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EMS in Nebraska

Its role in patient care

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Out of the darkness: the Evolution of EMS and the EMS Subspecialty

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Emergency Medical Services (EMS) has roots in ancient times, but continues to evolve with the American Board of Medical Specialties approving EMS as the newest Emergency Medicine subspecialty in September 2010. The first EMS subspecialty examination was administered October 23-25, 2013, and the first EMS board certified physicians were notified of successful completion in late 2013. Where did EMS start, where has it been, where are we now, and what in the heck is this EMS subspecialty thing?

Some experts date the development of EMS back to the Good Samaritan as recounted in the Bible, but it can be traced further back to the writings of Homer. Machaon (Son of Æsculapius who was deified as the Greek god of medicine) extracted the barbed arrow, sucked the wound, and applied a secret ointment.

Many credit Baron Dominique-Jean Larrey, chief physician in Napoleon's army, with institution of the first prehospital system in 1797. He developed the concept of triage and, inspired by horse-drawn "flying artillery," he developed a "flying ambulance" designed to transport the injured from the field to aid stations. During the civil war, the Union Army developed an organized system to evacuate soldiers from the field, and in the mid to late 1860s, the first civilian ambulance services developed in Cincinnati and New York City. Volunteer ambulance services first developed on the East Coast in the 1920s with ongoing growth resulting in a disorganized system of variable and sometimes poor quality.

In 1960, there was little regulation of EMS training or ambulance specifications, but at that time President Kennedy announced that traffic accidents were a major public health problem. President Johnson formed the President's Commission on Highway Safety in 1965 and their report identified motor vehicle crashes as a large public health burden, recommended development of a coordinated national highway safety program, and felt that the timeliness and adequacy of care of the injured patient were critical. In 1966, The National Academy of Sciences–National Research Council released the report titled "Accidental Death and Disability: The Neglected Disease of Modern Society" that documented the absence of quality in emergency care. Their criticisms included lack of treatment protocols, few trained medical personnel, inefficient transportation, lack of modern communications and equipment, the abdication of responsibility by political authorities, and the lack of research evaluating prehospital care. The recommendations

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Out of the darkness: the Evolution of EMS and the EMS Subspecialty *(continued)*

of this report were incorporated into the Highway Safety Act of 1966. The Act established the cabinet-level Department of Transportation (DOT) to accelerate highway traffic safety programs and improve EMS through a combination of demonstration projects and matching grants which allowed the development of regional experimentation with different types of EMS systems. Federal funding encouraged the development of state EMS systems through 1981 at which time the funding switched to block grants at the state level.

Development of Emergency Medicine (EM) as a specialty paralleled that of EMS, and the first EM residency program was established at the University of Cincinnati in 1972. EM was recognized as a specialty in 1975.

The American Board of Medical Specialties is a not-for-profit organization that assists 24 approved medical specialty boards in the development and use of standards in the ongoing evaluation and certification of physicians. The American Board of Emergency Medicine (ABEM) became a member board in 1979. ABMS has over 150 specialty and subspecialty boards and defines a medical subspecialty as:

- being a primary clinical specialty and having a unique body of knowledge,
- a scientific body of literature as the underpinnings of the subspecialty (dedicated journals, textbooks),
- presence of a significant number of physicians practicing in the specialty,
- presence of a sufficient number of training programs to ensure training of subspecialists,
- and evidence of benefits to patients and society.

ABEM first investigated pursuing EMS as a subspecialty in the 1990s. At that time, it was felt that EMS was too administrative, had no unique body of knowledge, and lacked sufficient scientific underpinnings. In 2001, the National Association of EMS Physicians (NAEMSP) formed a task force to investigate the possibility of NAEMSP offering certification. Then, in 2006, the Institute of Medicine report stated that: "physicians who provide medical direction for EMS systems should meet standardized minimum requirements for training and certification that are reflective of their responsibilities," and "recommends that the American Board of Emergency Medicine create a subspecialty certification in EMS." A draft application was begun in 2007, submitted in 2009, and EMS was approved as an Emergency Medicine subspecialty in 2010. EMS joins the existing EM subspecialties of Anesthesiology Critical Care Medicine, Hospice and Palliative Medicine, Internal Medicine-Critical Care Medicine, Medical Toxicology, Pediatric Emergency Medicine, Sports Medicine, and Undersea and Hyperbaric Medicine.

Emergency Medical Services is a clinical specialty that includes the care of patients in all environments outside of traditional medical care facilities including clinics, offices, and hospitals until arrival to a definitive medical care facility. It includes evaluation and treatment of acute injury and illness in all age groups, planning and prevention, monitoring, and team oversight.

"The purpose of subspecialty certification in EMS is to standardize physician training and qualifications for EMS practice, to improve patient safety, and enhance the quality of emergency medical care provided to patients in the prehospital environment, and to facilitate further integration of prehospital patient treatment into the continuum of patient care."

