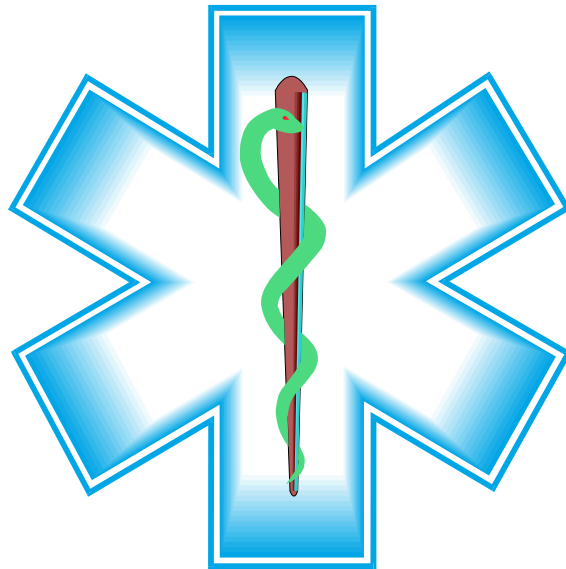

Tuolumne County
Emergency Medical Services Agency

2006 Annual Statistical Report



February 22, 2007

Prepared by: Clarence I. Teem, EMS Coordinator

Tuolumne County Emergency Medical Services Agency

20111 Cedar Road North, Sonora California 95370 (209) 533-7460

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INTRODUCTION

The 2006 Annual Statistical Report compiles and condenses an entire year's worth of call volume, response time and patient demographic information about the Tuolumne County EMS system for public review. The data included in this report is derived from pre-hospital patient care records (PCRs) completed by Tuolumne County Ambulance personnel and base/receiving logs completed by emergency department personnel from Tuolumne General Hospital and Sonora Regional Medical Center.

Since July 1, 1993, Tuolumne County Ambulance has collected PCR information using the software program EMS DataProJ (formerly the EMS Database System) provided for their use by the Tuolumne County EMS Agency. Once entered in EMS DataProJ, the data is submitted in an electronic format to the EMS agency where the data is imported into a central version of EMS DataProJ. The EMS agency then validates and combines the data submitted by Tuolumne County Ambulance with patient outcome data derived from the base/receiving logs submitted by the two Base Hospitals, Tuolumne General Hospital and Sonora Regional Medical Center.

In September 2000, Tuolumne County Ambulance, with the assistance of the EMS agency, initiated a program for completing PCRs using EMS OutfielderJ (a laptop based PCR data entry program developed by CompuCounsel, now called Inspironix, of Sacramento in conjunction with Manteca District Ambulance). EMS OutfielderJ has replaced hand-written PCR forms and billing tickets. EMS OutfielderJ provides immediate data availability for daily quality assurance/quality improvement reviews and imports patient billing information directly into the billing system used by Tuolumne County Ambulance.

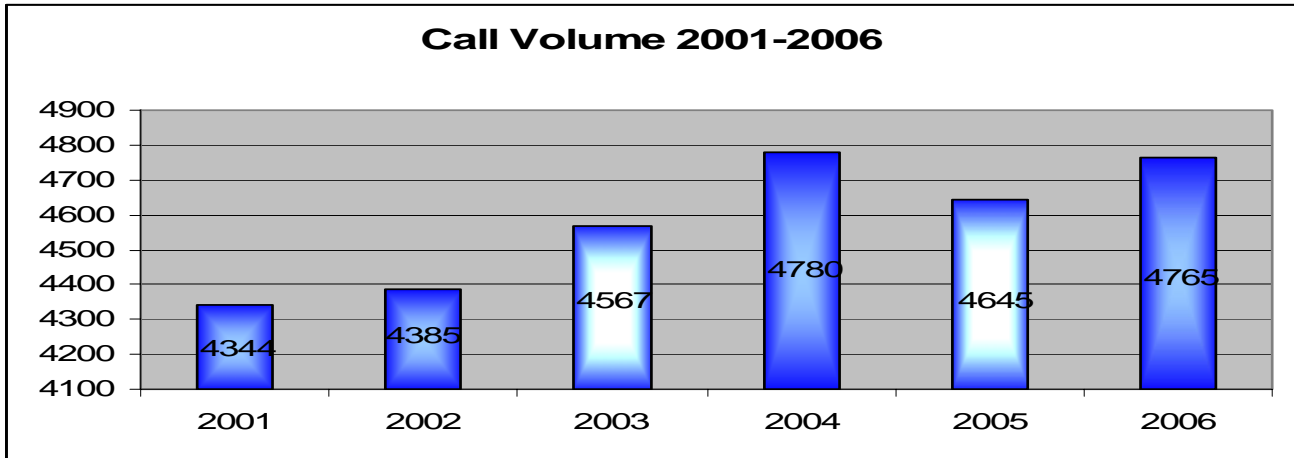
The Tuolumne County Emergency Medical Services (EMS) System is comprised of four 9-1-1 answering points including Tuolumne County Sheriff's Dispatch, City of Sonora Police Department Dispatch, CHP Dispatch and Mariposa County Sheriff's Dispatch; Ambulance dispatching provided by the Tuolumne County Sheriff's Dispatch Center. Basic life support (BLS) first response services 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., Tuolumne City Fire Dist., and the Groveland Fire Dist. Special BLS response services from U.S. Forest Service, County Search and Rescue, Don Pedro Recreation Agency, Dodge Ridge Ski Patrol Advanced life support (ALS) service provided by Tuolumne County Ambulance Service. Mercy Ambulance in Mariposa County provides the Lake Don Pedro area ALS services. Petroleum Helicopter Inc. (PHI) stationed at Columbia Airport and day-to-day mutual aid by air ambulance service providers from throughout Northern California provides air ambulance service.

In June 2003, grant funds were made available to the Tuolumne County EMS Agency 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 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, 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 EMS Agency, El Dorado County EMS Agency, Fresno, Kings, Madera EMS Agency, Northern California EMS Agency, Sacramento County EMS Agency, and Santa Barbara County EMS Agency. 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.

OVERVIEW OF CALL VOLUME

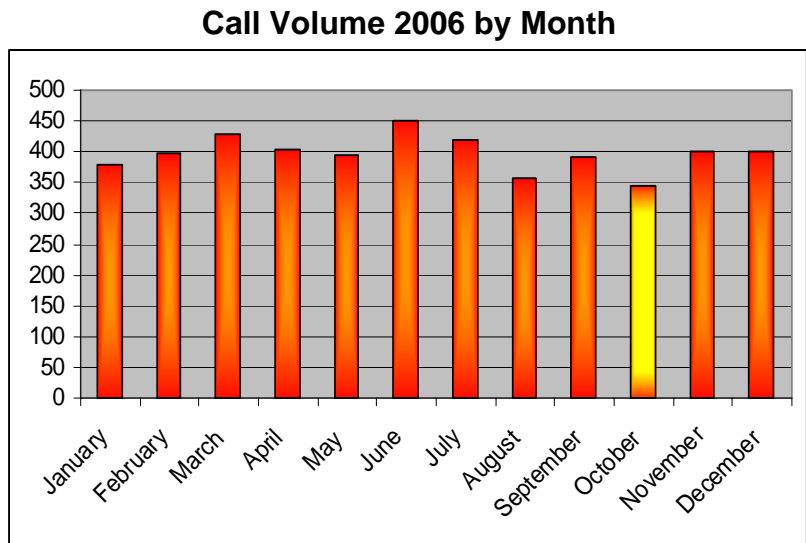
As illustrated in the graphs below, in 2006 there was a slight increase in calls for EMS services from 2005. 2004 remains the busiest year on record for emergency medical service (EMS) requests in Tuolumne County. The Tuolumne County EMS system has grown approximately 77% since 1994, the first year with reliable data. Unless otherwise specified EMS requests include both scene and transfer call types.



EMS Requests by Month and Year

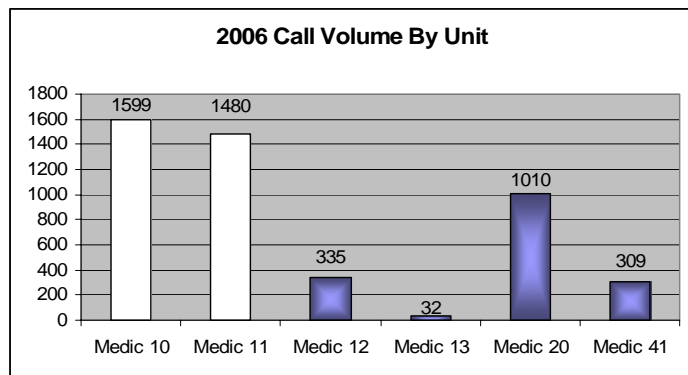
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2001	383	355	358	357	330	377	396	379	366	354	308	382
2002	383	327	407	344	370	330	426	436	354	352	326	330
2003	390	318	380	363	325	368	442	381	383	393	403	421
2004	392	397	385	337	391	376	453	425	390	389	376	469
2005	363	369	399	354	414	389	467	414	365	377	355	379
2006	379	396	428	403	395	450	419	356	391	344	402	402

2006	
Month	Requests
January	379
February	396
March	428
April	403
May	395
June	450
July	419
August	356
September	391
October	344
November	402
December	402



As illustrated below, Medics 10 and 11 responded to the majority of all EMS requests. The Sonora area has a call volume rate more than three times greater than any other area of the County.

