

## Preventing Motor Vehicle Occupant Injuries in Children Ages 0-14

Research has shown that restraints such as lap/shoulder belts for adults, and car seats for children, reduce the rates of fatal and hospitalized injuries. In the U.S., an estimated 147,246 adults and 5,085 children were saved by safety belts or child restraints from 1975 to 2001.<sup>1</sup>

Effective motor vehicle injury prevention strategies should have a strong component of “the three Es” – education, enforcement and engineering. Recommendations for prevention strategies and best practices are described below:

### Specific Strategies for Reducing Motor Vehicle Injuries in Children Ages 0-14

The Task Force on Community Preventive Services, an independent, non-federal, public health group, completed an extensive review of evidence-based best practices.

Recommended interventions include: strong laws on child safety seats, primary safety belt use laws, and primary enforcement laws (see Box A); enhanced enforcement programs with community-wide information; and child safety seat distribution and incentive programs with education. There was insufficient evidence to recommend car seat education-only programs.<sup>4</sup>

([www.thecommunityguide.org](http://www.thecommunityguide.org)) Other reviews support the approach of strong laws and enhanced enforcement, in combination with focused education.<sup>5,6,7,8</sup>

Program evaluation is very important and should be included with the program development. Evaluation needs to include monitoring events completed and people contacted (Process Evaluation), as well as evaluating the behavior change due to the intervention program (Impact or Outcome Evaluation). Programs need to verify through observational surveys or written surveys that more children are using seatbelts and car seats. More information on evaluation is available through links at:

[www.cdphe.state.co.us/ps/bestpractices/usesincomm.html](http://www.cdphe.state.co.us/ps/bestpractices/usesincomm.html)

**A combination of the following strategies could be effective in reducing childhood injury and death as a result of motor vehicle crashes:**

- [Coalition Building](#)
- [Legislation and Enforcement](#)
- [Car Seat Distribution, Incentives and Education](#)
- [Car Seat and Booster Seat Checkpoints](#)
- [Car Seat and Seatbelt Public Awareness](#)
- [Health Care Provider Counseling](#)
- [Targeted Car Seat and Seatbelt Education](#)

#### Box A. Seatbelts, Child Restraints

- When correctly installed and used, child safety seats reduce the risk of death by up to 71 percent for infants and 54 percent for children ages 4 years and younger in passenger cars.<sup>2</sup>
- Children in booster seats (recommended for ages 4-8) were 59 percent less likely to be injured than those in seat belts only.<sup>3</sup> Colorado’s booster seat law covers children ages 4-6 and less than 55 inches tall and went into effect August 1, 2003. ([www.carseatscolorado.com](http://www.carseatscolorado.com))
- Seat belts are 45–60 percent effective in preventing fatal injuries. Airbags, combined with lap/shoulder safety belts, offer the most effective safety protection for adults.<sup>2</sup>

- [Child Care Facilities](#)
- [Children](#)
- [Parents/Caregivers](#)
- [All Drivers](#)

### Coalition Building

The strengths of a community-based, traffic safety coalition are the development of long-term programs, effective leadership, multi-agency collaboration, involvement of local partners and the ability to develop appropriate strategies for specific target group(s). More information on forming traffic safety coalitions is available at:

[www.nhtsa.dot.gov/safecommunities](http://www.nhtsa.dot.gov/safecommunities)

<http://ctb.ku.edu/tools/coalitions/index.jsp>

[www.opha.on.ca/resources/coalitions.pdf](http://www.opha.on.ca/resources/coalitions.pdf)

[www.nhtsa.dot.gov](http://www.nhtsa.dot.gov) (go to “search” and type in coalition building)

- Encourage the formation of coalitions or committees to address traffic safety in general and use of safety belts and car seats.
- Representatives would come from public health, law enforcement, hospitals and health care providers, parents/caregivers, child care centers, schools, injury prevention specialists, service organizations, insurance companies and others.
- Include municipal and private traffic safety engineers in the coalition. They can identify where crashes occur and work on engineering solutions to help prevent traffic crashes.

