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Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of all Children

Policy Statement—Child Passenger Safety

abstract

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Child passenger safety has dramatically evolved over the past decade; however, motor vehicle crashes continue to be the leading cause of death of children 4 years and older. This policy statement provides 4 evidence-based recommendations for best practices in the choice of a child restraint system to optimize safety in passenger vehicles for children from birth through adolescence: (1) rear-facing car safety seats for most infants up to 2 years of age; (2) forward-facing car safety seats for most children through 4 years of age; (3) belt-positioning booster seats for most children through 8 years of age; and (4) lap-and-shoulder seat belts for all who have outgrown booster seats. In addition, a fifth evidence-based recommendation is for all children younger than 13 years to ride in the rear seats of vehicles. It is important to note that every transition is associated with some decrease in protection; therefore, parents should be encouraged to delay these transitions for as long as possible. These recommendations are presented in the form of an algorithm that is intended to facilitate implementation of the recommendations by pediatricians to their patients and families and should cover most situations that pediatricians will encounter in practice. The American Academy of Pediatrics urges all pediatricians to know and promote these recommendations as part of child passenger safety anticipatory guidance at every health-supervision visit. *Pediatrics* 2011;127:788–793

COMMITTEE ON INJURY, VIOLENCE, AND POISON PREVENTION

KEY WORDS

child passenger safety, motor vehicle crash, child restraint system

ABBREVIATIONS

AAP—American Academy of Pediatrics
CSS—car safety seat

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Improved vehicle crashworthiness and greater use of child restraint systems have significantly affected the safety of children in automobiles. Major shifts in child restraint use, particularly the use of booster seats among older children, have occurred in response to public education programs and enhancements to child restraint laws in nearly every state.[1–3] In addition, there has been a substantial increase in scientific evidence on which to base recommendations for best practices in child passenger safety. Current estimates of child restraint effectiveness indicate that child safety seats reduce the risk of injury by 71% to 82%[4,5] and reduce the risk of death by 28% when compared with those for children of similar ages in seat belts.[6] Booster seats reduce the risk of nonfatal injury among 4- to 8-year-olds by 45% compared with seat belts.[7] Despite this progress, approximately 1500 children younger than 16 years die in motor vehicle crashes each year in the United States, nearly half of whom were completely unrestrained.[8]

The American Academy of Pediatrics (AAP) strongly supports optimal safety for children and adolescents of all ages during all forms of travel.

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This policy statement provides 5 evidence-based recommendations for best practices to optimize safety in passenger vehicles for all children, from birth through adolescence (a summary of recommendations is listed in Table 1):

1. All infants and toddlers should ride in a rear-facing car safety seat (CSS) until they are 2 years of age

TABLE 1 Summary of Best-Practice Recommendations

Best-Practice Recommendation	Complementary Information
1. Best-practice recommendation Infant-only or convertible CSS used rear-facing All infants and toddlers should ride in a rear-facing car safety seat (CSS) until they are 2 y of age or until they reach the highest weight or height allowed by the manufacturer of their CSS.	Infant-only seats usually have a handle for carrying and can be snapped in and out of a base that is installed in the vehicle. They can only be used rear-facing. Convertible CSSs can be used either forward- or rear-facing and typically have higher rear-facing weight and height limits than infant-only seats. When children using infant-only seats reach the highest weight for their seat, they should continue to ride rear-facing in a convertible seat for as long as possible. Most currently available convertible seats can be used rear-facing to at least 35 lb. Combination CSSs are seats that can be used forward-facing with a harness system and then, when the child exceeds the height or weight limit for the harness, as a booster seat with the harness removed.
2. Best-practice recommendation Convertible or combination CSS used forward-facing All children 2 y or older, or those younger than 2 y who have outgrown the rear-facing weight or height limit for their CSS, should use a forward-facing CSS with a harness for as long as possible, up to the highest weight or height allowed by the manufacturer of their CSS.	Several models of convertible and combination CSSs can accommodate children up to 65 or 80 lb when used forward-facing. The lowest maximum weight limit for currently available forward-facing CSSs is 40 lb.
3. Best-practice recommendation Belt-positioning booster seat All children whose weight or height is above the forward-facing limit for their CSS should use a belt-positioning booster seat until the vehicle lap-and-shoulder seat belt fits properly, typically when they have reached 4 feet 9 inches in height and are between 8 and 12 y of age.	There is a safety advantage for young children to remain in CSSs with a harness for as long as possible before transitioning to booster seats.
4. Best-practice recommendation Lap-and-shoulder vehicle seat belt When children are old enough and large enough to use the vehicle seat belt alone, they should always use lap-and-shoulder seat belts for optimal protection.	Booster seats function by positioning the child so that both the lap and shoulder portions of the vehicle seat belt fit properly; the lap portion of the belt should fit low across the hips and pelvis, and the shoulder portion should fit across the middle of the shoulder and chest. They come in both high-back (a seat back that extends up beyond the child's head) and backless models. The lap portion of the belt should fit low across the hips and pelvis, and the shoulder portion should fit across the middle of the shoulder and chest when the child sits with his or her back against the vehicle seat back. If they do not, then the child is likely too small to use the vehicle seat belt alone and should continue to use a belt-positioning booster seat.
5. Best-practice recommendation All children younger than 13 y should be restrained in the rear seats of vehicles for optimal protection. All children younger than 13 y should be restrained in the rear seats of vehicles for optimal protection.	CSSs should be installed tightly either with the vehicle seat belt or with the LATCH system, if available. LATCH is a system of attaching a CSS to the vehicle that does not use the seat belt. It was designed to ease installation of the CSS. Whether parents use LATCH or the seat belt, they should always ensure a tight installation of the CSS into the vehicle.

