



CENTRAL IOWA EMS DIRECTORS Synergy

Fall 2015

BRIDGING THE
GAP BETWEEN
HOSPITALS
AND EMS



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Synergy*

UnityPoint Health Des Moines is dedicated to assisting EMS provide the best care for every patient every time. We are proud to collaborate and work side by side with our EMS partners 24/7.

With a brand new Emergency and Trauma Center under construction, all phases are designed to help our network of emergency providers do their jobs with as little hassle and deviation from process as possible.

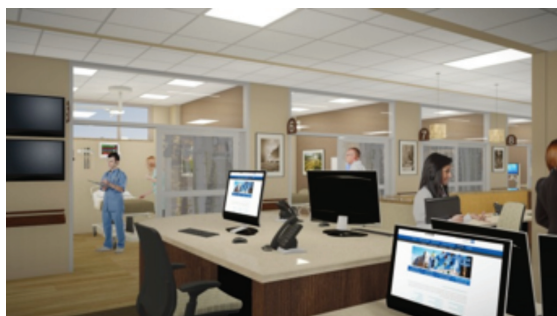
We appreciate your patience. Your input has driven many key decisions regarding design and implementation of the new project. Stay tuned to CIEMSD Facebook for important information and new updates. 2016 will be an exciting year and we look forward to continued partnership and mutual success.



EMS week 2015



Rendering of new ED/Trauma Center



Rendering of new ED/Trauma Center



New ambulance bay floor in place

Introducing The Metro STEMI Task Force

This unique task force is administered by the Central Iowa EMS Directors. Initiated in early 2014, this task force brought together all entities caring for and seeking to improve the patient outcomes of patients with ST elevation myocardial infarctions. Current task force members include Central Iowa EMS Directors Association, Broadlawns Medical Center, Mercy Hospital Medical Center, UnityPoint Health (Methodist, Lutheran and West), Iowa Heart, UnityPoint Health Cardiology, and Iowa Clinic Cardiology.

Since August 2014, EMS agencies transporting STEMI alert patients to Des Moines metro area hospitals have been asked to complete a STEMI Data Tag. This tag stays with the STEMI patient and the contents become part of the Electronic medical record. Data from the tags is entered into the action registry for Mission Life Line allowing for valuable insight regarding performance measures which will hopefully lead to improved outcomes for STEMI patients. Better data collection methods, standardized protocols, processes and educational materials have been developed through collaborative member efforts since task force inception.

Other benefits of STEMI tag completion have been increased access to patient follow up for QA/QI purposes and increased cooperation between all members of the metro cardiac medical community.

The Data Tag project has now been active since August 2014. The first 12 month's data shows that 175 STEMI alerts have been initiated at Des Moines metro hospitals by EMS. 75 tags have been utilized by EMS for a 43% compliance rate. It is the goal that a Data tag will be completed on ALL STEMI patients.

For complete STEMI data results – see www.CIEMSD.org

If your department needs additional information on the Metro STEMI Task force please contact

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Visit us on the web at www.CIEMSD.org

TO IMMOBILIZE OR NOT?

By Brian Helland, Assistant Chief-EMS, Clive Fire Department

EMS is at a crossroads. This statement is becoming trite – we see it everywhere with new changes in EMS funding, CMS rules, IHI's Triple Aim, and value based organizations. It is also accurate when describing changes in our current practice of immobilization.

We find a subtle difference in “evidence based medicine” vs. “evidence driven medicine.” However, that subtle gray area is where EMS providers live. Much of what we do in our out of hospital EMS practice has been handed down to us from the medical providers in hospitals and teaching institutions, and we apply that science in an environment where it has not yet been tested. Spinal immobilization is one of those practices.

Spinal immobilization is based on the same practice we use for other orthopedic injuries. A deformity in a bone is best handled by immobilizing the joint above and below the affected bone; an injury at a joint is best handled by immobilizing the bone above and below the affected joint. In the context of the spine, we are attempting to immobilize the 33 bones and interspaced joints using a single long splint to prevent movement and possible further injury.

