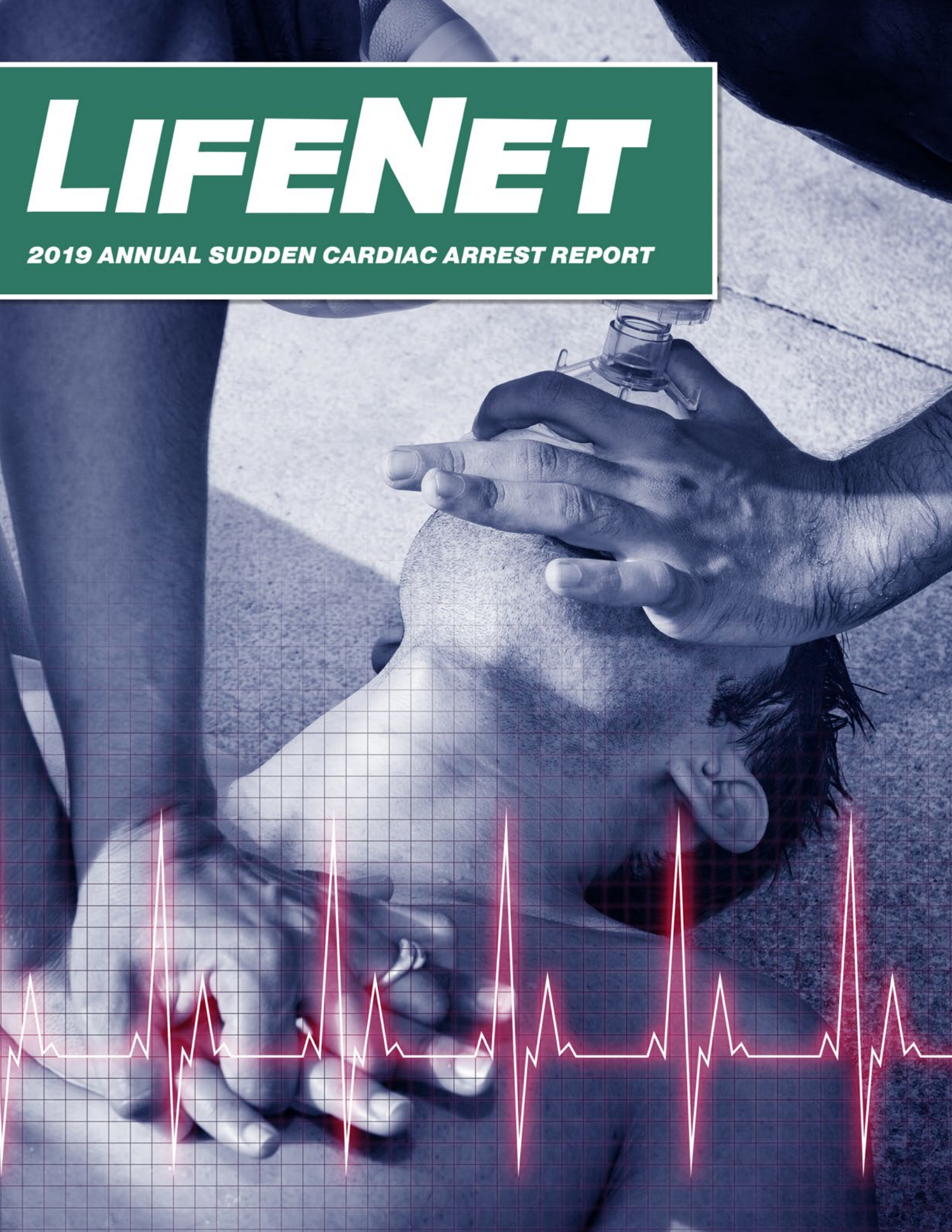
LIFENET

2019 ANNUAL SUDDEN CARDIAC ARREST REPORT



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When someone collapses from cardiac arrest, everything that happens after that moment can impact a person's chances of survival.

American Heart Association

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EXECUTIVE SUMMARY

Sudden Cardiac Arrest (SCA) is one of the leading causes of death and a major public health problem in the United States. Since 2005, LifeNet, Inc. has used the Utstein Style to measure and report on cardiac arrest data. As part of this process, LifeNet clinical staff review and report on every adult SCA patient whose arrest is deemed to be of a medical (non-traumatic) origin.

Patients experiencing SCA fall into two categories: Witnessed SCA and Not-Witnessed SCA. Patients who have an SCA event that is witnessed by another person generally have the best chance of survival because someone is present to activate EMS, thus beginning the steps in the "Chain of Survival".

Once a LifeNet medical crew makes contact with an SCA victim, they must determine if the patient has any reasonable chance of survival. When the paramedics determine a patient may have a chance to survive, and that no obvious reasons to withhold treatment are present, they initiate an aggressive resuscitation attempt. This includes cardiopulmonary resuscitation (CPR) in which artificial ventilation and external chest compressions are performed. In addition, paramedics establish intra-venous and/or intra-osseous access and administer medications and manually defibrillate when necessary to attempt to stimulate the heart and achieve a return of spontaneous circulation (ROSC). Generally, patients who achieve ROSC are transported to the emergency department for further resuscitation and care. Patients who do not respond to pre-hospital resuscitative efforts are considered to be deceased and documented as a field termination.

In 2019, paramedics throughout the LifeNet system responded to 929 non-traumatic SCA events. ALS resuscitation was attempted on 412 (44%) of those SCA events. Of the 412 resuscitation attempts, 251 patients (61%) were transported to the hospital while 161 resuscitation attempts (39%) ended with field terminations. There were 58 patients (14%) who survived to hospital discharge. The national average in this overall survival category is 8% - 10%.

In the Texarkana Division, resuscitation was attempted on 181 of the 450 patients who suffered SCA. These attempts include 86 transports and 95 field terminations. There were a total of 57 patients who had ROSC while 21 patients survived to discharge for a survival of 12%.

In the Hot Springs Division, resuscitation was attempted on 186 of the 393 patients who suffered a SCA. These attempts include 136 transports and 50 field terminations. There were a total of 72 patients who had ROSC, while 29 patients survived to discharge, for a survival of 16%.

In the Stillwater Division, resuscitation was attempted on 45 of the 86 patients who suffered a SCA. These attempts include 29 transports and 16 field terminations. There were a total of 16 patients who had ROSC, while eight patients survived to discharge, for a survival of 18%.

When comparing LifeNet's SCA data with other EMS systems, it is important to note that other systems report their survival percentages based on "Witnessed V-Fib" events only. LifeNet's Witnessed V-Fib survival percentage for 2019 is 32%.

LifeNet System Wide 2019 SCA Statistics

929
Non-Traumatic SCA events LifeNet responded to in 2019

44%
LifeNet attempted ALS resuscitation on 412 SCA patients

61%
LifeNet transported 251 SCA patients to the hospital

39%
161 resuscitation attempts ended in field terminations

14%
58 SCA patients survived to hospital discharge

8-10%
National average of patients surviving to discharge

32%
LifeNet's Witnessed V-Fib survival percentage

DEFINITIONS

Asystole
The cession of all electrical activity in the heart.

Base Station Physician (BSP)
On-duty hospital physician responding by radio, telephone, or cell phone contact.

Bystander
Person who performs cardiopulmonary resuscitation on a cardiac arrest patient and is not a member of the organized emergency response system.

Call Response Interval
Interval of time starting when the call for help is answered at a LifeNet communications center until paramedics arrive at the scene. Also referred to as call received/receipt until at scene interval.

Cardiac Etiology
A cardiac arrest presumed related to heart disease.

Cardiopulmonary Resuscitation (CPR)
Widely used method of resuscitation utilizing a series of closed chest compressions and manually assisted ventilations.

Computer Aided Dispatch (CAD)
A dispatch system utilized by LifeNet EMS to manage emergency and non-emergency call taking and dispatch operations.

Death Determined at Scene (DAS)
Circumstances in which the condition of a cardiac arrest victim is such that resuscitation attempts are determined to be futile.

First Responder Organization (FRO)
An identified organization of trained personnel used for rapid incident response.

Other Lethal Rhythm (OLR)
Various non-arrest rhythms that will not sustain life.

Public Access Defibrillation (PAD)
The provision of defibrillation by non-traditional “first responders” such as security guards, lifeguards, etc...

Pulseless Electrical Activity
An organized cardiac rhythm where no pulse/cardiac output is present.

Resuscitation Not Attempted
Patients for whom paramedics do not attempt resuscitation on. Current LifeNet policy states if a patient has evidence of being dead for a period of time where resuscitation attempts would have no hope of success, the paramedics do not attempt resuscitation.

Additionally, resuscitation is not attempted on patients with a Do Not Resuscitate (DNR) order.

Return of Spontaneous Circulation (ROSC)
Resumption of sustained perfusing cardiac activity after cardiac arrest. Signs of ROSC include spontaneous breathing, coughing, or movement, and a palpable pulse or a measurable blood pressure.

Sudden Cardiac Arrest (SCA)
The sudden collapse of a victim found to be pulseless and breathless.

Unwitnessed Arrest
The patient is found after the arrest has occured.

Utstein Criteria
Internationally recognized data template for reporting out-of-hospital cardiac arrest.

Ventricular Fibrillation / Ventricular Tachycardia (VF/VT)
A state of disorganized electrical activity in the heart.

Witnessed Arrest
Patient collapse was seen or heard by a bystander.

INTRODUCTION

According to the Center for Disease Control and Prevention (CDC), someone has a heart attack every 40 seconds in the United States, and each minute, more than one person dies from a heart disease-related event.

According to the American Heart Association's (AHA) *Heart Disease and Stroke Statistics - 2018 Update*, there are more than 356,000 out-of-hospital cardiac arrests annually in the U.S., nearly 90% of them fatal. The majority of these events occur at a home or residence (68.5%), followed by public settings (21%) and nursing homes (10.5%).

Because SCA is one of the leading causes of death in our nation, the emergency management of this devastating event remains one of the core purposes of any emergency medical services (EMS) system.

In many cases, a SCA event occurs due to ventricular fibrillation, an abnormal heart rhythm that causes the heart muscle to fibrillate or quiver in a chaotic motion. If left untreated, this condition leaves the heart muscle unable to pump blood and death occurs within minutes. Survival from SCA depends on the interval between the patient's collapse and the delivery of the first defibrillatory shock. This becomes remarkably time dependent, where seconds and minutes equal living, dying, or becoming neurologically impaired due to lack of oxygen being sufficiently supplied to a patient's brain.

Creating optimal opportunity for successful resuscitation includes:

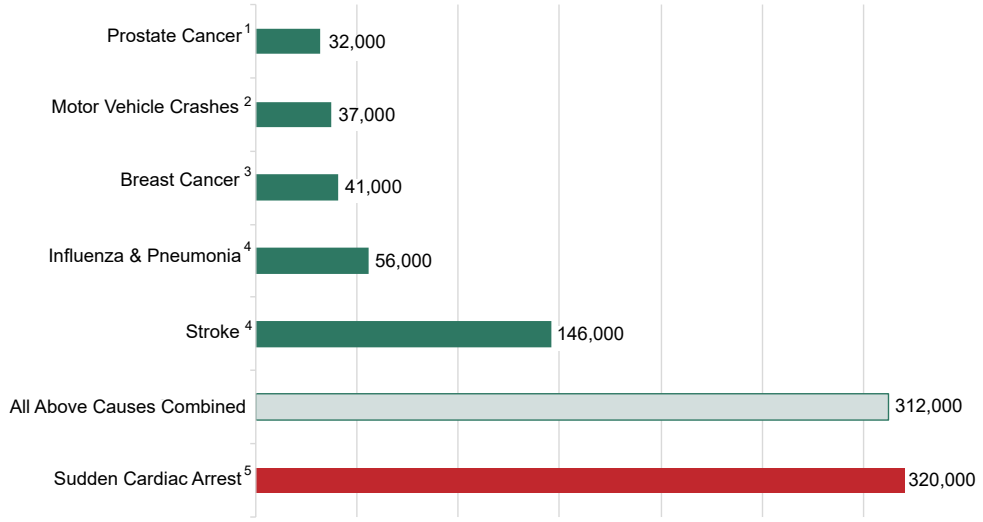
1. Early recognition
2. Early access to EMS
3. Early initiation of CPR
4. Early access to defibrillation
5. Timely response and superior skill from EMS
6. Focused post-arrest care in the event of ROSC

According to the AHA, clinical and epidemiological studies have confirmed:

1. Almost every adult (over 90% in most studies) who survives sudden non-traumatic cardiac arrest was resuscitated from Ventricular Fibrillation (VF).
2. The success of defibrillation is remarkably time dependent.