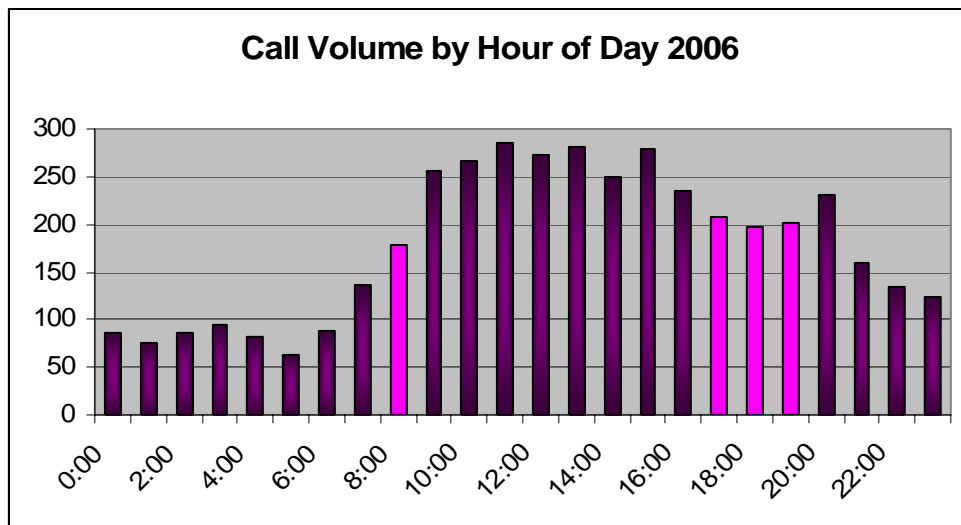
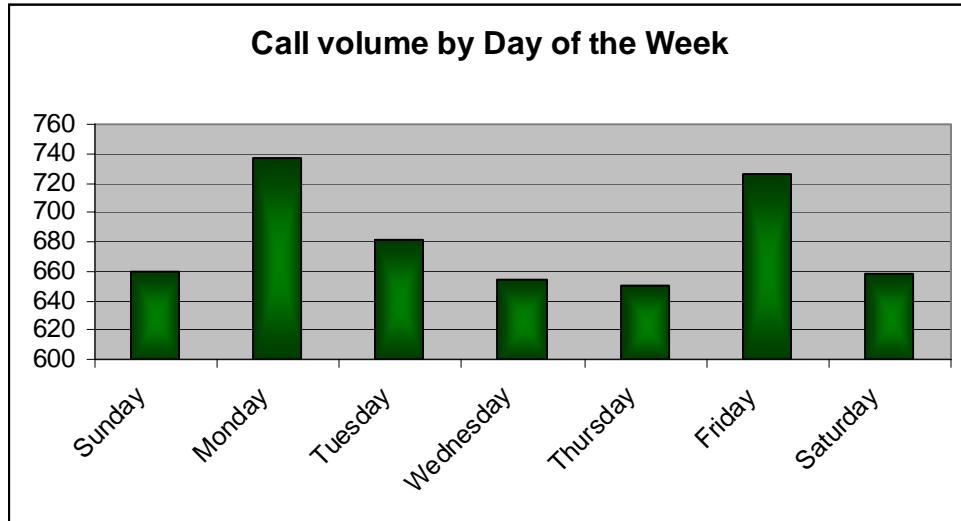
EMS Requests by Medic Unit		
Unit	Requests	Unit Location
Medic 10	1599	Sonora
Medic 11	1480	East Sonora
Medic 12	335	Flexibly Deployed
Medic 13	32	Flexibly Deployed
Medic 20	1010	Soulsbyville
Medic 41	309	Groveland



Call Volume 2006 by Days of the Week

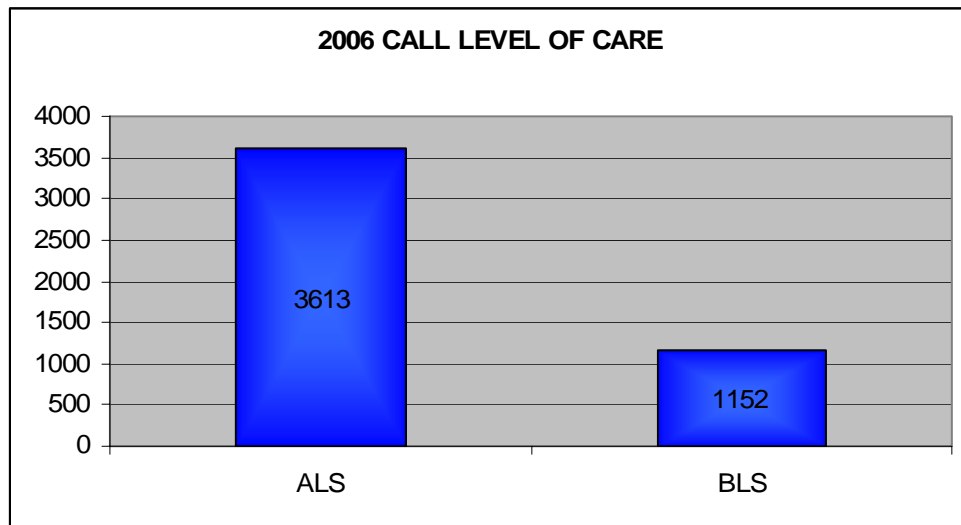
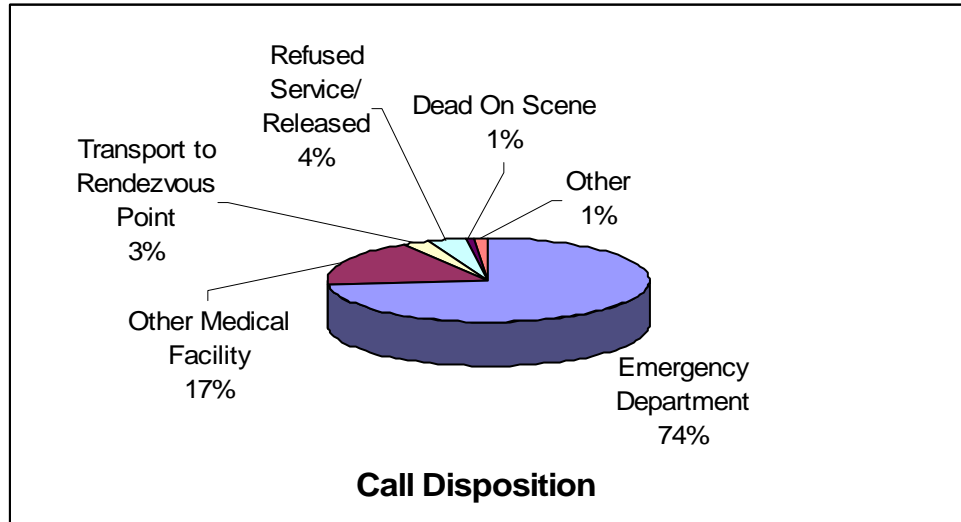
A breakdown of requests by day and time of day shows that call volume is fairly consistent during the week with the hours of 8 a.m. to 5 p.m. being the busiest hours of service, as illustrated by the graphs on the two following pages.

The chart below illustrates that Monday is the busiest day of the week, followed by Friday. The chart also shows that Thursday is the slowest day followed closely by Wednesday.



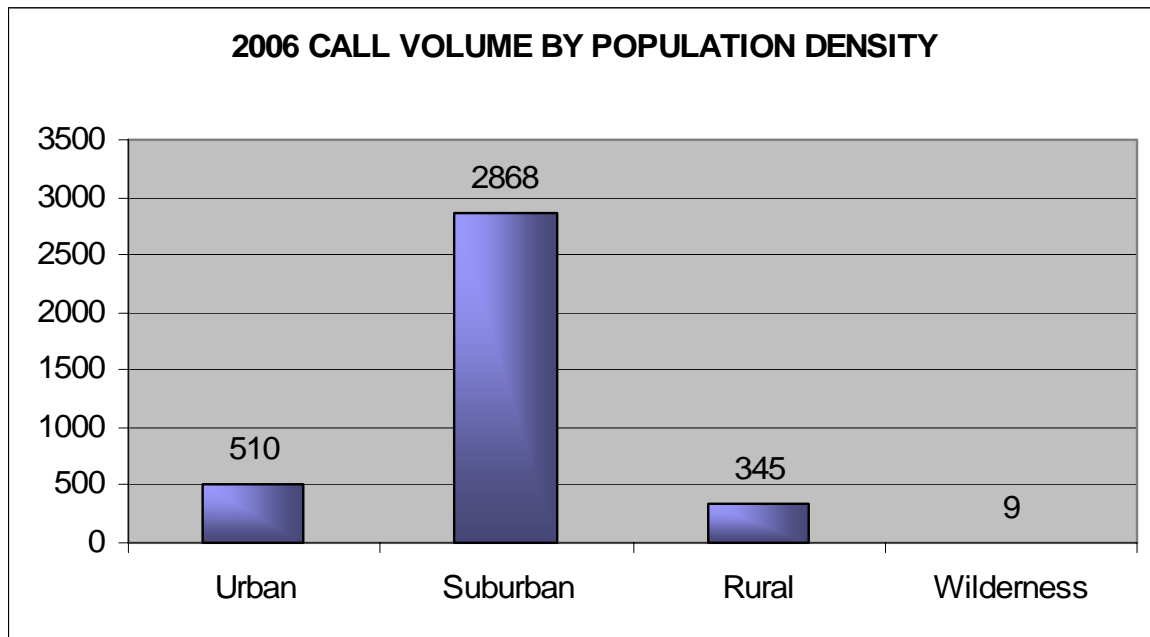
Call Disposition 2006

The tables below illustrate 74% of all requests resulted in the patient being transported to an emergency department, 76% of all requests resulted in the delivery of advanced life support (ALS) procedures and medications administered to the patient.

