



Trauma System Report 1994-1998

In June 2001 Alameda County EMS released a five year report on the Alameda County Trauma System from 1994 through 1998. This article contains highlights from that report. A copy of the full document is available (printed or on disk) from the EMS Agency (see end of article). It is also available on the EMS web site.

The Alameda County Trauma System was designed in 1985 to assure optimum preparation, response and definitive care for people who sustain critical traumatic injuries within the county. The trauma system operates within the Emergency Medical Services Division of the Alameda County Public Health Department.

Trauma data is maintained in a system called the Trauma Registry. Data is collected for three primary purposes: to assure quality control in the trauma system, for research, and to identify target populations and support the development of injury prevention programs.

The Trauma Report includes a system overview of the number of trauma patients transported to trauma centers with a breakdown by gender, age, race/ethnicity, day of the week and month of the year for each mechanism of injury. The information is then broken down into unintentional and intentional injury and death. The location of the injury and/or death has been provided for three mechanisms (motor vehicle crashes, pedestrian injuries and assaults).

Trauma System Overview

Between 1994 and 1998, 20,062 trauma patients were transported to one of three trauma centers that serve Alameda County. (See Figure 1)

During the five year period from 1994-1998, the percent of trauma patients transported to each of the three trauma centers were:

- Highland Hospital/Alameda County Medical Center 49.3%
- Eden Medical Center 35.3%
- Children's Hospital 15.4%

Key findings:

- In the five year period from 1994-1998, the vast majority of the patients transported to trauma centers were discharged alive (94%).
- In 1998, males comprised the majority of all traumatic injuries (71.7%) and deaths (74.1%).

- In 1998, assault was the leading cause of death among critical trauma patients (31.7%).
- From 1994-1998, the number of penetrating injuries decreased from 25.8% to 16.6%.

Mechanism of Injury

In 1998 in this county 4,671 people sustained traumatic injuries and 457 people died (8.9%). The three leading mechanisms of death were 1) assaults, 2) self-inflicted, and 3) motor vehicle occupant crashes (see Figure 3 on page 3). Figure 2 shows a systemwide overview of trauma injuries and death by mechanism of injury.

Unintentional Injuries and Deaths

Unintentional injuries or deaths are primarily transportation related. These include motor vehicle, motorcycle and bicycle crashes, as well as pedestrians struck by motor vehicles. There are other unintentional causes of trauma such as falls, and sports/recreational activities.

Key findings for 1994-1998:

- Males between the ages of 30-49 are at the greatest risk of dying in a motor vehicle crash.
- White and African-American males between the ages of 40-49 had the highest risk of dying from a pedestrian injury.

In the five year period, 7,836 people were seriously injured and 546 died from unintentional causes. In 1998, one-third of motor vehicle occupant injuries occurred on Friday or Saturday. Nearly half of the injuries occurred to people between the ages of 20-40.

During the same time period, motorcycle crashes resulted in 627 trauma injuries and 55 deaths. Bicycle crashes accounted for 1,039 injuries and 21 deaths. For pedestrians, 1,765 sustained trauma injuries, and 161 died.

The other unintentional injuries and deaths resulted from falls, and sports/recreational activities. Falls accounted for 4,011 serious injuries and 238 deaths. Trauma injuries from sports/recreational activities resulted in 3,991 people being seriously injured and 218 deaths.

Key findings in 1998:

- Children under age 10 sustained 21.4% of all falls. None of them died as a result of their injuries.

