no mention of CPR or any skills requirement necessary in the educational teaching of children about SCA or CPR (AHA, 2011, p. 9-10). This presents a challenge for both a uniform approach to providing education on SCA and the ability to build a generation of lifesavers.

Procedures

Action research was used to help develop sustainable CPR training to be used in the school system within the Town of Castle Rock. In order to answer the questions posed by this project, several steps were completed. The first step was to complete a literature review and determine what information currently exists regarding SCA, CPR training, and how that information can be used to answer the research questions for this project. The second step was to develop and distribute a survey to see what other fire and EMS departments are doing to provide for education on SCA and CPR within their schools. The third step was to meet with and interview local school district representation and determine what they are currently doing to educate on SCA and CPR and what they feel the need for this type of education is in their overall goals and objectives. The final step was to use the literature review, survey information, and interview findings to develop and determine costs for a CPR training program best suited for the local school district.

In the first step, the author began research by attending the EACRR course at the NFA in Emmitsburg, MD. An initial search for appropriate research information was obtained using the database in the Learning Resource Center (LRC), located on the NFA campus. Previously completed applied research projects (APR), articles, books, and other relevant information to the topic of study were researched. The terms "sudden cardiac arrest", "CPR in schools", and "CPR programs for children" were used to help guide the researcher to literature available. Further information was gained using deep web research search engines available on the online library at the American Public University school system website where the author has student access. The information was accessed at varying times during the research project beginning in January and ending in July of 2013.

Step one saw some minor limitations for the study on the research. The first limitation was that previously written ARP's were scarce and only one provided current information. Another limitation was that some SCA and CPR organizations have embraced the need for school access programs, but few have detailed information on how programs can be developed or what the costs of the programs would be in totality.

During the second step, a survey was completed by using the information from the literature review process to develop questions related to SCA and CPR training available in other school systems. These questions were then put into a questionnaire on SurveyMonkey.com. An email was drafted and sent to a number of different listserv, National Society of Executive Fire Officers (NSEFO), International Association of Fire Chiefs EMS Google group (IAFC EMS Google), National Emergency Management Association (NEMSMA), and Oklahoma State University Fire Protection and Safety Engineering Technology Graduates (OSU Grads) to request distribution of the survey to members of the organizations. Confirmation emails were obtained that showed the survey had been distributed to 838 NSEFO, 1200 IAFC EMS Google, 1000 NEMSMA, and 940 OSU Grads. SurveyMonkey.com was then used to collect, categorize, and analyze the survey information obtained. Of the almost 4,000 surveys sent out, 193 responded to the survey. Of those respondents 31 had interest in talking more about the program they had or were familiar with in their area. Of the 31, 18 provided information of the author to contact them directly. A follow-up questionnaire was developed and sent to the 18 respondents with 9 of them providing more detailed information on the programs they were familiar with. The emails with survey information and results can be viewed in Appendix A. The follow-up questionnaires that the 9 respondents provided more detailed information on are included in the results section, if applicable, and are not provided in raw format in this ARP, the actual questions asked are in Appendix B.

In step two, there are many limitations that provided challenges for obtaining currently used program information from others who have developed and implemented these programs. The first is the number of respondents versus the number of surveys sent out. With the number of surveys sent out being near 4,000 the 193 respondents is too small of a sample size to assure a confidence level on the information requested (NFA, 2010, p.37). A second limitation is that some of the respondents may have been answering questions on information that they did not have direct knowledge about. This creates a flow-of-information that may not be completely reliable. A third limitation to the survey research was that while the respondents with program information were able to provide some details of their program, only a few had documented specific details that could be provided to the author on the programs they had in place.

For step three, the author met with Douglas County School District representatives to gain information on what the school district is currently doing to educate on SCA and CPR and how the district feels about developing and implementing a program on SCA and CPR for the students they teach. The author was able to schedule and meet with Principal Terry Olsen from the Castle Rock Middle School and Director of Health Services for the school district Paulette Joswick. These interviews took place in their respective offices and information was obtained while following 5 questions the author developed prior to meeting with representatives. These questions were helpful in guiding the interviews, but were not inclusive of the information obtained. The questions used to guide the interviews are attached in Appendix C, answers to the questions are provided throughout the results.

During the interview step of the research project, the author recognized a few limitations. The first limitation was that the school district was near the end of the last semester of the year. With year-end approaching, it was difficult to obtain time to meet with and interview more representatives of the school district. Another limitation was that the representatives were limited with ability for implementation of any proposed information. Further, any proposed program development, that involved curriculum changes, would need to go through further review with other stakeholders including the board of educators before any implementation could be finalized. These limitations guided the author to develop a pilot program that would have less impact on the DCSD, as a whole, while still providing the opportunity for inclusion as a complete program if and/or when it is recognized as a benefit.

In the final step, all of the information gathered as described above was collected and analyzed. The information was then used to provide recommendations on the research questions. Finally, a detailed program was developed to help guide the development of a SCA awareness, CPR, automated external defibrillator (AED), and first aid program that is capable of being implemented in the DCSD. This process will be described in detail in the results, discussions, and recommendations.

