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Number of Annual Service Requests: 110,000
Number of Ambulances: 51
Business Type(s): Privately-Public Partnership

Project Participants:

Michael Johnson – Regional Director – michael.johnson@amr.net
Enrico Aguilar – Clinical Manager – enrico.aguilar@amr.net
Herbert Hern, MD – Medical Director

Entry Categories:

Clinical Outcome Project

Situational Analysis:

On average, Contra Costa County sees approximately 725 cardiac arrests patients per year. AMR Contra Costa County responds to approximately 650 of those cases annually. Since 2008, Contra Costa County EMS has participated in the CARES (Cardiac Arrest Registry to Enhance Survival) registry. CARES allows for review of system trends in addition to allowing the ability to compare against a similar system. AMR Contra Costa County has also participated in retrospective analysis of cardiac arrest cases via the CodeStat software by Physio Control. Contra Costa County EMS began CodeStat in 2014 and transitioned the annotating duties to AMR Contra Costa County in January 2017.

During 2017, AMR experienced 3 sentinel events that served as an impetus to do an in depth review of cardiac arrest management in the county. A drop in cardiac arrest survival percentage was noted in the CARES data from 38.5%¹ (2016) to 28.6%¹ (2017). In addition to the drop in survival rates, review of the CodeStat analysis showed that as a system, providers lacked a uniform approach to cardiac arrest management. The lack of a uniformed approach, put our providers at risk for injury and our patients were not receiving optimal care.

The solution brought forth was to create a uniformed approach/system to cardiac arrest management that could replicated throughout our service area. That system is called CPR Highly Defined or CPR-HD.

Project Goal:

1. To provide a uniformed approach to cardiac arrest management.

Planning and Implementation:

¹Survival rate is derived using Utstein 2 criteria: a witnessed out of hospital cardiac arrest with bystander CPR, found in a shockable rhythm, and discharged with a CPC score of 1 or 2

There were many different ways to approach uniformed cardiac arrest management. During the research and development phase of the project, AMR looked at PIT crew CPR, CAM, and a variety of other systems.

CPR-HD is time driven management system that focuses on the three components shown to increase chance of survival: timely, appropriately paced compressions, timely and effective defibrillations, and limited interruptions/time off chest. This was achieved by creating a script that serves as the “Code Leader”. It does not remove or replace a provider’s critical thinking skills but simply organizes the management in a consistent and timely manner. In addition to the script, a stop watch is used to ensure accurate 2 minute compression cycles. In those 2 minute cycles, the cardiac monitor was pre-charged every minute and 45 seconds without a rhythm check. This eliminated an entire pause found in traditional cardiac arrest management and increased the time on the patient’s chest. Once charged, the providers can stop compressions, perform a rapid rhythm analysis and deliver quick, timely defibrillations once again allowing for more time on chest. Lastly a cardiac arrest “kit” was created where all the necessary medications and equipment is stored for quick, easy, and clean deployment at the patient’s side.

Once the script was completed, a pilot program was initiated to evaluate the effectiveness of the system. 8 AMR crews were trained as CPR-HD champions. AMR also trained 2 partnering fire agencies.

Results:

The pilot lasted approximated 4 months-time in which the pilot’s goal was met. Through a variety of crew configurations (BLS engines with the ambulance, ALS engine with ambulance, 2 trained crews working with each other, etc.), it was shown through CodeStat analysis that AMR had achieved uniform care of a cardiac arrest patient.

After meeting the project goal, the data was then presented to the Local EMS Agency (LEMSA) and the local Emergency Medical Care Committee.

Impact:

The data was positively met. As a result, CPR-HD was adopted as the county wide cardiac arrest management system. AMR assisted in the creation of the training modules for county wide rollout. In addition, AMR led training sessions for the rollout. Over the course of 2018, AMR not only trained the pilot crews in CPR-HD but also did a “soft rollout” with its entire field provider staff. The soft rollout included a brief overview of CPR-HD and reminders of CPR basics. The pilot and rollout resulted in an increase overall survivability of a cardiac arrest to 38.5%¹.

AMR was also involved in substantial community outreach and education in bystander CPR (Enhanced Bystander CPR). Through those efforts, the incidence of bystander intervention increased from 43.3% in 2016 and 41.9% in 2017 to 49.0% in 2018.

Budget:

\$10,000 including manpower training costs.