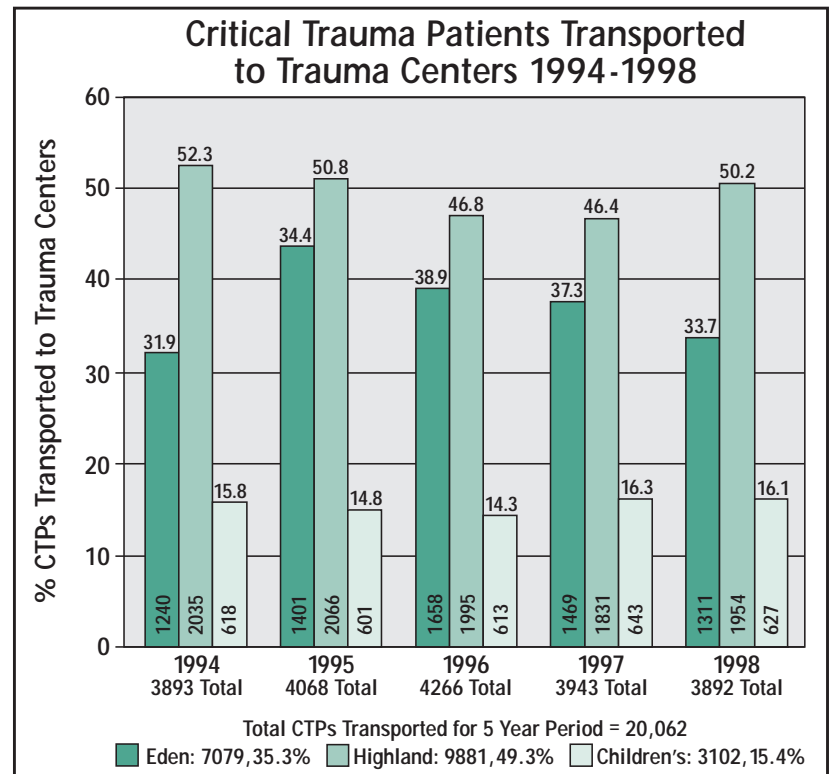


Figure 1

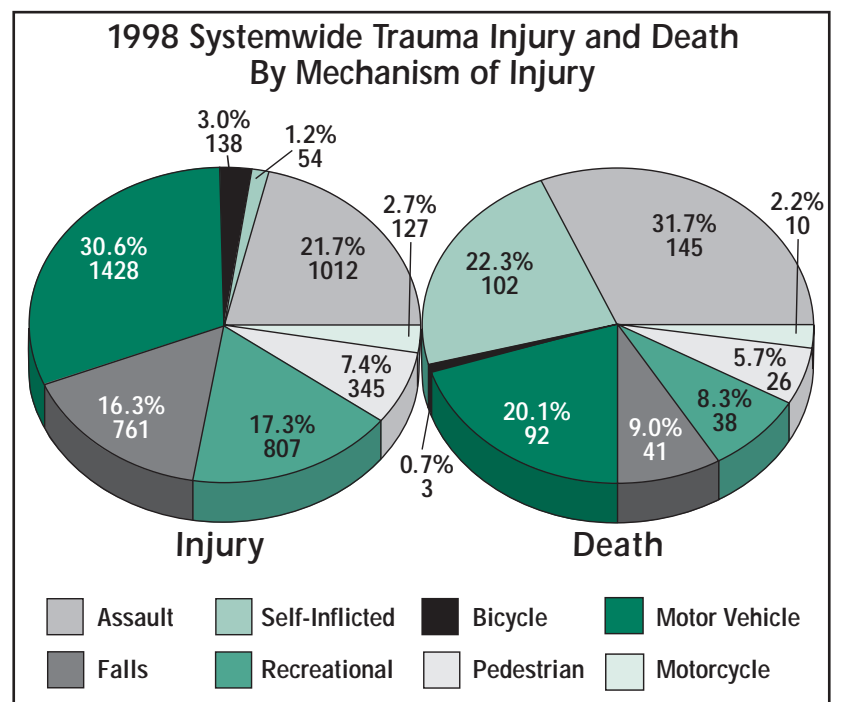


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From the Medical Director

The "Shadow Study"

By Jim Pointer, MD

I am reporting briefly on the results and implications of the "Shadow Study" (*Can paramedics using guidelines accurately triage patients?*, James E. Pointer, M. Andrew Levitt, Justin C. Young, Susan B. Promes, Benedict J. Messana, and Mary E.J. Ader). This paper is to be published in the Sept. 2001 issue of *The Annals of Emergency Medicine*.

