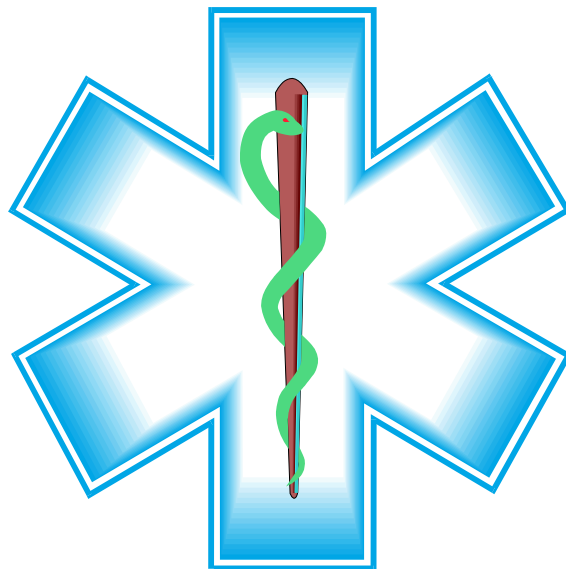

Tuolumne County
Emergency Medical Services Agency

2015 Annual Statistical Report



February 24, 2016

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INTRODUCTION

The 2015 Annual Statistical Report compiles and condenses an entire year's worth of data about the Tuolumne County EMS system. The data included in this report is derived from pre-hospital patient care records (PCRs) completed by Tuolumne County Ambulance Service (TCAS) personnel and statistical information provided by PHI, unless otherwise noted.

Since July 1, 1993, TCAS has collected PCR data using the software program EMS DataPro (EMSDP) provided for their use by the Tuolumne County EMS Agency (TCEMSA). Once entered in EMSDP, the data is submitted in an electronic format to the TCEMSA, where the data is imported into a central version of EMS DataPro. The TCEMSA then validates the data.

In September 2000, TCAS, with the assistance of the EMS agency, initiated a program for completing PCRs using EMS Outfielder (EMSOF). EMSOF provides immediate data availability for daily quality assurance/quality improvement reviews and imports patient billing information directly into the billing system used by TCAS.

The Tuolumne County Emergency Medical Services System is comprised of four 9-1-1 answering points including Tuolumne County Sheriff's Dispatch, City of Sonora Police Department Dispatch, CHP Dispatch (located in Merced County) and Mariposa County Sheriff's Dispatch.

- Ambulance dispatching is provided by the Tuolumne County Sheriff's Dispatch Center.
- BLS first response services are provided by Tuolumne County Fire Dept., Tuolumne City Fire Dist., Columbia College Fire Dept., Twain Harte Fire Dist., Columbia Fire Dist., Sonora City Fire Dept., Miwuk-Sugarpine Fire Dist., and the Groveland Fire Dist.
- U.S. Forest Service, Tuolumne County Sheriff's Search and Rescue, Don Pedro Recreation Agency, Dodge Ridge Ski Patrol provides specialized BLS response services.
- Tuolumne County Ambulance Service provides ALS service. Mercy Medical Transport from Mariposa County provides the Lake Don Pedro area ALS Ambulance service.
- PHI provides air ambulance services with day-to-day mutual aid from the California Highway Patrol (CHP) Air Operations Division, Mercy Air, CALSTAR and R.E.A.C.H. Air Ambulances.

In June 2003, grant funds were made available to TCEMSA for the purpose of purchasing and installing EMSSystem communication software and related computer hardware for the emergency departments of Tuolumne General Hospital and Sonora Regional Medical Center (SRMC) and the EMS agency office. In early 2004, EMSSystem linked Tuolumne County's EMS system with the other ten (10) counties of OES Region IV, enabling Tuolumne General Hospital (TGH), as the county's Disaster Control Facility, to view real-time emergency department availability when determining patient disbursement during a multi-casualty incident (MCI).

In 2004, The Tuolumne County Emergency Medical Services System developed and implemented a Trauma Plan, in conjunction with Memorial Medical Center, Doctors Medical Center of Modesto, Mountain Valley, El Dorado County, Central California, Northern California, Sacramento County, and Santa Barbara County EMS Agencies. The Trauma Plan provides a framework that assures that the citizens and visitors of Tuolumne County receive comprehensive prehospital and hospital trauma care. Tuolumne County relies on Trauma Centers throughout Northern California for in-hospital trauma care. Air Ambulances are used as the primary means of transportation for patients meeting Tuolumne County's major trauma patient criteria.

In July 2007, TGH closed leaving only one acute care hospital in Tuolumne County. SRMC assumed the duties of the county's Disaster Control Facility and Mountain Counties South Control Facility.

In 2008, EMSsystem was expanded to include data elements for the Department of Health and Human Services HAvBED (Hospital Available Beds for Emergencies & Disasters). This capability allows for accurate and consistent polling of hospital resources nationwide.

In June of 2009, TCEMSA was instrumental in the development of the Central Regional Trauma Coordinating Committee (CRTCC), a twelve county regional committee. The purpose of the committee is to standardize and improve the provision of trauma care within the region. The CRTCC, working in coordination with four other CRTCCs throughout the State and the State EMS Authority to build a strong, cohesive statewide trauma system.

In 2010, Tuolumne County EMS implemented an S-T Elevation Myocardial Infarction (STEMI) triage policy. This allows Paramedics in the field to transport, usually by air ambulance, a patient experiencing a serious cardiac event to be transported directly to a hospital capable of Percutaneous Coronary Intervention (PCI). Decreasing the time from the recognition of a STEMI to PCI greatly decreases the injury to the cardiac muscle and increases the survival rate of these patients.

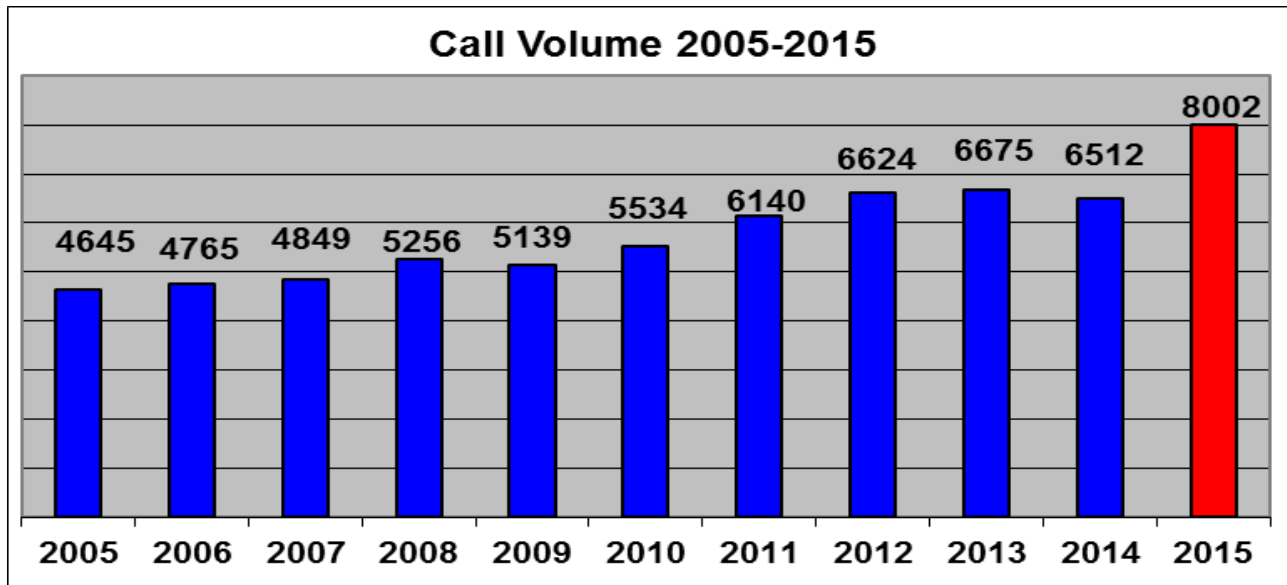
In September of 2011, Tuolumne County adopted the CRTCC Trauma Triage Criteria. This criteria is based on the Centers for Disease Control (CDC) trauma triage guidelines.

In February 2015, Dr. Todd Stolp retired, leaving both the Public Health Officer and EMS Medical Director positions vacant. Due to the increasing complexities of Public Health and EMS Systems it was decided that the bifurcation Public Health Officer and EMS Medical Director duties would best serve the County of Tuolumne. Dr. Liza Ortiz was hired as the Public Health Officer and Dr. Kimberly Freeman contracted with the County of Tuolumne as the EMS Medical Director.

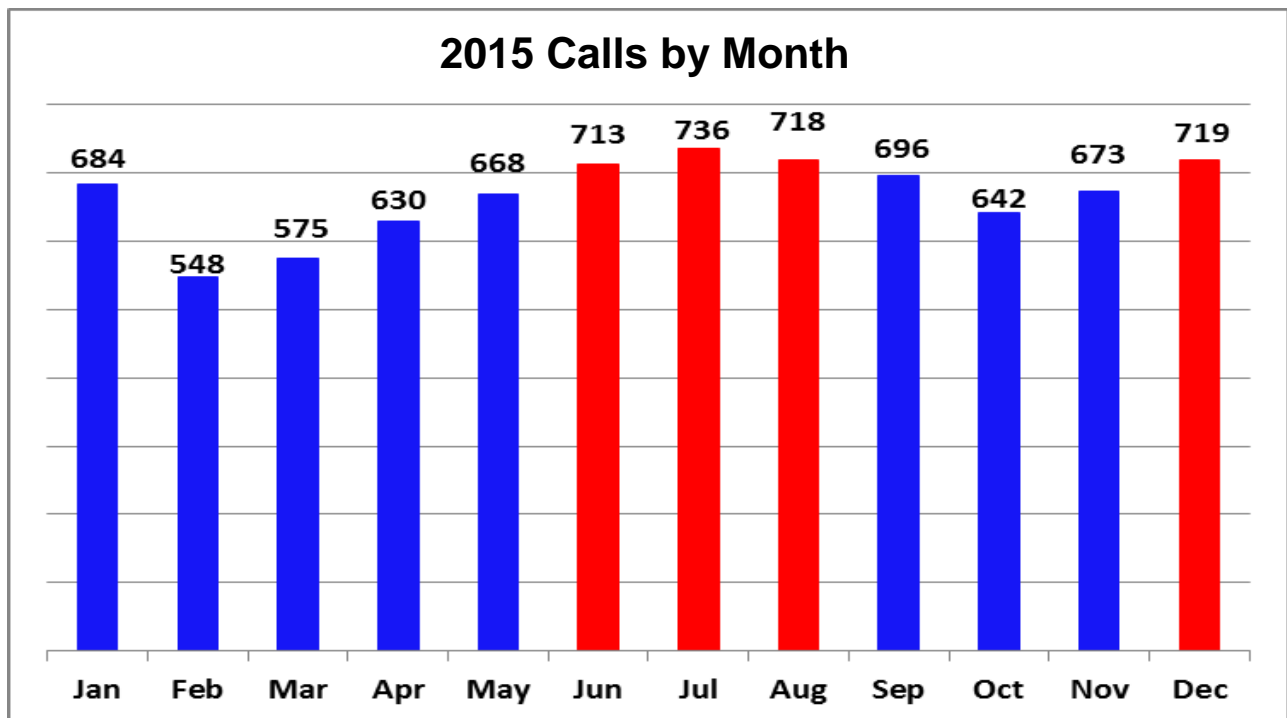
In November 2015, updated Treatment Guidelines were implemented. The addition of a skills section was added to define the performance standards for infrequently used and newly added skill and procedures.