There are two pathways for certification in EMS: the practice pathway and the training pathway.

Practice Pathways

(sunsets five years after ABMS approval)

- OPTION #1
  - Successful completion of an acceptable, unaccredited fellowship in Emergency Medical Services, and
  - Within six years immediately preceding the application, a minimum of 24 months EMS practice (at least 400 hours/yr) as:
    - *Assistant, Associate, or Medical Director of an EMS agency with patient care responsibility or*
    - *Direct provider of prehospital emergency care*
- OPTION #2
  - Within six years immediately preceding the application, a minimum of 60 months EMS practice (at least 400 hours/yr) as:
    - *Assistant, Associate, or Medical Director of an EMS agency with patient care responsibility or*
    - *Direct provider of prehospital emergency care*

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Caring for Myocardial Infarction before the patient arrives at your hospital

by Donald T. Rice, MD
EMS Physician Medical Director, State of Nebraska

As the EMS physician medical director to the State of Nebraska, I am surprised at the variety of responses I receive from doctors when asked how they manage a heart attack patient. For the purpose of this article I want to focus on STEMI (ST Elevation Myocardial Infarction) patients. Now, maybe you are an obstetrician reading this and think this doesn't apply to you. It actually does. You might be the next cardiac patient. Understanding the changes in care in Nebraska over the last two years could save your life.

It wasn't until December 2012 that the State EMS program finally approved a statewide STEMI system allowing paramedics and EMTs to effectively manage STEMI patients. Would it surprise you to know it took 10 years to get approval? The game changer was the ability to analyze prehospital electronic medical records. With computerized data, we were able to sift through case after case revealing some very disappointing facts about heart attack victims in Nebraska.

We found that many lingered in small emergency rooms for an average of four hours before being transferred to a cardiology center. We followed up our initial research and conducted a grassroots survey asking providers at critical access hospitals to talk about heart attack care at their facility.

We published the data last year as the RAMIS report.[1] Here is what we found:

- 41.5 percent of Critical Access Hospitals did not have standing patient acceptance agreements with regional STEMI centers forcing them to withstand delayed transfer.
- Although 99 percent of the Critical Access Hospitals have policies in place for thrombolytic therapy, 23 percent of the providers admitted they had providers or partners who did not use their own policies even if the patient was a candidate for fibrinolytic therapy.
- Although most Critical Access Hospitals had equal access to Advanced Life Support services, 70 percent would not allow a STEMI patient to bypass their own facility. This would condemn the patient to a lengthy delay.

To make treatment recommendations even more difficult, guidelines written by the American Heart Association focus on starting the clock when "first medical contact" is made.[2] This practice, however, is devoid of how long the patient has been actually suffering myocardial ischemia. So, let's get back to the obstetrician reading this article and bring this point out. Let's say you get called at your home and have a patient on the OB floor who has been having late decelerations and the fetal heart rate is dropping well down to 60. How would you feel if ACOG (American College of Obstetrics and Gynecology) revised their standards to state that the "decision to incision" time was flexible and even allowed you to add time on evenings and weekends? Albeit a crude analogy, I personally like it. Late decelerations are indicative of fetal ischemia. With a child we wouldn't tolerate these practices. With adults… are we ok with this? Several articles recently published have criticized the "door to balloon" concept and have cited increased mortality rates when patients inconveniently have heart attacks after hours or on weekends when cath labs are usually not staffed. [3, 4] Shiomi, et al, 2012, reports what would seemingly be obvious that symptom to balloon time is more important than door to balloon time. [5]

If we are to make significant improvements in managing these patients, change needs to begin in the prehospital environment. Based on current American Heart Association Guidelines (and an extremely large body of evidence) here is what you need to know.[6]

- Patients need definitive treatment within 120 minutes of "first medical contact." This means the hospital community needs to rely on the prehospital community. If we can make the diagnosis in the field, we can give you more time to assemble a cath team in your hospital.[7] "Door to balloon time" is antiquated.
- In Nebraska, paramedics are qualified to diagnose and manage STEMI patients. They should be allowed to

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Evolution in Cardiac Arrest Care

by Jason Kruger, MD
NMA Board Member
EMS Oversight Authority, Medical Director, Greater Lincoln/Lancaster County Area, Lincoln

According to the American Heart Association, out-of-hospital cardiac arrest accounts for over 350,000 deaths in the United States each year. Survival for out-of-hospital cardiac arrest hovers around 9 percent. CPR as we know it today (combining mouth to mouth ventilations with chest compressions) was first presented as an unnamed concept in a meeting of the Maryland Medical Society in 1960. With CPR now being slightly over 50 years old, it is interesting to note that survival from out-of-hospital cardiac arrest has been flat for most of those 50 years, with only a very recent increase in survival being noted. Also of note/concern: there is a substantial variance in survival from cardiac arrest by community.