First, I want to thank the 54 paramedics who participated in the study by completing the training and enrolling the 1180 patients. Obviously, your help was essential. The "Shadow Study" set out to determine if paramedics, using written guidelines, could accurately triage patients in the field.

In this prospective, descriptive study, the authors provided the paramedics with a guideline booklet, which contained a number of medical conditions, each of which were further subdivided into signs and symptoms. Depending on the signs and symptoms, the paramedics triaged patients into one of four potential dispositions (see Table I).

Table I.
Potential Dispositions for Trial Study

Category 1	Needs ED visit by advanced life support
Category 2	Needs ED visit by any form of transport
Category 3	Needs to see a practitioner within 24 hours
Category 4	Needs no further evaluation

Actual destination protocols were not changed; all patients were transported to the Highland Campus of Alameda County Medical Center where researchers abstracted paramedics' data forms and the prehospital care reports. Three of the physician authors, blinded to the paramedic ratings, triaged the patients into the same four categories (Table I) that the medics previously had performed. However, the physicians had the benefit of reviewing the entire ED

clinical record. The paramedics' ratings were compared with those of the physicians.

The results for the 1180 patients showed that paramedics rated 1000 (84.7%) of the patients as needing to come to the ED (categories 1 and 2) and 180 (15.3%) as not requiring a ED visit (categories 3 and 4). The physician review panel determined that 113 (9.6%) patients were undertriaged, that is, these patients were given a lower classification by the paramedics than by the physicians. Of these patients, 99 (8.4%) of these patients were undertriaged "away from the ED" by the paramedics but determined by the physicians to have been in need of an ED visit. Of these patients, 31 (2.6%) were determined by paramedics to need no physician follow-up (category 4). Of these 31, three required hospital admission. The other 28 patients were diagnosed with a variety of conditions, but they required an ED work-up only. On the other hand, of the 128 patients that the physicians determined to have needed an ALS ambulance, the paramedics agreed with them on all but one patient.

There were a variety of reasons for the undertriage. In 55 cases (48.7%), the undertriaged patients were misclassified because the paramedics misread or misused the guidelines. In 27 (23.9%) of the undertriaged patients, the paramedics correctly followed the guidelines. In these cases, occult conditions were found which could not have been predicted without an ED work-up. In 32 (28.3%) of the undertriaged cases, the guideline instructions were felt to be ambiguous so that no appropriate guideline for the patients' condition could be determined. What are the implications of these results? While 9.6% is arguably not an unacceptable triage rate in these circumstances, the

results aren't as bad as they sound. If the guidelines had been clearer and more comprehensive, only the patients with occult conditions would have been missed. This would have amounted to an undertriage rate of 2.3%!

This study has several limitations. First, there are no published acceptable (or unacceptable) rates for paramedic field triage. As alluded to above, the guidelines themselves were far from perfect. The authors were unable to develop guidelines that would cover every possible presenting complaint. Missing complaints included weakness, flu-cold symptoms, tingling, eye injuries, tooth/gum complaints, testicular complaints, and headache. Also, the physicians themselves had difficulties in developing objective criteria for categorizing the patients. For example, does a patient who required parenteral medication, but was not admitted to the hospital, need an ED visit? Last, the paramedics may have been influenced by the knowledge of their participation in this study (Hawthorne effect) since it was impossible to blind them to their involvement.

Since very little exists in the EMS literature regarding paramedic triage, the authors have added (a bit) to the knowledge in this important area. If EMS Systems are to change from the manner in which they have been doing business for the last 30 years, planners and medical directors need to fully utilize the skills of our field personnel and exercise creativity and fiscal responsibility in determining our patients' destinations. We hope that the "Shadow Study" has taken us a little bit closer to fulfilling these ideals. As usual, please contact me for any further information or a full copy of the paper.