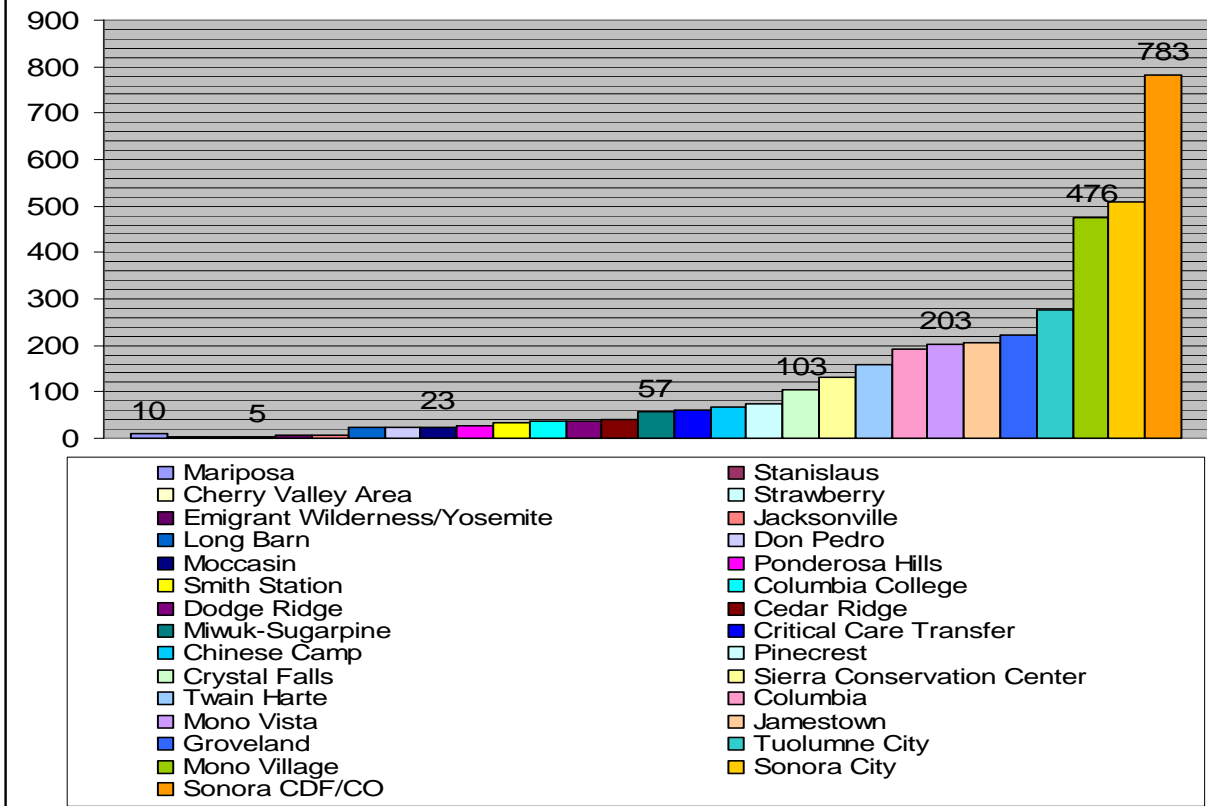


Call Volume 2006

The breakdown of EMS requests by location reveals that the majority (77%) of requests occur in the suburban areas of Tuolumne County, where the majority of Tuolumne County residents live.

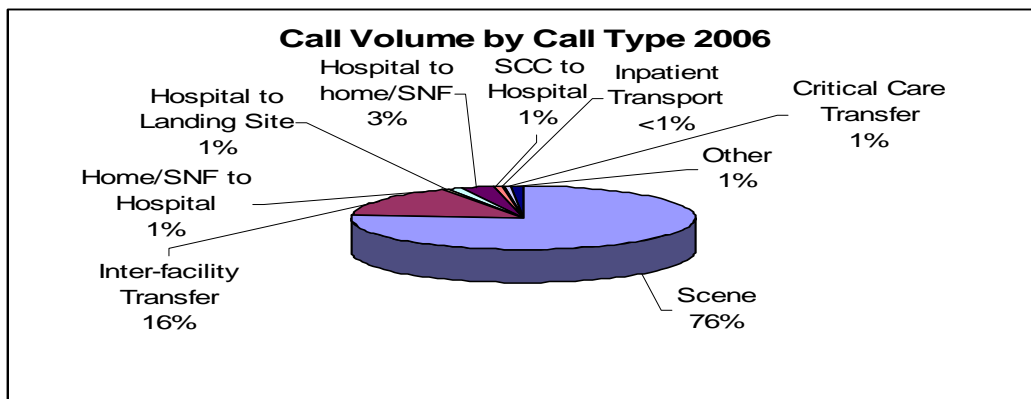


2006 Call Volume by Area



SCENE REQUESTS

In 2006, scene emergencies accounted for 76% of the total EMS requests for service. Transfers make up the remaining 24% of EMS requests for services, and consisted of ambulance interfacility transfers, air ambulance transfers from a hospital to a landing site, critical care transfers, and 4% transfers to and from a patient's home to a hospital, transports for diagnostic service such transporting a patient for an MRI.



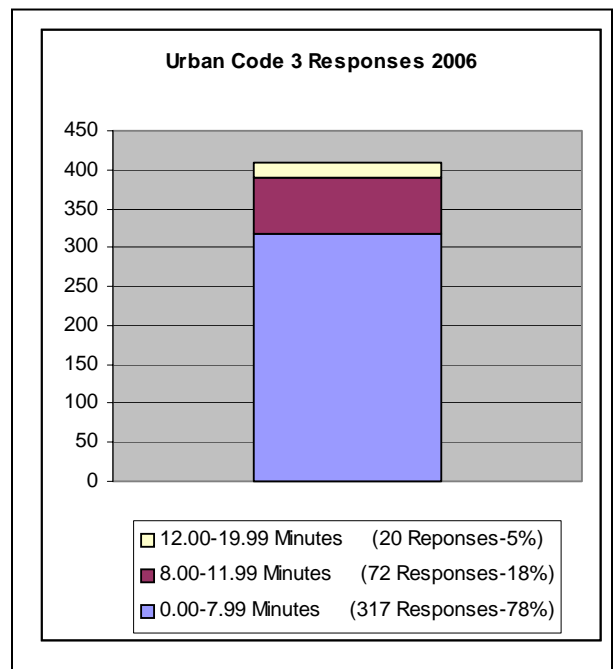
Response Times

The State of California Emergency Medical Services Authority has established recommended guidelines for response time standards to EMS requests, based on population density. The State of California Emergency Medical Services Authority recommends that EMS responses meet these response time guidelines at least 90% of the time.

	BLS First Response	BLS AED First Response	ALS Ambulance
Urban = 101 to 500 people per square mile	5 minutes	5 minutes	8 minutes
Suburban = 51 to 100 people per square mile	15 minutes	ASAP	20 minutes
Rural = 7 to 50 people per square mile	15 minutes	ASAP	20 minutes
Wilderness = less than 7 people per square mile	ASAP	ASAP	ASAP

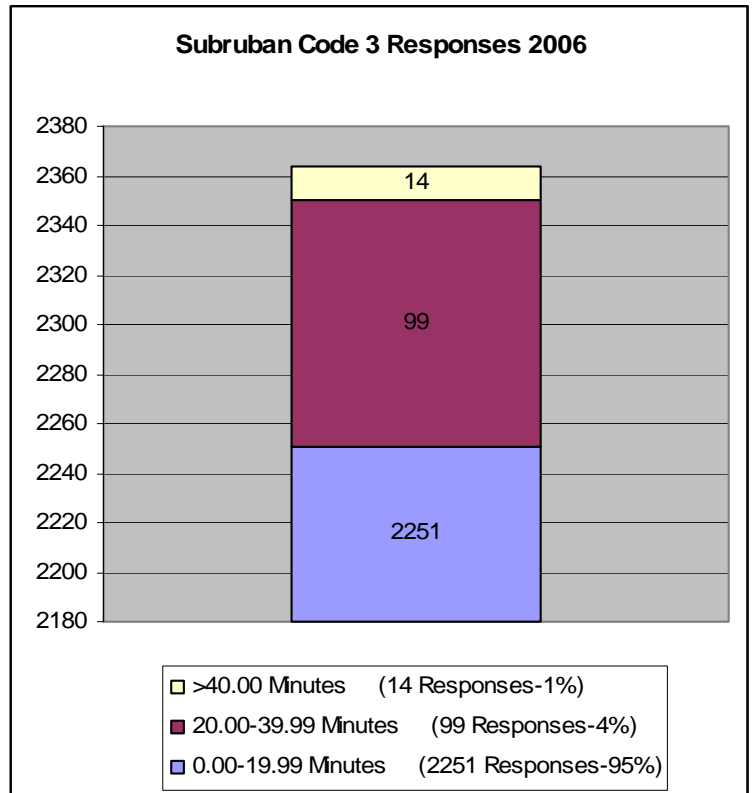
The chart below shows the 90th percentile Code 3 response time for an ALS ambulance in the **urban area** of Tuolumne County is 9.00 minutes with an average response time of 5.81 minutes. In Tuolumne County, only the City of Sonora is classified as an urban area. *See tables on this page and next two pages.*

