

EMS - The Community's Homeostatic Mechanism

By Michael Wallace - Division Chief of Professional Standards for Largo Fire Rescue

Since the inception of EMS, our goal has not always been clearly defined. We have suffered through many changes in protocols by physicians, changes in perceptions by both politicians and the public as well as changes in portrayal by the media. Our profession is considered to be among the most respected of all fields by the public. Still, I am not sure that we always have a clear understanding of our own mission.

For all of our patients in distress, our mission is to support existing physiologic systems or to temporarily replace those systems that have failed. We continue this support until we deliver the patient to the emergency department. Consider this, anyone having a true medical emergency is suffering from shock. Shock is defined as inadequate perfusion of oxygen at the cellular level to maintain functionality. If the patient is having trouble breathing or ischemic chest pain, it is a form of shock. If the chief complaint is ischemic chest pain, we provide supplemental oxygen. Coronary arteries are dilated with medication, and therefore oxygen delivery to the cells is improved. If the complaint is dyspnea, we increase the percentage of circulating oxygen molecules in the patient's blood and possibly make the airway more patent by dilating the bronchial tree or reducing inflammation. Almost all symptoms of our patients in distress can be attributed to shock. Our mission is to treat all forms of shock. The EMS system is comparable to the endocrine system, which increases insulin circulating in the blood stream in response to a blood sugar imbalance. EMS response can be compared to the body's response to cold that produces heat-generating shivers, or heat that produces sweat for evaporation and cooling. We are not unlike the increase in respirations and heart rate that occurs when exercise increases the demand for oxygen.

Homeostasis: The body's mechanism, which allows our systems to maintain a narrow comfort zone. Blood sugar, temperature, pH, oxygen and CO₂ levels, all must be maintained within a narrow range of acceptable values. The body adjusts internal responses to maintain certain levels of sugar, heat, and oxygen.

EMS is very much the homeostatic mechanism for society. As part of the bigger picture, we provide a rapid response to an out of control situation. We provide some of the most sophisticated, technologically advanced systems in the world to return a situation back to normal. We arrive every time, without exception, more than 100,000 times a year or more than a million times since I started my career in EMS here in Pinellas County. Not unlike Federal Express, not only do we absolutely, positively get there, we can tell you in what direction the transport unit is heading and how fast they are traveling. Not even Fedex can do that.

The point of this writing is that we are not just service to society. We are society's homeostatic mechanism. When something goes awry in our community, we are called upon to get things back to normal. Our job is to make sure that things don't get too far out of kilter and to return them to normal if they do. We are the homeostatic mechanism that keeps society well.

VISIT OMD's WEBSITE at www.medcontrol.com

The Office of the Medical Director is continuing to update and provide clinical information to the healthcare team through the Internet. We encourage each clinician and administrator who has access to the Internet to join us in this endeavor by filling out a simple user application found on the "Members" page on the site.

The information and the data posted in this area will not be available to individuals outside the EMS system. So far, the information posted has proven quite beneficial to providers and individual clinicians. Please join the other **255 members!**

Information posted so far:

- The most up to date equipment inspection forms used within the EMS system
- Various operational forms

Today's EMS

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We continue to have many ideas for this area; please continue to give us your comments and feedback. Email us at cyberomd@aol.com and let us know what you'd like to see on our site.

Epinephrine dosing in Sudden Cardiac Arrest (SCA) Patrick Shepler, Clearwater Fire Department

In 1994, the OMD submitted an Abstract to the National Association of EMS Physicians relative to the dosing of Epinephrine during Sudden Cardiac Arrest (SCA). Because the EMS system is currently in the middle of learning new advances in the treatment of SCA, it is important to review this abstract and the essence of managing time-critical events. The following is a reprint of this abstract:

Analysis of compliance with a prehospital Epinephrine dosage regimen

Objective: Compliance with drug dosage regimens is necessary to establish relationships between dosage and outcome. Investigation was made to determine if epinephrine was given as often and in amounts called for by local protocols.

Methods: 200 cases were randomly selected from a cardiac arrest registry database between 1/1/92 and 12/31/93. Of those, 51 cases were excluded for incomplete data, ROSC prior to epinephrine need, or lack of a medication route.

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The remaining 149 cases were analyzed to determine how often and how much epinephrine should have been given compared to what actually occurred, after a medication route became available and epinephrine was called for in the protocol. Local protocols call for 1mg. Initially with 3mg. q5min. thereafter.

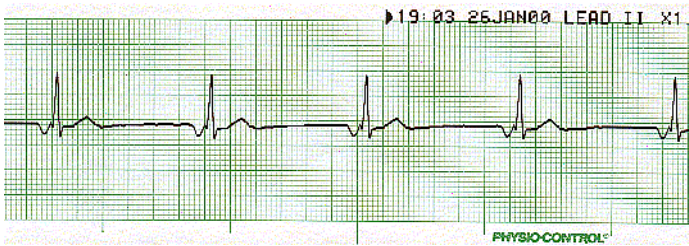
Results: An average of 4.69 (sd +/- .69) doses should have been given on the basis of time, but only an average of 3.01 (sd +/- 1.19) doses were actually given.

Based on local protocols, an average of 12.03mg. (sd +/- 5.11mg.) were called for, but only 5.72mg. (sd +/- 2.99mg.) were actually administered. The time from at patient to availability of a medication route (IV or ET) was 4.53 minutes (sd +/- 2.69). The time from at patient to administration of the first dose was 7.70 minutes (sd 4.37).

Conclusions: Compliance is highly variable and therefore cannot be assumed in outcome studies of EMS CPR. These results call to question compliance for other drugs in CPR and other clinical situations.

This study shows that time during an arrest is very subjective and can easily slip-away. The "ten minute notification" is one tool that can be used to keep on-track with arrests. Unfortunately, many of us hear it on each and every call and have come to ignore it. Some EMTs and medics are so new to the system; they do not even know the history of the "ten minute timer"!

Now is a good time to evaluate how we perceive and manage time during cardiac arrest; as well as the use of the timer.



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