

**PINELLAS COUNTY EMS
OFFICE OF THE MEDICAL DIRECTOR**

**Annual Report
October 1, 2007 to September 30, 2008**

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I. Introduction

We are pleased to provide our *twelfth-annual* report highlighting the operations of the Office of the Medical Director (OMD) to the Authority's Executive Director, on behalf of the Pinellas County Emergency Medical Services Authority. This document addresses our current state of affairs and the progress made in Pinellas County's Emergency Medical Services (EMS) System from October 1, 2007 to September 30, 2008.

The patient care rendered by the Pinellas County EMS System remains excellent and a standard that other systems strive to emulate. As our monitoring of the system continues to broaden, we are continuing to refine our ability to obtain clinical performance and outcome data that will facilitate a more objective look at the quality of care delivered. We continue to work with each provider agency and the EMS Administration to develop performance tools and methods for quality assessment and improvement. However, without the cooperation and dedicated work of OMD staff, Medical Communications Officers, agency EMS Coordinators, the Medical Control Board, the County EMS Authority, and the EMTs and paramedics who make this system work every day, for every patient, it would be impossible to reach our goals.

It is with great confidence that we present this annual report as a measure of our success. We look forward to the opportunity to report to you on our accomplishments next year.

II. Certification of EMS Personnel

The OMD is responsible for the issuance of county certification and recertification of system paramedics, emergency medical technicians (EMTs), paramedic Emergency Medical Dispatchers (EMDs), Critical Care Transport (CCT) personnel, On-Line Medical Control (OLMC) staff and wheelchair transport personnel operating within the Pinellas County Emergency Medical Services System. Each of these varying types of certification has an established background check, state certification (where applicable), orientation, testing, and continuing education requirements, as set forth by the Pinellas County Rules and Regulations.

As of September 30, 2008, we processed one person fewer than last Contract Period, with the following breakdown:

Personnel Counts	2003	2004	2005	2006	2007	2008
Certified Paramedics *	760	716	636	694	727	755
Provisional Paramedics *	39	14	3	13	11	15
Paramedics (Total)	799	730	639	707	738	770
Certified EMTs *	716	701	606	692	696	707
Provisional EMTs *	24	17	1	6	4	4
EMT (Total)	740	718	607	698	700	711
SWAT Paramedics	32	28	29	27	27	24
Certified Dispatchers	32	41	43	40	42	41

Critical Care Nurses *	11	13	12	8	8	7
Critical Care Paramedics	24	19	19	23	27	15
Critical Care EMTs	13	13	12	13	16	14
OLMC/ Physician & MOD *	11	13	13	10	10	9
Certified wheelchair *	162	156	156	129	173	131
Totals:	1723	1630	1427	1552	1629	1628

* **PRIMARY CERTIFICATION HOLDERS.** All others are sub-groups of the primary groups.

The grand total of all County Certified paramedics, EMTs, Critical Care Nurses, On-Line Medical Control staff and Wheelchair Transport Drivers is 1,628, an decrease of 0.1% from the 2007 total of 1,629.

We consider county certification an area of critical oversight. With our continuous effort to make certain that the EMS system complies with medical standards, procedures, education and quality accountability, this information and our feedback is directly linked to this certification database. Because of the importance placed in this area, we must be certain that our data is always accurate and dependable. **In order to maintain this standard, OMD staff made 6,440 critical modifications to this database this year, a 21.5% decrease from last year's 8,101.** This decrease was due in part to the “off year” the system was in for re-certification in Advanced Cardiac Life Support (ACLS), Basic Life Support (BLS) and the State of Florida certification renewals.

III. On-Line Medical Control (OLMC) Activity

The OLMC program continues to be a critical information portal for our clinical care teams. It provides our staff the opportunity to discuss patients’ clinical presentations and alternatives for their care as the treatment team encounters them. By listening to and interacting with the clinician, we can guide, educate and better assure that optimal care is provided. One vital function is to work with the patient to determine the "most appropriate" hospital for their continuum of care. Many times these decisions are quite complex and involve matching the patient's medical needs with a hospital's service capabilities. With our personal interaction in this area of care, we believe these decisions will ultimately improve the patient's long-term prognosis.

From a risk management perspective, the OLMC program provides high caliber review, consultation and recommendation for medical-legal situations the EMS system manages daily. Many of these consultations include aiding the clinician in the assessment of the patient’s mental competency for refusal of treatment and transportation. A significant proportion of calls involve other psycho-social issues, such as treating the underage child without parental consent and management of patients in law enforcement custody. This service is available to our entire EMS system 24 hours a day, seven days a week. Contact with OLMC occurs when the patient's level of care and/or the medical-legal risk issue reaches a prescribed trigger point in protocol. We deliver this service with a small core group of Board Certified Physicians and two clinical paramedic supervisors called “Medical Officers of the Day” (MOD). This group has been intentionally kept small in order to more easily assure that OLMC providers are appropriately trained in the intricacies of

consultation in this risky medical-legal environment. OLMC providers are also monitored for quality assurance purposes by the OMD.

Internally, we view each of our consultations as a high priority. As such, we continually look at the quality of our timeliness in providing this service. One parameter that we monitor is our performance from the time the field crew calls for a consultation (crew hail time) to the time our OLMC staff member answers on the radio (time on-line). For the contract period 2007/2008, this time interval was **thirty seconds or less ninety-two percent of the time**, which is 1% decrease from the last report. Our efforts continue in monitoring accuracy, consistency with protocol, and appropriateness of consultations provided by the OLMC staff.

During the contract period the OLMC staff managed 13,577 consultations compared to 12,617 during the last fiscal year, a 7.6% increase in activity. The increase in the number of OLMC consults is a direct reflection of the system's increase in response volume. Of note, the OLMC staff is managing more and more high-risk consultations reflective of patients refusing treatment, standard treatment recommendations being made by the paramedics and/or transport to a hospital.

In review of the 13,577 consultations made during the Contract Period (CP), the severity of the patient's condition was as follows:

	CP 02/03	CP 03/04	CP 04/05	CP 05/06	CP 06/07	CP 07/08
Severity Red (Life-threatening or unstable)	1,101	906	1,371	1,300	1,462	1,371
Severity Yellow (Potentially life-threatening)	4,534	4,612	6,787	6,013	5,746	6,367
Severity Green (Non-life or limb threatening)	2,828	3,111	5,442	5,677	5,356	5,689
Severity Black (Deceased)	18	27	30	29	26	41
No Severity	38	20	39	43	27	109
Total	8,519	8,676	13,669	13,062	12,617	13,577

IV. Mass Gathering and On-site Medical Control

The Office of the Medical Director frequently assists in the planning for safety and medical coverage for a variety of mass gathering and sporting events per authority granted through the County Rules and Regulations. Such events can include the Florida Gulf Beaches Marathon, motorsports events, municipal concerts and other events in public venues. The OMD provides oversight of medical coverage planning and can also provide on-site medical control for large, higher risk events. On-site medical control allows for definitive therapy in many cases, advanced levels of physical evaluation, facilitated handling of medical legal issues, and especially minimizes the potential impact on the entire EMS and hospital system. On average, on-site medical control can cut required hospital transports by two-thirds or more. The results are a less stressed healthcare system, event participants who

receive exemplary care and can often return to the event, happier event promoters and local businesses, and a positive impact on the public's perception of EMS and our communities in general.

During the contract period, staff supervised medical care at several events, with well over 100 patients evaluated and about 30 patients transported. Staff also participated in planning meetings for the 2008 Honda IRL Grand Prix in St. Petersburg and provided on-site coordination during the three-day event. Staff also provided planning services for the 3 Day Breast Walk as well as planning and on-site coordination services for the Ironman 70.3 World Championships in Clearwater.

The Medical Control staff also responds when requested to multiple casualty incidents, where they can also assist with multiple patient triage, definitive care, and facilitation of obtaining appropriate refusals and consents. Staff also participates in mass casualty exercises with other County resources.

V. Medical Communications Officer (MCO) Activity

A. Medical Channel Monitoring

The MCO program continues to play a major role in the clinical management and quality improvement activities of the EMS system. Like the OLMC program, the MCO program is staffed 24 hours a day, seven days a week, and is physically located within the Sunstar Communications Center. Each of the twenty-six (26) MCOs that make up the program is a County Certified Paramedic and is considered a respected clinical member of the EMS system.

