



# CENTRAL IOWA EMS DIRECTORS Synergy

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BRIDGING THE  
GAP BETWEEN  
HOSPITALS  
AND EMS

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## Transporting Children Safely

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According to NHTSA and EMSC, six million children are transported in ambulances each year in the United States. According to the American Ambulance Association, 10,000 ambulance crashes occur every year that cause death or injury. Statistics show that one fatality occurs for every 100 crashes. EMS personnel have a fatality rate almost twice that of law enforcement employees.

The Centers for Disease Control (CDC) and Emergency Medical Services for Children (EMSC) provide general recommendations for transportation of children in an ambulance. However, research is limited regarding crash dynamics in an ambulance. There are currently NO Federal Motor Vehicle Safety Standards for the patient compartment of an ambulance for a child restraint.

In 2009, the National Highway Traffic Safety Administration (NHTSA) assembled a work group to evaluate EMS transport practices and make recommendations.

This workgroup conducted a literature review, described the problem, reviewed previous transportation guidelines, and drafted recommendations. The recommendations included: to prevention forward motion/ejection, secure the torso and protect the head, neck and spine of all children transported in emergency ground ambulances. The guidelines are in DRAFT form and are available to review



at: <http://www.nhtsa.gov/staticfiles/nti/ems/pdf/EMSconference05aug2010.pdf>. Achieving these goals will greatly improve the transportation of children from a crash or during a medical emergency.

To achieve these goals, the following should be followed:

- ALL ambulance occupants should use seatbelt or restraint devices
- Movable equipment should be secured.
- Driver screening and selection should be guided by the state's EMS personnel policies.
- Training that includes hands-on emergency ground ambulance operation instruction, monitoring of driving practices through use of technology and other means.
- Use of principles of emergency medical dispatching to determine resource and response modalities and methods to reduce the unnecessary use of emergency lights and sirens.

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# Journey Through The Iowa Trauma System

The Iowa trauma system was implemented on January 1, 2001 and is unique in that it is a comprehensive, inclusive system with urban and rural components. Iowa's trauma system is comprised of EMS personnel, hospitals, trauma nurse coordinators, trauma registries, Trauma System Advisory Council (TSAC) and System Evaluation Quality Improvement Committee (SEQIC) that function in an organized, coordinated manner.

This comprehensive trauma system enacted many important state-wide changes in our trauma system, including EMS and inter-hospital transfer protocols, trauma level designation for all Iowa acute care facilities based upon hospital capabilities, advanced trauma life support training at each hospital, and a statewide registry. Trauma system implementation has improved the structure of the trauma education and triage criteria, the process of care and resulted in improved outcomes, especially in the most severely injured patients.

With all this implementation, one might still wonder what really happens on both sides of the trauma patient's journey through the trauma system.

One story can illustrate many of the important decisions that help ensure the best possible outcome for the injured patient.

Prehospital personnel must act within their scope of practice and make quick decisions based on patient status, mechanism of injury and distance to nearest hospital offering the highest level of care to the trauma patient. First responder units and Basic level EMS units must quickly call for advanced level care for transport. Those medics responding must triage the injured patients rapidly and begin to provide all necessary treatment while en route to the most appropriate trauma care facility for definitive care.

**For example:** an incoming paramedic squad gives the trauma center the following report.

"We are inbound with a 25 min. estimated time of arrival. 35 year old female involved in a single car rollover at highway speed. Pt. trapped with 25 minute extrication time. Suspected injuries include chest, femur and pelvis. Vital signs: blood pressure 80/palpation, heart rate 130, respiratory rate 36, Pulse ox 92% on non-rebreather at 15 liters/min, glasgow coma scale 15, IV line x 1, Long back board and c-collar in place. Pain meds: fentanyl 50 mcg IV. 2nd patient was a 2 year old that was ejected and has been flown out by air medical helicopter. Requesting trauma alert"

It is often difficult for medics to decide whether to travel a shorter distance to a lower level of Trauma care facility or to take the additional time to transport to a higher level of trauma care. This adult patient was correctly transported 25 miles to the nearest Level 2 Trauma facility per Iowa Department of Public health/ Bureau of EMS/Iowa trauma system protocol. It states that the patient should be transported to a Level 1 or 2 Trauma Care Facility if within a 30 mile radius of the scene.

After receiving report, the hospital mobilizes their trauma team by activation of a preset pager group and overhead page. This team might include any or all of the following resources:

- ED personnel (nurses, paramedics and ED techs)
- Trauma Surgeon
- Surgery residents
- Radiology staff
- Respiratory therapist
- ED physician
- Chaplain or social worker
- Security
- Transport



The notification also goes out to the Operating Room, blood bank, and ICU charge nurse.