Response Time Interval in Minutes (Urban)	Code 3 Responses	% of total
00:00 - 07:99	317	78%
08:00 - 11:99	72	18%
12:00 - 19:99	20	5%
Minimum Response Time	0.00 minutes	
Maximum Response Time	15.00 minutes	
Average Response Time	5.81 minutes	
Standard Deviation	2.68 minutes	
90 th percentile	9.00 minutes	
95 th percentile	11.00 minutes	



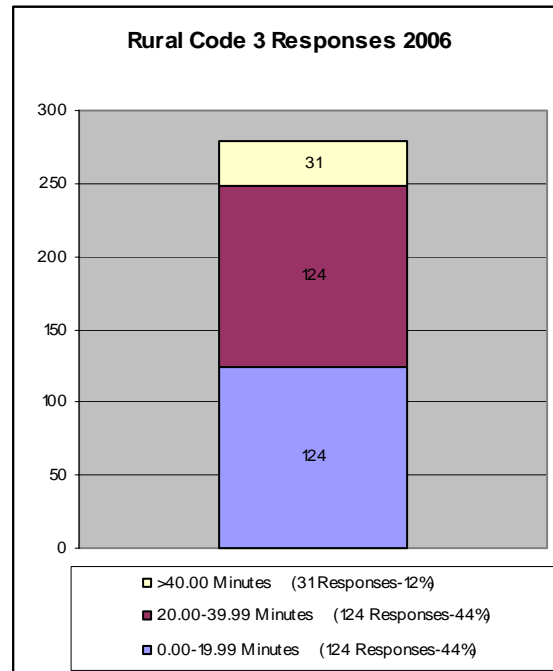
The chart below shows that the 90th percentile Code 3 response time for an ALS ambulance in the **suburban areas** of Tuolumne County is 16:00 minutes with an average response time of 9.94 minutes. Suburban areas of Tuolumne County include the first response areas of Mono Village, Mono Vista, Crystal Falls, Cedar Ridge, Sonora CDF, Moccasin, Twain Harte, Tuolumne City, Columbia, Jamestown, Mi-Wuk/Sugarpine, Groveland and Columbia College.

Response Time Interval in Minutes (Suburban)	Code 3 Responses	% of total
00:00 - 19:99	2251	95%
20:00 - 39:99	99	4%
>40:00	14	1%
Minimum Response Time	0.00 minutes	
Maximum Response Time	132.00 minutes	
Average Response Time	10.10 minutes	
Standard Deviation	6.49 minutes	
90 th percentile	16.00 minutes	
95 th percentile	19.00 minutes	



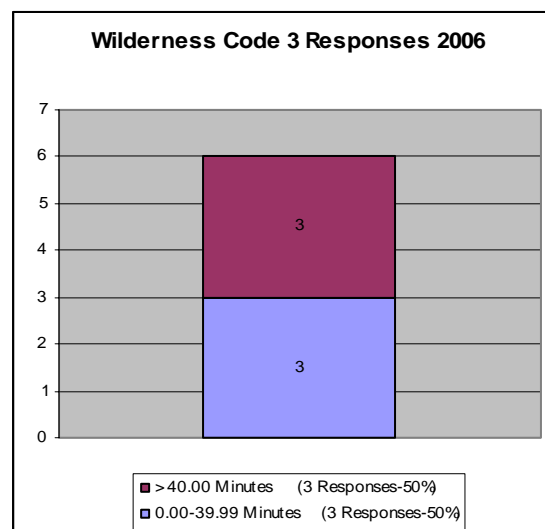
The chart below shows that the 90th percentile Code 3 response time for an ALS ambulance in the **rural areas** of Tuolumne County is 41:00 minutes with an average response time of 24.63 minutes. Suburban areas of Tuolumne County include the first response areas of Dodge Ridge, Pine Crest, Strawberry, Long Barn, Don Pedro, and the Sierra Conservation Center.

Response Time Interval in Minutes (Rural)	Code 3 Responses	% of total
00:00 - 19:99	124	44%
20:00 - 39:99	124	44%
>40:00	31	12%
Minimum Response Time	2.00 minutes	
Maximum Response Time	90.00 minutes	
Average Response Time	24.63 minutes	
Standard Deviation	12.07 minutes	
90 th percentile	41.00 minutes	
95 th percentile	46.00 minutes	



The chart below shows that the 90th percentile Code 3 response time for an ALS ambulance in the **wilderness area** of Tuolumne County is 50:00 minutes with an average response time of 24.05 minutes. Wilderness areas of Tuolumne County include the Portions of the Immigrant Wilderness, Carson Iceberg Wilderness, Yosemite National Park, and the Cherry Lake Area.

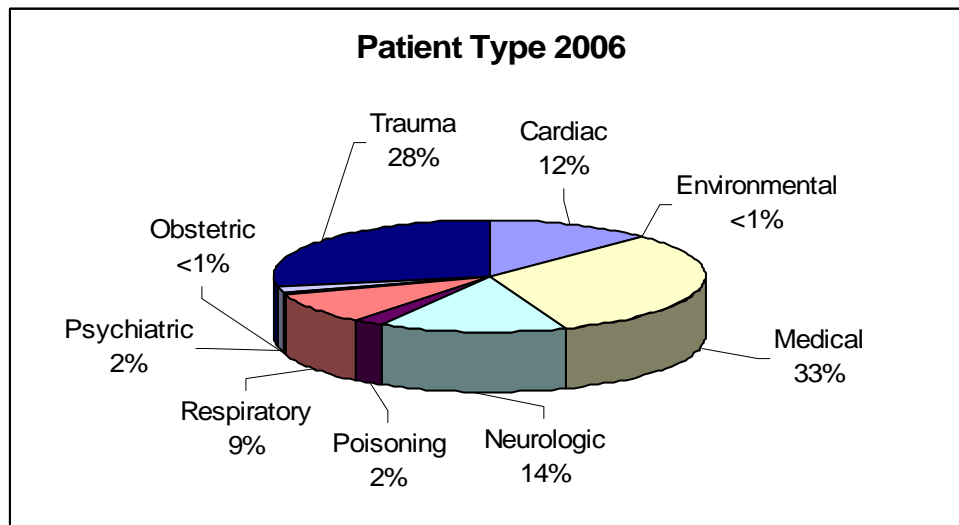
Response Time Interval in Minutes (Rural)	Code 3 Responses	% of total
00:00 -39:99	3	50%
>40:00	3	50%
Minimum Response Time	35.00 minutes	
Maximum Response Time	94.00 minutes	
Average Response Time	48.86 minutes	
Standard Deviation	19.11 minutes	
90 th percentile	50.00 minutes	
95 th percentile	94.00 minutes	



PATIENT AND HOSPITAL DATA

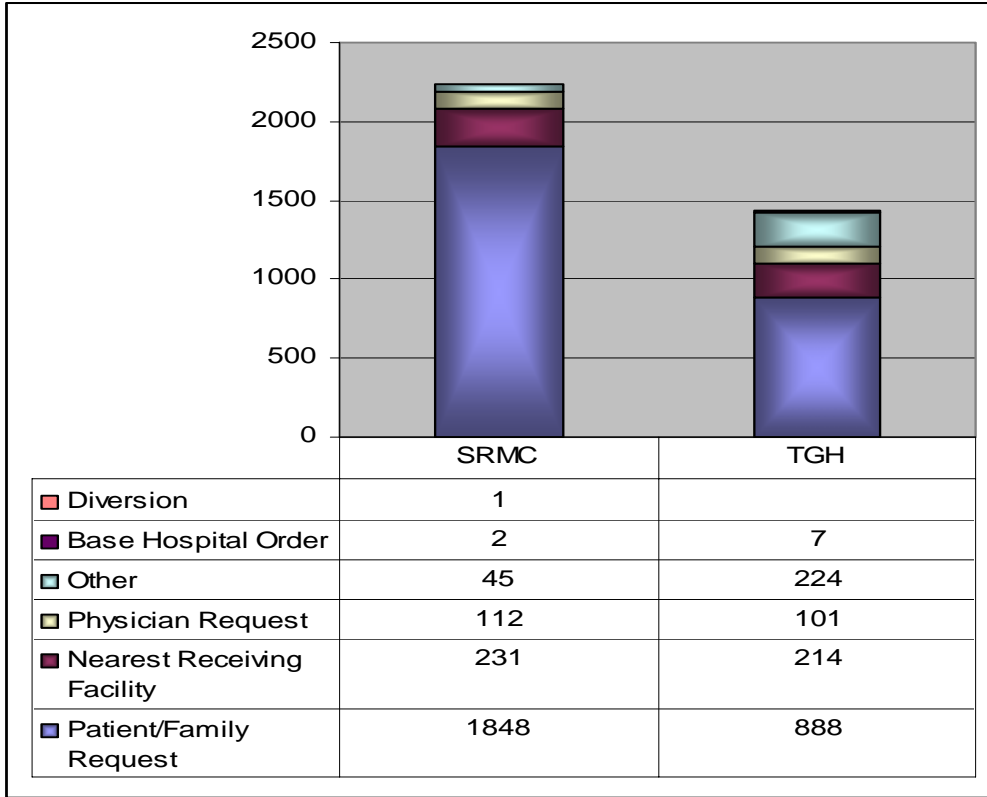
Unlike past years, medical patients have superseded patients with a traumatic injury as the single largest patient category.