LATCH indicates lower anchors and tethers for children.

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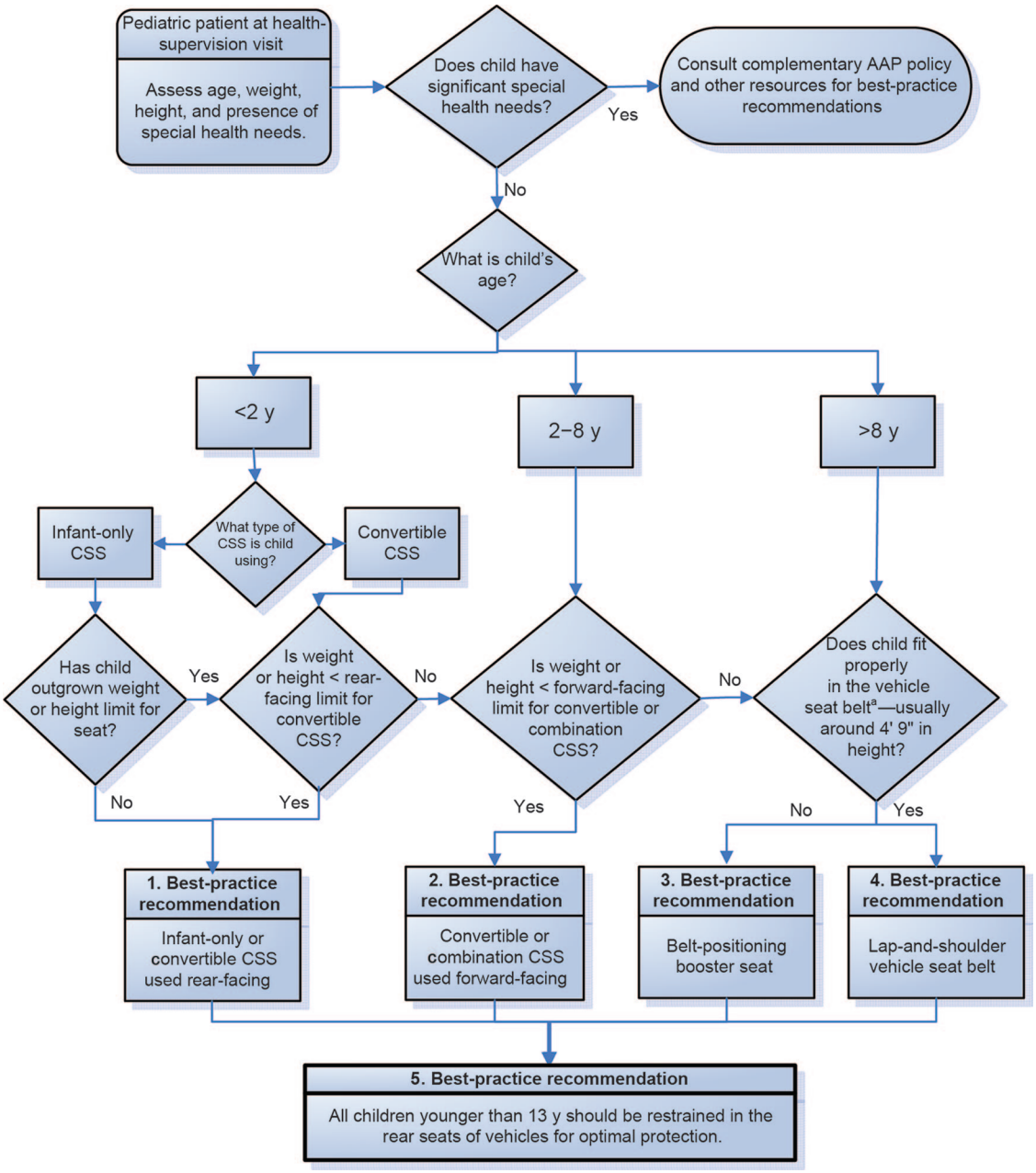

