Physician Insertion via Helicopter Emergency Medical Services (HEMS) to Improve patient care in the time of disaster response.

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*Each of us should strive "to rise above the routines of the daily ward round and to see in every patient an opportunity not only to serve mankind in the best tradition of medical excellence, but to add to the store of medical knowledge."*

—A. McGehee Harvey

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In many parts of the world physicians are supplements to the emergency medical services. Often deployed to patients that are classified, or triaged to be critical. These patients are in need of high-level treatment prior to arriving to hospital. Most evidence cited, is poor when it comes to pre-hospital physician triage and the immediate care that is delivered.

For sake of argument, we must, in my mind define the most important term for this argument. What is “critical care” by definition? Webster defines “critical” as; relating to, indicating or being the stage of a disease at which an abrupt change for better or worse maybe anticipated with reasonable certainty”. The patients that fit in the above definition need the services of intensive care prior to arrival to hospital. Webster defines “intensive care” as “services, and monitoring devices to meet the needs of gravely ill patients”.

This paper will argue based on the collection of data; could better patient outcomes be probable within a system with highly qualified physicians? Defining particular terms arguing for a physician insertion model can lead to improved patient outcomes along with the implement “true” intensive care at the roadside.

Can the Doctor improve patient outcome?

Gravely ill patients are not the only patients that are seen everyday. Whether a doctor or paramedic, yes, the data shows that there is not any difference in care, when the patient is not critical or if the scene time is less then 90 minutes. Study published in the journal of pre-hospital disaster medicine; the results found no pre-hospital time threshold that decreased mortality or morbidity (Dissmann, 2007).
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Morbidity and mortality however maybe improved with a balance of time in the field. Intensive care provided by the physician, and insertion of that physician into the field at the side of the critical patient improving patient outcomes. In a study conducted in NSW Australia, using flying doctor service, the results concluded improved mortality in trauma patients (Ringburg, 2009). As the patients become more critical, a more intensive approach must be taken to improve patient outcomes. Deployment of the physician to the immediate beside of the critical patient as mentioned above improves patient’s outcome. The argument has been made for physician remaining on scene for too long for a procedure that can be performed in hospital. However the physician may have a better idea of what treatments that patient will need from the long term care rendered in hospital. Anticipating tertiary treatment will allow for a higher and more precise level of intensive care at the scene. The increased level of critical care provided could be the key to why physician care improves overall outcomes and reduces morbidity and mortality.

The experience of doctors reducing time in the field while producing critical care

Expertise and Skill

Many European models of EMS use physicians (P-EMS). Mostly, no one really questions the use or the possible importance of the properly trained physician within the hospital setting. What is questioned time and time again, is does the expertise of the pre-hospital physician really make the difference in patient outcomes in the pre-hospital setting? A recent article in the Washington Post referenced a study done by the University of Chicago. The study’s author, Prachi Sanghavi, reported that in most cases, patients being transported by a basic life support ambulance had better outcomes then that of an advanced life support ambulance. (Sanghavi, 2015). The study continued to
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argue for scene times increasing with the advance level skills being performed contributing to poorer outcomes of the patients. “Research has shown that crews on advanced ambulances take longer to perform those invasive procedures, in part because they don’t have as much practice as clinicians in hospitals” (Sanghavi, 2015). Increasing expertise and skill is needed at the time of critical incidents. “Therapeutic interventions have been carried out by a specialist in anesthesiologist at the scene following best standard of care. By definition, the specialist would be deemed negligent if he failed to use his level of skill, knowledge, and care in diagnosis and treatment of patients” (Mikkelsen, 2015). Patients in need of time sensitive care deserve the most advanced care at their side in the time of that need.

**Time critical interventions**

In a retrospective study performed in Denmark, researchers investigated, pre-hospital care provided by specially trained physician based pre-hospital programs. These programs were referred to as physician emergency medical services or P-EMS in the study. Overall the study was to see if long-term outcomes of the patients were improved (Petri, 2005). Early time critical interventions made at the road side could, have implications of impacting patient outcomes. Research showed that patients receiving “life saving” interventions in the pre-hospital scene had a 2.7% increase in returning home (Petri, 2005). The study had criteria of time sensitive injuries in need of a physician; sudden loss of consciousness, absence of breathing, impaired breathing, severe chest pain, suspected serious illness and pediatric emergencies, to name a few. Treatment protocols, in relation to the P-EMS versus that of an EMT or Paramedic based system,
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Physician base EMS demonstrates more sophisticated concepts in patient care that decrease morbidly mortality.

“Increased survival in relation to a pre-hospital system consisting of emergency medical technicians and paramedics alone and thus supports the concept of applying specialists in anesthesiology in the pre-hospital setting especially when treating patients with cardiac arrest, patients in need of respiratory support and trauma patients” (Petri, 2005).

As research has found in the German-Franco pre-hospital model the presence of a physician staffed mobile unit improves patient outcomes and ultimate discharge from the hospital to home. Evaluation of the competency of true critical care provided at the roadside indeed prevents critically injured patients from poorer outcomes or death when a physician gives care.

