Testing Child Restraint Devices for Ambulances

Project Summary

Problem Statement

With ambulance crash rates at least 2.5 times greater than that of an automobile, and an estimated 1.6 million children transported in ambulances annually in the United States, development and testing of crashworthy pediatric restraint devices for ambulances is long overdue.

Over the last ten years, federal research has led to dramatic improvements in emergency medical services (EMS) practitioner and adult patient safety when involved in an ambulance crash. These efforts resulted in the publication of ten new standards covering key components such as EMS practitioner seating, patient cot and cot retention system, cabinets, equipment mounts, and the ambulance body structure. These documents have been embraced by national standard setting bodies and state EMS regulators. Unfortunately, the safe transport of children (neonates, infants, toddlers, pre-teens) has not been addressed by any of these standards.

Without standards, state regulators and purchasers have no way to distinguish high-quality, safe, pediatric transport devices from those that are inadequate or even dangerous.

Just as there are specific standards for both child car and booster seats in a personal vehicle, standards are necessary to ensure the safety of devices used to transport children in ambulances, as children simply cannot be secured safely on an adult cot. Due to the unique transport needs of the pediatric population, the National Association of State EMS Officials (NASEMSO), along with national experts, recommends the creation of pediatric transport standards, which would address three ambulance transport scenarios based on patient size, illness and/or injury.

The Ask

Manufacture, testing, and licensing of an ambulance is not regulated by the federal government. The only available avenue to influence real change is through the consensus standards development process. NASEMSO's proposed methodology requires the active participation of ambulance manufacturers and their suppliers, pediatric transport device manufacturers, pediatric transport experts, emergency medical service (EMS) practitioners, and ***key government officials***. Currently, NASEMSO has support from over 50 organizations and private industry partners. Many of these partners would provide engineering and medical expertise to support standard development and validation testing. This proposal replicates the methodology used successfully in creation of adult safety standards for ambulance transport.

Approximately $2,200,000 is needed to complete this 5-year project.

Additional Information

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NASEMSO Safe Transport of Children in Ambulances Project Executive Summary:

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Frequently Asked Questions:

Why will this cost $2.2 million?

We anticipate this to be a five-year effort that includes development of three test methods (year 1), validation testing to refine and most importantly validate the soundness of the test method (years 2 and 3), and finally publication and adoption (years 4 and 5). More than 50% of the cost of this effort will be consumed during the full-scale test validation process (e.g. repeated testing at crash test facilities).

Why can't we use the adult standards and restraints?

The restraints used to secure an adult on a cot are simply too large to adequately restrain a child, just as adult automobile restraints are too large to safely restrain a child in a car. Given the size of a pediatric patient, specialty restraint systems or devices are required. These specialty restraint systems and devices will require unique testing protocols and pass/fail criteria, just as pediatric automobile seats require unique testing methods, test dummies, and pass/fail criteria.

Why weren't pediatric patients included in the original adult standards?

The original standard development program was focused on EMS practitioner safety during a crash. The testing focused on improving worker seating and requiring robust medical equipment mounts and secure cabinets to limit flying equipment and supplies.

Why can't we use personal vehicle car seat or booster seat standards?

Traditional car seats are anchored and tested on a fixed forward-facing seat to simulate the back-seating area of an automobile. Such seat and anchor systems do not exist in an ambulance. In fact, child car seat manufacturers have specifically recommended against using their devices in an ambulance for this reason. In addition, if an automobile car seat were used, it would limit the ability of the EMS practitioner to provide medical assistance to the pediatric patient.

How would product manufacturers participate?

Product manufacturers have agreed to participate on the standards development committees and to design and manufacture new, more robust products, as in-kind contributions to the effort. By the end of the effort, each manufacturer should have a product available that has been tested and meets a new standard. Through this process we will be able to accelerate the introduction of new, safer products to market.

Why do we have to test to develop new standards?

Testing is the process used to prove the new standard is written clearly and can be effectively used to evaluate the strength of each pediatric transport device. Without testing or "proving" the new standard to be useful and effective, we will not be able to achieve consensus nor will we be able to have the standard published by an accredited standards development organization.

Who would publish these standards?

We are proposing these three new standards be published by the Society of Automotive Engineers (SAE). The SAE published the original ten test standards described earlier. The SAE is aware of this proposed project and has indicated interest in working on this project.

What would be the end result of this project?

At the conclusion of this collaborative, cost-sharing effort, the project team should have a minimum of three new published test standards (patient transport modes listed above) and industry partners will have designed and tested new, safe, and more robust pediatric transport devices. Once each test method is published, manufacturers will be able to advertise that the products they have developed and tested meet a specific, industry accepted minimum testing requirement. Manufacturer test results, derived from the new consensus test methods, may then be used comparatively by prospective purchasers both nationally and internationally, as they strive to provide safe and effective transport options for their pediatric patients.