Medical Control Board
Office of the Medical Director

Annual Report from the Medical Director
Operational & Fiscal Year July 2019 - June 2020

Report Structure

Continuing with this year's Medical Control Board/Office of the Medical Director (MCB/OMD) Annual Report, based upon feedback from key government and EMS system leaders in metropolitan Oklahoma City and Tulsa, the content is structured for efficient and purposeful review of key activities accomplished by MCB physicians, the Chief Medical Officers, and OMD professionals.

Medical Oversight Design

The **Medical Control Board** is established by the Emergency Physician Foundations of Oklahoma City (Western Division) and Tulsa (Eastern Division). The Medical Control Board is comprised of eleven physicians devoting volunteer service to the patients served by the EMS system for metropolitan Oklahoma City and Tulsa and to the dedicated men and women rendering emergency medical care as an Emergency Medical Dispatcher, Emergency Medical Technician (EMT), EMT-Intermediate, Advanced EMT, or Paramedic. By design, emergency physicians constitute all positions on the MCB with exception of one position designated filled by another physician medical specialist. The emergency physicians most typically represent the busiest emergency departments in the areas served by the EMS system. The following physicians served on the MCB during this operational and fiscal year:

Chad Borin, DO, FACOEP – St. Anthony Hospital (Oklahoma City)
Chair
Russell Anderson, DO– Hillcrest Hospital South (Tulsa)
Vice Chair
David Smith, MD – Integris Baptist Medical Center (Oklahoma City)
Secretary
Roxie M. Albrecht, MD, FACS, FCCM – Trauma Surgery/Surgery Critical Care (Oklahoma City)
Barrett T. Bradt, MD – Saint Francis Hospital (Tulsa)
Jeffrey D. Dixon, MD, FACEP – Hillcrest Medical Center (Tulsa)
David Gearhart, DO, FACOEP – Oklahoma State University Medical Center (Tulsa)
Karyn Koller, MD - University of Oklahoma Medical Center (Oklahoma City)
John Nalagan, MD, FACEP – Mercy Hospital (Oklahoma City)
Keri Smith, DO – Integris Southwest Medical Center (Oklahoma City)
Michael Smith, MD, FACEP – St. John Medical Center (Tulsa)

The MCB meets bimonthly to review a report from the President of the Emergency Medical Services Authority, a report from the Chief Medical Officers, standard of medical care advancements and/or revisions endorsed by the Chief Medical Officers, financial statements of the MCB/OMD, and new business brought before the MCB by any interested party.

The Chief **Medical Officer** is the day-to-day recognized clinical authority in the EMS system, serving as such between times the MCB is meeting. *Jeffrey M. Goodloe, MD, NRP, FACEP, FAEMS, LSSBB* is the Chief Medical Officer for all agencies receiving medical oversight from the MCB/OMD.

Beginning July 1, 2009, the MCB contracted with the Department of Emergency Medicine at the University of Oklahoma's School of Community Medicine for physician medical director services. Substantial benefits to the EMS system and its patients are achieved through this arrangement, bringing research and educational capabilities from the University of Oklahoma, its emergency medicine residency program, and its collegial network of medical professionals.

This year is Dr. Goodloe's eleventh year as the Chief Medical Officer (formerly titled Medical Director) for the MCB/OMD. For familiarization purposes, his biography can be found at the MCB/OMD website, okctulomd.com.

The **Office of the Medical Director** is comprised of the following professionals:

Jeffrey M. Goodloe, MD, NRP, FACEP, FAEMS, LSSBB – Chief Medical Officer
Curtis L. Knoles, MD, FAAP – Assistant Chief Medical Officer
David S. Howerton, NRP – Division Chief – Medical Oversight - West (Metro Oklahoma City)
Duffy McAnallen, NRP – Division Chief – Medical Oversight - East (Metro Tulsa)
Matt Cox, NRP – Division Chief - Critical Care Analytics
Kimberly Hale – Administrative Assistant

OMD professionals work daily to assist public safety agencies charged with emergency medical services responsibilities to fulfill those according to the clinical care standards established by the MCB. Medical outcomes determinations, individual medical care review, personnel education, personnel credentialing, equipment/vehicle performance review and inspection are just some of the myriad activities performed in support of excellence in pre-hospital emergency medical care.

All OMD division chiefs are particularly experienced and gifted clinicians and administrative leaders, guided by admirable work ethic. Each has served this and other EMS systems in a multitude of responsibilities, beginning with field service and progressing to their current oversight duties.

Philosophy of Medical Oversight

The provision of emergency medical services is more than public safety in metropolitan Oklahoma City and Tulsa; it is a practice of medicine delegated by the MCB's Chief Medical Officer to over 4,000 non-physician EMS professionals serving over 1.5 million residents, workers, and visitors of the affiliated cities.

Just as an individual has right to access an educated, qualified, and credentialed physician providing progressive medical care in times of illness or injury, it is incumbent the EMS system serving metropolitan Oklahoma City and Tulsa provide educated, qualified, and credentialed EMS professionals authorized to deliver the finest pre-hospital medical care available. When an individual in this service area experiences sudden, unexpected medical symptoms from relatively benign, though concerning pain, to the extreme severity of cardiopulmonary arrest, he or she can rest assured individuals answering the call for help will be trained and prepared to address the medical situation at hand. This cannot happen without up-to-date, progressive medical treatment protocols, accompanying education and training, and a comprehensive credentialing program.

Beginning July 1, 2009, the MCB/OMD committed to bringing its medical treatment protocols to new standards, unparalleled amongst large, urban EMS systems in the United States. Protocols were added, updated, and/or reformatted consistently at MCB meetings this year as summarized within this annual report. All MCB treatment protocols continue to follow the now MCB-recognized innovative, evidenced-based format. In other words, additional clinical capabilities and care are being added and provided for the patients needing those most. This commitment to excellence in pre-hospital emergency care reflects the drive and energy of the MCB, Chief Medical Officers, OMD professionals, leaders in affiliated fire departments and EMSA, and all field EMS professionals.

Throughout the operational year, these MCB treatment protocols continued to be referenced and indexed by benchmarking EMS systems within the United States and even abroad. The patients of this EMS system can continue to rest assured they are receiving the absolute best in pre-hospital emergency medical care.

Further supporting front-line clinical personnel, the Chief Medical Officers and the OMD Division Chiefs are collectively available 24/7/365 for real-time paramedic clinical consults, most often made for 1) complicated patient presentations; 2) high-risk to patient safety patient-initiated refusals of further assessment, on-scene care, care enroute to hospital, and/or ambulance transport; or 3) field termination of cardiopulmonary arrest resuscitations.

Key Advances in Medical Treatment Protocols

Heat Stroke – Athletic Participants with Field Cooling Capabilities On-Site at Event – a multidisciplinary, multi-medical specialty protocol introduction led by the OMD team. This protocol synergizes the interests of emergency physicians, orthopedic/sports medicine physicians, athletic trainers, coaches and school districts in keeping athletes safe from heat stroke and if succumbing to heat stroke, rapid on-site cooling to achieve safer core body temperature prior to ambulance transport to a hospital-based emergency department.

Positive End-Expiratory Pressure – introducing a new protocol with pediatric-focused treatment for sudden cardiac arrest presentations.

Categorization of Hospitals – updating clinical care capability additions at multiple hospitals in the metropolitan Oklahoma City and metropolitan Tulsa areas.

MCB/OMD Administrative & Clinical Policies

Historically, most administrative actions of the MCB/OMD prior to July 2009 had been "management by memo" in structure. Over time as the EMS system grew and structure, those memos proved difficult to track, confusing in intent, dated in instruction, and while unintentional, contradictory in direction. In efforts to be more transparent in operation, clearer in administrative and clinically-related expectations, and to better support field professionals, the Chief Medical Officer specified creation of an MCB/OMD Policy and Procedural Manual in the 2009 – 2010 operational and fiscal year to accompany the Medical Treatment Protocols. Like the treatment protocols, this continues to prove a multi-year project due to scope and nature of

always advancing the practice of EMS medicine and its oversight. During this operational year, the MCB/OMD policies & procedures were reviewed, updated and available on the MCB/OMD website and redesigned smartphone and tablet app.

MCB/OMD Review of System Performance Parameters

Basic Life Support EMSA Ambulances – Working in conjunction with EMSA leadership and GMR operations, this tier of ambulance response has continued to prove successful in its second year of operation. This program allows EMTs to fully utilize their assessment skills and garner valuable experience with electronic health records. Efficiency for Advanced Life Support (Paramedic) Ambulance response is gained as BLS ambulances can be allocated to a scope of incidents, including hospital to home, BLS level hospital to hospital, organ harvesting team transfers, and helipad/airport to hospital with flight crews maintaining primary patient care responsibility. EMTs assigned to this program have performed notably well.

Response Times – EMSA calculates and supplies MCB/OMD with monthly performance reports regarding response times by Global Medical Response (formerly known as American Medical Response), EMSA's contractor for clinical and clinically-related administrative services. All monthly reports supplied to MCB/OMD by EMSA were personally reviewed by the OMD Division Chiefs, the Chief Medical Officers, and the MCB. Reports most typically indicate aggregate compliance with contracted response time standards, with exceptions in which Global Medical Response was held accountable by EMSA per contractual specifications. Fire departments, particularly the larger departments, such as Oklahoma City and Tulsa supply their response times for EMS-related calls monthly as well. These reports are personally reviewed by the OMD Division Chiefs and the Chief Medical Officers monthly. All reports indicate reasonable response time performances.

Response time allowance changes approved by the EMSA Board of Trustees that went into clinically operational effect on November 1, 2013 continued throughout this operational year. This specifically allowed for the historical 8:59 Priority 1 standard to be extended to 10:59 within the beneficiary cities. Priority 2 responses were also extended, specifically from 12:59 to 24:59, with notable cessation of red lights and sirens (RLS) use. Significant safety benefits of these changes were anticipated and observed during their seventh operational year, yet no clinical detriments in patients relatable to these response time allowance changes were noted by the Chief Medical Officers and OMD Division Chiefs.

Hospital-Initiated EMS Diversion Requests – GMR calculates and supplies to the EMSA CIO for MCB/OMD monthly reports on the number of hospital-initiated EMS diversions their personnel encountered in ambulance transports. All monthly reports supplied to MCB/OMD by GMR were personally reviewed by the OMD Division Chiefs, the Chief Medical Officers, and the MCB. Most reports indicate reasonably desirable control of diversion numbers by hospitals in the service area. In May of 2008, the MCB took action to reduce then-elevating numbers of hospital-initiated EMS diversion requests by instituting a protocol that allows paramedics to override such requests if the patient was clinically stable and had a pre-existing relationship with

that hospital, its network, and/or a physician on its active or referring medical staff. The effects of that protocol continue to show positive impact as the EMS system promotes patients receiving continuity of care for better clinical outcomes and fiscal stewardship.

A continuing area of concern related to hospital emergency department patient saturation is EMS "bed delay" times. This time period begins when EMSA EMTs and paramedics arrive in an emergency department with the patient packaged on the stretcher and encounter no available beds in which to transfer the patient for ED care and extends to the time in which a transfer into a bed or chair occurs. The Chief Medical Officer advised the MCB of continuing concerns, stemming from prior analysis prepared by EMSA, supporting anecdotal experiences detailed in daily EMSA Field Operations Supervisor Reports that ambulances were being held, at times, over 1 hour at hospitals. The problem continues to be more prevalent in Tulsa than Oklahoma City, likely due to fewer hospitals serving its metropolitan area, though some improvements were noted for a third continuous year throughout this operational year. COVID-19 has most recently had significant impact upon hospital emergency department volumes, specifically decreasing them by up to 40%. While the Chief Medical Officers and OMD Division Chiefs are concerned about the dynamic of persons avoiding use of EMS and hospitals, fearful of contracting COVID-19 in the processing seeking emergent medical care, the benefits to those that do seek care has been a near eradication of "bed delay" once arrived at their appropriate emergency department. The Chief Medical Officer anticipates an unfortunate return of "bed delay" as patient volumes normalize back to historical volume trends.

Trauma Priority & Destination Reports – GMR calculates and supplies MCB/OMD monthly reports detailing the numbers and percentages of trauma patients by priorities (One, Two, or Three) and destinations. All monthly reports supplied to the MCB/OMD by GMR were personally reviewed by the OMD Division Chiefs, the Chief Medical Officers, and the MCB. All reports indicate continuance of the following: 1) Priority One Trauma patients comprise <15% of traumas monthly, with most months seeing <10%. 2) Documentation supporting patients identified as Priority One Trauma is typically at or above 90%. 3) Destination for Priority One Trauma patients is appropriately selected at or above 98% of the time. Deviations from appropriate destination selection are reviewed with individual paramedics making those deviations.

Clinical Continuous Quality Improvement Agency Reports – GMR and fire department EMS liaisons calculate and supply MCB/OMD monthly reports detailing the activities related to EMS in the respective agency. All agencies with EMT-Intermediates, Advanced EMTs and/or Paramedics regularly adhere to the requirements to supply these reports. Content is comprised of call types and volumes, airway management performance, cardiac arrest management performance, intravenous access performance, pharmaceutical utilization, and educational initiatives. All monthly reports supplied to the MCB/OMD by these agencies with advanced life support capabilities were personally reviewed by the OMD Division Chiefs and the Chief Medical Officers. These reports consistently reflect that agency personnel are meeting or exceeding the clinical expectations of MCB/OMD. Summary statements of these reports are either reported to the MCB by Dr. Goodloe and/or the full agency reports are available for review to any MCB physician at their request. Smaller, basic life support fire departments are varied in their reporting consistencies. OMD Division Chiefs and the Chief Medical Officers

continue to work with these departments to facilitate timely and consistent reporting of their activities.

Cardiac Arrest Outcomes – The EMS System for Metropolitan Oklahoma City and Tulsa continues to achieve enviable outcomes in cardiac arrest. Whereas the national average for survival from out-of-hospital cardiac arrest (witnessed arrest, bystander CPR, and shockable cardiac dysrhythmia upon EMS arrival) has improved to nearly 13.6%, outcomes in Oklahoma City and Tulsa are well above this national aggregate performance. See Attachment A – 2018 Cardiac Arrest Report. The 2019 Cardiac Arrest Report is being completed at the time of this Annual Report and will be posted on the MCB/OMD website ahead of next year's Annual Report.

Response Vehicle Inspections – OMD Division Chiefs continue to inspect new emergency medical response vehicles, such as fire engines and ambulances, to ensure correct medical equipment provisioning and condition. Few deficiencies are typically discovered and immediately corrected when found.

MCB/OMD Project Initiatives

COVID-19 Updates – As the SARS-CoV-2 pandemic neared the United States, Dr. Goodloe identified the need to delineate roles within the OMD team. Since late January, Dr. Goodloe authored over 25 evidence-based medical updates designed to inform and empower EMS personnel to provide the best available care to patients with symptoms consistent with COVID-19, while protecting themselves with appropriate PPE practices. Most Updates reflect 8-10 hours of scientific research and distillation of findings into approachable consumption. These Updates were also designed to keep personnel families, key governmental leaders, the MCB, Fire Chiefs and Fire Department leadership teams, local GMR leadership, and the EMSA Board of Trustees continuously informed as well about key advances in the medical response to COVID-19. These Updates were sought by multiple EMS physicians across the United States and have become consistently posted as a resource to the entire membership of the National Association of EMS Physicians and visitors to the naesmp.org website that seek COVID-19 information. This work will continue throughout our EMS system's response and planning to the SARS-CoV-2 pandemic.

Cardiac Arrest Outcomes Optimization Program (aka "50/50" Program) – Building upon the EMS system's pattern of admirable success in aggressively resuscitating cardiac arrest victims, the MCB continued promulgated sophisticated resuscitation team dynamic protocol standards. These standards detail optimal team role performances to maximize chest compression fraction time, reduce delays in timely defibrillation, and achieve coordinated efforts in lifesaving.