¹Survival rate is derived using Utstein 2 criteria: a witnessed out of hospital cardiac arrest with bystander CPR, found in a shockable rhythm, and discharged with a CPC score of 1 or 2

Supporting Documentation Upload:

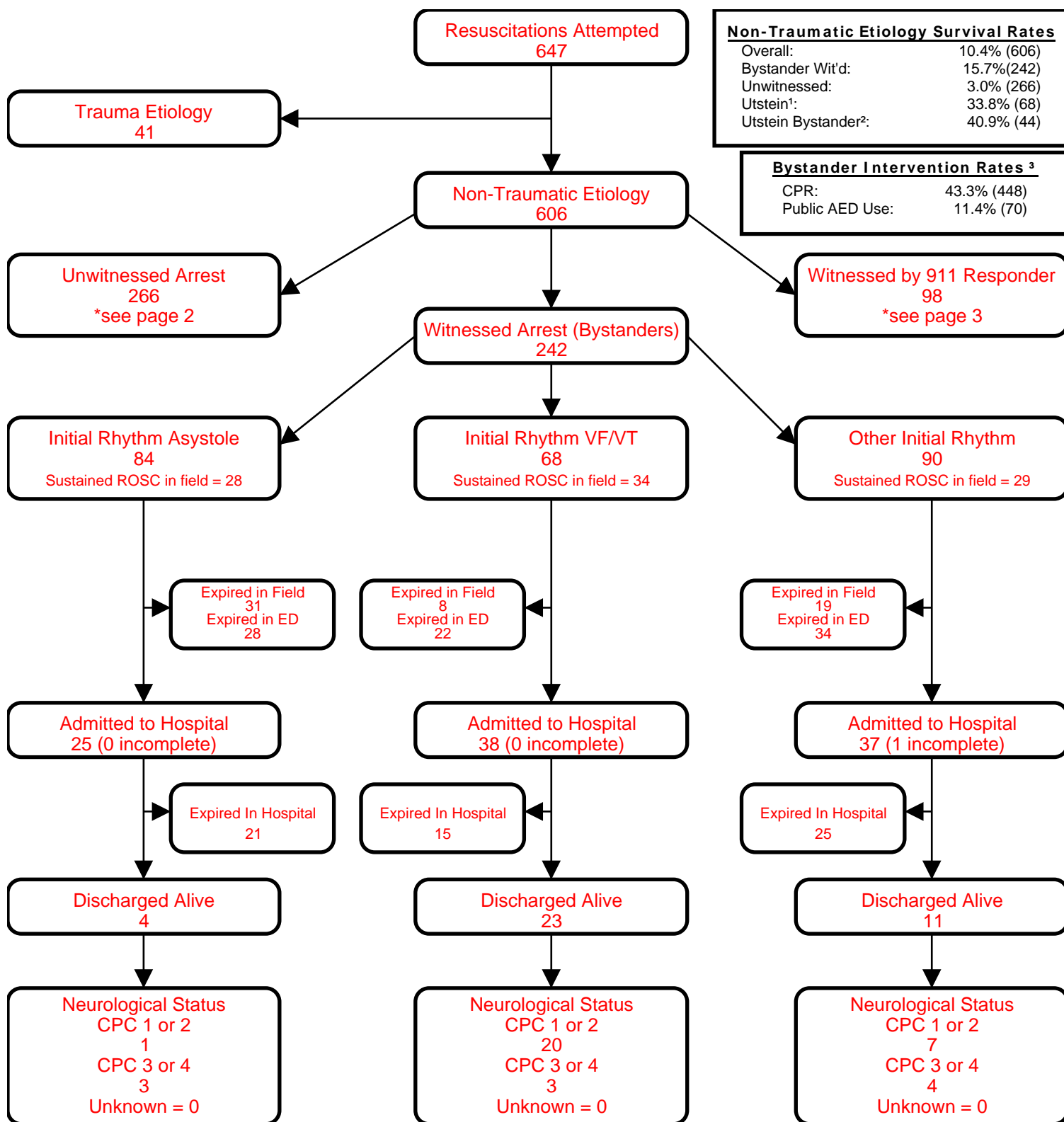
<https://cchealth.org/ems/pdf/2019-tg/FP09%20-%20Cardiac%20Arrest%20Management.pdf>

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Utstein Survival Report

AMR Contra Costa

Service Date: From 1/1/2016 Through 12/31/2016



Non-Traumatic Etiology Survival Rates	
Overall:	10.4% (606)
Bystander Wit'd:	15.7%(242)
Unwitnessed:	3.0% (266)
Utstein ¹ :	33.8% (68)
Utstein Bystander ² :	40.9% (44)

Bystander Intervention Rates ³	
CPR:	43.3% (448)
Public AED Use:	11.4% (70)

¹Utstein: Witnessed by bystander and found in shockable rhythm.

²Utstein Bystander: Witnessed by bystander, found in shockable rhythm, and received some bystander intervention (CPR and/or AED application).