OVERVIEW OF CALL VOLUME

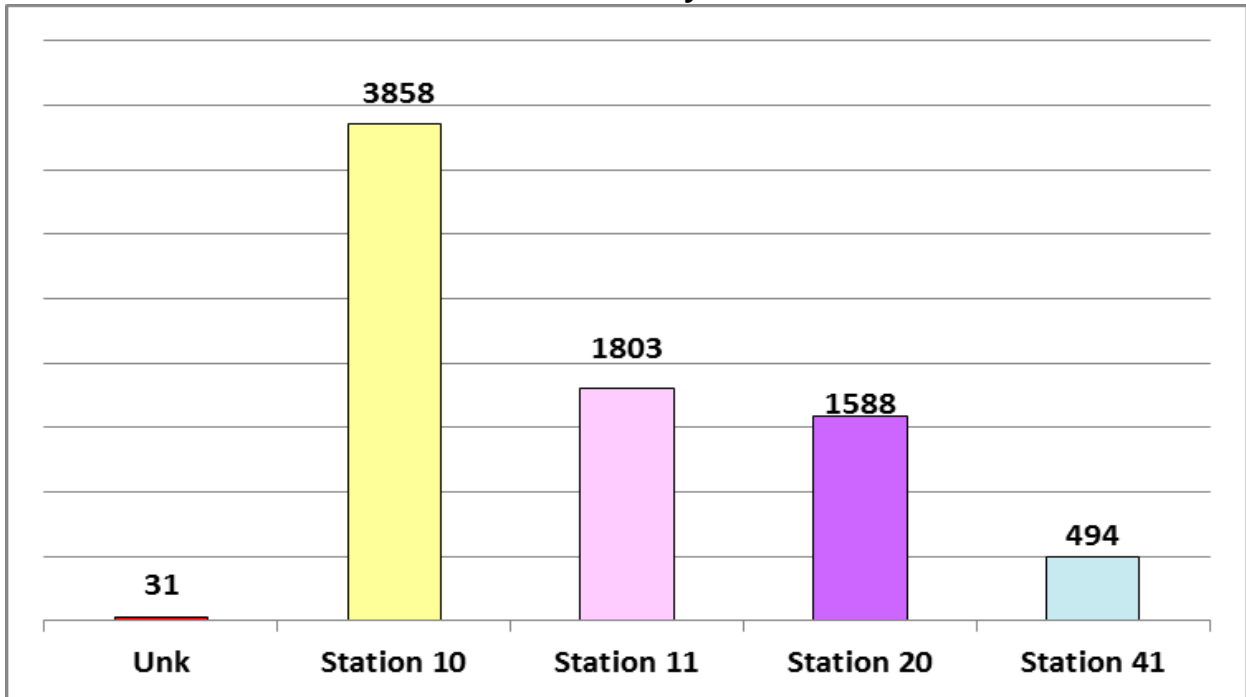
As illustrated in the graphs below, 2015 call volume increased by about 20% when compared to 2013, previously the busiest year, prior to 2015. Since 2004, there has been a 72% increase in the call volume. Unless otherwise specified EMS requests include both scene and transfer call types.



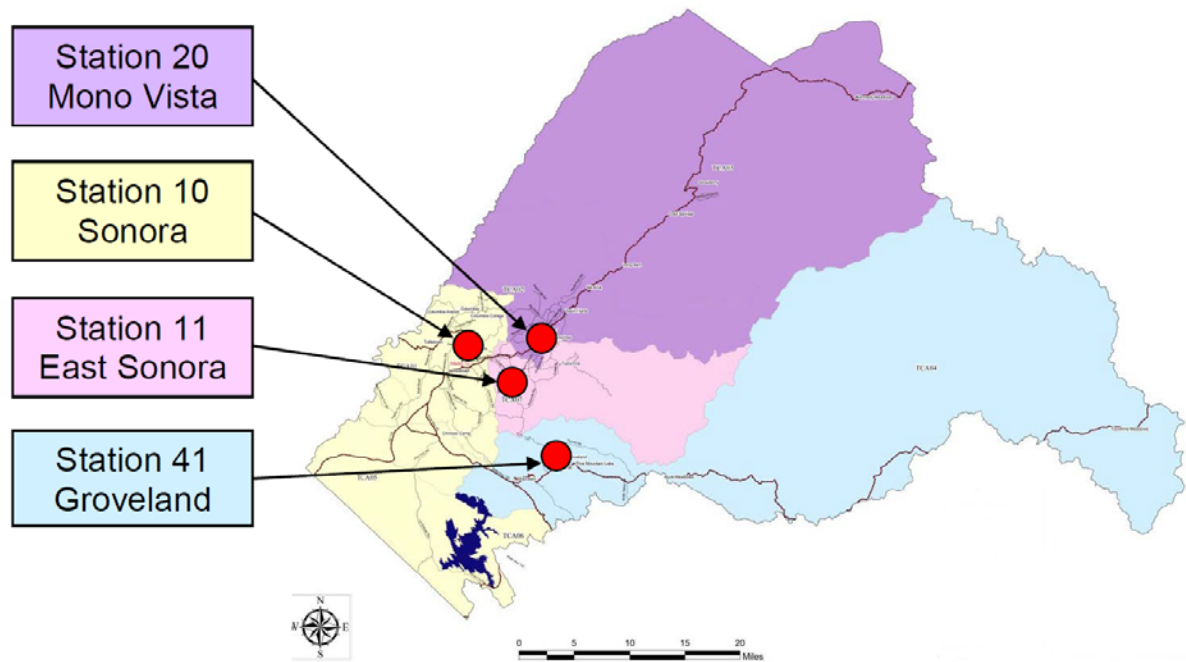
For the first time monthly call volume exceeded 700 calls; it occurred four times in 2015.



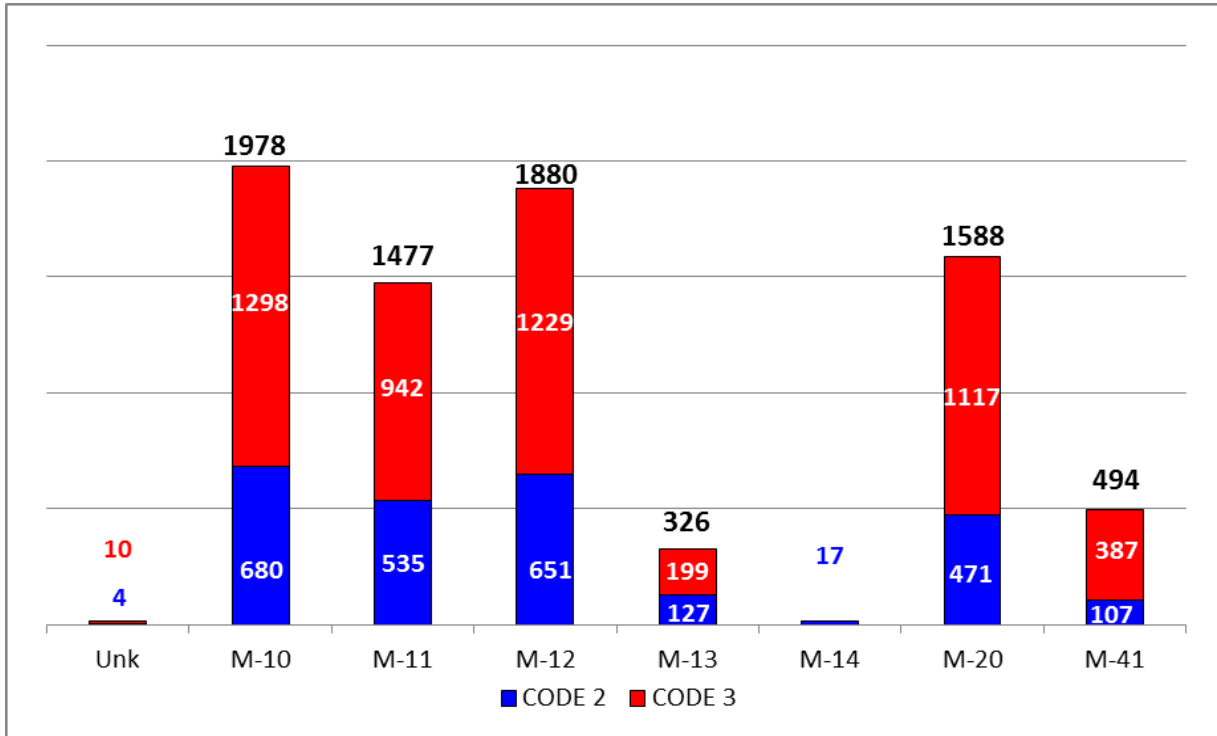
2015 Calls by Station



As illustrated above, Station 10 responded to the majority of all EMS requests.