Cardiac arrest resuscitation team dynamics continue to be reinforced during continuing education for all current EMS professionals in the system and are reviewed in focused detail during the orientation for all EMS professionals joining this system. Coordinated skill precision is further reinforced through individual feedback supplied to all EMS professionals involved in a specific resuscitation. Utilizing the CodeSTAT software platform, resuscitation care elements (chest compressions, ventilations, defibrillations) are analyzed by the OMD Division Chief - Critical

Care Analytics, annotated for clinical event accuracy, and then reported to the Chief Medical Officers, OMD Division Chiefs – Medical Oversight, and relevant agency CQI personnel to then be forwarded to the frontline clinical personnel actually performing the care analyzed. This feedback is essential in reinforcing excellent care provision and helping individuals make desirable modifications for future resuscitations. Attempted resuscitations are formally annotated, and reviews are returned to CQI personnel typically within 72-96 hours to forward to front-line credentialed personnel.

The EMS system has shown abilities to produce approximately 30-40+% neurologically intact survival among victims experiencing a citizen witnessed, citizen CPR initiated, and EMS discovered shockable cardiac rhythm upon their arrival. While very good in its impact upon cardiac arrest survival, the MCB/OMD has stated a system goal of achieving 50%+ survival in the same patient types in both metropolitan Oklahoma City and Tulsa, thus the program's "50/50" description and our endless enthusiasm to achieve this goal in a multi-year progression program. See Attachment A – 2018 Cardiac Arrest Report. The 2019 Cardiac Arrest Report is being completed at the time of this Annual Report and will be posted on the MCB/OMD website ahead of next year's Annual Report.

Coordinated Continuing Education – Prior to July 2009, OMD did not have consistent interaction and oversight of continuing education in the EMS system. The results, without a hub of coordination, have proven that agencies are pursuing disparate educational initiatives, resulting in educational message inconsistencies. Work continues in rectifying these dynamics to promote consistency in educational messaging and consistency in timing of education material distribution throughout the EMS system, thereby promoting better integration of treatment plans between fire-based and EMSA-based EMS professionals. Multiple OMD-produced educational videos are also accessible on the okctulomd.com website.

EMS Professional Credentialing Testing – OMD Division Chiefs – Medical Oversight, with oversight by the Chief Medical Officer, continued the practice of verification of clinical skills performance and knowledge base testing of all professionals on a biannual basis. Continued updating of all personnel credentialing written examinations was performed with direct involvement of the Chief Medical Officers. A computer-based testing platform allows for more efficient testing access and completion for EMS professionals and OMD professionals alike.

EMS System Promotion – Metropolitan Oklahoma City and Tulsa is blessed with the multitude of dedicated EMS professionals in its EMS system. Dr. Goodloe and Dr. Knoles, with endorsement by the MCB, have continued a purposeful plan to better recognize the achievements of these EMS professionals. Academic writing, system-based research with outcomes presentations at scientific assemblies and acceptance of EMS conference speaking invitations are routinely conducted to promote this fine EMS system. The cumulative results advance the interests of patients, EMS professionals, and the cities within the service area. Specific actions in this realm included:

Second Annual State of the Future of Resuscitation International Conference – Paris, France (Goodloe)
Sweetening Up the CPR Sweet Spot: Identifying Optimal Combinations of Compression Rate & Depth
Concise Device Advice: Examining CPR Quality-Device Interactions

Society for Academic Emergency Medicine Regional Conference at UT Southwestern Medical Center – Dallas TX (Goodloe)
Tornadoes in Oklahoma: Implications for "Vulnerable" Populations.

Hillcrest Medical Center Fall CME Symposium – Kansas City MO (Goodloe)
Challenges in the Practice of EMS Medicine

EMS Today 2020/The JEMS Conference – Tampa FL (Knoles)
Update from the Eagles Panel
Pediatric Sepsis Panel – Recognition & Treatment

Response Configurations – When a caller dials 911 with a medical complaint in metropolitan Oklahoma City or Tulsa, that complaint is coded into one of approximately now 1,900 condition and acuity determinants established within the Medical Priority Dispatch System (MPDS), a proprietary medical dispatch software system. MPDS is the most widely utilized such system in developed countries around the world and is supported by evidenced-based medicine. MPDS has been adopted by the MCB in specifying clinically appropriate utilization of fire response resources, while attempting to keep as many resources available in service for highest acuity medical responses and non-medical roles (fire suppression, hazardous materials, specialized rescue, and training). The design is to promote the usually closest fire apparatus is available for response to the scene of particularly serious, time-sensitive medical emergencies, such as cardiac arrest, unconsciousness, or gunshot wounds to the chest or abdomen. The criteria utilized to determine whether fire response was selected has previously been agreed to by the affiliated fire departments. During this operational year, in scheduled and ongoing analysis, the Chief Medical Officer and OMD personnel conducted further review of each MPDS code for EMS system response configuration and priority for ambulance response.

EMSA Electronic Health Records Availability to Emergency Department/Hospital-Based Medical Practitioners – MCB physicians, the Chief Medical Officers, and OMD professionals worked collaboratively throughout the operational year with EMSA's Jim Winham and Frank Gresh to increase the accountability of GMR to provide timely patient care documentation in accordance with existing MCB policy.

ESO Data Solutions Electronic Health Record (EHR) - The MCB/OMD team is optimistic about additional clinical insights and record availability timeliness that can be realized with full implementation of EMSA's migration to the ESO Data Solutions EHR. This implementation understandably was delayed in part due to EMSA formulating a project management team and subsequently by the SARS-CoV-2 pandemic preparations and operations. The MCB/OMD team is substantively supporting and participating in the implementation process, estimated to be realized in EMSA FY 20-21. Examples of the MCB/OMD team's activities to date in these

regards include fostering high-level executive team discussions at the ESO Data Solutions world headquarters in Austin in December, leading the clinical data parameters review and selection committee in the EMS system, and attending the ESO Wave 2020 Conference in Austin in February.

We believe significant advantages are ahead for clinical insights and capabilities with fire department adoption of the same ESO Data Solutions EHR. When accomplished, this will represent the first time in the EMS system's history that both first response and ambulance transport will consistently share the same EHR.

Regional Medical Oversight Team "Best Practices" and Efficiency Identification – The Chief Medical Officers and all OMD professionals hosted the third Mid-America Symposium for EMS Medical Oversight in Tulsa, with participation by the EMS medical oversight teams from Wichita/Sedgwick County, Kansas (led by John M. Gallagher, MD, FACEP, FAEMS), Johnson County, Kansas, and new this year, Kansas City, Missouri Fire Department (led by Erica Carney, MD) as well as Colorado Springs, Colorado Fire Department (led by Eric "Stein" Bronsky, MD). This continues to be the first of its kind, team-oriented, medical oversight for EMS convocation and yielded outstanding efficiencies in protocol development, continuing education creation, and simulation testing practices. A fourth event is planned for the coming operational year, if COVID-19 travel will allow, to include an invitation to the medical oversight team at University of New Mexico School of Medicine/Albuquerque Fire Department.

Handtevy System Smart Device App – MCB/OMD funded this app for utilization by all field personnel in the EMS system, allowing real-time medication dosing and equipment size selection assistance in time-sensitive situations, including pediatric cardiac arrest. This became operational in concert with a system-focused educational conference in Edmond in October, featuring Dr. Peter Antevy, the developer of the Handtevy system for pediatric medication administration.

Whole Blood Transfusion Initiation by EMS – Following the successful creation of a whole blood transfusion program in the San Antonio metropolitan area, the OMD team was joined by Lt. Ryan Mackey from OKC Fire Department, Deputy Chief Bryan Jones from EMSA, and Dr. Amanda Celli, trauma surgeon from the University of Oklahoma Medical Center's Level I Trauma Team, in attending by invite the first National Whole Blood Academy in San Antonio in January. Also understandably impacted by SARS-CoV-2 pandemic issues, we are excited to initiate this program in close cooperation with OUMC's Level I Trauma Team and the Oklahoma Blood Institute in this coming operational year. Significant clinical outcome advantages can be realized for the most serious of hemorrhagic shock trauma victims based upon San Antonio derived data to date.

Directions for Operational & Fiscal Year 2020-2021

The upcoming year will be filled with continuation of the multitude of projects identified in this report as well as additional advancements and revisions to clinical standards of care. Cardiac arrest resuscitative care will continue to be a hallmark of intervention efforts over the coming year, with anticipation of continuing formal research into the early impacts of adding active

compression-decompression CPR. We also anticipate field verification of a device that supports "heads up" CPR to further optimize cardio-cerebral perfusion in the sudden cardiac arrest patient.

Additional strategic planning, including regional EMS system medical oversight collaborations and benchmarking, will occur within the coming operational year to continue to build upon service to organizations comprising the EMS System for Metropolitan Oklahoma City and Tulsa, EMS professionals within those organizations, and the patients we collectively are honored and humbled to serve.

We anticipate developing strategic plans more focused upon educational content production in-house for delivery to the EMS professionals in this system and beyond, in a multi-year, graduated capabilities model. Keeping our budget essentially neutral this year has prevented additional personnel in OMD hire.

In sum, this past operational and fiscal year has seen tremendous energies and enthusiasms evident from MCB/OMD. Similar commitments and enthusiasms have been mirrored by many of the EMS leaders and liaisons in affiliated agencies. Continued effective working relationships between affiliated agencies and MCB/OMD have resulted in the two achievements that matter most:

1 – High quality EMS clinical care for the spectrum of acute illness and injury patients.

2 – Determined, agency-neutral support for the EMS professionals providing high quality EMS clinical care.

During the 2010-2011 operational year, the Chief Medical Officer adopted the following philosophy of his Seattle counterpart:

On Achieving Success

"There is no 'silver bullet.' There is just hard work."
Michael Keyes Copass, MD.
This sentiment continues to be found in prominent position upon every desk at which work is performed by the Chief Medical Officers, the OMD Division Chiefs, and the Administrative Assistant. It will remain in such places throughout Dr. Goodloe's tenure as the Chief Medical Officer, serving as a constantly visible reminder of the expectations in meeting the incredible trust afforded to MCB/OMD by the patients we serve.

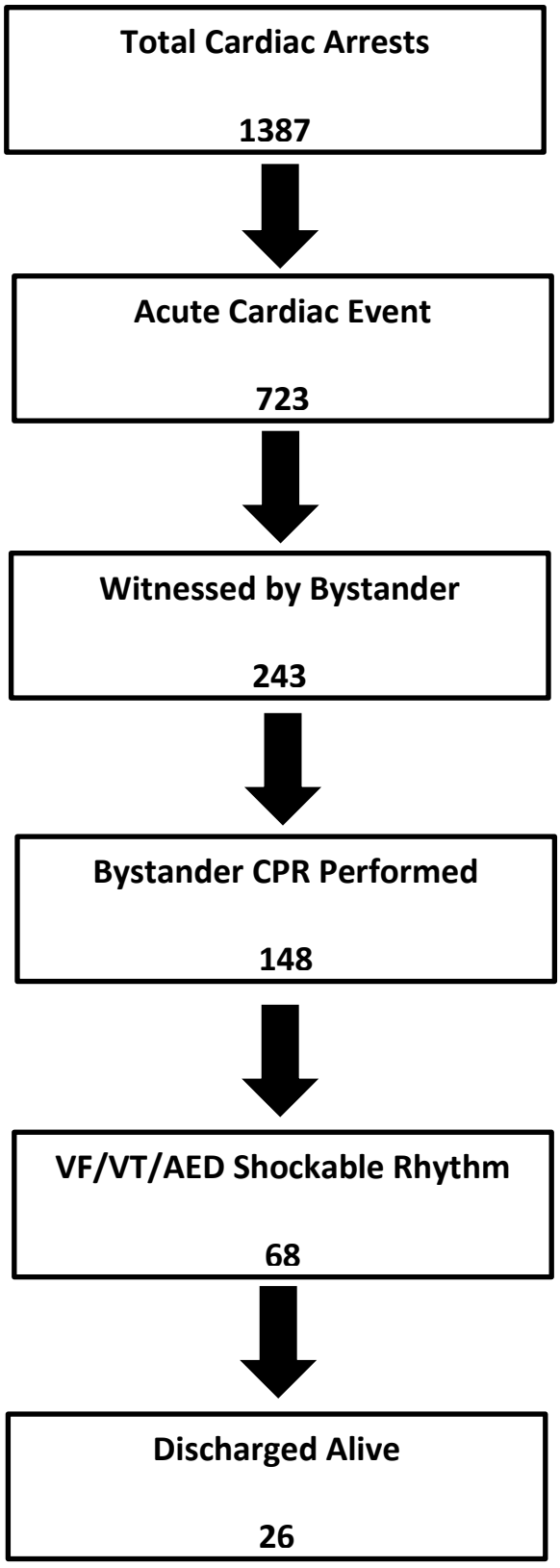
Hard work, focused enthusiasm, and the relentless pursuit of optimal clinical care and outcomes continue to advance both the science and art of EMS medicine in the EMS System for Metropolitan Oklahoma City and Tulsa. We again enter the coming year, Operational & Fiscal Year July 2020 – June 2021, convinced it will be the finest in the history of the MCB/OMD.

2018 Cardiac Arrest Summary and Outcomes

COX, MATT

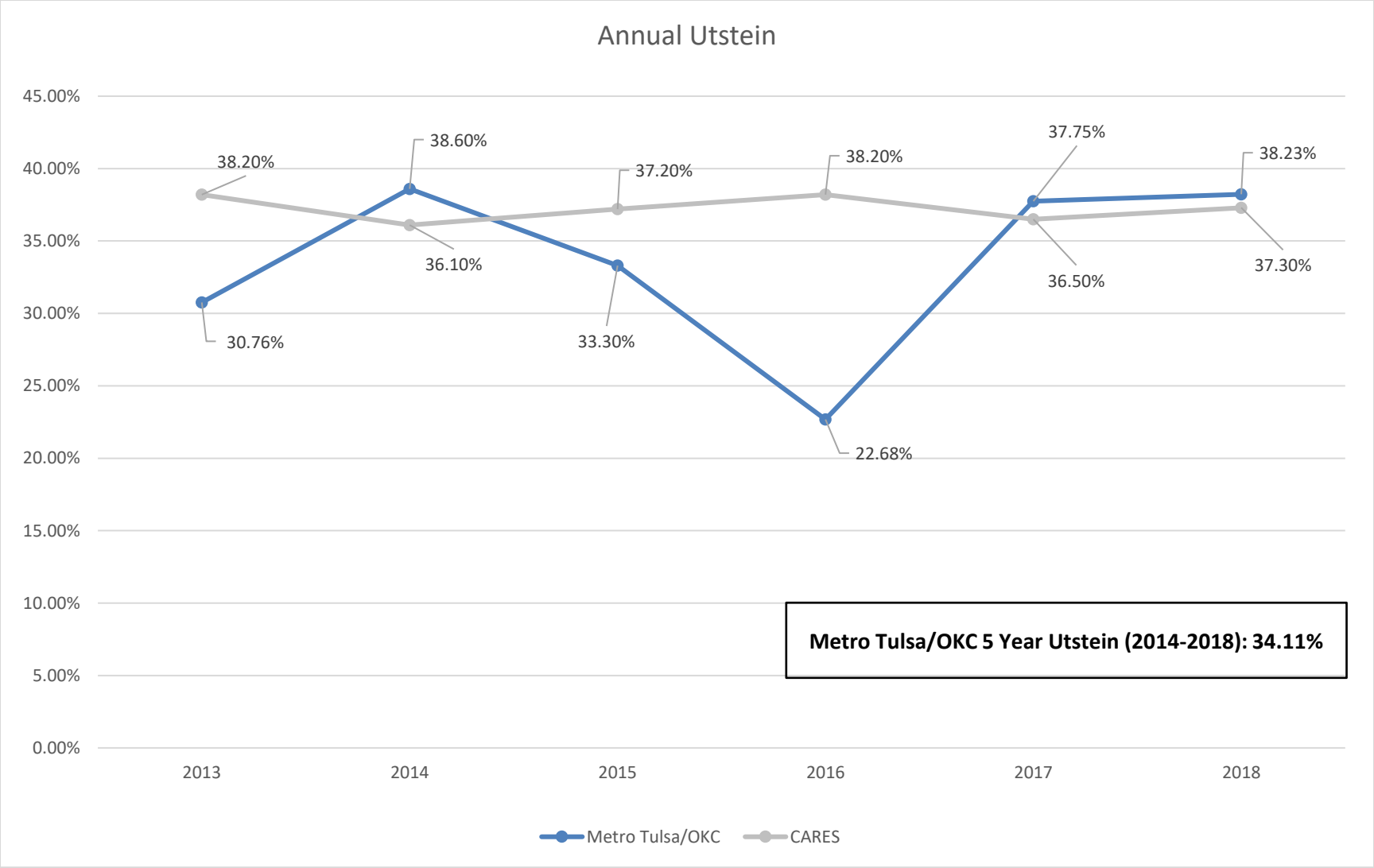
OFFICE OF THE MEDICAL DIRECTOR
1417 N Lansing Ave
Tulsa, OK 74106

