# Precious Cargo: Securing And Transporting Pediatric Patients

by Jackie Stackhouse Leach

## EMT Objectives

After reading this article, the EMT will be able to:

- list the policies and procedures that EMS organizations should implement to ensure a safe transport for all patients, but especially pediatrics;
- identify ideal and acceptable methods for securing and transporting injured, ill, and uninjured pediatric patients;
- check for proper patient positioning in a Child Restraint System.

### Introduction

The guidelines in this article are taken from the National Highway Traffic Safety Administration (NHTSA) September 2012 Working Group Recommendations. NHTSA's working group is comprised of Children's Health, Medical, and Emergency Organizations and members from Federal agencies. Their best-practice recommendations were released to help ensure that America's children are safely transported in emergency ground ambulances.

According to some estimates, approximately 6.2 million patient transport ambulance trips occur annually, of which roughly ten percent of those patients are children. Insurance companies report that approximately 10,000 ambulance crashes result in injury or death annually, suggesting that up to 1,000 ambulance crashes involve pediatric patients each year.

The NHTSA 2012 Working Group reached consensus that safe transportation recommendations for children in ambulances must be reached. According to NHTSA's Fatality Analysis Reporting System (FARS) article published in 2006, from 1987-1997, 339 ambulance crashes were recorded and that resulted in 405 fatalities and 838 injuries. The injuries included passengers, drivers, other vehicles and their passengers. It also included pedestrians and bicyclists. It should be noted, though, that the FARs data does not capture crash information unless a crash results in a fatality; i.e., it does not include data on crashes in which only non-fatal injuries, or no injuries, were sustained.

### Working Group Recommendations

The NHTSA Working Group developed a set of recommendations to safely and appropriately transport children (injured, ill, or uninjured) from the scene of a crash or other emergency incidents in ground ambulances.

The most important recommendation was to *make everything as safe as*


*Child secure in seat, ready for transport*

*-continued from page 10*

***possible.*** It is important to note that safety for transporting a child in an ambulance starts with general operational policy and procedures that enhance ambulance safety for all occupants, regardless of age.

The group recommended that EMS professionals and their organizations implement operational policies and procedures that address the factors listed below:

1. seat belt and restraint use for ***all*** ambulance occupants all of the time;
2. securement of movable equipment;
3. maintaining and cleaning neonatal and child restraint seats and equipment per manufacturer's instructions;
4. following current pediatric standards of care for injured children;
5. driver screening and selection;
6. training that includes hands-on emergency ground ambulance operation instruction;
7. monitoring of driving practices through use of technology and other means;
8. use of principles of emergency medical dispatching to determine resource and response modalities; and
9. methods to reduce the unnecessary use of emergency lights and sirens (when transporting patients) when appropriate.

## Hypothetical Situations

As part of its best-practice recommendations for safely transporting children in ambulances, the NHTSA Working Group developed five hypothetical situations that emergency responders could reasonably encounter. Three of these five situations – with both an "Ideal" and "Second-Best" EMS response – are reproduced here. The Working Group suggests that all EMS systems use these recommendations to "pre-plan" for those situations and events where infants and children may be on the scene – as primary patients or not – so such events can be successfully mitigated. Pre-planning must also involve other public health, public safety and other partners to be most successful.

EMS personnel need to pre-plan for:

1. Injured or ill parents, guardians or caregivers who need to be transported to definitive care, with uninjured and well infants and/or children on the scene.
2. Events involving multiple patients who need to be transported. This may include a mother in labor or a parent/guardian and one or more newborns.

Addressing and planning for these situations in advance will better prepare EMS personnel. Regardless of what type of vehicle is used in these situations, an age/size-appropriate child restraint system that complies with FMVSS No. 213 must always be used. ***Generally speaking, when the number of patients exceeds the ability to provide adequate care with existing EMS personnel and emergency ground ambulances, or to secure child patients as described in the follow-***

*-continues on page 12*

### Situation #1

For a child who is uninjured/not ill* (accompanying an injured or ill patient). Consult manufacturers' guidelines to determine optimal orientation for the child restraint (i.e., rear-facing or forward-facing) depending on the age and size of the child.