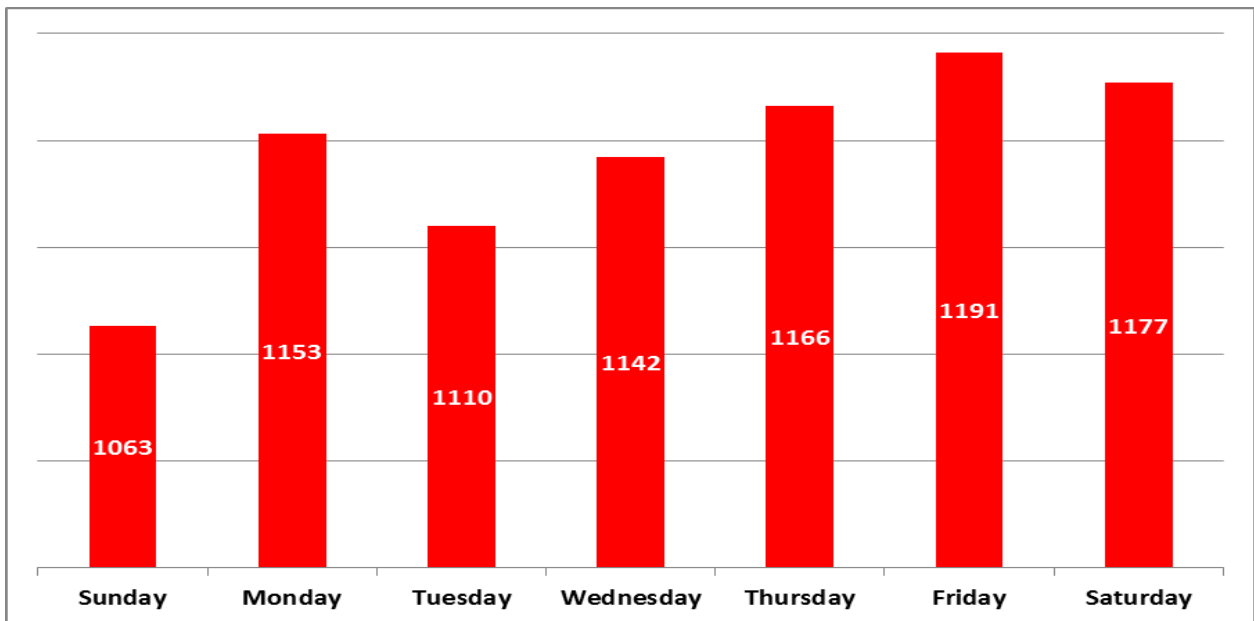


2015 Calls by Unit and Code of Response

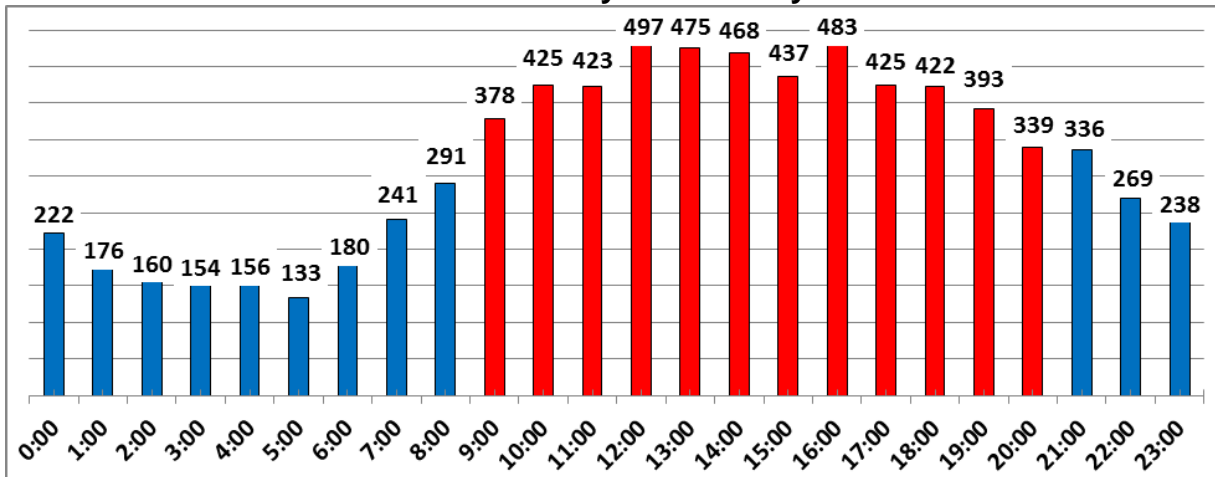


A breakdown of requests by day and time of day shows that call volumes may vary widely during the week, with the highest volumes on Mondays, Thursdays, Fridays and Saturday.

2015 Calls by Days of the Week



2015 Calls by Time of Day



Response Times

The California Emergency Medical Services Authority (EMSA) has established recommended guidelines for Code 3 response time standards to EMS requests, based on population density. Although the validity of these response time guidelines has been called into question, the EMSA recommends that EMS responses meet these response time guidelines at least 90% of the time.

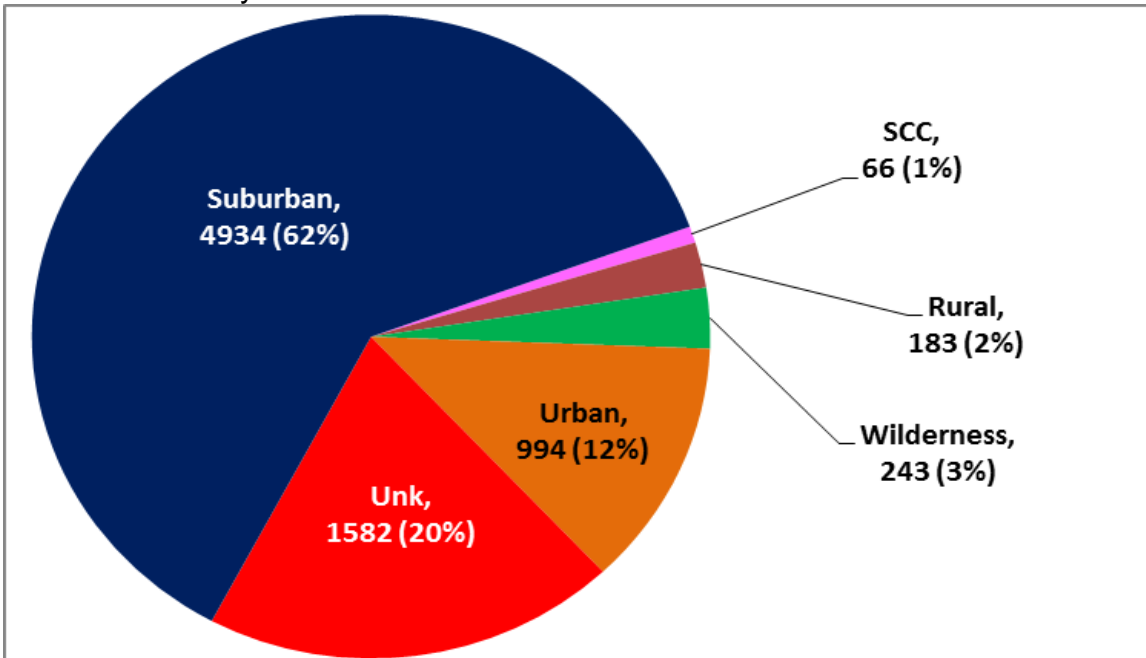
	BLS 1 st Response	ALS Ambulance
Urban	5 minutes	8 minutes
Suburban	15 minutes	20 minutes
Rural	15 minutes	20 minutes
Wilderness	ASAP	ASAP

Urban = 101 to 500 people per mile **Suburban** = 51 to 100 people per mile
Rural = 7 to 50 people per mile **Wilderness** = less than 7 people per mile
SCC = Sierra Conservation Center (secured facilities may be exempted from response time requirements)

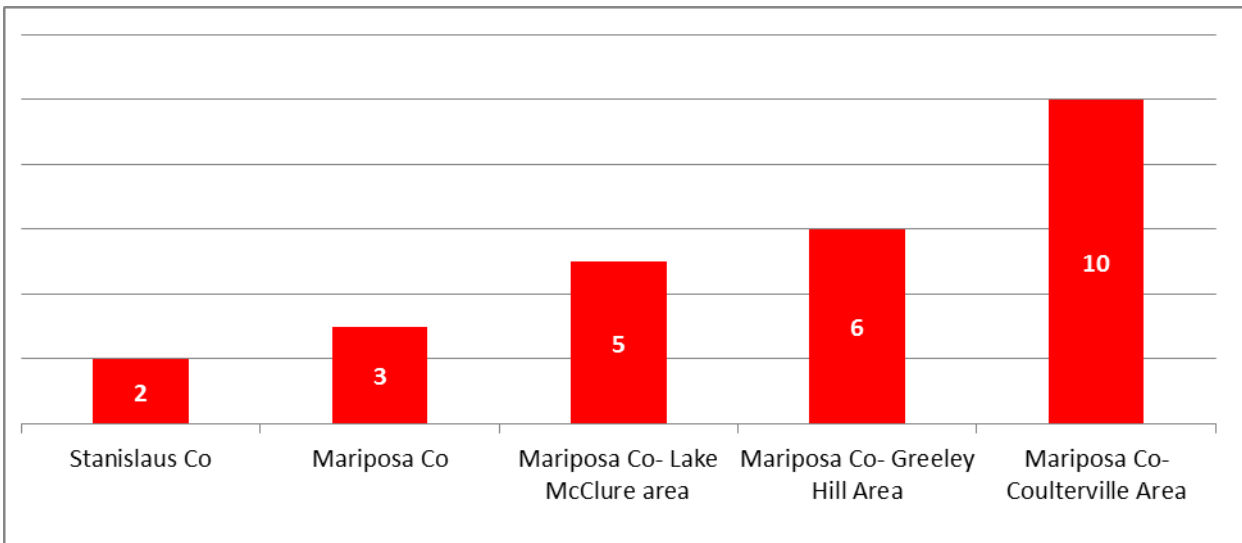
	Urban	Suburban	Rural	SCC	Wilderness
Minimum:	0 min	0 min	0 min	1 min	0 min
Maximum:	17 min	79 min	50 min	38 min	74 min
Average:	6.43 min	10.51 min	19.03 min	19.25 min	24.97 min
90 %ile:	10 min	16 min	23 min	33 min	42 min

CALL LOCATION

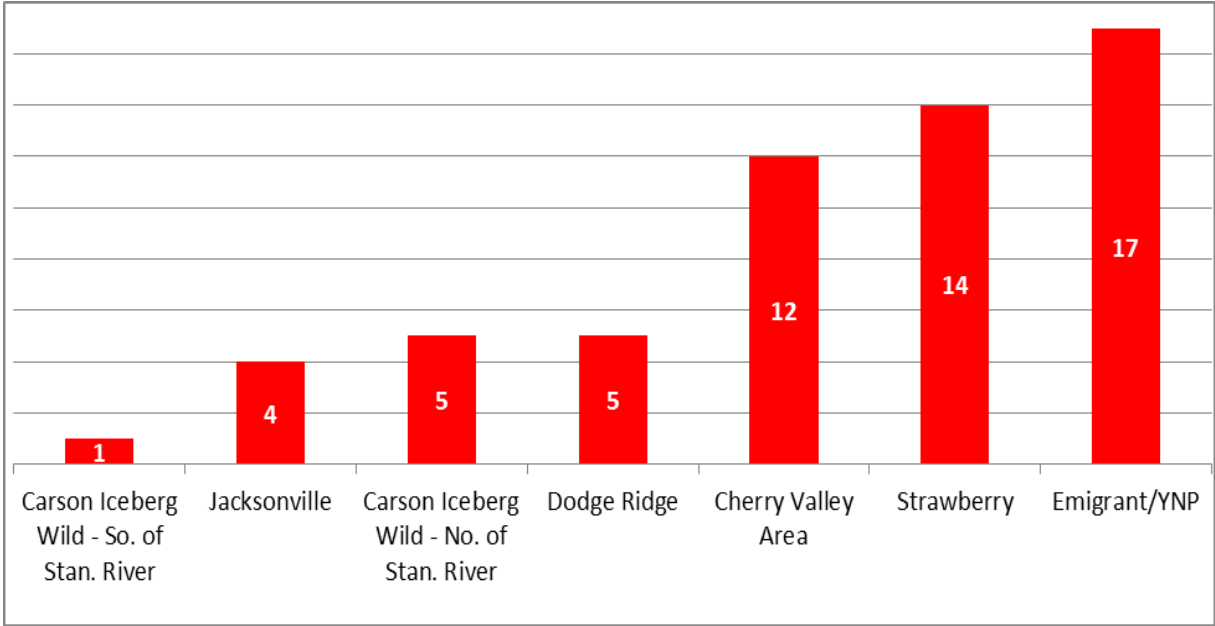
The breakdown of EMS requests by location reveals that the majority (62%) of requests occur in the suburban areas of Tuolumne County, where the majority of Tuolumne County residents live.



