American College of Emergency Physicians

Ethical Questions in Emergency Medical Services:

Controversies and Recommendations

Information Paper

Developed by the ACEP EMS Committee

October 2012

Workgroup:

Torben K. Becker, MD
Marianne Gausche-Hill, MD, FACEP, FAAP
Andrew L. Aswegan, MD, FACEP
Eileen F. Baker, MD, FACEP
Richard N. Bradley, MD, FACEP
Robert A. De Lorenzo, MD, MSM, FACEP
David J. Schoenwetter, DO, FACEP

Abstract:

There are many ethical issues that are encountered during the prehospital care of children and adults. Although provider judgment plays a large role in the resolution of conflicts at the scene, it is important to establish protocols and policies, when possible, to address these high risk and complex situations. This article describes some of the common situations with ethical underpinnings encountered by emergency medical services (EMS) personnel and managers including denying or delaying transport of patients with non-emergency conditions, use of lights and sirens for patient transport, determination of medical futility in the field, termination of resuscitation, restriction of EMS provider duty hours to prevent fatigue, substance abuse by EMS providers, disaster triage and difficulty in switching from individual care to mass casualty care, and the challenges of child abuse recognition and reporting. A series of ethical questions will be proposed followed by a review of the literature and when possible recommendations for management are made.

Ethical Questions in Emergency Medical Services: Controversies and Recommendations

I. Delay or Denial of Transport for Non-Emergent Conditions

Emergency Medical Service (EMS) providers care for and transport patients with non-emergent conditions on a daily basis. The possible implications for other patients, hospitals, EMS providers and society as a whole are complex.

Is it ethically justifiable for EMS to deny or delay transport for a patient who does not have an emergent medical condition?

While some systems have attempted to limit the use of EMS transport for patients without emergent medical conditions, it is important to recognize that "emergent medical condition" has a broader definition for the general public than for medical personnel. This differentiation was the impetus for implementation of the Prudent Layperson Standard. A "prudent layperson" possesses an average knowledge of health and medicine, which is less than that of EMS personnel, and magnitudes less than emergency physicians who serve as the gold standard. The Prudent Layperson Standard defines an emergent medical condition as anything that a person without medical training might anticipate causing serious impairment to his or her health in an emergency situation. Since "emergency situation" cannot always be clearly defined, the standard remains purposefully subjective for the safety of patients. In essence, an emergency is whatever the patient says it is until proven otherwise by a medical professional. Despite this limitation, some communities and health plans have found varying levels of success using nurse and physician-staffed telephone triage programs where advice can be given for situations that are determined not to need emergency department care [1, 2]. Studies looking at the ability of EMS providers to safely triage potentially non-urgent medical conditions have not been as promising [3-5].

Patients without an emergent medical condition may also have numerous secondary reasons for utilizing EMS, and some communities have taken steps to address these issues. For patients with limited mobility or who simply lack transportation to routine medical care, many areas have set up alternative transportation options. The patient can then be transported non-urgently to either their established source of medical care or the emergency department if they do not have a primary physician. Other patients want to arrive in the ED by ambulance because they believe their care will be expedited. Continuing established triage guidelines and educating the public about them are realistic ways to decrease this source of misuse. Other patients may call EMS as a way to remove themselves from unpleasant situations. For instance, homeless people may call during extreme weather. Interpersonal conflict, including abuse, will lead some people to access EMS to escape a situation without having to notify law enforcement. Intoxicated individuals call EMS for non-emergent medical conditions due to impairment in judgment. Different case management interventions are useful in decreasing such misuse of EMS, especially if targeted to high-frequency users [6].

Is it ethically justifiable for EMS to deny a patient transport to different hospitals when the patient's goal is "doctor shopping"?

Patient autonomy is held paramount in the US healthcare system. When EMS is called, competent patients typically can choose their hospital destination as long as the transport time is not prohibitive. While there are many legitimate reasons patients may request transport to a specific hospital (such as access to specialty care or proximity to family), some patients request transport to alternate hospital systems for the purpose of "doctor shopping" – attempting to obtain medications and other treatment that is duplicative in nature.

For the patient who is simply "doctor shopping", EMS personnel need to consider what is in the best interest of the patient in addition to society as a whole. Patients who are obtaining and taking narcotic medication more than prescribed

are at an increased risk of overdose, especially when they withhold information regarding medications they have recently taken.

Recommendations

1. For frequent users of EMS, case management interventions can be useful in educating patients about appropriate times to call their primary care provider versus EMS. This could also include expanding the availability of primary care services or telephone triage programs for situations that are determined not to require emergency department care.

2. For patients that lack a source of transportation, but who otherwise do not need EMS-based transport, alternative transportation options should be explored.

3. When a patient who is obviously "doctor shopping" requests transport to a different hospital than where they routinely receive care, EMS personnel should exercise their judgment in deciding where to transport, as long as it can be determined that the patient has no legitimate reason to be transported to an alternate facility. EMS providers must err on the side of patient safety in these situations. Involving EMS managers in these decisions is prudent, and strong consideration should be given to development of specific protocols. This could include care management plans that involve representatives of the affected EMS agencies, emergency departments and ideally the patients themselves.

Conclusions

Patients who utilize EMS when they do not have an emergent medical condition have various reasons for doing so, and the ethical implications are unique to each patient encounter. Society and EMS will continue to look for ways to decrease the emergent transport of patients who do not have emergent medical conditions. Despite these interventions, however, there will still be situations where EMS is called upon to transport a patient who does not have an emergent medical condition. The concepts of beneficence and justice should be applied in

a patient-centered fashion (as opposed to preservation of system resources) whenever possible [7]. The emergency department is the safety net for all of healthcare, and EMS in essence extends that net beyond the immediate vicinity of the hospital. Unless there is a clear alternative that meets the needs of the patient at hand without compromising appropriate medical care, EMS personnel should transport the patient to the one place that evaluates and treats all patients who arrive there – the emergency department.

In certain situations, such as obvious "doctor shopping", patient autonomy cannot take precedence over the best interest of society and the ultimate best interest of the patient. Although it is almost impossible to stop some patients from abusing the EMS system, developing a strategy that includes management plans may lessen the impact of these patients on EMS.

II. Use of Lights and Sirens for Patient Transport

Considerable literature regarding lights and sirens (L&S) operation by emergency vehicles has accrued over the past twenty years. Thousands of emergency vehicle accidents (EVAs) occur per year as a result of L&S. Fifty percent involve a reportable injury, and 1% involve a fatality [8]. A 2006 epidemiological analysis of occupational fatalities among EMS providers over a five-year period found that of 91 fatalities, 74% resulted from emergency vehicle crashes [9]. In another study, ambulance crashes were found to account for 53% of dollars paid out for an urban emergency ambulance service. 72% of claims against this agency were a result of crashes involving an ambulance [10].