The recent increase in survival from out-of-hospital cardiac arrest is likely secondary to a greater understanding of what saves lives in cardiac arrest and what does not. Survival is dependent upon high-quality CPR. Survival is dependent on chest compressions being the right depth, the right rate, providers allowing appropriate time for chest recoil, minimizing interruptions in chest compressions, and early defibrillation of appropriate cardiac dysrhythmias. Bystander CPR is important in improving survival. There has been a recent movement in promoting hands-only CPR for lay rescuers as a means for minimizing interruptions in chest compressions and encouraging bystanders to perform CPR. Things that have been shown to decrease survival in out-of-hospital cardiac arrest include prolonged pauses in chest compressions along with hyperventilation during resuscitation. It is interesting to note that some recent large studies have associated advanced airway placement with worse outcomes in out-of-hospital cardiac arrest. This association does not prove causation, but it is an interesting trend to monitor.

Where does a community start to try to improve survival in out-of-hospital cardiac arrest? The first and most basic step is to accurately measure survival. In October 2013, Lincoln Fire and Rescue became the first EMS agency in the state of Nebraska to be accepted into the CARES registry. CARES (Cardiac Arrest Registry to Enhance Survival) was started in 2004 as a partnership between the CDC and Emory University. The registry allows communities to input their cardiac arrest data and then compare their local data to national numbers. Generally speaking, if you do not know your baseline save rates, it is hard to improve. There are currently more than 40 communities in 26 states participating in the CARES registry. This includes eight states that are participating with entire statewide registries. Based on the successful implementation in Lincoln, the state of Nebraska has been invited to become the ninth state to participate with an entire statewide registry in CARES. This will allow every EMS agency in Nebraska to participate so that every community in Nebraska can determine its own survival rates for out-of-hospital cardiac arrest.

Lincoln Fire and Rescue (LF&R) currently analyzes every out-of-hospital cardiac arrest in which it provides care. Using software from their monitor/defibrillators, LF&R can accurately measure a chest compression fraction in every code. Chest compression fraction is simply the percentage of time during a code in which chest compressions are being performed. Nationally published data puts the national chest compression fraction average around 50 percent. Survival in cardiac arrest correlates strongly with higher chest compression fractions being associated with higher survival rates. LF&R routinely averages around 90 percent for chest compression fractions in out-of-hospital cardiac arrest. If it is not measured, it is hard to improve. LF&R is doing a number of other things to help improve survival in cardiac arrest patients. Metronomes are used during every code to ensure chest compressions are being done at the correct rate. Prehospital therapeutic hypothermia is being initiated in select patients in order to try to improve neurologic outcome in survivors of cardiac arrest. Patients are being taken preferentially to hospitals with cardiac catheterization labs because a number of studies have shown improved survival in patients taken promptly to the catheterization lab after achieving a return of spontaneous circulation.

There are a number of questions that remain in the treatment of cardiac

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Air Medical Transport

by Tadd Delozier, MD
Medical Director, StarCare, Lincoln

Although ground transport remains the mainstay of most prehospital services, helicopters and fixed wing aircraft are integral parts of EMS systems. Air Medical Transport (AMT) is a term covering the use of an airplane or helicopter to move patients to and from health care facilities and accident scenes. Personnel provide comprehensive prehospital, emergency, and critical care to all types of patients during aeromedical or rescue operations.

The use of air transport of patients dates to World War I, but its role was dramatically expanded during the Korean and Vietnam conflicts where it became the mainstay of rapid transport of wounded soldiers to definitive surgical care. The successful use of helicopter transport in military trauma was eventually extrapolated to the civilian world. The first helicopter program was established in Denver by St. Anthony Hospital in 1972.

The advantages of AMT are to provide critical care capabilities during inter-facility transport and/or deliver a higher level of care at the scene of a trauma with a decrease in the time required to transport a patient to a trauma center or receiving hospital that can provide definitive care.

Effective use of helicopter services depends on the initial assessment, by either the EMS responder or original provider, to determine whether the patient's condition warrants AMT. Protocols and training must be developed to ensure that appropriate triage criteria are applied. In the case of trauma, activation will depend on the "real-time" assessment of a trauma victim's injuries or potential injuries based on the mechanism of injury. The purpose of triage is to assure that the majority of seriously ill and injured patients receive appropriate transportation.

This system assumes a significant over-triage rate to assure that critically ill and injured patients are not missed.

Crew and patient safety is the single most important factor to be considered when deciding whether to transport a patient by helicopter. Weather, air traffic patterns, and distances between the facilities must also be considered. The general rule of safety is upon the crew. If one flight member is not comfortable with the flight for whatever reason, the flight is cancelled.