Results

The literature review provided the author with information to begin to put together information on what a SCA and CPR program in schools would look like. The survey information received from the external survey did not yield a large number of respondents, however the information that was provided was useful in further developing and putting together the program information the research set out to address. While the personal interviews conducted with the DCSD were not many, the information obtained is helpful in answering the research questions of the research paper.

The first question of the research paper asks, how are other fire departments working with their primary and secondary schools relative to CPR training? Information on other CPR training programs of other fire departments and EMS organizations was solicited through an external survey (Appendix A). The first question of the survey showed that out of the 193 respondents that 106 (55%) did not provide CPR classes in schools leaving 87 (45%) with potential information about school CPR programs. Questions two and three of the survey provided some information about the requirements of the program that the 87 respondents shared they had in their schools. Here only 76 respondents answered whether their program was required of the student, with 32 (42%) stating the program was a requirement of the students. When the respondents were asked what governed the requirements, 37 showed that the state, local, school district, or other entity governed the requirement of the program.

Question four of the survey showed that 35 of the respondents had EMS services that were involved with the CPR programs in their schools. These 35 would be the best people to

find out more information from about the programs they were familiar with. Of those 35, 31 answered question number 5 asking for contact information to talk more about their program, but only 18 provided actual contact information. Of the 18 that provided contact information, the author sent a detailed set of questions (Appendix B) for further information on their program. With the 18 respondents provided with detailed questions the author received 9 responses back.

The 9 returned detailed responses were used to provide more information about CPR training programs that are working in schools currently. It was shown that most of the programs being used (7 of 9) were following an AHA curriculum (hands-only, Heartsaver, Friends and Family CPR) and the other two were using American Red Cross curriculum. Most of the programs (7 of the 9) were being delivered in the high school setting (freshman through senior), junior year being the most popular. Two of the programs focused in on middle school 7th and 8th graders and one had a program for both high school and elementary school 5th graders. For costs related to the programs, most showed anywhere from \$5-15 to help pay for the cost of issuing certification cards and most programs have worked with outside entities to help offset the costs with grants and other sources of funding. All of the programs share involvement of running the program with the schools being the lead and the EMS/fire organizations assisting with instructors or other needs that the programs have. Most of the programs showed their success by how many people were trained and one program provided information that showed their success was measured with their bystander CPR rates increasing from 5 to 25 percent in a two-year period (T. Jenkins, personal communications, April 8, 2013). None of the respondents were able to provide a detailed program layout or flow sheet that they or their respective schools followed to implement or maintain their program. Two of the programs provided useful information on the

design of the program and what other organizations/entities were used to assist in getting their respective programs going.

Question number two, what are schools currently doing to educate students on SCA and CPR? This question was answered through interviews with representatives of the DCSD. In an interview with Principal Olsen, he was able to comment on his school and what was being provided on SCA and CPR. Teaching students about SCA and CPR is not a requirement of their school curriculum. Castle Rock Middle School has in the past-taught students CPR and has manikins that were purchased years ago to help facilitate the process. Currently, teaching students about CPR is left up to the health teachers at their discretion. "The curriculum is so specific that it does not currently provide a place to have CPR training for the students" (T. Olson, personal communication, May 30, 2013).

Teaching CPR in the classrooms of DCSD is not something new. In the past, the district health services has worked with many different schools in the district to help provide CPR training to both middle school and high school kids in health and/or physical education classes. Currently, the only program based CPR classes that are being offered in the district are those associated with the districts student athletic trainer program. In this program, participating students are certified in CPR to meet the requirements of the program. No other specific CPR programs are currently being provided in the district (P. Joswick, personal communication, June 11, 2013).

Recently, the Rocky Heights Middle School worked in conjunction with the AHA to debut a video on hands-only CPR to kids at the school. The video is meant to show the ease of hands-only CPR and that performing CPR can save lives. The video comes to these after an incident where a student who experienced SCA at another area high school and revived by students who performed bystander CPR (P. Joswick, personal communication, June 11, 2013).

Question number three, what organizations and programs could work with the CRFD for CPR training in schools? Answers to this question were brought up in the survey results provided by the nine respondents of the follow-up survey see Appendix B. Most of the respondents stated they used the AHA curriculum to train the students in their respective programs. Four of the nine respondents listed AHA Heartsaver CPR as the curriculum they used, while three stated they used AHA curriculum with no specific course listed, and the other two documented that American Red Cross was curriculum used in their programs. Two of the respondents provided information on outside organizations that they work with the help administer their CPR programs.

The first is Project Heart Smart (PHS) and is a program designed to focus training on calling 911 and performing compression only CPR. This project has held trainings for large venues with future ideas to get involved with teaching children in schools (Bearce, 2013, p. 15). While the project is not a certification provided training, it does educate and provide skills training to the lay rescuer about CPR. The training is provided in approximately 30-40 minutes and uses manikins to practice the skills portion. Other than manikins, a facilitator, and some copied paperwork there is little cost to using this program. The video that the program is based on is free and downloadable on the project website (http://projectheartstartnm.org/default.aspx).