As a result, some agencies have instituted no-L&S policies on non-emergent returns (transportation of the patient to the hospital) in an attempt to decrease liability. In addition, many larger municipalities have developed a tiered emergency response system, allowing first-response, non-transporting units to

arrive on scene first. Later, transporting units (often staffed by an Emergency Medical Technician-Basic (EMT-B)/ Emergency Medical Technician-Paramedic (EMT-P) team) arrive and assume care. Utilizing a priority dispatch system allows dispatchers to send response vehicles based upon the urgency of the call. Call priority is assigned a level linked to the type of response vehicle dispatched and whether they utilize L&S [8].

What are the potential harms and benefits of operating emergency vehicles without lights and sirens?

The operation of emergency vehicles with lights and sirens has a long-standing history. Much of it dates back to fire operations, in which a few minutes can make a difference in damage caused by structure fires [8]. The thinking that 'minutes count' has been extended into EMS response. Certainly, focus upon trauma's 'golden hour,' door-to-balloon times for myocardial infarction and thrombolytic windows for stroke treatment help reinforce the urgency of initiating definitive emergency care.

Conversely, running L&S places the emergency crew, the patients they transport and the public at large at increased risk of injury. Limiting the number of L&S responses, then, should reduce an agency's liability.

In addition, authors also note that failure to implement a priority dispatch system might result in additional liability as advanced life support crews may be tied to an emergency of lesser acuity, when another true emergency call exists [8].

Are there potential liability issues for not running L&S? And further, can dispatchers reliably prioritize emergency calls?

Many agencies have adopted an eight minute response time standard as a result of a 1978 study in Seattle. It showed improved survival of non-traumatic cardiac arrest patients receiving care between four and eight minutes from the event [11]. Critics of the eight minute response time standard note that the 1978 study was

conducted at a time when defibrillators were scarce and CPR with chest compressions was less emphasized. Further, they point out that non-traumatic cardiac arrest represents only one to two percent of ambulance calls. Basing the indicator for system performance upon only two percent of the calls may be misguided, even though they represent those most in need of emergency care [12]. Pons *et al.* found that an eight minute response time offered no benefit in the large urban setting they studied, but that response times under four minutes benefited patients with intermediate or high risk of mortality [13]. While the clinical significance of trauma's 'Golden Hour' has been questioned by some [14], it nevertheless has become a standard for comparison of EMS systems.

Over the past twenty years, several studies have compared transit times (both responding to the scene and transporting to the hospital) as well as patient outcomes, with and without use of L&S. Kupas *et al.* studied the transport of urban and suburban patients. The decision to transport was based upon the patient's condition immediately before transport. Of the L&S transports, 24 of 130 (18%) worsened or expired, but of the no-L&S group, only 13 of 1,495 (1%) worsened en route. This protocol allowed for no-L&S transportation of 92% of the patients and none of these patients arrived in extremis [15]. Hunt *et al.* found that patients transported from scene to the emergency department with L&S arrived only an average of 43.5 seconds sooner than those without L&S [16]. Similarly, Marques-Baptista found that the time saved by usage of L&S averaged 2.62 minutes. Further, of the 112 patients transported with L&S, only five received time-critical hospital interventions, and none received any such intervention within the time saved by utilizing L&S [17].

In 1998, Ho and Casey published a study in which one emergency vehicle responded to the scene with L&S, while a similarly equipped "chase" vehicle followed without L&S. They demonstrated that L&S response to the scene saved 3.02 minutes, on average, which is statistically significant [18]. A similar study by Brown *et al.* demonstrated an average difference in response times of 1 minute

and 46 seconds. While statistically significant, the investigators questioned the clinical relevance of such time savings [19].

Based upon the studies cited above, as well as other investigations, many municipalities have modified their dispatch protocols to allow for no-L&S emergency operation. For example, in 2008, the Scottsdale Fire Department developed recommendations for medical response protocols in an effort to reduce risk and enhance safety. Their research included many of the studies cited above, as well as data generated by their own investigation. Their medical director concluded that L&S responses were warranted in less than half of the responses. He determined that L&S utilization could be decreased from 95.3% to 47.3% of the time. It was estimated that this could cut the number of 'near miss' traffic events almost in half. The Scottsdale Fire Department now bases the need for L&S not only upon call type but also upon traffic conditions, distance to the scene and other pre-arrival information [20].

Implementing no-L&S policies requires prioritization of EMS calls through a dispatcher. Research has revealed that the time required to complete the triage process prior to dispatch is often substantial [21]. Nevertheless, dispatchers are able to overcome this limitation by dispatching based upon chief complaint and historical analysis of needs. First-response and EMS units are dispatched prior to completion of the triage algorithm with L&S. Their response level is then modified while they are en route, as indicated [21].

In 1994, the National Association of EMS Physicians (NAEMSP) and the National Association of State EMS Directors (NAEMSD) recommended that emergency vehicles should not exceed the locally posted speed limit in urban settings and should not exceed the posted limit by more than 10 miles per hour in rural areas [22].

In most states, traffic laws are in place for operating a vehicle involved in an emergency response. Some allow emergency vehicles to proceed through red lights and stop signs, exceed the maximum posted speed limits and park in restricted zones. All of these privileges require that the vehicle be operated in a safe and controlled manner, and that the safety of other motorists and pedestrians be considered [23].

Recommendations

1. The use of warning lights and siren during an emergency response to the scene and during patient transport should be based on standardized protocols that take into account situational and patient problem assessments.

2. EMS dispatch agencies should utilize an emergency medical dispatch priority reference system that has been developed in conjunction with and approved by the EMS medical director to determine which requests for prehospital medical care require the use of warning lights and siren.

3. The utilization of emergency warning L&S should be limited to emergency response and emergency transport situations only.

4. EMS providers, in concert with local governments, should establish minimum standards for the safe operation of EMS vehicles, and to monitor the use of such standards.

Conclusions

Emergency responders bear the burden of responsibility not only to provide optimal care to their patients, but also to ensure the safety of the public at large. This includes minimizing risk to pedestrians, drivers, patients and fellow rescuers during emergency vehicle operation. Studies overwhelmingly demonstrate that L&S operation places all parties at an increased risk, with little gained in terms of time savings (in response to the scene or in transportation to the hospital) or in time-critical hospital interventions.

It behooves EMS medical directors and EMS responders to develop policies limiting L&S operations as much as possible. Continued study of the effectiveness of L&S with respect to patient outcome is essential. Further, data regarding emergency vehicle (EMV) related collisions should be collected and analyzed so as to enhance EMV operations and promote safe driving practices. EMS agencies and individual providers may limit liability incurred in EMS operations by implementing procedures that optimize expeditious prehospital emergency care without endangering EMS crews, their patients and the public.