2018 Utstein

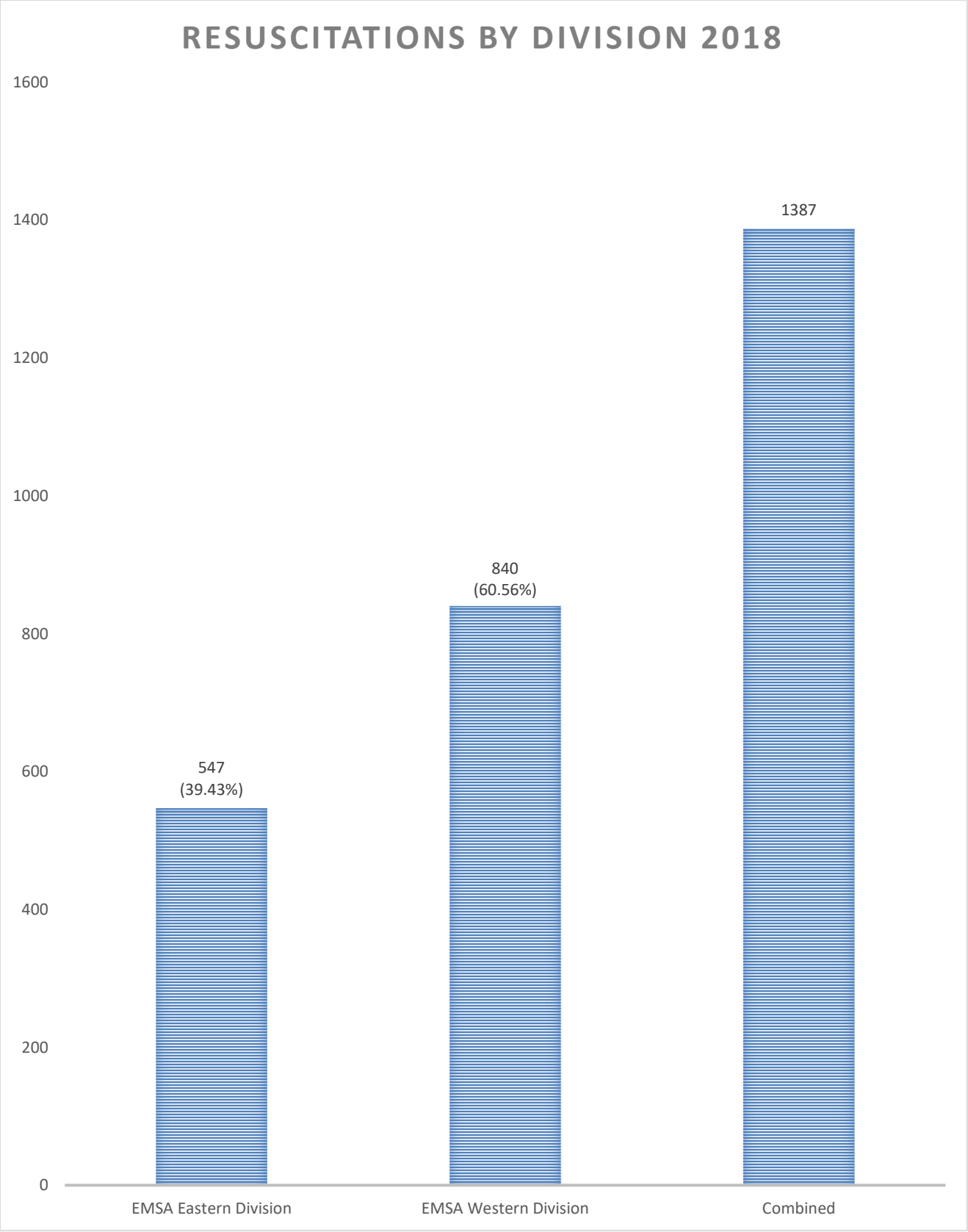


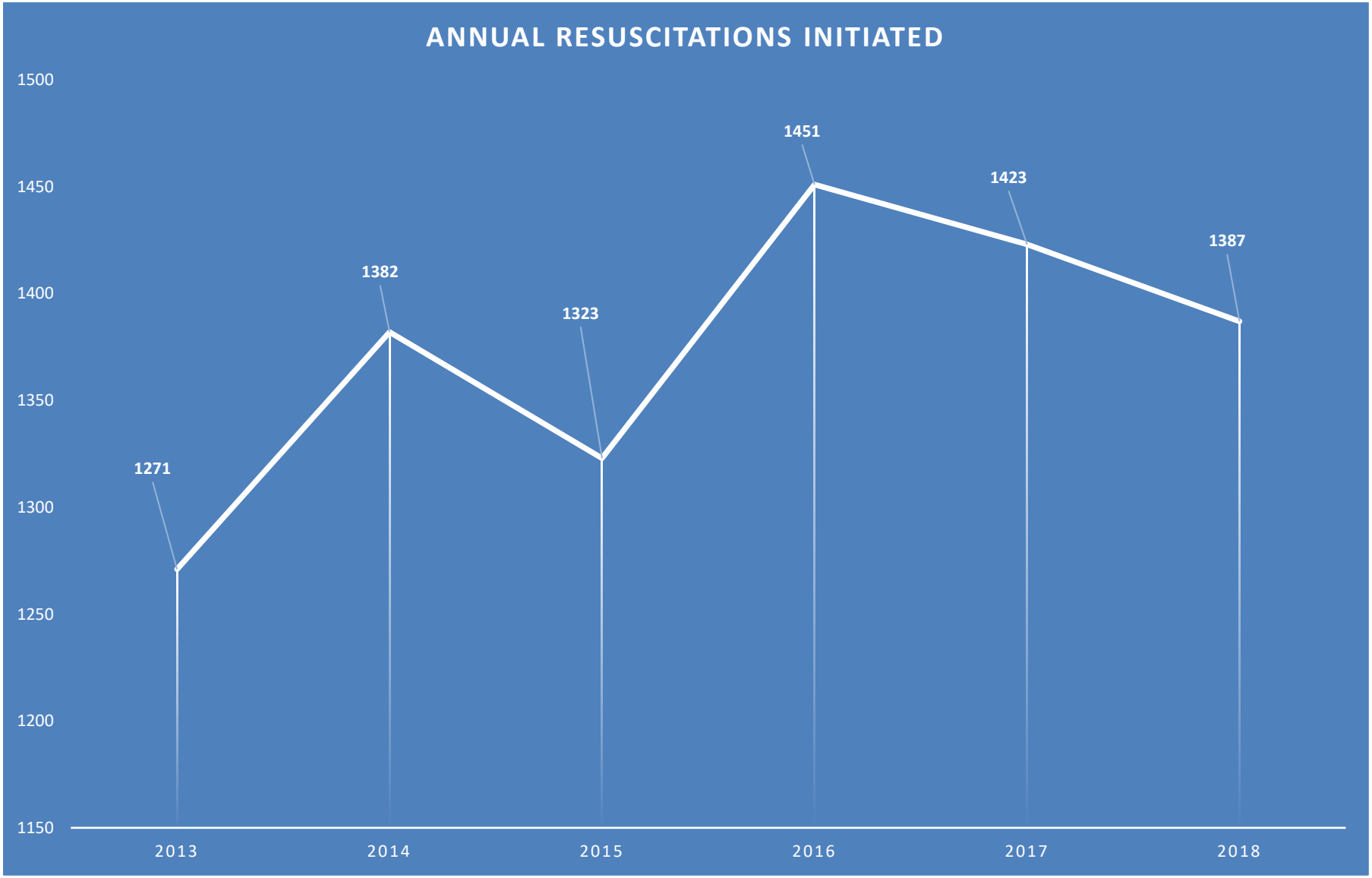
2018 Utstein:	38.23%

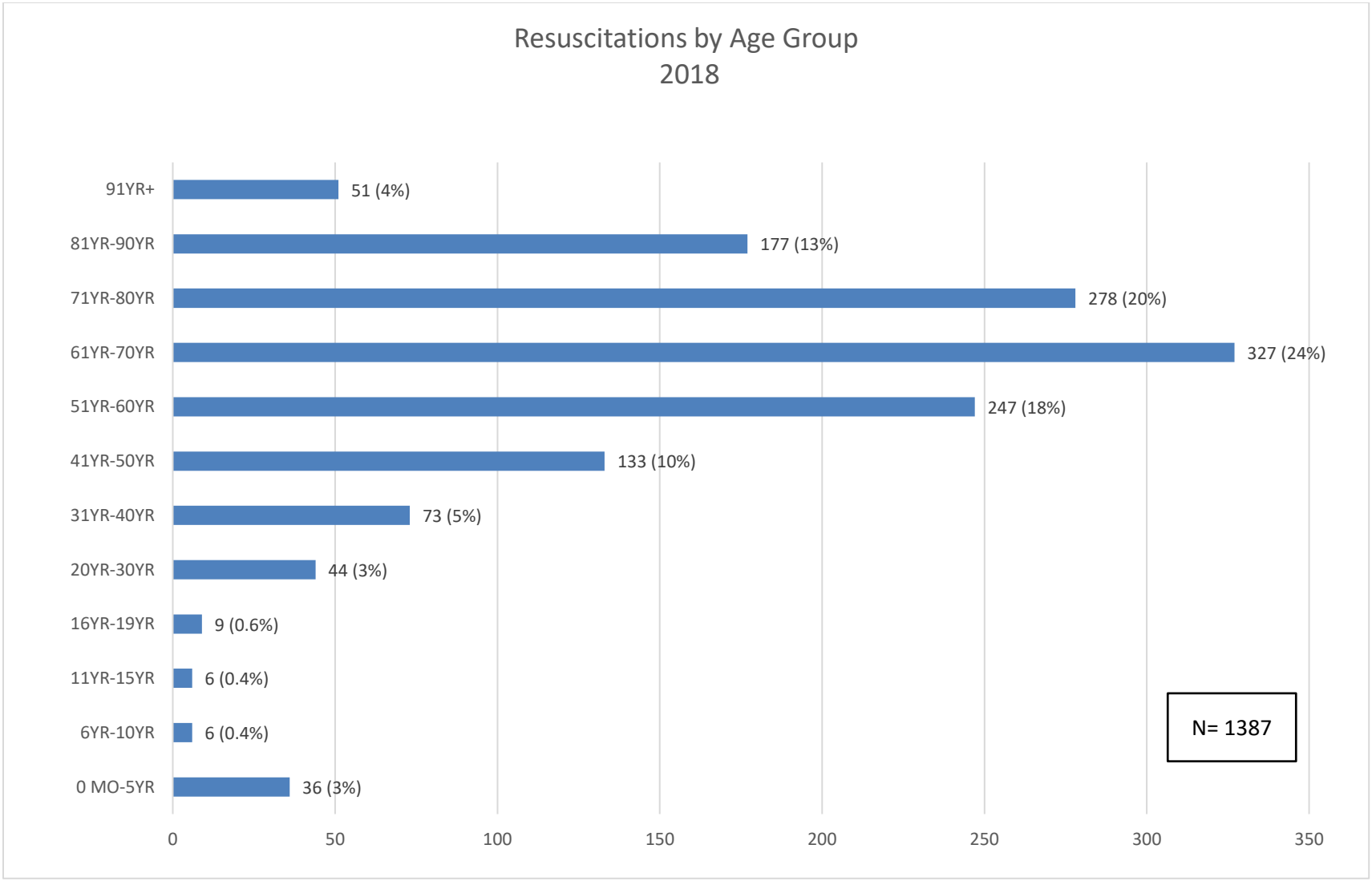
Utstein Neurologic Score Totals	
CPC 1:	*21*
CPC 2:	*3*
CPC 3:	*1*
CPC 4:	*1*

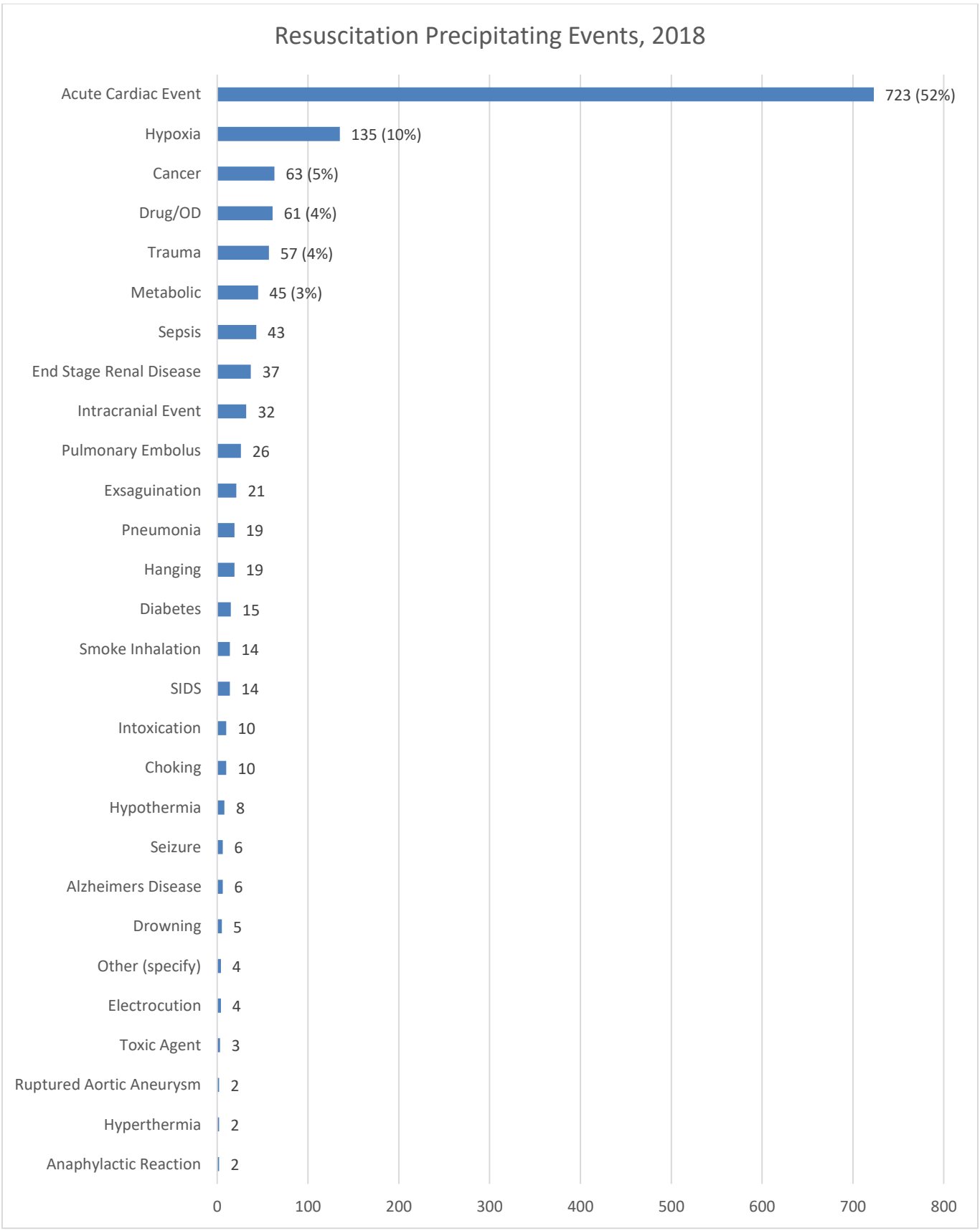


*CARES Registry Utstein Data Obtained Via Annual Reports Available, https://mycares.net/sitepages/data.jsp