**Evaluation:** Track meetings held, record attendance, verify participation by diverse membership, and develop and monitor use of a coalition Action Plan.

### Legislation and Enforcement

The following are common legislation or enforcement tactics shown to be effective at increasing restraint use and decreasing motor vehicle injuries.

- Traffic safety laws regarding primary seatbelt enforcement
- Specific child restraint requirements
- Motorcycle helmet laws
- Graduated licensing laws
- Blood alcohol limits

Enhanced enforcement campaigns, most notably “Click It or Ticket” (CIOT), involve intensive and short duration traffic law enforcement efforts combined with paid and earned media. “Click It or Ticket” state programs have been effective in raising seatbelt and restraint use, particularly when the intensive enforcement is combined with defined periods of paid and earned media, specific enforcement messages, and observational surveys.<sup>13</sup>

- Through a traffic safety coalition, support stronger laws. Provide data and information to groups who are promoting stronger legislation

#### **Box B. Results of Motor-Vehicle Legislation**

- The implementation of a .08 BAC level state law has been associated with reductions in alcohol-related fatalities in at least 10 studies.<sup>9</sup>
- The average seat belt use rate in primary enforcement state is 78 percent. In secondary enforcement states (like Colorado), the average use rate is only 67 percent.<sup>10</sup>
- States with motorcycle helmet laws have a reduced incidence of motorcycle deaths and injuries.<sup>11</sup>
- States with graduated licensing programs have reported 5-31 percent reduction in crashes among teenagers.<sup>12</sup>

- regarding seatbelt, booster seat, graduated licensing, and impaired driving laws.
- Support local law enforcement efforts on increased enforcement of seatbelt and child safety seat laws, graduated licensing laws and impaired driving laws.
  - Help publicize enhanced seatbelt enforcement campaigns such as Click It or Ticket. ([www.dot.state.co.us/TrafficSafety/index.cfm](http://www.dot.state.co.us/TrafficSafety/index.cfm))
  - Work with local Colorado State Patrol offices to publicize the increased enforcement at their Targeted Road Patrols locations.
  - Help publicize the Colorado Booster Seat Law that went into effect August 1, 2003. ([www.carseatscolorado.com](http://www.carseatscolorado.com))
  - Coordinate with local law enforcement to help publicize enhanced DUI enforcement campaigns. ([www.dot.state.co.us/TrafficSafety/index.cfm](http://www.dot.state.co.us/TrafficSafety/index.cfm))
- Train law enforcement on proper car seat use. One study in Colorado found that police officers, provided with training on car seats, increased the number of citations issued.<sup>14</sup>
- With law enforcement, help develop alternative penalty programs such as waiving the fine if the driver purchases a safety seat or attends a child passenger safety violator class.

**Evaluation:** Track coalition publicity efforts and media outreach, track results of local enhanced enforcement efforts using seatbelt surveys. ([www.dot.state.us/TrafficSafety/Seatbelts/index.cfm](http://www.dot.state.us/TrafficSafety/Seatbelts/index.cfm)) When using written surveys, include questions about awareness of enforcement campaigns and the likelihood of being stopped for restraint violation.

#### Car Seat Distribution, Incentives and Education

Car seats save lives and health care dollars. A \$50 safety seat for a child on Medicaid, averaged over 4 years, is reported to save \$100 in medical costs and \$1,400 in preserved good health.<sup>15</sup>

- Develop car/booster seat distribution programs for low-income families. Programs should include parent/caregiver education on proper installation.
- Locate funds through local retailers, service organizations or grants to pay for free car seats or make seats available on a sliding fee scale.
- Contact local retailers to make them aware of the new Colorado Booster Seat Law and ask retailers to stock car seats and booster seats at a variety of prices.
- Provide incentives (trinkets, food coupons, movie tickets, etc.) to families using car/booster seats at locations such as child care centers, schools, health department, park and recreation activities and shopping centers.
- Consider purchasing car/booster seats in bulk from a local retailer or through a mail-order distributor. A sliding fee scale system can serve all residents and provide some funding for the program.