On arrival, the EMS crew will receive 30 seconds of silence for report. The care is transferred to the trauma team and assessment begins with initial interventions taken to preserve ABC's. Labs are drawn, radiology prepares the CT machine and OR prepares for possible emergent surgery. Blood bank delivers O negative blood units to the trauma bay just in case the patient needs an immediate transfusion due to blood loss.

The patient is placed on a portable monitor and transported to either CT or direct to surgery if needed. This patient will then be admitted to the surgical ICU and monitored by the trauma services team and specialists such as Neurosurgery, pharmacy, nutrition, orthopedics, rehabilitative medicine and care management.

EMS will receive a follow up report on all trauma alert patients in order to pass along patient outcome information and any needed correspondence regarding quality of care. This loop closure is essential to maintain the best outcome for current and future trauma patients.

Iowa's trauma system has been developed through evidence based research and maintains a dedication to the continuing education for all members of the system. The journey of a trauma patient is remarkably organized and efficient, but the hope still lies in the hands of the providers.

**From EMS to Hospital, they all make the difference!**

# Assessment Based Spinal Immobilization

## Protocol Spotlight

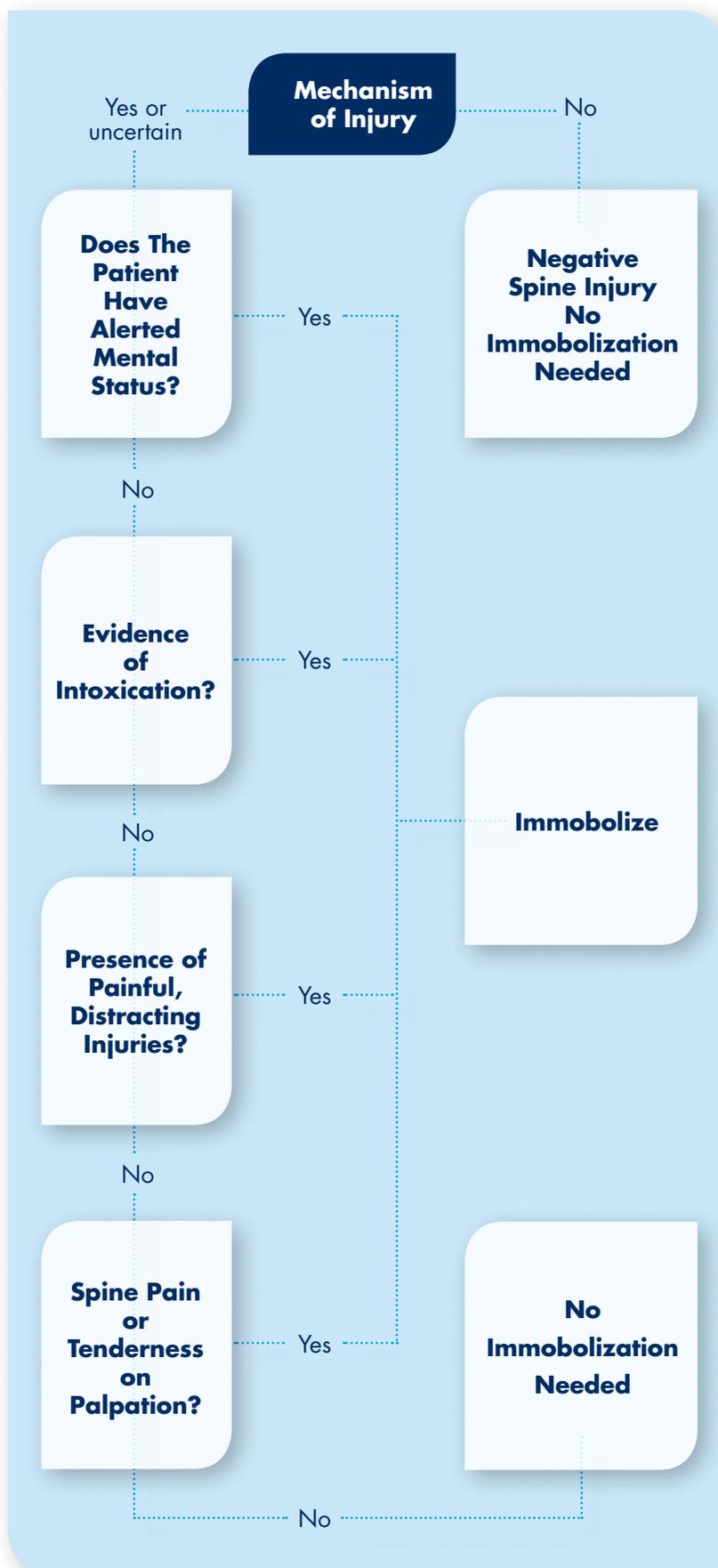
In 1999, the National Association of EMS Physicians published a position paper with respect to spinal immobilization in the pre-hospital environment. They identified that spinal immobilization at that time was based solely on the mechanism of injury. This led to everyone who suffered a ground level fall, minor motor vehicle crash, or bonk on the head in the swimming pool to be immobilized.