We now have evidence on both sides of the issue of spinal immobilization in the out of hospital setting. Some studies promote a good clinical exam showing a high reliability to find spinal injuries. Some studies show an increase in pain and pressure sores for people who are immobilized for various periods of time. However the evidence is not considered “high level” meaning there are no randomized controlled trials testing our treatment against a control or standard.

On the conservative side of the argument: The standard of care has been established. One of the first recorded issues of a secondary spinal cord injury comes from Dr. Geisler in 1966 who claimed that rough handling by those performing first aid was the causative factor in at least 2 of 29 cases of delayed spinal cord injuries. His argument was not supported by anything other than his opinion, but people listened.

In 1971, the American Academy of Orthopedic Surgeons wrote the first EMT textbook. They cautioned EMTs about the importance of immobilizing spinal injuries to prevent flexion, extension, and twisting movements during patient handling and transport.

Over the next 30 years, EMS educators, medical directors, system developers, and supervisors perpetuated this treatment modality until it has become the standard of care to immobilize anyone who has the

potential for a spinal injury.

Changing a standard of care in our current environment of evidence based medicine will be difficult if we must rely on randomized controlled trials. These trials are very difficult and costly to perform in the out of hospital environment, so we must use what evidence we have to drive our care. Interpreting available evidence and applying it to a different setting can be fraught with problems and risk of unknown consequences. If immobilization doesn't cost anything and causes no harm, then our current practice would still be a prudent approach.

Arguments for change:

Spinal immobilization has never been shown to be effective. If we were discussing implementing spinal immobilization as a new treatment, it would never pass the evidence test as there are no randomized controlled trials showing its efficacy. In short, if the backboard had not been invented, it would not be invented in the future.

Several studies do show there is potential harm in immobilization on a long spine board. Pressure sores develop over bony prominences. In patients who are malnourished or have decreased healing abilities (much of our older population) these sores can progress to ulcerations, can become infected and result in sepsis. This is an increase in morbidity and could conceivably increase mortality as well.

A group of healthy volunteers were given pulmonary function tests. They were then immobilized on long spine boards using our contemporary techniques, and the pulmonary function tests were repeated. Pulmonary function was impaired among all the test subjects. Once again, this is weak evidence, however extrapolate this to a pt. with a pulmonary contusion or a pneumothorax, and it seems self-evident that immobilization would likely cause harm.

We do have some stronger evidence for change. The National Emergency X-Radiographic Utilization study (NEXUS) looked at using clinical exam findings to determine if ED physicians needed to order c-spine films of patients with potential neck and spine injuries. Over 34,000 patients were enrolled though several trauma centers. Uniform criteria were used to assess the patients, and then x-rays were performed. Only eight patients had cervical spine injuries that were missed, and only two of those were clinically significant.

Can this translate into assessment based immobilization in the out-of-hospital environment? Several states and EMS

agencies have implemented the NEXUS criteria for assessment based immobilization protocols since it was introduced in Maine in 2002. It would take an exhaustive literature search to determine if there have been any patients who experienced bad outcomes as a result, however with all the emphasis on assessment based immobilization in the past several year, common sense would dictate that any bad outcomes would have surfaced. Instead, we have position papers from the National Association of EMS Physicians and the American College of Surgeons, Committee on Trauma that both endorse the concept and practice of assessment based immobilization.

The end answer is this – do the research and make determinations for your service in conjunction with your medical director. EMS is a delegated practice in Iowa – this means we work under the license of our medical director. They need all the pieces of the puzzle to help make informed decisions. Change is difficult, especially when the risks are high. Work with your medical director to make the best decisions for your patients.

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Ebola/Infectious Disease Transport Teams in Iowa

By David Edgar

While Ebola is no longer a headline in the news, it is important that pre-hospital and emergency department staff understand the processes and teams put in place to handle a suspected Ebola patient or a patient with a highly contagious disease.