**Evaluation:** Collect information on number of seats distributed, locations, and demographics. Document the cost of a distribution program. Use an observational survey to document seat use. If using a written survey, ask where people got their car/booster seat.

**NOTE: The Task Force on Community Preventive Services review found there was insufficient evidence to recommend education-only programs. Therefore, the following strategies should be used in conjunction with the above proven strategies. One of the key components is the message of restraint use for ALL vehicle occupants. There is a strong relationship between restraint use of drivers and the restraint use of children. Restraint use is lower and injury rates are**

generally higher for youth over the age of 5, compared to the 0-4 age group that often receive most of the attention in traffic safety programs.

### (Background/Statistics)

#### Car Seat and Booster Seat Checkpoints

Many local health agencies and traffic safety coalitions participate in checkpoints to ensure that car/booster seats are installed and used properly. National studies report that 85 percent of child restraints are used incorrectly.<sup>16</sup>

The advantages of checkpoints are the ability to ensure a child is appropriately and correctly restrained and to provide one-on-one education. The disadvantages are the events are labor-intensive, and that checkpoints only impact the interested families who attend the checkpoint. Checkpoints, by themselves, may not be the most efficient and effective way to produce a community-wide increase in restraint use.

- Work with the local coalition to provide training to ensure an adequate number of certified technicians in your area.
- Participate in community-wide car seat checkpoints.
- Arrange for mini-checkpoints for specific groups such as Headstart, Migrant Health, child care facilities, etc.
- Check restraint use of all children present in the vehicle. For example, in Colorado Springs, 95 percent of the 4-8 year olds at checkpoints wearing seatbelts should have been in booster seats.<sup>17</sup>
- Include education about seatbelt use for older children and adults.

#### (Targeted Car Seat and Seatbelt Education)

**Evaluation:** Track number of children checked, seats distributed, and calculate misuse rates. Be cautious about using checkpoint forms or surveys done at checkpoints to evaluate your whole program. Misuse rates may not decrease over time when there is always a population of new parents struggling with car seats. For example, in Colorado Springs where the community-wide booster seat usage rate for 4-8 year olds increased from 7 to 37 percent, the misuse rate at checkpoints did not change.<sup>18</sup> Families who attend checkpoints may not represent the whole community, so checkpoints do not provide community-wide restraint use data. In addition, due to the complexity of the issue, checkpoints may not impart parents with the skills necessary to install a car seat correctly in all future situations. Participant surveys can provide a convenient sample of information on some knowledge and awareness areas, such as where this population obtains seats, acceptance of booster seats, what media messages they remember, and the perceived likelihood of getting a ticket for non-restraint use.

#### Car Seat and Seatbelt Public Awareness

Public awareness is an important part of a community-wide strategy. In addition to events held in conjunction with enhanced enforcement campaigns

(Legislation and Enforcement), local traffic safety coalitions can provide press conferences, media events, and other public awareness activities.

- Organize public awareness around National Child Passenger Safety Awareness Week in February, National SAFE KIDS Week in May and other events (calendar at: [www.buckleupamerica.org](http://www.buckleupamerica.org)).
- Work with local law enforcement to publicize examples of children who were saved by a seatbelt or a car seat.
- Encourage media to report on seatbelt use or non-use in crashes.
- Publicize the results of local checkpoints or observational surveys.

- Ask major employers to get involved in promoting seatbelt use to their employees by enacting seatbelt policies.

**Evaluation:** Track numbers of press releases, media events, and media “hits.” Collect stories of how an intervention or media event led to more seatbelt use or other impacts.