An air ambulance is a specially outfitted aircraft that carries medical staff and equipment vital to monitoring and treating critically ill or injured patients. Common supplies include: IV fluids, medications for emergent conditions, ventilators, ECG monitors, CPR and advanced airway equipment. The medical crew usually consists of two very experienced members. A paramedic-nurse combination is a widely used configuration that has many strengths. The paramedic has expertise, training, and experience in handling the uncontrolled scene and the unpackaged patient, while the critical care nurse has vast experience in caring for unstable patients utilizing multiple advanced monitoring and treatment modalities. An important and expanding role for AMT is the transfer of the "specialty patient." Such patients are ones who can best be served by a crew that has specific training and experience distinct from that of the standard flight crew. Examples include the unstable neonatal or ECMO patient for whom a neonatal nurse might be critical, the high risk obstetrical patient, or the unstable ventilator patient who could benefit from the care of a respiratory therapist. At larger medical centers, the organ harvest and transplant team may benefit from utilization of the air medical transport system. Pilots often have an extensive military background including rescue and medical transport missions utilizing a variety of aircrafts. This requires a great deal of experience with their program's aircraft because the conditions of air ambulance flights are often more challenging than regular non-emergency flight services.

The nature of the air medical program frequently determines the type of medical direction required. In most cases, the medical crew has considerably advanced skills so medical control permits them to exercise more decision-making latitude. Their assessment and treatment abilities tend to be more complex and particularly on inter-facility transfers, permit reading X-rays and interpretation of lab results and acting on those abnormalities. With multisystem trauma or patients with critical care needs, the crew is capable of life saving treatments and procedures not typically performed at the referral hospital or by local EMS providers. Some systems operate almost entirely offline using

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Exploring the use of paramedics to aid in reducing hospital readmissions

by Shirley Knodel, RN, MS
Scottsbluff and Gering, Nebraska

Hospitals are searching for ways to reduce unnecessary readmissions. According to CMS, the top three hospital readmission diagnoses are acute myocardial infarctions (AMI), heart failure (HF/CHF), and pneumonia. Regional West Medical Center (RWMC) data reflects that these are also the top three diagnoses for readmission to RWMC. CMS has instituted a Hospital Readmissions Reduction Program (Centers for Medicare and Medicaid Services (CMS), 2012). A complex calculation that is utilized by CMS to calculate penalties for hospitals with excessive readmission rates as compared to the national average began for discharges after Oct. 1, 2012, with the calculation being modified each successive year. The Medicare Payment Advisory Commission (MedPAC), which reports to Congress, has estimated that 12 percent of Medicare patients may be readmitted for potentially avoidable reasons. Averting one out of every 10 of those returns could save Medicare $1 billion, MedPAC says. (Hagland, 2013) Nationally, the average fine decreased from 0.42 percent in the first year of the program to 0.38 percent. Other payers are also looking to partner with hospitals that have been successful at reducing costs of care, including readmission reductions.

While RWMC has not been penalized for high readmission rates, an interest exists in finding ways to prevent unnecessary emergency department visits and hospital admissions. The rural area in the panhandle of Nebraska presents unique challenges in recruiting and retaining adequate numbers of medical providers and nurses. In a rural setting, creativity and looking beyond traditional models is necessary.

Discussions led to an idea for trialing the use of paramedics to do home visits to patients post discharge. The concept was that a paramedic could do the visits between ambulance runs. Further discussion led to determining what exactly the team believed would help these patients stay well and in their own home. This led to a review of the scope of practice of the paramedic in comparison with the scope of practice of the RN. The determination made was that the visits needed to focus on health maintenance and teaching, not complex nursing care visits. The patient population would focus on those with a diagnosis of heart failure or pneumonia.

On Feb. 14, 2013, Valley Ambulance and RWMC partnered together in a pilot project aimed at just that. The pilot project was coordinated by Randy Meininger, NRP, ASM, owner of Valley Ambulance; Diana Rohrick, RN, BSN, home health director, RWMC; Shirley Knodel, RN, MS, CNO/VP RWMC; and medical director for the project, Jeffrey Holloway, MD.

The program was narrowed in scope to patients discharged from the RWMC medical floor who live within the corporate boundaries of Scottsbluff and Gering with the diagnosis of heart failure or pneumonia. The discharge staff on the medical floor explained the program to the eligible patients and sought consent for participation. The patients were then randomly assigned to receive visits from a paramedic or a homecare RN. The outcomes were measured to determine the effectiveness of the health maintenance and teaching model based on readmissions. The readmission outcomes were also compared between those patients receiving visits by a home health RN versus a paramedic.

Eligible patients were offered the option of receiving a visit within 24 hours of discharge and one a week there after for a total of four visits. The protocols, teaching tools, and documentation were standardized and used by both the paramedics and the RNs. The discharge staff on the medical floor explained the program to the eligible patients and sought consent for participation. The patients were then randomly assigned to be visited by a paramedic or a homecare RN.