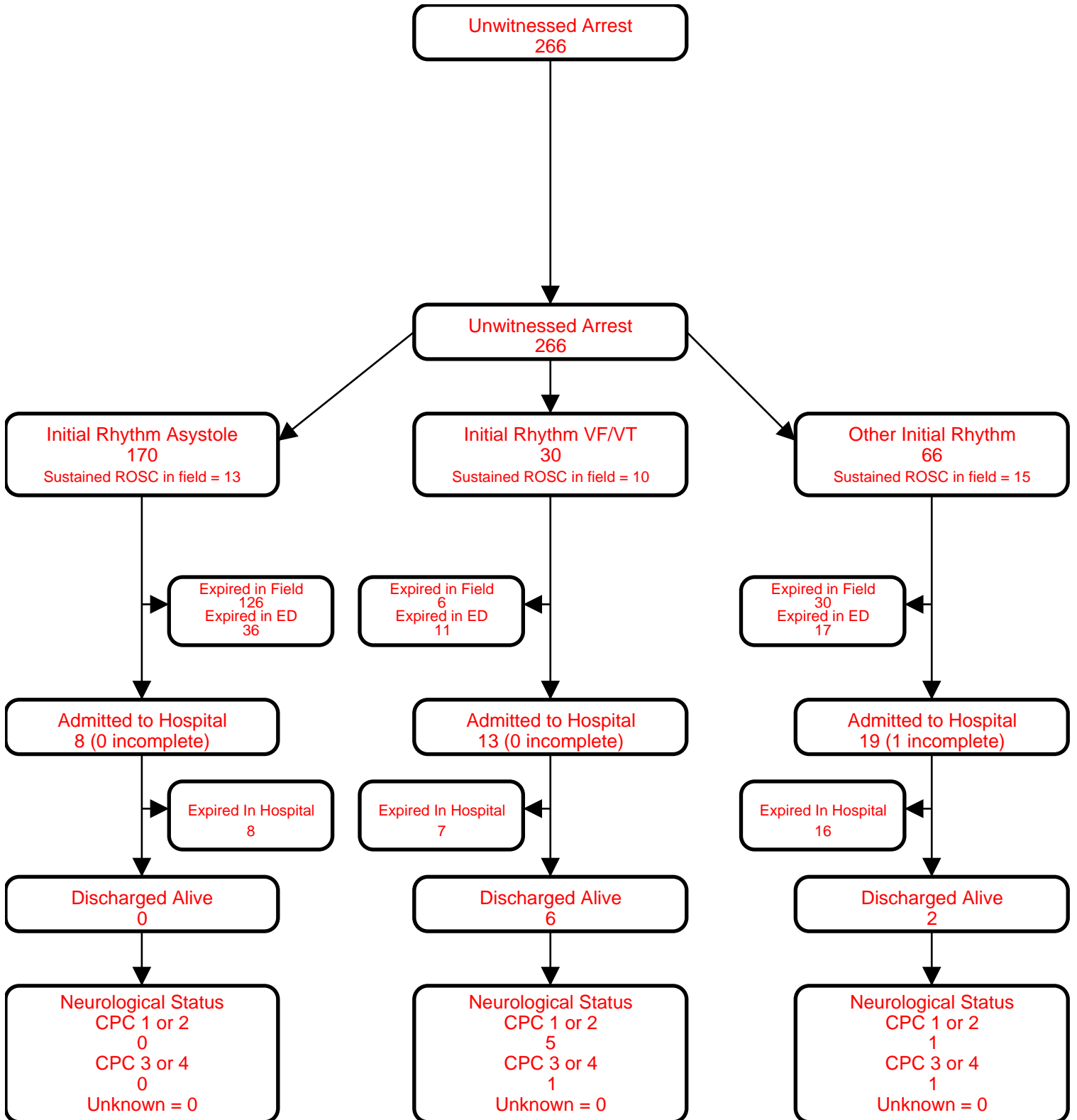
³Bystander CPR rate excludes 911 Responder Witnessed, Nursing Home, and Healthcare Facility arrests. Public AED Use rate excludes 911 Responder Witnessed, Home/Residence, Nursing Home, and Healthcare Facility arrests.

*Only data from the previous calendar year is fully audited. Data from the current calendar year is dynamic.