III. Termination of Resuscitation and Medical Futility

EMS systems are designed to provide medical care for time-sensitive and potentially life- or limb-threatening illness or injury. Cardiac arrest is one of those life-threatening conditions for which EMS care has an impact on survival. Rapid delivery of providers who can perform cardiopulmonary resuscitation (CPR) and defibrillation saves lives [24]. The public perceives the provision of resuscitation by EMS providers as a right except when they choose to suspend that right through advance directives. EMS providers are faced with making critical decisions about provision of resuscitation to patients whose preferences related to CPR are unknown or whose advance directives are not accessible. Balancing local EMS policy on initiation of CPR with legal factors, ethical concerns of patient autonomy, and cultural beliefs of patients creates a complex set of decisions for EMS providers.

What is the evidence for termination of resuscitation (TOR) guidelines of medical arrest versus trauma arrest?
There are more than 300,000 cardiac arrests occurring in the United States each year, with EMS responding to 25-50% of these cases [25, 26]. Survival of patients in cardiac arrest is dependent upon numerous factors such as etiology of

arrest, age of patient, co-morbid disease, and early resuscitative efforts by citizens. Most patients do not survive and thus guidelines for termination of resuscitation are important for on-scene management. Survival from blunt traumatic cardiac arrest is even more dismal and thus utilization of valuable resources to resuscitate these patients may not be justified [27]. In addition there are safety concerns for EMS providers relative to engaging in the process of medical resuscitation (possible exposure to infectious disease), scene safety concerns in traumatic cases (possible exposure to hostile assault or gunfire), and transport safety concerns when transporting patients with lights and sirens.

A number of professional organizations, such as the NAEMSP, the American Heart Association (AHA), and the American College of Surgeons Committee on Trauma (ACS COT), have addressed these concerns through the development of guidelines for the termination of resuscitation for adults and children in medical and traumatic cardiac arrest [25, 28-30].

What are criteria for non-initiation of CPR by EMS providers?
EMS providers have been trained to initiate CPR as soon as arrest has been identified. However, there are cases for which the automatic initiation of CPR may not be justified. The AHA outlines some of these situations: 1) situation where scene safety for the EMS provider cannot be assured; 2) obvious signs of death including decapitation, incineration, and decomposition of the body, and less objective signs such as rigor mortis and dependent lividity; and 3) presence of valid and signed advance directives by the patient that CPR is not desired or there is a Do-Not-Resuscitate (DNR) order by a physician for the patient [29]. Although these guidelines are designed to be applied in both adult and pediatric populations, EMS providers often feel less comfortable in not initiating resuscitation for children [31, 32]. That said, many children are ultimately declared dead in the field by EMS providers in conjunction with local policy [33]. It has been shown by Marco *et al.* that prehospital providers will honor official documents outlining the advance directives of patients [34]. Thus policies created

by EMS managers that outline acceptable documents to be used would provide guidance to EMS personnel when these situations arise.

Are there criteria for TOR once CPR has been initiated by EMS providers?

In 2000, the NAEMSP recommended that TOR be considered when field resuscitative efforts have been unsuccessful to achieve return of spontaneous circulation (ROSC) after 20 to 30 minutes of advanced life support (ALS) care [35]. These ALS procedures include definitive airway management, intravenous access, defibrillation as indicated, and delivery of medications as per Advanced Cardiac Life Support (ACLS) guidelines. Available TOR guidelines have been validated by a number of investigators [35-38], and have been embraced by many EMS system administrators. Morrison *et al.* validated a universal prehospital termination rule for systems with both basic and advanced life support EMS personnel which resulted in a lower transport rate and did not miss potential survivors. This rule had 100% specificity, a positive predictive value of 100% and recommends TOR when there is no ROSC prior to transport, the arrest is not witnessed by EMS personnel and no shock was delivered during the resuscitation [37]. This would result in a predicted transport rate of 46% versus transporting all patients. The ethical concerns related to TOR center around universal application of these guidelines regardless of age and cultural background, as well as of timing and robustness of the application of recommended interventions based on preconceived notions of futility. Although other concerns center on the public's reaction to TOR, it has been documented that families are very accepting of TOR and non-transport for loved ones who have unsuccessful resuscitation efforts in private residences after non-traumatic cardiac arrest, especially if there were advance directives [39].

What is futility or medically non-beneficial care?

Ethical consensus about "futile" or "medically non-beneficial" treatment is that treatment is not obligatory when it offers no benefit to the patient. The term "futility" is used to cover situations of improbable outcomes, improbable success

and unacceptable benefit-burden [40, 41]. Some situations obviously fit this description. For example, when a patient is brain dead but still on a respirator, the cessation of treatment will not harm that patient. For some religious belief systems, however, death is considered to be when the heart and/or lungs stop functioning and not when the brain stops functioning which is the criteria used in health care institutions. In some circumstances, families may want to prolong treatments in an effort to buy time to come to acceptance of imminent death of a loved one or even to await arrival of others from out of town [42].

Given the difficulties of determining what treatment is "futile", can we ever determine what is of "no benefit" to the patient in the short time we are exposed to the patient's situation as prehospital providers?

There are a number of studies that address conditions for TOR such as no EMS personnel witness to arrest, no shockable rhythm and no ROSC prior to transport [25]. In the absence of these strict criteria, is there a place for determining "medically non-beneficial" or "futile" treatment in the field?   According to Iserson, treatment can be withheld because of resource issues such as in a mass casualty situation where triage decisions are based on salvageability of the patient [43, 44]. More often though, there is no resource limitation and most ethicists conclude that it is inappropriate to limit health care based on societal costs [45]. Another potential societal reason not to make decisions about "non-beneficial" treatment in the field is organ donation, i.e., there may be value to others in resuscitating a patient. Because of the limited supply of available organs, each opportunity to secure organs from patients who suffer brain but not cardiac death, potentially allows for organ donation and lives saved. There is, however, a growing body of literature that supports non-resuscitation of patients in the field for whom it may be medically non-beneficial. For example, a recent study describes universally poor outcomes for traumatic pediatric arrests and concluded that they were unable to identify a subset of patients for whom aggressive resuscitation was indicated [27]. In another study, all infants presenting with SIDS died [46]. Both of these reports indicate that such

resuscitations and transport may be inappropriate. Thus, despite classic ethical thought regarding prehospital futility, it may be becoming more acceptable to create policies that offer guidance regarding the appropriateness of "medically non-beneficial" or "futile" treatment attempts in the field.

Recommendations

1. EMS systems managers should develop evidenced-based policies for the declaration of death by EMS personnel without attempts at resuscitation that address adult and pediatric populations. These policies may include situations of medical futility in which lifesaving treatment would not be initiated even in the absence of advance directives, and guidance for acceptable documents to be used for advance directives of patients.