Primary Illness/Injury Type	Patients	% of total
Cardiac	590	12%
Environmental	6	<1%
Medical	1500	32%
Neurologic	681	14%
Poisoning/Overdose*	99	2%
Respiratory	439	9%
Obstetric	17	<1%
Psychiatric	86	2%
Trauma	1336	28%

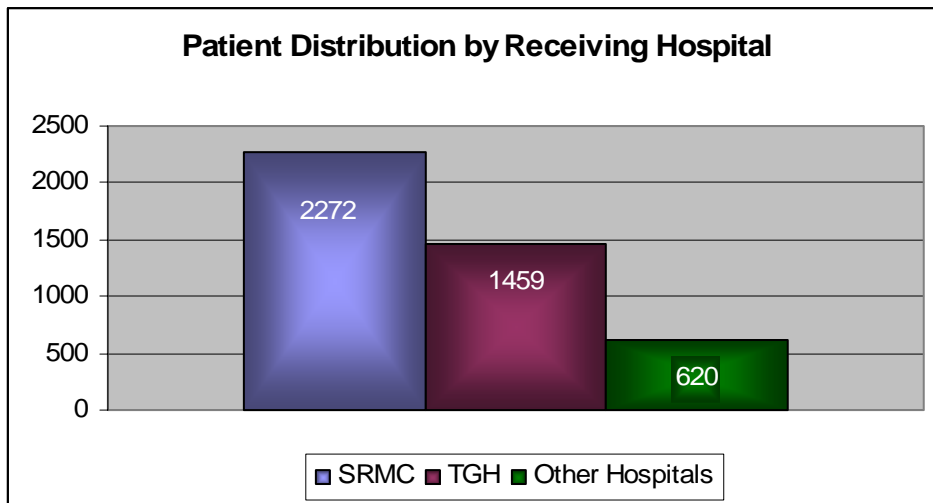


* Poisoning/Overdose category does not differentiate between accidental and intentional ingestion or overdose. Nor does it differentiate between prescription and illicit drugs. Medication reactions and anaphylaxis are included in the Medical category.

As shown in the chart below, for those patients transported to a hospital in Tuolumne County approximately 84% of all scene transports are made to the hospital of the patient's or families' choice.



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

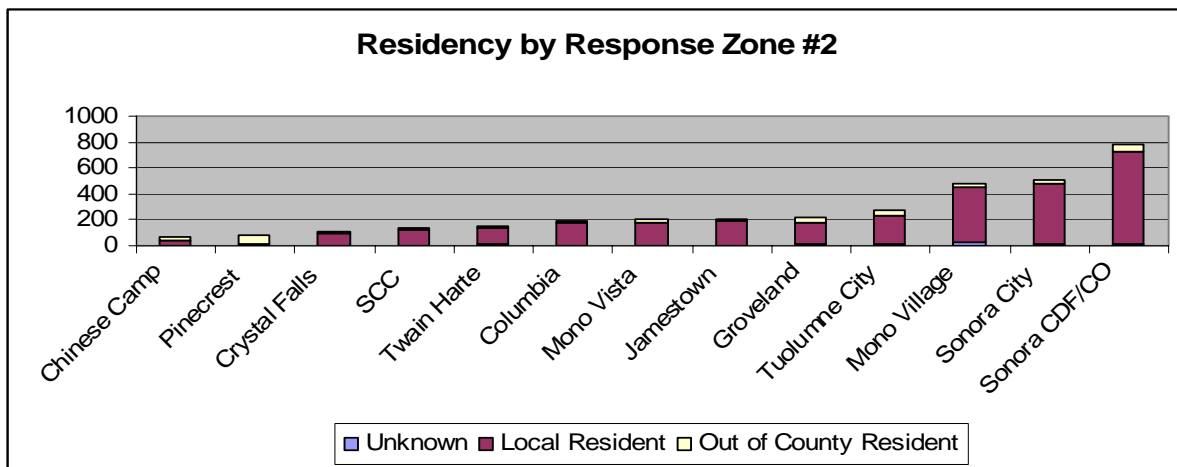
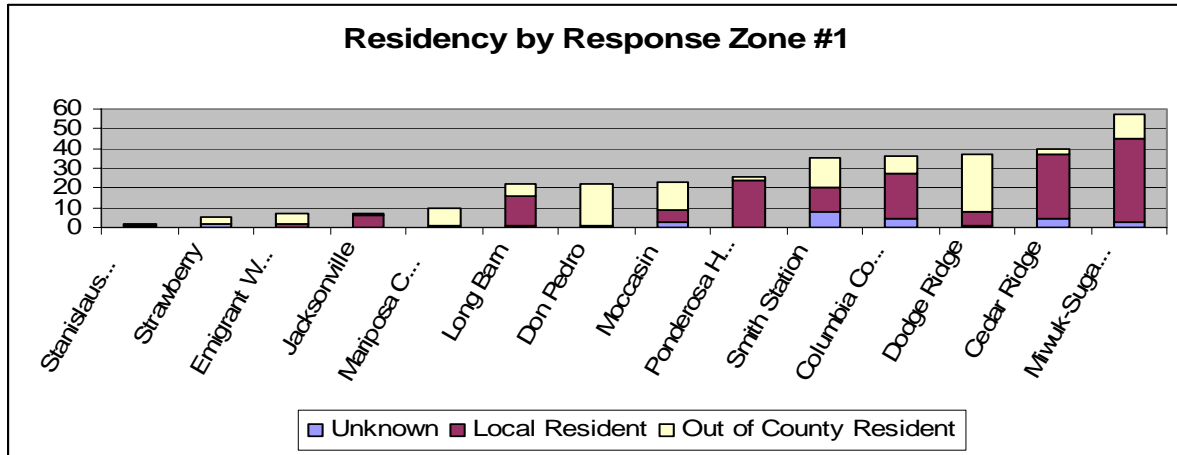
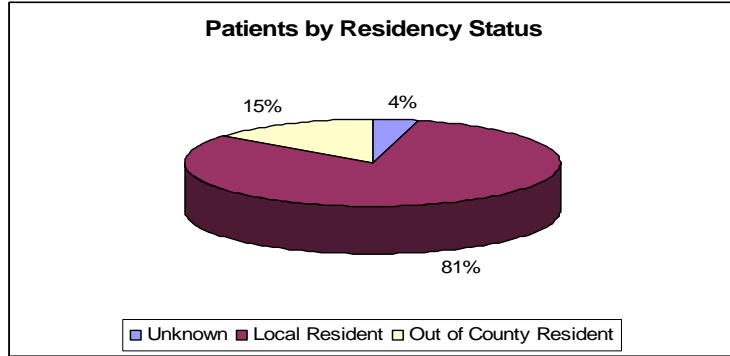


Residency Status of EMS Patients

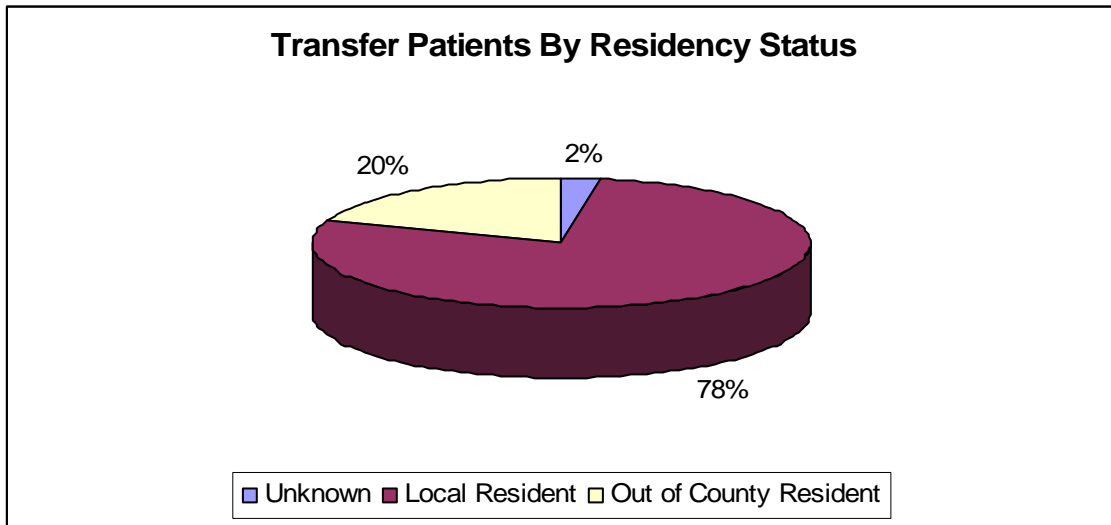
In 2006, people living in Tuolumne County generated 81% of requests for EMS services. 15% of the requests were generated by people who reside outside of Tuolumne County, and the residency status of 4% of the patients is unknown.

