THE ISSUES

Despite safety improvements to the motor vehicle and roadway and despite educational and legislative measures to promote safe driving, crash injuries remain the leading cause of death and serious injury for children, adolescents, and young adults. Annually, nonpedestrian motor vehicle mishaps claim more than 18,000 lives of Americans less than 25 years of age. The vast majority die as occupants of passenger cars. Teenage boys and young male adults are at greatest risk with annual death rates exceeding 100/100,000 population for licensed drivers aged less than 25 years. One out of every one hundred 15-year-old boys will die in a motor vehicle crash before reaching age 25 years.

To deal with the silent "highway epidemic," the American Academy of Pediatrics launched the "First Ride—Safe Ride" program in 1980. Increasing the use of car seats by newborns was an appropriate Academy project goal as pediatricians can be particularly effective in counseling new parents. The "Every Ride—Safe Ride" program will expand this effort to deal with the more difficult task of reducing occupant injuries to older children and adolescents. This program will promote safe and responsible driving behavior and encourage the use of car seats and automobile seat belts (active restraints).

Seat belts, when used, can reduce the likelihood of a crash fatality by about 50%. Car seats can be even more effective, and there is some evidence that, when properly used, they can reduce the likelihood of death by 90% and serious injury by 70%. However, despite past educational efforts, seat belt use rates are in the 10% to 15% range and even with car seat use laws enacted in most states, actual use rates in excess of 30% to 40% have not been demonstrated. Therefore, most of the injury-reducing potential of active restraints remains unrealized.

Recognizing the limitations of active restraints, the Committee on Accident and Poison Prevention believes that automatic (or passive) restraints have a far greater potential to spare lives and serious injuries to children and adolescents. The major advantage of automatic restraint technology is that it doesn't depend on passenger compliance to buckle up; it is always available during every ride.

There are two available automatic restraint systems: automatic belts which move into position across the occupant as the car door closes, and the crash air cushion (air bag) which is a soft, inflatable container that deploys from the dash or steering column at the moment of a crash. Both systems can reduce fatalities by approximately 50%, which is comparable to fatality reduction with use of conventional belts. Both of these systems have been extensively tested and are suitable for general use.

Advantages and disadvantages of the two systems have been debated. Automatic belts offer the advantages of lower cost and wider experience. They are easier to repair or replace following a crash. On US highways, there are approximately .5 million cars currently equipped with automatic belts. In some crash situations such as side impacts, they restrain lateral movement of the occupant more effectively than air cushions, which are designed to deploy only in frontal and front-angle crashes.

The disadvantages of automatic belts include the fact that they may fit and protect smaller children suboptimally; they are obtrusive and sometimes uncomfortable; and most seriously, they are easily disconnected. On vehicles in which automatic belts have been ordered as an option, the disconnect rate has been estimated at 20%. Were automatic belts required on all cars, disconnect rates have been projected to run 30% to 40% or higher.

Air cushions have the advantage of being invisi-

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PEDIATRICS (ISSN 0031 4005). Copyright © 1984 by the American Academy of Pediatrics.
ble and unobtrusive until deployed and therefore are unlikely to be disconnected or inactivated. They may provide superior protection in some of the more serious crashes as they distribute crash forces over a wider body surface area, lessening the potential for injury to the abdomen and pelvis. Unlike belts, they have the potential to protect occupants from flying glass and metal.

Disadvantages of air cushions include the expense of the product. If mass produced as standard equipment, they might add $150 to $300 to the price of an automobile, but cost estimates vary widely.\(^2^,^3\) Indirect savings to consumers such as reduced insurance premiums over the life of the automobile are not taken into account in these estimates.

Concern has been raised regarding the safety of the chemically based air cushion inflation system and also whether the inflating cushions might pose an injury hazard to the rare out-of-position child standing or kneeling on the floor of the front seat.\(^4\) However, there is good evidence for the safety and effectiveness of the system based on more than 800 million miles of driving experience in more than 12,000 air cushion-equipped cars on US highways over the past decade. This experience includes more than 240 “real world” crash air cushion deployments. The chemicals are heat stable, nonexplosive, and appear to be adequately contained within the system.\(^5\) There have been no reports of children thrown or smothered by air cushions, and although it cannot be stated with certainty that no hazard exists, the overwhelming evidence is that benefits far outweigh the risks. It has been estimated by the US Department of Transportation that air cushions, if available on all passenger cars, would save 9,000 lives annually.

### CONCLUSION AND RECOMMENDATIONS

The American Academy of Pediatrics recognizes vehicle occupant protection as a major child health problem. The Academy supports the use of currently available seat restraints, recognizing that poor compliance severely limits their effect on injury and mortality statistics. The Committee believes that automatic passenger protection systems have considerable potential to save additional lives and to reduce disabling injuries. Air cushions are the superior system and are to be preferred as they are unobtrusive and less likely to be disconnected. Although the remote hazard potentials should be recognized, the Committee knows of no public health measure that is totally free of risk or side effect and it sees no justification in delaying air cushion protection on this account.

Automatic passenger protection systems as an adjunct to safety belts should be made available in all new passenger cars to provide universal crash protection for children, adolescents, and their parents.

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### REFERENCES

# Automatic Passenger Protection Systems

*Pediatrics* 1984;74;146

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