The probability of defibrillating (shocking) someone back to a perfusing heart beat declines between 2% to 10% per minute, starting with the estimated probability of 70% to 80% survival at time zero. These statistics show that a patient who has not been shocked within 10 minutes from their collapse has a high probability of not surviving the SCA event. Other studies demonstrate that CPR prior to defibrillation can significantly improve the likelihood of defibrillation success.

Common Causes of Death in the US in 2017



SOURCES:
(1) Prostate Cancer: Statistics, 2019, www.cancer.net/cancer-types/prostate-cancer/statistics
(2) U.S. DOT Announces 2017 Roadway Fatalities Down, 2018, www.nhtsa.gov/press-releases/us-dot-announces-2017-roadway-fatalities-down
(3) Breast Cancer Facts & Figures, 2017, www.cancer.org/research/cancer-facts-statistics/breast-cancer-facts-figures.html
(4) Mortality in the United States, 2017 www.cdc.gov/nchs/products/databriefs/db328.htm
(5) Latest AHA Statistics on Cardiac Arrest Survival Reveal Little Progress, 2019, www.sca-aware.org/sca-news/latest-aha-statistics-on-cardiac-arrest-survival-reveal-little-progress

TIMING IS EVERYTHING

Out-of-Hospital Chain of Survival

The cornerstone to providing optimized care to SCA patients and increasing survival rates is timely and effective interventions from the moment someone notices symptoms. The bystander or family member who witnesses the SCA event must not only recognize the symptoms, but must also call for help. Bystander CPR and use of an Automatic External Defibrillator (AED) must start before, and continue until, the arrival of skilled EMS crews.

Early Access & Recognition of Symptoms | **Early CPR with High-Quality Chest Compressions** | **Early Defibrillation** | **Early Advanced Care** | **Post Resuscitation Care**

Chain of Survival Link 1: Early Access & Recognition of Symptoms

Early access means:
- Recognizing that a cardiovascular emergency exists
- Immediately phoning EMS

Elements that strengthen early access are:

Enhanced 911

LifeNet's 911 call system has "enhanced 911". This means the caller's address and phone number are displayed on the EMS dispatcher's computer screen, reducing response time. The system also helps callers who speak foreign languages, can't speak, or don't know their location.

Improved Addresses in Rural and Urban Areas

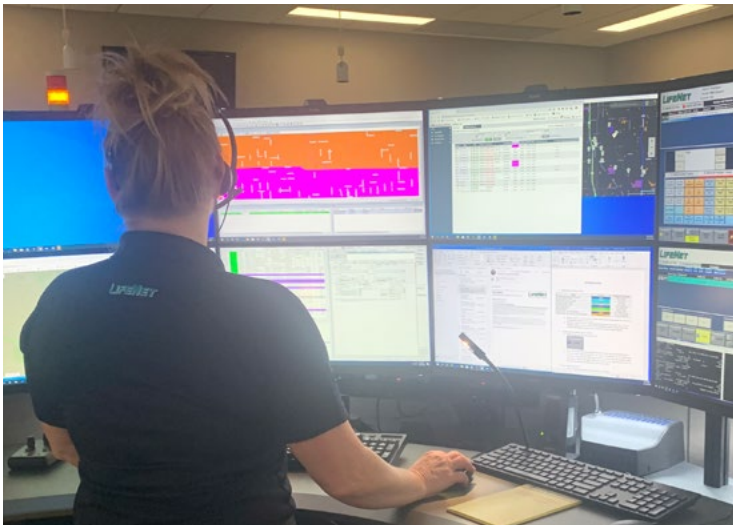
Many communities have delays in emergency response because house numbers aren't assigned or properly displayed. To implement and use an enhanced 911 system, all locations in a community must have proper addresses that are also properly displayed.

Qualified Emergency Medical Dispatchers (EMDs)

EMDs are able to give CPR (and other medical) instructions by phone, enabling callers to care for SCA victims until help arrives. Without trained EMDs, victims may face delays that could mean the difference between life and death. Each of LifeNet's communication centers has at least one EMD qualified person on duty at all times.

Awareness of Early Warning Signs

Early access only happens if the community knows who to call and when to call. Many people deny (or don't know) the symptoms of a cardiovascular emergency. Instead of phoning 911 first, some people call loved ones or their own doctor. This wastes precious time. One of LifeNet's primary awareness efforts is to assist the community in learning the warning signs and when to call 911 first.



Chain of Survival Link 2: Early CPR

When CPR is performed, rescue breathing and chest compressions circulate oxygen rich blood to vital organs. This buys time for the victim until defibrillation can be given. Early CPR as a link in the chain of survival is stronger when bystanders or callers know CPR and EMDs can give CPR instructions by phone.

LifeNet does not conduct in-house CPR certification classes for the public. When contacted, we direct people to either their local American Heart Association training site or to the American Red Cross for the proper training. However, LifeNet does teach “Hands-only CPR” at churches, civic groups, businesses, and events throughout our service areas.

In 2019, CPR was performed prior to arrival of EMS on 272 (76%) of the arrests that LifeNet responded to. Pre-arrival CPR was done by a first responder in 28% of the calls, a bystander in 13% of the calls, a healthcare provider in 24% of the calls, and a family member in 36% of the calls.

Chain of Survival Link 3: Early Defibrillation

Early defibrillation means delivering an electric shock to the heart within minutes of a cardiac arrest. Defibrillation is performed with a device called a defibrillator. Automated external defibrillators (AEDs) are user-friendly, computerized defibrillators that use voice prompts to lead a rescuer through the steps of defibrillation. Trained rescuers can use AEDs to give a potentially lifesaving electrical shock to a victim’s heart during cardiac arrest.

Early access and use of an AED prior to EMS arrival on scene is important. According to the American Heart Association, “a victim’s chance of survival decreases by seven to ten percent for every minute that passes without defibrillation.” Most studies recommend an AED be applied within four minutes of witnessing a SCA event.

In urban areas, LifeNet’s average response time to deliver an ALS crew to the emergency scene is about 6.5 minutes, and it can take the medical personnel an additional one to two minutes to deliver defibrillation (shock) once at the patient’s side.

In 2019, an AED was used 21 times in LifeNet’s Texarkana Division, 15 times in LifeNet’s Hot Springs Division and three times in LifeNet’s Stillwater Division. Patients who received both pre-arrival CPR and AED shock had a survival rate of 27%, compared to a survival rate of only 17% for patients with a witnessed SCA event where only CPR was performaed.

LifeNet has created programs designed to equip lay rescuers with AEDs and train them to perform Bystander CPR and use the device. This helps ensure the people most likely to arrive first at a medical emergency are equipped to help. These people include firefighters, law enforcement and security officers, industrial facility staff, retirement community workers, churchgoers, and others.

LifeNet’s AED Matching Grant Fund asks a not-for-profit partner agency to fund half of the cost of a new Zoll AED, while LifeNet funds the other half. Organizations requesting an AED upon approval of matching funds must schedule an AED training class taught by LifeNet.

LifeNet’s AED Loaner Program allows area nonprofits the opportunity to check-out a loaner AED for business and community events at no cost.

Chain of Survival Link 4: Early Advanced Care

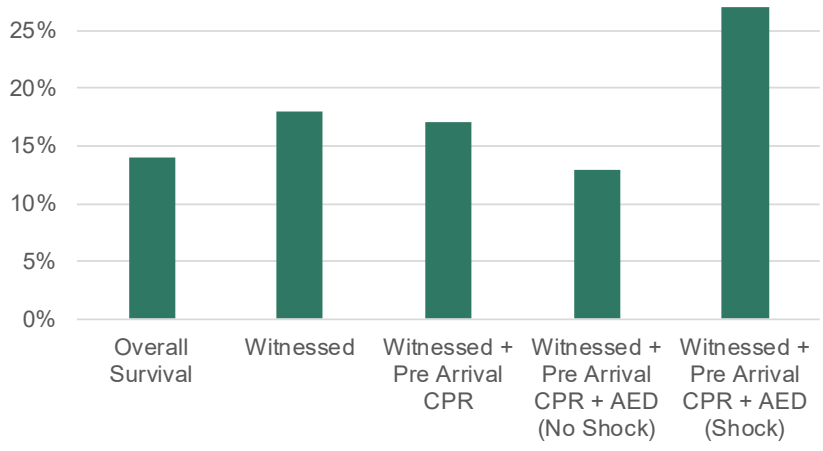
Early advanced care means having highly skilled, qualified, and equipped paramedics who are able to quickly respond to an SCA event and begin treating the victim as soon as possible. LifeNet paramedics can administer drugs, perform advanced airway procedures, and utilize other interventions and protocols to help stabilize patients who suffer a cardiovascular emergency.

Ideally, advanced cardiovascular care should be available within the first eight minutes of collapse or the onset of symptoms, assuming CPR and early defibrillation were started before EMS arrived on scene. This gives victims the greatest chance of long-term survival. By providing an all Advanced Life Support (ALS) response system, LifeNet ensures a trained paramedic arrives on the scene of each SCA response call.

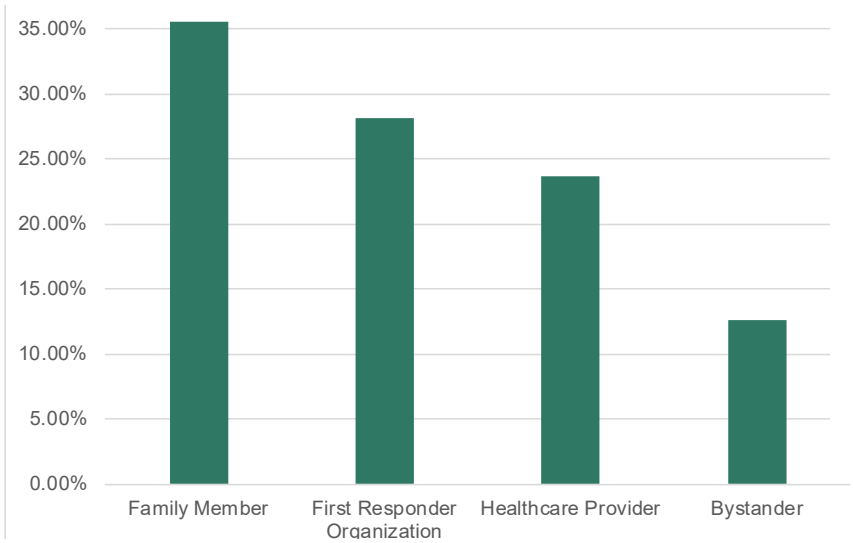
Chain of Survival Link 5: Post Resuscitation Care

Post-cardiac arrest resuscitation care refers to a comprehensive system of care for patients after ROSC once they arrive at the hospital.

Impact of Pre-Arrival AED & CPR on SCA Survival



Who Performed Pre-Arrival CPR?



SCA in the Workplace

According to a report from the US Occupational Safety & Health Administration (OSHA), there are about 10,000 cardiac arrests in the workplace each year in the United States.

OSHA AED Placement Recommendations

- Installed to ensure response within 3-5 minutes.
- Areas where many people work closely together, such as assembly lines and office buildings
- Close to a confined space
- Areas where electric-powered devices are used.
- Outdoor worksites where lightning may occur
- Health units where workers may seek treatment for heart attack symptoms
- Company fitness units and cafeterias
- Remote sites, such as off-shore drilling rigs, construction projects, marine vessels, power transmission lines, and energy pipe lines

Alarmingly, only 50% of people can locate an automated external defibrillator (AED) at work?

