Position on Booster Child Safety Seats

Safe Kids Austin supports efforts to develop, maintain, and strengthen child passenger safety for children traveling in motor vehicles. This position outlines the necessity to keep children in a booster seat until the seat belt fits the child properly, the child is 4'9" in height, or as long as possible as allowed by the child safety seat's manufacturer's instructions.

Background

Although there has been unprecedented progress in the field of child passenger safety, motor vehicle collisions (MVCs) are a leading cause of unintentional injury deaths for children one and older.[1,2] Annually, about 5,000 children and adolescents under the age of 21 die in MVCs, which represent 15% of all fatal MVCs.[3,4] This fatality rate is twice that of other developed countries, such as Sweden, Japan, and Norway.[5] For every fatality, 18 children are hospitalized and 400 receive medical treatment for MVC-related injuries.[6]

The National Highway Traffic Safety Administration (NHTSA) estimates that highway MVCs cost the United States $242 billion in 2010 or $784 per citizen.[7] Child safety seats are a cost-effective way to reduce MVC injuries among children. In fact, child safety seats result in an estimated cost savings to society of $2400 for an average cost of only $57.[8]

The highest MVC mortality rates are among African Americans and American Indian/Alaskan Native children. Mortality rates are lowest among Asian/Pacific Islander children and intermediate among Hispanic and White children.[9]

Child Safety Seat Overview:

Child safety seats (CSSs) are restraint systems that decrease the risk of ejection during an MVC, distribute the impact forces of the vehicle through bones as opposed to soft tissues, minimize the MVC forces on the occupant by maximizing deceleration time, and limit contact with the occupant and structures inside the vehicle.[4] There are two types of forward-facing CSSs normally found in vehicles:

1. Convertible seats in the forward-facing position that can convert from the rear-facing to forward facing position.
2. Combination seats with a 5-point harness that can be later used as a booster seat without the harness.[10]

Once a child has outgrown the forward-facing position height and weight limit of their CSS, the child should be transferred to a booster seat until the seat belt fits appropriately across the child's shoulder and hips, until the child is 4'9" in height, or as long as possible as allowed by the CSS manufacturer's instructions.[9] Booster seats do not use a harness but rather use the vehicle's lap and shoulder belt to safely restrain the child in the booster seat. Booster seats ensure that the seatbelt fits the child correctly. There are two main types of booster seats:

1. High-back booster seats, which should be used in vehicles without headrests or with low seat backs, but can be used in vehicles with headrests as well.
2. Backless booster seats.[10]

Most booster seats are not installed in a vehicle; however, there are booster seats on the market today that can be secured to a vehicle seat using the lower anchors to provide additional stability and also prevent the seat from becoming a projectile in an MVC when it is not in use.[10]

The Importance of Children Using a Booster Seat

In 2011, the American Academy of Pediatrics (AAP) released a best practice recommendation that, when children reach the maximum height or weight limit for the forward-facing position in their CSS, children should remain in a booster seat until the seat belt fits properly, the child is 4'9" in height, the child is between eight and twelve years old, or as long as possible as allowed by the CSS's manufacturer's instructions.[4] However, many children are transferred to seat belts too soon.[11] Most seat belts will not properly fit a child until they are 4'9" or are between eight and twelve years old.[4] Booster seats are best used when children have outgrown a forward-facing car seat with a 5-point harness but are still too small for a seat belt.[12]

Because motor vehicle seats are designed for adults, children do not fit appropriately and may slide down in the seat to bend their knees over the seat. This causes the lap portion of the seat belt to move onto the soft tissue of the stomach area and the shoulder belt to be positioned near or on the neck or face, instead of the collarbone, which put the neck and spine at risk.[13] Children under 4'9" tall who are not in a booster seat often place the shoulder belt beneath their arm or completely behind their body to avoid the discomfort of having the shoulder belt on their neck. Moving the shoulder belt behind the child removes any form of upper body restraint, which can lead to serious injuries or seat belt syndrome.[13] Seat belt syndrome is when the child's body jackknifes as the lap belt crashes into the child's stomach area and damages these organs and the lumbar spine.[11] Furthermore, the child's head moves forward and can collide with the dashboard, another seat in the vehicle, or the floor of the vehicle, causing major head injuries.[13]