Examples of lessons learned were that medication confusion was the most common problem for patients of both diagnoses in the beginning of the project, but through joint problem solving, this became less of an issue as the project progressed. Simple things like owning a scale to monitor weight were barriers to overcome. Follow-up appointments with primary care providers did not always occur within the first week of discharge; more calls were made to providers on these patients to prevent

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readmissions. Compliance with follow-up visits to the primary care provider was highest when the patient left the hospital with the appointment already made. Weekend discharges where the appointments were not made had the lowest compliance with prompt follow-up with the primary care provider. The discharge instructions would often say to call the primary care provider for a weight gain of two pounds in 24 hours, however when the patient called their provider they often reached an answering service or an office nurse who told them to go to the emergency department. Discharge instructions were sometimes taken home by a family member who did not live with the patient. The patient then did not have a copy to refer to. Typed instructions were easier for patients to read versus templates where blanks were filled in with hand-written instructions. Some patients stated they could not afford their medications despite having been screened for this before discharge. When a patient would call on Monday after a weekend admission to seek an appointment, the primary provider was not aware of the patient's hospitalization as the hospitalists would make those calls on Monday during office hours. These lessons learned have been shared with hospital leadership as well as providers, and they are driving changes within the system of care.

The pilot project concluded Feb. 14, 2014. The results in the following table indicate that health monitoring and teaching post-hospital discharge is beneficial due to the complexity of the heart failure and pneumonia patients. This can be safely provided by paramedics when the right support is available. Examples are a medical director as well as support from primary care providers, nursing leadership, and pharmacy leadership. This group can provide oversight and development of protocols, teaching, and monitoring tools. This partnership is essential as lessons learned can be addressed real time to improve outcomes. There were instances when the paramedic determined that the patient was in need of more complex care and contacted the provider. Some of these instances did result in the providers ordering home health care for the patient.

The sample size for this pilot project is small due to a variety of reasons. Despite the sample size, the hospital administration, providers, and Valley Ambulance leadership all see this as a

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Paramedic Readmission Prevention Project
February 2013 - December 2013

	Total Patients	Total Readmissions	Readmission Rate
Total Patient Population *	159	34	21.4%
Study Participants - Sample Group	63	9	14.3%
Non-Participants - Comparison Group	96	25	26.0%
Study Participants - Sample Group	63	9	14.3%
Heart Failure Diagnosis	26	1	3.8%
Pneumonia Diagnosis	32	6	18.8%
Other Diagnoses **	5	4	80.0%
Study Participants - Sample Group	63	9	14.3%
Paramedic Home Visit	37	4	10.8%
Home Health RN Home Visit	26	5	19.2%

* "Total Patient Population" includes all patients discharged from the RWMC Medical/Oncology unit with a diagnosis of PN or CHF, whose primary residence was within the Scottsbluff/Gering corporate limits. Non-participants include both those patients who met the population definition but chose not to participate in the study, as well as those who fit the population definition but were not given the opportunity to participate in the study.

** "Other Diagnoses" includes study participants who were identified by the discharge nurse as having CHF or Pneumonia but did not have CHF or Pneumonia on final coding.

Gage County EMS is calling 911… the challenges facing rural EMS

by Robin DeVries, RN, BSN, EMT
Gage County EMS

The rural system for emergency medical services (EMS) in Gage County has reached a breaking point. Over the past two decades, the expense for emergency medical care has increased substantially while the funding from all sources has decreased. This path has made the current state of services unsustainable.

What is EMS?

Emergency Medical Services (EMS) is an integrated system of emergency responders to handle medical or trauma needs. It starts with a call to 911 and ends with care provided by a hospital emergency department. EMS has been available with a 911 call since the late 1970s. It involves more than just ambulance transporting services or just a first responder unit. EMS is prehospital emergency care.

EMS also includes on-site volunteers at community events or assisting with first aid. Many local high school football games have EMS volunteers in attendance to care for a critically injured player or a fan having a medical emergency. Fans tend to assume that there will be someone available to care for a medical situation especially with the recent increase in awareness surrounding athletics and the potential for head injuries. EMS also offers health and safety education and health screenings to the public. This is in addition to fire safety and prevention efforts that take place at schools and daycares.

Within Gage County, there are three levels of emergency medical response. First, non-transport squads (often the first people at the scene) respond quickly and assist before the ambulance arrives with emergency equipment. Personnel are Emergency Medical Technicians and have basic life support training. Such squads are not able to charge patients for services rendered. The second level of care - the transport squads that have an ambulance and the ability to transport a patient - are able to charge for services. Lastly, the Advanced Life Support (ALS) system provides the most advanced emergency care. The ALS system is comprised of paid professionals. These responders and paramedics have the ability to administer life-saving medicines and treatments. Rural Gage County can receive these services from either Beatrice or Lincoln Fire and Rescue. Transporting agencies charge for their services and are reimbursed by insurances companies or Medicare and Medicaid at a reduced rate.

Who is EMS?

Emergency responders are your neighbors. Over 80 percent of Nebraska's ambulance squads are staffed by volunteers. They often have family obligations that may take precedence over their volunteer time. Many of these volunteers have paid jobs outside of their hometown. We estimate that approximately three-quarters of the population within a rural community is out of town during any given work day.