2. EMS systems managers should consider establishing evidence-based policies for termination of resuscitation when attempts at resuscitation are unsuccessful for both medical and trauma arrests.

Conclusions

Overall, many EMS professionals agree with the need to establish declaration of death, TOR, and medical futility policies that address the needs of both adults and children within EMS systems. Given the complexity of these decisions, EMS system managers should prospectively develop evidenced-based guidelines, and protocols that address such decisions. These policies will help clarify which ethical factors an EMS provider must consider in a complex situation, such as cardiac arrest. They will also allow for patient autonomy through recognition and acceptance of advance directives, and for best utilization of limited prehospital resources for those patients who may most benefit from prehospital care.

IV. Duty Hours and Maintenance of a Competent EMS Workforce

Duty hours are an important factor for many occupations and vocations. Certain jobs, such as in the airline industry [47], have mandated duty hour requirements from which deviation is not permissible. The driving force behind this is safety; in some cases the safety of the employee, but in many cases this also involves the safety of the customer or the public.

Medicine has recently experienced the scrutiny of duty hours on resident education. In the last decade, there has been both increased regulation and enforcement of duty hour requirements, as well as consequences for the violators. This has been done in small part for reasoning related to the quality of life for the resident, but the major driver has been patient safety [48].

EMS providers, as a culture, are notorious for extreme numbers of duty hours per week; at least anecdotally. Although many providers "love what they do" and will relay they are happy to commit the hours, there are other driving forces. Low pay, specifically when compared to their public safety counterparts (law enforcement and the fire service), is frequently mentioned as a contributor. There are many EMS agencies with low call volume, and it can be perceived that significant rest can be obtained at work despite working long hours.

What are the average weekly duty hours for an EMS provider?
It is not clear from the literature that this number is known. The Longitudinal Emergency Medical Technician Attributes and Demographics Study (LEADS) Interim Report (2002) indicates average hours available for EMT-Bs (48.1) and EMT-Ps (51.8) [49]. However, it is unclear if these are "on the clock" hours versus time the providers felt that, if called, they could respond to calls on either a volunteer or per-diem basis. By phone contact, the National Association of Emergency Medical Technicians (NAEMT) did not have this data available. The National Registry of Emergency Medical Technicians (NREMT) cited the LEADS data on this question. The NHTSA "Workforce Agenda for the Future" does not mention specific published data on EMS personnel duty hours.

In summary, it is unlikely that there is a definitive data repository for EMS personnel continuous duty hours.

What drives EMS personnel duty hours, and is there an optimal balance between performance and fatigue?

The LEADS report indicates that more than 40% of EMS providers are not satisfied with their salary. There is no additional data to determine whether this economic stress on EMS providers leads to increased duty hours. In reality, this could have a mixed effect on EMS hours, as some providers with other professions may work fewer EMS hours in lieu of more lucrative vocational activities. Also, it is unknown how the LEADS survey separated this data point between volunteers and paid/career EMS providers.

There is a lack of data regarding employer factors reflecting duty hours. However, most healthcare organizations have restrictions on duty hours. Anecdotally, the New York City Fire Department limits shifts to 16 hours for EMS providers. The Joint Commission issued a *Sentinel Event Alert* publication regarding workplace fatigue and medical errors [50]. The impact of this on EMS nationwide is unclear.

Although salary and employer are important motivators and/or regulators of EMS personnel duty hours, additional factors need to be identified. Many EMS providers work for more than one EMS agency, and this makes tracking personnel hours and shift length difficult. Likewise, EMS providers may have actual duty hours constrained by travel and schedule between employers/agencies? An EMS provider's "duty period" (time of being on-duty until the next work-free time, inclusive of travel time between agencies) may be very lengthy, yet the total hours logged as "duty hours" may not reflect this excessive time between work-free periods.

What is the impact of concerns regarding patient and EMS provider safety on EMS personnel duty hours? Is work satisfaction related to length of work?

Safety in medicine is paramount. From Hippocrates' *primum non nocere* ("First, do no harm") to the modern Institute of Medicine (IOM) reports documenting errors in medicine and the impact of long resident work hours, the practice of medicine has and continues to be reviewed to insure that patients receive maximum benefit and, when possible, are exposed to little or no risk from medical intervention [51, 52]. Perhaps more so than most vocations in medicine, EMS personnel are at greater exposure to injury to self as well as potentially causing harm to patients. Therefore, the impact of EMS duty hours is critical for both provider and patient safety.

There are numerous publications on the effects of medical personnel work hours on patient safety [53, 54]. There is also a growing body of literature for EMS personnel specifically [55-59]. A recent study by Patterson *et al.* indicated 2.2 greater odds of an error or adverse event for fatigued versus non-fatigued EMS providers [55]. However, current research data face several limitations, as they are either based on survey data (which does not correlate directly to patient outcomes) or are study data for tasks (which are not conducted on real patients). Additionally, the exact correlation between duty hours and fatigue is not as clearly delineated for EMS as it has been in other areas of medical care.

There is a much larger body of literature, however, regarding the effects of work hours and fatigue on safety to the EMS provider [60-62]. Again, some of this is not correlated directly to hours of duty, but to night shifts [63]. Patterson *et al.* also discuss the impact of duty hours on not only the patient, but also the EMS providers [55].

Although the LEADS report discusses job satisfaction and impact of balance between personal and professional life, there is no clear data linking the quality of life or the ability to recruit or retain EMS providers to the duty hours.

Recommendations

1. Although little data are available on the impact of such restrictions, EMS managers should establish policies for limiting the number of hours of continuous duty by EMS providers. This may be based on projected patient volume and complexity of patient care, as well as likely development of provider fatigue with extended shifts.

2. More research is necessary to determine optimum duty hours (maximum hours during which a provider maintains competence and minimizes fatigue) for EMS providers.

Conclusions

There is a paucity of information published in the peer review literature regarding EMS personnel duty hours specifically, although the topic is frequently mentioned in studies on EMS personnel demographics. More information is needed to quantify the duty hours of EMS providers, to assess impact on EMS personnel quality of life, and to determine the safety impact of duty hours to both the providers and the patients. EMS stakeholder groups should engage in this effort and seek collaboration with each other and researchers in the field.

V. Substance Abuse by EMS Providers

Substance abuse among EMS providers is a potentially serious problem. Impaired/intoxicated prehospital providers pose a risk to themselves, their patients, their co-workers and the public. Possible adverse outcomes include impaired judgment leading to diagnostic or therapeutic errors, or traffic accidents leading to economic damage and possible injuries or deaths. In addition, negative publicity associated with impaired EMS providers may reflect badly on EMS in general and diminish public confidence in the capability of EMS to provide safe care.