The MCO conducts multiple tasks centered on the delivery of quality patient care; one important aspect is monitoring the medical consultations between our field clinicians, our OLMC staff, and the hospitals receiving our patients. This radio monitoring continually assists us in confirming that the EMS system conforms to our established Standards of Care. In order to confirm this, we developed a software program that allows us to track compliance with system protocols while monitoring these radio communications.

In CP 07/08, MCOs monitored 11,025 medical radio reports from field providers directly to local hospitals compared to 11,560 last fiscal year, or a 5.6% decrease in activity. Three Quality Assurance Reviews (QARs), corresponding to 0.03% of all such calls, were filed as a result of this monitoring. Although when combined with the 13,577 OLMC consultations, it is evident that we do not (and cannot) monitor 100% of all hospital contacts, we do believe that we have a sample of sufficient size for us to be confident that our system is compliant with our established Standards of Care. When we add in Registries for Sentinel Events such as Trauma Alerts, Cardiac Arrests, Intubations, and Drowning/Near-drownings, we are confident that we are monitoring 100% of all critical patients managed by the EMS system.

B. Hospital Resource Management System

Without doubt, digital technology has transformed our individual processes for selecting the most appropriate hospital destination for our patients. Automated key processes now enable the field caregivers to spend little time in determining the most appropriate destination. Having identified many of the bottlenecks in workflow, this automated process saves time in selecting available resources ultimately influencing better patient outcomes.

The focal point for maintaining and updating hospital status information is our Medical Communications Officer (MCO). Their role is quite dynamic and multi-faceted, ranging from keeping local hospitals from becoming too over-crowded with EMS patients, to monitoring prolonged ambulance service delays that can ultimately lengthen response times within the community. The MCOs perform under structured protocols to ensure that hospital status changes are made on a timely basis, balancing individual hospital needs with system needs. Even though this function is time consuming for the MCO, it offers us important information to make decisions on a case by case basis, ultimately improving our patients' healthcare and the EMS system's overall performance.

To accomplish these tasks, the MCO uses a custom software system to track and log the details of the hospital status changes. Each status change, including documentation of conversations and identification of personnel involved, is logged into the computer by the MCO. During the Contract Period, **the MCO logged 3,827 conversations compared to 2,810 last year a, 36.2% increase, while coordinating 1,657 Emergency Department (ED) status change events compared to 1,289 last year, a 28.5% increase and 985 hospital resource status change events compared to 814 last year, a 21% increase. We believe this increase is a direct result of higher response volume and the continuing problems with local hospitals retaining on-call physician specialty care services.**

To better understand the significance of hospital status changes, we use the following ED Bypass definitions:

RED = CLOSED: - No Hospital Patient Access - An internal hospital disaster, or a high demand for Emergency Department/Internal hospital resources have overwhelmed the facility to the extent that safe patient care cannot be provided to additional system patients. When a bed transfer delay of 60 minutes or longer is experienced, or when multiple EMS units (3 or more) are delayed with no indication of bed transfer, thus decreasing the availability of EMS resources (vehicle and personnel), the hospital will be placed on closed status. NOTE: In most situations, the hospital will already have been placed on one of the other diversionary conditions listed below.

YELLOW = BYPASS: - No Severity YELLOW patients - This bypass is intended for any patient the field clinician has triaged as serious, but not immediately experiencing a life-threat. This patient population usually requires advanced medical care (ALS) including at least an ECG monitor and IV. The hospital would still receive Severity GREEN and RED patients.

GREEN = No Severity GREEN Patients - This bypass is intended for any patient the field clinician has triaged as stable and without potential for life threat. These patients often receive only Basic Life Support (BLS) services, although they may receive ALS services in the form of medication for pain management. The hospital would still receive Severity RED and YELLOW patients. This status is rarely used.

Service/Resource Divert Status Changes:

	2005	2006	2007	2008
Divert Status Changes	1,089	837	814	985

Calls related to Service/Resource Divert Status Changes:

Call Type	2005	2006	2007	2008
Coordination/Warning	199	128	138	266
Status Change	917	673	814	1144
Information/Comments	50	36	39	43
Total:	1,166	837	991	1,453

ED Bypass Status Changes:

Status Change	2005	2006	2007	2008
OPEN	1,147	1,108	583	753
GREEN	3	1	0	3
YELLOW	615	557	374	386
RED	782	766	332	515
Total:	2,547	2,432	1,289	1,657

Calls related to ED Bypass Status Changes:

Call Type	2005	2006	2007	2008
Coordination/Warning	1,040	863	363	464
Status Change	2,294	2,172	1,366	1,838
Information/Comments	139	149	90	72
Total:	3,473	3,184	1,819	2,374

Additionally, for every hospital status change made, each of the field Sunstar ambulance crews and EMS system managers are notified via pager.

Paging server activity:	2005	2006	2007	2008
Hospital Status Pages	17,801	25,316	13,344	27,396

Secondly, an electronic hospital status board located in the Sunstar Communications Center displays the most up to date information for our dispatchers. For our *fifteen* hospitals, a full Internet display is available at www.medcontrol.com showing the status of each hospital's Emergency Department (ED) along with any specialty service disruptions they might have reported. This process, the information, and the tools that make it all work are considered a **critical operational** component of the EMS system's infrastructure. A fundamental goal of the EMS system is to transport each patient to the right hospital with the "most appropriate" resources the first time.

VI. Continuing Medical Education Report (CME)

1,550 clinicians (paramedics, nurses and EMTs only) attended a total of 724 classroom CME offerings plus two months of on-line CME. The overall system compliance with attendance and completion remains excellent. During this year, the EMS system had an average compliance of 96.3% for completion within the primary and first makeup offerings of CME, compared to 92.8% during the last reporting period. Attendance during the “primary” offering was 78.2%, compared to 86.6% last Fiscal Year.

VII. Medical Audit Report

Over the last several years we collectively evaluated the processes involved in managing our real-time “quality accountability system.” From our perspective, there is no better time than the time of the identification of a questioned occurrence, perceived complaint, or conflict to obtain the information from the people who are involved. We have named this structure a “Quality Assurance Review” (QAR). It has worked very well in streamlining our management and the processes necessary for investigation and case disposition. **All of QARs are kept in an electronic database that can only be reviewed by office staff. All information is kept confidential under Section 401.425, F.S.**

During the Contract Period the EMS system responded to 180,169 emergency and non-emergency responses, compared to 172,391 last year, a 4.5% increase. During this time, the OMD managed 553 QARs, representing 0.3% of system responses. Each QAR is assigned a severity classification of Purple, Green, Yellow, or Red, in order of increasing risk or urgency, with the following distribution during this Contract Period.

- PURPLE = Commendation
- GREEN = Low priority
- YELLOW = Potential serious
- RED = Potential critical

	FY 04-05	FY05-06	FY06-07	FY07-08
Ambulance Responses	166,401	171,319	172,391	180,169
Ambulance Transports	115,757	118,334	121,089	130,032
QARs	702	625	609	553
Percentage of Responses	0.42%	0.36%	0.35%	0.30%

QAR Severity Breakdown for Contract Period:

	Purple	Green	Yellow	Red	Total
Number	16	100	383	58	557
Percentage	2.9 %	18.0%	68.8 %	10.4 %	

A sample breakdown of Quality Review Audits has been assembled. The categories vary but cover mainly areas of patient care. The following list shows categories to which QARs may be assigned and related data for the Contract Period:

A. Transportation

The reviews in this area include appropriate selection of hospital destination, scene time, and 100% review of all fire department (FD) transports. During the Contract Period, we reviewed 23 FD transports, compared to 26 last Contract Period. This is an 11.5% decrease from last Fiscal Year. During the same period, Sunstar transported 130,032 patients, compared to 121,089 last reporting period; FD transports therefore represented 0.01% of all system transports. This remains an important review for us, as the inappropriate use of First Responder resources reduces a rescue's in-district availability for more urgent 9-1-1 response activity. Also included in this category is appropriateness of hospital destination, which had 37 reviews (or 6.7% of total QAR activity). This is a 32.7% decrease from the last reporting period (55 events).