Excerpted from a copyrighted article in "The Annals of Emergency Medicine."

Senior Injury Prevention Project Awarded an EMSA Grant

The Senior Injury Prevention Project (SIPP) was awarded a \$100,000 one year grant from California Emergency Medical Services Authority to help accomplish its 2001-2002 goals. The SIPP is a coalition of nonprofit and public agencies led by the Alameda County Public Health Department and United Seniors of Oakland & Alameda County. SIPP's goal is to reduce the number of preventable injuries among the senior population in Alameda County and to raise awareness regarding the need for an organized countywide Senior Injury Prevention Program. (See box for a listing of member organizations.)

Senior Injury Prevention Program Members

Alameda County Public Health, EMS Division
United Seniors of Oakland & Alameda County
Alameda County Area Agency on Aging
Alameda County Commission on Aging
Alta Bates Summit Medical Center
Alameda County Medical Center (Highland Hospital)
SPECTRUM Community Services
Vietnamese Senior Center
St. Mary's Center
East Bay Korean Community Center

Focus groups held since April, 2000, showed that people want programs that are fun. They also showed that adults over age 60 are also not fond of being

called "seniors." An alternate term, "the SPA Generation" (Sixty-Plus Adults) was received favorably.

The coalition is using a multi-faceted approach that includes: physical fitness, home safety, and recognizing and altering risky behaviors. "Many organizations interact with people age 60 and older, including fire departments, transport agencies, fitness clubs, senior centers, doctors, pharmacists, hospitals and several others," says Colleen Campbell, Alameda County EMS Injury Prevention Coordinator. "One of the SIPP's goals is to link all of these providers together to educate people about preventing injuries and coordinating interventions when needed."

This year's goals include developing 1) a falls prevention packet, 2) an injury prevention resource directory, and 3) a SPA safety guide. The EMSA grant will be used to hire a public health outreach worker and a clerical staff person to help meet these objectives.

The Falls Prevention Packet is an educational tool that identifies many of the common causes of falling and ways to prevent them. For example, people increase their risk of falling if they carry several bags of groceries in front of them and cannot see where they are

walking. "Most of us developed daily activity habits throughout our early adulthood and now aren't even aware of them," Colleen explains. This packet will help call people's attention to risky behaviors and ways to get the same tasks done more safely. The packet will also stress the importance of physical fitness along with suggestions for how to stay fit; it will also contain a home safety checklist.

One of the group's key objectives, an Injury Prevention Resource Directory, came out of the SIPP Conference in March, 2001. This directory will list agencies that assist in injury prevention activities such as fire departments that assist in home safety checks, fitness or senior centers that offer Tai Chi classes, agencies that perform balance and gait testing, and locations of strength training classes. The directory will be given to SPAs themselves, as well as to the service providers who interact with SPAs.

The SPA Safety Guide will involve both education and outreach. The education component will include:

(continued on pg. 4)

- Adults between age 60-69 sustained 6.2% of falls and accounted for 24.4% of deaths, showing that this age group is at the highest risk of death from a fall.
- African-American males age 20-29 are at the greatest risk of dying from a sports/recreational injury.

Intentional Injuries and Deaths

Intentional injuries and death are primarily caused by violence including assaults and self-inflicted injuries. From 1994 to 1998 the leading causes of traumatic death were related to violence. There were 5,568 assault related injuries and 1,064 deaths. There were 221 self-inflicted injuries and 485 deaths during that time.

In 1998 there were 1,009 injuries from assault and 145 deaths. (See Figure 4) Of the 457 people who died from traumatic mechanisms of injury in 1998, 54% of them were from assaults or self-inflicted injuries. The number of assaults was ten times higher than self-inflicted injuries and the survival rate was also higher (83.9%). However, only 31.3% of people with self-inflicted injuries survived.