Utstein Survival Report

AMR Contra Costa

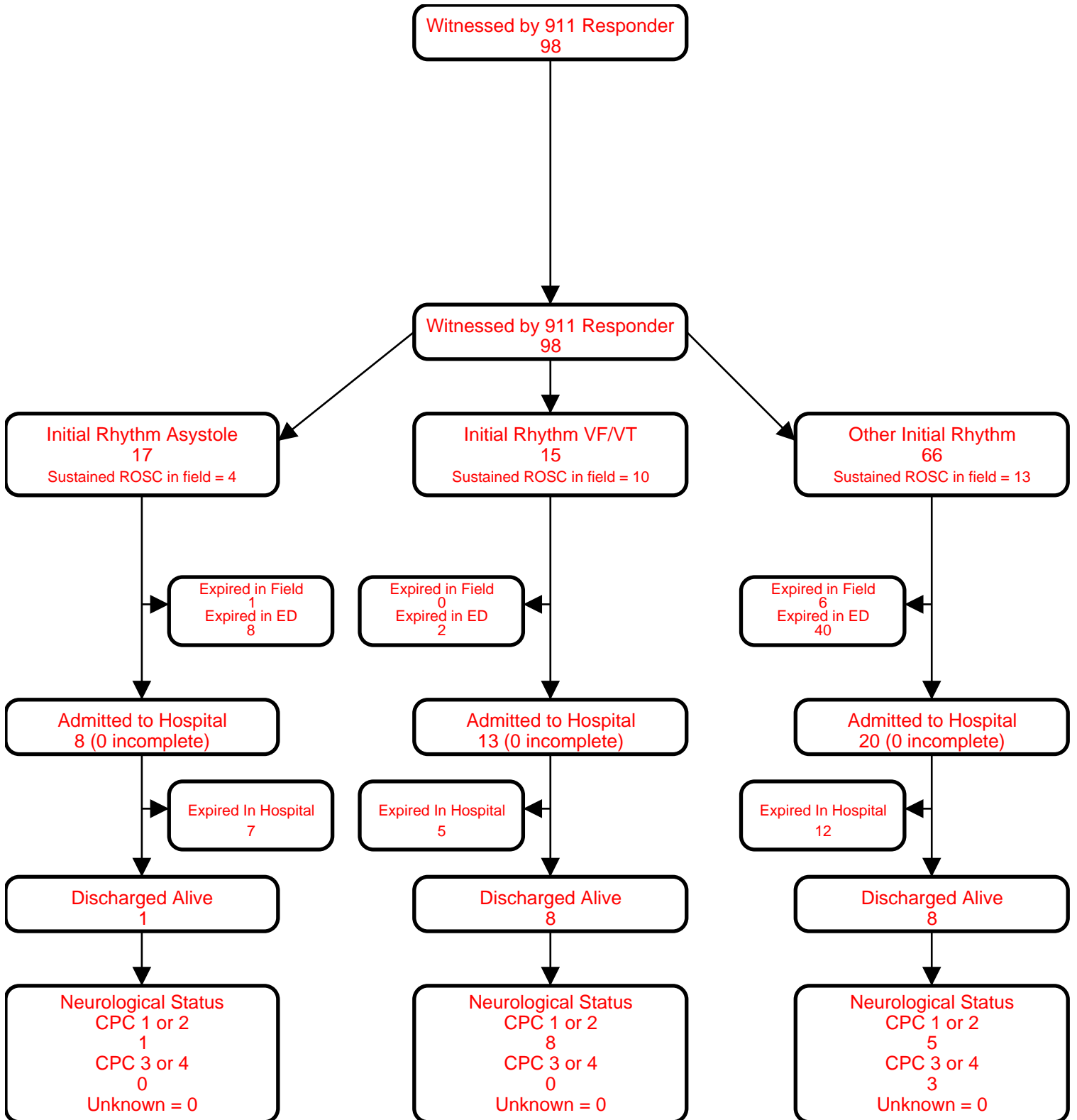
Service Date: From 1/1/2016 Through 12/31/2016