They further identified that spinal immobilization is not innocuous – there are some hazards to the procedure. Long term neurological sequelae have been reported after patients were immobilized for several hours waiting to be seen in busy emergency departments. There is also an added cost for those patients who develop pain as a result of immobilization, requiring the physician to do additional x-rays and tests to ensure that there is not a more severe underlying injury.

The protocol to the right is based on the National Emergency X-Radiography Utilization Study (NEXUS) that looked at 34,069 patients. Based on those findings, a protocol was developed to help providers identify those patients who should be immobilized. This protocol relies on 5 clinical criteria: normal alertness, absence of intoxication, absence of spinal tenderness, absence of focal neurological deficit, and absence of painful distracting injury.

Iowa is among several states that utilize selective immobilization criteria for EMS providers who are certified at the Paramedic Specialist level. Some medical directors have opted not to utilize this protocol, and still have their crews immobilize patients based on mechanism of injury. Some medical directors utilize a modified assessment based spinal immobilization protocol that accounts for age, past medical history (i.e. Down's Syndrome) or other factors.

In the protocol, painful distracting injuries include any injury that may prevent the patient from paying attention or giving a reliable exam for spinal pain. The exam for spinal tenderness must include hands-on assessment, looking for pain on palpation of the cervical spinous processes. Altered mental status also includes the inability to communicate from language barriers or any other circumstance that could result in an unreliable exam. Lastly, most protocols include the statement of “when in doubt, immobilize.”



## Ideally:

- Transport using a size-appropriate child restraint system that complies with FMVSS 213 in a vehicle other than a ground ambulance.
- Transport child in a size-appropriate child restraint system that complies with injury criteria of FMVSS 213—secured appropriately on a cot.
- Secure the child to a size-appropriate spine board and secure the spine board to the cot, head first, with a tether at the foot to prevent forward movement.
- If possible, for multiple patients, transport each as a single patient.
- For mother and newborn, transport the newborn in an approved size-appropriate child restraint system that complies with the injury criteria of FMVSS 213 in the rear facing EMS provider seat with a forward-facing belt path that prevents both lateral and forward movement, (convertible or integrated child restraint system and not an infant only seat) leaving the cot for the mother.

In summary, transporting children safely in a ground ambulance, raises many questions.

A place to start is in your own department. Include the service director, medical director and service employees

## and ask the following questions:

- Does your department have policies, just as you have airway protocols, that address the safe transportation of children, using the most current research?
- Has your department researched the demographics of the pediatric population in your area, to determine which restraints might be appropriate?
- Does your department identify types of child restraints that are approved and available at your facility?
- Has your department reviewed instruction manuals for restraint devices and cot devices?
- Does your department have policies addressing the cleaning and storage of such devices?
- Does your department train on the use of such devices?
- Does your department have access to Certified Car Seat Technicians to use as a resource?
- Has your department reviewed the NFPA's 1917 ambulance standards, and discarded the old "KKK" standards.

**This is an ever changing topic. Solutions to these problems will continue to emerge as more ambulance testing is done and more standards implemented. Stay informed.**

## State of the art EMS

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# CPR ASSIST DEVICES

**CPR** assist devices are becoming more common in the pre-hospital and hospital settings. These devices are designed to provide consistent chest compressions without interruption and provide better blood flow to heart and the brain during cardiac arrests; thus helping to improve patient outcomes.

When used these devices are able to free up staffing in the hospital and pre-hospital settings because multiple staff members are no longer needed for performing manual chest compression freeing up staff members to perform other important tasks, or respond to the next call for



help. These devices typically require minimal training to use and are easy to put on and take off.

These devices are either battery or aired power and can operate for up to an hour without having to have a battery changed.

Zoll makes a product called the Auto Pulse that uses a load distributing band that squeezes the entire chest to deliver compressions and maximize coronary perfusion.

Physio Control makes a product call the Lucas device. It uses a suction cup with pressure pad to deliver chest compressions and maximize coronary perfusion.