The second outside organization information provided was a program that was developed in the Adams County Denver Metro area called the Student Medical and Responder Training (SMART). This program was developed as a way for area fire and EMS agencies to work with schools in providing CPR education to students. The program revolved around the fire and EMS agencies certifying schoolteachers and administrators as CPR instructors and then having those instructors teach the children with assistance from the fire and EMS agencies. The program uses the AHA Heartsaver curriculum and has been successfully implemented in multiple Adams County School District locations. The program continues to grow with grants being provided by supporting agencies and organizations and has plans to expand to other counties, school districts, and agencies (D. Baldwin, personal communication, April 8, 2013).

Question number four, what are characteristics and details of a CPR training program best suited for schools in the Town of Castle Rock? This question was best answered by the literature review, survey results, and interviews. In the literature review, one recommendation that was made was a four-step program designed around making first aid and CPR a lifelong learning process. This process involves beginning teaching basic first aid, recognition, and calling for help in the first step, recommended for ages 6-10. In the second step, CPR is added and recommended for students age 10-15. The third step would add a more advanced approach to first aid and be provided to students above the age of 15. For step four, the process would be continually repeated every two years providing the student with reinforcement of the lifesaving skills and knowledge (Bollig et al, 2009, p.692). This age specified step process is based on developing a child over their life and provides the opportunity to increase the knowledge and skills of a child as they become more familiar and more comfortable with lifesaving tasks (Plant et al, 2013, p.419).

Hands-only CPR is fast becoming a recognized way to teach anyone to perform CPR in a SCA situation. This campaign is a great way to get young kids involved with understanding a lifesaving technique and also laying a foundation for continuing the framework of knowledge and skills to build a normal responsive behavior during a SCA event. Group directed video

based CPR programs can be taught in as little as 20-30 minutes and have been shown to produce acceptable levels of proficiency for adult CPR in the school aged child (AHA, 2011, p. 6). This type of approach is a great way to introduce school children to CPR and increase the likelihood that they will initiate the time critical skill of CPR during a SCA event.

As the school aged child grows, so can the information and skill ability. According to the AHA (2011), a certification class that teaches adult/child/infant CPR, adult/child/infant choking, and adult/child AED use can be taught in as little as four hours (p. 6). This would be dependent on the use of a certified instructor. Furthermore, the required ratio of 1 instructor to 6 students would need to be maintained so that thorough skills evaluation and testing are accomplished correctly. All of the programs that the author received information about in the survey results were programs that certified the students during the course of the training and the certifications were either provided through AHA or the American Red Cross.

When discussing program details with DCSD representatives, the common concern was a time issue. "While four hours isn't a huge time commitment the challenge would be to get the get the time committed to the curriculum in the right place" (P. Joswick, personal communication, June 11, 2013). "After school activities are a way for a school to introduce information that is not directly related to the curriculum and they typically see high levels of student involvement" (T. Olson, personal communication, May 30, 2013). Another concern was programs ability for sustainability. When discussing sustainability with Health Services Director Joswick (2013), her thoughts pointed toward using the program to help CPR train and educate more of the staff and teachers along with the children. Currently, the school district does not require CPR certification for every staff member or teacher. A program that addresses multiple

needs would be more beneficial to a school district and therefore have more ability to sustain over time.

Question number five, what would be the costs of a CPR training program in a school? Costs associated with a school CPR program were best answered through the literature and some of the information provided in the survey analysis. In reviewing the survey information, most of the organizations that are working with their schools to provide a CPR program are doing so at the cost of certification cards and/or teaching materials. This was shown in a range of \$5-15 depending on the program and if they were covering the cost of the certification and/or the cost of teaching materials. In the Natick Massachusetts Fire Department, the anticipated need for a school year CPR program that would be taught by outside instructors and certify over 700 students would be \$20,000 (J. Sheridan, personal communication, February 21, 2013). This breakdown would be approximately \$28 per student and would be a fully funded program generating a significant number of CPR trained students each year. Most of this amount would be used to pay the outside instructors an hourly wage to provide the student instruction. According the AHA (2011), the needed funding for school-administered program would cost approximately \$27 per student (p. 6). This would be based on a certification course and would be taught in-house using a portion of the per student cost to train teacher or administrator instructors. Further information provided in the literature review shows that most school sanctioned CPR training relies on funding from outside resources and requires collaboration of private/public entities to support the programs (AHA, 2011, p. 7).

The results of this combined information has produced a program overview for CPR and AED training in the primary and secondary schools of the Town of Castle Rock see Appendix D. The written program is a guideline to help implement a CPR/AED and/or first aid training

program into the primary or secondary educational facility. This program provides step-learning principles that can be built upon as a child develops from the primary educational level into the secondary school. The program also outlines implementation information as well as roles and responsibilities of both the school district and fire department. This program is designed to be implemented as a pilot within single schools at different ages to determine the best practices and changes needed to roll the program out as a district wide model.