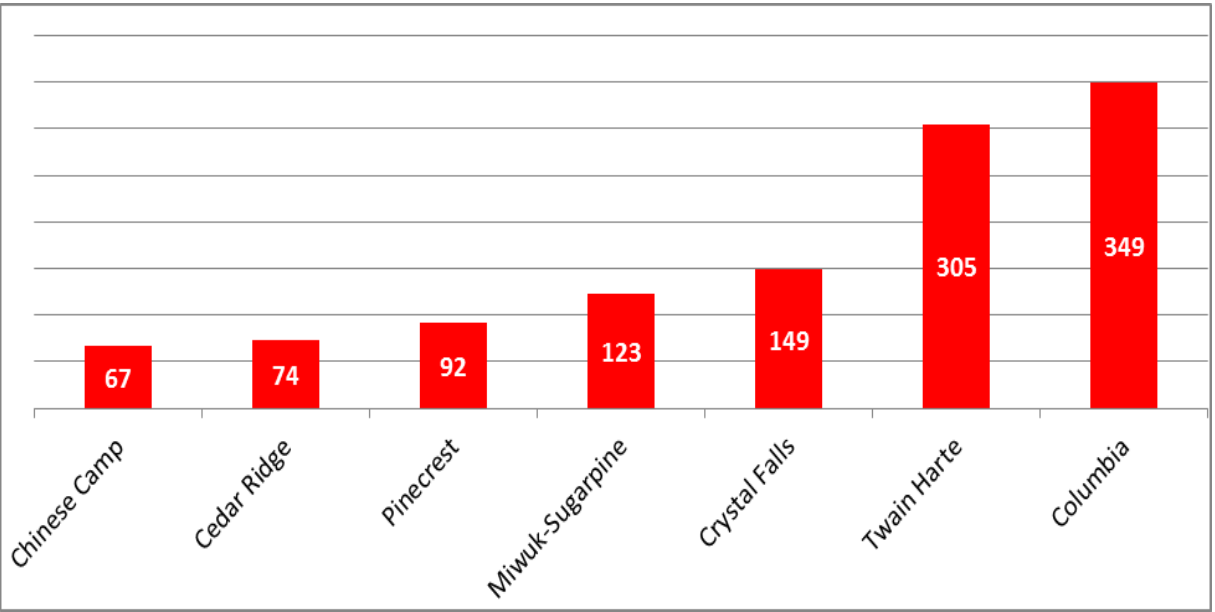
2015 Mutual Aid Responses by Tuolumne County Ambulance



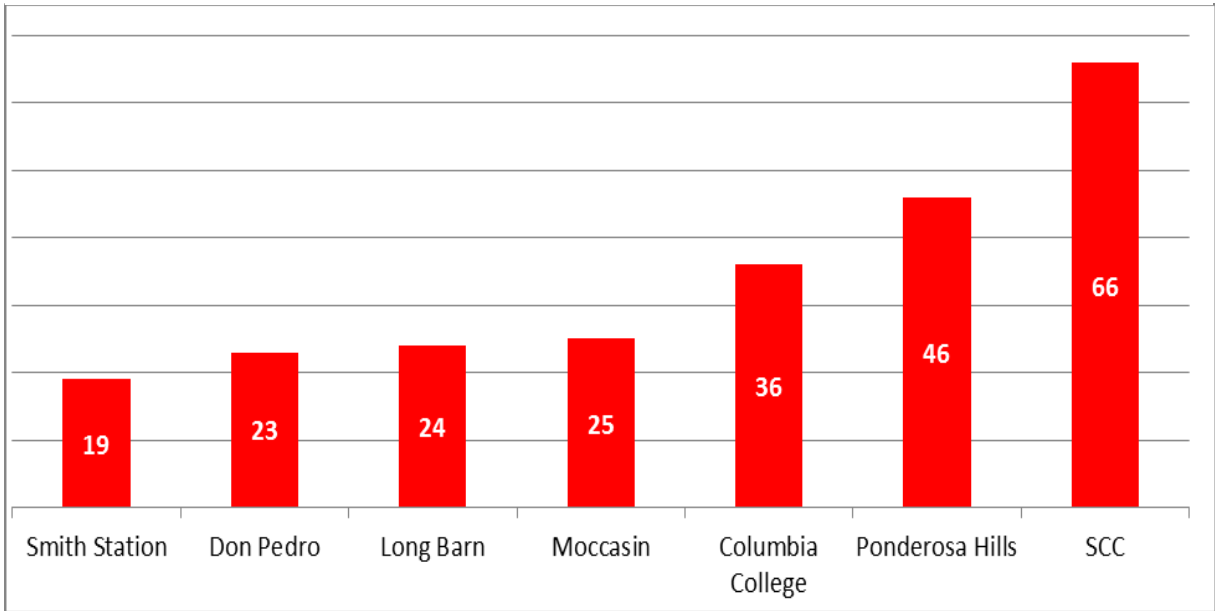
2015 Calls by Map Zone Chart #1



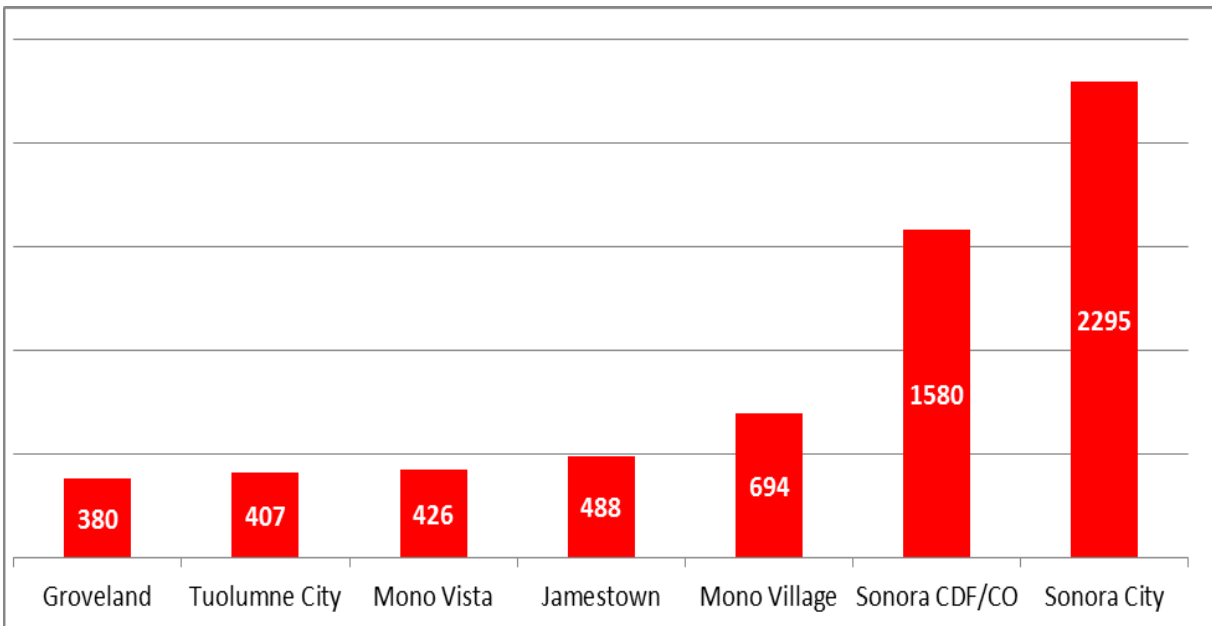
2015 Calls by Map Zone Chart #2



2015 Calls by Map Zone Chart #3



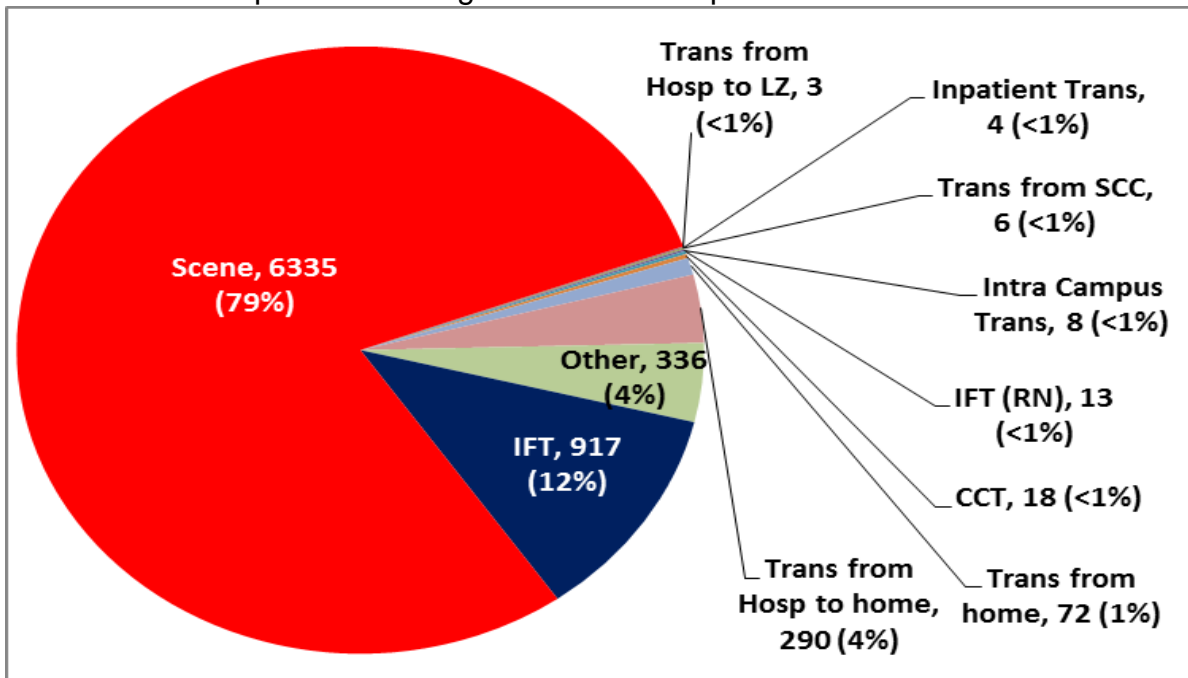
2015 Calls by Map Zone Chart #4



2015 Calls by Scene Description			
Construction Site	1	Government Building	57
Ranch/Agricultural	1	Bar/Restaurant	61
TGMF	1	Hotel/Motel	62
Tuolumne River	1	SCC	68
Other hospital not listed	2	Other	111
EMS LZ	4	City Street	132
Industrial/Manufacturing	4	Casinos	138
Swimming pool	5	Camp/Outdoor Facility	141
Dodge Ridge	6	Clinics/Doctor's Offices	163
Lakes	6	Office Business	262
Tuolumne County Jail	15	Highway	282
Park/Ball Field	16	County Road	312
Church	17	Congregate Living Facilities	643
National Forest	17	SRMC	1370
Other Waterway	22	Residence	3735
School	56	Unknown	291

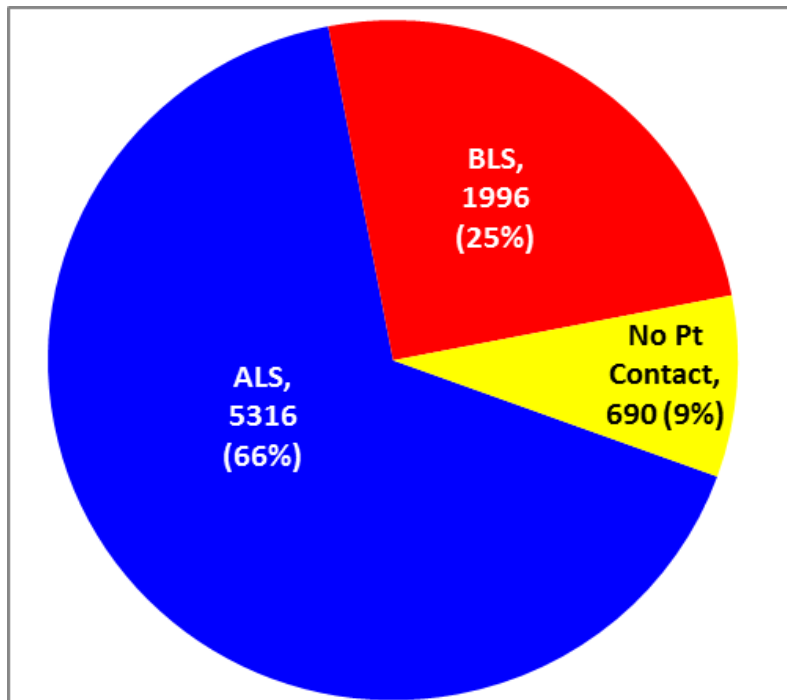
Calls by Type

In 2015, scene emergencies accounted for 79% of the total EMS requests for service. Transfers make up the remaining 21% of EMS requests for services.