All Patients

Residency Status	% of Patients
Tuolumne County Resident	81%
Non- Tuolumne County Resident	15%
Unknown Residency Status	4%

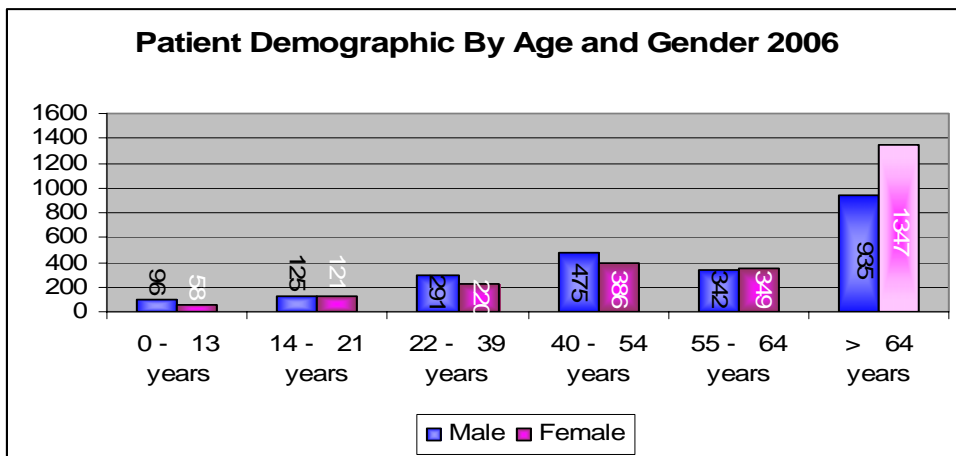


The graph below shows the residency status of patients transferred from hospitals in Tuolumne County. This includes transfer between local facilities and transfer to trauma centers and other specialty facilities.



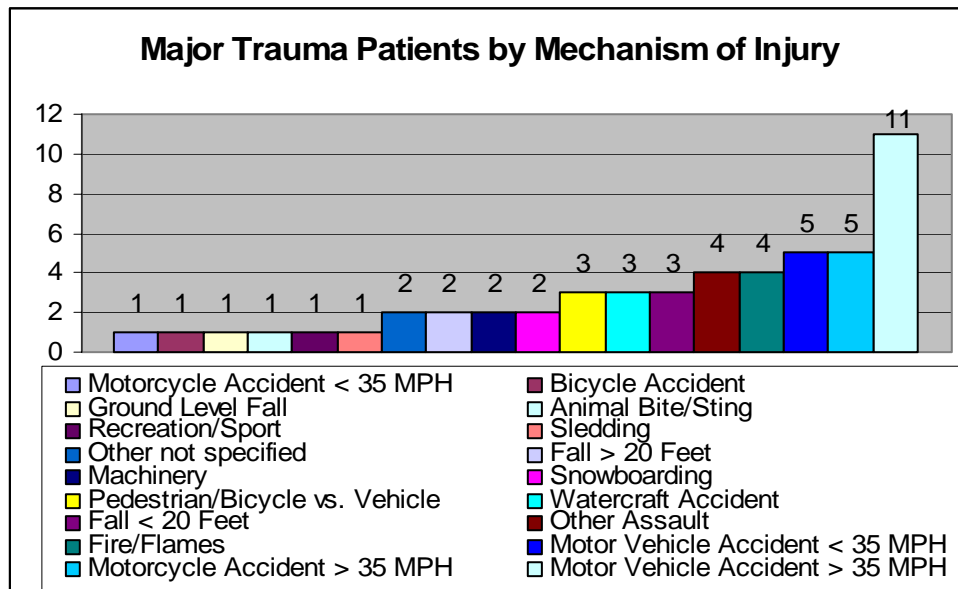
EMS Demographics

As the chart below shows, patients greater than 64 years of age account for 48% of ambulance patients, and 52% of ambulance patients are females. The average age of ambulance patients is 56.



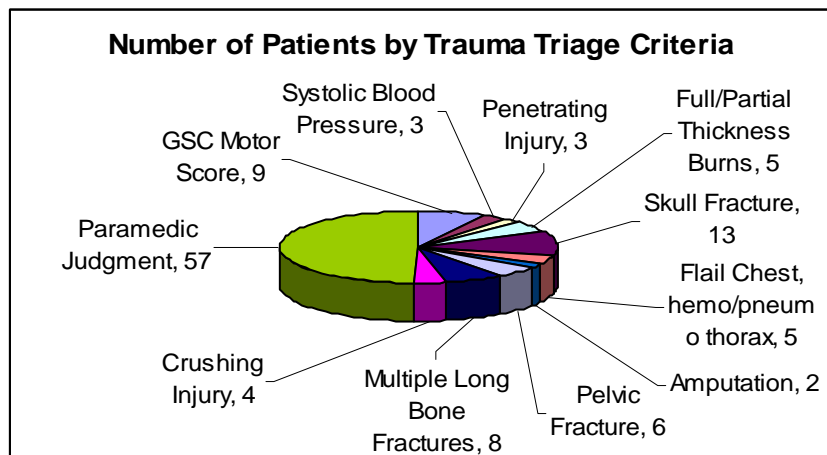
TRAUMA SYSTEM

The chart below shows the mechanism of injury for major trauma victims in Tuolumne County in 2006. Motor vehicle accidents with speeds greater than 35 miles per hour are the greatest mechanism of injury for major trauma victims in Tuolumne County.



The Tuolumne County Trauma Plan has defined nine 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 50% of the time.

Triage Criteria	Number	% of Total
GSC Motor Score	9	8%
Systolic Blood Pressure	3	3%
Penetrating Injury	3	3%
Full/Partial Thickness Burns	5	4%
Skull Fracture	13	11%
Flail Chest, hemo/pneumo thorax	5	4%
Amputation	2	2%
Pelvic Fracture	6	5%
Multiple Long Bone Fractures	8	7%
Crushing Injury	4	3%
Paramedic Judgment	57	50%

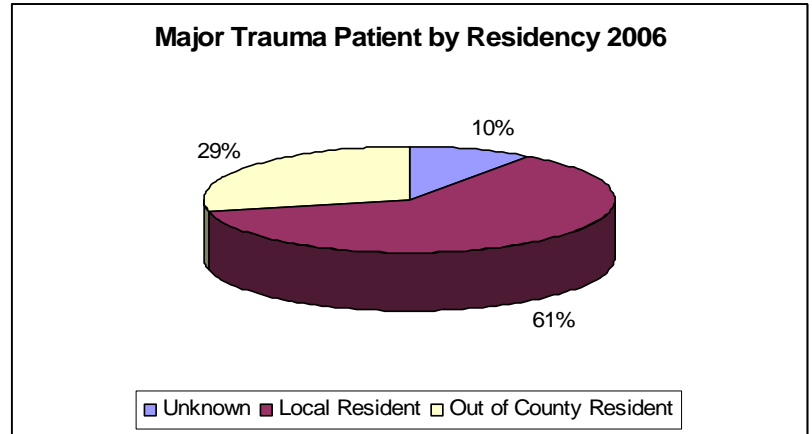


Trauma Demographics

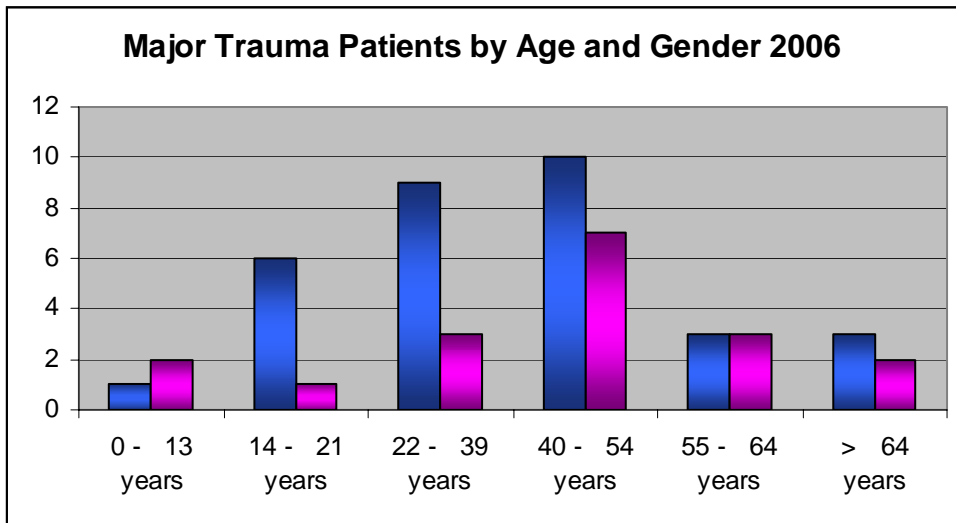
In 2006, a sampling of data shows that people living in Tuolumne County generated 61% of requests for EMS services due to major trauma. 29% of requests were generated by people who reside outside of Tuolumne County and the residency status of 10% of the patients is unknown.