LifeNet offers AED and Bystander CPR classes to groups of 10 or more people at no cost. Learn more by visiting our website at www.LifeNetEMS.org/bcpr-aed-class/

Everyday heroes are the people who step up during an accident or an emergency and make a difference. In May of 2019, LifeNet had the opportunity to extend the LifeNet Lifesaver Award to Courtney Barham, Jody Barham, Jeff Cigainero, Dianne Greenhaw, Marshall Greenhaw, Adrian Sidwell, and Robyn Williams during a presentation at the Fouke School District in Miller County, Arkansas. These individuals assisted in getting an AED and performing chest compressions on a man in sudden cardiac arrest for more than 20 minutes during a basketball game at the gym. Their heroic efforts were instrumental in saving the man's life.

LifeNet LifeSaver Award

The LifeNet LifeSaver Award recognizes people who have saved a life, regardless of the risk, through the application of first aid knowledge and skills.

Possible nominees include individuals, or groups of individuals who:

- Performed Bystander CPR or applied an AED that resulted in successful ROSC
- Successfully controlled the bleeding of a patient whose bleeding was life threatening.
- Successfully maintained the airway of a patient whose airway was compromised and life threatening.

To learn more about how to nominate someone for this award visit: www.LifeNetEMS.org/lifenet-lifesaver-award/

LifeNet presented two AEDs to the Ouachita Fire Department in 2019 as part of our AED Matching Grant Fund. Pictured are Assistant Fire Chief Clay Nutt and Tommy Singleton, LifeNet Director of Operations for LifeNet in Malvern, Arkansas.

AED Matching Grant Program

LifeNet is committed to making our community a safer place, and providing funding to help provide AEDs in the community is one way we help. Through the program, we ask as a not-for-profpartner agency to fund half of the cost of a new Zoll AED, while LifeNet funds the other half. Partner agencies must be non-profit or not-for-profit organizations that reside within LifeNet's ground service areas.

For organizations in Payne County, Oklahoma, the Western Payne County Ambulance Trust Authority (WPCATA) provides a limited number of AEDs at NO COST to recipient entities.

Upon approval of matching funds, organizations must:

- Schedule a Bystander CPR & AED Use training class taught by LifeNet
- Present a check to LifeNet for $650 (estimated) at time of request (a mounting case is available for purchase for an additional $100)

To learn more about how to apply for an AED Matching Grant, visit www.LifeNetEMS.org/aed-matching

Organizations who are not eligible to receive a matching grant can purchase an AED through LifeNet at our bulk discounted rate. To learn more about the Zoll AED recommended by LifeNet, visit www.LifeNetEMS.org/Zoll or call 903-831-1803.

Piney Fire & Rescue Chief Scott Miser is presented an AED by LifeNet Paramedic Hope Garrison in LifeNet's Hot Springs Division.

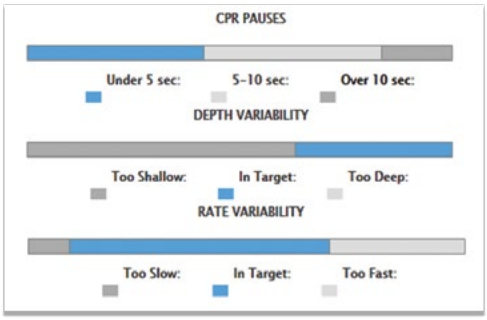
LifeNet Operations Manager Shon Matthews presents four AEDs to Farmers Bank and Trust in Texarkana. The bank invested $5500 to ensure an AED was available in every branch in the immediate area.

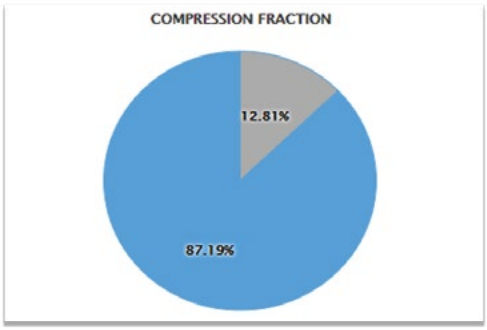
MEASURING CPR EFFICIENCY

As more is learned about resuscitation science, it has become abundantly clear that CPR quality is the key to improving survival rates for SCA victims. Therefore, capturing and monitoring CPR performance during the event is extremely important.

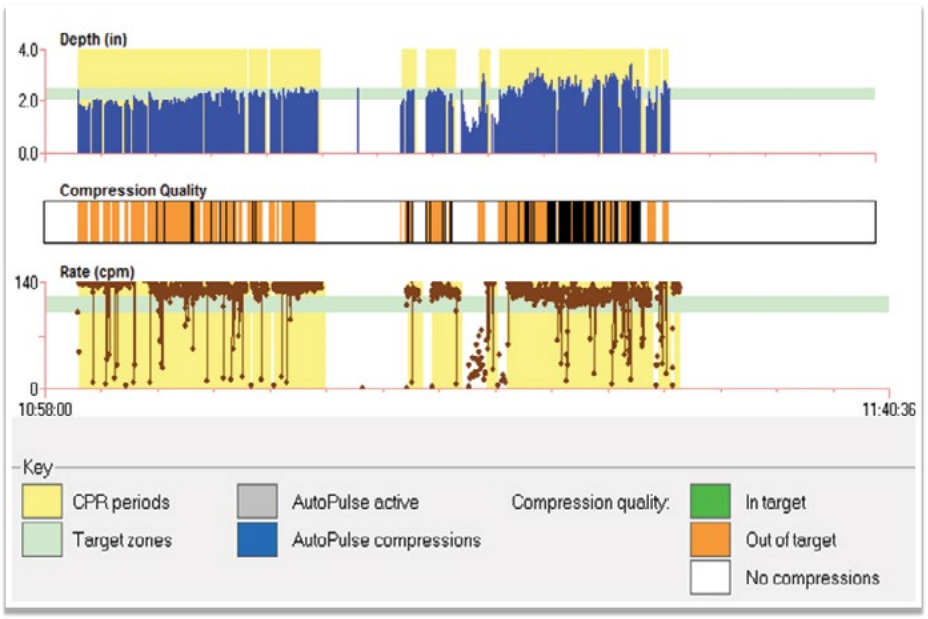
LifeNet utilizes the the ZOLL X Series® Cardiac monitor/defibrillator. It is equipped with the ability to not only provide real-time CPR quality feedback but to also record the data for review later. Through various visual and audio prompts, the CPR feedback module is designed to help guide the rescuers to provide high quality CPR. In order to facilitate this capability, LifeNet issues feedback capable pads to all area responders for use with their AEDs.

Sample Zoll Online CaseReview© Reports





Once a cardiac arrest event has concluded, the LifeNet field crew can then review their performance via ZOLL's RescueNet Code Review® software on their tablet PC. As a part of LifeNet's ongoing quality improvement initiatives, the field crews also receive feedback from the Quality Improvement department regarding their performance and compliance. An example of a CPR performance report graph is pictured below:



ZOLL Online CaseReview© provides an in-depth look at the performance of resuscitation on a specific patient and can also be used to monitor trends. This program creates charts and graphs that provide an easy to read summary of specific parameters such as compression fraction, CPR pauses, and depth and rate variability. These summarized data can then be passed on to the field crew as part of the quality improvement process.

According to studies and guidelines published by the American Heart Association in 2015, chest compressions should be delivered at a rate of "100-120/min" and "at least 2 inches" in depth. LifeNet Clinical Managers regularly review CPR data and focus improvement efforts on rate, depth, and reducing "hands-off" time when it comes to compressions and avoiding over-ventilation.

In February of 2019, one of LifeNet's medical crews was reunited during a press conference at Wadley Regional Medical Center in Texarkana with a patient they helped save from heart complications. During the press conference, which was held to announce the hospital's new designation as an accrediated chest pain center, Dr. Robert Fry, an emergency room physician said, "There's a great team that's gone into making this effort possible. That includes EMS because they're the ones that get the ball rolling. The most important thing is we have a team approach, not only from EMS but also the nursing staff. Everybody is working in perfect harmony."

INTEGRATED POST CARDIAC ARREST CARE

By using medications designed to help a struggling heart pump more efficiently, post arrest care is essentially a focused treatment plan designed to prevent a person who has been "clinically dead" from suffering the same fate again.

While protocols for post arrest care vary from region to region, several treatments are considered to be the "standard of care." Mainstays of this treatment plan include: appropriate oxygenation and ventilation, vasopressor agents and glucose evaluation and control.

In an effort to stabilize the patient post arrest, LifeNet personnel focus on obtaining a 12 lead ECG, administering vasopressor agents, providing ventilatory support, and monitoring dextrose evaluations.

Once a patients' heartbeat has been restored (ROSC), the focus then becomes maintaining the heartbeat. Paramedics perform a series of evaluations, including blood pressure management. When the blood pressure is too low, vasopressor agents (such as Dopamine) are infused into the patient to achieve a higher blood pressure.

LifeNet field staff also utilize End-Tidal CO2 (ETCO2) as a guide while treating the SCA patient. Generally speaking, a victim of SCA will often have a low ETCO2 reading. When this measurement rebounds, it can be the first sign that the patient has achieved ROSC. ETCO2 is also a good tool for managing ventilations when the patient is not breathing on his or her own.

Obtaining a 12 lead ECG is important in the post-arrest care of an SCA victim. The 12 lead can show heart muscle ischemia and damage and may point to what caused the SCA event to begin with. This information is critical and can be transmitted to the receiving hospital from the monitor prior to EMS arrival. This heads-up gives the hospital staff time to prepare the cath lab to receive the patient.

LIFENET'S 2019 SCA SURVIVAL RATE DATA

System-Wide 2019 SCA Data

Since 2005, LifeNet has classified all instances of SCA using the Utstein Style for uniform reporting of cardiac arrest. The term "Utstein style" is synonymous with consensus reporting guidelines for resuscitation. It originated from an international multidisciplinary meeting held at the Utstein Abbey near Stavanger, Norway, in June 1990.

The Utstein Style was first proposed for emergency medical services in 1991 to provide a uniform method of collecting and reporting cardiac arrest statistics. By using these quality improvement strategies, we are not only able to measure our success nationally, but we are also able to use the information to assist in planning and education.

Data is collected using information from our electronic patient care reports (ePCRs) prepared by LifeNet paramedics. Clinical managers extract the data from ePCRs used to document a SCA event and then sift through that data to collect the needed information. Additionally, each division's clinical manager follows up on each patient transported to find out if he or she survived to discharge. System-wide, 929 adult patients (less than 1% of LifeNet's service area's population of 288,020) were recorded as having sudden death out of the hospital. This number includes all unresponsive, breathless, and pulseless adult patients that stimulated 911 activation.

In the LifeNet system, resuscitation is not attempted on patients with obvious signs of death, patients with a valid out-of-hospital DNR, or any patient that is believed to be not viable (no reasonable expectation of survival). When a patient is believed to be viable, aggressive resuscitation efforts are performed until the patient has ROSC and is transported or the efforts are deemed futile and the resuscitative efforts are terminated. In some circumstances, a patient may be transported while resuscitation is ongoing.

Of the 929 SCA patients LifeNet responded to in 2019, resuscitations were attempted on 412 (44%) with 251 patients (61%) transported to the hospital while 161 patients (39%) ended with field terminations.

Return of Spontaneous Circulation (ROSC) occurred in 150 patients (36%). ROSC is resumption of sustained, perfusing cardiac activity after cardiac arrest. Signs of ROSC include breathing, coughing, or movement and a palpable pulse or a measurable blood pressure.

A total of 58 patients survived to hospital discharge. The overall survival percentage for LifeNet EMS in 2019 is 14%.

LifeNet measures and reports its survival percentage based on all cardiac arrests. Other systems measure and report their survival percentage based only on "witnessed - v-fib" arrests. Using this format, LifeNet's 2019 survival percentage is 32%.

As noted earlier in this report, LifeNet understands the importance of building the Chain of Survival in the community to improve survival rates. In Seattle, Washington, where CPR training is widespread and EMS response and time to defibrillation is short, the survival rate for witnessed - v-fib cardiac arrest is reported to be about 50%. In New York City, where few victims receive bystander CPR and time to EMS response and defibrillation is longer, survival from sudden witnessed - v-fib cardiac arrest has been reported as low as one to two percent.