RESUSCITATIONS BY DIVISION 2018
1600
1400
1200
1000
800
600
400
200
0
547
(39.43%)
840
(60.56%)
1387
EMSA Eastern Division
EMSA Western Division
Combined


ANNUAL RESUSCITATIONS INITIATED
1500
1450
1400
1350
1300
1250
1200
1150
1271
1382
1323
1451
1423
1387
2013
2014
2015
2016
2017
2018


Resuscitations by Age Group
2018
91YR+
51 (4%)
81YR-90YR
177 (13%)
71YR-80YR
278 (20%)
61YR-70YR
327 (24%)
51YR-60YR
247 (18%)
41YR-50YR
133 (10%)
31YR-40YR
73 (5%)
20YR-30YR
44 (3%)
16YR-19YR
9 (0.6%)
11YR-15YR
6 (0.4%)
6YR-10YR
6 (0.4%)
0 MO-5YR
36 (3%)
0
50
100
150
200
250
300
350
N= 1387


Resuscitation Precipitating Events, 2018
Acute Cardiac Event
723 (52%)
Hypoxia
135 (10%)
Cancer
63 (5%)
Drug/OD
61 (4%)
Trauma
57 (4%)
Metabolic
45 (3%)
Sepsis
43
End Stage Renal Disease
37
Intracranial Event
32
Pulmonary Embolus
26
Exsaguination
21
Pneumonia
19
Hanging
19
Diabetes
15
Smoke Inhalation
14
SIDS
14
Intoxication
10
Choking
10
Hypothermia
8
Seizure
6
Alzheimers Disease
6
Drowning
5
Other (specify)
4
Electrocution
4
Toxic Agent
3
Ruptured Aortic Aneurysm
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Hyperthermia
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Anaphylactic Reaction
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200
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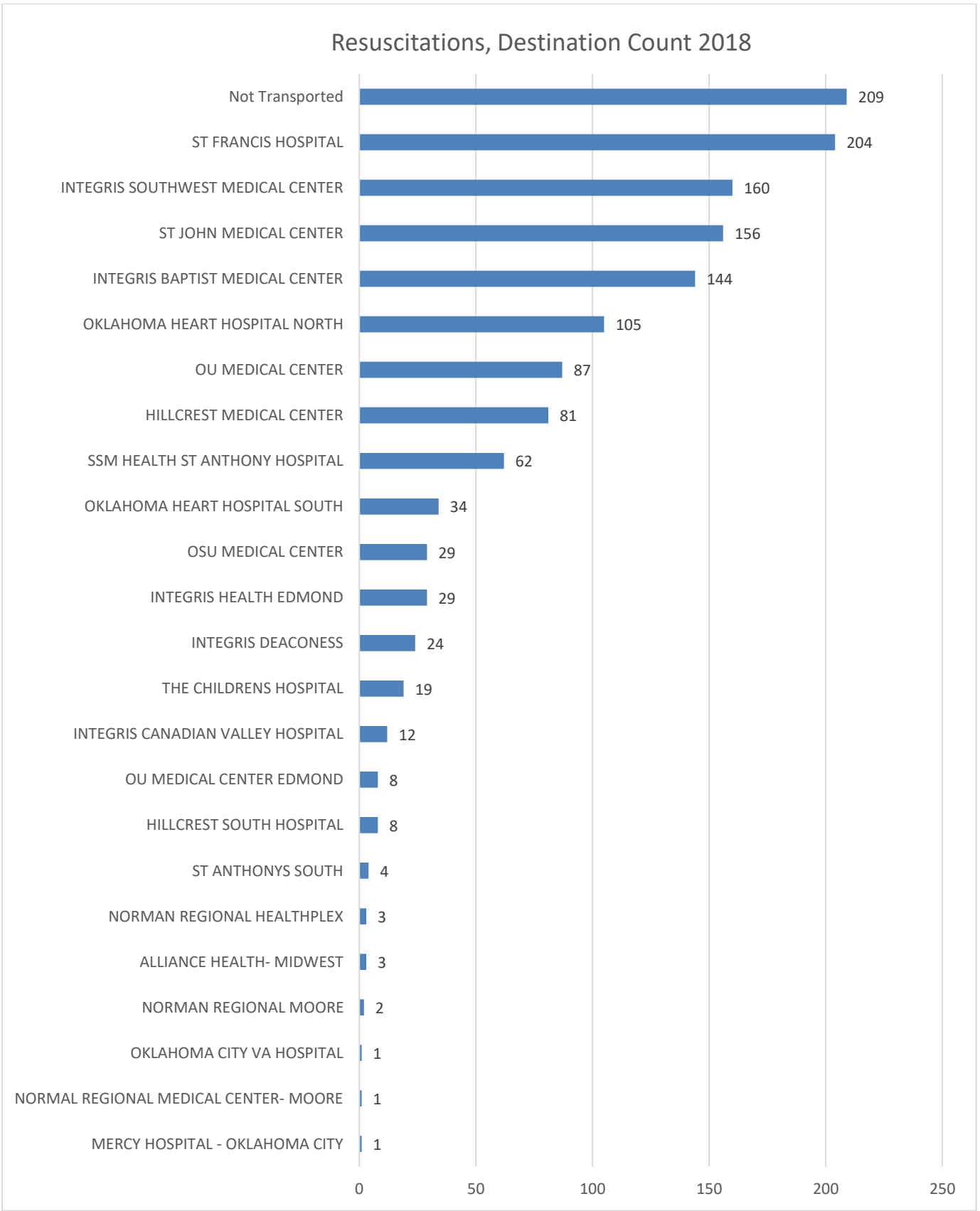
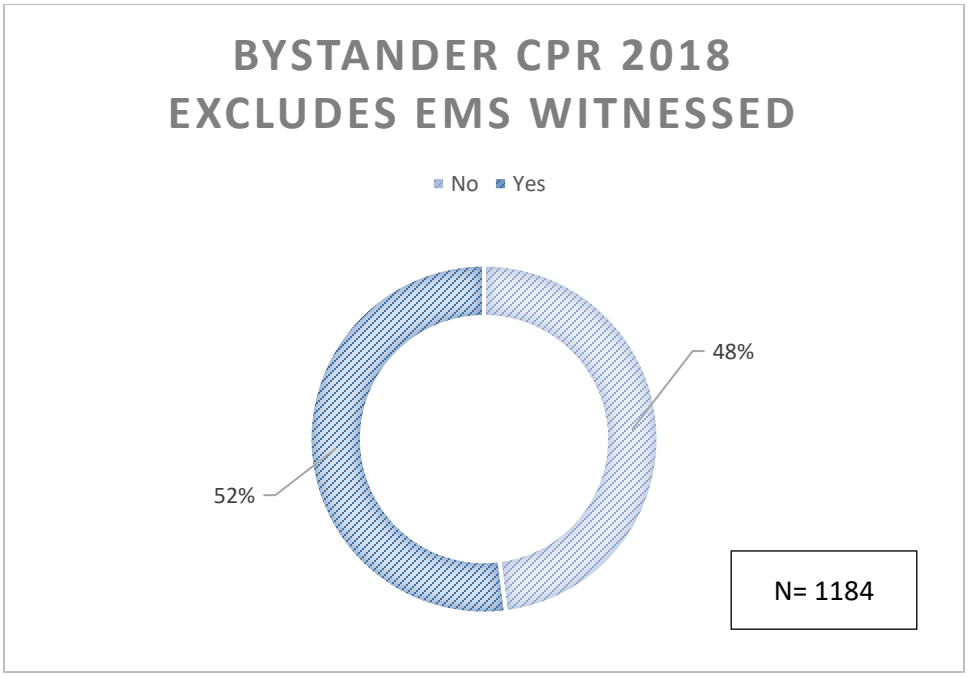
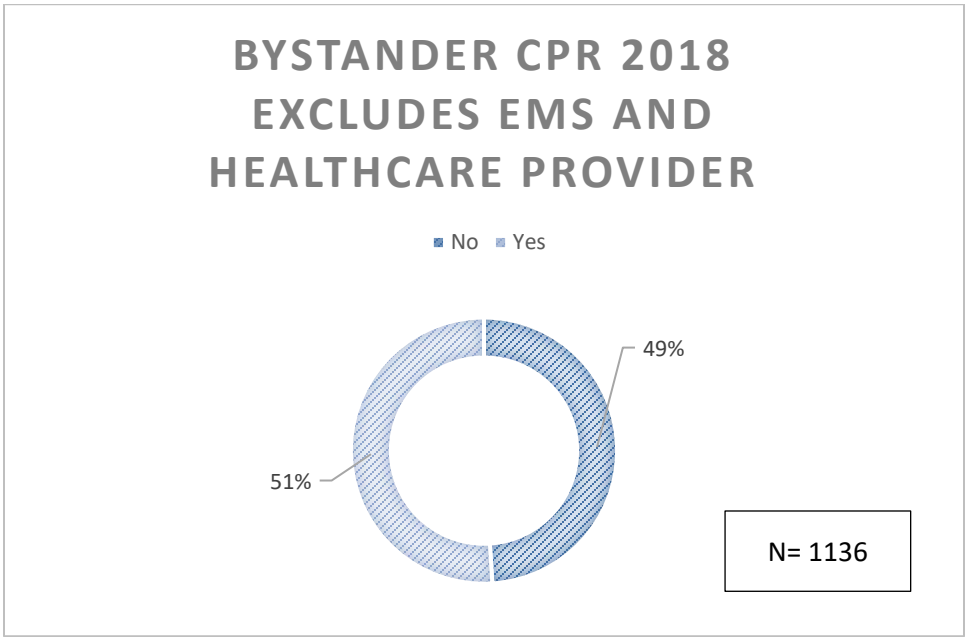
400
500
600
700
800


Resuscitations, Destination Count 2018
Not Transported
209
ST FRANCIS HOSPITAL
204
INTEGRIS SOUTHWEST MEDICAL CENTER
160
ST JOHN MEDICAL CENTER
156
INTEGRIS BAPTIST MEDICAL CENTER
144
OKLAHOMA HEART HOSPITAL NORTH
105
OU MEDICAL CENTER
87
HILLCREST MEDICAL CENTER
81
SSM HEALTH ST ANTHONY HOSPITAL
62
OKLAHOMA HEART HOSPITAL SOUTH
34
OSU MEDICAL CENTER
29
INTEGRIS HEALTH EDMOND
29
INTEGRIS DEACONESS
24
THE CHILDRENS HOSPITAL
19
INTEGRIS CANADIAN VALLEY HOSPITAL
12
OU MEDICAL CENTER EDMOND
8
HILLCREST SOUTH HOSPITAL
8
ST ANTHONYS SOUTH
4
NORMAN REGIONAL HEALTHPLEX
3
ALLIANCE HEALTH- MIDWEST
3
NORMAN REGIONAL MOORE
2
OKLAHOMA CITY VA HOSPITAL
1
NORMAL REGIONAL MEDICAL CENTER- MOORE
1
MERCY HOSPITAL - OKLAHOMA CITY
1
0
50
100
150
200
250

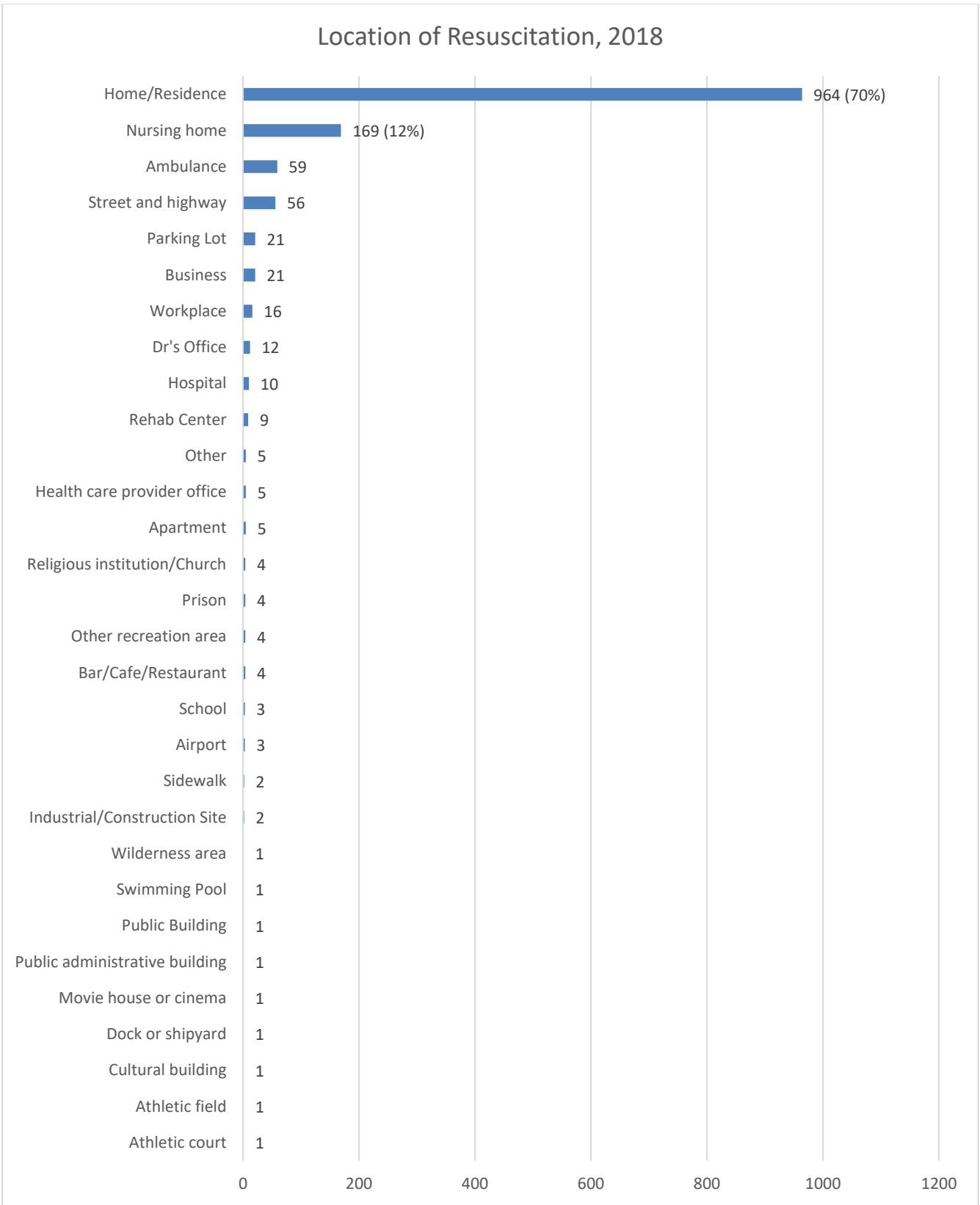


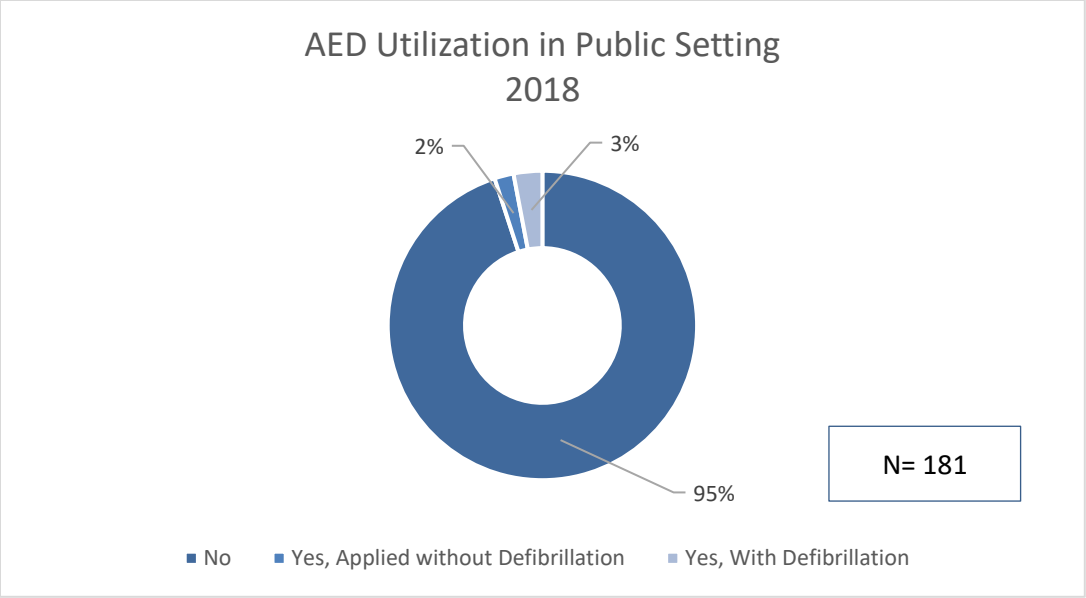
*Excludes Incidents where EMS witnessed the cardiac arrest.