Discussion

Based on the information that has been gathered in this research paper, bystander CPR in SCA events is considered to be a piece of the puzzle to patient survival and quality of life. This coupled with the need for early recognition of life threatening events and calling for EMS to respond to the event are two of the five links in the chain of survival of SCA. More importantly, these first couple of links in the chain of survival are the most critical and time sensitive needs during a SCA event (Griesser & Boyle, 2010, p. 7). As EMS providers prepare to respond with the most up to date knowledge and cutting edge equipment to continue the links in the chain of survival, they are often caught behind the proverbial eight ball due to lack of bystander CPR. With bystanders providing CPR to victims of SCA events at a rate of less than 30 percent, the chances of survival in the out of hospital cases are less than 10 percent. This number can easily be increased two or three times if bystanders take action and are trained in CPR (Crowley, 2012).

In communities where bystander CPR rates are higher the improvements of SCA survival are also higher. Therefore, using the approach to teach more people CPR shows that SCA survival will also increase survivability (Struck, 2013). This information translated into finding a population that would make the most impact on a community by learning CPR. Compliance with children attending primary school is well over 95 percent, while attendance of secondary education is in excess of 75 percent. Therefore schools provide greater opportunity to reach a large portion of a community and in turn provide a trickle-down effect of CPR training to that community over time (AHA, 2011, p. 3).

Other positive affects of teaching CPR in schools is that children are already in the learning environment. They are likely to be around in a situation where a SCA event occurs in their lifetime. Learning CPR can be a useful tool as a child grows and begins to seek employment or other group related activities. Being able to respond to a situation such as SCA with CPR can decrease a persons feeling of guilt from not helping, therefore increasing their overall self-esteem. Most importantly, children are great educators and their exposure to lifesaving knowledge is likely to reach friends and family that do not or have not had exposure to CPR and peak their interests as well (Plant et al, 2013, p.416).

The first question of this research project was to determine how other departments are working with their schools in regards to CPR training. Many agencies, over 50 percent of the respondents, reported that their schools are not participating in a CPR training program of any type. More surprisingly, in the schools that did have CPR programs less than 47 percent had involvement from the fire/EMS agency in administration of the program ((Butts, 2013, figure 1). Although the author was not able to find many agencies that participated in a school CPR training program, two agencies were able to provide information on the programs that they used or had involvement with. Both the Project Heart Start and SMART program were informational in providing tips on the development of a school CPR program in the Town of Castle Rock.

When the author interviewed DCSD representatives to determine what the school district was currently doing to educate students on CPR the results were interesting. In the past, some of the schools themselves had taken on the task of providing a CPR program that entailed them

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purchasing manikins and training materials for the students. These programs were and still are administered at the discretion of the health and/or physical education teacher. Some of the schools have had the training being discontinued due to other curriculum needs and testing requirements (T. Olson, personal communication, May 30, 2013). Other than the sporadic training that is being provided by those motivated teachers the only other school program that exists is within the athletic trainer program. This information shows that both the need and commitment to a sustainable program within the schools and the district is possible and should be further investigated to help build a safer community.

As the information on organizations and programs that could be worked with on a school CPR program was investigated and analyzed, it was determined that the AHA has a strong presence in regards to CPR training curriculum in schools. In fact, 7 of the 9 survey respondents showed that they use a form of AHA curriculum in their respective school program. In 2011, the AHA published a study that showed the importance of CPR and AED training in schools. This study outlined not only why CPR training is important in schools, but also how their training curriculum could be specifically tailored to fit within school curriculum (AHA, 2011). The AHA also promotes the hands-only CPR training that can be used to build the foundation of school children as they learn the lifesaving skill of CPR and can be done with minimal cost to developing the program ("CPR," 2011, para. 5). This program, along with the others (Heartsaver, Friends and Family CPR, and CPR Anytime) AHA promotes, can all be tailored to work within the school setting. Other entities, such as American Red Cross and Project Heart Start, are organizations that can help with developing programs to be used to educate and train students in the school setting. Although the AHA has been shown as a leader in the field of school based CPR curriculums, it is incumbent upon any newly developing program to talk with

and learn more about other organizations and entities that may be willing to assist with and provide information and resources to foster building of the program.

Costs associated with developing and implementing a CPR program in a school is not easily defined. The information that was provided through the survey results show that, of the programs that information was provided on, they were all providing the CPR training to the schools at a small fraction of the cost of the training. Most all respondents stated that they were charging between \$5-15 to cover the certification card costs and/or a materials fee. With the equipment needed to perform the training costing hundreds, if not thousands, of dollars the costs are much higher. Another consideration for cost is that of the instructor(s) needed to teach the class. Whether these instructors are provided from a fire/EMS agency or are the teachers/administrators of the school their time must be figured into the equation. Information provided by the AHA (2011), shows that costs associated with a Heartsaver CPR training curriculum provided in the school the cost would be approximately \$27 per student and would cover all costs associated with the training including equipment and instructors (p. 6). Respectively, the Natick Massachusetts Fire Department has shown that they can produce a similar CPR training for \$28 a student (J. Sheridan, personal communication, February 21, 2013). When considering the implementation of program, such as CPR training in schools, the costs of such an endeavor must be weighed heavily against the outcomes.