What is the scope of substance abuse by EMS providers?

No national surveillance data are currently available to estimate the prevalence of substance abuse among EMS providers. Research results from other professions suggest that there is significant under-reporting of such cases. EMS workers are considered to be at higher risk for substance abuse than the general population, as the EMS environment itself, with difficult calls, high stress, and public misperceptions about EMS, may lead to increased rates of burn-out, depression and posttraumatic stress disorder [60, 64, 65].

Which factors influence substance abuse by EMS providers and how do regulatory bodies and EMS agencies respond to this problem?

EMS providers have relatively easy access to narcotics and other substances when compared to the general public. However, stress on the job and easy access to alcohol, make alcohol the most commonly abused substance, which would be consistent with the statistics available for other professionals and the general public [66].

However, there is a striking lack of evidence-based data and high-quality research on this topic, with the majority of data from anecdotal reports in the media and the grey literature. Some of these reports indicate that EMS providers who revealed substance abuse among colleagues faced accusations and were branded as "traitors" [67].

In 2007, the NAEMT issued a position statement on illicit drug use [68]. There are also a few initiatives on the state level that actively try to offer surveillance and solutions for this problem, such as in New Mexico and California [69, 70]. However, more frequently, it is up to individual agencies to develop appropriate policies on the early detection of substance abuse and initiation of appropriate interventions for impaired EMS providers [71].

Recommendations

1. EMS systems managers should establish policies which allow for EMS providers to self-report substance abuse without the immediate risk of losing their job and with a plan for recovery and return to work.
2. More research is needed to establish programs that identify substance abuse by EMS providers and that determine the effects of substance abuse on patient and co-worker safety.

Conclusions

In summary, it appears reasonable that further research should be encouraged to better understand the extent and severity of substance abuse among EMS professionals. Such data may also help to establish improved surveillance, prevention and treatment strategies, with educational initiatives for EMS professionals and allied professionals being one important step.

VI. Disaster Triage

Ethical questions are at the core of many decisions made during a disaster. In these situations the demands exceed the EMS resources that are available. As a result, EMS organizations and personnel face ethical challenges when deciding the best way to allocate resources. The decisions they make during a disaster may be very different from those made during normal operations, when EMS providers usually evaluate and manage patients one at a time. In a disaster setting, the priorities in resource allocation move from patient-centered to population-centered [72].

What are the ethical differences in day-to-day triage and triage in mass casualty scenarios?

Decisions during normal operating conditions are based on the principles of duty ("it is my job to respond, treat and transport everyone who calls for help") and

beneficence ("I should give my best to the patient in front of me.") In a disaster, however, EMS personnel will have a conflict between these principles and the principle of utility ("I need to provide the most good to the greatest number of patients.") Because these decisions may require actions that deviate from those practiced during normal conditions, there is a role for organizations with a national scope to develop consensus statements and to advocate for future research that will help to guide these decisions.

Calls to 9-1-1 are the common pathway for victims of disasters to contact authorities and where responders and government agencies in the United States first become aware of many of the complex incidents that occur after a disaster. In normal conditions, agencies usually respond to every call to 9-1-1 where EMS assistance is requested. For example, if someone calls 9-1-1 and states "I have a cut on my arm," an ambulance is usually sent. When EMS resources are not sufficient to meet demand, however, an EMS system may implement a scheme in which medically trained 9-1-1 dispatchers choose not to send EMS resources in response to requests for service where there are no obvious threats to life [72]. For example, the same call to 9-1-1 during a disaster may prompt the medically trained dispatcher not to send an ambulance unless the caller describes the bleeding as severe.

Similarly, during disasters, EMS personnel in the field will face ethical questions regarding the disposition of individuals whom they have assessed. Using the same example, in normal conditions, an EMS crew would usually transport any patient with an extremity injury. Faced with overwhelming demands for EMS services, or with hospital emergency departments that are filled above capacity, they may decline to transport individuals that do not have apparent life-threatening conditions or could self-transport by other means [72].

Also, during disasters, as EMS personnel seek to obtain the most utility from the resources that are available, they will take into consideration the high cost-benefit

ratio for attempting resuscitation for people with cardiac arrest. During normal situations, the median rate of survival to hospital discharge for people who have an out-of-hospital cardiac arrest is approximately 3.3% [73]. Since the interval from collapse to defibrillation is so important [74], and since EMS resources that are in short supply will have a longer response interval, survival from cardiac arrest will be even worse during a disaster. Thus, in order to avoid committing a significant amount of resources to an incident with a low likelihood of benefits, during disasters EMS personnel may be faced with the decision of whether or not to withhold attempts at resuscitation for patients in cardiac arrest [72].

Recommendations

1. Additional research is needed to determine those disaster situations in which it is ethically appropriate: (1) not to send EMS resources in response to 9-1-1 calls; (2) for EMS personnel not to transport individuals; and (3) not to attempt resuscitation of individuals in cardiac arrest.
2. The development of clinical policies on modified EMS practices during disasters should be encouraged and should include all age groups of patients likely to be encountered during disaster incidents.

Conclusions

Ethical issues in disaster situations center around the change from day-to-day triage of individual patients to the triage and treatment of the largest group of patients who will most benefit from emergency care. Policies in place for dispatch, on scene triage and treatment and destination in disaster scenarios could benefit both EMS providers, by reducing the stress of caring for patients within these scenarios, and patients, by delivering medical care in a fashion that improves its overall benefits and impact.

VII. Child Abuse and Reporting

As bona fide licensed or certified medical providers, it is clear from an ethical standpoint that EMS providers have an obligation to report their suspicions of child abuse [75-77]. The protection of a child's wellbeing is a high ethical priority and supersedes competing obligations such as the right to privacy. The legal duty, however, is a function of state and local law and regulations [78]. As such, there is great variability among states and territories on the degree of responsibility and the actions required in cases of suspected child abuse [79]. The variability of state laws and regulations no doubt makes the description of these differing approaches challenging [80].

In some cases, the EMS provider is mandated to directly notify state child protective services [81]. In many more states and territories there are no such legal requirements and instead the obligation revolves around the minimum acceptable practice of reporting the suspected abuse to the staff in the emergency department [76, 82]. Individual medical directors and EMS systems can and do provide specific guidelines and protocols for child abuse; however, there is no clearinghouse of information on the topic. In much the same fashion as child abuse, the obligation of EMS providers to report child neglect varies among the states and territories.