Key findings in 1998:

- 71.6% of self-inflicted deaths were in the white population and white males accounted for the highest number of deaths.
- 59.3% of assault related deaths were in the African-American population and African-American males accounted for the highest number of deaths.
- The highest number of injuries (74.1%) and deaths (69%) due to assaults were in the 20-50 year old age group with the highest occurrence in the 20-29 age group.
- Nearly half of the total self-inflicted injuries and deaths were by gunshots (49.1%). Of the various self-inflicted mechanisms, gunshots carried the highest risk of death (94.9%).

Injury Severity Ratings

All patients meeting Critical Trauma Patient criteria are entered into the Trauma Registry. Trauma patients' injuries are retrospectively scored by two methods:

- The first is called the Abbreviated Injury Scale (AIS), which is an anatomical severity scoring system. The AIS codes range from 1 being a minor injury to a maximum of 6.
- The second is the Injury Severity Score (ISS). The higher the ISS, the greater the severity of the injury. Trauma patients with an ISS of less than 15 have an approximately 99% probability of survival. The ISS (anatomical), the Revised Trauma Score (physiological), the mechanism of injury (blunt or penetrating) and the patient's age are the components used in calculating the patient's probability of survival.

These objective measurements are used during the medical chart audits of the trauma system's quality improvement program.

Recommendations and Action Plan

Alameda County EMS is taking the following steps based on the information in this report:

- The EMS Agency is adding data fields to its trauma registry that are more specific regarding of mechanism of injury and safety equipment (e.g. seat belt use, bicycle helmets, etc.). This data will help injury prevention groups target their efforts.
- In addition, data filters will be revised to ensure that complete data is collected on all trauma patients.
- Local EMS agencies are required to coordinate EMS system injury prevention programs. In 2000, Alameda County EMS required by contract that a nurse be dedicated to these programs at the trauma centers.