Last year, the Iowa Department of Public Health contracted with 5 EMS agencies within the State of Iowa to handle the transport of an infectious disease patient. Those teams have committed through the contract to train, equip and be available for the transport of these patients if requested by the Iowa Department of Public Health. The five teams are Medic EMS in Davenport, Area Ambulance Service in Cedar Rapids, West Des Moines EMS in Des Moines, AMR in Charles City and Mercy Ambulance in Des Moines.

The Iowa Department of Public Health felt that this was the best way to approach the need for specialized transport rather than trying to train and equip all EMS services in Iowa to complete these transports. In addition to the transport Services, Mercy Medical Center Des Moines and UnityPoint Health's Iowa Methodist Medical Center have contracted to be infectious disease monitoring hospitals. The University of Iowa has been identified as a longer-term treatment facility.

The Iowa Department of Public Health and County Public Health Departments work together with the Center for Disease Control to identify people coming into the country from areas of concern outside the United States. Once identified, the people are monitored for any potential signs or symptoms of Ebola. If a

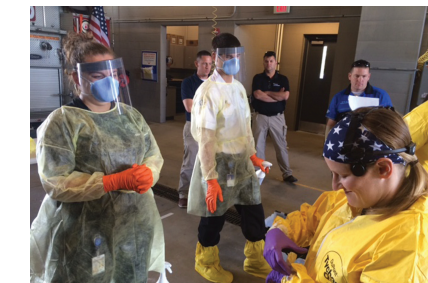


sign or symptom is identified they have specific instructions on whom to contact. If the IDPH determines that a patient needs to be transported to a monitoring facility for further testing then they will activate one of the transport teams to handle patient movement to the facility.

The transport teams have special procedures and equipment to safely transport these potential patients. If a team comes to your jurisdiction there will usually be a minimum of six personnel to properly facilitate a transport. Each person has a specific task with the process to ensure safety and proper treatment of the patient, medics and the public.

If a response team is called to transport a patient in your jurisdiction they will need assistance in a couple of areas. First, they will need to establish an area for donning protective equipment and making final preparations of the ambulance prior to going to the scene. Most likely this would be a fire or police station. Second, once they arrive at the scene a protective egress area will be taped off and no one should enter that area or assist in the loading of the patient. It will be important to keep other responders and the public out of this area. All patients will be treated, as infected and proper procedures will be followed even if the patient does not appear ill and is able to walk. In fact, most of these patients will not appear ill at all and the vast majority will not test positive for Ebola and will be released once the hospital receives the test results.

The threat of Ebola has greatly decreased as the disease becomes contained. Very few people in Iowa are being monitored. Many times the



question arises on what an EMS agency should do if they are called to an injury or medical emergency on a patient who is being monitored. The answer is that you treat them as you would any other patient with normal PPE. The fact that they are being monitored does not mean that they have the disease or any symptoms of the disease so they should be treated as any other patient. A patient who is being monitored has strict instructions on whom to call if they start running a temperature or have other Ebola symptoms.

The transport teams meet quarterly with IDPH, County Public Health Agencies, monitoring and treatment hospitals and other involved agencies to work through potential scenarios and create policies and operating procedures. While the Ebola concern is easing, the potential for other highly infectious diseases emerging is a reality so the teams will more than likely become permanent. If you would like additional information or a more in-depth presentation for your staff, feel free to contact me.

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Sepsis: 10 Things You Need to Know to Save Lives

Sepsis is the third leading cause of death in the United States [1], and survival depends on early recognition and treatment. Here are 10 things you need to know about sepsis to save lives:

1. **Sepsis is an overreaction to infection that can progress to shock.**

Sepsis is a body-wide inflammatory response to infection that injures tissues and organs. Harm from this immune response is often worse than damage from the actual infection. Sepsis can be triggered by relatively minor infections, and can continue after the invading microbes are neutralized.