Level of Care

66% of all requests for service resulted in the delivery of advanced life support (ALS) procedures and/or medications administered to the patient.



2015 Calls by Call Disposition

Trans by another ambulance	11 (<1%)	Patient Released	162 (2%)
Trans to Other Location	14 (<1%)	Trans to a SNF	233 (3%)
Trans to Non-Hospital Med Facility	39 (1%)	Call Cancelled Enroute	257 (3%)
Dead On Scene	98 (1%)	Trans to Hosp (non-ED)	329 (4%)
Trans to Rendezvous Point	107 (1%)	Other	357 (4%)
No Patient Contact Made	126 (2%)	Trans Refused AMA	540 (6%)
Trans to Home or Residence	128 (2%)	Trans to ED	5601 (71%)

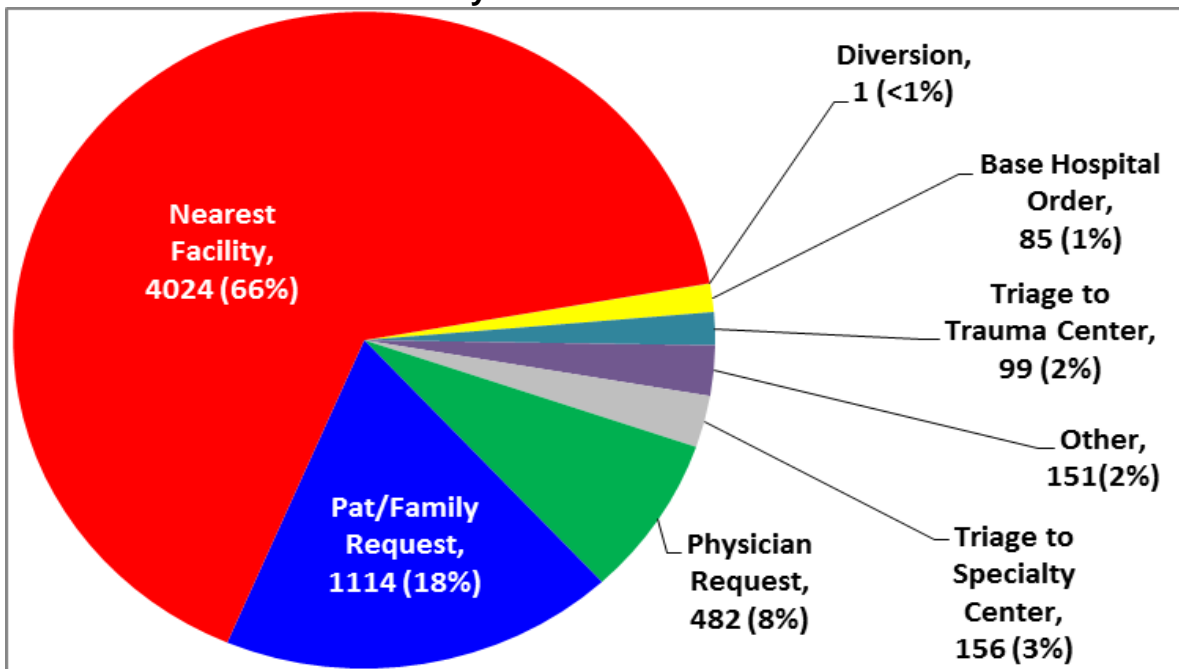
PATIENT AND HOSPITAL DATA

The chart below shows the patient distribution by receiving facilities, including transfers.

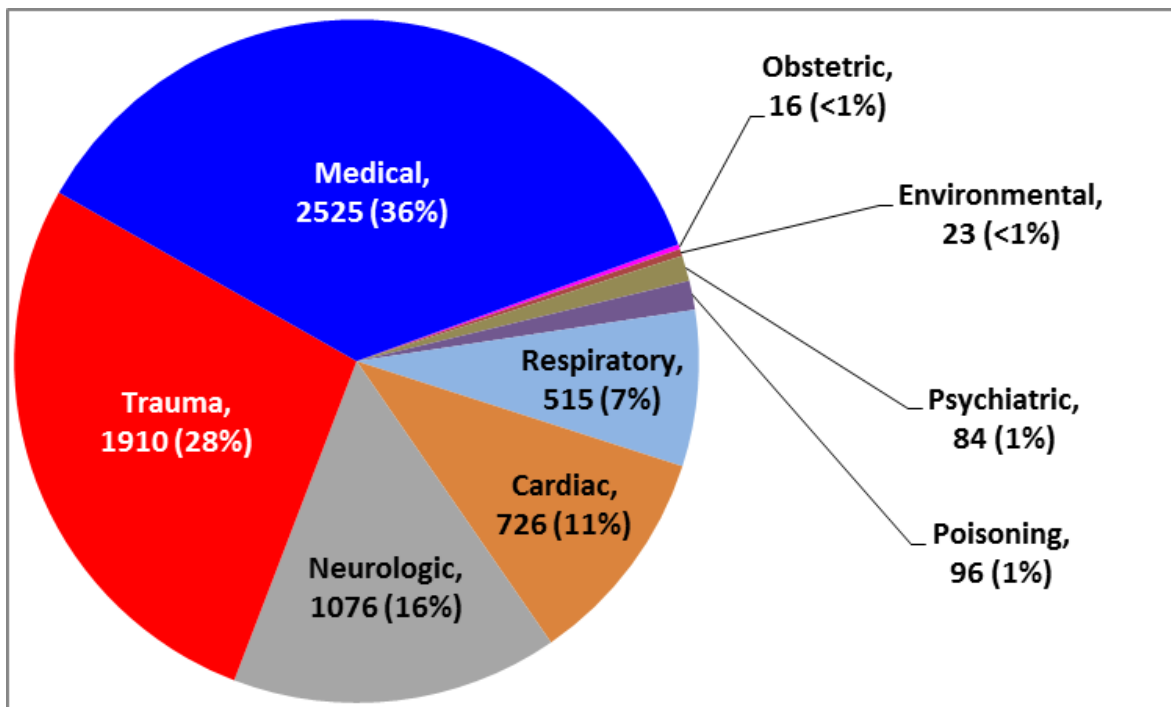
VA Medical Center Livermore	1	Mercy San Juan Hospital	3
Mark Twain-St. Josephs	1	Sutter General Hospital	3
Kaiser Hospital, Sacramento	1	Kaiser Hospital of Manteca	3
Kaiser, South Sacramento	1	Other Santa Clara County Hospital	4
Shriner's Hosp Sacramento	1	Other Fresno County Hospital	5
Other Sacramento Co Hospital	1	St Joseph's Medical Center	5
VA Med Center San Francisco	1	San Jose Medical Center	5
Santa Clara Valley Medical Center	1	Lucile Packard Children's Hospital	7
Kaiser Medical Center Santa Clara	1	VA Medical Center Palo Alto	7
Stanislaus Behavioral Health Center	1	San Joaquin General Hospital	17
Other Alameda County Hospital	2	Stanford University Hospital	19
Mt Diablo Hospital	2	California Pacific Medical Center	24
Valley Children's Hospital	2	U.C.S.F. Medical Center	25
Central Cal Children's Hospital	2	Oakland Children's Hospital	34
Mercy Hospital, Merced	2	U.C. Davis Medical Center	69
Other Napa County Hospital	2	Modesto Rehabilitation Hospital	86
Mercy General Hospital	2	Other Hospital Not Listed	102
Sutter Memorial Hospital	2	Memorial Medical Center	167
Emanuel Medical Center	2	Doctors Medical Center	534
Oak Valley Hospital	2	Sonora Regional Medical Center	4910

As shown in the chart below, for those patients transported to a hospital, approximately 66% of all transports are made to the nearest hospital and 18% of the patients were transported to the hospital of the patient's or family's choice.

2015 Calls by Destination Decision Reason



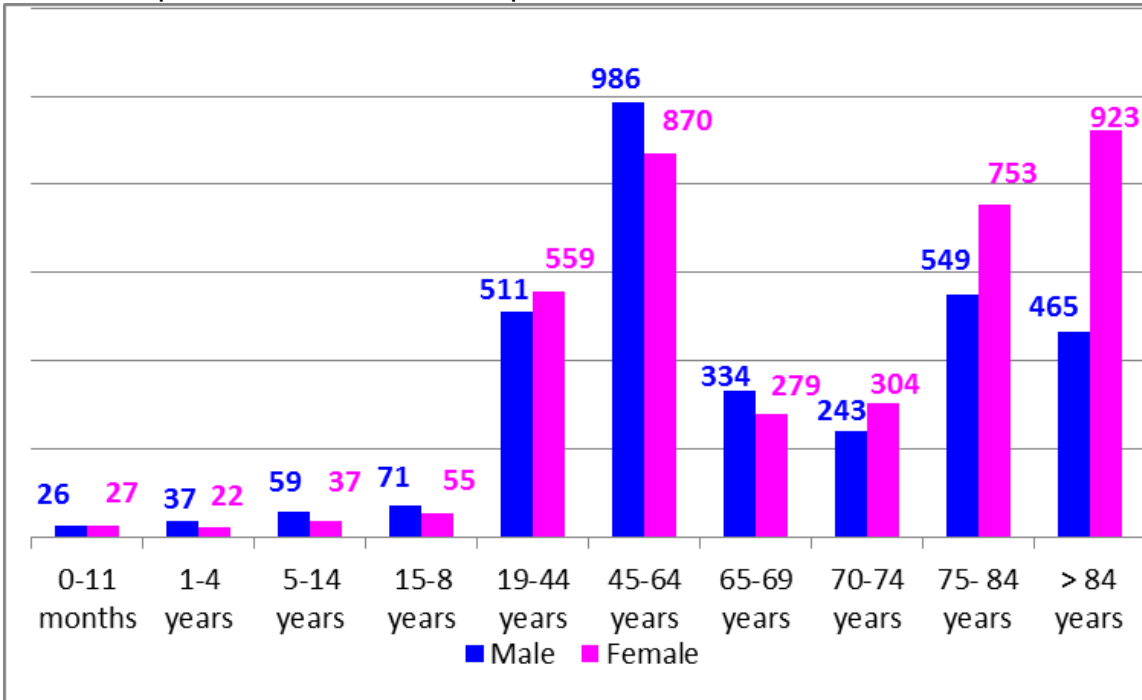
2015 Calls by Patients Primary Illness/Injury Type



Poisoning/Overdose category does not differentiate between accidental and intentional ingestion or overdose. Nor does it differentiate between prescription and illicit drugs. Medication reactions and anaphylaxis are included in the Medical category.