B. Medical Control

Thresholds that define when On-Line Medical Control (OLMC) contact is required are designed to enable as close to real time risk management and medical advice as possible. Therefore, instances in which system clinicians are not compliant with these requirements are of significant concern. Because of this concern we place a major emphasis on the system's compliance to these standards by having the MCO and the OLMC staff monitoring these radio reports. Secondly, the office staff routinely reviews and audits Patient Care Records (PCRs) which often result in returning data to system quality managers and to the educational efforts in Continuing Medical Education (CME) classes. As a result of this concerted effort, we had 95 QARs, or 17.2% of the total QAR volume compared to 121, or 19.9% the last reporting period, a 21.5% decrease.

C. Documentation

There has been a much greater emphasis placed on reviewing the patient care record. Staff reviews 100% of the patient care records related to QARs and a very high proportion of those related to OMD's various registries (such as cardiac arrest, intubation and serious injury). While documentation deficiencies are a common component of many QARs, only 11 QARs were identified as being primarily documentation-related. Involved crewmembers were appropriately remediated.

D. Communications

Communications reviews (Sunstar Communications Center and 911) are conducted when potential problems are identified. During the Contract Period, 2 events (or 0.4% of all QAR activity), were managed, reflecting a decrease of 33.0% from our last report. Several of our reviews involved calls not being shipped to appropriate Sunstar paramedic EMD personnel; others involved inappropriate transport instructions to the responding rescuers. These have remained very small in number.

E. Commendations

Written and verbal commendations of system personnel continue to be a focus of the organization. These are provided to the field crew when they have gone "above and

beyond” our normal expectations, when the care provided is exceptional, usually having a positive outcome. During the Contract Period, we logged 16 formal commendations (or 2.89% of the QAR activity) and 40 verbal commendations (0.3% of our 13,577 OLMC consultations). The verbal commendations come directly from the clinician’s interaction with the OLMC staff or from the MCO. Today, the OLMC staff, MCOs, other OMD staff, agency and county administrative staff, hospital staff, and patients have all originated commendations. We believe that both positive and constructive feedback is an important ingredient to good care and encourage OMD staff to be vigilant in recognizing and rewarding exemplary care.

F. Patient Care

Patient care service reviews represent a generalized category with specifics available in three groups: Airway Management, Medications, and Procedures. Each event requires extensive investigation, the development of appropriate individualized remediation processes, and follow-up. Where trends are identified, protocol changes and/or system education are considered. Especially if clinical restrictions are necessary, the OMD makes every effort to resolve issues as quickly as possible. The OMD has adopted a philosophy of extensive personal involvement in these processes.

VIII. Sudden Cardiac Arrest (SCA)

The emergency management of this devastating event remains one of the *core purposes* of any EMS system. The cornerstone for optimized care of these patients is timely and effective intervention by the community, the EMS system, and other healthcare organizations (the “Chain of Survival”). From the bystander or family member calling for help, to the provision of bystander CPR and use of an Automatic External Defibrillator (AED), until the arrival of a paramedic or emergency medical technician with a defibrillator, all must come together in partnership to collectively achieve the highest likelihood of survival of SCA possible.

During the Contract Period, 951 patients experienced an out of hospital SCA (including traumatic cardiac arrest) and were treated by EMS. International research has shown that some arrhythmias are more survivable than others. The following table shows the presenting arrhythmias and outcome statistics for these patients.

Rhythm	2007 SCAs (Percent of total SCAs)	Admitted (Percent of rhythm)	Survived (Percent of rhythm)	2008 SCAs (Percent of total SCAs)	Admitted (Percent of rhythm)	Survived (Percent of rhythm)
Asystole	418 (42.6%)	70 (16.7%)	13 (3.1%)	400 (42.1%)	85 (21.3%)	20 (5.0%)
PEA	207 (21.1%)	68 (32.9%)	16 (7.7%)	273 (28.7%)	88 (32.2%)	32 (11.7%)
V. Tach. (VT)	9 (0.9%)	6 (66.7%)	3 (33.3%)	12 (1.3%)	8 (66.7%)	6 (50.0%)
V. Fib. (VF)	200 (20.4%)	109 (54.5%)	66 (33.0%)	202 (21.2%)	90 (44.6%)	57 (28.2%)
Other	148 (15.1%)	58 (39.2%)	31 (20.9%)	64 (6.7%)	30 (46.9%)	15 (23.4%)
Totals (Percent of total SCAs)	982(100%)	311 (31.7%)	129 (13.1%)	951(100%)	300(31.5%)	130 (13.7%)

As we can see, the survival from Asystole or PEA is relatively low, while those patients experiencing VF or VT have a much higher survival rate. Although survival is low from Asystole and PEA, these categories still accounted for 40.0 % of the overall survival from

SCA and therefore should be considered for resuscitative efforts. However, for the purpose of comparing SCA survival, the Utstein Template (an internationally recognized standard for reporting SCA information) only considers those patients in VF or VT as meeting template inclusion criteria. Additionally, the Utstein Template states that the SCA must be a) witnessed (Seen or Heard) and b) of cardiac etiology. Therefore, out of the 951 SCA patients, 214 presented in VF or VT; however, only 194 of these cases were considered as having cardiac etiology. Of those, 113 were witnessed (heard or seen) by a bystander, thereby meeting the Utstein Template requirements. Of those 113, 33 patients survived to discharge from the hospital. **Therefore, based upon our review and applying the appropriate information to the Utstein Template, the current Pinellas County survival rate is 29%, a 21.2% decrease from last reporting. These figures are based on Fiscal Year 07/08.**

	2004	2005	2006	2007*	2008
Utstein Template	23%	17%	18%	37%*	29%

* After January 1, 2007, in compliance with new protocols and AHA guidelines, the VF or VT determination was made after two minutes of Cardio-Pulmonary-Resuscitation (CPR)

Another area of system performance measured is "return of spontaneous circulation" (ROSC). During cardiac arrest, the heart stops beating altogether or beats in such a way as to not be able to circulate blood through the body. CPR and advanced life support treatment's goal is to reestablish that spontaneous circulation, thus achieving ROSC. Many patients may experience a temporary ROSC during resuscitation, but then are unable to sustain it long enough to affect their final outcome. However, other patients experience "Sustained ROSC", a strong clinical indicator for improved outcome. For this calculation of ROSC, we measure all SCA patients who meet the "Utstein Template" criteria who also exhibit **sustained ROSC at hospital arrival**, regardless of ultimate outcome. We consider this measurement to be the "Out of Hospital-Utstein".

	2004	2005	2006	2007	2008
Out of Hospital Utstein/ROSC	42%	33%	42%	54%	42%

The Utstein Template deliberately focuses on the subset of patients with the highest possibility of survival to hospital discharge. Can we use similar information and apply it to all cardiac arrest victims? In February 2004, the Journal of Emergency Medical Services (JEMS) published an article that examined data from 200 of the nation's largest cities. In this study, the average *rate across all cardiac arrest patients* for arriving at the hospital with ROSC was 20.3%. In Pinellas County for this contract year, our **overall** sustained ROSC to hospital rate was 37%.

Via OMD, Pinellas County EMS is participating in a multicenter research study examining both ROSC and discharge data for SCA patients treated utilizing protocols that reflect the latest American Heart Association Guidelines, including "new" CPR and the Impedence Threshold Device.

OMD also tracks the physical location of SCA events; this data may assist in designing a number of strategies to improve SCA survival in those areas. In Pinellas County, SCAs occurred in the following location distribution:

- 566 (59.5%) in the residential/private property setting.
- 74 (7.8%) in the commercial/business setting.
- 181 (19.0%) in the nursing home setting (varying from assisted living facilities to licensed, skilled nursing facilities).
- 125 (13.1%) in miscellaneous settings. (This would include such areas as a vehicle, street, golf course, mass gathering, churches, and public places not otherwise classified (NOC) in the data base).
- 5 (0.5%) unknown as of reporting.

IX. Survivor Follow-up Program

In August 2002, we started a new service designed to follow-up and survey each of our cardiac arrest survivors and/or the family members directly involved in their care. By using this information, we can learn more about the causative factors of the cardiac arrest and the benefits of pre-arrival medical instructions provided by EMS, as well as the family's involvement in the patient's care. We can also use this information to gauge how well our community physicians are educating and treating this group of high-risk patients once they are discharged from the hospital.