Texarkana 2019 SCA Data

Texarkana, Arkansas
- 89 SCA Victims
- 39 Attempted Resuscitations
- 6 Patients Survived to Discharge
- 15% Survival Rate

Texarkana, Texas
- 203 SCA Victims
- 81 Attempted Resuscitations
- 9 Patients Survived to Discharge
- 11% Survival Rate

Hot Springs 2019 SCA Data

Hot Springs, Arkansas
- 174 SCA Victims
- 81 Attempted Resuscitations
- 17 Patients Survived to Discharge
- 21% Survival Rate

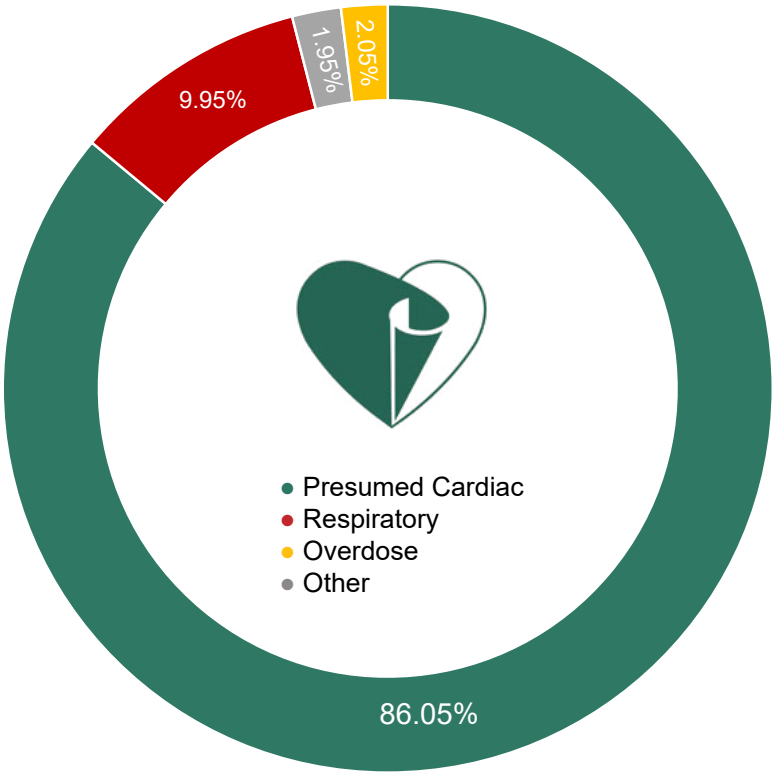
Hot Springs Village, Arkansas
- 59 SCA Victims
- 26 Attempted Resuscitations
- 1 Patients Survived to Discharge
- 4% Survival Rate

Malvern, Arkansas
- 57 SCA Victims
- 29 Attempted Resuscitations
- 8 Patients Survived to Discharge
- 28% Survival Rate

Stillwater 2019 SCA Data

Stillwater, Oklahoma
- 86 SCA Victims
- 45 Attempted Resuscitations
- 8 Patients Survived to Discharge
- 18% Survival Rate

Origin of SCAs System Wide in 2019



552 Men

367 Women

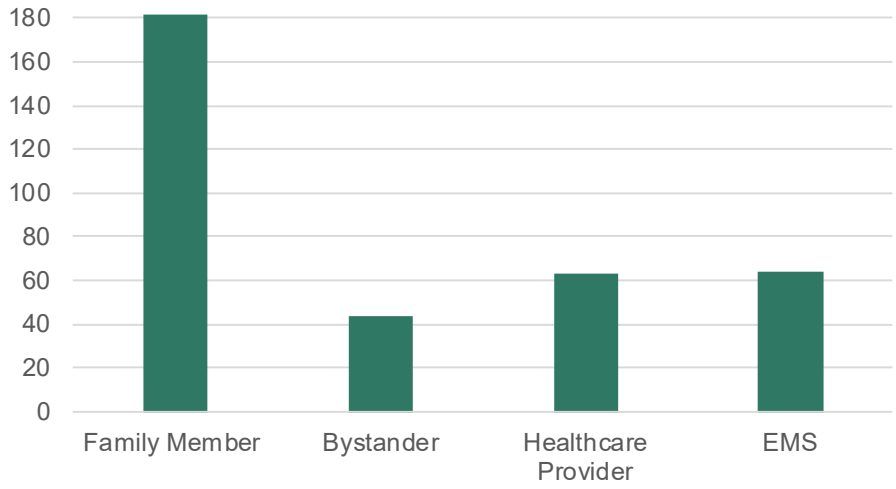
Of the 929 SCA events LifeNet responded to during 2019, 86.05% were presumed to have started from a cardiac issue, 9.95% from a respiratory issue, and 2.05% were from an overdose. Men accounted for 580 SCA victims, while 367 women were SCA victims.

Witnessed vs. Non-Witnessed SCA Events

Of the 929 SCA events in 2019, 576 were not witnessed, while 353 were witnessed. Of the witnessed events, 182 were witnessed by a family member, 44 by a layperson bystander, and 63 by another healthcare provider. In 64 of the SCA events, EMS was on scene prior to the arrest and witnessed the event.

353 Witnessed

576 Not-Witnessed



System-Wide SCA Results by Year

CRITERIA	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Non-Traumatic SCA	447	610	610	641	690	622	745	825	801	913	846	918	947	929
Resuscitations NOT Attempted	261	388	403	446	473	436	494	529	520	593	532	539	567	517
	58%	64%	66%	70%	68%	70%	66%	64%	65%	65%	63%	59%	60%	56%
Resuscitations Attempted	186	222	207	195	217	186	251	296	281	320	314	379	380	412
	42%	36%	34%	30%	31%	30%	34%	36%	35%	35%	37%	41%	40%	44%
Resuscitation Attempts Transported to ED	131	154	155	141	147	131	175	206	188	211	211	228	231	251
	70%	69%	75%	72%	68%	70%	70%	70%	67%	66%	67%	60%	61%	61%
Resuscitation Attempts that ended in Field Termination	55	68	52	54	70	55	76	90	93	109	103	151	149	161
	30%	31%	25%	28%	33%	70%	30%	30%	33%	34%	33%	40%	39%	39%
Resuscitation Attempts that achieved ROSC	47	67	85	75	84	70	107	116	111	132	131	130	146	150
	25%	30%	41%	38%	39%	38%	43%	39%	40%	41%	42%	34%	38%	36%
Total Resuscitation Attempts that Survived to Discharge	18	21	27	23	23	24	39	48	38	52	72	49	56	58
	10%	9%	13%	12%	11%	13%	16%	16%	14%	16%	23%	13%	15%	14%

SCA Disposition 2019 by Division

Criteria	Hot Springs Division	Texarkana Division	Stillwater Division	System Wide
Total Patients Recorded	393	450	86	929
Total Death Determined at Scene	207	269	41	517
Total Resuscitations Attempted	186	181	45	412
Transported to ED	136	86	29	251
Total Field Terminations	50	95	16	161
Total Patients with ROSC	72	57	21	150
Total Resuscitation Survived to Discharge	29	21	8	58
Pct Resuscitation Survived to Discharge	16%	12%	18%	14%

System-Wide Witnessed V-Fib Survival Percentages

Service Area	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Texarkana, USA	27%	20%	33%	17%	28%	29%	42%	32%	21%	38%	32%
Hot Springs, AR	23%	22%	40%	27%	57%	50%	47%	27%	22%	46%	32%
Texarkana Division	21%	20%	29%	24%	27%	40%	31%	30%	19%	33%	29%
Hot Springs Division	16%	20%	28%	27%	45%	40%	39%	41%	25%	29%	32%
Stillwater Division	n/a	n/a	n/a	50%	27%	50%	0%	57%	50%	8%	33%
LifeNet System	20%	20%	28%	27%	34%	41%	23%	36%	25%	28%	32%

Neurological Outcome Results by Division

Criteria	Hot Springs Division	Texarkana Division	Stillwater Division	System Wide
Total Patients Recorded	393	450	86	929
Total Resuscitations Attempted	186	181	45	412
Total Discharged from Hospital	29	21*	8	58*
Good Neurological Outcome	11	17	7	35
Fair Neurological Outcome	7	3	0	10
Poor Neurological Outcome	11	0	1	12

*= unknown neurological outcome

- **Good Neurological Outcome**
  Indicates the patient returned to pre-arrest function with minor or no deficits.
- **Fair Neurological Outcome**
  Indicates the patient has some significant disabilities as a result of the SCA event.
- **Poor Neurological Outcome**
  Indicates that the patient is neurologically devastated as a result of the SCA event.

BYSTANDER CPR & AED USE TRAINING

WHAT?

LifeNet's FREE Bystander CPR (B-CPR) & AED Use Class is designed to teach everyday people how to perform quality chest compression and utilize an AED. The hour-long class includes a 20-minute lecture and hands-on practice. Practicing CPR is the most important element of the course.

WHERE?

LifeNet offers the FREE class to groups of 10+ people wherever it is most convenient for the group. If a group does not have a place to hold the class, LifeNet can usually secure a location.

NEED CERTIFICATION?

This class is NOT a CPR Certification Class. In order to be CPR certified, you must attend a class that teaches you rescue breathing, how to perform CPR on a child, and other topics. Many area community colleges offer certified CPR Classes for a fee. Most certified classes take 4-5 hours to complete and cost around $70 to attend. While we encourage everyone to become CPR Certified, we recognize the time and money involved is not suitable for every individual. Our free class is offered as an alternative for those who would like to learn how to perform CPR but are not required to be certified.

HOW?

To schedule a free class, call 903-831-1803 or complete the form on our website at www.LifeNetEMS.org/bcpr-aed-class/

MEDICAL DIRECTION

Clinical Oversight and Direction

Medical Direction is the key to LifeNet's success in the field. LifeNet has four medical directors who each aprove medical protocols and determine those which are standing-orders as opposed to those which require online approval. LifeNet EMTs and paramedics operate vicariously through the medical director with the establishment of Clinical Protocols and Procedures.

LifeNet encourages a strong reliance on standing-order protocols that are best practices and evidence-based. However, the Medical Directors can determine those protocols and procedures that require direct approval by a physician. Receiving facility physicians are the primary source for online medical direction for most patient encounters. LifeNet's Medical Directors can serve as an online resource for unique situations, when appropriate. LifeNet's Medical Directors maintain relationships with area peers involved in patient care and communicate adjustments in clinical approach, equipment, and technologies.

The Medical Director has the final authority regarding the clinical privileges of field staff and can remove privileges if a clinical performance concern cannot be addressed satisfactorily through education and training from support staff. The mechanisms LifeNet employs to monitor individual and system performance are intended to avoid such situations.

LifeNet utilizes a Clinical Steering Committee (CSC) to direct clinical and quality initiatives within the company and to monitor the performance of the LifeNet systems as a whole. Participants include key contributors from each division who are routinely involved in, or responsible for, quality improvement and clinical development. These include regional Medical Directors, Clinical Managers, Operations Directors, Leads for each Communications Center and General Managers. Ad-hoc contributors include Field Training Officers or any field staff involved in research, QI, or technology implementation. Examples of CSC activities include: protocol development, research, facilitation of medical device trials, and advising the LifeNet Board and CEO regarding purchase decisions for clinical enhancement. Each meeting involves ongoing review of quality initiatives and system performance so that trends identified in any one region may be compared to those of others and with peer agencies in data-sharing opportunities.

LifeNet strives to maintain relative consistency in clinical approach among regions. However, each Medical Director is at liberty to approve or facilitate variation from those norms when they better fit the practices or expectations of regional medical communities. The activities and outcomes of the CSC go hand-in-hand with Medical Advisory Boards (or their equivalent) in each region. Information shared between those groups mutually contributes to the foundation of appropriate medical care and oversight.