The current literature is incomplete in describing the exact nature of the ethical and legal obligations on child abuse reporting in EMS. The major professional societies (e.g., American College of Emergency Physicians, American Academy of Pediatrics, National Association of EMS Physicians, National Association of Emergency Medical Technicians) with a stake in EMS and prehospital care do not offer policy statements in this area

 The federally-funded Emergency Medical Services for Children (EMSC) Program has provided some training in this area through the Center for Pediatric

Emergency Medicine's educational materials entitled: *Child Abuse & Neglect. A Continuing Education and Teaching Resource for the Prehospital Provider* [83, 84]. The Pediatric Education for Prehospital Professionals Course also offers training for Basic and Advanced Life Support providers in recognition and management of infants and children with child maltreatment; however reporting laws vary between states [85].

It is important to recognize that at least one commentator has pointed out that while well-intentioned, the development of guidelines or mandates on child abuse reporting for EMS professionals must be accompanied by appropriate training [86].

Recommendations

1. The major EMS professional organizations should consider adopting policy statements on child abuse reporting. Ideally, these would be joint statements so that the message to the EMS community is harmonious.
2. An assessment of the educational needs of EMS providers and medical directors would help identify key topical areas for development and dissemination. Potential organizations to explore this include the EMSC Program, professional societies hosting educational conferences, and other purveyors of EMS-focused educational material.
3. EMS agencies and systems with successful programs in the area of child abuse detection or reporting should be encouraged to share their experiences. A clearinghouse of best practices would serve to highlight different approaches to this important issue and enable more communities to enhance their reporting and response mechanisms to child abuse.

Conclusions

Reporting of child abuse by EMS providers is important for child safety; however, the mechanism for reporting and to whom the report is made varies from state to state. Establishment of national guidelines for reporting and education of EMS

providers may help to streamline these efforts.

References

1.   Dale J, Williams S, Foster T, Higgins J, Snooks H, Crouch R, Hartley-Sharpe C, Glucksman E, George S: *Safety of telephone consultation for "non-serious" emergency ambulance service patients*. Qual Saf Health Care, 2004; 13(5): 363-73.
2.   Chan TC, Vilke GM, Smith S, Sparrow W, Dunford JV: *Impact of an after-hours on-call emergency physician on ambulance transports from a county jail*. Prehosp Emerg Care, 2003; 7(3): 327-31.
3.   Schmidt T, Neely KW, Adams AL, Newgard CD, Wittwer L, Muhr M, Norton R: *Is it possible to safely triage callers to EMS dispatch centers to alternative resources?* Prehosp Emerg Care, 2003; 7(3): 368-74.
4.   Hauswald M: *Can paramedics safely decide which patients do not need ambulance transport or emergency department care?* Prehosp Emerg Care, 2002; 6(4): 383-6.
5.   Silvestri S, Rothrock SG, Kennedy D, Ladde J, Bryant M, Pagane J: *Can paramedics accurately identify patients who do not require emergency department care?* Prehosp Emerg Care, 2002; 6(4): 387-390.
6.   Rinke ML, Dietrich E, Kodeck T, Westcoat K: *Operation care: a pilot case management intervention for frequent emergency medical system users*. Am J Emerg Med, 2012; 30(2): 352-7.
7.   Brown JF: *Ethics, Emergency Medical Services, and Patient Rights: System and Patient Considerations*. Adv Emerg Nurs J, 1999; 21(1): 49-57.
8.   Clawson JJ (1989): "Emergency Medical Dispatching." In: Rousch WR, Aranosian RD, Blair TMH, Handal KA, Kellow RC, Stewart RD (Editors): *Principles of EMS Systems*. Dallas: 119-133.
9.   Maguire BJ, Hunting KL, Smith GS, Levick NR: *Occupational fatalities in emergency medical services: a hidden crisis*. Ann Emerg Med, 2002; 40(6): 625-32.
10.   Colwell CB, Pons P, Blanchet JH, Mangino C: *Claims against a paramedic ambulance service: a ten-year experience*. J Emerg Med, 1999; 17(6): 999-1002.
11.   Eisenberg MS, Bergner L, Hallstrom A: *Cardiac resuscitation in the community. Importance of rapid provision and implications for program planning*. JAMA, 1979; 241(18): 1905-7.
12.   Al-Shaqsi SZK: *Response time as a sole performance indicator in EMS: Pitfalls and solutions*. Open Access Emergency Medicine, 2010; 2: 1-6.
13.   Pons PT, Haukoos JS, Bludworth W, Cribley T, Pons KA, Markovchick VJ: *Paramedic response time: does it affect patient survival?* Acad Emerg Med, 2005; 12(7): 594-600.

14.   Lerner EB, Moscati RM: *The golden hour: scientific fact or medical "urban legend"?* Acad Emerg Med, 2001; 8(7): 758-60.

15.   Kupas D, Dula D, Pino B: *Patient outcome using medical protocol to limit" lights and siren" transport*. Prehospital Disaster Med, 1994; 9(4): 226.

16.   Hunt RC, Brown LH, Whitley TW, Prasad NH, Owens CF, Mayo CE: *Is ambulance transport time with lights and siren faster than that without?* Ann Emerg Med, 1995; 25(4): 507-511.

17.   Marques-Baptista A, Ohman-Strickland P, Baldino KT, Prasto M, Merlin MA: *Utilization of warning lights and siren based on hospital time-critical interventions*. Prehospital Disaster Med, 2010; 25(4): 335.

18.   Ho J, Casey B: *Time saved with use of emergency warning lights and sirens during response to requests for emergency medical aid in an urban environment*. Ann Emerg Med, 1998; 32(5): 585-588.

19.   Brown LH, Whitney CL, Hunt RC, Addario M, Hogue T: *Do Warning Lights and Sirens Reduce Ambulance Response Times?* Prehosp Emerg Care, 2000; 4(1): 70-74.

20.   Olson GM: *Enhancing Safety During Emergency Medical Responses*. Accessed: 05/19/2012. Available from: http://www.usfa.fema.gov/pdf/efop/efo41949.pdf.

21.   Hinchey P, Myers B, Zalkin J, Lewis R, Garner Jr D: *Low acuity EMS dispatch criteria can reliably identify patients without high-acuity illness or injury*. Prehosp Emerg Care, 2007; 11(1): 42-48.

22.   Clawson JJ, Forbuss R, Hauert SA, Hurtado F, Kuehl AE, Leonard WH, Manigas PA, Ryan JL, Sharpe DR: *Use of Warning Lights and Siren in Emergency Medical Vehicle Response and Patient Transport*. Prehospital Disaster Med, 1994; 9(2).

23.   Burns L: *So You Want To Drive an Ambulance?* Emerg Med Serv, 1999; 28: 53-58.

24.   Stiell IG, Wells GA, DeMaio VJ, Spaite DW, Field BJ, Munkley DP, Lyver MB, Luinstra LG, Ward R: *Modifiable factors associated with improved cardiac arrest survival in a multicenter basic life support/defibrillation system: OPALS study phase I results*. Ann Emerg Med, 1999; 33(1): 44-50.