*Excludes incidents where EMS witnessed the cardiac arrest

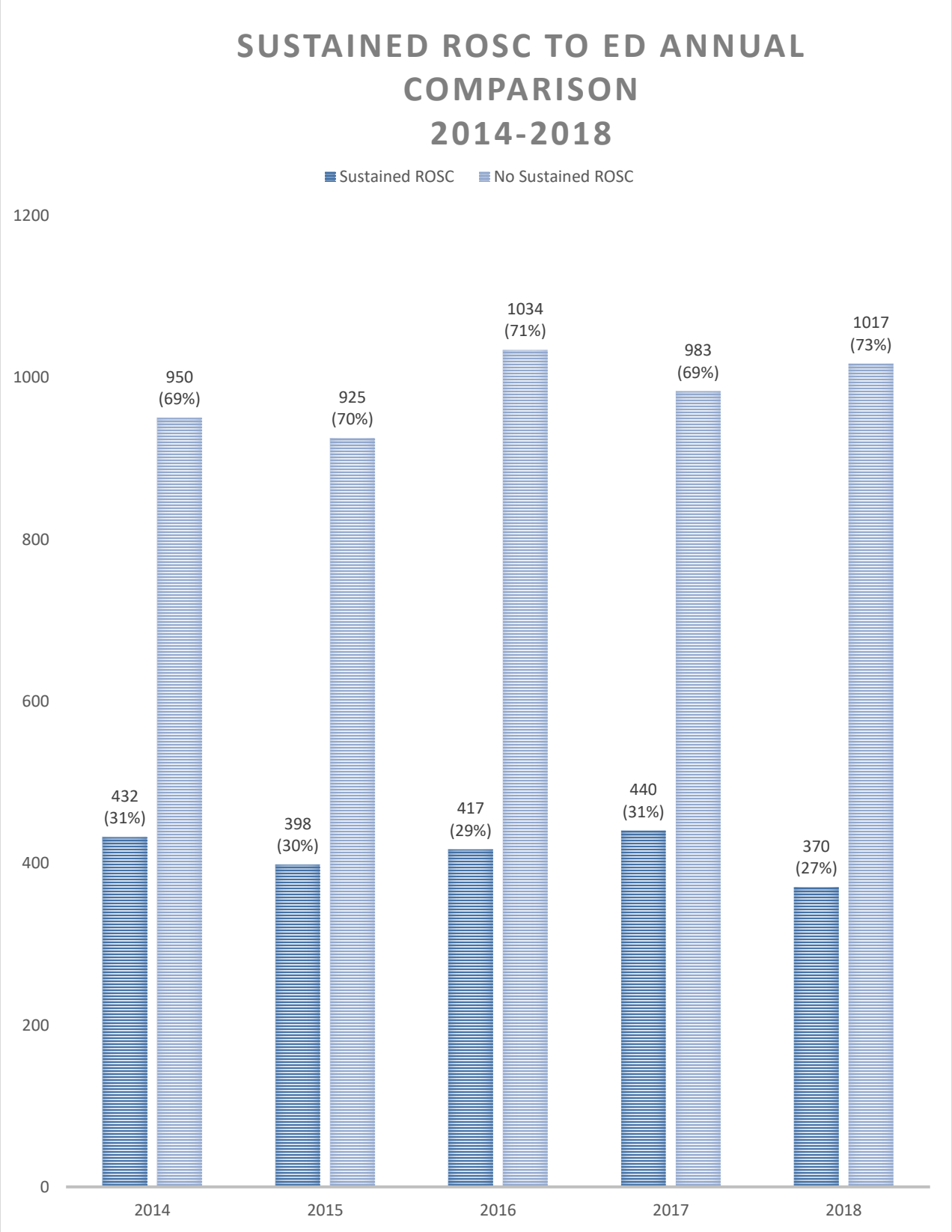
**Excludes incidents where bystander CPR was performed by a healthcare provider (i.e. Nursing Homes, Clinics, etc.)

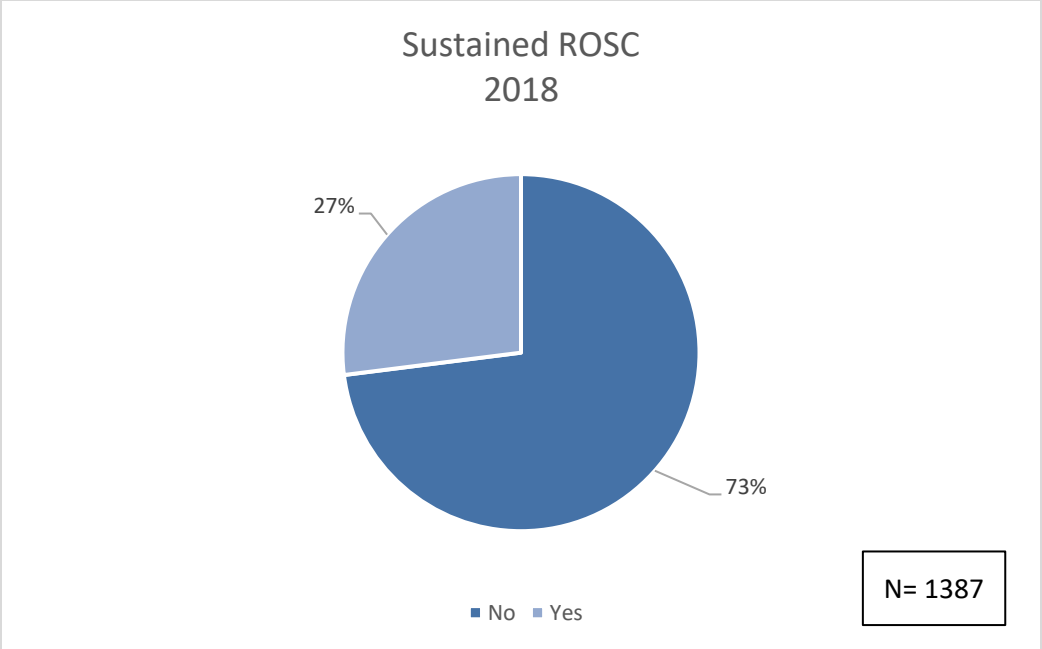

Location of Resuscitation, 2018
Home/Residence
964 (70%)
Nursing home
169 (12%)
Ambulance
59
Street and highway
56
Parking Lot
21
Business
21
Workplace
16
Dr's Office
12
Hospital
10
Rehab Center
9
Other
5
Health care provider office
5
Apartment
5
Religious institution/Church
4
Prison
4
Other recreation area
4
Bar/Cafe/Restaurant
4
School
3
Airport
3
Sidewalk
2
Industrial/Construction Site
2
Wilderness area
1
Swimming Pool
1
Public Building
1
Public administrative building
1
Movie house or cinema
1
Dock or shipyard
1
Cultural building
1
Athletic field
1
Athletic court
1
0
200
400
600
800
1000
1200

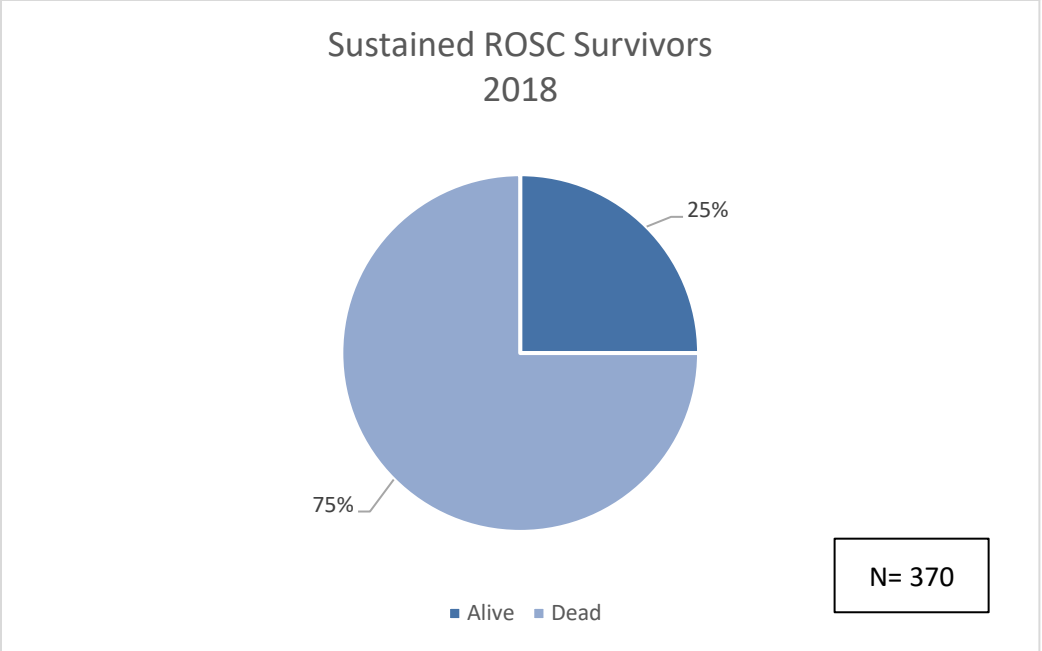


*Excludes utilization by Emergency Responders (i.e. System Credentialed Providers) outside EMS agencies, Healthcare Providers (Clinics, Nursing Homes)

**Includes only incidents in Public Setting (i.e. excludes ambulance, nursing home, private residence, etc.) where an AED might be available.

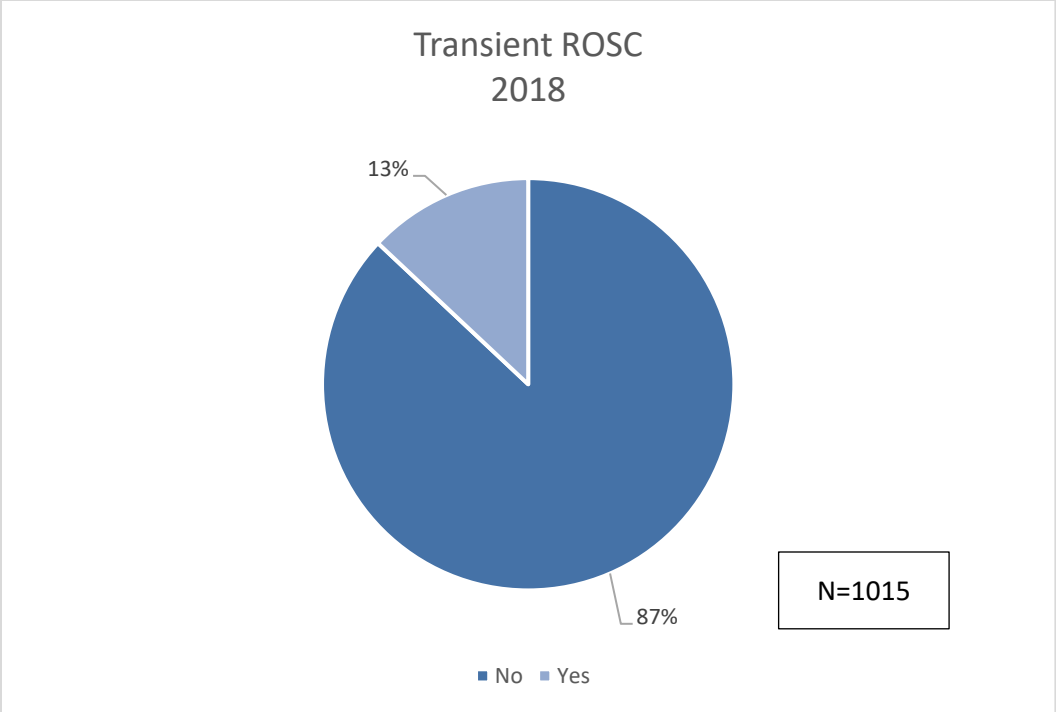

SUSTAINED ROSC TO ED ANNUAL COMPARISON
2014-2018
Sustained ROSC
No Sustained ROSC
1200
1000
800
600
400
200
0
432 (31%)
950 (69%)
398 (30%)
925 (70%)
417 (29%)
1034 (71%)
440 (31%)
983 (69%)
370 (27%)
1017 (73%)
2014
2015
2016
2017
2018

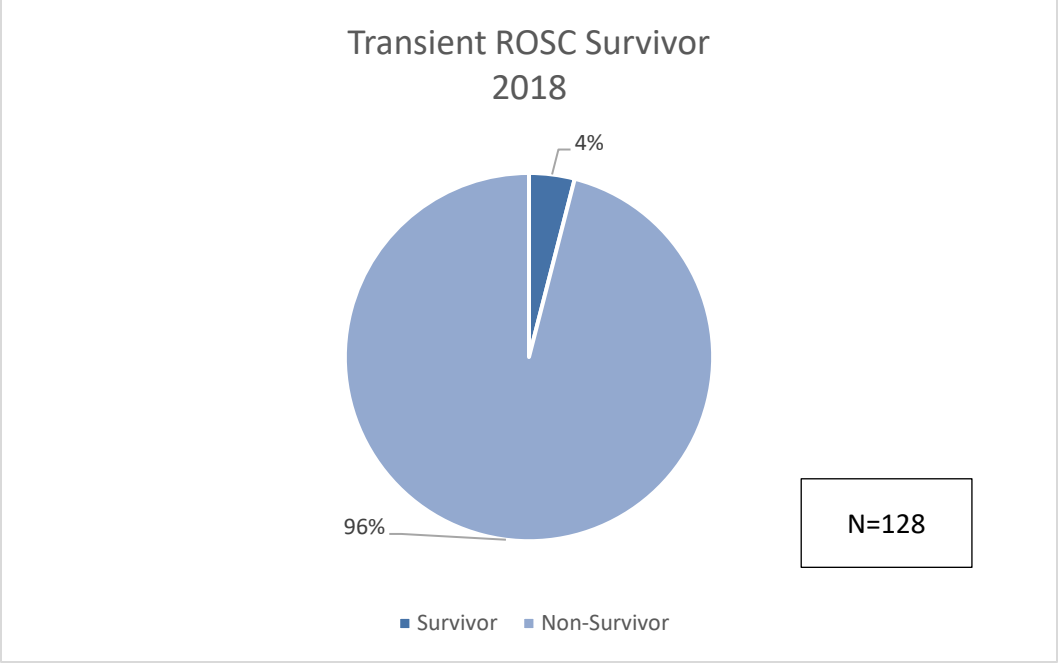




*ROSC is defined as any cardiac arrest patient that was delivered to the receiving facility with ROSC maintained, whether transient ROSC occurred or not.