Why do we need volunteer EMS?

The Department of Labor estimates that a volunteer system is a savings of $299,592 in donated labor costs ($17.10 per hour).

What EMS costs are increasing?

Fuel costs are triple what they were 20 years ago. Medical supplies, emergency medical equipment, emergency medicines, and personnel training has increased with general medical inflationary costs.

The State of Nebraska, in the interest of public safety, has increased the legal requirements for training for first responders and emergency medical responders. Twenty years ago, volunteers needed only to be trained in CPR. Now, training involves more rigorous education and testing at frequent intervals. This involves more volunteer time.

EMT class is 150 hours initially and they are required 20 hours of education every two years to maintain license. Paramedic training is in excess of 15 months with 72 hours of continuing education requirements every 18 months. The state has continuing education requirements that must be maintained to assure proficiency. This is necessary to assure the high quality of care to all patients. This is in addition to the monthly meetings, trainings, and the critique of calls that are taxing to the volunteer. According to Safe Tec Solutions, to appropriately staff a 24 hour service you need 14 active EMT members with the realistic assumption

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that only one out of four members are really an active member.

The cost of a new ambulance starts at $160,000 and they are typically replaced every 10 years. This expense increases rapidly when you take into account the cost of the equipment and medicines on board. Currently, more than one small town in Gage County shares funding for an ambulance.

Even the ALS services have budget issues within their own respective squads. This is not realistic going forward with few new recruits. We also need the continued support of our local communities, counties, and the State of Nebraska with the need for a reliable source of funding. Those squads that transport patients to the hospital are able to charge for such transportation if the patient has medical insurance to cover expenses. However, the squads that do not transport have no way of recovering expenses for education, supplies, insurance, and maintenance of equipment.

How is EMS currently funded?

For all the attention that first responders have received since 9/11, Gage County EMS receives no federal funding. The State of Nebraska also does not provide any direct funding for Gage County EMS. Gage County currently provides $5,000 per year, but this funding will be discontinued in 2014. Much of this funding is allocated for a future replacement ambulance. Little is left for operating costs. Some departments are fortunate to receive funding from local rural fire district taxes. This funding is invaluable, but not mandatory. The remainder comes from private donations. An exception is that the village of Cortland provides $8,000 per year to the city of Clatonia to help fund the volunteer ambulance service.

What happens if the local EMS system breaks down?

People will still get emergent care in rural areas because there will always be local volunteers to assist in a time of crisis. These are qualified medical personnel who feel called to serve their fellow community members.

However, the concern is twofold. First, even well-meaning volunteers need a system or network in place to help provide care. This involves knowing where, when, and how to provide medical assistance. An organized response may break down if there is no identifiable EMS system.

A second concern is the time to response. If EMS services are not organized, patients must rely on the third or highest level of EMS. This means that paid medical providers from Lincoln or Beatrice respond to urgent calls. This presumably would detract from their ability to respond to emergencies in bigger population centers. Rural response times could be much slower or non-existent in some cases. This may be troublesome for some people moving from larger cities to rural areas and expecting the same immediate emergency response. Nebraska currently has no state statutes requiring that citizens must have access to medical services at all. Only two states have regulations requiring emergency medical aid to the public.

Medically this is important. Irreversible brain damage starts in as little as four minutes of cardiac arrest. The American Heart Association says that 88 percent of cardiac arrests occur at home. In addition, the American Stroke Association states that EMS is the first medical contact for more than half of all patients who have a stroke. For best outcomes, strokes must be treated within three hours of symptom onset. A recent three-year data analysis also found that stroke patients brought in by EMS were twice as likely to receive a timely CT scan. With FAST recognition of symptoms in the field and appropriate medical intervention, stroke patients can have positive outcomes.

Does anybody really care about EMS?

Right now, it appears that nobody is answering the call from EMS. We assume in the world of national terrorism, natural disasters, and health care reform that the federal government is providing funding to care for our emergencies. Gage County has not had extra emphasis in providing funding for EMS. Small villages have very limited budgets to provide for this, nor any legal responsibility. To add to the dilemma, private donations have fallen over the past 20 years as rural families become more cash-strapped themselves.

It has become increasingly more difficult to find volunteers to provide emergency medical services as they

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Out of the darkness: the Evolution of EMS and the EMS Subspecialty *(continued)*

Training Pathway Eligibility

- Successful completion of an ACGME accredited fellowship in Emergency Medical Services

There are currently 29 accredited fellowship programs in EMS with more in the pipeline for 2014-15.

EMS certification is valid for 10 years and is attained by passing a written exam based on The Core Content of EMS which was developed by the EMS Examination Task Force of ABEM. The Core Content defines the content for the 2013 initial certification examination for the ABEM Subspecialty of EMS medicine.

One Nebraska physician is currently training in an accredited EMS fellowship program while another has achieved certification through the practice pathway.