Utstein Survival Report

AMR Contra Costa

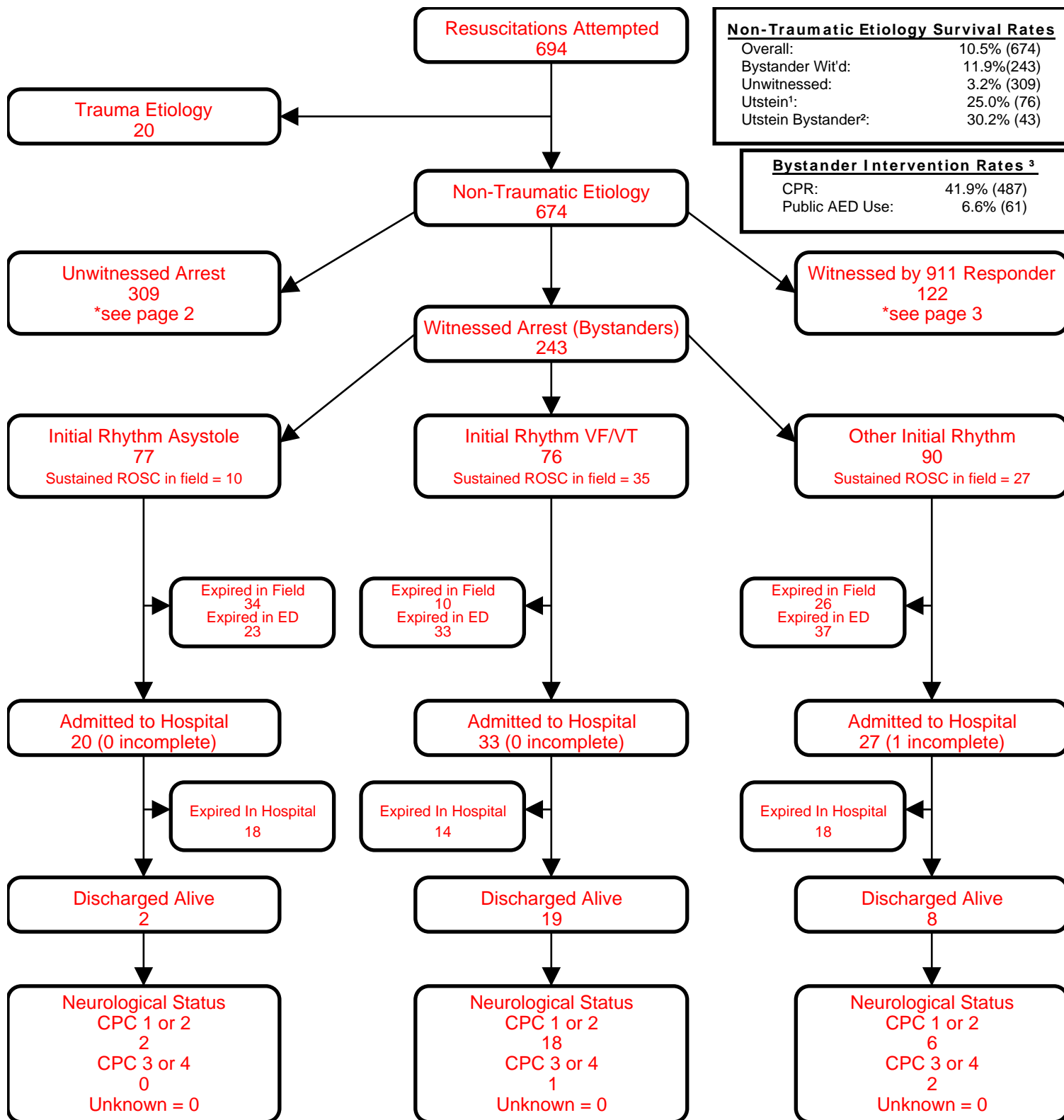
Service Date: From 1/1/2016 Through 12/31/2016



Utstein Survival Report

AMR Contra Costa

Service Date: From 1/1/2017 Through 12/31/2017



Non-Traumatic Etiology Survival Rates	
Overall:	10.5% (674)
Bystander Wit'd:	11.9% (243)
Unwitnessed:	3.2% (309)
Utstein ¹ :	25.0% (76)
Utstein Bystander ² :	30.2% (43)

Bystander Intervention Rates ³	
CPR:	41.9% (487)
Public AED Use:	6.6% (61)