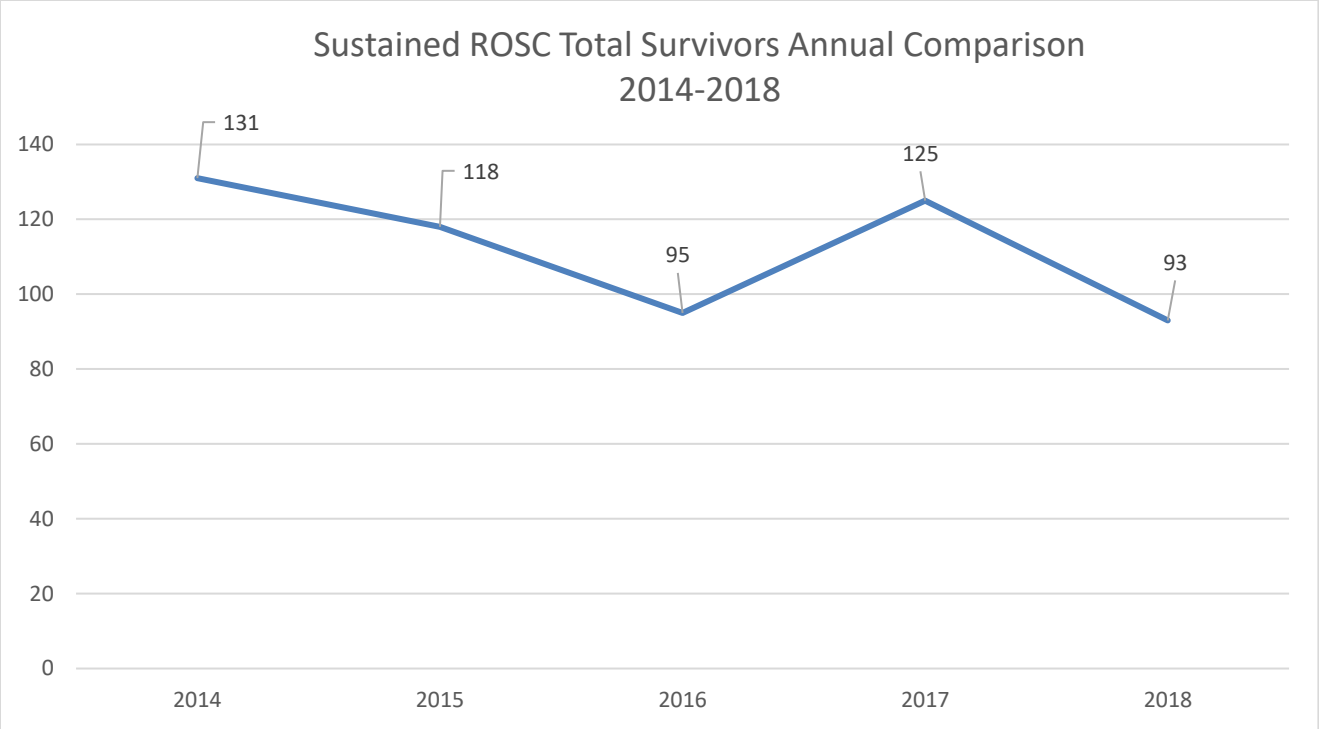
**25% of ROSC patients survived from hospital admit to discharge.

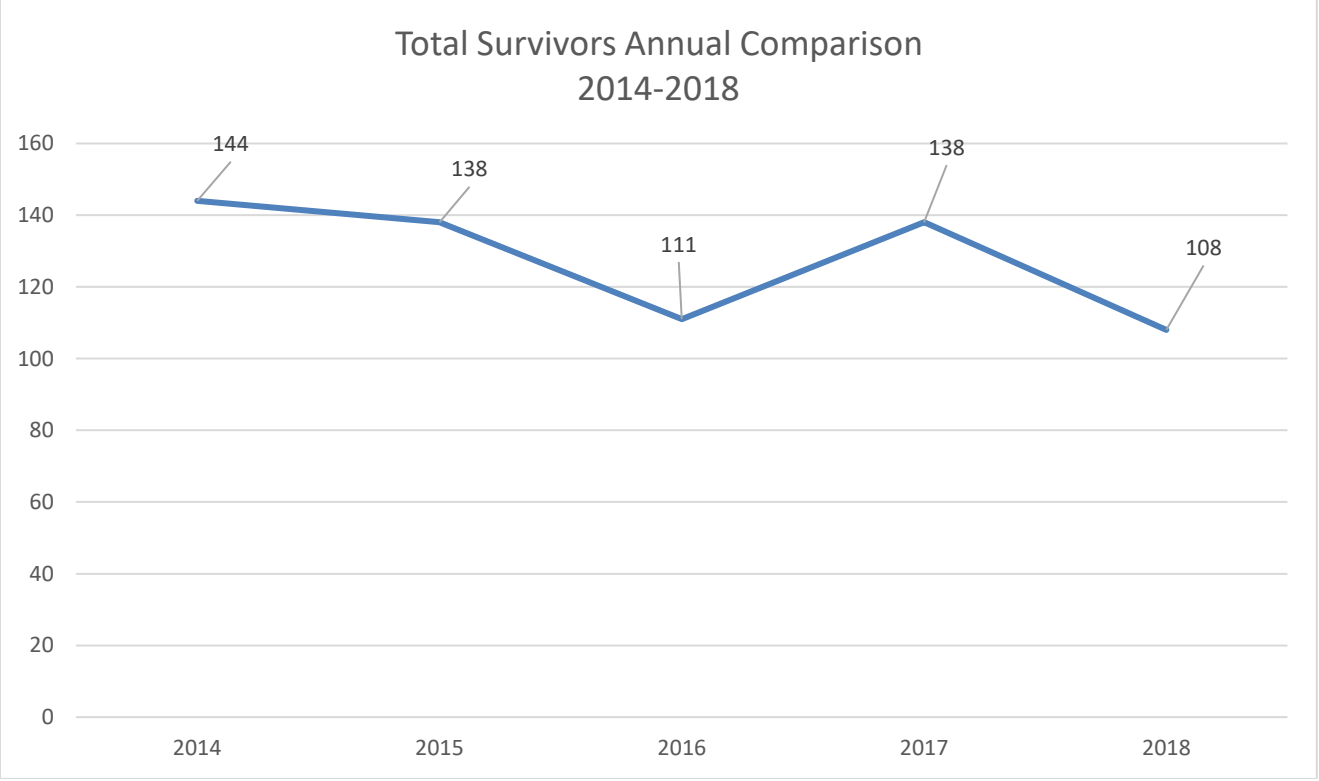


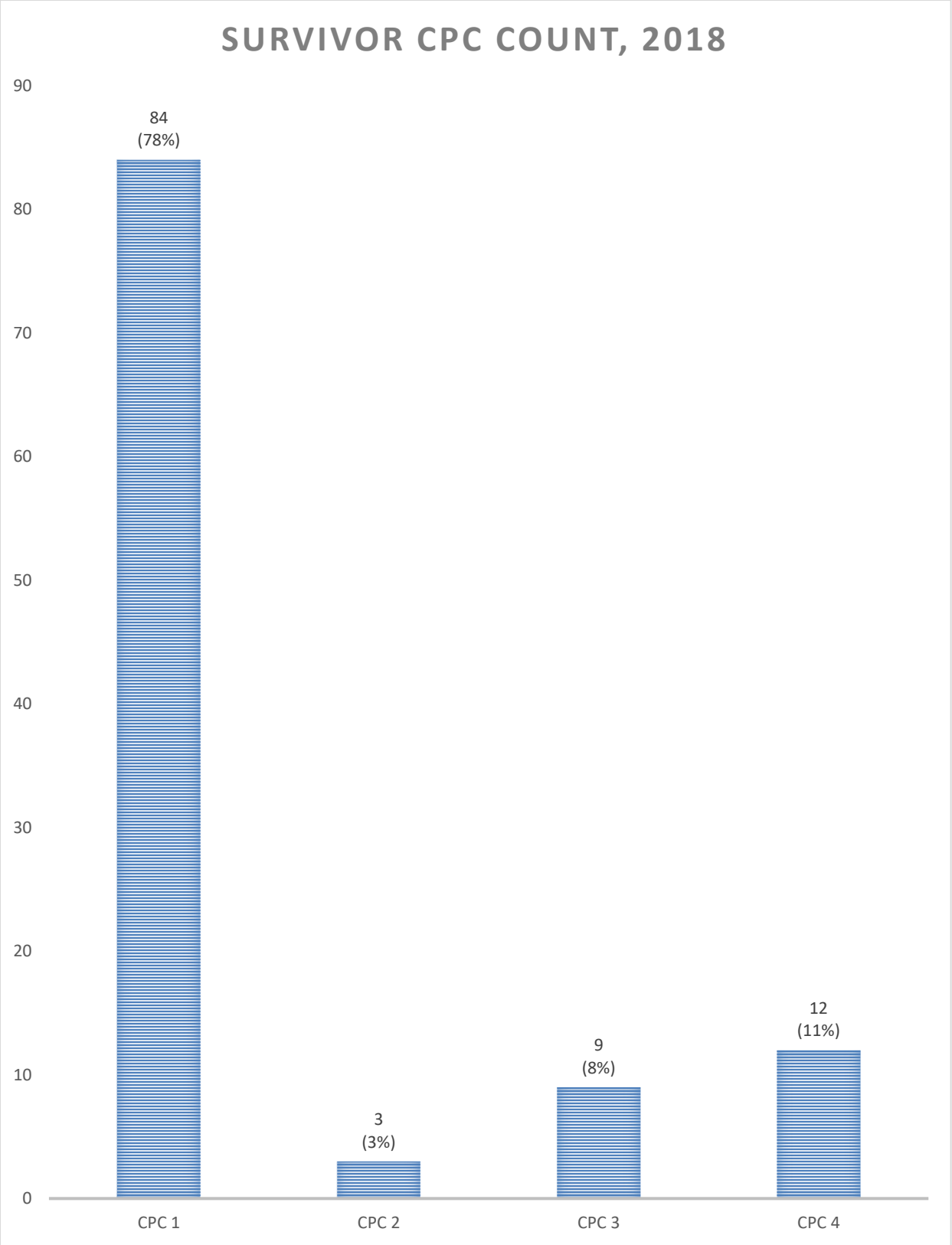


*Transient ROSC is Defined as any cardiac arrest patient that was a brief period of ROSC achieved, however was not delivered to the receiving facility with ROSC maintained.

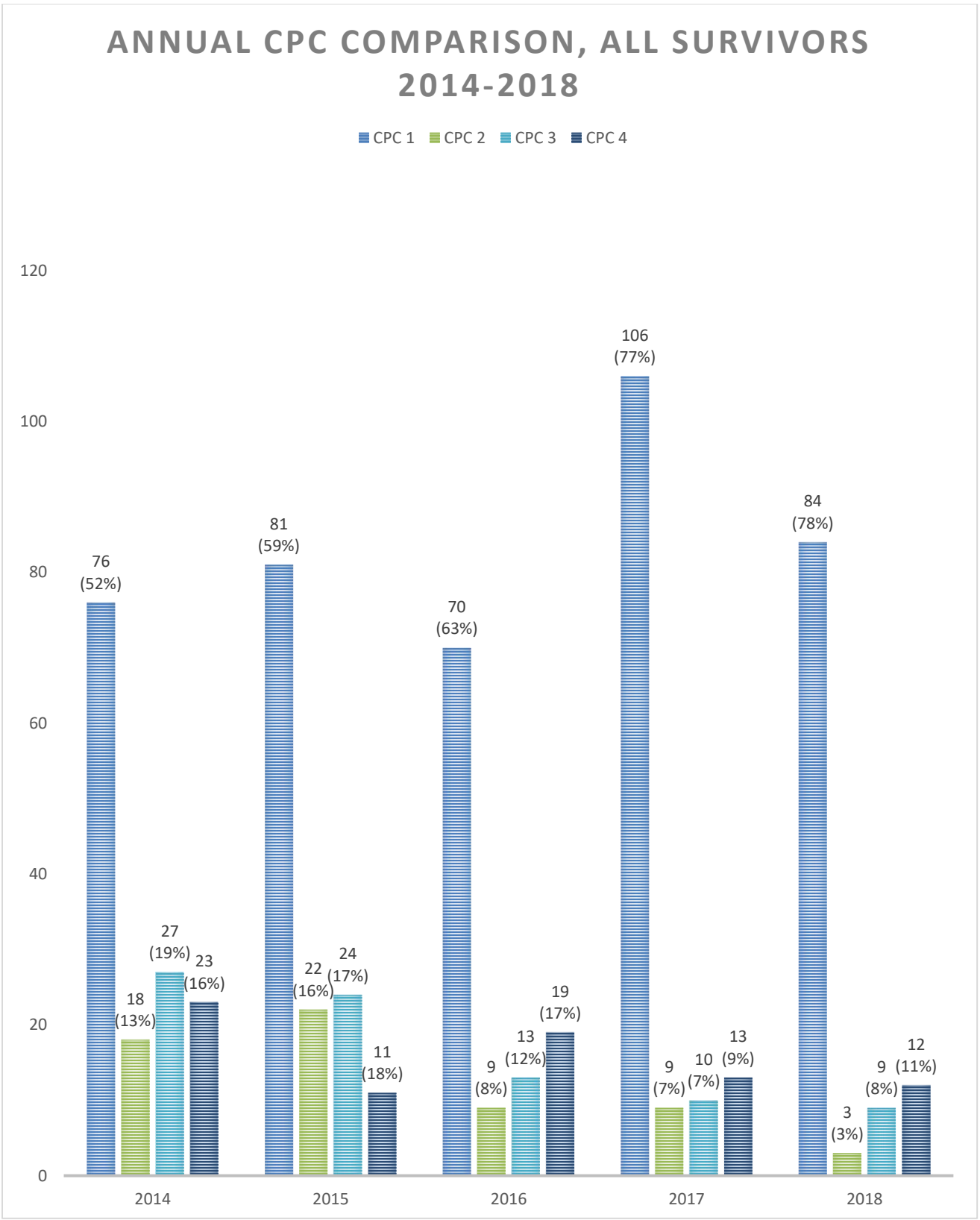
** 4% of transient ROSC patients survived from hospital admit to discharge.