**The Ideal:**

Transport the child in a vehicle other than an emergency ground ambulance using a size-appropriate child restraint system** that complies with FMVSS No. 213 *(see page 12).*

**If the Ideal Is Not Practical or Achievable:**

1. Transport the child in size-appropriate child restraint system that complies with FVMSS 213 appropriately installed in the front passenger seat (with airbags off if available) of the ambulance. ***Never*** place a rear-facing child restraint in front of an active air bag. -or-
2. Transport the child in a forward-facing EMS provider's seat/captain's chair in a size-appropriate child restraint system that complies with FVMSS 213. -or-
3. Transport the child in the rear-facing EMS provider's seat/captain's chair in a size-appropriate child restraint system that complies with FVMSS 213. This can be a convertible or combination seat using a forward-facing belt path. ***Do not use*** a rear-facing only seat in the rear-facing EMS provider's seat. You may also use an integrated child restraint system certified by the manufacturer to meet the injury criteria of FVMSS 213. -or-
4. If necessary, transport the ill or injured patient in the original emergency ground ambulance and leave the non-ill, non-injured child under appropriate adult supervision on scene. Transport the non-ill, non-injured child in an appropriate child restraint system that complies with FVMSS 213 to a hospital, residence or other location, in another appropriate vehicle.

*EMS providers are encouraged to check with equipment manufacturers for detailed information on the proper use and installation, results of crash testing, and possible limitations of any equipment that may be considered for use to fulfill the recommendations for the safe transportation of children in emergency ground ambulances.

**NHTSA's *Ease of Use Ratings* for child restraint systems (CRS) is a five-star ratings system that allows parents and caregivers to evaluate how easy certain CRS features are to use before purchasing a seat for their personal use in transporting a child. While the testing requirements and regulations do not include emergency ground ambulances, EMS agencies and providers may wish to review the *Ease of Use Ratings* materials available at *www.nhtsa.gov* when selecting CRS systems for use in emergency ground ambulances.

### Situation #2

For a child whose condition requires continuous and/or intensive medical monitoring and/or interventions.*

**The Ideal:**

Transport in a size-appropriate child restraint system that complies with the injury criteria of FMVSS No. 213 *(see page 12)* – secured appropriately on the cot.

**If the Ideal Is Not Practical or Achievable:**

Secure the child to the cot; head first, with three horizontal restraints across the torso (chest, waist, and knees) and one vertical restraint across each shoulder. If the child's condition requires medical interventions, which requires the removal of some restraints, the restraints should be re-secured as quickly as possible as soon as the interventions are completed and it is medically feasible to do so. In the best interest of the child and EMS personnel, the ambulance operator is urged to consider stopping the ambulance during the interventions.

-Continue to Situation #3 on page 12

*-continued from page 11*

*ing recommendations, EMS personnel need to request additional transportation resources that can respond in a timely manner.*

## The Pediatric Patient: Who's In Control?

As any EMT knows, being trained/prepared to secure and transport the pediatric patient is only half the battle; the other half is winning the trust and cooperation of these children under stressful circumstances. Most times, we are making quick decisions on how to transport a child.

If a child's own car seat is available and it is a convertible seat (i.e., two belt paths on the seat), in most cases it makes sense to use it. A child will be much more cooperative in their own seat, simply because it is more familiar. It also helps to allow the ambulatory child to get into the seat on his/her own, and to ask their help in buckling in. When pediatric patients believe they are important (just as adults), they feel more empowered. It may also help to distract them with equipment that they can hold and play with, such as a stethoscope or BP cuff.

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**Situation #3**

For a child or children requiring transport as part of a multiple patient transport (newborn with mother, multiple children, etc.). Consult child restraint manufacturers' guidelines to determine optimal orientation for the child restraint (e.e., rear-facing or forward-facing) depending on the age and size of the child.

**The Ideal:**

1. If possible, for multiple patients, transport each as a single patient according to the previous guidelines.
2. Transport in forward-facing EMS provider's seat/captain's chair in a size-appropriate child restraint system that complies with FMVSS No. 213 *(highlights of Standard below).*
3. For mother and newborn, transport the newborn in an approved size-appropriate child restraint system that complies with the injury criteria of FMVSS No. 213 in the rear-facing EMS provider's seat/captain's chair) that prevents both lateral and forward movement, leaving the cot for the mother. Use a convertible seat which has two belt paths. ***Do not use*** a rear-facing only seat in the rear-facing EMS provider's seat. You may also use an integrated child restraint system certified by the manufacturer to meet the injury criteria of FVMSS 213.