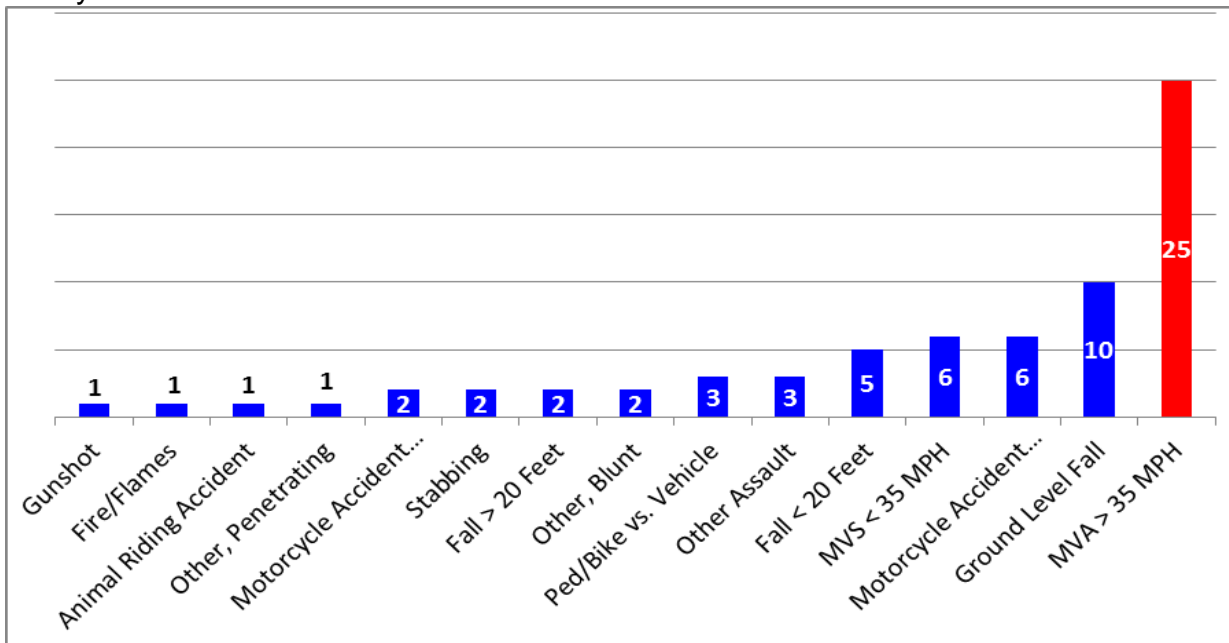
2015 EMS Demographics

The average age of EMS patients is 60 for males, 66 for females and 63 overall. Males comprise 46% of ambulance patients and 54% are females.

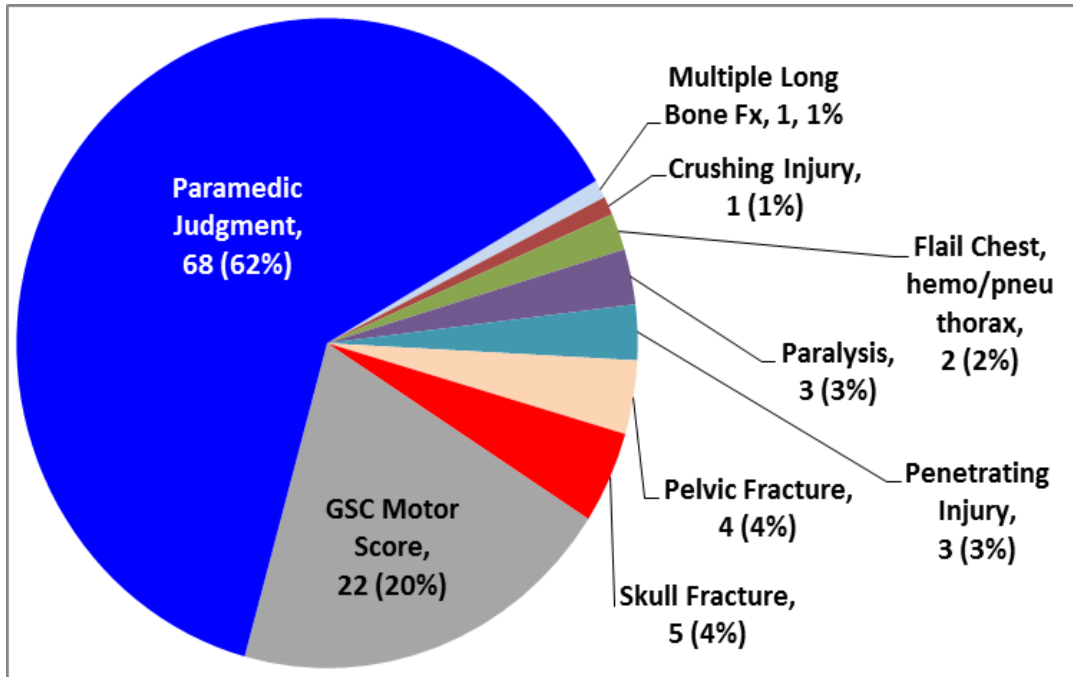


TRAUMA SYSTEM

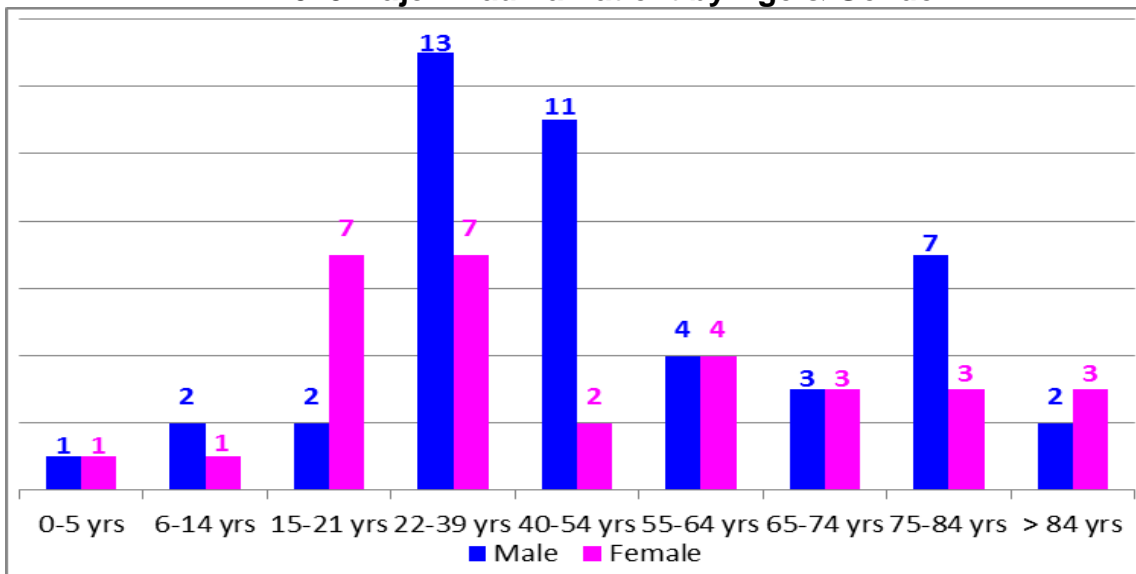
The chart below shows the mechanism of injury for major trauma victims in Tuolumne County in 2015.



The Tuolumne County Trauma Plan has defined ten separate trauma triage criteria. The criteria are designed to categorize those trauma patients with an increased risk of mortality and morbidity due to their injuries. Paramedic judgment was the criteria used 62% of the time.

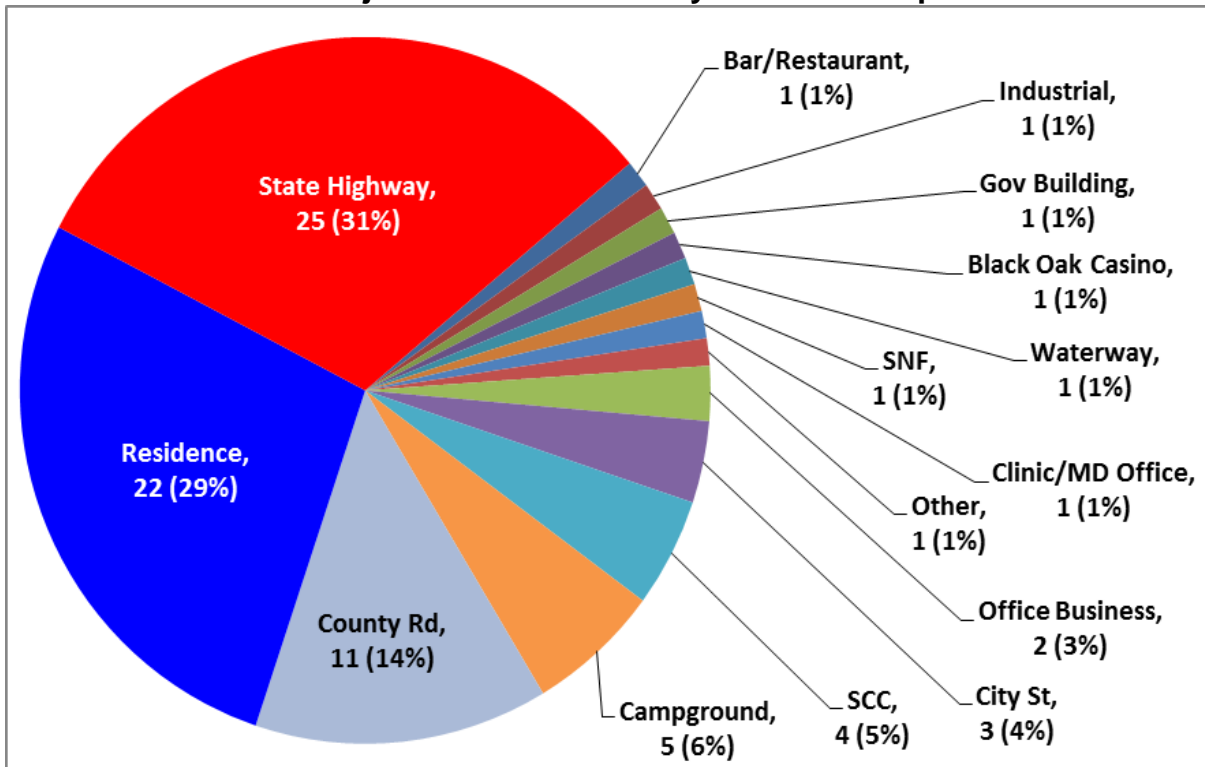


2015 Major Trauma Patient by Age & Gender

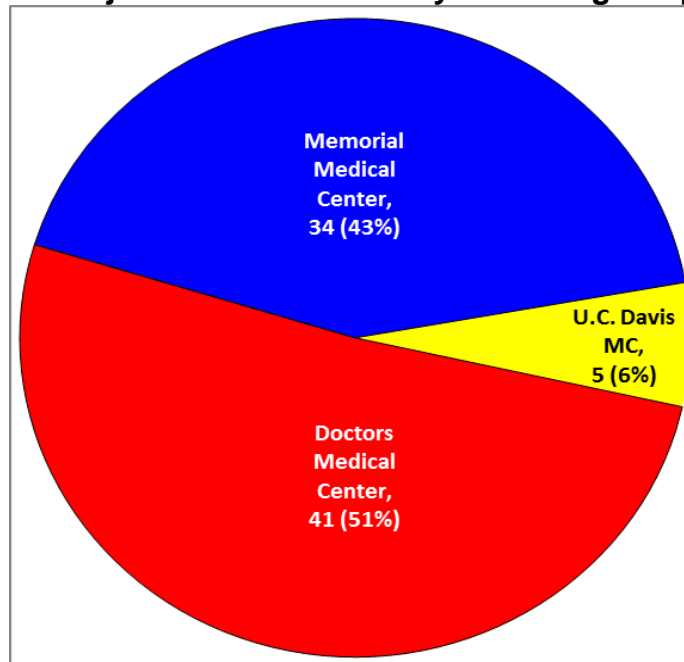


The average age of the Major Trauma patients is 47 for males, 46 for females and 46 overall. Males comprise 58% of ambulance patients and 42% are females.