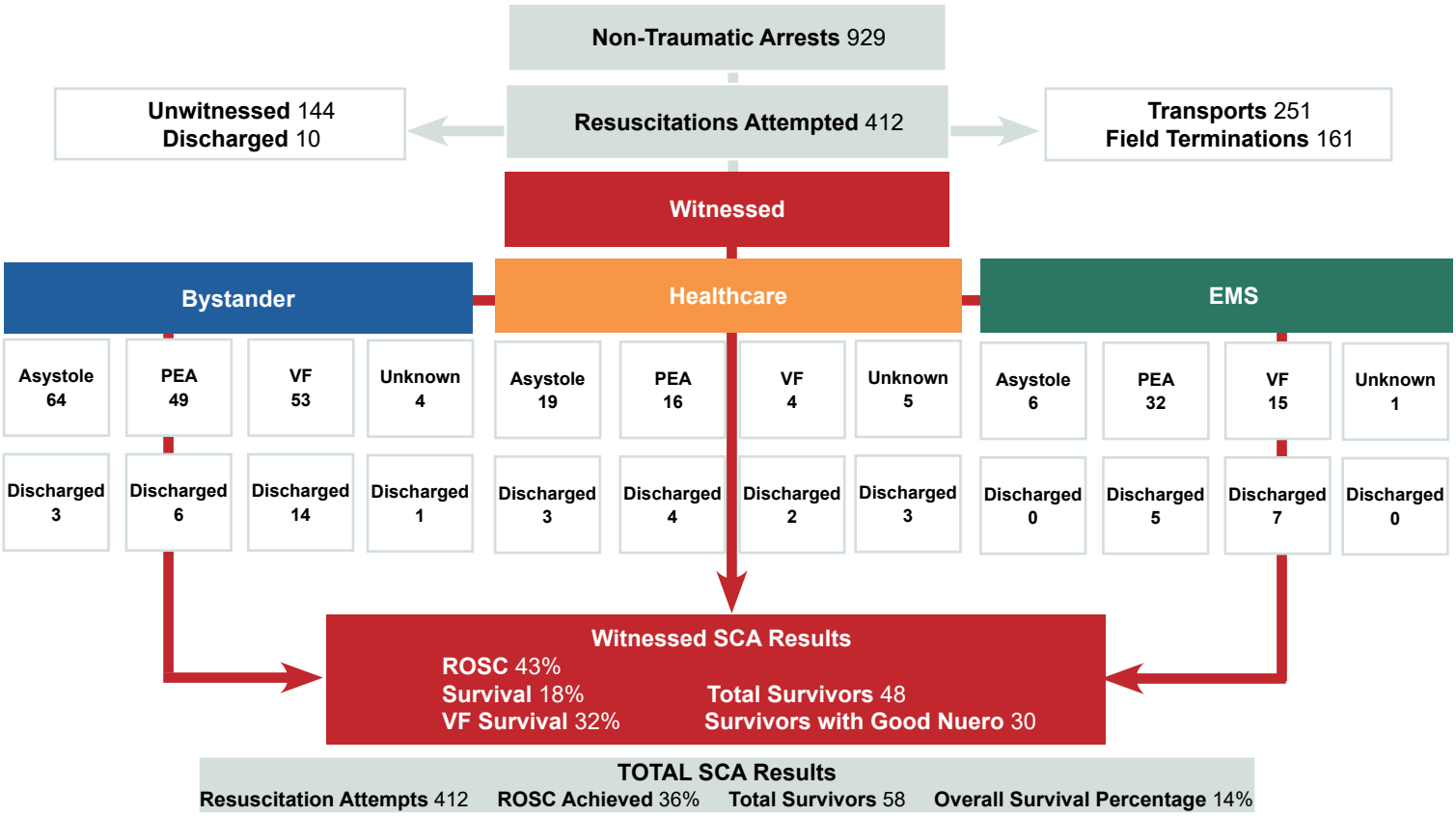
Matthew Young, MD
Medical Director, Texarkana Division
Dr. Young is the current Medical Director of Emergency Services for Texarkana Emergency Center. He has actively served on the Bioterrorism/Disaster Planning Committee, Texarkana College EMS Advisory Board, and the LifeNet Medical Advisory Committee. He was appointed to a non-funded position as the Medical Director of the Texarkana College EMS Program and is a member of the American Medical Association, American College of Emergency Physicians, Texas Medical Association, Bowie County Medical Society, the National Congressional Committee Physician's Advisory Board, and the National Association of EMS Physicians.

Patrick Cody, DO
Medical Director, Stillwater Division
Dr. Cody is a board certified emergency physician within the Norman Regional Health System. He is the program director for the Osteopathic Emergency Medicine Residency Program and the Medical Director for EMSStat ambulance service (Norman, OK), the City of Norman Fire Department, the City of Norman Communications Center, the Oklahoma City Community College EMS program and the Gomer Jones Cardiac Care Clinic inside the University of Oklahoma Gaylord Family Stadium. He is also the physician for the Norman Police Department SWAT team. His research interests are focused on pre-hospital care and its intersection with disaster medicine.

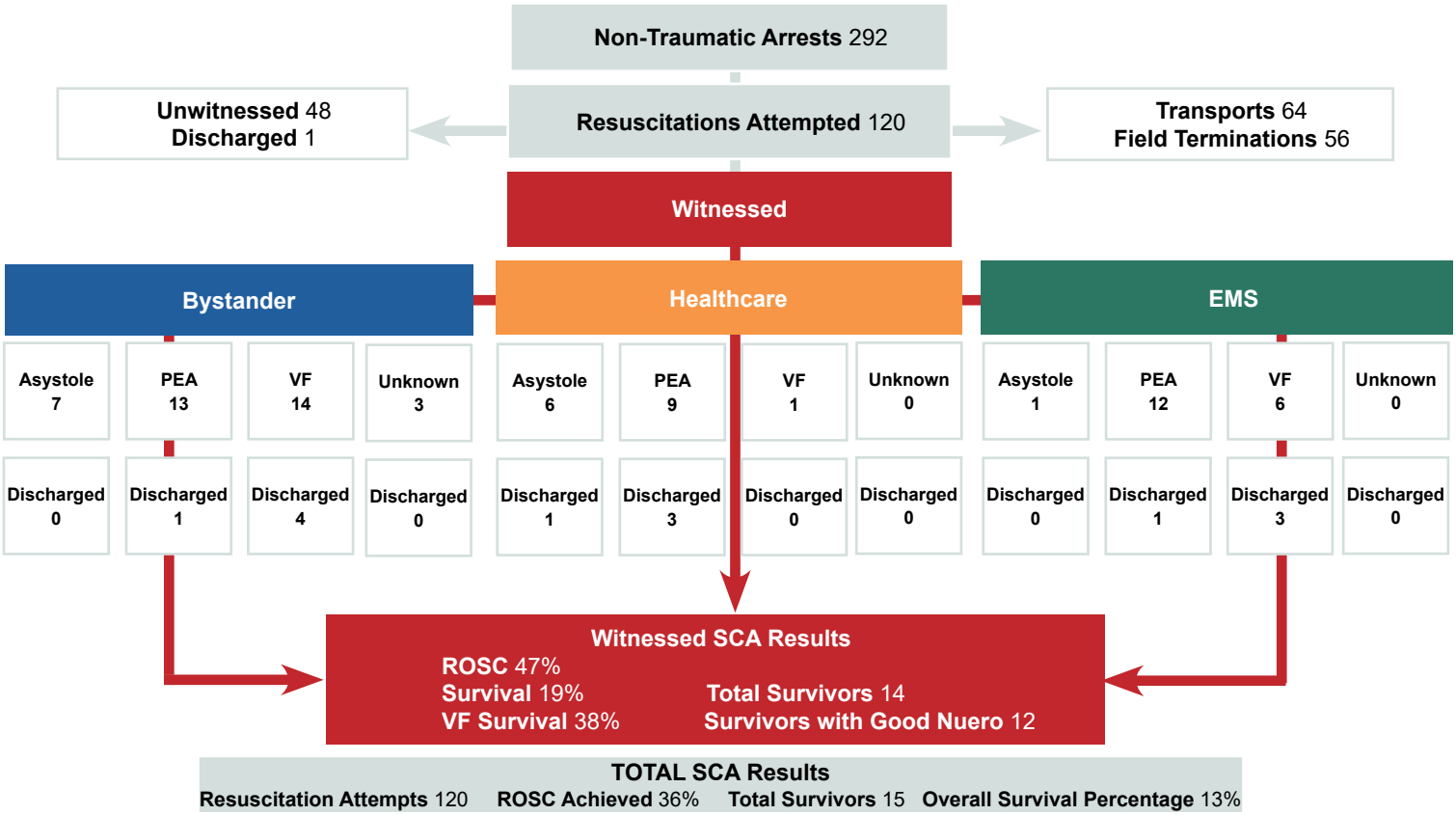
Karl Wagenhauser, MD
Medical Director, Hot Springs/Garland County
Dr. Wagenhauser serves as Medical Director for the Hot Springs Fire Department and AED program. He is a licensed physician specializing in Emergency Medicine and is currently on staff at CHI St. Vincent Hospital in Hot Springs. He is Board Certified in Emergency Medicine and a Fellow of the American College of Emergency Physicians. No stranger to EMS, he cultivated an interest in prehospital care early in his career, working as an EMT-Intermediate for his college ambulance service while still an undergraduate. He was one of the first two physicians in the State of Arkansas to successfully complete the EMS Certificate Examination, a subspecialty certification recognized by the American Board of Emergency Medicine

Andrew Bryan, MD
Medical Director, Malvern/Hot Spring County
Dr. Bryan attended medical school at the University of Arkansas for Medical Sciences and did his residency at Louisiana State University Emergency Medicine. He is Board Certified in Emergency Medicine through the American Board of Emergency Medicine and active in the American College of Emergency Physicians. Dr. Bryan is currently on staff at CHI St. Vincent Hospital in Hot Springs as well as Baptist Health Medical Center-Hot Spring County.

System Wide (Adult - Medical)



Texarkana, USA (Adult - Medical)