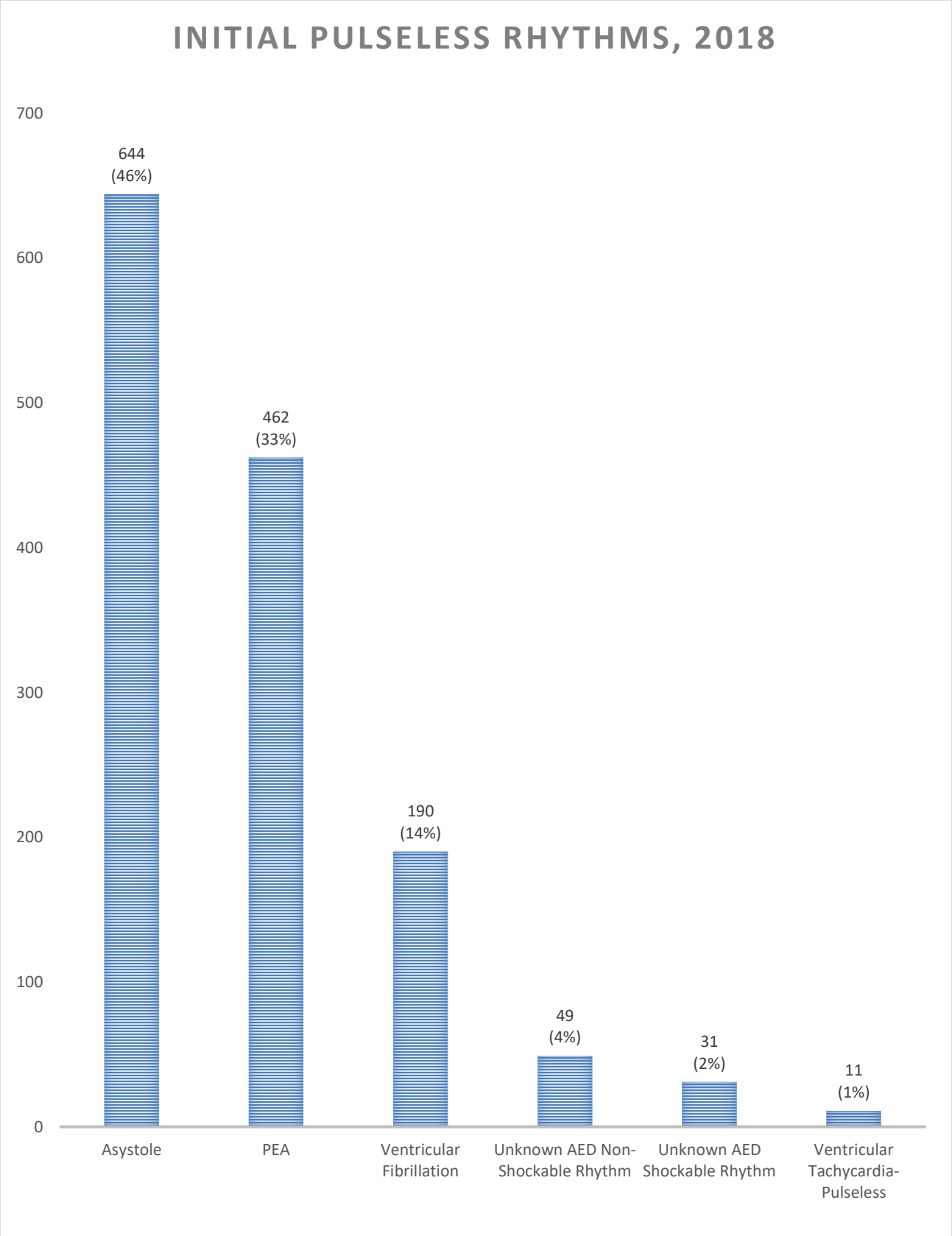

Sustained ROSC Total Survivors Annual Comparison
2014-2018
140
120
100
80
60
40
20
0
131
118
95
125
93
2014
2015
2016
2017
2018


Total Survivors Annual Comparison
2014-2018
160
140
120
100
80
60
40
20
0
144
138
111
138
108
2014
2015
2016
2017
2018

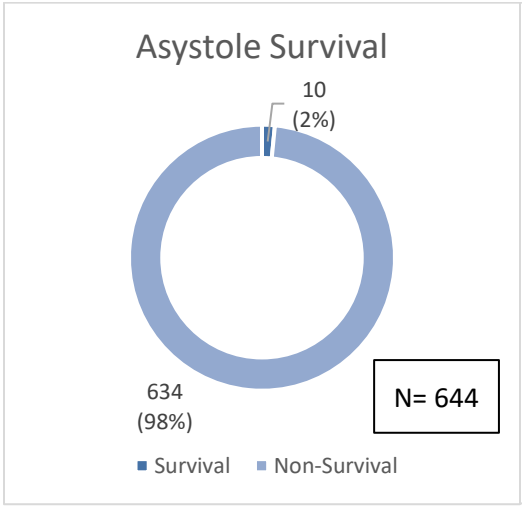


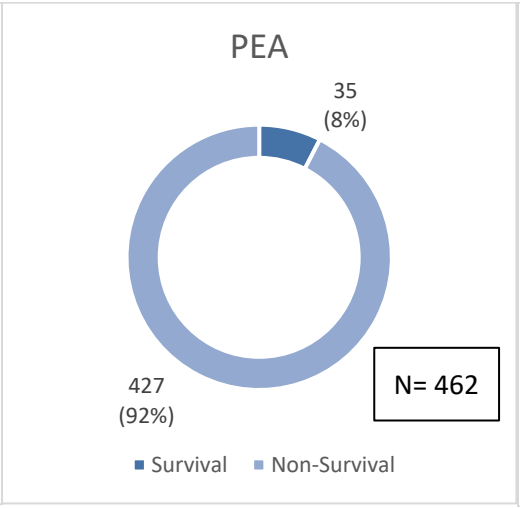
*Includes all cardiac arrest patients for year 2018

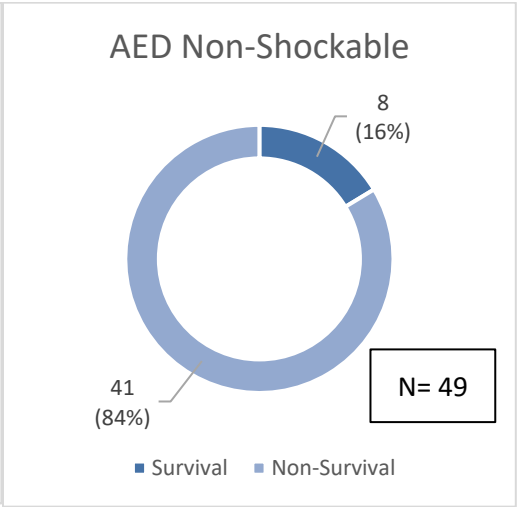

ANNUAL CPC COMPARISON, ALL SURVIVORS 2014-2018
CPC 1
CPC 2
CPC 3
CPC 4
120
100
80
60
40
20
0
76 (52%)
18 (13%)
27 (19%)
23 (16%)
81 (59%)
22 (16%)
24 (17%)
11 (18%)
70 (63%)
9 (8%)
13 (12%)
19 (17%)
106 (77%)
9 (7%)
10 (7%)
13 (9%)
84 (78%)
3 (3%)
9 (8%)
12 (11%)
2014
2015
2016
2017
2018

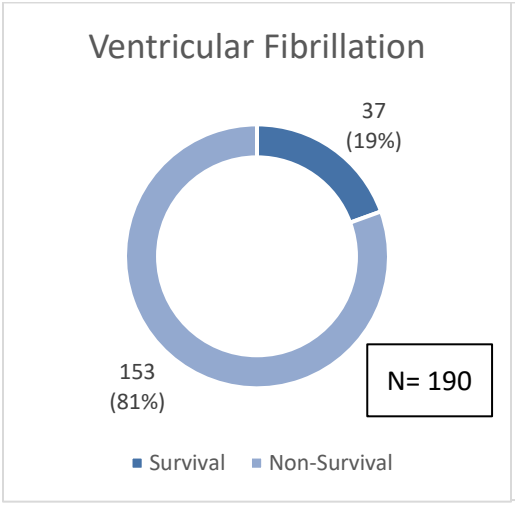

INITIAL PULSELESS RHYTHMS, 2018
700
600
500
400
300
200
100
0
644
(46%)
462
(33%)
190
(14%)
49
(4%)
31
(2%)
11
(1%)
Asystole
PEA
Ventricular Fibrillation
Unknown AED Non-Shockable Rhythm
Unknown AED Shockable Rhythm
Ventricular Tachycardia-Pulseless

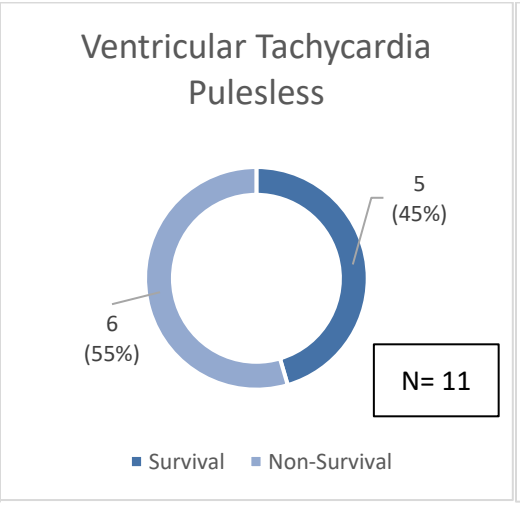
Initial Pulseless Rhythm Survival 2018

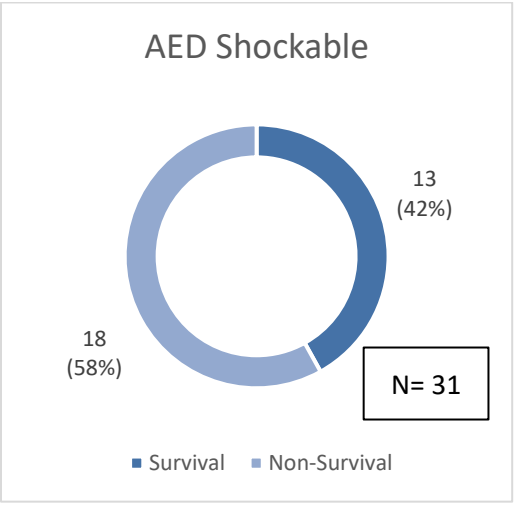


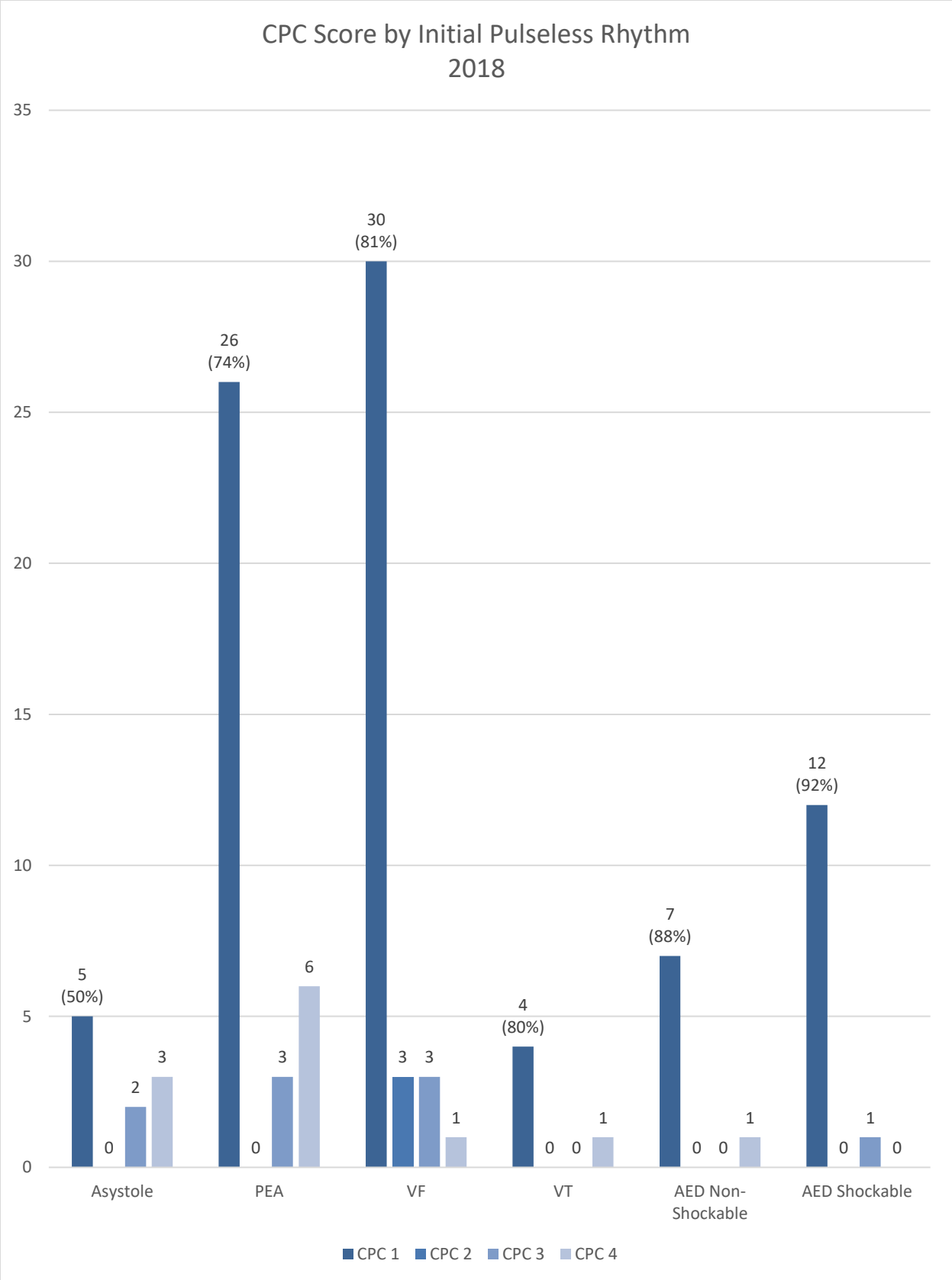




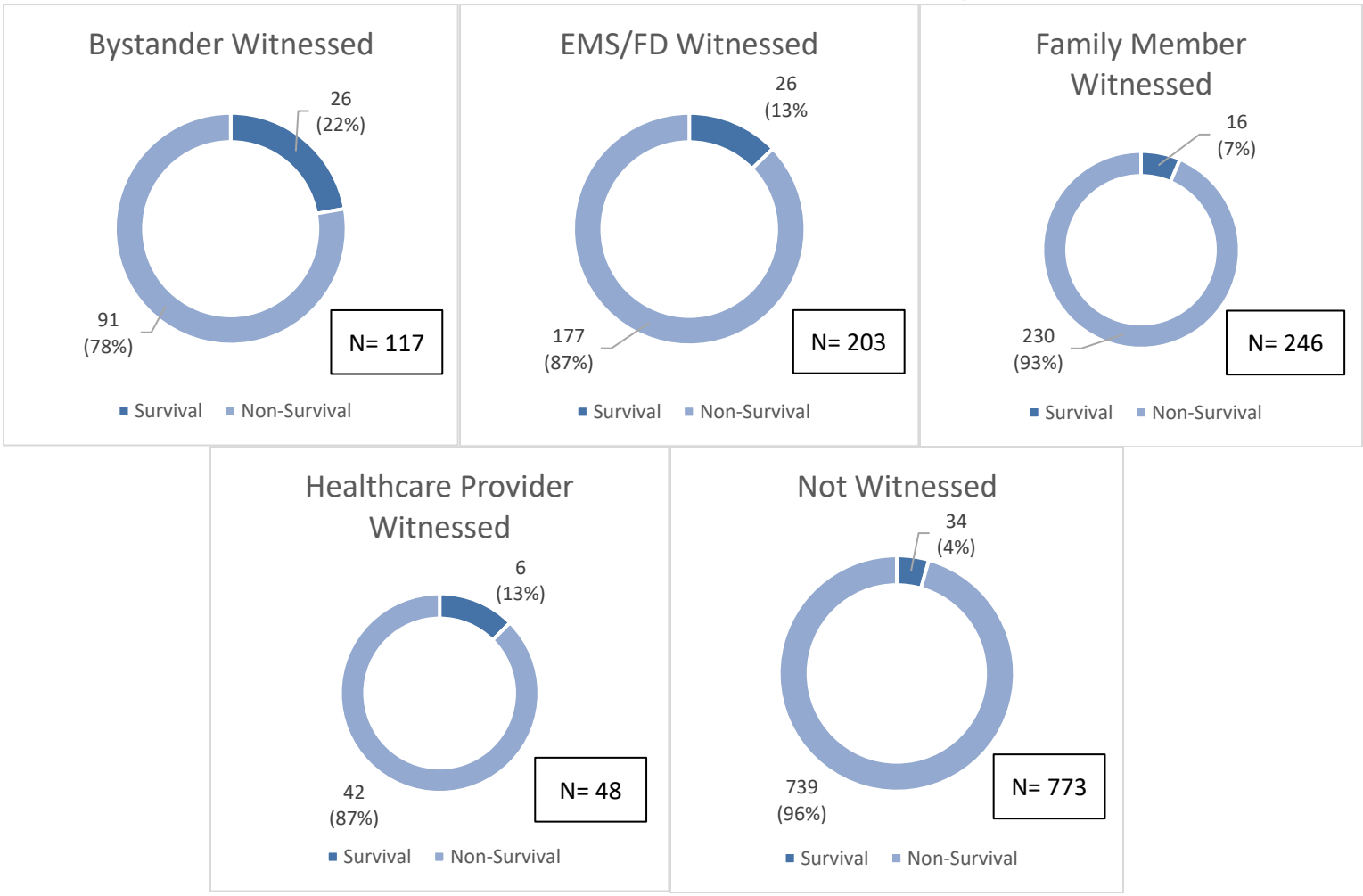







CPC Score by Initial Pulseless Rhythm
2018
35
30
25
20
15
10
5
0
5 (50%)
0
2
3
26 (74%)
0
3
6
30 (81%)
3
3
1
4 (80%)
0
0
1
7 (88%)
0
0
1
12 (92%)
0
1
0
Asystole
PEA
VF
VT
AED Non-Shockable
AED Shockable
CPC 1
CPC 2
CPC 3
CPC 4

Survival Rates, Cardiac Arrest Witnessed By 2018



Update 13 - COVID-19 – From Office of the Medical Director 04 APR2020 1800

To All EMS Personnel in the EMS System for Metropolitan Oklahoma City & Tulsa

Key Content:

- **Why is this pandemic happening?**
- **What is SARS-CoV-2? Coronavirus? COVID-19?**
- **What are the symptoms of COVID-19 and what is a "typical" illness of it?**

This communication may seem like taking a step back when it would seem we need to move forward quicker than ever, but ask yourself what are your answers to the above questions? Are you sure of your answers? What sources formed your answers and what are their sources? Those with prior or active duty military service can most easily appreciate that "fog of war" is a real dynamic, particularly in any prolonged, decentralized, complex mission. And that's exactly what we are in, a prolonged, decentralized, complex mission.