FIGURE 1
Algorithm to guide the implementation of best-practice recommendations for optimal child passenger safety (see Table 1 for a summary of recommendations and Table 2 for definitions and explanations).

or until they reach the highest weight or height allowed by the manufacturer of their CSS.

2. All children 2 years or older, or those younger than 2 years who have outgrown the rear-facing weight or height limit for their CSS, should use a forward-facing CSS with a harness for as long as possible, up to the highest weight or height allowed by the manufacturer of their CSS.
3. All children whose weight or height is above the forward-facing limit for their CSS should use a belt-positioning booster seat until the vehicle lap-and-shoulder seat belt fits properly, typically when they have reached 4 feet 9 inches in height and are between 8 and 12 years of age.
4. When children are old enough and large enough to use the vehicle seat belt alone, they should always use lap-and-shoulder seat belts for optimal protection.
5. All children younger than 13 years should be restrained in the rear

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TABLE 2 Explanations of Decision Points and Additional Resources

Does child have significant special health needs?	Children with certain temporary or permanent physical and behavioral conditions such as altered muscle tone, decreased neurologic control, skeletal abnormalities, or airway compromise may preclude the use of regular CSSs and may require the use of regular CSSs may require specialized restraint systems.
Consult complementary AAP policy and other resources for best-practice recommendations	The AAP has issued a policy statement that provides specific guidance on best-practice recommendations for children with special health care needs (www.pediatrics.org/cgi/content/full/pediatrics%3B104/4/988). To locate a child passenger safety technician in your area with special training in special health needs, go to http://cert.safekids.org.
<2 y	Infants younger than 2 y have relatively large heads and several structural features of their neck and spine that place them at particularly high risk of head and spine injuries in motor vehicle crashes. Rear-facing CSSs provide optimal support to the head and spine in the event of a crash, and evidence indicates that this benefit extends to children up to 2 y of age or longer. Children who are 2 y of age or older and small for age may need to be evaluated like children younger than 2 y. Consult a child passenger safety technician with enhanced training in special needs or other resources for assistance.
Has child outgrown weight or height limit for seat? / Is weight or height < rear-facing limit for convertible CSS? / Is weight or height < forward-facing limit for convertible or combination CSS?	The AAP annually updates information on child restraint systems currently available in the United States (http://aap.org/family/carseatguide.htm). More recent products have higher weight limits and should be used when possible. In general, children should remain in a child restraint system until they outgrow the weight or height limits for its intended use.
2–8 y	Most children 2 to 8 y of age are not large enough to fit properly in the vehicle seat belt and will require a CSS or booster seat for optimal restraint. A belt-positioning booster seat positions a child so that the lap and shoulder portions of the seat belt fit properly: the lap portion low across the hips and pelvis and the shoulder portion across the middle of the shoulder and chest.
>8 y / Does child fit properly in the vehicle seat belt[a]—usually around 4' 9" in height?	Most children shorter than 4 feet 9 inches in height will not fit properly in vehicle lap-and-shoulder seat belts. These 3 questions are an evaluation to determine whether a child is ready to be restrained by the vehicle seat belt without a booster seat. If the answer is "no" to any of these questions, the child should use a booster seat: Is the child tall enough to sit against the vehicle seat back with his or her knees bent at the edge of the vehicle seat without slouching and stay in this position comfortably throughout the trip? Does the shoulder belt lie across the middle of the chest and shoulder, not against the neck or face? Is the lap belt low and snug across the upper thighs, not the abdomen?

seats of vehicles for optimal protection.