Booster seats can prevent seatbelt syndrome and other injuries by helping to correctly position the seatbelt across the child's body. Booster seats allow the lap and shoulder belt to rest on the child's pelvic and clavicle bones, not their soft tissue, so the crash forces of the MVC are extended across the strongest body parts. When the seat belt is properly positioned on the child's body, the movement of the child during an MVC is minimized, and the head and spine are protected.[13]

States can reduce serious injuries among children from MVCs through child passenger safety and booster seat laws. The first child passenger safety law in the U.S. was passed in 1977 and, by 1985, all 50 states had adopted some form of a law regarding CSSs to increase safety for child passengers.[2] Nearly all states, including Texas, now also have booster seat laws which require children to use a booster seat after they outgrow their child safety seat but are still too small to use the seatbelt alone. The only two states without a booster seat law are Florida and South Dakota.[14,15] Texas law requires that children under 4'9" tall, unless they are at least 8 years old, must use a booster seat in a vehicle.[11] Most 8-year-old children are not yet tall enough to safely ride without a booster seat so this law could by strengthened by changing the age requirement or being based on height alone. In fact, child growth charts from the Centers for Disease Control and Prevention (CDC) indicate that children at age eight in the 50th percentile for height are only about 4'3"tall.[16] Furthermore, these growth charts indicate that children typically do not reach 4'9" in height, or the minimum recommendation for seat belt use, until the age of 11.[16]

Research has found that booster seats reduce injuries among children who have outgrown their car seat but do not properly fit in a seat belt. For children four to eight years old, booster seats decrease the risk of injury by 45%.[17] Another study found that children age four to seven in booster seats had a 59% reduction in risk of injury versus using only seat belts.[18] A study from Wisconsin expanded this finding to state data from 1998 to 2002 and found that deaths and hospital admissions of children from four to seven years old would decrease 57% if they were restrained in a booster seat.[19] Data from the Fatality Analysis Reporting System (FARS) has demonstrated that booster seats decrease the risk of fatal injuries by 67% in children four to five years old, and by 55% for children six to eight years old, compared to children who were not restrained in vehicles.[20] Furthermore, another study concentrating on abdominal injuries found that children ages four to eight restrained only in seat belts were 3.5 times more likely to develop an abdominal injury compared to children in booster seats.[21] State laws impact child injury and fatality rates from MVCs. A study from 2012 analyzed five states that increased their booster seat law requirement to age seven or eight. Results showed that the rate of booster seat use tripled and the rate of children with fatal or serious injuries dropped by 17%.[22]

Safe Kids Austin Position:

Safe Kids Austin maintains a position that most childhood MVC injuries and deaths are preventable. In conjunction with the AAP, Safe Kids Austin advocates the position that children should ride in a booster seat until the child is 4'9" in height or as long as possible as allowed by the child safety seat's manufacturer's instructions. Safe Kids Austin advocates this position supported by the best available research evidence to minimize the morbidity and mortality of childhood MVC injuries.

Best Practices Currently Supported by Safe Kids Austin:

- Children should use a booster seat when traveling in motor vehicles until the child is 4'9" in height or as long as possible as allowed by the child safety seat's manufacturer's instructions.
- The booster seat should be used only with a lap and shoulder seat belt. The shoulder belt should never be placed under the arm or behind the back of the child.

- Children should use a booster seat until the seat belt fits them properly. Children can transition to a seat belt when they pass the Safety Belt Fit Test:
    1. The child's knees bend at the edge of the seat with their lower back against the vehicle seat.
    2. The seat belt fits across the child's upper thighs, not across the stomach.
    3. The seat belt fits across the child's shoulder and chest, not across the neck or face.
    4. The child can maintain this position for the duration of the car ride.

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