25.   Millin MG, Khandker SR, Malki A: *Termination of Resuscitation of Nontraumatic Cardiopulmonary Arrest: Resource Document for the National Association of EMS Physicians Position Statement*. Prehosp Emerg Care, 2011; 15(4): 547-554.

26.   Lloyd-Jones D, Adams RJ, Brown TM, Carnethon M, Dai S, De Simone G, Ferguson TB, Ford E, Furie K, Gillespie C: *Heart disease and stroke statistics—2010 update. A report from the American Heart Association.* Circulation, 2010; 121(7): e1-e170.

27.   Brindis SL, Gausche-Hill M, Young KD, Putnam B: *Universally Poor Outcomes of Pediatric Traumatic Arrest: A Prospective Case Series and Review of the Literature*. Pediatr Emerg Care, 2011; 27(7): 616.

28.   Hopson LR, Hirsh E, Delgado J, Domeier R, Krohmer J, McSwain Jr N, Weldon C, Friel M, Hoyt D: *Guidelines for withholding or termination of resuscitation in prehospital traumatic cardiopulmonary arrest*. J Am Coll Surg, 2003; 196(3): 475.

29.   Morrison LJ, Kierzek G, Diekema DS, Sayre MR, Silvers SM, Idris AH, Mancini ME: *Part 3: ethics: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care*. Circulation, 2010; 122(18 Suppl 3): S665-75.

30. Physicians NAoE: *Termination of resuscitation in nontraumatic cardiopulmonary arrest*. Prehosp Emerg Care, 2011; 15(4): 542.

31. Hall WL, Myers JH, Pepe PE, Larkin GL, Sirbaugh PE, Persse DE: *The perspective of paramedics about on-scene termination of resuscitation efforts for pediatric patients*. Resuscitation, 2004; 60(2): 175-187.

32. Glaeser PW, Linzer J, Tunik MG, Henderson DP, Ball J: *Survey of nationally registered emergency medical services providers: pediatric education*. Ann Emerg Med, 2000; 36(1): 33-8.

33. Gausche M, Seidel JS, Henderson DP, Ness B, Ward PM, Wayland BW, Almeida B: *Pediatric deaths and emergency medical services (EMS) in urban and rural areas*. Pediatr Emerg Care, 1989; 5(3): 158-62.

34. Marco CA, Schears RM: *Prehospital resuscitation practices: a survey of prehospital providers*. J Emerg Med, 2003; 24(1): 101-106.

35. Bailey ED, Wydro GC, Cone DC: *Termination of resuscitation in the prehospital setting for adult patients suffering non-traumatic cardiac arrest*. Prehosp Emerg Care, 2000; 4(2): 190-195.

36. Skrifvars MB, Vayrynen T, Kuisma M, Castren M, Parr MJ, Silfverstople J, Svensson L, Jonsson L, Herlitz J: *Comparison of Helsinki and European Resuscitation Council "do not attempt to resuscitate" guidelines, and a termination of resuscitation clinical prediction rule for out-of-hospital cardiac arrest patients found in asystole or pulseless electrical activity*. Resuscitation, 2010; 81(6): 679-84.

37. Morrison LJ, Verbeek PR, Zhan C, Kiss A, Allan KS: *Validation of a universal prehospital termination of resuscitation clinical prediction rule for advanced and basic life support providers*. Resuscitation, 2009; 80(3): 324-8.

38. Verbeek PR, Vermeulen MJ, Ali FH, Messenger DW, Summers J, Morrison LJ: *Derivation of a Termination‐of‐resuscitation Guideline for Emergency Medical Technicians Using Automated External Defibrillators*. Acad Emerg Med, 2002; 9(7): 671-678.

39. Edwardsen EA, Chiumento S, Davis E: *Family perspective of medical care and grief support after field termination by emergency medical services personnel: a preliminary report*. Prehosp Emerg Care, 2002; 6(4): 440-444.

40. Beauchamp TL, Childress JF (2008): *Principles of biomedical ethics*. New York: Oxford University Press.

41. McIntosh B: *Medical Futility*. Accessed: 06/10/2012. Available from: http://dcmsonline.org/jax-medicine/2008journals/ethics/medical_futility.pdf.

42. Stone SC, Abbott J, McClung CD, Colwell CB, Eckstein M, Lowenstein SR: *Paramedic knowledge, attitudes, and training in end-of-life care*. Prehosp Disaster Med, 2009; 24(6): 529-34.

43. Iserson KV: *Principles of biomedical ethics*. Emerg Med Clin N Am, 1999; 17(2): 283-306.

44. Iserson KV, Heine CE, Larkin GL, Moskop JC, Baruch J, Aswegan AL: *Fight or flight: the ethics of emergency physician disaster response*. Ann Emerg Med, 2008; 51(4): 345-53.

45.   Iserson KV (2004): "Bioethical Dilemmas in Emergency Medicine and Prehospital Care." In: Monagle JF, Thomasma DC (Editors): *Health Care Ethics: Critical Issues for the 21st Century*. Sudbury: 138-145.

46.   Smith MP, Kaji A, Young KD, Gausche-Hill M: *Presentation and Survival of Prehospital Apparent Sudden Infant Death Syndrome*. Prehosp Emerg Care, 2005; 9(2): 181-185.

47.   Gregory KB, Winn W, Johnson K, Rosekind MR: *Pilot Fatigue Survey: Exploring Fatigue Factors in Air Medical Operations*. Air Med J, 2010; 29(6): 309-319.

48.   Nasca TJ, Day SH, Amis Jr ES: *The new recommendations on duty hours from the ACGME Task Force*. N Engl J Med, 2010; 363(2).

49.   Brown WE, Dickison PD, Misselbeck WJA, Levine R: *Longitudinal Emergency Medical Technician Attribute and Demographic Study (LEADS): An Interim Report*. Prehosp Emerg Care, 2002; 6(4): 433-439.

50.   The Joint Commission: *Health care worker fatigue and patient safety*. Sentinel Event Alert, 2011; (48): 1-4.

51.   Institute of Medicine (2000): *To err is human: building a safer health system*. Washington, D.C.: The National Academy Press.

52.   Institute of Medicine (2009): *Resident Duty Hours: Enhancing Sleep, Supervision, and Safety*. Washington, D.C.: The National Academic Press.

53.   Wagner MJ, Wolf S, Promes S, McGee D, Hobgood C, Doty C, McErlean MA, Janssen A, Smith‐Coggins R, Ling L: *Duty hours in emergency medicine: balancing patient safety, resident wellness, and the resident training experience: a consensus response to the 2008 Institute of Medicine resident duty hours recommendations*. Acad Emerg Med, 2010; 17(9): 1004-1011.