Sepsis causes blood clots to form in the microvasculature, which inhibits oxygen delivery and causes vital organs to fail. Severe sepsis also causes systemic vasodilation and increased capillary permeability, which causes hypotension and fluid leakage out of the vascular space. This causes septic shock, which

further inhibits perfusion to vital organs. Forty percent of patients diagnosed with severe sepsis die.[1]

2. **Trauma...STEMI...stroke...SEPSIS ALERT!**

Like other conditions that prompt a team response in hospitals, management of sepsis requires multidisciplinary team members to deliver time-critical interventions. Several hospitals improved mortality from severe sepsis by over 50% since implementing sepsis teams and early goal-directed therapy. This includes door-to-treatment guidelines for lactate measurement to detect sepsis, administration of antibiotics to fight the infection, and fluid resuscitation for shock.[2]

Sepsis care teams work across the hospital and respond to the ED when a patient arrives. There is also a movement to direct severe sepsis patients to larger hospitals that offer comprehensive critical care services and care

for a high volume of sepsis patients. EMS recognition of severe sepsis, initiation of treatment, transport to the most appropriate facility, and early notification of the hospital can help patients receive treatment goals faster.

3. **Add a temperature to your vitals to find SIRS.**

Early identification of sepsis begins with assessing patients for systemic inflammatory response syndrome (SIRS), which is defined as a patient having two or more of the following:

- Pulse > 90
- Respiratory rate > 20
- Temperature > 38 C (100.4 F) or < 36 C (96.8 F)
- Elevated white blood cell count (generally tested in hospital)

Identifying SIRS requires a temperature to be taken with vital signs; which is done on every patient in the hospital, but is less common in EMS. Either a fever or documented

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Sepsis: 10 Things You Need to Know to Save Lives Continued

hypothermia (temp < 36 C) with other reported assessment findings may prompt a sepsis response that affects the patient's entire hospital course.

4. Consider the many sources of sepsis.

A sepsis diagnosis is defined as a patient with SIRS criteria and a source of infection. Begin a search for one after assessing the patient's temperature and vital signs. Medical causes of infection include pneumonia, urinary tract infections, meningitis, abdominal infections, ear infections (primarily in children), and recent surgery.

Sepsis can also be caused by skin abscesses, infected wounds - even from minor scrapes and cuts - and bedsores. Indwelling medical devices, such as dialysis shunts, urinary catheters, tracheostomies, central lines, and medication ports are also possible sources of infection. Another clue is a prescribed antibiotic; get familiar with what these medications are and inquire why the patient is taking it.

5. Lactate may be the new 12-lead.

Prehospital 12-lead ECG's improve mortality for STEMI patients by identifying patients who need immediate reperfusion therapy and reducing the time to definitive care in the hospital. In severe sepsis, lactic acid is released into the bloodstream as hypoxic tissues use anaerobic metabolism for energy. This can be detected with a point-of-care lactate reading, which is above 4 mmol/L in severe sepsis. Some EMS services have adopted lactate meters and protocols to activate a team in the hospital.

An elevated lactate is not specific for sepsis; any cause of shock will increase it, as well as seizures and endurance athletic training. A lactate level may even be normal in advanced stages of sepsis because the compensatory mechanisms producing it have failed. If available, incorporate a lactate reading into other assessment findings.

6. End-tidal CO₂ may also help detect severe sepsis.

Tissue hypoxia in sepsis triggers an increased respiratory rate, but micro clots and hypotension impair blood flow back to the lungs to excrete waste products. Therefore, patients with severe sepsis may have an elevated respiratory rate with a low end-tidal CO₂ reading. These waste products then accumulate in the blood, one of them being lactate. One study found that an end-tidal CO₂ (ETCO₂) reading < 25 mmHG with two or more signs of SIRS correlated with a lactate reading above 4 mmol/L and suggests severe sepsis.[3]

There are other causes of a low ETCO₂ reading besides severe sepsis, including hemorrhagic shock and respiratory alkalosis from hyperventilation syndrome (patients having a panic attack are likely to have an elevated pulse and respiratory rate as well). Consider ETCO₂ findings along with other assessment findings for SIRS and a source of infection.