Research has already suggested that this group of survivors remains highly vulnerable (50% probability) to have a recurrence of SCA within the first twelve months after their initial collapse. Because of this risk, we believe that all survivors should be evaluated for possible placement of an implantable cardioverter-defibrillator (ICD). As part of our follow up program, we determine whether this evaluation has been made and encourage follow up with the patient's cardiologist if not. For those without ICD's who meet certain other selection criteria we also offer a free home Automated External Defibrillator (AED) for 13 months, to cover the survivor's most vulnerable time period. We arrange for CPR and AED training for the patient, their family, and others who may be in a position to aid the patient should they suffer another cardiac arrest. At the end of the 13 month period, the survivor is offered information on how to obtain their own AED should they wish to do so.

On the healing side, we know that cardiac patients who are offered psychosocial support have improved medical outcomes and measures of well being. We believe that connecting survivors, those at risk, families, and professionals will facilitate the emotional healing process. As a result, we now provide each of our survivors with information about the Cardiac Arrest Survivor Network (<http://www.suddencardiacarrest.org>) a local ICD support group and the ([Sudden Cardiac Arrest Foundation@mail.vresp.com](mailto:Sudden_Cardiac_Arrest_Foundation@mail.vresp.com)) a national association for cardiac arrest survivors. We believe our program will help our community survivors and their families to better understand and cope with surviving SCA. Most importantly, during this face to face meeting, we help facilitate and encourage the patient's family to learn CPR, which is, of course, taught free here at Sunstar.

On the partnership front, we continue our close partnership with the American Heart Association (AHA) and deliver heart healthy information to each of the survivors we meet. We can also expect enhanced partnerships with other allied healthcare providers to foster improvement in the survivor's longevity.

During the Contract Period, we made the following SCA follow ups:

Number of SCA survivors discharged home or to short term care	101
Number of OMD-AEDs placed in a survivor's home	1

X. Automated External Defibrillator (AED) Program

An automated external defibrillator (AED) is a device that can be used by non-medical personnel or others outside of the hospital to administer the same much-needed defibrillation treatment that EMS providers utilize to victims of sudden cardiac arrest before EMS's arrival. The AED is able to determine whether an irregular heartbeat is present, and will only administer a shock if defibrillation is necessary. It performs automatically with little action required from the bystander.

Many medical professional organizations are supporters of early defibrillation, including the American Red Cross, the American Heart Association, the American College of Emergency Physicians, and the National Association of EMS Physicians. The recognition of the importance of early defibrillation has resulted in the installation of defibrillators in many public places, such as airports, health clubs, sports venues, and the workplace. Unfortunately, 90 – 95% of SCA victims with a shockable rhythm may die because they didn't have quick access to this easy-to-administer lifesaving treatment. By making more people aware of sudden cardiac arrest and by improving access to AEDs, we can increase the survival rate for these people.

Today, the OMD registers and tracks the placement of each AED in Pinellas County. We customize the user notes placed in the 911-dispatch computer so each bystander calling 911 can be guided to the AED location and instructed in its use. During the Contract Period we registered **520** devices, bringing the total to **1,093** or a 105% percent increase from the last reporting period. The City of St. Petersburg Police Department placed 319 AEDs in police vehicles due to a grant they received. Additionally, the Baypines VA Healthcare System placed 50 AEDs on their campus and the Pinellas County school system added 25. The remaining registrations came from individual businesses, some private citizens and governmental buildings.

	Prior	2002	2003	2004	2005	2006	2007	2008
New AEDs Placed	145	112	99	109	58	54	19	520
% of total each year	13%	10%	9%	10%	5%	5%	2%	47%

XI. Acute Myocardial Infarction (AMI) Management

Understanding that "time is heart muscle," Pinellas County EMS continues to evolve in its ability to recognize and provide the most current treatment options to heart attack patients. These patients are classified as "STEMI patients", named for the "ST Elevation" electrocardiogram (ECG) changes typical of the acute myocardial infarction (AMI). Although "clot busters" (fibrinolytic) drugs have been available for years and have been shown to be effective, more recent research indicates that balloon angioplasty, or PTCA (Percutaneous Trans Coronary Angioplasty) can be even more effective in some patients. Hospitals that are capable of providing PTCA interventions are collectively known as PCI (Percutaneous Intervention) facilities. The concept of community STEMI Systems of Care has evolved over the last several years; these systems must include communication and cooperation between EMS and community hospitals. We are proud to say that Pinellas County has had an established but evolving STEMI System since 2002.

In calendar year 2008, the STEMI System maintained the same PCI facilities as in 2007. Those facilities are: Helen Ellis Hospital, Mease Countryside Hospital, Morton Plant Mease Hospital, Largo Medical Center, Northside Hospital and Tampa Bay Heart Institute, St. Anthony's Hospital, and Bayfront Medical Center. (All Children's Hospital is also a PCI facility, but EMS does not transport 9-1-1 patients directly to ACH.) Thanks to these facilities, no STEMI patients required transport out of Pinellas County in 2008.

STEMI Patient Transportation to PCI Facilities

OLMC continues with a mandatory consultation protocol for all STEMI patients in order to determine most appropriate destinations, assist patients in making those decisions, and track STEMI patient information as completely as possible. The Medical Control Board has endorsed the concept of transporting STEMI patients to PCI facilities; therefore, we monitor both compliance with the consultation protocol and STEMI patient destinations, with the goal of presenting all appropriate patients with the opportunity to be transported to a PCI facility. At the same time, we need to avoid needlessly flooding the existing PCI facilities with patients who do not meet the STEMI triage criteria in order to avoid overloading those scarce resources.

One of the key performance indicators that OMD has monitored since the inception of the STEMI Patient Triage System is the percentage of reported STEMI patients who were transported to PCI facilities. As illustrated by the table below, total STEMI patient numbers continue to increase and we continue to do an excellent job in referring STEMI patients to appropriate facilities. We do not expect this number to increase much further due to the fact that there will always be patients who are too unstable to tolerate transport to a PCI facility, who make an informed decision not to be transported to PCI facilities and patients whose STEMI findings do not develop until too late to divert to a PCI facility. We will, however, continue to monitor these statistics for patterns which may indicate a need for protocol change or remediation in individual cases.

STEMI Patient Transports to PCI Facilities

	2008	2007	2006	2005
Total STEMI patients	595	589	529	543
Percent transported to PCI facilities	99.5%	99.0%	98.9%	96.7%

STEMI Patient Distribution by Hospital

The distribution of STEMI patients for 2008 was as follows (EMS PCI facilities are designated via shading):

STEMI Patient Destinations	Total STEMI for 2008	2008 % of total STEMI	2007 % of total STEMI	2006 % of total STEMI	2005 % of total STEMI
All Children's Hospital	1	0.2%	0%	0.2%	0%
Bayfront Medical Center (BMC)	83	13.9%	13.4%	14.0%	20.8%
Bayonet Point (BPT)	0	0%	0%	0.2%	1.1%
Bay Pines VA (BPVA)	0	0%	0%	0%	0%
Edward White (EWH)	0	0%	0%	0%	0%
Helen Ellis (HEH) (Dec '05)	30	5.0%	9.3%	10.2%	0.7%
Helen Ellis (HEH) Non-PCI	N/A	N/A	N/A	N/A	0.2%
Largo Medical Center (LMC)	124	20.8%	16.6%	20.8%	19.7%
Mease Countryside (MCS) (Sep '07)	98	16.5%	7.3%	N/A	N/A
Mease Countryside (MCS) Non-PCI	N/A	N/A	0.5%	0.4%	1.1%
Mease Dunedin (MDU)	1	0.2%	0.2%	0%	0.6%
Morton Plant (MPH)*	83	13.9%	24.6%	26.0%	32.2%
Northside (NSH)*	139	23.4%	21.7%	21.1%	21.7%
Palms of Pasadena (POP)	2	0.3%	0.2%	0.6%	0.4%
St. Petersburg General (SPG)	0	0%	0.2%	0%	0%
St. Anthony's (STA) Non-PCI	N/A	N/A	N/A	0%	0.6%
St. Anthony's (STA) PCI * (Feb '06)	34	5.7%	5.9%	6.1%	N/A
St. Joseph's (STJ)*	0	0%	0%	0.6%	0.4%
Sun Coast (SUN)	0	0%	0%	0.2%	0.2%
Unknown (UNK)	0	0%	0%	0%	0.4%
TOTAL	595				

Note that there has been significant shifting in the distribution pattern, with Morton Plant Mease Hospital, Mease Countryside Hospital and Helen Ellis Hospital being most affected. Until calendar year 2006, Morton Plant was the sole PCI facility serving north Pinellas County. Since then, Helen Ellis (first full year 2006) and Mease Countryside (first full year 2008) have added PCI capability, dropping Morton Plant Mease from first to fourth in terms of both percentage and actual count of STEMI patients received. Northside now ranks first in both measures. Please note that OMD has NO indication that these shifts are related to quality of care at the various facilities; we believe that the primary factor is the increase in PCI capacity in north county.