This isn't a tornado. This isn't easily visible. It won't be over quickly. It won't confine its destruction to a neighborhood, bypassing whole communities otherwise. This is new for all of us. We're all learning and we've all been impacted.

The quantity of information available 24/7 online, on TV, in print, in conversations, even when factual, is overwhelming. Add to that the troublesome amount of misinformation in the endless stream of latest breaking news and numbers, and we can easily get lost in understanding what this is.

If you are receiving this communication as a public safety or healthcare system frontline professional, public safety or healthcare system leader or support staff, a governmental leader, or a family member of any of these critically important folks, this update is meant to NOT overwhelm - you have enough stuff that hits your "inbox" daily for that.

I sense the fear of the unknown or of the uncertain about this viral pandemic is growing, especially as the numbers of ill and sadly the numbers of dead rise locally. Let's see if we can utilize facts, established by science, to give us some deserved strength and reassurance that not all will be lost. You may find some of the language used surprisingly simple. You're welcome. I think simple in challenging times helps us all understand.

Why is this pandemic happening?

I'll bypass the historical, philosophical, and spiritual viewpoints and stick to what I can confirm with scientific fact. If this virus were not contagious, not able to be spread from person to person, there would be no pandemic. If we as humans had a natural immunity to this virus, a resistance to this illness that just happened on its own without us doing anything, there would be no pandemic. If we had access to a vaccine against this virus, smartly choosing to receive it before the illness came to our communities, there would be no pandemic.

But it is contagious, we don't have natural immunity, and there is no established, safe vaccine today. So, we have a pandemic – which is a word we aren't used to using much before the past several weeks. Pandemic just means that the spread of illness is pretty much involving the whole world. In hazardous materials terminology, we could accurately say that Planet Earth is inconveniently now our "Red/Hot Zone."

There are so many conspiracy theories about the origin of this pandemic that I quit trying to file them under "T" for "trash" what feels like a long time ago. Here's what is rooted in science, not the shadows of suspicions:

There are different types of organisms ("things" if you prefer) that can infect us. Those includes viruses, bacteria, and funguses. If you have (or had) an active child, regardless of how many times you bathe them daily, you likely have experienced all three of these in your kiddo. That's why your doctor may use an anti-fungus medication (maybe for a skin irritation caused by ringworm), or an anti-bacteria medication – aka antibiotic (maybe for strep throat). But it's also why your doctor didn't use an antibiotic when they diagnosed a viral infection, such as a cold in the fall/winter months.

Are there anti-virus medications? Yes, but only a few, targeting specific viruses that are well known, not a virus only discovered a few months ago. These include medications that you might be prescribed if you had a serious, bloody needle stick injury and the doctor is using the medications to reduce your risk of getting HIV illness. So, what about this pandemic virus? What the heck is it?

This current pandemic's origin is traced to a live animal and food marketplace in Wuhan, China, a metropolitan area of over 11 million people. The timing of the origin may vary by who/what you read, but consistently the timing is pinned to within the last 3-4 months of 2019 (the "19" in COVID-19, but we'll get to that in a bit). That has been established using epidemiology, the science of tracking things. It could have happened in so many other similar places on Earth, but there is no evidence that it did. Anywhere where there is considerable diversity of animal species to human contact carries risk for disease, including as serious as this pandemic. That is why public health departments worldwide work to establish sanitary laws. The laws are only as effective as citizens choose to follow and as enforcement efforts allow.

Because of past studies about disease spreading from animals to humans, we think this particular virus started in bats (source: CIDRAP/Dr. Michael Osterholm). Those bats bit other animals. Those animals wound up in that now infamous Chinese market to be handled and consumed by humans. But that alone isn't enough to cause us disease.

A virus that can cause disease in animals doesn't necessarily cause us illness, even if we breathe it, touch it, and eat it. It has to be a virus that survives and thrives in humans. How can a virus that causes illness in animals then cause illness in a completely different species, us? Well, it has to literally change its structure, its composition, how it's built. And that's what we mean when we say a virus mutates. Why does a virus mutate? To stay alive. That simple. And, that challenging. This is a particularly challenging virus because we know by laboratory analysis there already are at least two strains, or slightly different structures, just within the earliest of outbreaks in the metropolitan Seattle, Washington area. (source: Dr. Michael Sayre, Seattle Fire Department Medic One Medical Director) That is why there are predictions, reasonable predictions at that, why we most likely will have COVID-20 (or named something like that) months from now because this is a mutating virus. It likes to survive at our expense. Not necessarily our death, but our expense of at least being infected, allowing it to grow in us, and as far as it is concerned, having us spread it on to others (therefore, part of the reasons we must practice social distancing now when we can).

What is SARS-CoV-2? Coronavirus? COVID-19?

The virus. It has a scientific name. That's all "SARS-CoV-2" is, a scientific name. It's short for "Severe Acute Respiratory Syndrome Coronavirus 2." That does have importance because over the years ahead, we'll have other diseases and we can't just say "the virus" because that will get very confusing. But for this day, "the virus" pretty much works because we aren't thinking about many other ones.

Is a coronavirus this same virus? Well, yes and no. THIS virus, SARS-CoV-2, is an example or type of a coronavirus. However, there are other coronaviruses. Coronavirus refers to the physical structure of a family of viruses that each resemble something like a crown shaped structure, hence "corona" which means crown in the Latin language. Interestingly, the "common cold" that most of us get once or twice yearly in the cooler weather months, is typically caused by other coronaviruses, those that don't carry the concern this one is causing us. However, other coronaviruses have caused great concern in the past 20 years.

Severe Acute Respiratory Syndrome (SARS) started in China in late 2002. Within months, SARS spread to more than two dozen countries in Europe, South America, Asia, and North America, namely Toronto, Ontario, Canada. A key difference in SARS is that it didn't' prove contagious until AFTER infected persons showed symptoms of fever, cough, congestion. We see today that this present virus is contagious from estimates of up to 25% of infected persons BEFORE they develop symptoms to even know they themselves are ill. (*sources: 1: Dr. Robert Redfield, CDC Director, interview with National Public Radio, March 30, 2020. Information accessed at https://www.npr.org/sections/health-shots/2020/03/31/824155179/cdc-directoron-models-for-the-months-to-come-this-virus-is-going-to-be-with-us; 2: Wei WE, Li Z, Chiew CJ, Yong SE, Toh MP, Lee VJ. Presymptomatic Transmission of SARS-CoV-2 — Singapore, January 23–March 16, 2020. MMWR Morb Mortal Wkly Rep. ePub: 1 April 2020*)

Middle Eastern Respiratory Syndrome (MERS) started in Saudi Arabia in 2012, with episodic outbreaks since, including one in 2015 that involved South Korea. A key aspect of MERS research showed us that coronavirus is not as "seasonal" as disease as we would like to think it is. When you hear news reports that we'll be fine once summertime temperatures arrive in the United States? Well, there's absolutely no truth to that assertion. That's wishful thinking, not established fact. MERS replicates just fine in 110F weather in the Arabian Peninsula. (*source: CIDRAP/Dr. Michael Osterholm; also reported in The Osterholm Report, Episodes 1 and 2 – hyperlinks below*)

While it is sad both SARS and MERS have caused notable illnesses and deaths, these coronaviruses have allowed us to know better what we know so far about SARS-CoV-2, helping us in our efforts to decrease the spread, to reduce the risk, and to keep you safer.

COVID-19, short for "coronavirus disease" per the World Health Organization (WHO) – think of WHO as Earth's public health department, is the illness caused by this particular coronavirus. And this is most challenging part of all…

A scientist in a lab with a high-powered microscope can look at this virus and say, "Aha! Coronavirus."

A laboratory worker can use a test (more about those in Update 14) and say, "Aha! COVID-19 positive or SARS-CoV-2 positive." - Or hopefully more often, they would say negative/no virus.

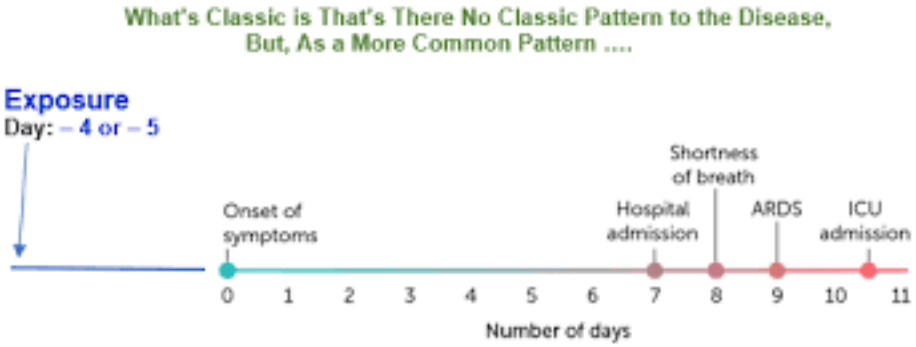
BUT… a doctor, a good doctor, or a good paramedic, or a good (you get the idea) can't just look a person and say "Virus!" or "No virus!"….these past few months have proven that humans display everything

from no symptoms even when infected to rarely, but sadly, death within days. This is challenging and it's going to stay challenging until highly accurate, highly accessible, and rapidly resulting tests are everywhere. And that's going to take time, scientific work, manufacturing and money.

In this immediate time, and this may be the most important sentence you read in Update 13: Being infected with coronavirus, having COVID-19, does not always equal dying. It's so important to remember that. Only a very small percentage die. However, this is the big news – the death count. Yes, each of these deaths is tragic, but I truly don't want this illness to cripple your emotional well-being about life, family, work, and the future. Many of us have heightened risks by our professional duties. I'm putting my final edits to this update during a break in patients arriving to a highly-functioning American Emergency Department. Many countries envy our healthcare system. And yet, there is no guarantee of my safety other than being responsible about the PPE choice I make, respectful of the infectious nature of this illness, and aware that as I've said this comes in all shapes and sizes and symptoms, so despite all that, I'm going to miss cases of this. In fairness to patients, how are they supposed to tell me they are worried about coronavirus when they have no classic symptoms of it yet? They can't. I don't share my Emergency Department journeys with you to make any of this about me. It's not; it's about you. And my point is, I'm right there with you. We're in this together. And we'll keep making choices as carefully and realistically as we can so we get through this together, safely, with our health.

What are the symptoms of COVID-19 and what is a "typical" illness of it?

Pictures can be so good at saving 1,000 words and making the points better anyway. Here's a graph I'm using for my own better understanding of COVID-19, recently shared in a Metropolitan Municipalities EMS Medical Directors Alliance conference:



(Image source: Dr. Paul Pepe – Metropolitan Municipalities EMS Medical Directors Alliance Briefing April 3, 2020)

The exposure could be anywhere from 2-14 days before symptoms, if symptoms even arise. The typical time from exposure to onset of symptoms we notice is 5 days at present, based on data from around the world, especially China and Italy. The symptoms are most commonly fever, achy muscles (myalgias), cough, and congestion. Sometimes gastrointestinal symptoms occur, such as nausea, vomiting, or diarrhea.

Fortunately, most people, as reported to date in many resources, most = 81% of those infected will require no hospitalization, fully recover and move on.

Of the 19% or so that need for hospitalization, it's often about a week after symptoms start. It's not an immediate need for hospitalization, which is why when sick we must stay home and be vigilant about how we are feeling and what, if anything, is changing day to day. This isn't a heart attack or stroke, either of which can appear without a moment's warning. Most of those folks needing hospitalization are because of problematic shortness of breath. Even most of those will do fine with some care in the hospital that might include oxygen and medications to manage the symptoms if home-based/over the counter medications weren't strong enough.

The estimated 5% of total infected persons that require ICU care do so because of severe lung problems, to an extent that a ventilator is needed to do the work of breathing for the patient. That is what Acute (some say Adult) Respiratory Distress Syndrome (ARDS) basically leads to, that you are going to need a ventilator as part of your care. We can easily understand if the patient is 80 years of age or older and has chronic lung disease that impairs their breathing on a good day, how this new viral illness can put them over the edge, requiring ICU care. What's harder for us to understand, and frankly scary at times, is how this same viral illness can seriously impair breathing in seemingly healthy, active persons in their 30s-50s. That sounds similar to so many of us, doesn't it?

There's a pessimistic view that once you need a ventilator, you're dead. That's not true. There are already very promising results from gifted intensive care unit physicians and nurses being shared. University Medical Center in New Orleans just reported this week that in the over 80+ number of patients they have had to put on ventilators for COVID19, that 40% were successfully extubated, meaning taken off the ventilator, because they improved and survived. *(Source: webinar with Dr. David Janz, University Medical Center, New Orleans, LA. accessed at https://www.youtube.com/watch?v=Ngu5-iOHdS4&feature=youtu.be&app=desktop)* That doesn't mean needing a ventilator is a great thing, but it sure isn't a death sentence. That's important to remember if you have family, friends, and coworkers that require a ventilator and ICU care as part of their treatment in the weeks ahead.

Educational Resource – COVID-19 – CIDRAP

Many of you are aware of my profound respect for an incredibly gifted epidemiologist at the University of Minnesota, Dr. Michael Osterholm. I encourage you to invest 39 minutes of time in listening to the second episode of The Osterholm Report – The Global Coronavirus Response (release date 31MAR).

You can access it at this link: https://www.cidrap.umn.edu/covid-19/podcasts-webinars/episode-2-global-coronavirusresponse or The Osterholm Report is available on Spotify, Apple Podcasts, or Google Play Music.

If you haven't heard the first episode of The Osterholm Report – COVID-19 – How We Got Here (release date 24 MAR), then this link will get you to that recording: https://www.cidrap.umn.edu/covid-19/podcasts-webinars/episode-1-howwe-got-here

Where Are We Going Next?

Yes, for those keeping close score, I did anticipate this Update 13 from the Office of the Medical Director being released a few days earlier and discussing in it return to work recommendations and limitations as well as how we are currently using and anticipate having to continue using in part a "non-testing"

strategy. We are in a dynamic time, one in which I haven't seen as many incoming resources as I did within the past few days. So that's where I've "been" amidst all those resources, digesting and vetting what I think will help keep you as safe as possible while delivering the best care possible. In that incoming whirlwind, I also heard a topic-changing voice. Never underestimate the benefit of what one person, speaking for those quiet, can provide. That's why this Update 13 covered what it did. Update 14 is coming as soon as I can get it down the digital production line in these next few days. It's always a balance. So much info, but only so much our "personal bandwidth" can digest at once. So, let's close this Update 13 down.

The truth that's more important than ever to share is that I am so proud of all of you for serving others in a risky time. We can reduce our risks, but none of us can eliminate our risks and still do what we do. I promise to keep in our fight for us and for others with all I can bring to it, which includes another weekend full of Emergency Department responsibilities while still being ever vigilant and responsive in our EMS system.

Let's be careful out there.

Dr. Goodloe