To develop a CPR training program that can be used in the schools in the Town of Castle Rock many pieces of a large puzzle must be brought together to make the picture clearly visible. To begin with, it must be understood why the program is needed and what the goals to be accomplished will be. Next, details of the program should be provided and avenues for change and addition/subtraction should be given so that the plan has more flexibility and less rigidity.

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The implementation of the program should be clearly identified and challenges must be anticipated and prepared for. Showing the areas of responsibility within the program can help guide the participating entities and give support where needed. The last piece of the program should show the expected outcomes to the program and bring all pieces of the program together.

Recommendations

SCA in the out of hospital setting typically results in death of the person experiencing the event. Bystander CPR during a SCA event is critical in the chain of survival, but is often times not done. EMS and fire departments are doing everything they can to provide the last three links in the chain of survival (rapid defibrillation, advanced life support, post arrest care). With these challenges recognized, a plan must be formulated to join the links of the chain of survival so that each piece is given the greatest opportunity. These recommendations will have a direct impact on people within our community suffering from a SCA event. The idea is to fill the gap between activating EMS and EMS arrival to the scene with bystander CPR. The described recommendations have been developed with the intent to maximize the rates of bystander CPR in the Town of Castle Rock, therefore increasing overall community safety. These recommendations can be useful information for helping other communities develop and implement school CPR programs.

The first recommendation is that the program overview on *CPR and AED Training in the Primary and Secondary Schools* (Appendix D) be presented to DCSD representatives. Although the ideas and thoughts of the program have been provided verbally, the written word will provide the representatives the time to process and review the program. This will give representatives of the DCSD a chance to provide any currently un-provided ideas/thoughts and seek ideas/thoughts from other representatives if needed. Having a written document will also give the representatives the chance to get support for the program at the administrative level since many times approval at a more senior level is required. Since this program will initially be done on a pilot project level the actual challenges that face the program may not be realized until the program is underway.

The second recommendation is that the DCSD representatives and the CRFD begin to work on meeting with current curriculum providers, namely the AHA and American Red Cross, to determine which curriculum would be best suited for this program. The idea is for the CRFD to bring the curriculum providers to the school district representatives and begin a conversation of what each curriculum will require and to match the best one to this program. This will include discussions about equipment such as manikins, AED trainers, and first aid supplies. At this time, costs of the programs will be discussed so that both the DCSD and CRFD have a solid idea of what the program will need to be funded with prior to implementing the program.

The third recommendation will be for the CRFD to work with the DCSD on seeking support for the program as a pilot project. This support may be in the form of funding to help with, or completely offset, the costs of the program. These funds may be donations, grants, or other funding that is recognized as being inline with both the needs of the program and that of the CRFD and DCSD. The support may also come in the form providing equipment, materials, or instruction needed for the program. The DCSD currently has some of the equipment and possibly materials to begin the program with and this will have to be completely evaluated prior to the implementation of the program.

The fourth recommendation is that the DCSD implement the program as a pilot project. This implementation is currently being recommended to begin at the elementary (higher level grade 5^{th} or 6^{th}), middle (7^{th} or 8^{th}), and high school (any grade level). This will provide an

opportunity for the programs tiered level training to be evaluated. It will further provide information on the challenges and obstacles that may be present at the different learning stages of child, teen, and young adulthood. Furthermore, doing a pilot program at different levels will provide a support to the program in the future when it is fully disseminated throughout the school district.

The last recommendation is that the implemented program be evaluated at all levels. This will include the ability for the program to work and be sustainable in the school district as full program and not just a pilot program. It should also include the challenges and crossroads the program was meet with and how those were handled and what can be done to avoid them as the program is further developed. An important area to evaluate will be the programs success. This can be measured with students taught, success stories from students, and/or an increase in the amount of bystander CPR during SCA events within the community. This evaluation phase may lead to district implementation of a curriculum-training requirement on CPR for students working toward graduation. If the success of the program is big enough, it may drive a state mandated bill to recognize CPR training for students as a requirement and identify funding to support the program.

SCA events are inevitable and CPR provided by bystanders is a pivotal piece of survivability with quality of life. The idea that we can increase the amount of bystander CPR with a passive approach of recommending that people become CPR trained is not realistic. The chain of survival relies on recognition and reaction of people in the community along with response and dedication from the fire and EMS profession. We must work together to make our communities a place to want to be, a safer place. The time to develop a new generation of lifesavers is upon us and must be embraced.

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Sent: Friday, February 15, 2013 4:01 PM To:

Fellow Professionals,

My name is Jason Butts and I am a Lieutenant/Paramedic with the Castle Rock Fire and Rescue Department in Colorado. I am currently enrolled as a second year candidate at the National Fire Academy's Executive Fire Officer Program (EFOP). As an EFOP candidate, I am completing an applied research project. My chosen subject is on sudden cardiac arrest (SCA) and teaching cardiopulmonary resuscitation (CPR) in primary/secondary schools. As part of my research, I am looking to obtain information on how other organizations are working with their schools in educating students about SCA and CPR. It would be greatly appreciated if you could assist me in completing the attached survey by March 15th, 2013. The survey is very short and will take less than a couple minutes of your time. The survey can be accessed through the following link:

https://www.surveymonkey.com/s/CTFS3CY

Thank you for your time and help with this project. If you should have any questions please contact me at the **second second sec**

Thank you, Jason Jason Butts, EMT-P, Lieutenant Castle Rock Fire and Rescue 300 Perry St. Castle Rock, CO. 80104 303-660-1066

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CPR in Primary and Secondary Schools

Q1. Do your elementary, middle, and/or high schools provide cardiopulmonary resuscitation (CPR) classes to students?