7. Septic patients can be sicker than they look.

Tissue hypoxia and organ failure in sepsis

can begin before hypotension, and patients may look relatively well during that time. Known as "cryptic shock," these patients are at greater risk of delayed treatment, and by the time they decompensate it is often too late. The key is identifying those patients and initiating aggressive treatment before they develop hypotension and begin to look sick.

8. Sepsis does not discriminate based on age or health status.

Sepsis is most common in the elderly and immunocompromised, such as those with HIV, hepatitis, organ transplants, on chemotherapy, or taking steroids. However, it can affect healthy children and young adults from minor illnesses and injuries. Approximately 42,000 children in the United States develop severe sepsis each year, and 4,400 of them die.[1]

Young and previously healthy people are at a higher risk than elderly people for post-sepsis syndrome, which includes amputations, organ dysfunction, cognitive impairment, debilitating muscle and joint pain, fatigue, and PTSD.[1] Be on the lookout for signs of sepsis in younger patients, as well as provider complacency while assessing them.

9. Fill the tank and shrink the tank.

Administer IV fluids (in the absence of pulmonary edema) to patients with suspected sepsis, even if they are normotensive. Start with a 20 mL/kg bolus, and administer up to two liters of normal saline or lactated ringers. Systemic vasodilation may be lurking, and it is important to increase fluid volume before that occurs.

One of the characteristics of septic shock is hypotension that does not improve with IV fluid. A vasopressor is indicated to constrict peripheral blood vessels and reduce fluid leakage out of the vasculature. It is important to remember that vasopressors are a last resort. However, if they are needed, Norepinephrine (Levophed) is the preferred vasopressor for septic shock[2], but Dopamine is more commonly used by EMS. Anticipate the need and calculate an infusion rate for a vasopressor in any hypotensive septic patient.

10. Early antibiotics - in the field?

Early antibiotics are another time-sensitive treatment for sepsis, and the goal is to administer them within one hour of arrival at the hospital. Some critical care transport teams have added antibiotics to initiate during inter-facility transfers, and other services have investigated the feasibility and safety of implementing them on ground ambulances.[4] Early studies look promising, and antibiotics may soon be another tool for EMS to save lives of severe sepsis patients.

References:

[1] Sepsis Alliance. *What is Sepsis?* Retrieved from: <http://www.sepsisalliance.org>

[2] Dellinger RP. *Surviving sepsis campaign: International guidelines for management of severe sepsis and septic shock: 2012*. *Critical Care Medicine*. 2013;41(2):580-637.

[3] Hunter CL, Silvestri S, Dean M, et al. *End-tidal carbon dioxide is associated with lactate levels and mortality in emergency department patients with suspected sepsis*. *American Journal of Emergency Medicine*. 2013;31(1):64-71.

[4] Mayfield TR, Meyers M, Mackie J. *Abstract: Incidence of Adverse Reactions to Initial Antibiotic Administration in Severe Sepsis Patients*. <https://www.cpc.mednet.ucla.edu/pcrf/abstracts/Preview.asp?AbstractID=1386&action=preview>



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Central Iowa Emergency Medical Service Director's Association Facebook Site



In 2014 CIEMSD launched our Facebook Page. Our goal with the page was to provide a central place to disseminate information to providers in the Central Iowa area. We have encouraged all those involved in the care of patients in the pre-hospital and hospital setting to like our page. We currently have 358 page likes on our site with our largest post reached out to over 5,000 people through shares.

We have been testing different types of posts to the site and it appears the most popular are those related to EMS in the news and areas of education to improve services. Our plans for the future are to potentially make this Synergy Newsletter available through the Facebook site rather than printing and sending out through the mail.

We would like to continue to see people follow the page and increase our likes to above 500. In addition to EMS providers, we would like to see more hospital staff following. We believe this will be a good way to educate everyone on current issues, policies, equipment and other ways that will help to provide better patient care and working relationships.

Please encourage those you might know in the healthcare field to like our page. We would also be interested if there are some additional items you would like to see on the site or if you would like to provide feedback.