2015 Major Trauma Patients by Scene Description



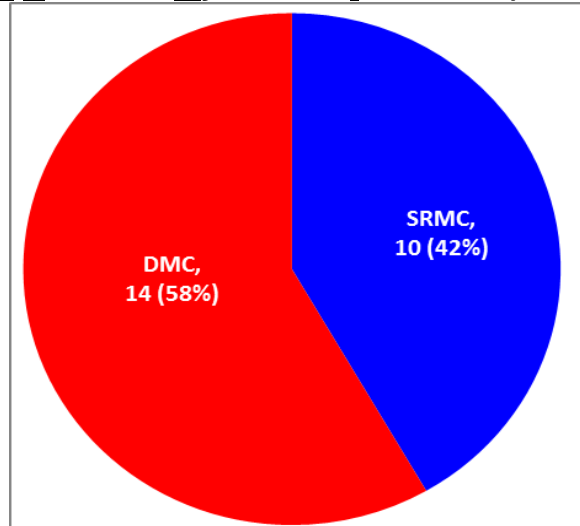
2015 Major Trauma Patients by Receiving Hospital



The Tuolumne County Trauma Plan has identified three major trauma patient destinations.

1. Doctors Medical Center (adult)
2. Memorial Medical Center (adult)
3. U.C. Davis Medical Center (adult & pediatric)

S-T Elevation Myocardial Infarction (STEMI)



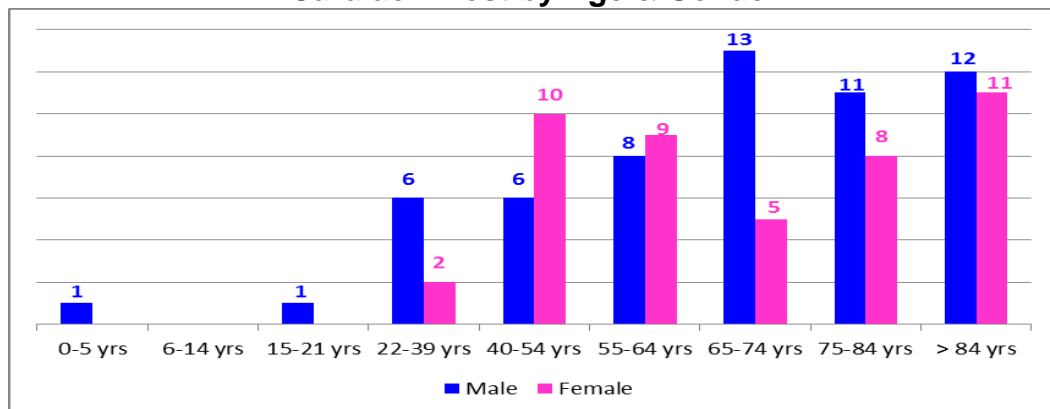
In 2015, 24 patients met the STEMI triage criteria; 10 of them were transported to SRMC by ground ambulance, and 14 were transported to Doctors Medical Center. Males comprised 75% of STEMI patients, 25% female. The average age of STEMI patients was 60 years old.

CARDIAC ARRESTS

Cardiac Arrests	Attempt Resus.	Cardiac Origin	Witnessed by Bystander	Witnessed by EMS	Bystander CPR	Bystander AED	Rhythm Asystole	Rhythm VF/VT
110	66	27	13	4	18	1	44	4
Rhythm Other	ROSC at Any Time	Efforts Ceased Field	Efforts Ceased ED	Admitted or Transferred	Expired in Hospital	Expired within 24 Hrs.	Discharged Alive	
15	16	36	16	10	5	2	5	

Of the 66 attempted resuscitations 7.5% survived to discharge, compared to 9.6% survival rate documented by Cardiac Arrest Registry to Enhance Survival (CARES), United States, October 1, 2005–December 31, 2010. This may be in part to a 27% bystander CPR rate compared 33% documented by CARES and prolonged response times that are common in rural EMS Systems such as Tuolumne County. CARES data from California is provided by EMS Systems that are predominately metropolitan and urban in nature, with more resources, shorter response and transport times and specialty hospitals.

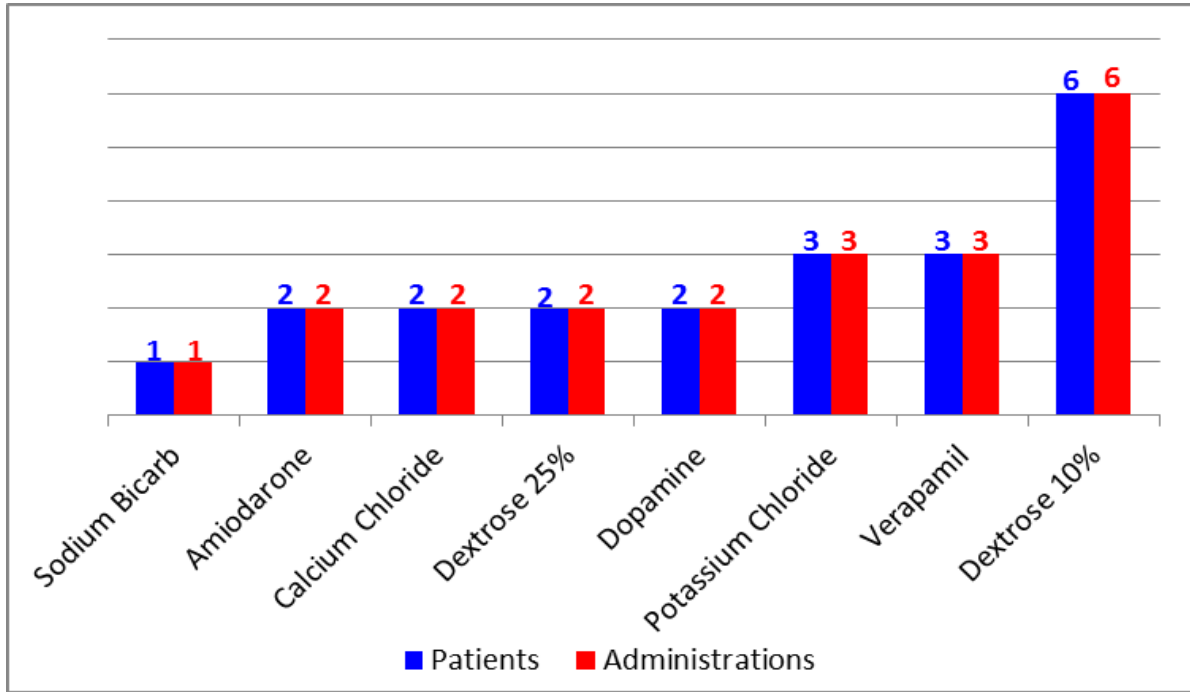
Cardiac Arrest by Age & Gender



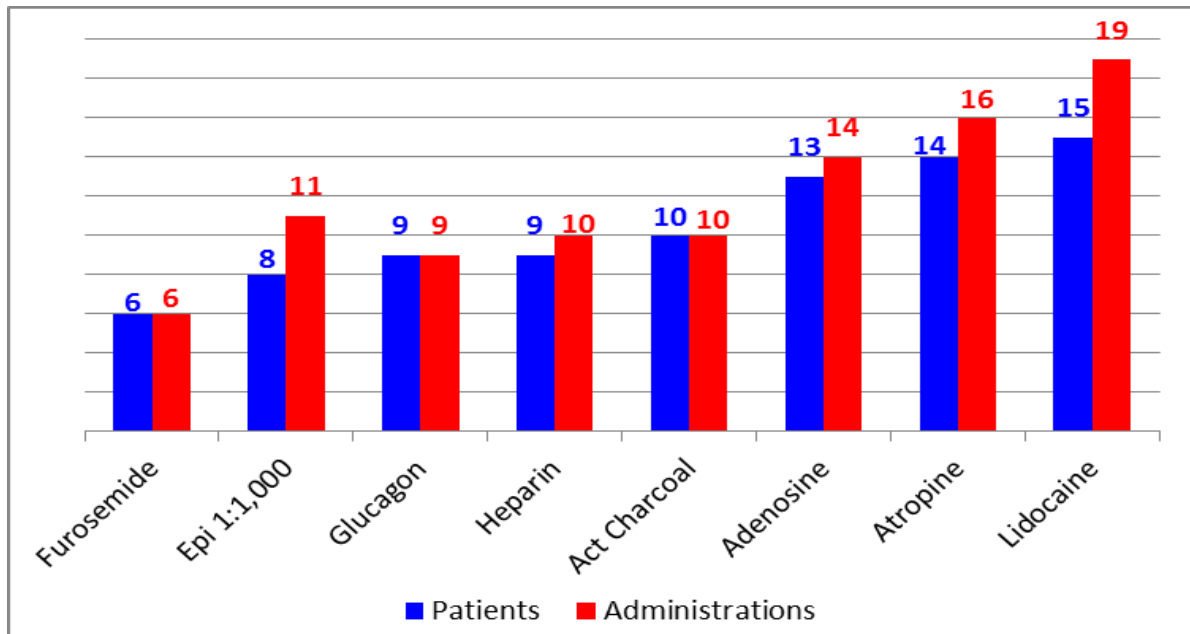
ALS MEDICATIONS

The charts below represent the number of times a medication was administered and how many patients received the medication.

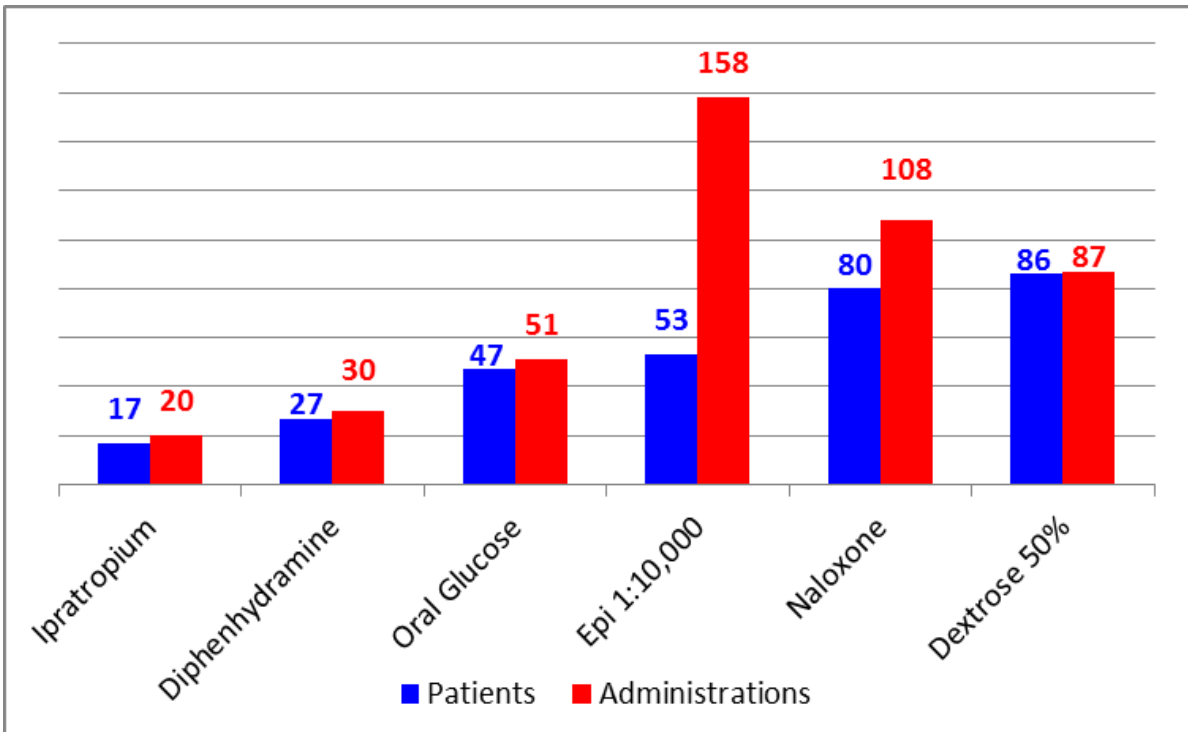
2015 Medications by Patients & Administrations Chart #1