Answer Options	Response Percent	Response Count
Yes	45.1%	87
No (selecting this choice will end the survey. Thank you for		
your time)	54.9%	106
	answered	
	question	193
	skipped	
	question	0

Q2. Is the CPR training that is provided a requirement of the students?

Response	Response
Percent	Count
42.1%	32
57.9%	44
answered	
question	76
skipped	
question	117
	Response Percent 42.1% 57.9% answered question skipped question

Q3. If the training is a requirement, do you know what entity requires the training?

	Response	Response
Answer Options	Percent	Count
No requirement	41.1%	23
School/District requirement	41.1%	23
Local requirement	3.6%	2
State requirement	10.7%	6
Other (please specify)	12.5%	7
	answered question skipped	56
	question	137

Q4. Does your department (Fire, EMS, Health, etc) participate in the CPR training that is provided in the educational facilities?

Answer Options	Response Percent	Response Count
Yes	46.7%	35
No	53.3% answered	40
	question skipped	75
	question	118

Q5. If your department participates in CPR training in educational facilities and you would be willing to share your program information, please provide your name and email address in the comment box. Thank you for taking the time to complete this survey!

Answer Options	Response Count
	31
answered question	31
skipped question	162

Appendix B

Sent: Saturday, April 06, 2013 10:57 AM



Attachments:

Follow up questions to CP~1.docx (101 KB)[Open as Web Page] Fellow Professionals,

I am writing to you to both thank you for your time and support with completing the survey on sudden cardiac arrest (SCA)/CPR and to request further information on the programs that you have going within your communities. Below is a list of questions that will help me with how your community is addressing CPR in the school system and how this can be implemented within my community. The intent behind this project is to not only show the support for CPR and awareness about SCA in your community, but also how any community can implement a program that educates people on how they can help other people. If you don't mind taking a few minutes to answer the questions and send me an email back that would be very appreciated. I am also attaching a copy of the same questions in a word document if that is easier for you to fill out and send back. Lastly, if you have any material that would be helpful, please let me know how I can best receive that from you. Thank you for your time and I look forward to hearing from you.

Respectfully,

Jason

Jason Butts, EMT-P, Lieutenant Castle Rock Fire and Rescue 300 Perry St. Castle Rock, CO. 80104 303-660-1066 jbutts@crgov.com

Follow-up Questions to Departments with CPR Programs

1.) What CPR program is currently being used in the schools in your area (AHA, American Red Cross, StudentCPR.com, or other program-please provide details)?

2.) What grade level is the program being used for and have other grade levels been considered?

3.) How much does the program cost (per student, per class, per year, any information about cost is useful)?

4.) Who runs the program and what is your department's involvement (details about instructors and program directorship would be helpful)?

5.) Is the program successful and how is this success measured?

6.) What other information about the program can you provide that you have found to be important?

7.) Do you have a program curriculum, paperwork, fliers, or other written documentation that you could provide to help develop a similar program in my community, if so could you please send it to me?

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Respondents to Follow-up Questionnaire

Questions #1

#1. We use the AHA Heartsaver AED program. Sometimes we also add the First Aid component if the instructor desires and time allows.
#2. AHA - to train coaches and school personnel
American Red Cross - student course for Sophomores- Senior students* Be Red Cross Ready High School Program
#3. AHA program
#4. AHA hands only
#5. AHA Healthcare Provider CPR/AED: Nursing Students, Fire Students, Law Enforcement Students. AHA Heartsaver CPR/AED: Cosmetology, Early Childhood Education
#6. AHA Heartsaver
#7. Both our school and community CPR are AHA
#8. American Red Cross
#9. AHA

Question #2

#1. Currently, we do this as part of the Health class that is offered to the Juniors and Seniors. We have not considered any grades lower than this at this time.

- #2. HS Sophomore-Senior, seniors have first chance. We offer one class each semester.
- #3. 5th Grade and high school health classes
- #4. We are targeting the 8th grade as they have size and ability to re-teach.
- #5. High School Juniors and Seniors
- #6. 7th grade health, high school(graduation requirement)
- #7. Junior year of HS.
- #8. Currently, 10th grade. It will eventually be offered to other grades
- #9. Freshman and Junior in HS

Question #3

#1. We have a fixed rate with the schools that has been in place for years of \$7. That cost just covers the processing of their certification cards. We absorb the cost of the instructor and materials. Kids do not keep the books, but have them available for the class.