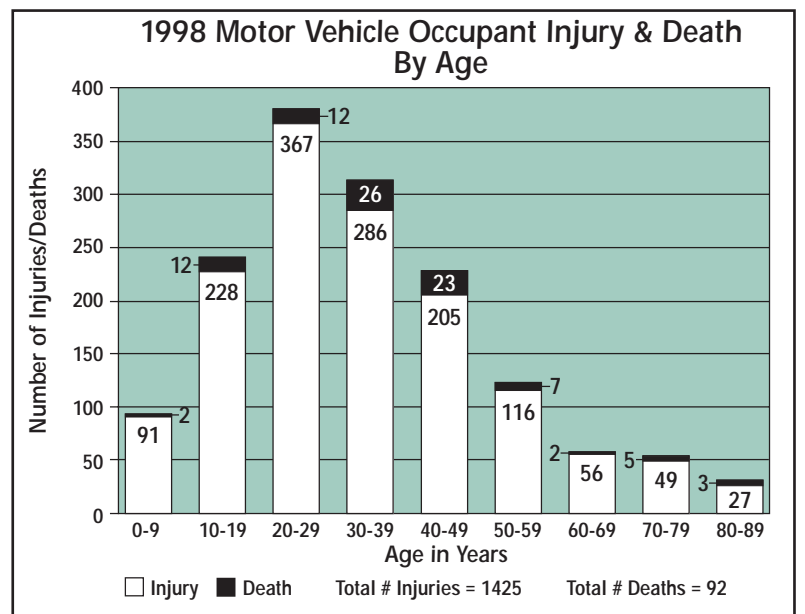


Figure 3

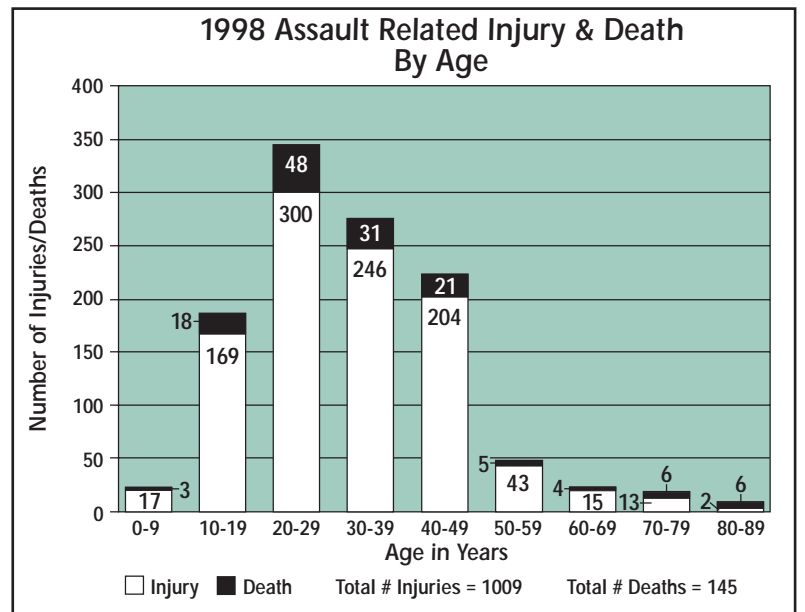


Figure 4

- Nearly all of the 457 trauma related deaths were preventable. This presents a challenge to the entire Alameda County Public Health Department to continue to ensure that its prevention programs are well-coordinated, implemented and evaluated.

If you would like a copy of the Trauma System Report, contact Kris Helander-Daugherty at khelande@co.alameda.ca.us or 267-3227.

Planning a Response for Weapons of Mass Destruction

The United States Justice Department has funded 15 local Public Health Departments throughout the country to begin preparing for a weapons of mass destruction terrorism incident. As one of the selected counties, the Alameda County Public Health Department received a federal grant that the agency is using to train its employees in emergency response to a weapons of mass destruction incident. These trainings will build on what we learned last year in the Terrorism Conference and strengthen our response capabilities.

In May and June of 2001, most of the Public Health Department employees were trained in Emergency Procedures, Basic First Aid and First Response First Aid, with an emphasis on weapons of mass destruction. Members of the Public Health Department's Emergency

Response Teams received five additional training sessions related to emergency response in general and weapons of mass destruction in particular. A tabletop exercise to test and evaluate the management team's readiness will be conducted in September. Alameda County EMS retained Emergency Management & Safety Solutions to conduct the trainings. The firm will also work with EMS to develop a disaster response plan for a weapons of mass destruction incident for the entire Public Health Department.

Jim Morrissey, EMS' new disaster trainer, will be building a curriculum from these classes to offer ongoing hands-on disaster preparation training for all Public Health Department employees.

Dr. Chen Announces New Position

Dr. Art Chen, Health Officer for the Alameda County Public Health Department since 1996, resigned from his position effective August 17, 2001. Dr. Chen is joining the Alameda Alliance for Health as the organization's Medical Director. He cited increased family pressures as the impetus to make this change. In looking at the close relationship and similar values of the two agencies, Dr. Chen says, "I am in total support of the vision and mission that Arnold [Perkins] and all of you have charged for the Public Health Department...[At the Alameda Alliance for Health] I will not be far in my individual and organizational commitment towards addressing the needs of Alameda County's underserved populations."

Dr. Chen has made many valuable contributions to the Public Health

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The EMS News is published bi-monthly to inform and educate its readers about the Alameda County EMS system and issues affecting prehospital medical care.

Your questions and comments are welcome and should be addressed to Kris Helander-Daugherty, 267-3227.

For change of address or number of copies, contact Sonya Lee, 267-3233.

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SEE EMS WEB SITE FOR STAFF DIRECTORY

SIPP Grant (cont. from pg. 2)

- Specific information on the changes our bodies go through as they age;
- Ways to adapt habits to safely accommodate these physical changes;
- Self-assessment tools to guide a person in evaluating their own physical status (e.g. lists of questions for pharmacists and doctors about medication interactions).