“Stay and Play” V. “Load and Go”

In the UK, the pre-hospital setting when using HEMS has two teams, physician-paramedic (PP) and standard paramedic crews (SPC). Each pre-hospital team is activated based on the severity of the call. Studies have shown that when the PP team has been utilized in inner-urban areas, concerns are razed over the idea that the physician wants to “stay and play” more often then the SPC team would in the similar situation with similar casualties. “UK regions with potentially less trauma, concerns have been raised by ambulance services that a willingness of doctors to ‘stay and play’ may lead to unnecessary delays on-scene without any additional benefit to the patient” (Dissmann, 2007). That maybe true from a data collection standpoint maybe even within the construct of evidence based practice. For example, if there are less trauma casualties in
that region, does there really need to be a physician being inserted to the roadside? With there being less trauma related cases, there is not a patient population to support the benefit. However when the PP team is activated and does provide treatment at the roadside, there is an increased hospital to discharge of patients being taken care of by a physician in the pre-hospital setting.

The Teeside helicopter emergency services in the UK performed a study that discovered patient outcome improvement in the pre-hospital setting. The study concluded; 1) There were no significant differences in the mean on scene times between the physician-paramedic and the critical care paramedic missions. 2) The physician-paramedic teams were faster on-scene on an incident-by-incident basis, but had to deal with a greater proportion of more complicated incidents. 3) There was a noticeable trend for reduced on scene times when physician-paramedic attended medical emergencies in remote areas (Dissmann, 2007). The deviation in scene times will come from the physician’s willingness to perform high level interventions on critically injured or sick patients at the roadside. Taking into consideration that no two incidents are the same. Having thought about those variables applied to the model used in the study, understanding that when the physician chooses to perform a higher level intervention at the roadside, the over all outcome long term is better for the patients recovery. “ HEMS physicians exceeded the Royal Colleges Ambulance Liaisons committee guidelines (link listed in references) by 43.1% of missions while providing acute medical interventions at the roadside” (Dissmann, 2007). Overall patient care delivered by the physician is true critical care. The decisions made to
intervene with complex procedures is made by a clinician with a greater ability of determining what the patient needs for overall improved recovery and tertiary care.

**Efficiency and effectiveness of Physician-EMS**

The approach to the EMS care provided in the states, enforces the idea of “load and go” to a university hospital or a high acuity trauma center. The pre-hospital system in the states has been pushing true critical intensive care at the road-side. Critical care and transport to the highly specialized trauma center has become the mantra to the routine trauma care of EMS in the states. To improve efficiency and effectiveness of this dogmatic approach to critical care treatment, timely insertion of a physician plays a vital role in treating multiple traumatized patients. “The treatment times for the helicopter were several minutes shorter when a physician-staffed rescue team arrived at the emergency site” (Gries et. al 2007). Studies have concluded delays in management of these patients worsen the prognosis. “Trauma patients profit from primary delivery to a trauma center” (Gries et, al 2007). Therefore, the goal of physician-staffed air rescue services is to treat these patients as quickly as possible and deliver them to a suitable trauma center. Improvement to pre-hospital treatment with the addition of a physician to the air rescue team in terms of disposition and efficiency will improve patient outcomes from traumatic injury.

Changing the medical crew of the HEMS formula in the states would ultimately be a difficult undertaking. The argument is to provide critical care at the scene immediately. Providing true critical care at the side of the road means providing that care by definition and with both skilled and experienced providers utilizing intraoperative highly acute cognitive expertise. Lets say for a moment, we were going to replace
physicians in the hospital emergency department with paramedics. People would be in an outrage. Patients would question, why am I coming to the hospital and not being able to see a physician? I’ve asked a similar question, why can’t the trauma patient in the pre-hospital incident have a physician at the roadside? Providing that critical care immediately, will allow for a quicker move through the hospital and the patient benefitting in the their long term outcomes.

**Limitations**

Adding physicians to the pre-hospital system could have benefits, its not without its’ drawbacks either. The argument however, is for the utilization of the physician in the pre-hospital setting on the very acute patient. It could be examined on another level the benefit increases from care on scene to hospital treatment being given at the bedside prior to hospital arrival. Another point of interest could be the increased level of care. If a physician were present for bedside intensive care, the medics would be able to go beyond standardized care without disrupting the flow of treatment to call hospital. The review of literature has its limits. The review was intended to make an argument and assess data to support the addition of physicians to EMS.

**Conclusion**

The argument here is not to remove paramedics from the field. EMS is a team event. Treating a patient takes a symbiotic melding of a team. The team must come together to enhance care and ultimately improve patient outcomes. Re-tooling the focus of EMS on utilizing objective reasoning, interpreting a standardized definition of critical care all the while improving physician presence at the side of the patient prior to hospital arrival is the main objective of this review. Intensive care out side of hospital may
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present with an increased fluidity of EMS and faster, earlier specialized level of care in the states. Any Future research conducted of the pre-hospital physicians impacts on the trauma system could determine any meaningful change needed to the current dogmatic system of EMS currently being practiced in the US.
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