#2. The Red Cross program for HS students is free, we get a grant from the Red Cross - they give us all the supplies for free - first aid and lungs for the manikins. We received free manikins as well. AHA - we purchased all the equipment and lungs etc. for the class - we charge each participate \$ 5.00 for the card if they are a school employee - the district picks up the remaining coast.We offer this class in the summer to non-school district employees as well 0- cost goes up to \$35.00. We have not had to replace much yet..... except the video - school district provided that.

#3. We use on-duty firefighters and haven't incurred significant cost.

#4. We are currently budgeting for the basic mannequins to be given to each student so they can re-teach. We have formed partnerships with local hospitals to help fund the program

#5. offers the course free of charge, SY 2013/14 cost will be \$10/student

#6. The only cost to the student is if they want a card (around \$5.50), Manikins and teaching materials were purchased through grants, The schools need to budget for replacement equipment, The teachers need in-service time to get certification, The district should budget for in-service time every two years

#7. \$ 20 / person for the Community Program. \$ 15 for the student

#8. I am unsure of the cost.

#9. Costs absorbed by a grant

Question #4

#1. The schools coordinate with us to set these up. We run the actual class, but it is part of their Health classes. Our instructors just teach the CPR/AED/First Aid components and their teachers can help or interject as needed.

#2. School nurse – district, Teacher that is also a licensed Athletic Trainer, The program is attached to the Health/PE department, We run a class through the athletic department as well.#3. The program is ran by a fulltime EMS Program Manager and is conducted by on-duty shift personnel and Captains from the Training Division

#4. We manage the program through our Pub ED Chief officer and have local fire stations assist in the delivery.

#5. I manage the program by formatting rosters and printing cards, We have five instructors, We operate under the Northwest Medical Center

#6. The health and P.E. teachers become the CPR instructors, Local EMS helps as adjunct instructors for better student ratios

#7. We exclusively run the Community and assist on the School Program where the instructor is a school nurse.

#8 The program is a partnership between the

Public School System. It is run jointly by those organizations.

#9. Fire Department would provide instructors

Question #5

#1. We believe it to be successful in the fact that we get to interact with the kids, they get a certification that is useful to them and may help them with summer or regular jobs, like lifeguarding, babysitting, etc. We don't really measure it, it's more of a "feel good" kind of thing knowing they are getting something that they've not been exposed to before.

#2. We have increased enrollment in the HS class the past 3 years. We have cap of 25 for the class - The faculty/school personnel is about 20 -30 per year that re-take the class. Some of the adults in the class have to have the certificate

#3. Yes. We have seen bystander CPR rates (using Utstein template) go from 5% to around 20-25% in two years. We have trained over 15,000 citizens (mostly school children but many adults as well)

#4. Yes. We track students trained and then also ask for reports back on how many people the kids train. Last year we trained 75 kids in one school who they in turn trained an additional 1500 citizens.

#5. Success can be measured by the number of certifications, certified over 355 students this school year.

#6. We have seen hundreds of teachers and students being trained, AEDs are now in these schools and athletic arenas, I have not heard of any interventions or success cases yet

#7. Yes, we annually train @ 200 residents in the Community Program and the School trains all Juniors (@ 150 students)

#8. Yes, the program is successful. Success is measured through the number of students trained (1,679 so far) and the increased collaboration among the governmental units.

#9. Certification of 711 students

Question #6

#1. It is getting increasingly difficult to find the time on the school's part to have us come in, especially with their testing standards and other requirements. We actually had them cancel this year's classes on us, but we hope we can pick back up next year to get back on track.

#2. How the class is marketed:We visit a cadaver lab, We do some line- on research, We tie this into medical jobs/ jobs in general, We attempt to relate how it will most likely be someone in their family

#3. No response

#4. Please contact Pub Ed Chief Officer for additional program details.

#5. No response#6. See attached

#7. It's a great way to get residents know about the value of the department and our ops.

#8. It is important to get media exposure and have buy-in from the leaders of the organizations. #9. N/A

Question #7

- #1. Sorry, we don't have this kind of material.
- #2. I do not call me with questions. John
- #3. No response
- #4. can provide additional details.#5. We follow the AHA Curriculum
- #6. See attached
- #7. Program should be outlined on our web
- #8. Unfortunately, I do not.
- #9. Outlined in response

Appendix C

Questions for Interview with DCSD Representatives

- 1.) Is the school district aware of the statistics related to SCA and the effects CPR can have?
- 2.) What are the schools and district doing to educate students on SCA?
- 3.) Are there CPR programs currently in the schools?
- 4.) Is there any mandated CPR, AED, or other related training?
- 5.) Would the DCSD be interested and support an educational program on SCA awareness and CPR training?