### Health Care Provider Counseling

According to parent surveys and focus groups, physicians are a family’s major resource for health and safety information. Pediatricians report that they discuss child passenger safety with >75 percent of parents with children less than one year old; discussions drop to 75 percent for patients 1-4 years, 56 percent for 5-9 year olds, and 50 percent with parents of patients over age 10. Pediatricians report fairly high levels of knowledge about car seat issues, but also report interest in more information on transporting special needs children (75 percent), resources for parental referral (75 percent), and proper selection and installation of car/booster seats (70 percent). Their sources of information are the American Academy of Pediatrics (AAP) (49 percent), Consumer Product Safety Commission, (23 percent), National Highway Traffic Safety Administration (NHTSA) (15 percent), and SAFE KIDS (15 percent).<sup>18</sup>

- Include health care providers in your coalition.
- Encourage providers and their staff to attend a car seat technician training.
- Find out what information providers want: information they can turn into their own patient handouts, brochures and/or exam room posters, prescription pads with car seat information, website information for providers and/or patients, a schedule of local checkpoints, etc.
- Provide a clear explanation of the current car seat law, including the section on booster seats.
- Offer to hold checkpoints at the health care provider’s location and ask them to invite their patients.
- Ask providers to include information on booster seats with any reminders they send to patients about booster shots or other age-related reminders.
- Find an interested physician or other health care provider to present Grand Rounds or other educational sessions.

**Evaluation:** Track number of providers contacted, numbers who receive information, and type and number of materials distributed. Follow-up to determine what materials were used.

### Targeted Car Seat and Seatbelt Education

It is important to develop interventions for a targeted population with a focused message. Education may include using social marketing techniques, segmenting the target audience with specific messages, applying health behavior change theories, and developing programs that build specific traffic safety skills.

### Child Care Facilities

Child care facilities should be targeted because they serve 4-6 year olds (addressed in the new booster seat law), they are often not well informed about child passenger safety issues, and parents of young children can be reached through child care facilities. In a Washington state survey of child care centers, completed 8 months before their state booster seat law went into effect, only 48 percent of the centers said they were prepared for the law. Identified barriers were: lack of available booster seats, limited storage space, lack of knowledge of the law, and discomfort with talking to staff/parents about using booster seats.<sup>19</sup>

In addition, a National SAFE KIDS Campaign (NSKC) child care survey found that 46 percent of children ages 0-8, who should have been in child seats, were reported to be transported in lap or shoulder/lap belts and 37 percent of parents were not aware of a caregiver's formal or informal policy on transporting children.<sup>20</sup>

- Provide short training sessions and/or educational materials to child care providers, especially concerning the new booster seat law.
- Problem solve with the providers to help them overcome barriers to car/booster seat use.
- Offer checkpoints at the facilities or have the providers personally invite parents to a scheduled checkpoint.
- Provide car/booster seats to parents through an on-site distribution program. Assist centers in setting up a bulk purchase program to conveniently offer seats to parents.
- Assist centers in developing a transportation policy, including recommendations for parents. ([www.safekids.org](http://www.safekids.org) and [www.aap.org/advocacy/hcca/cps.htm](http://www.aap.org/advocacy/hcca/cps.htm))

### Children

Restraint use decreases as the age of the child increases. In 1997, Colorado parents reported restraint use to be 92 percent for 5-8 year olds, 86 percent for 9-12 years, and 73 percent for 13-15 year olds.<sup>21</sup> State observational surveys found restraint use for 0-4 years to be 80 percent, compared to 60 percent for 5-15 year olds.<sup>22</sup>

- Basic restraint education for children has proven to increase knowledge of safety seats and seatbelts and how to use them.<sup>23</sup>
- Encourage schools to include injury prevention as part of a regular school health and safety curricula. Examples of evaluated curricula are: Risk Watch [www.riskwatch.org](http://www.riskwatch.org) and ThinkFirst [www.thinkfirst.org](http://www.thinkfirst.org).
- Programs need to stress seatbelt use for kids ages 8 and up, as well as seatbelt use for all occupants. Children can often become the advocates or teachers of seatbelt use for the whole family.