STEMI Patient Outcomes

Of course, the entire concept of a STEMI system is to transport patients to the most clinically appropriate facility, i.e., a PCI facility. Without outcome information, the true effectiveness of the system is not interpretable. In 2008, our Medical Communications Officers (MCO's) were successful in achieving at least limited follow up on 90.6% of STEMI patients. This information represents the status of the patient at the time of a follow up telephone call from the MCO to the receiving facility, generally between 60 and 120 minutes after arrival at the hospital, not definitive information about every patient's disposition from the ED. We believe that the slight decline in MCO follow up primarily relates to the continually increasing MCO workload. It is our goal to eliminate this particular MCO duty when we have full data sharing processes in place via the efforts of the STEMI Work Group.

Patient Outcome Where at Least Partial Information is Available

	2008	2007	2006	2005
Percentage of patients with follow up	90.6%	93.9%	94%	88.0%
Where disposition known:				
% to cath	42.3%	48.8%	45.7%	40.0%
% admitted	32.1%	33.1%	31.0%	33.1%
% in ED but Alert cancelled (new info for 2008)	9.5%			
% still in ED, final unknown	10.8%	14.1%	19.3%	23.2%
% discharged	3.2%	2.4%	2.2%	1.7%
% expired	1.9%	1.1%	1.4%	1.1%
% transferred	0.4%	0.5%	0.4%	0.8%

The table above reflects fluctuations in proportions of STEMI Alert patients being taken to the cath lab. We believe that the reason for these fluctuations is multifactorial. The decline in 2008 may not be related to decreased STEMI patient selection for cath at the hospitals; with incomplete followup, it may not be valid to assume that the fluctuations are anything other than statistical. Also, because the follow up call was sometimes placed in less than 90 minutes, it is possible that some patients who were shown as in the ED at the time of the call actually did go to the cath lab afterward, but still within the 90 minute target door to reperfusion time. There are no national standards regarding what percentage of our STEMI Alert patients should be receiving emergent PCI, but we feel that the current figures are reasonable considering that the decision to take a patient to the cath lab is multifactorial and involves information that is often not available to EMS personnel.

OMD staff continues to attempt to obtain follow up via hospital Medical Records Departments for the remaining patients and more specific ED dispositions for patients who were still in the ED at the time of the follow up.

Other STEMI System Related Activity

- In August of 2008, Sunstar began transmitting STEMI patient 12 lead ECG's to Mease Countryside, Morton Plant Mease, and St. Anthony's. As of the time of this report, several other hospitals are in the process of acquiring receiving capability as well. OMD has supported Sunstar's QA activity regarding implementation of this process by furnishing daily lists of STEMI Registry calls for individual follow up.
- The STEMI Work Group has been reestablished and is actively working on establishing on-going data sharing relationships. The group has also worked to set up and troubleshoot the new 12 lead ECG transmission program. All PCI facilities are now submitting quarterly Key Performance Indicator (KPI) data to OMD to help us to assure that they are maintaining compliance with national performance standards. Meeting minutes and KPI data are posted on the OMD website.
- OMD continues to participate as requested in various hospital accreditation activities
- Dr. Romig has been asked by the American Heart Association to serve as a local media spokesperson on an on-going basis on cardiac issues and to present Get With the Guidelines recognition awards for stroke and STEMI patient care to local hospitals.
- Dr. Romig is also participating in on-going activities with the American Heart Association such as Mission Lifeline and draft legislation that seeks to officially require the establishment of STEMI Systems of Care throughout the state.

XII. Care of the Injured

A. Statistics

Trauma is a major cause of death and disability in our society. It also remains a major health problem right here in Pinellas County. Our community, like other large metropolitan areas, is not immune to its high cost and long-term effects. Therefore, a better understanding of the causes, treatments, and outcomes of these events is necessary. Today, we track 165 fields of information, including subcategories of information that may be selected in "pull down" fields. Ideally, our goal would be to study information on all types of traumatic injury of any severity; however, because of the resources necessary to undertake such a large study we have elected to *exclude* patients with:

- Less severe and isolated injury (for example, a fractured hip)
- Other specific, non-life threatening injuries (minor fractures, cuts and bruises)
- Scene fatalities in which no resuscitation is attempted by EMS

This is not to say that these types of injuries are any less important to us; however, according to Florida law, they are not serious enough to warrant trauma center activation, nor are they *urgently* time critical like other serious trauma. Our concentration continues to rest on trauma patients for whom critical decision-making and the urgent delivery of care will make a difference in their survival. Patients included in the following data and analyses meet one or more of the following criteria:

- Each patient who meets the State of Florida *Trauma Alert* criteria by established definition.
- Each injured patient who is transported using rotor-wing aircraft to a trauma center.

Overall, 911 patients met our research definition for the trauma patient. Of these, 889 (or 97.6%) were declared Trauma Alerts, requiring activation of the Trauma Center staff.

	2005	2006	2007	2008
Trauma Alerts plus other air transport trauma patients	1,212 (+4.8%)	1,013 (-16.5%)	1,072 (+5.8%)	911 (-15.0%)
Trauma Alerts	1,071 (+10.0%)	974 (-8.1%)	1,044 (+7.2%)	889 (-14.8%)

Analysis of this data yields the following information

- The most prevalent cause of serious injury (Trauma Alerts plus other air transport patients) transported to a Trauma Center is a Motor Vehicle Crash (MVC), accounting for 335 or 36.8% of the 911 serious traumas. This is a 19.7 % decrease from the 417 reported last Contract Period.
- The second most prevalent cause of serious injury is a Fall, accounting for 170 or 18.6% of 911 serious traumas. This is a 17.5 % decrease from the 206 falls reported last year
- Of the 901 transports to all area hospitals (10 patients either died on scene or refused transport), 880 (or 97.7%) were classified as a “Trauma Alert” patient.
- The most prevalent cause of injury for “Trauma Alert” patients was also a Motor Vehicle Crash, accounting for 329 patients, or 37% of all Trauma Alerts. This is an 18.4% decrease from the 403 reported last Contract Period.
- A total of 235 rotor-wing requests were made from the field, with 37 (15.7%) being canceled. Of this total, 185 (78.7%) were for patients meeting Trauma Alert criteria. In addition, rotor wing "requests" have decreased from 314 in the prior Contract Period to 235, a decrease of 25.2%. We are continuing to monitor our system for appropriate use of this costly and potentially risky mode of transport. We have found our clinicians to be quite responsive to refresher training regarding the critical decision making required to determine if air transport is indicated.

Flight Statistics by Counts:

	2005	2006 %Chg	2007 %Chg	2008 %Chg
Rotor Wing Flights - Total	441	293 (-33.6%)	270 (-7.9%)	198 (-26.7%)
Trauma Alert by Helo	314	257 (-18.2%)	247 (-3.9%)	185 (-25.1%)
Non-Trauma Alert by Helo	127	36 (-71.7%)	23 (-36.1%)	13 (-43.5%)
Rotor Wing Requests	497	330 (-33.6%)	314 (-4.8%)	235 (-25.2%)
Rotor Wing Canceled	56	37 (-33.9%)	44 (18.9%)	37 (-15.9%)

- A breakdown by individual rotor wing aircraft reveals: 98 (49.5%) by Bayflite 1; 4 (2.0%) by Bayflite 2; 92 (46.5%) by Bayflite 3; 2 (1.0%) by Bayflite 4; 2 (1.0%) by Aeromed 1.