Trauma Patients

Residency Status	% of Number
Tuolumne County Resident	61%
Non- Tuolumne County Resident	29%
Unknown Residency Status	10%



As the chart below shows, major trauma patients ages 40-54 accounted for 34% of all scene requests and males accounted for 64% of all major trauma patients.



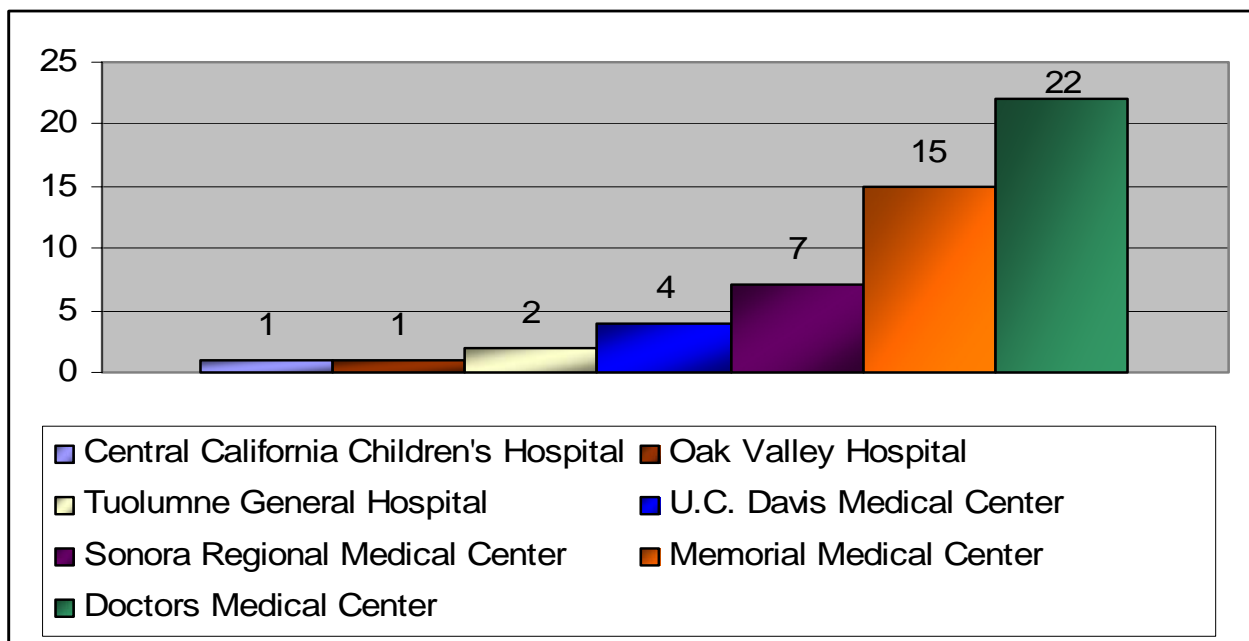
The Tuolumne County Trauma Plan has identified four major trauma patient destinations.

1. Doctors Medical Center (adult)
2. Memorial Medical Center (adult)
3. U.C. Davis Medical Center (adult & pediatric)
4. Central California Children's Hospital (pediatric)

However, under some circumstances major trauma patients may be taken to another Trauma Center, such as Sutter Roseville Medical Center, or one of our two local hospitals.

The majority of Tuolumne County's major trauma patients (71%) are flown to either Doctors Medical Center or Memorial Medical Center in Modesto; both are designated as Level II Trauma Centers.

Major Trauma Patients by Receiving Hospital 2006



ADVANCED LIFE SUPPORT SKILLS

Infrequently used skills are skills that are not likely to be used by a Paramedic once in a six-month period.

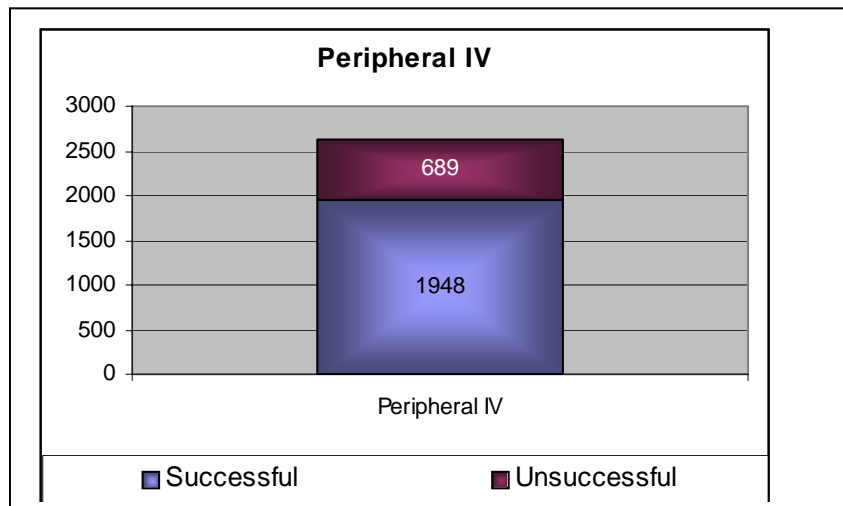
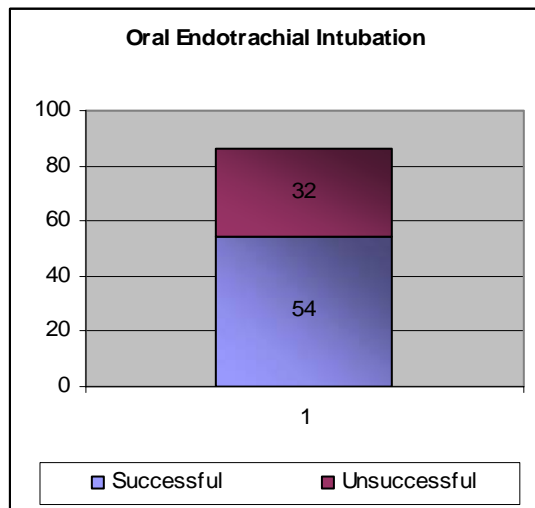
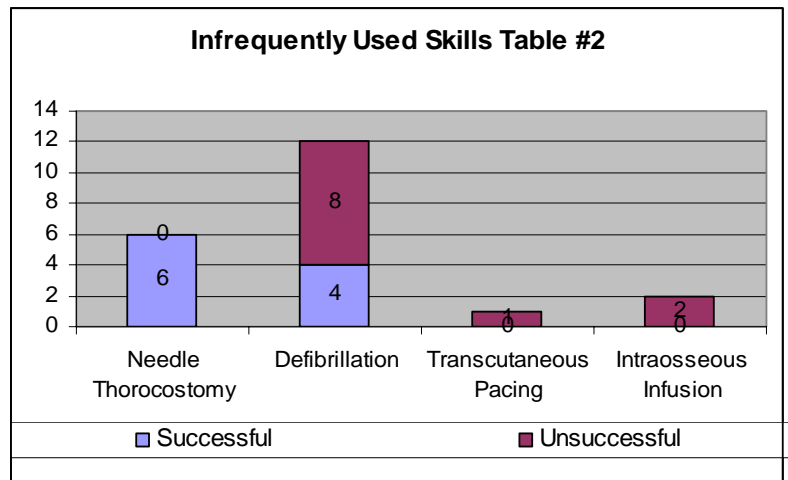
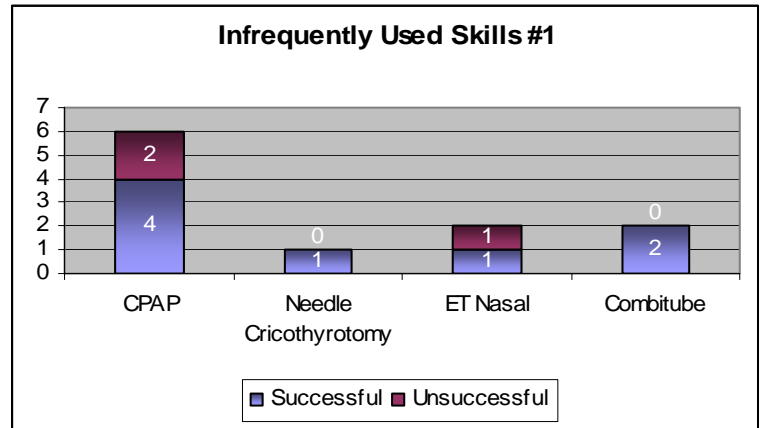
Infrequent Skills	# of Attempts	Success Rate
CPAP**	6	66%
ET, Nasal	2	50%
Combi-Tube	2	100%
Needle Thorocostomy	6	100%
Needle Cricothyrotomy	1	100%
Defibrillation*	12	66%
TCP*	1	0%
Intraosseous Infusion	2	0%

Commonly Used Skills are skills that are likely to be used by a Paramedic more than once in a six-month period of time.

