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MISUSE OF CHILD RESTRAINTS

Incorrect use of child restraints can lead to serious injury to the child in the event of a crash. A study conducted for the National Highway Traffic Safety Administration (NHTSA) in the mid 1990s found that four-out-of-five child restraints were being used incorrectly. A recently completed NHTSA-sponsored study updates that research.

Observing Critical CRS Misuse

The purpose of this study was to obtain a measure of misuse of child restraints among the general public. The study focused on forms of misuse that could reasonably be expected to raise the risk of injury to a child. These "critical misuses" were identified in a workshop attended by child passenger safety experts in fields of biomechanics, injury prevention, public health, child restraint system (CRS) manufacturing, and program implementation. The critical misuses were:

- age and weight appropriateness of CRS;
- direction of CRS;
- placement of CRS in relation to air bags;
- installation and secureness of CRS to the vehicle seat (tight safety belt);
- secureness/tightness of harness straps and crotch strap of the CRS;
- use of locking clip for certain vehicle safety belts;
- fit of vehicle safety belts across child in belt-positioning booster seat;
- defective or broken CRS elements.

Following training on field procedures and protocols, teams of observers checked the restraint use of children under 80 pounds in six States: Arizona, Florida, Mississippi, Missouri, Pennsylvania, and Washington. The communities serving as observation sites in the study covered a range of socio-demographic and economic characteristics. Local and community shopping centers were primary choices for sites. The data collection procedure involved intercepting potential target vehicles (driver with young child under 80 lbs), explaining the purpose of the study, asking permission to make observations, and directing the driver to a safe parking area if permission was received. The team then conducted the observation and recorded the information.

Restraint Use By Children

The study collected data on 5,527 children under 80 lbs in 4,126 vehicles. Most children (62.3 percent) were restrained in a CRS, but one-in-four (25.9 percent) was using a safety belt and another 11.8 percent were completely unrestrained. CRS use predominated among infants under 20 lbs (97.1 percent) and toddlers 20 to 39 lbs (86.4 percent), but fell sharply among children 40 to 59 lbs (41.7 percent) and 60 to 79 lbs (10.9 percent).

Frequency of Restraint Use by Restraint Type and Weight Category

Weight Category	Restraint Type			Total
	CRS	Safety Belt	Unrestrained	
< 20 lb	496 (97.1%)	1 (0.2%)	14 (2.7%)	511
20-39 lb	2,146 (86.4%)	157 (6.3%)	180 (7.2%)	2,483

Weight Category	Restraint Type			Total
	CRS	Safety Belt	Unrestrained	
40-59 lb	710 (41.7%)	735 (43.1%)	259 (15.2%)	1,704
60-79 lb	90 (10.9%)	538 (64.9%)	201 (24.2%)	829
Total	3,442 (62.3%)	1,431 (25.9%)	654 (11.8%)	5,527

The current study differed from its predecessor in the weight range of the children observed, with the earlier study looking at children under 60 lbs rather than under 80 lbs. When only those children under 60 lbs in the current study are compared to the children in the previous study, the results show a substantial increase in CRS use (from 50.6 to 71.5 percent) and decrease in safety belt use (from 36.6 to 19.0 percent).

The data indicated that children being unrestrained remains a serious problem. Almost one-in-four children 60 to 79 lbs (24.2 percent) and almost one-in-six children 40 to 59 lbs (15.2 percent) were not using any type of safety restraint. Some infants (2.7 percent) and toddlers (7.2 percent) were also unrestrained.

Critical CRS Misuse

Critical CRS misuse was observed for more than seven-in-ten CRSs (72.6 percent). The most common misuses were loose vehicle safety belt attachment to the CRS and loose harness straps securing the child to the CRS. Misuse was most common among child restraints designed for younger children: infant seats (83.9 percent), rear-facing convertible seats (83.5 percent), forward-facing convertible seats (81.9 percent), and forward-facing only seats (79.3 percent).

Percentage of CRSs Exhibiting Critical Misuses by CRS Type

CRS Type	Percentage	Number of CRSs
Infant Seats	83.9%	497 CRSs
Rear-Facing Convertible	83.5%	140 CRSs
Forward-Facing Convertible	81.9%	1,247 CRSs
Forward-Facing Only	79.3%	766 CRSs
Integrated Forward-Facing	63.6%	22 CRSs
Belt-positioning Booster	39.5%	664 CRSs
Shield Booster	60.5%	86 CRSs
Integrated Booster	42.9%	7 CRSs
Other Booster	20%	5 CRSs
Lap Top	0%	6 CRSs
Other Restraints	100%	2 CRSs

Age/fit inappropriateness was observed for 7.4 percent of infant seats, 7.1 percent of forward-facing convertible seats, 9.5 percent of forward-facing only seats, and 9.2 percent of belt-positioning boosters.

Other Child Restraint System Misuses

Visible damage (crack in the shell, broken harness parts, frayed harness straps, torn padding) was observed on 114 of the CRSs. An overextended CRS base (20 percent or more of base beyond vehicle seat) was observed for 80 of the CRSs.

Improperly Fitting Safety Belts

About one-fourth of the observed children under 80 lbs (25.9%) were not using a child restraint but were wearing a safety belt. In most cases, the safety belt did not fit correctly. Improper fit was observed for 69 percent of the children in lap/shoulder belt combinations, 70 percent of the children in lap-belt-only systems, and 88 percent of the children in shoulder-belt-only systems.

Driver Characteristics

Of the drivers observed for safety belt use, 77.4 percent were restrained. When the driver was wearing a safety belt, 91.7 percent of the children less than 80 lbs. were

restrained in either a CRS (44.2 percent) or safety belt (47.5 percent). When the driver was not wearing a safety belt, the percentage of children less than 80 lbs who were restrained dropped to 62.3 percent--43.2 percent in a CRS and 19.1 percent in a safety belt.

How To Order

For a copy of Misuse of Child Restraints (55 pages) prepared by TransAnalytics, LLC, write to the Office of Research and Technology, NHTSA, NTI-130, 400 Seventh Street, S.W., Washington, DC 20590 or send a fax to (202) 366-7096. Alan Block was the contract manager for this project.

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Washington, DC 20590

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1200 New Jersey Avenue, SE, West Building, Washington, DC 20590 USA 1-888-327-4236 TTY:1-800-424-9153