- A total of 176 (88.9%) of the air transport patients were transported to Bayfront Medical Center Hospital; 12 (6.1%) went to St. Joseph's Hospital and 7 (3.5%) to Tampa General Hospital. 3 (1.5%) patients were taken to All Children's Hospital.
- Of patients transported by air to Bayfront Medical Center, 11.4% were discharged from the Emergency Department. This represents a decrease from 15.7% in the previous Fiscal Year. While it would seem that we would want to minimize this figure, national standards recognize a need for over-triage rates between 15 and 20 % in order to avoid missing significantly injured patients. We are actively seeking input from the Trauma Centers regarding possible under-triage to air transport.
- Similarly, for Trauma Alert patients taken to Bayfront via all transport methods, 16.3% of these patients were discharged from the Emergency Department.
- An overall total of 738 (81.0%) of our trauma patients were transported to Bayfront Medical Center by air or ground. 80 (8.8%) of the patients were taken to St. Joseph's Hospital and 31 (3.4%) were taken to Tampa General. 52 (5.8%) were transported to various other facilities due to the patient's critical nature, instability, OLMC approved trauma transport exception, and/or informed patient choice.
- On the average, patients who met Trauma Alert Criteria and were transported by ground reached the Trauma Center (Bayfront) in 41 minutes from the *estimated* time of injury compared to 40 minutes last year. This excludes prolonged extrication and staging situations.
- On the average, patients who met Trauma Alert Criteria and were transported by air reached the Trauma Center (Bayfront) in 50 minutes from the *estimated* time of injury compared to 50 minutes last year. This excludes prolonged extrication and staging situations.
- Trauma Alert patients delivered to Bayfront Medical Center, our main Trauma Center, arrived there before the conclusion of the Golden Hour 91% of the time compared to 93% last year. The first hour following the estimated time of injury is recognized as a crucial window of time for appropriate interventions to take place in order to ensure the best possible long-term outcome for the critical trauma patient. (Prolonged extrication and staging situations were not included in figuring this statistic.)
- The most prevalent months for serious injury were: April, 85 (9.3%); July, 85 (9.3%); and June, 83 (9.1%), with an average of 76 incidents per month.
- According to our data, the highest incidence of severe trauma occurs between the ages of 21-30 (177) and 41-50 (172), followed by 31-40 (127) and 11-20 (121). The 11-50 year age group accounts for 65.5% of all serious traumas, compared to 62.6% last year.
- The areas that generated the largest portions of the 911 serious trauma calls this year include:
 - St. Petersburg: 238 (26%), compared to 294 (27%) last report
 - Clearwater: 127 (14%), compared to 131 (12%) last report
 - Pinellas Park: 100 (11%), compared to 95 (9%) last report
 - Largo: 80 (9%), compared to 126 (12%) last report
 - Lealman: 61 (7%), compared to 60 (6%) last report
 - Palm Harbor Fire District: 55 (6%), compared to 63 (6%) last report

- Seminole: 54 (6%), compared to 64 (6%) last report
- Dunedin: 30 (3%), compared to 46 (4%) last report

These eight communities shared 81 % of the seriously injured patients transported by EMS.

B. Water Related (Submersion) Injuries

The following standardized definitions were utilized in analysis of submersion injuries:

- Drowning: Submersion in a fluid medium (usually water) that results in the victim's death within 24 hours of the submersion incident.
- Near-Drowning: Submersion incident in which the victim survives for at least 24 hours, irrespective of whether they subsequently survive or die from complications related to the submersion incident. Although some experts discourage use of the term "secondary drowning," it is sometimes used to describe near-drowning cases that ultimately result in death from delayed complications related to the submersion incident.
- Pediatric: A patient with anatomical and physical characteristic of someone 15 years of age or younger.

Our summary of information excludes drowning related to suicide, which accounted for 26 incidents from 1995 through September 30, 2008.

Nationally:

- Drowning was the second leading cause of injury-related death for children (aged 1 through 14 years), accounting for 940 deaths in 1998.¹
- In 1998, 4,406 people drowned, including 1,003 children younger than 15 years old.¹

Where do childhood drownings occur most often? Most children drown in swimming pools. According to the U.S. Consumer Product Safety Commission (CPSC), emergency departments reported between 60-90% of drownings among children aged 0-4 years occur in residential pools; more than half of these occur at the child's own home. For in-ground pools, 60% fewer drownings occur when four-sided fencing is in place.²

In Florida:

According to the Department of Health, drowning takes the lives of approximately 426 people each year.

Drowning is the leading cause of death for young children in Florida, with 547 children ages zero to four years drowning in Florida between 1995 and 2001. Of these children, 314 drowned in their home swimming pools; 233 drowned in a variety of other sources of water. Unfortunately, for these children, most of them will become unconscious within two minutes of submersion. Approximately 92 percent of the children who survive a near drowning are found within this two-minute period.³

In Pinellas County:

Between October 1, 1995 and September 30, 2008, an average of 60 persons each year experienced a submersion related accident here in Pinellas County. During this same time, an average of 15 persons drowned each year. The overall rate of submersion incidents hit a high of 76 in 1998/1999 and a low of 49 in 2006/2007. The overall number of drowning deaths ranges from a low of 10 in 2000/2001 to a high of 30 in 1998/1999. This year the overall number of deaths from drowning continues to remain high, as we experienced 19 deaths this reporting period.

The highest number of submersions occurred among toddlers from birth to five (5) years old. This age group has accounted for 265 incidents, or 33.8% of the submersion incidents in Pinellas County over the last 13 years.

Compiling our surveillance data over the last thirteen years presents a clearer epidemiological understanding of this problem in the Pinellas County area. The numbers of submersions begin to increase during the month of April, peaking in the month of June. They begin to decrease after June and taper off by the end of September.

The high frequency of activity in the summer suggests that climate is a causative factor in the accident. Discomfort caused by summer heat probably leads to swimming in undesignated areas and in public and private pools. Circumstances of drowning and the profile of a person who has drowned vary by age, race, and sex. For instance, swimming pools have been shown to present the greatest aquatic hazard for toddlers.

From the period of October 1, 1995 through September 30, 2008, Pinellas County experienced 790 submersion-related incidents (excludes suicides).

Submersion Related Incidents by Fiscal Year:

Fiscal Year	Total #	% of Total	# of Adults	% of Year #	# of Children	% of Year #	Unknown Age	% of Year #
1996	60	7.6%	26	43.3%	34	56.7%	0	0%
1997	73	9.2%	31	42.5%	42	57.5%	0	0%
1998	67	8.5%	35	52.2%	32	47.8%	0	0%
1999	76	9.6%	46	60.5%	30	39.5%	0	0%
2000	73	9.2%	40	54.8%	33	45.2%	0	0%
2001	56	7.1%	29	51.8%	26	46.4%	1	1.8%
2002	51	6.5%	28	54.9%	21	41.2%	2	3.9%
2003	50	6.3%	29	58.0%	18	36.0%	3	6.0%
2004	65	8.2%	34	52.3%	28	43.1%	3	4.6%
2005	55	7.0%	35	63.6%	20	36.4%	0	0%
2006	57	7.2%	31	54.4%	26	45.6%	0	0%
2007	49	6.2%	28	57.1%	21	42.9%	0	0%
2008	58	7.3%	33	56.9%	25	43.1%	0	0%
Total	790		425	53.8%	356	45.1%	9	1.1%

Submersion Related Deaths (Drowning and Near Drowning) by Fiscal Year:

Fiscal Year	Submersion Type	# of Adults	# of Children	# of Unknown	Total
1996	Drowning	14	3	0	17
	Near Drowning	1	1	0	2
	Total	15	4	0	19
1997	Drowning	11	4	0	15
	Near Drowning	1	1	0	2
	Total	12	5	0	17
1998	Drowning	12	2	0	14
	Near Drowning	0	0	0	0
	Total	12	2	0	14
1999	Drowning	22	4	0	26
	Near Drowning	2	2	0	4
	Total	24	6	0	30
2000	Drowning	18	4	0	22
	Near Drowning	1	2	0	3
	Total	19	6	0	25
2001	Drowning	8	1	0	9
	Near Drowning	1	0	0	1
	Total	9	1	0	10
2002	Drowning	8	0	2	10
	Near Drowning	7	2	0	9
	Total	15	2	2	19
2003	Drowning	10	0	1	11
	Near Drowning	7	4	2	13
	Total	17	4	3	24
2004	Drowning	13	2	2	17
	Near Drowning	10	0	1	11
	Total	23	2	3	28
2005	Drowning	10	3	0	13
	Near Drowning	5	0	0	5
	Total	15	3	0	18
2006	Drowning	5	2	0	7
	Near Drowning	9	1	0	10
	Total	14	3	0	17
2007	Drowning	6	2	0	8
	Near Drowning	9	3	0	12
	Total	15	5	0	20

2008	Drowning	10	1	0	11
	Near Drowning	8	0	0	8
	Total	18	1	0	19
Total		208	44	8	260

XIII. Intubation

Endotracheal intubation provides definitive airway management for patients experiencing severe respiratory distress or cessation of breathing. The patient's trachea (windpipe) is "intubated" with a plastic tube, which keeps the airway open, protects it from obstruction and aspiration of stomach contents, blood and other foreign bodies, and ensures delivery of a high concentration of oxygen. The decline in intubations for this Contract Year may at least in part be due to the implementation in April 2008 of Continuous Positive Airway Pressure (CPAP) therapy and other protocol changes for patients in congestive heart failure (CHF). This therapy is often so effective in treating CHF patients that we can prevent them from requiring intubation. The Pinellas County EMS system remains "state of the art" in comparison to other nationally recognized EMS systems due to the development and use of specific quality monitoring and management tools, aggressive protocols, on-going continuing medical education and remediation programs.