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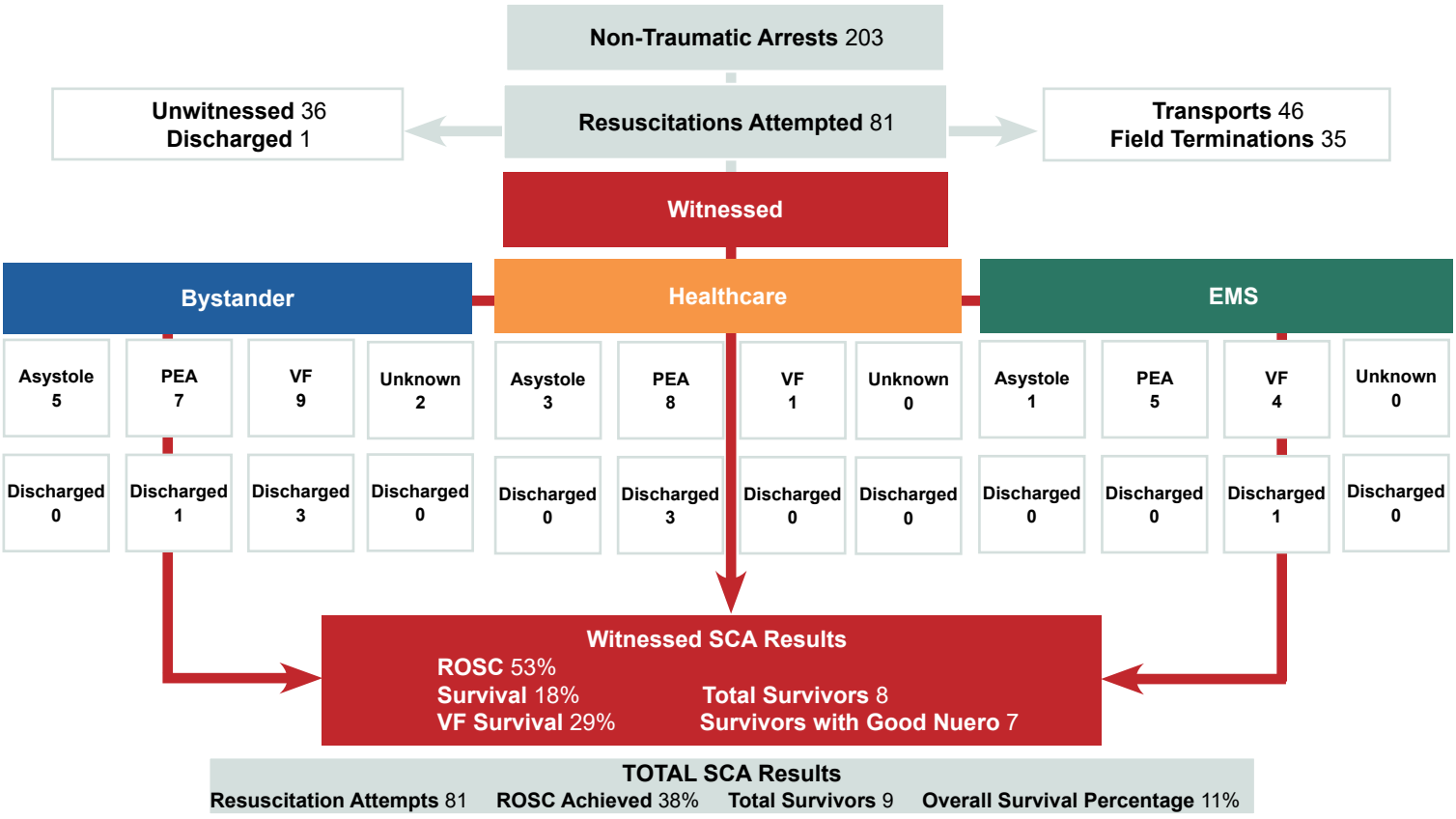
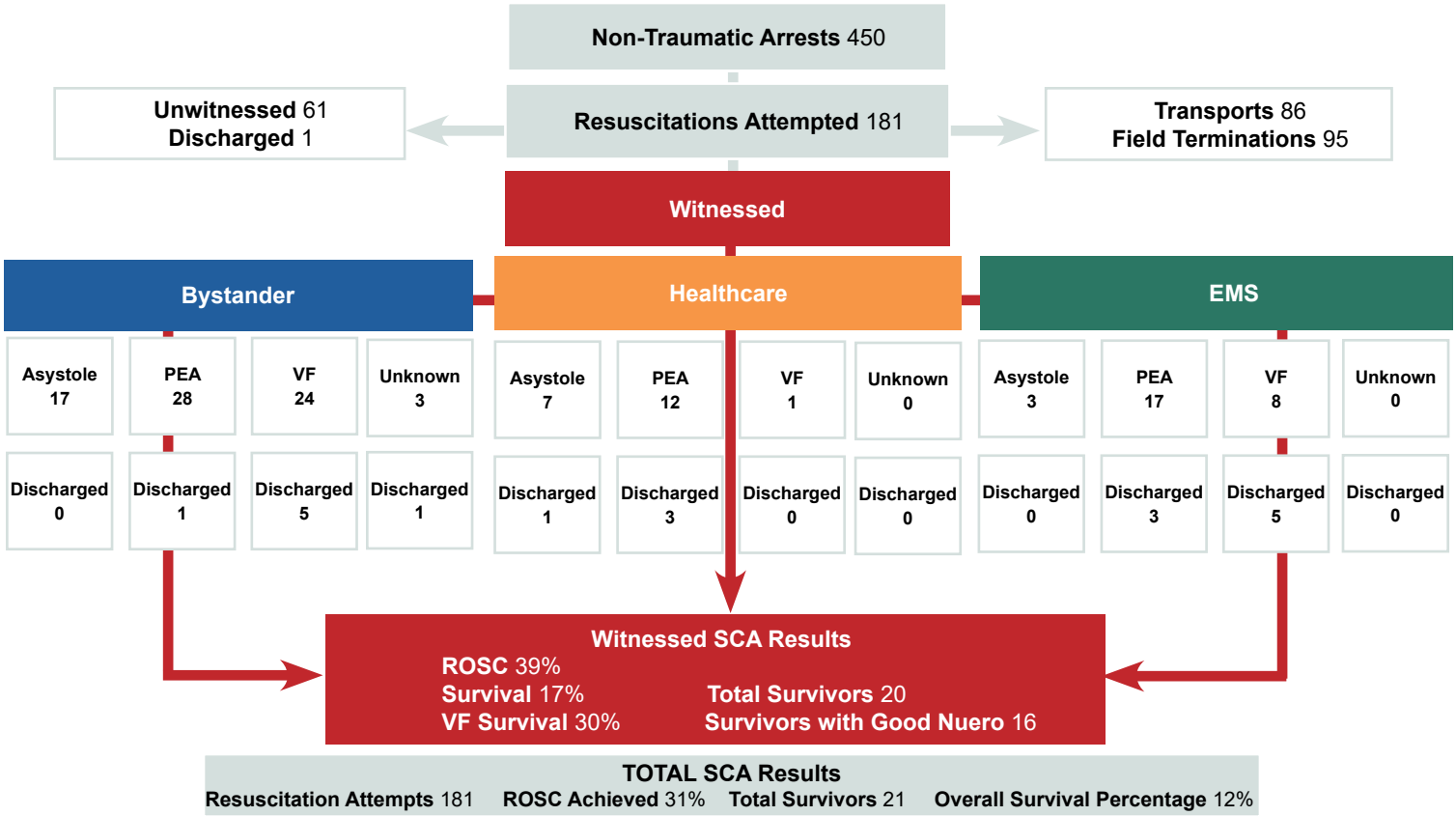
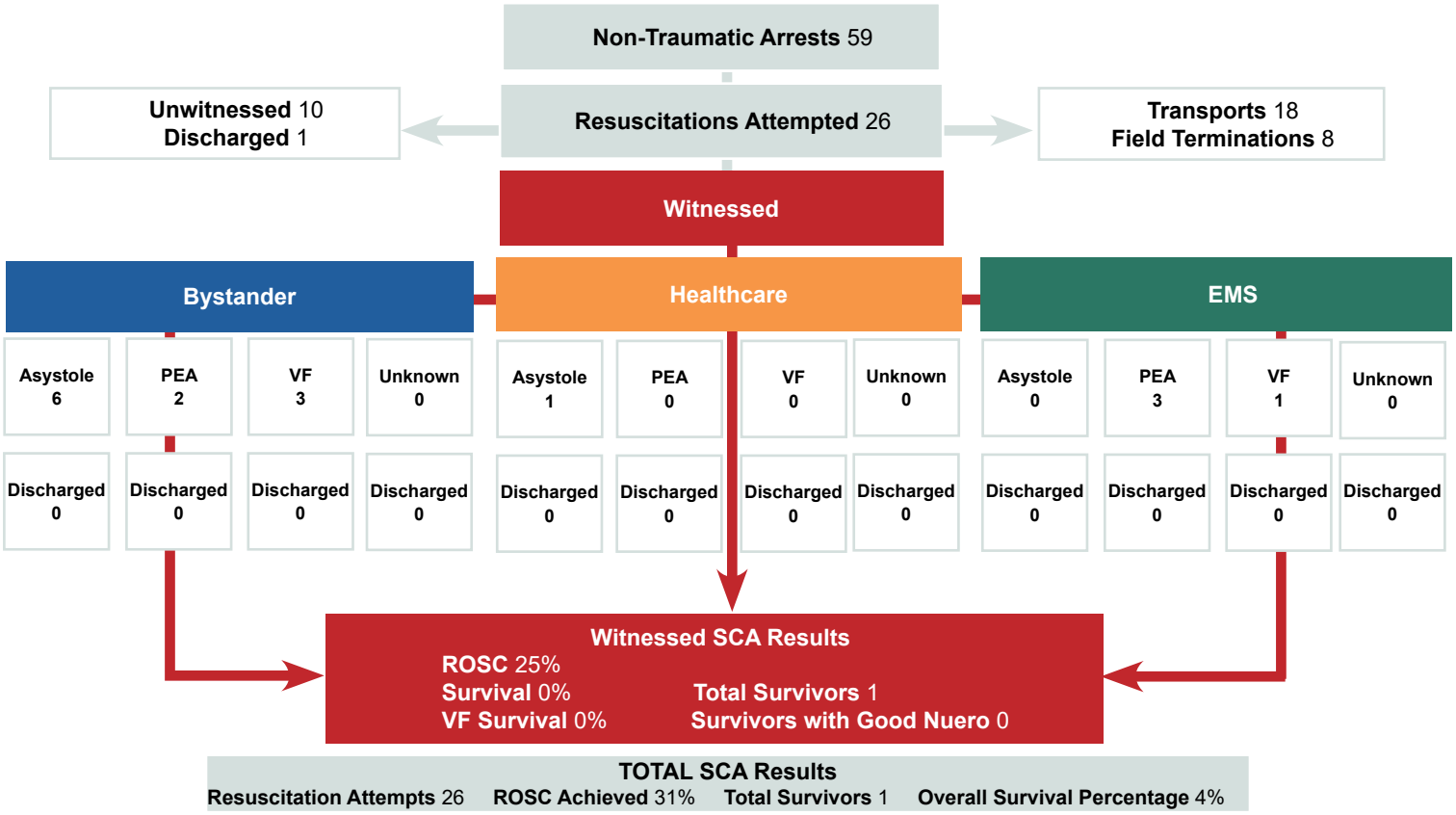


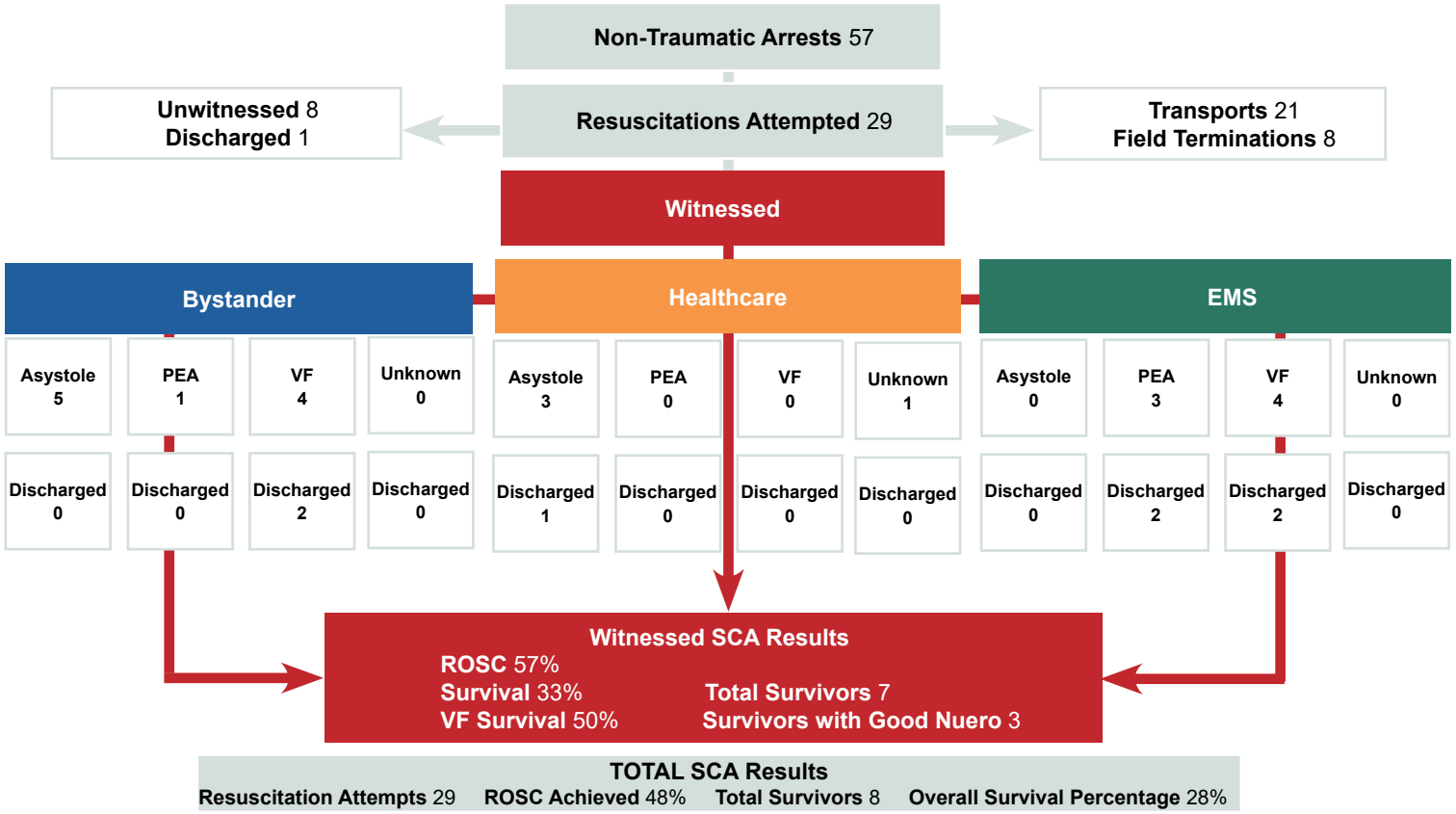
Texarkana Division (Adult - Medical)