### Parents/Caregivers

The booster seat program in Colorado Springs found that a school-based program of distribution of educational brochures, booster seat distribution and opportunity for individual education was successful. The booster seat use at those schools went from 2 to 33 percent; compared to schools without the targeted intervention where booster seat use went from 0 to 11 percent.<sup>18</sup> All parent or family education programs need to emphasize restraint use for **ALL** vehicle occupants.

- Include parents in your traffic safety coalition.
- Provide information to parents as part of scheduled school or health department activities (Parent Teacher Association/Organization (PTA/PTO) meetings, family nights, immunization, WIC and well child clinics).
- Provide a simple version of the child passenger safety law to parents.
- Emphasize to parents that a strong parental rule makes a difference. Restraint use should never be negotiable. Parents appreciate assistance in ways to deal with this issue.
- Let parents know that kids aren't necessarily opposed to booster seats. Kids in booster seats tell us: "I can see out the window better." "The seatbelt fits me better."

- Ensure that materials are at an easy-to-read level. One study found that car seat instructions are written at the 7 to 12<sup>th</sup> grade level; exceeding the reading skills of most American consumers.<sup>24</sup>
- Include messages about impaired driving. Most children killed in drinking driver-related crashes were riding in the vehicle with the drinking driver.<sup>25</sup>

### All Drivers

In addition to public awareness (Car Seat and Seatbelt Public Awareness), legislation and enhanced enforcement efforts (Legislation and Enforcement), target seatbelt and restraint use messages to specific groups.

- Concentrate on part time seatbelt users. Only a small percentage of the population rarely or never wears a seatbelt. There are indications that the best strategies would target turning part-time seatbelt users into full-time seatbelt users.<sup>26</sup>
- Develop specific messages for young parents since 18-24 year olds use seatbelts less than older adults.<sup>27</sup> Emphasize the protection of the whole family.
- Include messages about impaired driving. Drivers need to protect the children they transport.

**Evaluation:** Track number of materials distributed and distribution locations. Use a community-wide observational survey to monitor progress in restraint use for children and adults. Use pre-and post- tests to monitor a change in knowledge, attitudes and behavior. Use follow-up surveys to monitor child care centers that develop transportation policies, and providers/facilities who increase discussions or materials to parents/patients.

### Conclusion

Health agencies and safety advocates can assist in prevention efforts by participating in community coalitions that: promote enforcement of existing laws, advocate for stronger traffic safety legislation, develop and implement effective educational strategies, and provide program evaluation.

## **Background/Statistics**

### Motor Vehicle Injury Facts

- Motor vehicle traffic crashes are the leading cause of injury death for children ages 0-14. On average, 25 Colorado children, ages 0-14, die as occupants in motor vehicle crashes each year. This represents 22 percent of all injury deaths in this age group.<sup>28</sup>
- Motor vehicle traffic crashes are the 2<sup>nd</sup> leading cause of injury hospitalization for children ages 0-14. (The leading cause is falls.)<sup>2</sup> On average, 235 children ages 0-14 are hospitalized each year for injuries sustained as an occupant in a motor vehicle crash. This represents 11 percent of all childhood injury hospitalizations in this age group.<sup>28</sup>
- Fifty-two percent of children ages 0-14 who were killed in a motor vehicle in 2000-2001 were unrestrained,<sup>29</sup> putting them at twice the risk of death and injury as those riding restrained.<sup>30</sup>