Fiscal Year	Intubations
1998	1,460
1999	1,554
2000	1,520
2001	1,270
2002	1,209
2003	1,176
2004	1,177
2005	1,209
2006	1,328
2007	1,310
2008	1,187

The Medical Communications Officer (MCO) tracks and follows up on each patient intubated within the EMS system. We receive tube confirmation and outcome information from each of our 15 hospitals in "real time", allowing our staff to take immediate action if a problem is identified. We are happy to report that we continue to have great success in this area of care.

XIV. Equipment and Supplies

A. Tracking equipment and supply problems.

We have developed a functional framework for gaining feedback from system personnel regarding equipment performance. The MCO serves as the avenue of communication directly between the OMD and the field clinician. The MCO uses a computerized

equipment-tracking program that documents the necessary information for later review and decision-making. When we encounter problems with system medication(s) or equipment, we immediately communicate our action plan with system managers and those in areas of responsibility. This is usually done through the Internet and other means of sharing information. This investigation process has led to a number of reports to the Food and Drug Administration (FDA) and has even triggered manufacturing changes that affect all users of affected products.

B. The OMD Web Site (Medcontrol.com)

Today, we believe that quicker, more efficient ways of communicating with our healthcare team are critically important. Rapid access to information, business forms, statistics, and clinical guidelines makes our job easier. Having a better informed and more knowledgeable work force improves patient care, limits risk to the system and contributes to career longevity. For this reason, OMD maintains a website at www.medcontrol.com. The site was recently re-organized and we remain continually vigilant to make adjustments and improvements after receiving feedback from our constituents. Links and downloadable documents are contained in either the Public or Member libraries along with various sources of local system information including:

- The most up-to-date equipment inspection lists for ALS and BLS vehicles
- Various other system forms, including equipment malfunction reports, paramedic and EMT certification applications, and the Submersion Post Event Survey forms.
- Minutes from various system stakeholder meetings, including the Equipment Committee, the Medical Control Board and the Nurse Managers' Group.
- Applicable Rules and Regulations and Ordinances.
- The most up-to-date Medical Operations Manual (MOM), with quarterly updates, is posted for system review and download, including a Palm based version.
- A *real-time* display of our local Emergency Department (ED) statuses including the internal status of *critical life saving* resources. The information is used to assist the EMS system in *determining the most appropriate* hospital for transportation of our patients.
- A *real-time* display of all ambulances inbound/arrived at each hospital is now monitored and available for viewing. This information tracks the total time on task for each individual ambulance at each hospital. The information assists decision-makers in monitoring individual hospital *drop-time* performance. Similar to the flight status screen at a local airport, the display allows the hospital staff to see what units are inbound and to prioritize bed space and staffing to accommodate these units. Today, these tools add a layer of communication between the EMS system and our hospital emergency departments that has not been experienced before. Some of our area Nurse manager's provided these comments:
 - "We love the screen and live by it!"
 - "We hold our folks accountable for ambulance bed delays. As a manager, this information allows me to see our status at anytime and to prioritize patient placement."
 - "I have this information available on my cell phone and routinely check our status and who is delayed."

- The posting of all critical office memos and other directives used in the clinical management of the EMS system
- Calendars for system Continuing Medical Education (CME) offerings as well as on-line copies of CME curricula
- Serving as the central access point for all EMS system managers to query, track and monitor agency CME compliance.
- Articles supporting system protocols or considered by the Medical Director to be useful in enhancing clinical knowledge.

Web Server Statistics for Medcontrol.com:

We always had some belief that both our EMS system and outsiders found some value in our site; however, now we can let statistics speak for us in terms of web activity. This Monthly Report identifies activity for each month in the report time frame. Each page query can result in several server requests as the images for each page are loaded. Depending on the report time frame, the first and last months may not represent a complete month's worth of data, resulting in lower queries.



Month	Number of requests
1. March 2009	574,302
2. February 2009	790,939
3. January 2009	1,090,713
4. December 2008	148,490

The most active month was January 2009 with **over a million requests handled**. This may at least partly be due to requests for download of the electronic version of the 2009 MOM manual. The monthly average is: **651,111 requests**.

C. Substantial Equipment Changes During Fiscal Year 2007/2008

- Due to a supply disruption, backorders and severe shortages of the **Lancet** (a sharp instrument used to obtain a diabetic's blood sample) the OMD facilitated an evaluation to determine a replacement strategy. Because the product falls under the Federal Needlestick Safety and Prevention Act as a "Sharps Device", a very systematic process was required. End-user clinicians heard presentations by manufacturer's representatives on a number of available blood sampling products, had an opportunity to have questions answered, and physically handled the devices. In total, the evaluation took eight hours and the group reached consensus on a recommendation. The group's recommendation was accepted by the County, not only assuring on-going supply, but also yielding a significant cost savings for the system. The OMD developed a PowerPoint presentation which was distributed to the system as part of the implementation plan.
- Due to a manufacturing decision to discontinue the "prefilled" syringe formulation of **Amiodarone** (a cardiac anti-arrhythmic medication) carried by the EMS system, the OMD conducted extensive research to find a replacement. The prefilled syringe allowed for rapid administration without excessive drug handling, a distinct advantage in emergent situations. Unfortunately, the investigation determined that only "vial" format drug is now available, requiring more time and manipulation prior to administration. Although this is not the best format for EMS, it was our only option. Fortunately, the change did yield a significant cost savings for the system. The OMD developed a PowerPoint presentation, which was distributed to the system as part of the implementation plan.
- The office made a recommendation to remove the **sterile burn sheets** for the out of hospital care of the burn patient. This decision was based on national standards of care contained in the International Trauma Life Support Course and from the Advanced Burn Life Support Course. Our partners at the Tampa General Hospital Burn Unit also supported this decision. The removal of this product yielded a cost saving for the system.
- One function of OMD is to file reports with manufacturers and the Food and Drug Administration when medical devices fail. During this contract period, OMD was made aware of a long spine board (a device used to immobilize patients with possible head and neck injuries) that broke under normal conditions of use. Such a malfunction could result in injury to both the patient and EMS personnel. This incident was reported to the manufacturer and the FDA and the board was returned to the manufacturer. The long spine board was under warranty and was replaced by the manufacturer.
- Based upon our examination of OMD data in the course of regular reevaluations, we made the recommendation to remove **Neo-Synephrine** (a drug used to assist the paramedic in performing a nasotracheal intubation). Due to low system use, high cost and a significant decrease of emphasis of nasotracheal intubation, the medication was removed, yielding a cost saving for the system.
- Based upon an examination of system data and product use in the course of regular reevaluations, we recommended the removal of the disposable **emergency survival blankets** from the system. Because the system has other methods to provide warmth to the patient, it was determined this blanket was unnecessary. The removal yielded a cost saving for the system.