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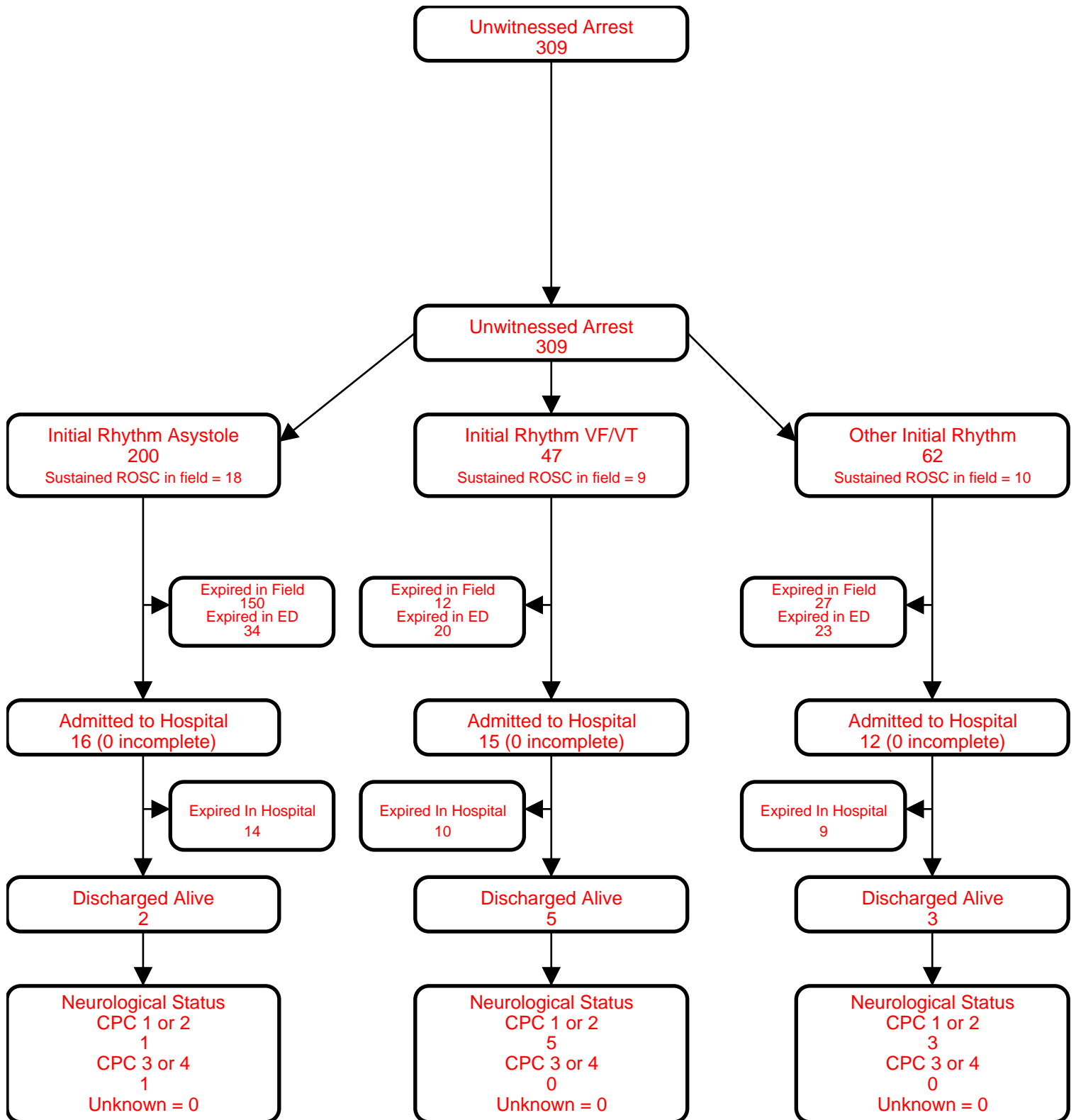
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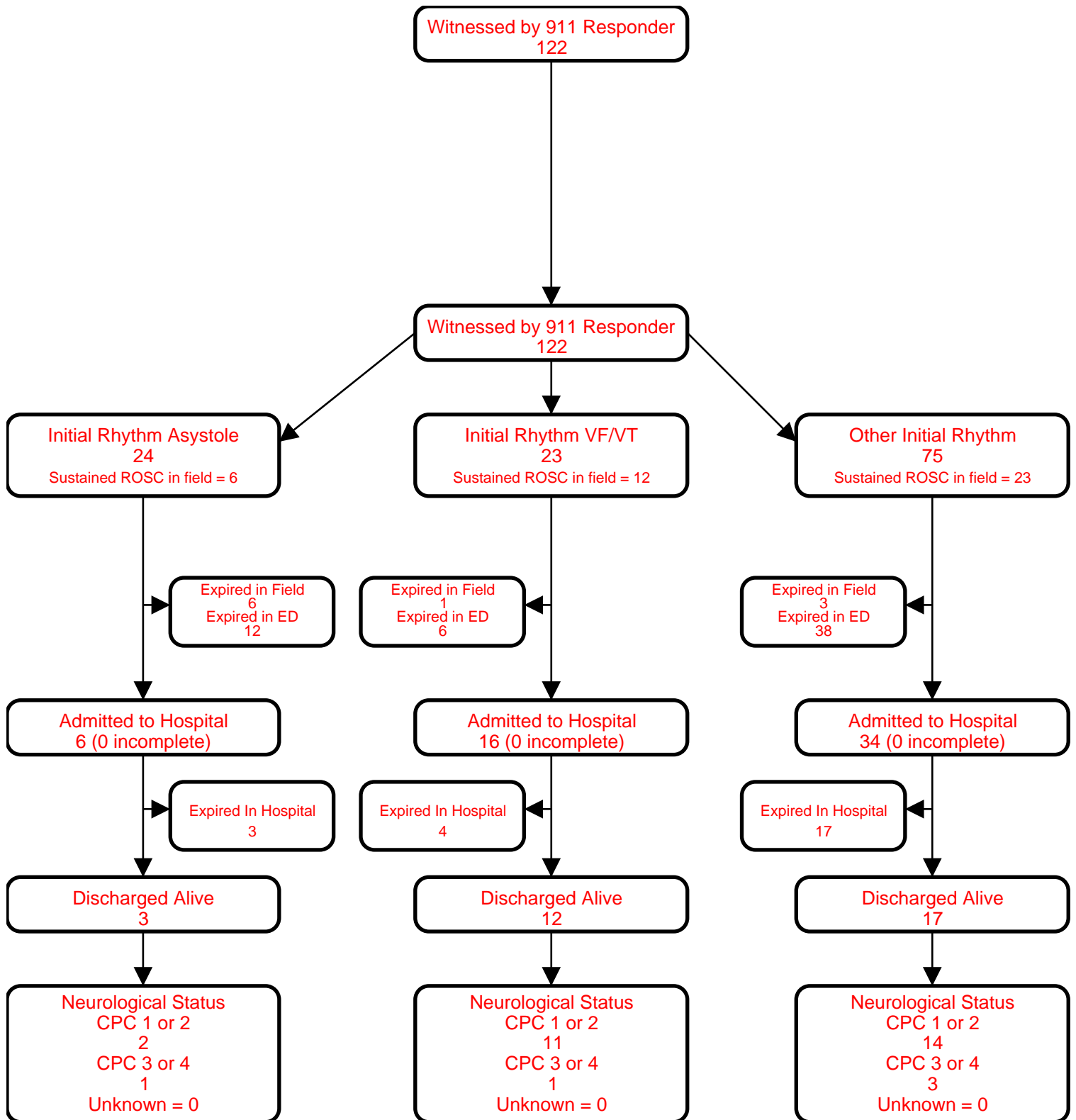
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Utstein Survival Report