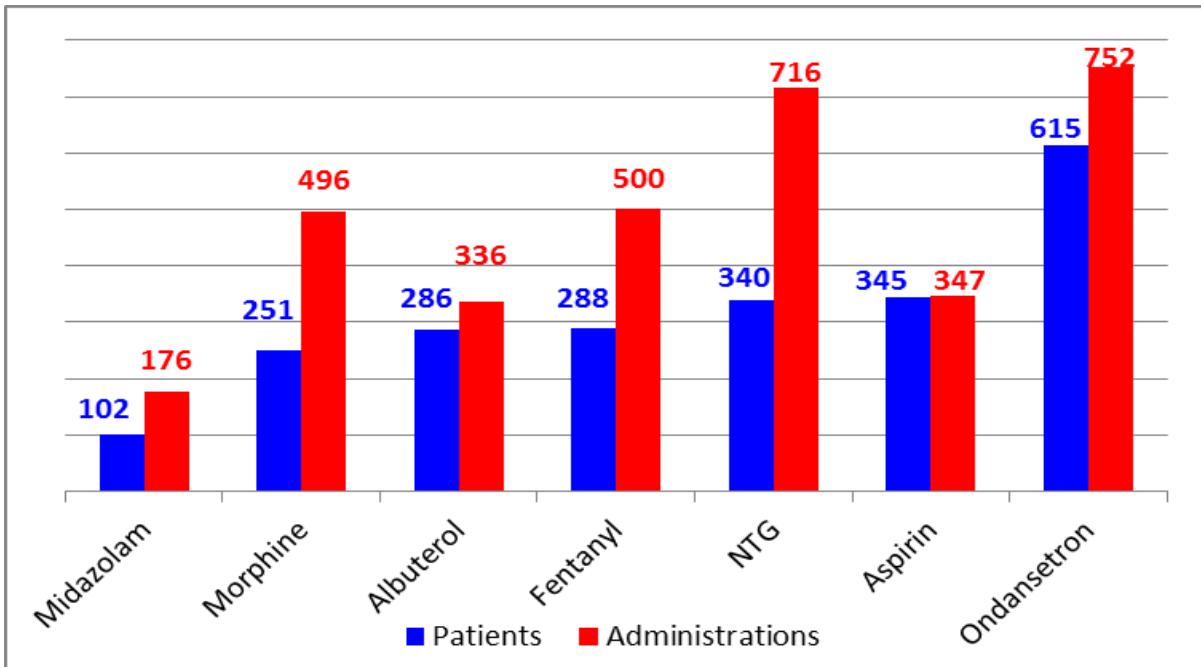
2015 Medications by Patients & Administrations Chart #2



2015 Medications by Patients & Administrations Chart #3



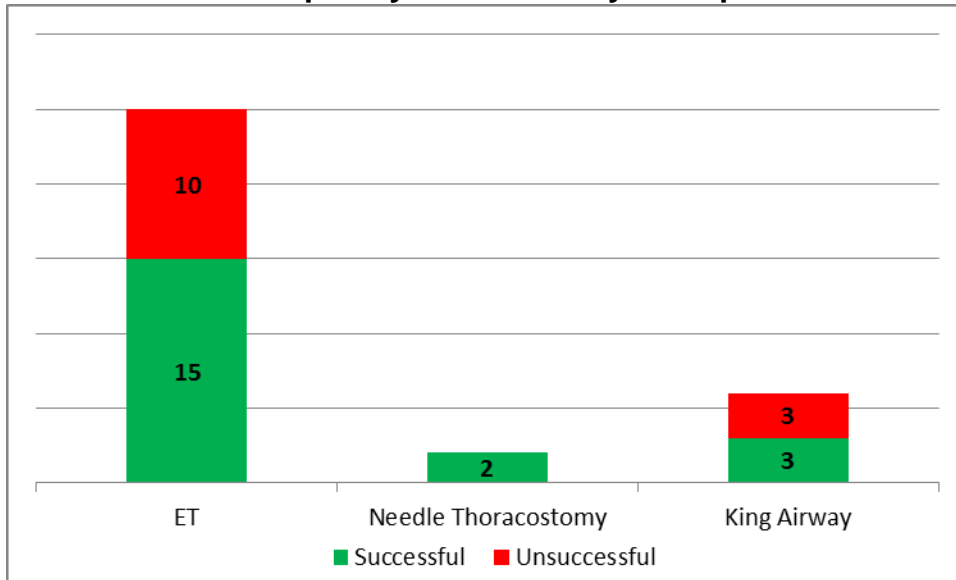
2015 Medications by Patients & Administrations Chart #4



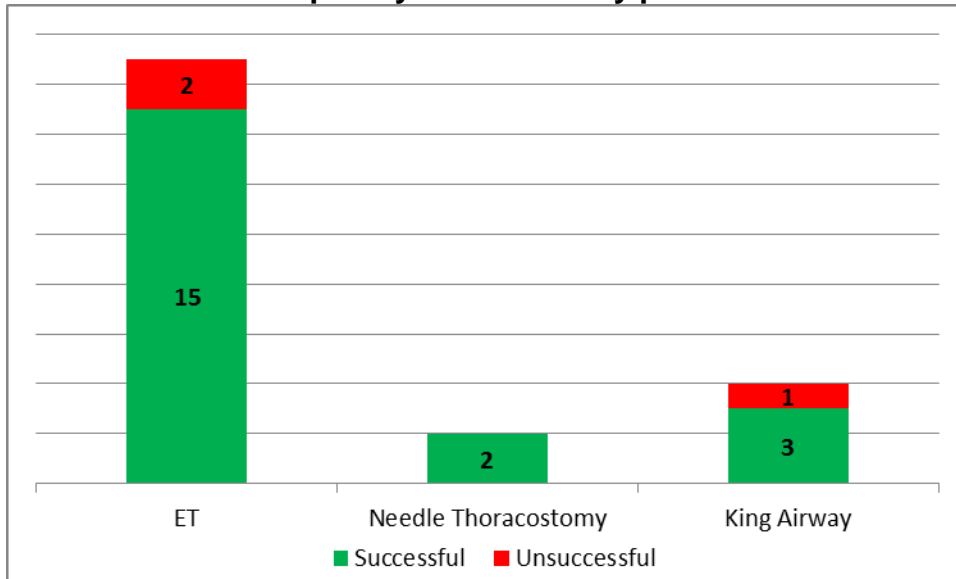
ALS INFREQUENTLY USED SKILLS

The data on Infrequently Used Skills shows that 87% of the patients that ET intubations were attempted were successfully intubated; however the success rate per attempt was 65%.

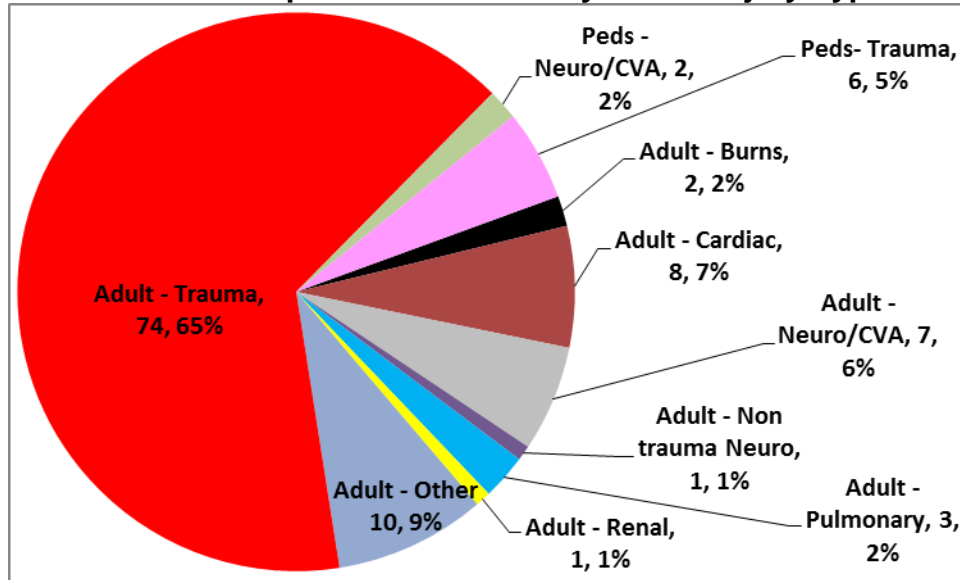
Infrequently used skills by attempt



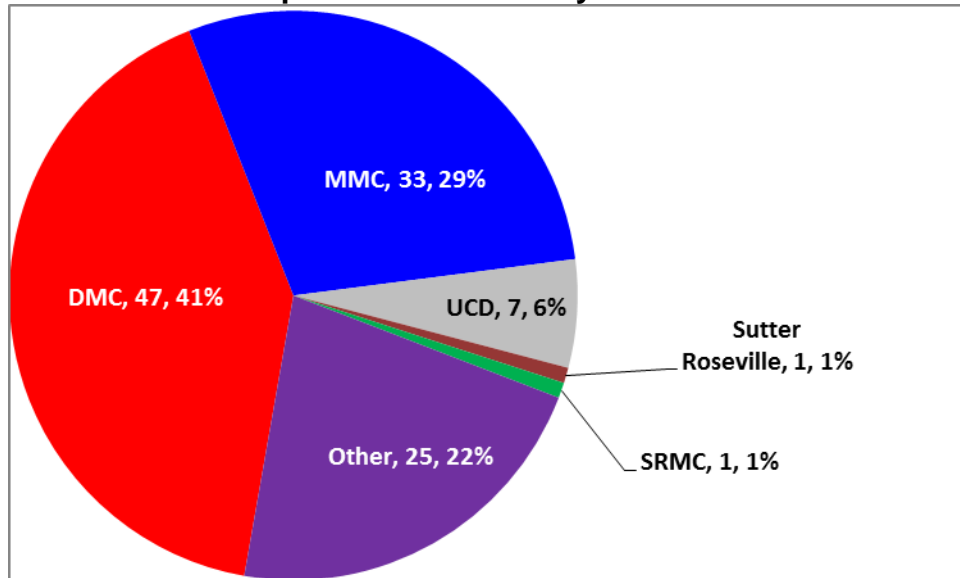
Infrequently used skills by patient



PHI 2015 Requests for Service by Illness/Injury Type



PHI 2015 Requests for Service by Patient Destination



Other includes canceled calls & other hospital no listed.

SUMMARY

I would like to thank Tuolumne County Ambulance Service, and PHI Air Medical for providing the data that made this report possible. I would also like to thank all of the First Response Agencies for the excellent service they provide to the County of Tuolumne.

The Tuolumne County EMS System remains a strong asset to the County, its citizens and visitors. The eleven-year trend shows a general increase in calls for EMS service, particularly along the Highway 108 corridor.

Continuing fiscal challenges remain a concern for the ambulance enterprise fund. Tuolumne County Ambulance has enrolled in the GEMT program and has been able to recover some of the revenue that was previously unavailable. However, the uncertain futures of GEMT, MediCare Super Rural add on and the shift to managed care makes it difficult to perform long term budgeting and planning. The decreasing reimbursement for services rendered and increasing costs will provide many challenges to the County of Tuolumne, maintenance and expansion of the EMS system should be one of the top priorities of the County.