It should be noted that the recommendation that all children younger than 2 years be restrained in an infant-only or convertible CSS used rear-facing represents a significant change from previous AAP policy and is based on new data from the United States[9] as well as extensive experience in Sweden.[10,11] It is important to note that most currently available CSSs have weight limits for rear-facing use that can accommodate the new recommendations.[12]

Certain considerations contained in this policy statement are relevant to commercial airline travel as well and are noted in the accompanying technical report.[13] Other AAP policy statements provide specific recommendations to optimize safety for preterm and low birth weight infants,[14] children in school buses,[15] and children using other forms of travel and recreational vehicles.[16–18] In addition, complementary AAP policy statements provide recommendations for teenaged drivers[19] and the safe transport of newborn infants[20] and children with special health care needs.[21,22]

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Pediatricians play a critical role in promoting child passenger safety. To facilitate their widespread implementation in practice, evidence-based recommendations for optimal protection of children of all ages in passenger vehicles are presented in the form of an algorithm (Fig 1) with an accompanying table of explanations and definitions (Table 2). A summary of the evidence in support of these recommendations is provided in the accompanying technical report.[13] Because pediatricians are a trusted source of information to parents, every pediatrician must maintain a basic level of knowledge of these best-practice recommendations and promote and document them at every health-supervision visit. Prevention of motor vehicle crash injury is unique in health-supervision topics, because it is the only topic recommended at every health-supervision visit by *Bright Futures*.[23] Pediatricians can also use this information to promote child passenger safety public education, legislation, and regulation at local, state, and national levels through a variety of advocacy activities, including ensuring that their state's child passenger safety law is in better alignment with the best-practice recommendations promoted in this policy statement.

Because motor vehicle safety for children is multifaceted and will continue to evolve, all pediatricians should familiarize themselves with additional resources to address unique situations for their patients that may not be covered by the algorithm and to maintain current knowledge. In particular, many communities have child passenger safety technicians who have completed a standardized National Highway Traffic Safety Administration (NHTSA) course and who can provide hands-on advice and guidance to families. In most communities, child passenger safety technicians work at formal inspection stations; a list of these stations is available at www.seatcheck.org. If your community does not have an inspection station, you can find a child passenger safety technician in your area on the National Child Passenger Safety Certification Web site (http://cert.safekids.org) or the NHTSA child safety seat inspection station locator (www.nhtsa.dot.gov/cps/cpsfitting/index.cfm). Car seat checkup events are updated at www.safekidsweb.org/events/events.asp. In addition, additional resources for pediatricians and families can be found at www.aap.org or www.healthychildren.org.

LEAD AUTHOR

Dennis R. Durbin, MD, MSCE

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H. Garry Gardner, MD, Chairperson
Carl R. Baum, MD
M. Denise Dowd, MD, MPH
Dennis R. Durbin, MD, MSCE
Beth E. Ebel, MD
Michele Burns Ewald, MD
Richard Lichenstein, MD
Mary Ann P. Limbos, MD
Joseph O'Neil, MD, MPH
Elizabeth C. Powell, MD
Kyran P. Quinlan, MD, MPH
Seth J. Scholer, MD, MPH
Robert D. Sege, MD, PhD
Michael S. Turner, MD
Jeffrey Weiss, MD

CONTRIBUTOR

Stuart Weinberg, MD – *Partnership for Policy Implementation (PPI)*

LIAISONS

Julie Gilchrist, MD – *Centers for Disease Control and Prevention*
Lynne Janecek Haverkos, MD – *Eunice Kennedy Shriver National Institute of Child Health and Human Development*
Jonathan D. Midgett, PhD – *Consumer Product Safety Commission*
Alexander S. Sinclair – *National Highway Traffic Safety Administration*
Natalie L. Yanchar, MD – *Canadian Paediatric Society*

STAFF

Bonnie Kozial
dshp@aap.org

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