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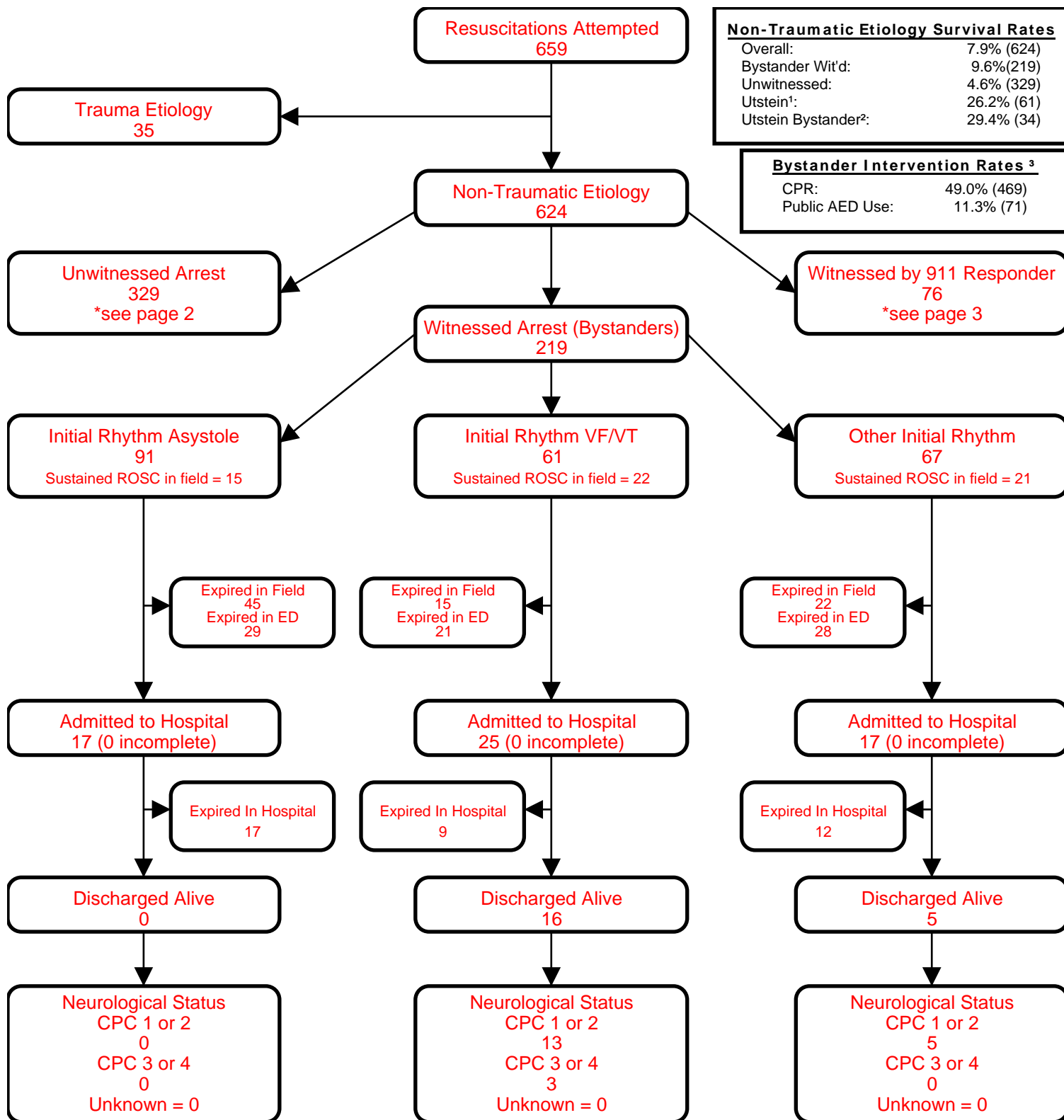
Service Date: From 1/1/2017 Through 12/31/2017