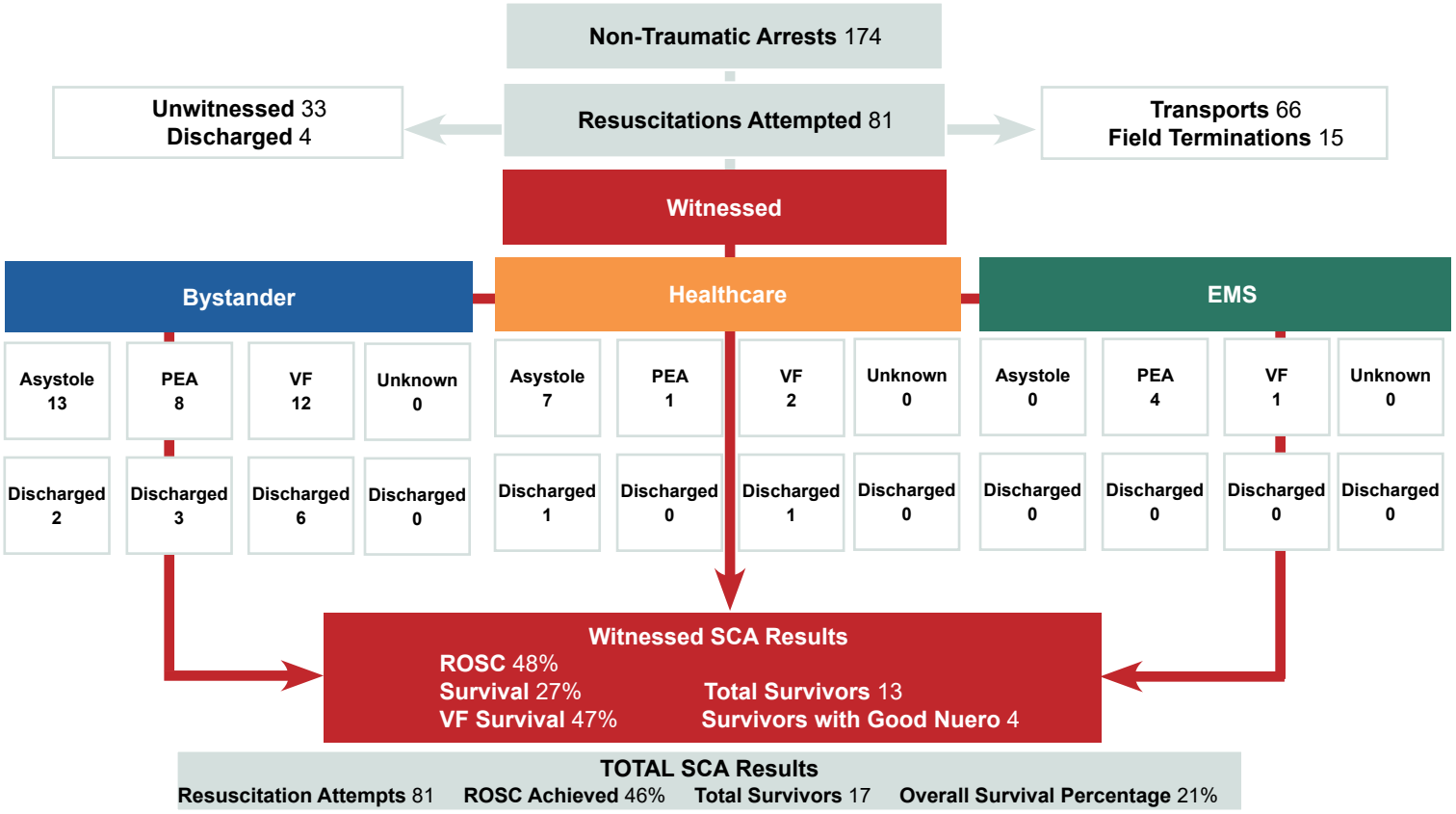
Hot Springs Village, Arkansas (Adult - Medical)



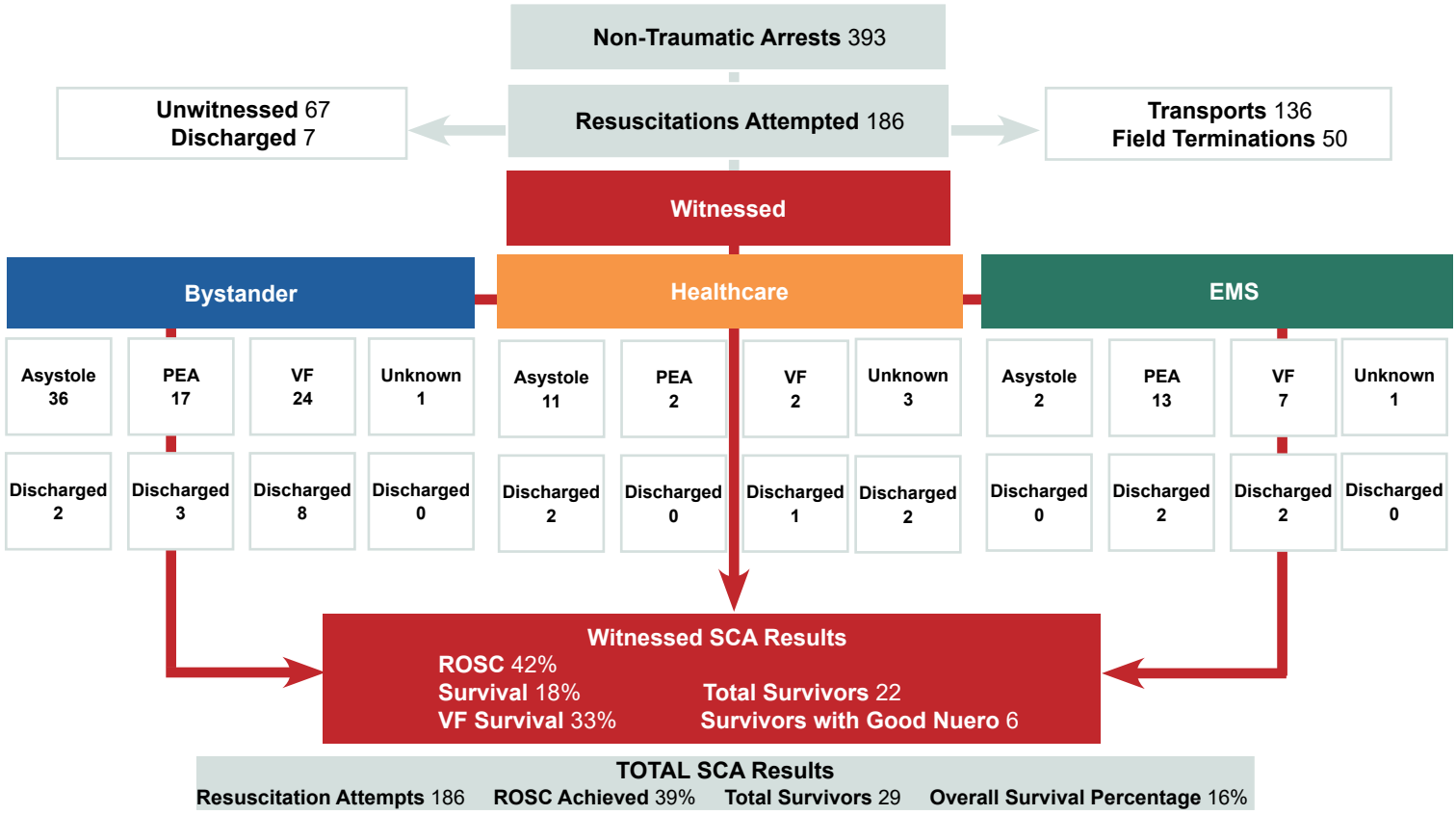
Malvern, Arkansas (Adult - Medical)



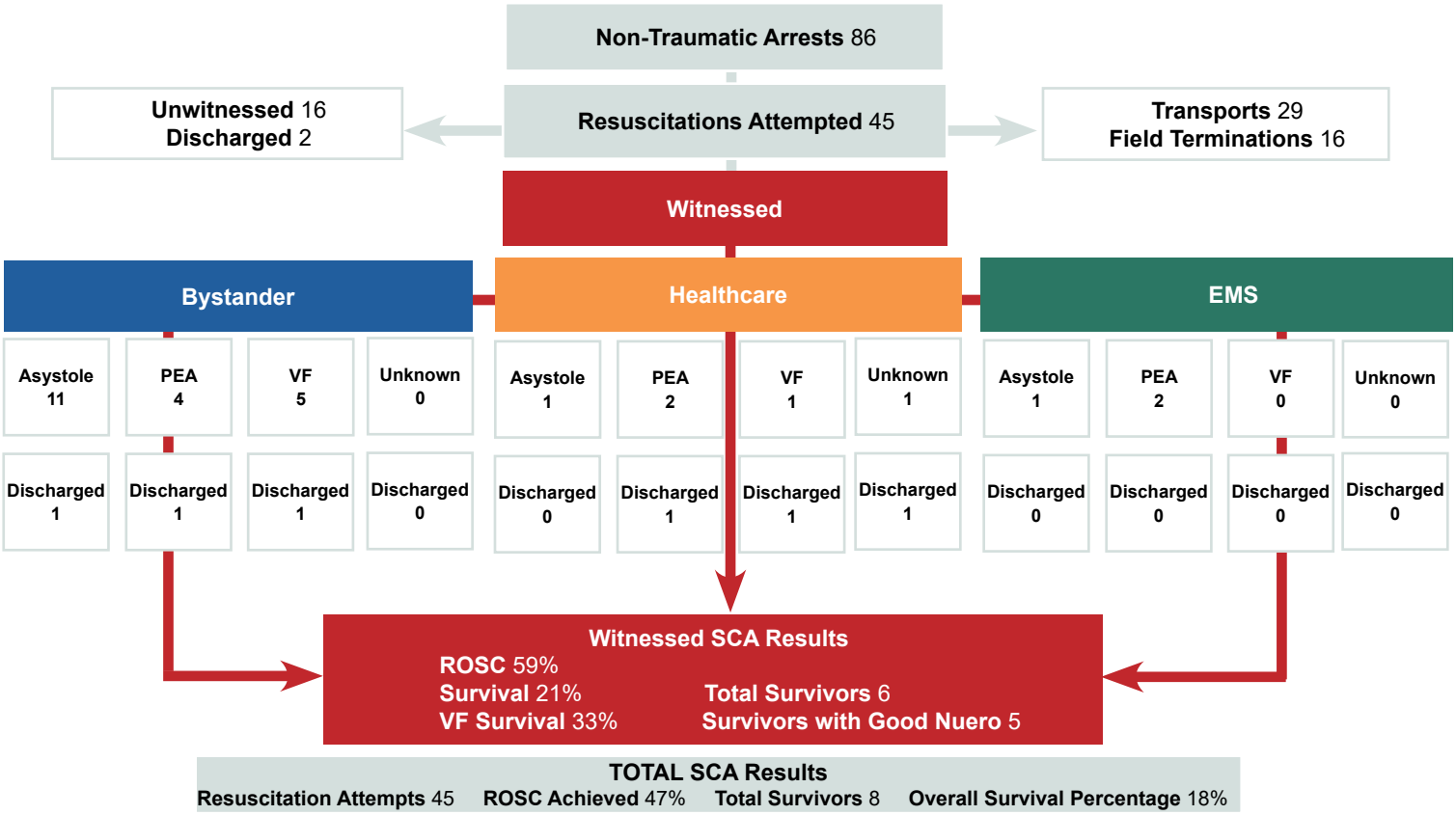
Hot Springs, Arkansas (Adult - Medical)



Hot Springs Division (Adult - Medical)



Stillwater Division (Adult - Medical)



Appendix Key

Asystole
Absence of Electrical Activity

"Good" Neuro Outcome
Equivalent to a CPC 1

"Fair" Neuro Outcome
Equivalent to a CPC 2

"Poor" Neuro Outcome
Equivalent to a CPC 3 and CPC 4

PEA
Pulseless Electrical Activity

VT/VF
(Pulseless) Ventricular Tachycardia / Ventricular Fibrillation

Appendix Notes

Hot Springs Division
Includes data for all calls run within the Hot Springs Division. This area includes Garland County, part of Hot Spring County, and all of Hot Springs Village.