- Based upon an examination of system data in the course of routine reevaluations, we made the recommendation to remove the **Benzoin Swab** (the swab contains a substance which dries rapidly and creates a sticky surface on the skin to increase the adherence of ECG electrodes or tape to the skin). This product was used very infrequently; its removal yielded a cost saving for the system.
- Our current spinal motion restriction products were reevaluated taking into consideration the required logistics and risk involved. In particular, the reusable head pad and head pillows were difficult to decontaminate reliably, were very vulnerable to nicks and cuts which contributed to possible injection control problems, required frequent replacement and were very expensive. Hospital staff also tended frequently to throw these reusable items away. Due to all of these considerations, we researched, assisted with field testing, and recommended the use of a disposable style head immobilizer. The new disposable device was approved, yielding a cost saving for the system and assisting with potential patient and worker safety and liability issues.
- In order to comply with the Florida Department of Health Rule 64J, we recommended the addition of an Infant/Neonatal version of the “End-Tidal CO2” Filterline set. This equipment is utilized to confirm the placement of an endotracheal tube that has been placed into the airway/trachea of an infant/neonatal patient.
- We assisted in the evaluation and made the recommendation that all system EMS units carry a disposable patient mover. This mover is capable of supporting a patient weighing 1500 lbs and has multiple handles, allowing a larger number of personnel the ability to assist with the lift. Previously, first responder units had to request a similar product from a Sunstar unit, requiring first responders to sometimes delay aspects of patient care. The device also has potential to help reduce back injury to system personnel.
- We assisted in the evaluation of and made the recommendation to implement the EZ-IO for adult and pediatric patients. It allows the paramedics to obtain immediate access to the patient’s vascular system through their leg bone. With the American Heart Association’s determination that drug delivery through the endotracheal tube during a cardiac arrest is not effective, the importance of this type of vascular access capability has increased significantly and extended to use in adults rather than primarily pediatric patients. The previous intraosseous access equipment was very difficult to use in adults.
- Due to the implementation of the EZIO, the following items were removed from the system:
 - Jamshidi 18g Intraosseous Needle
 - Madette (Mucosal Atomization Device for the endotracheal tube)
 - Port Access Kit

XV. Additional Projects and Commitments

- A. Medical Operations Manual (MOM):** The Medical Director, through the OMD, takes personal responsibility and accountability for the care provided to the sick and injured. Because of this commitment, we invest countless hours investigating new treatments and updating specific areas of care based upon our quality improvement activity and

constituent feedback. The Medical Director is committed to making protocol recommendations to the Pinellas County EMS Medical Control Board evidence-based, and provides appropriate rationale and references to the Board prior to their deliberations. The MOM is printed quarterly if additional updates are necessary and distributed to more than 900 personnel. We also make the information available through our web site (www.medcontrol.com) in both PDA and PC applications. Due to the document's scope and diversity, we now coordinate and host the MOM committee meetings. These meetings are a cooperative effort between OMD and the EMS agency administration, which includes field representatives. The objective of this committee has been to make the MOM more user-friendly while also maintaining a content level necessary for appropriate guidance and risk management strategy. As an initial step, the committee reduced the number of pages from 514 to 334 (180 pages). This maneuver saved 90,000 pages from being printed, ultimately saving costs, the environment, and providing the end user a more manageable resource. The Pinellas County MOM has been used as a model for EMS systems across the country.

- B. Medical Control Board (MCB):** The OMD staff serves as administrative adjunct and logistical support for the Pinellas County EMS Medical Control Board. The Board met three times during the Contract Period, reviewed and approved several major protocol changes and new treatment options and contributed to and monitored the process of adding a Free Standing Emergency Center to possible EMS transport destinations.
- C. Research and Publication:** Annually the OMD submits three (3) EMS related articles to major trade journals and periodicals and conducts one (1) research project, focusing on a particular aspect of the EMS System. The research project is submitted as an abstract to a major medical journal. During this contract period, OMD enrolled Pinellas County EMS in a major multicenter research study examining the effects of “new CPR” plus an Impedence Threshold Device (ITD) on sudden cardiac arrest patient outcome. Pinellas County submits the largest group of data of the seven EMS systems contributing. Several related papers have already been published and more are in various stages of development. We have a national reputation for our advanced care and high performance quality. Due to our funding and the commitment from the EMS Authority, we remain national leaders within our industry. We have a national reputation for our advanced care and high performance quality. Due to our funding and the commitment from the EMS Authority, we remain national leaders within our industry.
- D. Professional Liability and Risk Management:** Most importantly, the OMD provides a continuous buffer in protecting our EMS system from medicolegal insults. Today, the medical industry is in medicolegal turmoil. As a result, the OMD considers every move, action and conceptual consideration with an eye toward risk management while also considering the welfare of every patient. While no EMS system is risk free, our management style and the programs mentioned help protect our constituents and the EMS Authority from these large dollar expenses. The Executive Director is a licensed Health Care Risk Manager in the state of Florida and is nationally board certified in this sub-specialty.

- E. Community Partnerships:** The OMD has developed many partnerships throughout our tenure. These include our hospitals, public safety officials, public health officials, emergency management, the medical examiner, state officials, national EMS leaders, and local constituent groups that support improved care and/or education. Part of our commitment to these groups is the provision of data. We track and archive information that most EMS system would be unable to produce. We gladly commit our time to support each of these constituents. Our staff sits on many of our community boards, giving guidance and direction. In this contract year, OMD continued to communicate with law enforcement officials and organizations on issues including field blood alcohol draws, use of less than lethal force weapons (such as Tasers), and Incapacitated Persons and Baker Act statutes.
- F. Continuing Medical Education:** The Medical Director has been extremely involved in not only determining the needed content for CME for system clinicians, but also researching, writing, and reviewing curricula, providing feedback to and even teaching Train-the-Trainer sessions. The OMD continues to work with St. Pete College, the CME Task Force, and the CME Steering Committee on developing some of the finest CME within the industry. The OMD has also increased the feedback provided to clinicians through CME in the areas of aggregate STEMI patient and cardiac arrest management data.
- G. Other Teaching and National EMS Activities:** The Medical Director lectures frequently at local, regional, and national EMS conferences, including the Virginia State EMS Conference, ClinCon, the Critical Care Transport Medicine Conference, the Air Medical Transport Conference, and others. She also serves as content reviewer for several EMS textbook and on-line CME publishers. Her national involvement as a Board of Trustees member with the Air Medical Physician Association and other related activities supplements and compliments her activities within Pinellas County. Dr. Romig has begun this contract period to work more closely with the Great Southeast Affiliate of the American Heart Association to serve as a standby media spokesperson, to participate in the delivery of Get With the Guidelines Stroke and Cardiac Care Achievement Awards to local hospitals, and to enhance the Affiliate's understanding of EMS issues. She was instrumental in providing feedback to the Affiliate regarding its attempts to pass legislation regarding STEMI systems of care. Dr. Romig was recognized in July 2005 with the 2005 Raymond A. Alexander Florida EMS Medical Director of the Year Award for her work at the Office of the Medical Director and other EMS activities within the state.

The Executive Director of the organization has served on the American Heart Associations Executive Database Steering Committee. This committee represented the entire Heart Association and not just local affiliates or councils. He has also served as the vice-chairman for the State of Florida, EMS Quality Managers Association and has become the expert in the field for teaching and mentoring other EMS systems in the use of the Utstein Template, an international consensus document for sudden cardiac arrest survival. In 2006, he was appointed (and still remains active) as a data committee member for the National EMS Information System (NEMESIS) for the state of Florida

now referred to as EMSTARS (www.floridaemstars.com). He was also appointed by the American College of Emergency Physicians (ACEP) EMS section for their Ad-Hoc AED Placement sub-committee. In 2006, he received the State of Florida Bureau of EMS, Larry S. Jordan Lifetime Achievement Award. In 2008, he was appointed by the State Surgeon General as a subject matter expert to the Emergency Medical Review Committee (EMRC). The EMRC provides a mechanism for statewide and national EMS data analysis for the purpose of statewide quality improvement and research. This includes the identification of EMS best practices, performance benchmarks and a peer-networking platform. His term will be no longer than four years (<http://www.doh.state.fl.us/demo/ems/emrc.html>).

H. System Accreditations: Dr. Romig continues to serve as a site reviewer for the Commission on Accreditation of Ambulance Services (CAAS).

Resources:

1. National Center for Health Statistics (NCHS). National Mortality Data, 1998. Hyattsville (MD): NCHS 2000.
2. US Coast Guard Boating Statistics, 1992. Washington, DC: US Department of Transportation (COMDTPUB P16754.8).
3. National SAFE KIDS Campaign, 1998.