



Presentation Title: A Systematic Approach to Resuscitation in the Spokane Valley

Presented by: Fire Chief Rich Llewellyn

I. Formative Evaluation – Planning

According to the American Heart Association, more than 350,000 cases of out-of-hospital sudden cardiac arrest (SCA) occur each year in the United States. This condition is the third leading cause of death in the United States and affects individuals in all demographic categories. In many cases, with the right training and equipment, SCA is a reversible condition.

One standardized methodology for quantifying and reporting survivability in the case of SCA is called the Utstein Style. This reporting methodology is used by several registries that track SCA survival rates, including the Cardiac Arrest Registry to Enhance Survival or CARES. The Spokane Valley Fire Department (SVFD) first began participating in the CARES registry in 2011 as a way to track our organizational performance in the treatment of SCA.

Data from that initial year showed that we were failing to realize the SVFD's vision to "...strive for 'excellence' in everything we do..." and "...become recognized as the 'premier' fire department in the state." In 2011, the Utstein survival rate for cardiac arrest in the SVFD's jurisdiction was 23.1%, which was more than 19 percentage points behind the overall rate for Spokane County. Because the patient population is limited by the specific criteria for Utstein inclusion, evaluation of a multi-year time frame is valuable. From 2011 to 2014, the Utstein survival rate in the SVFD was 33.3%, which was still significantly lower than the 38.9% rate in Spokane County.

The Spokane Valley Fire Department's goal was to increase survivability of cardiac arrest through a systematic approach that identified and implemented industry best practices.

The process associated with achieving this goal involved a department-wide effort to identify and implement best practices for department and community response to SCA. From a grass roots effort to adopt the pit crew method of high-efficiency CPR to the Fire Chief facilitating the regional adoption of the PulsePoint app, individuals at all levels of the organization contributed.

II. Process Evaluation – Implementation

The implementation process focused on identifying, evaluating, and implementing best practices for resuscitation. One existing program was expanded, while others were new to the organization. Best practices that were expanded or implemented include:

- Friend & Family CPR Class – Free CPR classes are provided to the public on one Saturday per month. The one offering of Infant CPR was continued, while the Adult/Child CPR class was expanded to two offerings.

- CODE-STAT Program – The SVFD purchased software that allows us to download performance summaries of every cardiac arrest. Specially trained “annotators” evaluate every incident and provide timely (usually same day) performance feedback.
- Pit Crew CPR – Members of two ALS engine companies that were temporarily quartered together pioneered the local use of the pit crew method of high-efficiency CPR. This method is now included in the training schedule on a quarterly basis.
- High School CPR – Recent legislation in Washington requires that high school students receive CPR training. The SVFD has partnered with five high schools to offer this training.
- PulsePoint App – PulsePoint is an app that crowdsources bystander CPR by identifying and alerting volunteer participants of cardiac arrests in nearby public places. This app also notifies participants of nearby AED locations. Since launching in 2014, between 3,000 and 3,500 SVFD residents have enable the CPR function of the app.
- PulsePoint Verified Responder – To address the majority of SCA cases that occur in private residences, the SVFD is participating in a pilot program that equips 49 off-duty members with AEDs and alerts them of SCAs in nearby residences.

III. Impact Evaluation – Short-Term Results

Based on anecdotal evidence of initial successes, the pit crew CPR methodology was quickly and enthusiastically adopted by the rest of the department. Pit crew CPR was subsequently adopted as the standard of care in Spokane County.

The initial goal for the compression ratio, the percentage of time during cardiac arrest that compressions are taking place, was 90%. To date over 300 cardiac arrests have been annotated with an overall compression ratio of 96%.

IV. Outcome Evaluation – Long-Term Results

A comparative evaluation of two years of resuscitation data shows an improvement of Utstein survival rates from 18.8% in 2014 to 60.0% in 2015, with Utstein “Bystander” survival rates increasing from 11.1% to 66.7%. Evaluation of crew performance using the CODE-STAT program reveals further confirms the effectiveness of initial and ongoing training in pit crew CPR.

Recommendations for others:

We recommend that others use a similar, multi-focal approach to improving SCA outcomes. The involvement of internal and external stakeholders is a key consideration. Additionally, organizational culture and leadership must encourage improvement initiatives and acknowledge successful efforts.

Conclusions:

Improving survival rates of SCA victims requires an outcome-based focus at all levels of the organization.