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COMMENTARY

Rear-Facing Car Safety Seats: Getting the Message Right

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Information learned during medical training changes frequently with advances in nearly every field of medicine. Now we are asked to learn new advice to give parents and caregivers of infants and young children regarding the safest way for them to ride in a car.

Child fatalities and injuries in motor vehicles have been significantly reduced since initiation of occupant-protection measures in the 1970s.[1] The combined efforts of the counseling of primary medical care providers, the education and research provided by the National Highway Traffic Safety Administration, the car safety seat manufacturers, and many research facilities, and the support of child passenger safety advocates across the country have been largely responsible for these results. Many challenges remain as we strive to continue to reduce the rates of injury to children on our nation's highways. It is critical to realize that, despite marked improvement in rates of restraint in all age groups, over half of children killed are improperly restrained or unrestrained. Our first priority must be to ensure that every child is restrained appropriately for his or her age and size for every trip in a car.

Helping parents make the best decisions for selection and proper use of car safety seats and seat belts is very important. Continual evolution of knowledge, safety information, and changes in car safety seat designs make this task extremely challenging for health care providers.

One significant change in counseling is now emerging that may greatly improve the safety of infants and young children. A recent analysis of the protection provided in rear-facing compared with forward-facing car safety seats has revealed that children under the age of 2 years are 75% less likely to die or sustain serious injury when they are in a rear-facing seat.[2] This finding was true regardless of direction of the crash, even those crashes with side impact, which typically are the most severe.

Although the study could not provide data dividing the ages by individual months, it is notable that rear-facing car safety seats were more effective than forward-facing car safety seats for both infants under 1 year and children aged 12 to 23 months. The odds of severe injury for forward-facing infants under 12 months of age were 1.79 times higher than for rear-facing infants; for children 12 to 23 months old, the odds were 5.32 times higher.

This information is additionally supported by data from Sweden, where children have ridden in rear-facing seats up to 4 years of age for many years, and very low death and injury rates have been documented[3].

For many years the American Academy of Pediatrics has recommended that for best protection, children should ride in a rear-facing seat to the highest weight that is allowed for use by the manufacturer of the seat.[4] Health care providers and many parents with older children, however, have learned the earlier message that children should ride in a rear-facing seat up to 1 year of age and 20 lb,[5] although that recommendation was later modified to "at least 1 year of age and . . . at least 20 lb."[4]

Now we are challenged by greater evidence to implement what we know to be best practice: Children should ride in a rear-facing seat to the highest weight or height allowed for use rear-facing by the manufacturer of the seat. As an infant approaches 20 lb, when his or her head is within an inch of the top of the seat, and at the 4-, 6-, or 9-month visit, it is appropriate to counsel families that they should transfer the infant to a convertible seat that is approved for rear-facing use to higher weight and height limits.[6] Parents may be helped to understand the importance of using the convertible car safety seat in the rear-facing position longer than 1 year if they are counseled that children are 5 times safer than when riding in a forward-facing seat into the second year of life.

At this time, it is not possible to determine at what month of age, if any, that this is no longer true, but as more and more parents follow this advice, we hope it will be possible to elicit these data in the future.

Another barrier to implementation of this best-practice recommendation is the common myth that if a

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child's feet or legs reach the back of the vehicle seat, he or she is at increased risk for a lower-extremity injury. Current data do not substantiate that myth. Lower-extremity injuries are rare for children facing the rear, on the order of 1 per 1000 children (Partners for Child Passenger Safety Study, unpublished data, 2007). In addition, riding facing front does not eliminate a child's risk of lower-extremity injuries, because these injuries, as well as injuries to the head and spine, have been described among forward-facing children in child-restraint systems.[7]

Hence the challenge: counsel parents that for best protection, their child should ride in a rear-facing seat to the highest weight or height allowed for use rear-facing by the manufacturer of the convertible seat.

When facing forward, a seat with a full harness should be used until the child exceeds the height or weight specifications of the seat in that orientation, and then the child should transition to a seat with a harness to a higher weight or to a belt-positioning booster seat. Children who have outgrown their seat with a full harness should use a belt-positioning booster seat until the seat belt fits:

- The shoulder belt should lay across the middle of the chest and shoulder, not the neck or throat.
- The lap belt should be low and snug across the upper thighs, not the stomach.
- The child should be tall enough to sit against the vehicle seat back with his or her legs bent without slouching and can stay in this position comfortably throughout the trip.

These recommendations are compatible with those of the National Highway Traffic Safety Administration (www.nhtsa.dot.gov) and are best-practice recommendations of the American Academy of Pediatrics. These issues are recognizably complicated, and physicians will often find it helpful to determine the location of certified child passenger safety technicians in their community or hospital where they can refer families for consultation and assistance. A certified child passenger safety technician can be identified by zip code at www.seatcheck.org or by calling 866-SEAT-CHECK.

Physicians and other health care providers are recognized as respected authorities in the care of children. This is one important example of the value of getting the message right.

REFERENCES

1. FARS: Fatality Analysis Reporting System. Available at: www.fars.nhtsa.dot.gov. Accessed September 24, 2007
2. Henary B, Sherwood C, Crandall J, et al. Car safety seats for children: rear facing for best protection. *Inj Prev.* 2007;13(6):398–402
3. Jakobsson L, Isaksson-Hellman I, Lundell B. Safety for the growing child: experiences from Swedish accident data. In: *Proceedings of the 19th International Technical Conference on the Enhanced Safety of Vehicles.* Washington, DC: National Highway Traffic Safety Administration; June 6–9, 2005. Paper Number 05–0330
4. American Academy of Pediatrics, Committee on Injury and Poison Prevention. Selecting and using the most appropriate car safety seats for growing children: guidelines for counseling parents. *Pediatrics.* 2002;109(3):550–553
5. American Academy of Pediatrics, Committee on Injury and Poison Prevention and Committee on Fetus and Newborn. Safe transportation of premature and low birth weight infants. *Pediatrics.* 1996;97(5):758–760
6. American Academy of Pediatrics, Bright Futures Steering Committee. Four-month visit. In: Hagan JF, Shaw JS, Duncan PM, eds. *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents.* 3rd ed. Elk Grove Village, IL: American Academy of Pediatrics; 2008:335–350, 351–366, 377
7. Arbogast KB, Cornejo RA, Kallan MJ, Winston FK, Durbin DR. Injuries to children in forward facing child restraints. *Annu Proc Assoc Adv Automot Med.* 2002;46:213–230

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