Utstein Survival Report

AMR Contra Costa

Service Date: From 1/1/2018 Through 12/31/2018



Non-Traumatic Etiology Survival Rates	
Overall:	7.9% (624)
Bystander Wit'd:	9.6%(219)
Unwitnessed:	4.6% (329)
Utstein ¹ :	26.2% (61)
Utstein Bystander ² :	29.4% (34)

Bystander Intervention Rates ³	
CPR:	49.0% (469)
Public AED Use:	11.3% (71)

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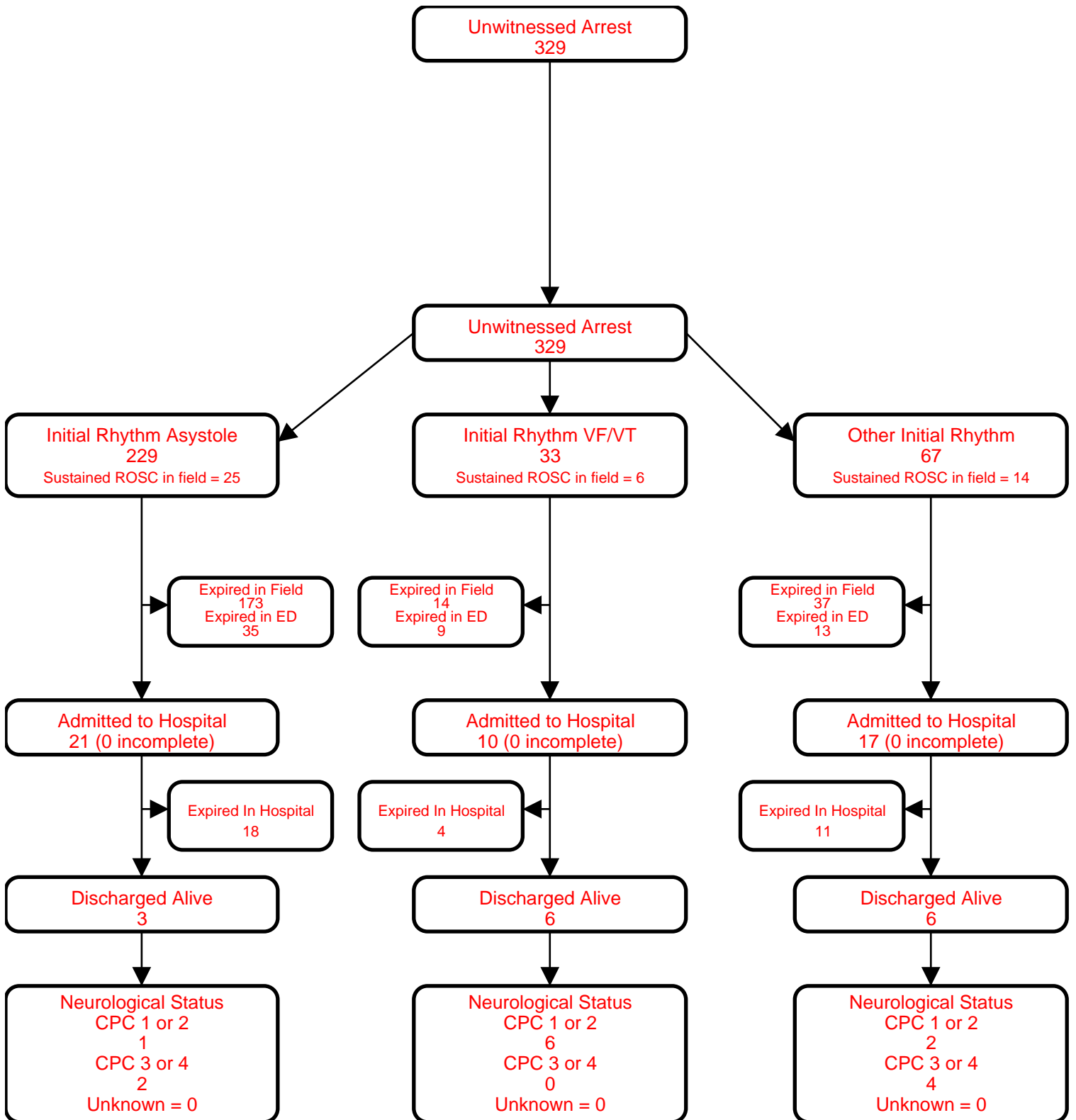
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Utstein Survival Report

AMR Contra Costa

Service Date: From 1/1/2018 Through 12/31/2018



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