Dr. Eric Ernest attended the Creighton University EMS education program receiving a BSEMS degree. He then attended Creighton University School of Medicine and completed an Emergency Medicine residency at the University of Nebraska Medical Center in 2013. Staying true to his EMS roots, he will complete a one year EMS fellowship in June 2014. Dr. Ernest plans to return to UNMC as faculty as the first EMS fellowship trained physician in the state of Nebraska and plans to become involved in local EMS medical direction. He will sit for the next EMS certification exam tentatively scheduled in 2015.

Dr. Tim Larsen has been on faculty in the Department of Emergency Medicine at UNMC for the last 13 years. He assumed the position of medical director of LifeNet of the Heartland, an Air Methods community-based air medical transport service in 2005. Staying true to his commitment to EMS, he decided to follow the clinical pathway to EMS certification. He took the examination in October 2013 and is now the first EMS board-certified physician in the state of Nebraska.

EMS has come of age: out of the darkness and into the light! Please join me in welcoming the newest subspecialty in EM and those trailblazing physicians who are following the pathway of EMS certification. □

Caring for Myocardial Infarction before the patient arrives at your hospital *(continued)*

activate a STEMI system where they operate.

- Nebraska also allows for basic EMTs to collect prehospital 12 Lead ECGs. These ECGs are sent elsewhere for interpretation.
- We have arranged for grants and money to give rescue services 12 lead equipment and training to accomplish this. If you have a rescue service in your area that is progressive and wants to learn how to help your community by collecting prehospital ECGs, have them contact the EMS office.
- The office of EMS is educating Critical Access Hospitals on the importance of allowing direct transfer of patients to PCI centers. Bypassing local facilities with ALS transport has been shown to improve outcomes in cardiac care.[8]
- It is important for Critical Access Hospitals that do receive STEMI patients to make sure they are "in and out" of your hospital in less than 30 minutes. Diagnosis is on the ECG alone. Drawing labs is allowable, but the patient should be sent ahead of the results of those labs.
- Hospitals, physician, and rescue services should develop regionalized plans that allow for the best use of the resources in their particular area.

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Evolution in Cardiac Arrest Care *(continued)*

arrest. For example, therapeutic hypothermia has been shown in a number of studies to improve survival in cardiac arrest. However, the research has not been able to answer: how cold, how long to keep the patient cold, how soon does the cooling need to be started, what method of cooling is superior, and who should/should not be cooled? Communities across the country are putting substantial effort into attempts to improve survival amongst their citizens. Public, hands-only CPR campaigns have occurred in Lincoln, Neb., as well as a number of other communities across the country. By the end of 2014, the city of Lincoln will be participating in the PulsePoint program. PulsePoint is a mobile phone app that alerts CPR trained individuals that a person nearby may be in cardiac arrest. The alert is sent out along with dispatch of EMS. The alert includes the location of the patient in cardiac arrest as well as the location of the closest public access defibrillator. This has the potential to increase the percentage of patients receiving bystander CPR as well as decrease the time to first defibrillation.

For the first time in 50 years of CPR and measuring survival numbers, we are beginning to see an increase in survival from out-of-hospital cardiac arrest. There is substantial variation in survival by community. Seattle, Wash., had a 57 percent survival rate for out-of-hospital witnessed v-fib cardiac arrests in the year 2012. Tragically, there are major metropolitan areas that have survival rates less than a tenth of that. Witnessed v-fib cardiac arrest is a survivable disease. As we move forward, we physicians need to be vocal leaders in our communities to champion efforts to improve survival for our fellow citizens, neighbors, friends, and family members. □

Air Medical Transport *(continued)*

protocols to direct care and only resort to online medical control when protocols have been exhausted. Some programs have full-time, on-site medical directors with pertinent backgrounds (Emergency Medicine) while others are available by cell phone. The medical director oversees and is responsible for the quality of medical care provided by the transport team. This includes ensuring continuing medical education and competency of the flight crew along with regular reviews of the policies and patient care protocols used to direct the crew in providing state-of-the-art care.

After a spike in air ambulance crashes in the U.S. in the 1990s, the U.S. government and the Commission on Accreditation of Air Medical Services, (CAAMS), now known as the Commission on Accreditation of Medical Transport Systems (CAMTS), stepped up the air ambulance flight requirements, ensuring that all pilots, personnel, and aircraft meet much higher standards. This accreditation is still voluntary, but it displays to potential customers and patients the willingness to meet the standards of excellence in patient care and safety of the transport environment.