54.   Page D: *Sleep Saves: Fatigue a leading cause of medical errors in the field*. JEMS, 2012; 37(2): 32.

55.   Patterson PD, Weaver MD, Frank RC, Warner CW, Martin-Gill C, Guyette FX, Fairbanks RJ, Hubble MW, Songer TJ, Callaway CW: *Association Between Poor Sleep, Fatigue, and Safety Outcomes in Emergency Medical Services Providers*. Prehosp Emerg Care, 2011.

56.   Lamb D: *Measuring critical care air support teams' performance during extended periods of duty*. AACN Adv Crit Care, 2010; 21(3): 298.

57.   MacDonald E: *Only pilots get tired and other urban myths*. Air Med J, 2005; 24(2): 63-65.

58.   Allen TL, Delbridge TR, Stevens MH, Nicholas D: *Intubation success rates by air ambulance personnel during 12-versus 24-hour shifts: does fatigue make a difference?* Prehosp Emerg Care, 2001; 5(4): 340-343.

59.   Caldwell JA: *The impact of fatigue in air medical and other types of operations: a review of fatigue facts and potential countermeasures*. Air Med J, 2001; 20(1): 25-32.

60.   Van Der Ploeg E, Kleber RJ: *Acute and chronic job stressors among ambulance personnel: predictors of health symptoms*. Occupational and Environmental Medicine, 2003; 60(suppl 1): i40-i46.

61.   Hickman BJ, Mehrer R: *Stress and the effects of air transport on flight crews*. Air Med J, 2001; 20(6): 6-9.

62.	Erich J: *Dead Tired*. Accessed: 05/19/2012. Available from: http://www.emsworld.com/article/10225273/dead-tired.

63.	Frakes MA, Kelly JG: *Off-duty preparation for overnight work in rotor wing air medical programs*. Air Med J, 2005; 24(5): 215-219.

64.	Mitani S, Fujita M, Nakata K, Shirakawa T: *Impact of post-traumatic stress disorder and job-related stress on burnout: A study of fire service workers*. J Emerg Med, 2006; 31(1): 7-11.

65.	Donnelly E: *Work-Related Stress and Posttraumatic Stress in Emergency Medical Services*. Prehosp Emerg Care, 2011; 16(1): 76-85.

66.	Sterud T, Ekeberg Ø, Hem E: *Health status in the ambulance services: a systematic review*. BMC Health Serv Res, 2006; 6(1): 82.

67.	Alton A: *StopNarcoticTampering.org*. Accessed: 05/19/2012. Available from: http://www.stopnarcotictampering.org/main/Home_1.html.

68.	National Association of Emergency Medical Technicians: *Position Statement on Illicit Drug Use by EMTs and Paramedics*. Accessed: 05/19/2012. Available from: http://www.naemt.org/Libraries/NAEMT%20Documents/Illicit%20Drug%20Use%20by%20EMTs%20and%20Paramedics.sflb.

69.	New Mexico EMS Bureau: *Emergency Medical Services Impaired Practitioner Program*. Accessed: 05/19/2012. Available from: http://nmems.org/documents/ImpairedPractitionerBrochure.pdf.

70.	California State Firefighters' Association Emergency Medical Services Committee: *Emergency Responder Substance Abuse Task Force*. Accessed: 05/19/2012. Available from: http://www.stopnarcotictampering.org/main/Industry_Task_Force_files/ERSATF.pdf.

71.	Sherman JL: *Firefighters facing mandatory drug tests in 2010*. Accessed: 05/19/2012. Available from: http://old.post-gazette.com/pg/09365/1024790-53.stm.

72.	Hanfling D, Altevogt BM, Viswanathan K, Gostin LO (2012): *Crisis Standards of Care: A Systems Framework for Catastrophic Disaster Response*. Washington, D.C.: The National Academies Press.

73.	Nichol G, Thomas E, Callaway CW, Hedges J, Powell JL, Aufderheide TP, Rea T, Lowe R, Brown T, Dreyer J, Davis D, Idris A, Stiell I: *Regional Variation in Out-of-Hospital Cardiac Arrest Incidence and Outcome*. JAMA, 2008; 300(12): 1423-1431.

74.	White RD, Asplin BR, Bugliosi TF, Hankins DG: *High Discharge Survival Rate After Out-of-Hospital Ventricular Fibrillation With Rapid Defibrillation by Police and Paramedics*. Ann Emerg Med, 1996; 28(5): 480-485.

75.	Adams JG, Arnold R, Siminoff L, Wolfson AB: *Ethical conflicts in the prehospital setting*. Ann Emerg Med, 1992; 21(10): 1259-1265.

76.	Clauss E, Blair L, Meredith M: *EMS Providers Can Identify Child Abuse*. JEMS, 2011; 36(10): 62-68.

77.	Erbrich N, Lutz K: *Child Abuse and Neglect*. EMS for Children Newsletter, 2009; 13(3): 1-5.

78.	Baren JM: *Ethical dilemmas in the care of minors in the emergency department*. Emerg Med Clin N Am, 2006; 24(3).

79.   Bell L: *Court decides EMTs don't have to report child abuse*. Accessed: 05/19/2012. Available from: http://www.mediccast.com/blog/2010/07/19/court-decides-emts-dont-have-to-report-child-abuse/.

80.   Sandman L, Nordmark A: *Ethical conflicts in prehospital emergency care*. Nurs Ethics, 2006; 13(6): 592-607.

81.   Degrandi T: *EMS and Child Abuse*. Accessed: 05/31/2012. Available from: http://www.emsworld.com/article/10322162/ems-and-child-abuse.

82.   Larkin GL, Fowler RL: *Essential ethics for EMS: cardinal virtues and core principles*. Emerg Med Clin N Am, 2002; 20(4): 887.

83.   Markenson DS, Tunik MG, Treiber M, Cooper A, Skomorowsky A, Foltin GL, Aiello SE: *Child Abuse & Neglect. A Continuing Education and Teaching Resource for the Prehospital Provider*. Accessed: 05/19/2012. Available from: http://webdoc.nyumc.org/nyumc/files/cpem/u3/can.pdf.

84.   Markenson D, Foltin G, Tunik M, Cooper A, Matza-Haughton H, Olson L, Treiber M: *Knowledge and attitude assessment and education of prehospital personnel in child abuse and neglect: report of a National Blue Ribbon Panel*. Ann Emerg Med, 2002; 40(1): 89-101.

85.   Dieckmann RA, Brownstein D, Gausche-Hill M (2006): *Pediatric Education for Prehospital Professionals: PEPP Textbook*. Sudbury: Jones & Bartlett Publishers.

86.   Carcano J: *Legal Lines: Child Abuse Mandated Reporting: A Good Idea?* . Accessed: 05/19/2012. Available from: http://www.emsvillage.com/articles/article.cfm?id=1043.