- In 1999, 32 percent of fatal crashes in Colorado were alcohol-related.<sup>2</sup> Sixty-four percent of passengers younger than age 15, who were killed in drinking driver-related crashes during 1985-1996, were riding in the vehicle with the drinking driver.<sup>25</sup>
- The motor vehicle occupant injury death rates are similar for boys and girls and vary little for the different age groups. Hospitalization rates for children injured in a motor vehicle crash are similar for boys and girls overall. However, for ages 1-4, boys have a higher rate than girls. The hospitalization rate for 10-14 year olds is significantly higher than the rates for the other age groups; the rate for <1 year olds is significantly lower than all the other age groups.<sup>28</sup>
- The death rates for children ages 0-14 for motor vehicle traffic crashes are similar for different race/ethnic groups.<sup>2</sup>
- In a 1997 survey of Colorado adults, 85 percent reported using a seatbelt or car seat for their children under age 16. Young children, ages 0-4, were much more likely to be reported to be restrained while riding in a car (96 percent) than children ages 13-15 (73 percent).<sup>21</sup>
- Children living in a household with an adult who always use a seatbelt are 15.7 times more likely to always use car seats or seatbelts.<sup>22</sup>
- A 2002 observational seatbelt survey in Colorado showed adults to be at 73 percent seat belt use.<sup>11</sup> The national goal for seatbelt use is 78 percent by 2003.<sup>32</sup>
- Females in Colorado are more likely, than males, to report use of seatbelts consistently. Persons ages 18-24 reported the lower percent seatbelt use (55 percent).<sup>27</sup>

<b>Death and hospitalization rates, with confidence intervals, for children ages 0-14 for total motor-vehicle occupants, CO<sup>28</sup></b>					
<b>Age Group</b>	<b>&lt;1</b>	<b>1-4</b>	<b>5-9</b>	<b>10-14</b>	<b>TOTAL</b>
<b>Death Rate (1992-2001)</b>	4.8 (2.9-6.6)	2.8 (2.1-3.5)	2.1 (1.6-2.7)	3.5 (2.8-4.2)	2.9 (2.6-3.3)
<b>Hospitalization Rate (1995-2001)</b>	12.6 (9.1-16.1)	22.8 (20.4-25.2)	24.0 (21.9-26.1)	35.0 (32.4-37.6)	26.6 (25.3-27.9)



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## Best Practice Documents

The Community Guide to Preventive Services, Motor Vehicle Occupant Injury Prevention. [www.thecommunityguide.org](http://www.thecommunityguide.org)

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## Resources

### **General Motor Vehicle Occupant Safety**

Colorado Department of Public Health  
and Environment

[www.cdphe.state.co.us/pp/injuryprevention](http://www.cdphe.state.co.us/pp/injuryprevention)

Colorado Child Passenger Safety

[www.carseatscolorado.com](http://www.carseatscolorado.com)

Colorado Department of Transportation

[www.cdota.state.co.us/TrafficSafety/index.cfm](http://www.cdota.state.co.us/TrafficSafety/index.cfm)

National Highway Traffic Safety  
Administration

[www.nhtsa.dot.gov](http://www.nhtsa.dot.gov)

Safe Communities

[www.nhtsa.dot.gov/safecommunities](http://www.nhtsa.dot.gov/safecommunities)

Buckle Up America

[www.buckleupamerica.org](http://www.buckleupamerica.org)

Centers for Disease Control  
and Prevention

[www.cdc.gov/ncipc](http://www.cdc.gov/ncipc)

SafeUSA

[www.safeusa.org](http://www.safeusa.org)

National SAFE KIDS Campaign

[www.safekids.org](http://www.safekids.org)

American Academy of Pediatrics

[www.aap.org](http://www.aap.org)

Safety Belt Safe USA

[www.carseat.org](http://www.carseat.org)

Boost America

[www.boostamerica.org](http://www.boostamerica.org)

### **Motor Vehicle Safety Curricula**

National Fire Protection Administration

[www.riskwatch.org](http://www.riskwatch.org)

ThinkFirst

[www.thinkfirst.org](http://www.thinkfirst.org)

***For more information on motor vehicle safety please contact:***

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