Air medical services should seek to develop and maintain good professional relationships with all EMS agencies within their service area. In many systems, EMTs or paramedics are empowered with the ability to request a helicopter for scene response. Rural populations are unique in that they have limited access to the lifesaving specialized care common to urban areas. Geographic and financial limitations severely hinder the ability of rural communities to provide the equipment, personnel and training necessary to deliver optimal prehospital care. AMT delivers Advanced Life Support services to the patient which enhances prehospital survival. The operating range and speed of AMT systems optimizes the efficiency of rural caregivers. Inter-hospital cooperation is enhanced as the transport team promotes education, skill retention, and camaraderie among participants. The impact of rural AMT and the cost efficiency of care cannot be overlooked. Improvements in cost containment will be seen as patients obtain care faster, reducing the amount of specialized procedures performed, and decreasing the length of stay. □

Exploring the use of paramedics to aid in reducing hospital readmissions *(continued)*

step in the right direction and believe that the work needs to continue. New concepts are already being discussed such as a primary provider clinic case manager to communicate with the paramedics regarding needs as well as to conduct phone calls to the patients identified at risk after the home visits are concluded. Carrying this concept out to rural communities is also being discussed. Traditional models of care are not adequate for patients with complex needs. In rural areas where provider shortages exist and patients often travel 30 miles or up to two hours to see their primary provider, creative solutions need to be explored.

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Gage County EMS is calling 911… the challenges facing rural EMS *(continued)*

travel outside their community for jobs. The requirements for training also add a burden as citizens try to find a balance of time.

What does the future hold for EMS?

As previously stated, funding from Gage County will discontinue for 2014, and there are no future plans for receiving federal grant funding for Gage County EMS. There are committed volunteers currently involved in this issue, but their future involvement may be tenuous if the population sees no value in EMS. The federal health care changes largely ignore funding for EMS and are instead focusing on individual coverage for health care.

There is a state statute that delegates a responsibility to have fire protection available. Your home owner's insurance is affected by such quality, but there is no such thing for medical protection. Maybe new legislation is needed.

It is the intent of this article to bring awareness to this issue. We want to continue to provide EMS in Gage County into the future. We do make a difference and are proud of our results. We, along with other EMS squads across the state, need the continued support from our local communities, counties, and the State of Nebraska for a reliable source of stable funding. The State of Nebraska has heard the concerns and the idea of a county-wide department for such services is an idea that was brought forth. There is no such change in the works, however. We realize, of course, that Gage County is not the only county experiencing these issues. This is a statewide, if not nationwide, issue and solutions need to be brought forth and implemented for the good of all Nebraskans. □

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Tips for Talking to Your Children about Money

by Ross Polking
Provided by the Foster Group

Having a conversation with your kids about finances is no easy task, but it is important to educate your children on effective money management.

The importance of teaching such skills to children was most recently substantiated by a 2013 survey conducted by Junior Achievement. The results showed that teens who feel that they will be able to support themselves without parental assistance between the ages of 18 and 24 declined to 59 percent in 2013, noticeably down from 75 percent in 2011. Some of this is a result of general economic conditions and the challenging job-market. Other causes, though, certainly could be found in the lack of financial acumen within our younger generations. Hard lessons are being learned more and more as kids transition off of mom and dad's payroll.

Equipping children to better understand and manage financial resources should start early and be done with patience and persistence. With a few simple steps, you may be able to give your kids an age-appropriate understanding of how money is used and why properly managing finances is necessary. Some considerations to make in establishing your financial "curriculum":

- Start early. Talking with a 4-year-old about the intricacies of mutual funds may be a fruitless venture, but that doesn't mean you can't teach your kids about income and expenses and the need to save. As they get older, you will be able to move on to more complicated topics such as taxes, insurance and retirement.
- Give them an allowance. Allowances can give your kids a concept of how finite money can be. This provides them with the experience of seeing money dwindle or accrue based upon their handling of it.
- Set up a budget. Help them create a budget. For instance, you can allow them to spend a certain amount of their money on entertainment, but the remaining amount should be set aside for savings and charity.
- Pay them. Consider paying your kids for at least one of their chores to show your children that money is not free and comes in exchange for hard work. In that same vein, once your kids start driving, it's a good idea to remind them that gas isn't free. There are few faster ways to teach the importance of being conservative with money and resources than to have your kids start paying at the pump each time they take the car out for a spin.
- Open checking & savings accounts. Help them create vehicles to facilitate their spending and saving. Walk them through how to balance a checkbook, the benefit of earning interest, and to be mindful of service charges and fees where applicable.
- Set the example. Put theory into practice by showing your children your own money-saving strategies at work. Take them grocery shopping with you and stick to a strict list to demonstrate successful budgeting.
- Talk often. Speaking with your kids about money is not a one-time discussion. They need guidance throughout their lifetime, even after they are adults themselves. Be an open ear for their concerns and offer advice when necessary.

The more prepared and educated your children are on managing their own piggy bank, the better their chances of making sound financial decisions. Not to mention fewer calls to mom and dad for money!

The information and material provided in this article is for informational purposes and is intended to be educational in nature. We recommend that individuals consult with a professional advisor familiar with their particular situation for advice concerning specific investment, accounting, tax, and legal matters before taking any action. □

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