Outreach workers will work with individuals on a per case basis to evaluate their needs and help them identify ways to improve safety in daily living.

The SIPP program, with the assistance of the Community Assessment and Public Education unit of the Public Health Department is developing the evaluation tools necessary to allow ongoing assessment of the project's success.

Dr. Chen (cont. from pg. 3)

Department and Emergency Medical Services, and he will be greatly missed.

EMS Medical Director, Dr. Jim Pointer, says, "I have found him to be totally committed to patient care. His courage in calling for a Declaration of Emergency during the 1998-99 flu crisis was one example of his commitment to doing what is best for patients and for the community."

EMS Acting Director, Cindy Abbissinio, says, "Dr. Chen has been a solid resource for me. He has always been fair-minded and considered all sides of an issue before making a decision." The Public Health Department and the EMS Agency wish Dr. Chen the very best in his new position.

Keep Cool This Summer

As the summer heats up and the state's energy crisis continues, the Alameda County Sheriff's Office of Emergency Services (OES), Alameda County Public Health Department and a coalition of other interested agencies are preparing a Heat Emergency Plan. Dennis Jennings, OES Emergency Services Coordinator, started the coalition after reading about similar plans in San Jose, and San Mateo and Contra Costa counties. "We are particularly concerned about elderly people, people with certain medical conditions and the developmentally disabled, all of whom need to maintain a stable body temperature," says Dennis.

The group is producing a brochure titled, *Heat Wave, Are You Prepared?*, which includes the types of buildings people can go to stay cool such as libraries, shopping malls and movie theaters, and why minimizing caffeine and alcohol helps. "This brochure also includes information about the causes, evaluation and treatment for heat cramps, exhaustion and stroke and a discussion of medications and heat," says Jim Morrissey, Alameda County EMS Disaster Operations. It will be distributed by first responders and numerous community organizations. Information on effectively dealing with the heat will also be sent to the local media. A copy of the brochure is on the EMS web site. Contact Dennis at 925-803-7800 for more information.



EMS News and Announcements

The EMS Agency welcomes **Sandy Hollandsworth** to our staff. Sandy has worked closely with EMS previously as our finance liaison in the Public Health Department. She is now joining us in EMS. Sandy will be assisting Cindy with finance issues, contract monitoring and working with Charlie Selhorst on information system issues. "I look forward to working with everyone involved in providing emergency medical services in Alameda County,"

Sandy says. She can be reached at 267-3237 or sholland@co.alameda.ca.us.

This year's annual Statewide Disaster Drill will be on weapons of mass destruction. It will held on Thursday, November 15, 2001. Cynthia Frankel is actively recruiting evaluator/controllers for this important event. For more information, contact her by pager at 442-3170 or by e-mail at cfrankel@co.alameda.ca.us.

Meeting Notes

EMOC-Thurs., August 16, 9:00-10:30am at the EMS District Office.

Research Committee-Thurs., Aug. 16, 11:00am-1:00pm at the EMS District Office. Lunch will be provided. Please RSVP to Tom McGuire at 267-3228 or tmcguire@co.alameda.ca.us.

Bay Area Paramedic Journal Club-Tuesday, September 11, 6:30-10:00pm, Vo's Restaurant, 59 Grand Avenue, Oakland. RSVP to Tom McGuire at 267-3228 or tmcguire@co.alameda.ca.us.

2001 POLICY REVIEW PROCESS DATES

DEADLINE FOR POLICY IDEAS	PUBLIC DRAFT OUT	PUBLIC COMMENTS DUE	PUBLIC HEARING AT EMOC	FINAL POLICIES SENT OUT	UPDATE TRAINING	POLICIES IMPLEMENTED
FEBRUARY 23	MAY 4	JULY 3	AUGUST 16	SEPTEMBER	SEPT. -NOV.	DECEMBER 1