*Cardioversion, Defibrillation, and Transcutaneous Cardiac Pacing (TCP) are considered successful when a change occurs in the patient's cardiac rhythm.

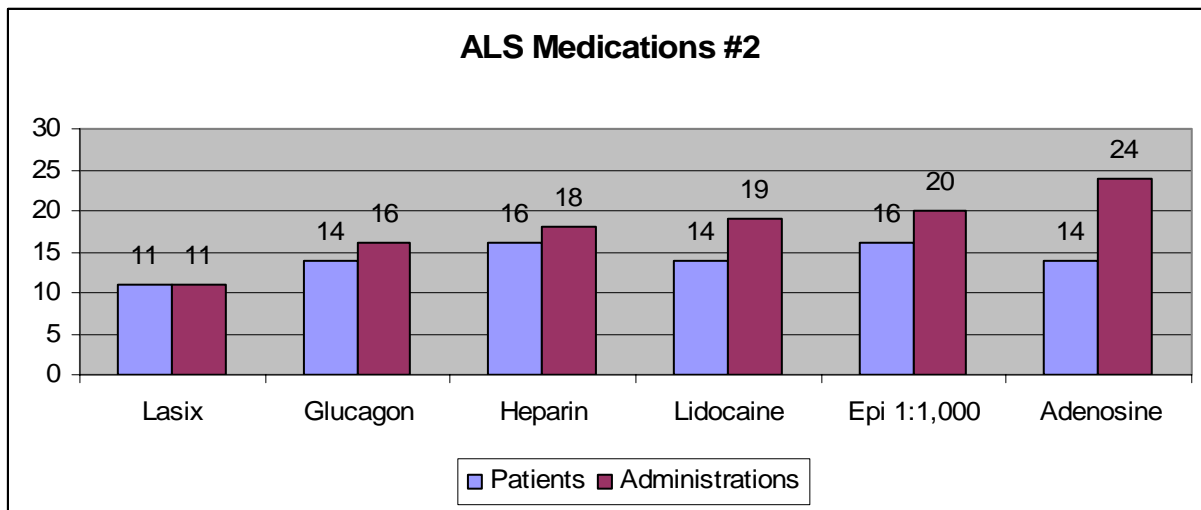
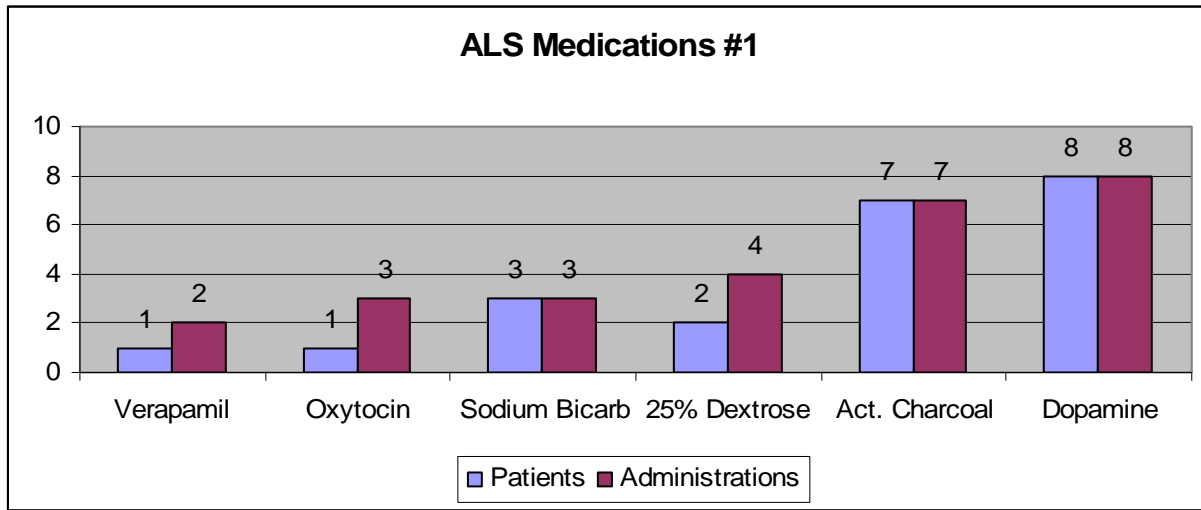
** Continuous Positive Airway Pressure (CPAP) is considered successful if the patient's level of respiratory distress decreases.

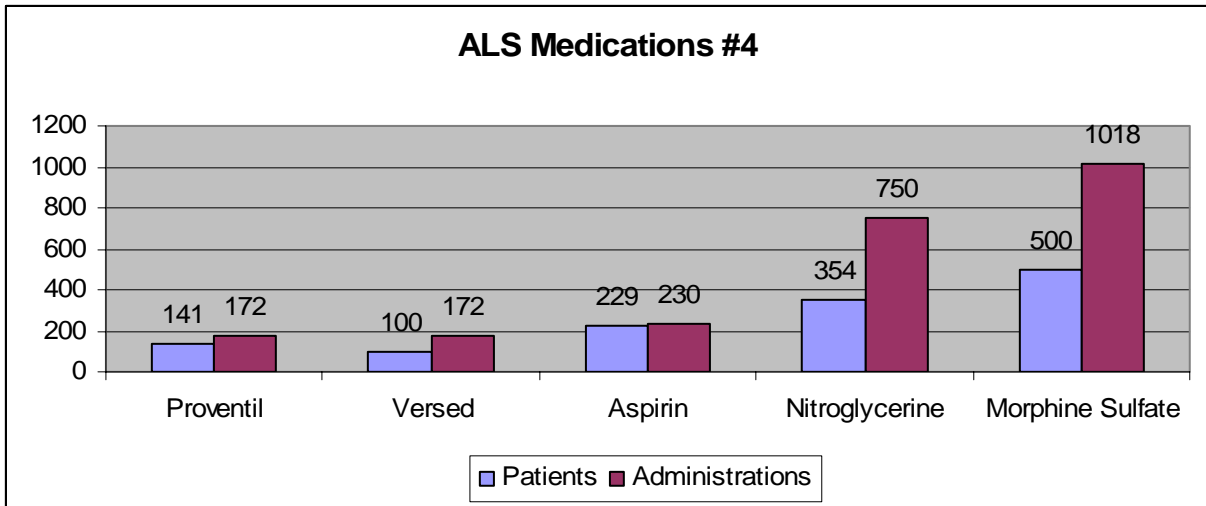
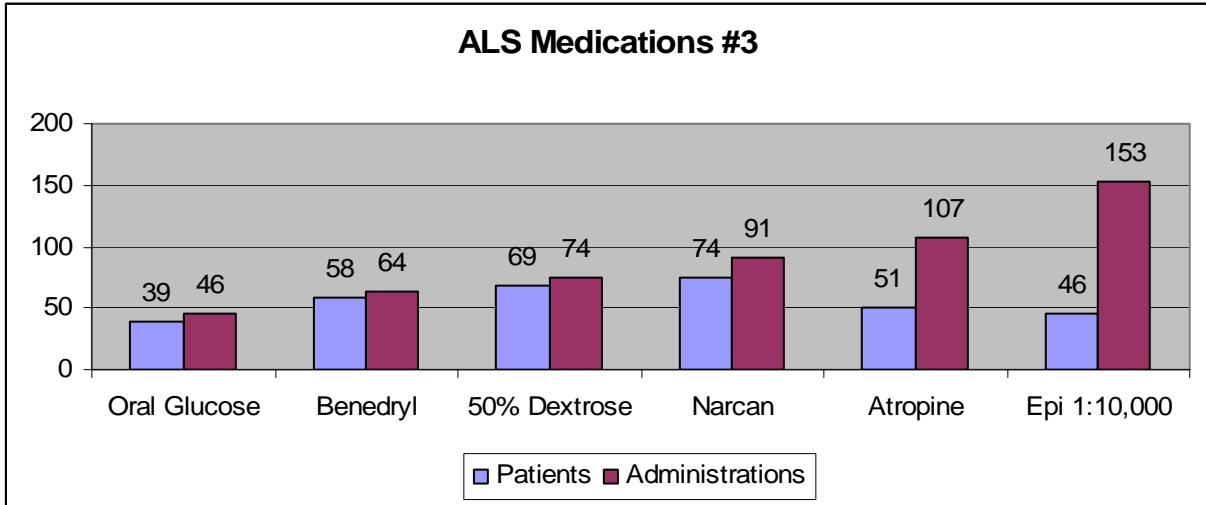
The skill may be performed correctly, but if no change occurs, it is considered unsuccessful.



ADVANCED LIFE SUPPORT MEDICATIONS

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





SUMMARY

I would like to thank Tuolumne County Ambulance Service, Tuolumne General Hospital and Sonora Regional Medical Center 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 and its citizens and visitors. The six-year trend shows a general increase in calls for EMS service. The response times for scene calls have remained fairly constant. With the addition of a new ambulance station on Tuolumne Road, Tuolumne County Ambulance Service will have a more effective deployment pattern; I anticipate that response times will continue to decrease.

The changing environment of the upcoming years will afford us many opportunities to improve the EMS System. The almost constant evolving science of prehospital medicine will require updating of treatment guidelines, training practices, and equipment.