Appendix D



Program Overview (Pilot Study)

A Community Partnership for Developing a Future Generation of Lifesavers

Facts:

- Strong citizen CPR/AED programs have a dramatic effect on patient survival and recovery
- AED's are more readily available in public places such as sports facilities, stadiums and schools
- Colorado's Good Samaritan Act protects the general public from liability when performing CPR/AED skills
- Primary and Secondary school aged students are more than capable of learning and performing these skills
- This is a great opportunity to develop citizens to respond to future emergencies
- Students trained in CPR/AED could provide emergency services prior to the EMS ambulances arrival and save lives

Program Goals:

- To teach Cardiopulmonary Resuscitation (CPR)
- To teach Automated External Defibrillation (AED), age appropriate
- To teach how to assist a choking victim, age appropriate
- Improve community emergency response and bystander awareness

- Develop career opportunities for students (lifeguards, firefighters, nurses, paramedics, etc.)
- Instill responsibility, pride, confidence, and respect among students
- To give students the skills to respond and assist their teachers, classmates, friends, family, and community
- Develop a future generation of lifesavers

Program Details:

Hands-Only CPR

- Taught at the primary school level
 - o Can begin at first grade
 - Taught until sixth grade
 - Taught on a yearly basis to support reinforcement
- Includes "chain of survival explanation" (calling for help, 911)
- Chest compressions only CPR for older child and adult
- No certified instructor is needed to introduce and/or teach
- A teacher with CPR training can facilitate this learning with EMS, fire, hospital, etc. providing assistance as needed
- Time commitment of 20-30 minutes for a complete session
- Video led with manikins used for skill development
- No written test or skills verification
- Certification is not provided, this is an introduction to CPR and will be built upon as the child develops

CPR, AED, and Choking (Adult, Child, and Infant): Non-Certification

- Taught at the middle school level
 - Begins at seventh or eighth grade
 - o Can be taught as non-certification one year or both
- Includes "chain of survival" information (call for help, 911, CPR, AED)
- Teaches adult hands-only CPR
- Adds child CPR, and infant CPR
- Adds AED use in adults
- Adds adult, child, and infant relief of choking
- No certified instructor is need to teach this information
- A teacher with CPR training can facilitate this learning with EMS, fire, hospital, etc. providing assistance as needed
- Time commitment of less than two hours for all sessions
- Video led with manikins (adult, child, infant) and AED trainer used for skills development
- Student manual can be provided depending on curriculum used
- No written test or skills verification
- Certification is not provided, if certification is desired skip non-certification and see below

CPR, AED, and Choking (Adult, Child, and Infant): Certified

- Taught beginning at the middle school and into secondary school levels
 - Begins at seventh or eighth grade
 - Certification is good for two years with most curriculums
- Includes "chain of survival" information (call for help, 911, CPR, AED, advance life support, and continued care)
- Teaches adult CPR and AED use, child CPR, infant CPR and adult/child/infant relief of choking
- Certified instructors for curriculum being taught is required and student to instructor ratios must be maintained for optimal teaching abilities
- Time commitment is three to four hours including written test and skills evaluation
- Video and certified instructor led
- Manikins to student ratios must be meet, adult/child/infant needed
- AED trainer needed
- Student manual must be provided and curriculum specific
- Certification provided and renewed on a two year basis

First Aid: Certified

- Can be offered with CPR/AED training or separately as a stand-alone class
- Taught beginning at the middle school and into secondary school levels
 - o Begins at seventh or eighth grade
 - Certification is good for two years with most curriculums
- Teaches first aid basics, medical emergencies, injury emergencies, and environmental emergencies
- Certified instructors for curriculum being taught is required and student to instructor ratios must be maintained for optimal teaching abilities
- Time commitment is two to three hours including written test and skills evaluation
- Video and certified instructor led
- Basic first aid materials and epinephrine trainer pen needed
- Student manual must be provided and curriculum specific
- Certification provided and renewed on a two year basis

Projected Plan for Program Implementation:

- Begin the program as a "pilot" at a couple/few select schools in the Castle Rock area to assess viability and needs
- Obtain grants and other funding to assist with financing of mannequins, AED trainers, and related teaching/student materials
- Partner and coordinate with emergency response agencies to facilitate instruction and funding as needed
- Train health and/or physical education teachers as CPR/AED (first aid as needed) instructors for continuation of the program

- Facilitate ongoing CPR/AED (first aid as needed) every two-year renewal requirements for teachers, which could occur as an in-service for teachers
- Obtain support from training centers for CPR/AED (first aid as needed) training
- Obtain medical support from various hospitals, fire and EMS agencies in the county, as needed
- Obtain support from American Heart Association, The American Red Cross, training centers, hospitals, various school associations, etc. to help meet the needs of the program
- Expand the program into the entire Douglas County School District

DCSD Responsibilities:

- School administration will support this program as part of the school curriculum and provide school credits for students
- Schools will notify parents of this program and obtain permission to take this course while receiving school credits
- Teachers will take the train the trainer course and receive instructor certification
- Teachers will provide this training to all students as part of the school curriculum
- Schools agree to replace any equipment obtained through grants or other funding
- Schools will facilitate the required renewal instructor time for teachers to obtain and keep certifications every two years, keeping the program sustained in-house

CRFD Responsibilities:

- Help identify school to begin pilot program
- Help identify curriculum to base program upon
- Support efforts, provide information, and assist with funding of equipment and training needed
- Assist, as needed, with any support that is needed to help the program grow and develop

Projected Outcome:

The program dispersed to a large community area with students trained in CPR/AED/first aid to assist, as first responders, in the community will result in saving numerous lives and support the efforts of a safer community