**PLEASE NOTE:** A child passenger, especially a newborn, must never be transported on an adult's lap. Newborns must always be transported in an appropriate child restraint system. Never allow anyone to hold a newborn during transport.

**If the Ideal Is Not Practical or Achievable:**

When available resources prevent meeting the criteria shown for the previous Situations for all child patients, transport using space available in a non-emergency mode, exercising extreme caution and driving at reduced (i.e., below legal maximum) speeds.

## Federal Motor Vehicle Safety Standard No. 213

### Highlights of the Regulation for Child Restraint Systems

- Covers all types of systems (infant carriers, child seats, harnesses, and car beds) to restrain children under 80 pounds in motor vehicles.
- Requires that child restraint systems pass a 30 mph frontal sled test, which simulates a crash.
- Specifies maximum rotation during crash test for rear-facing child restraints.
- Specifies limits on child dummy measurements for forward-facing child restraints:
  - Head injury criteria (potential brain injury resulting from abrupt deceleration). Does not apply in tests with 10-year-old dummy (65-80 lbs.).
  - Head excursion (distance dummy head travels forward)
  - Force on chest
  - Knee excursion
- Requires that restraints not break during dynamic tests.
- Requires that child restraints retain a child dummy within the confines of the restraint during crash tests.
- Specifies requirements for foam padding and flame-retardant fabric.
- Requires that safety seats pass the 30 mph test secured with vehicle lap belt or lower LATCH attachments only as well as a more stringent test for forward-facing restraints with a tether anchored. Exceptions: child harnesses and products for children with special needs may be tested with top tether straps anchored. Boosters are tested with a vehicle lap-shoulder belt.
- Specifies the amount of force needed to open buckles on child restraints, so that toddlers cannot unbuckle themselves but adults can easily open the buckle. (Before crash test, minimum force is nine lbs. and maximum is 14 lbs.; after crash test, maximum is 16 lbs.)
- Requires permanent, visible labels on the restraint with the following information: certification that it conforms to standards for use in motor vehicles, basic instructions for correct installation, child weight limits (including maximum weight for use of lower LATCH attachments), name and address of manufacturer/distributor, and date made. Air bag warning label required for rear-facing restraints. The restraint must have a designated location for storing the instruction booklet or sheet. An additional label may be present to state certification for use in aircraft.
- Permits child restraint systems to be designed as an integral part of motor vehicle seats.
- Requires that the manufacturer include a registration card with the child restraint and notify consumers of product recalls.
- Requires that child restraints include LATCH attachments. FMVSS 225 requires that vehicles have LATCH anchors (FMVSS 225).

***SafetyBeltSafe U.S.A.*** P.O. Box 553, Altadena, CA 91003
www.carseat.org 310/222-6860, 800/745-SAFE

# Properly Secured

There are dozens of Child Restraint Systems on the market, and all have their unique features. But more important than the particular model(s) your squad chooses to carry is its proper usage. There is no one-size-fits-all; proper usage depends on the size and weight of your pediatric patients, and the location in the ambulance where the seat is secured.

The photos on this page provide general guidance on proper usages. Riding members should be trained in the configurations of whatever system your squad uses.


**Forward Facing:** Car seat in the front of the ambulance, ***only forward-facing,*** using the seat belt for installation. Turn air bags ***off,*** if possible.

***Above*** ↑
**Overhead:** Generally, the top of the child's head should be at least an inch from the top of the car seat shell.

***Left*** ←
**No Pinching:** The harness straps should be snug to the child's chest. You should not be able to pinch any fabric at the top of the child's shoulders.

***Right*** →
**Points Of Reference:** The chest clip should be at the child's armpit level.


**Seat In A Seat:** This Diono model features an infant insert which assists in ensuring the harness fits the child at or below their shoulders.

**Two Paths:** Convertible car seat must have two belt paths to secure the car seat to the stretcher. There must be a label stating rear-facing belt path (blue stickers in this photo) and a label stating forward-facing belt path (red stickers). The stretcher seat belt will be threaded through these two belt paths (utilize the stretcher seat belt at the chest level and the seat belt at the hips level). Ensure the top of the stretcher is in an upright position.