Hot Springs, AR
Includes data for all calls run in Hot Springs, AR.

Hot Springs Village, AR
Includes data for all calls run in Hot Springs Village, AR.

Malvern, AR
Includes data for all calls run in Malvern, AR.

Stillwater Division
Includes data for all calls run within the Stillwater Division. This area includes Western Payne County, OK.

Appendix Notes

System Wide
Includes data for all calls run across all of LifeNet's service areas.

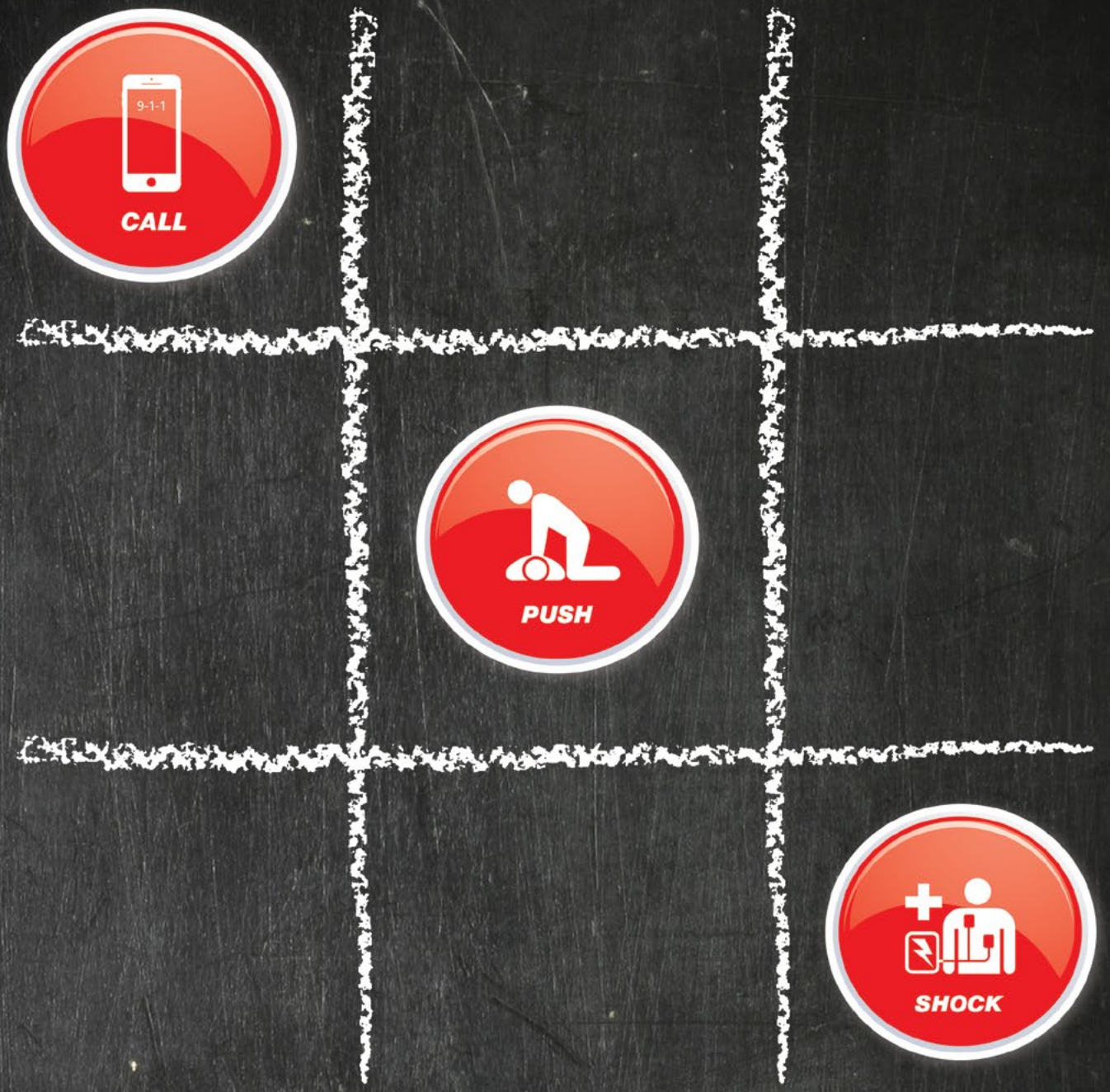
Texarkana, USA
Includes data for all calls run in Texarkana, TX and Texarkana, AR.

Texarkana, TX
Includes data for all calls run in only Texarkana, TX.

Texarkana Division
Includes data for all calls run within the Texarkana Division. This area includes Miller County in Arkansas along with Bowie, Red River, and parts of Cass County in Texas.

2019 Sudden Cardiac Arrest Survivor Data

Run Date	Jurisdiction	Response Time	Pt Age	Gender	Witnessed	AED Defib	Presenting Rhythm	Transport Destination	Neuro
1/6/2019	HS	0:02:08	61	M	Lay Person	No	VT	Natl Park - HS	Fair
1/9/2019	TXK	0:07:54	80	M	Healthcare Provider	No	PEA	Wadley - TXK	Good
1/12/2019	SWO	0:06:10	56	F	Healthcare Provider	Yes, w/o defib	PEA	Stillwater Med Center	Good
1/22/2019	TXK	0:19:16	69	F	LifeNet EMS	No	PEA	St. Michael - TXK	Fair
1/27/2019	HS	0:05:16	69	M	Healthcare Provider	No	VF	Natl Park - HS	Good
2/3/2019	HS	0:05:58	41	M	Family Member	No	PEA	St. Vincent - HS	Fair
2/6/2019	TXK	0:15:26	60	M	LifeNet EMS	No	VF	Wadley - TXK	Good
2/8/2019	HS	0:06:31	80	M	LifeNet EMS	No	PEA	Baptist - Malvern	Poor
2/8/2019	HS	0:14:59	80	M	LifeNet EMS	No	PEA	Baptist - Malvern	Poor
2/9/2019	TXK	0:07:00	64	M	LifeNet EMS	No	VF	Wadley - TXK	Good
2/23/2019	TXK	0:03:34	32	F	Healthcare Provider	No	PEA	Wadley - TXK	Good
2/24/2019	TXK	0:03:57	54	M	Family Member	No	VF	St. Michael - TXK	Good
3/10/2019	HS	0:10:12	30	M	Healthcare Provider	No	Unknown Rhythm	St. Vincent - HS	Good
3/20/2019	SWO	0:16:17	51	F	Not Witnessed	Yes, w/o defib	Unknown Rhythm	Stillwater Med Center	Good
3/21/2019	HS	0:03:37	75	M	Lay Person	Yes, w/ defib	Unknown Rhythm	St. Vincent - HS	Good
3/23/2019	TXK	0:06:40	73	F	Family Member	No	VF	St. Michael - TXK	Good
3/27/2019	HS	0:06:14	64	M	Not Witnessed	No	VF	St. Vincent - HS	Good
4/2/2019	HS	0:06:25	90	M	Family Member	No	Asystole	Natl Park - HS	Poor
4/2/2019	HS	0:03:44	60	M	Lay Person	Yes, w/ defib	Unknown Rhythm	St. Vincent - HS	Good
4/3/2019	SWO	0:15:00	65	M	Family Member	No	Asystole	Stillwater Med Center	Poor
4/6/2019	TXK	0:05:24	33	M	Lay Person	No	Unknown Rhythm	Wadley - TXK	Good
4/7/2019	HS	0:06:16	60	M	Not Witnessed	No	PEA	St. Vincent - HS	Poor
4/12/2019	TXK	0:04:24	59	F	Family Member	No	VF	Wadley - TXK	Good
5/7/2019	TXK	0:02:28	67	M	Lay Person	No	VF	St. Michael - TXK	Good
5/19/2019	SWO	0:11:31	56	M	Not Witnessed	Yes, w/ defib	Unknown Rhythm	Stillwater Med Center	Good
5/23/2019	TXK	0:07:22	68	F	LifeNet EMS	No	VF	PRMC-North	Fair
6/4/2019	TXK	0:06:55	50	M	Lay Person	Yes, w/Defib	VF	Wadley - TXK	Good
6/7/2019	HS	0:11:22	38	M	Not Witnessed	Yes, w/ defib	VF	St. Vincent - HS	Poor
6/21/2019	TXK	0:11:54	64	M	LifeNet EMS	No	PEA	St. Michael - TXK	Fair
7/16/2019	HS	0:13:30	85	F	LifeNet EMS	No	VF	Baptist - Malvern	Poor
8/5/2019	HS	0:08:37	42	M	Lay Person	Yes, w/ defib	VT	Baptist - Malvern	Good
8/13/2019	TXK	0:05:11	64	F	Not Witnessed	Yes, w/ Defib	VF	St. Michael - TXK	Good
8/15/2019	TXK	0:21:42	79	F	LifeNet EMS	No	VF	St. Michael - TXK	Good
8/20/2019	HS	0:09:56	64	F	Healthcare Provider	No	Unknown Rhythm	St. Vincent - HS	Good
8/22/2019	HS	0:12:08	65	M	Healthcare Provider	Yes, w/ defib	Asystole	Natl Park - HS	Fair
8/30/2019	HS	0:05:32	63	F	Not Witnessed	No	PEA	St. Vincent - HS	Fair
9/4/2019	TXK	0:04:15	73	F	Healthcare Provider	Yes, w/o Defib	Asystole	St. Michael - TXK	Good
9/5/2019	HS	0:05:43	70	F	Family Member	No	PEA	St. Vincent - HS	Poor
9/8/2019	TXK	0:20:22	80	F	Family Member	Yes, w/o Defib	PEA	Landing Zone	Good
9/8/2019	SWO	0:04:39	44	M	Lay Person	No	VF	Stillwater Med Center	Good
9/13/2019	HS	0:03:48	82	M	Not Witnessed	No	VF	St. Vincent - HS	Poor
9/23/2019	HS	0:03:51	49	M	Not Witnessed	No	Unknown Rhythm	St. Vincent - HS	Good
9/25/2019	TXK	0:17:42	70	F	LifeNet EMS	No	PEA	St. Michael - TXK	Good
9/29/2019	TXK	0:10:05	53	M	LifeNet EMS	No	VF	St. Michael - TXK	Good
9/29/2019	TXK	0:05:37	47	M	Lay Person	No	PEA	Wadley - TXK	unk
10/27/2019	HS	0:07:49	54	F	Lay Person	No	VF	St. Vincent - HS	Fair
10/28/2019	TXK	0:05:27		M	Healthcare Provider	Yes, w/o Defib	PEA	St. Michael - TXK	Good
11/9/2019	HS	0:10:37	45	M	LifeNet EMS	No	VF	St. Vincent - HS	Good
11/26/2019	SWO	0:03:52	19	M	Healthcare Provider	Yes, w/ defib	Unknown Rhythm	Stillwater Med Center	Good
11/27/2019	HS	0:05:22	66	F	Family Member	No	PEA	Natl Park - HS	Good
11/29/2019	HS	0:05:02	75	F	Healthcare Provider	No	Asystole	Baptist - Malvern	Poor
11/30/2019	HS	0:05:03	84	F	Not Witnessed	No	PEA	Baptist - Malvern	Poor
12/12/2019	HS	0:04:43	46	F	Family Member	No	VF	Baptist - Malvern	Good
12/16/2019	HS	0:06:13	73	M	Family Member	Yes, w/ defib	VT	St. Vincent - HS	Poor
12/17/2019	HS	0:04:53	66	F	Lay Person	No	VF	St. Vincent - HS	Fair
12/20/2019	SWO	0:04:17	84	M	Family Member	No	PEA	Stillwater Med Center	Good
12/22/2019	SWO	0:03:54	80	M	Healthcare Provider	No	OLR	Stillwater Med Center	Good
12/27/2019	HS	0:08:46		F	Lay Person	No	Asystole	Natl Park - HS	Fair



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