ATTENTION

Although the research on which this statement was based is out of date, the position/recommendations contained in this policy were reaffirmed by the ACPM Board of Regents on 1/31/2005 until the evidence can be reevaluated.

Strengthening Motor Vehicle Occupant Protection laws:
American College of Preventive Medicine
Public Policy Statement

Rebecca L. Ferrini, MD, MPH

Burden of Suffering
Motor vehicle injuries are the seventh leading cause of death in the United States, killing 40,000 Americans and disabling 1,800,000 each year. (1) Motor vehicle crashes are responsible for more traumatic brain and spinal cord injuries and more potential years of life lost in the United States than any other cause and are the leading cause of death among Americans 5-32 years of age. (1) The death rate from motor vehicle collisions, 1.8/100 million vehicle miles/year, has been gradually declining, a multifactorial trend thought to be associated with improved automobile design and safety features (such as seat belts, collapsible steering columns, improved auto body design) lowered speed limits, improvements in road design, and stringent enforcement of traffic safety laws. (2) Legislation mandates that U.S. automobiles manufactured after September 1, 1989, have automated protection (either air bags, motorized shoulder belt, or automatic lap-shoulder belts anchored to the door) as well as lap-shoulder belts in the rear seats. The air bag is a supplemental restraint system, designed to be used together with lap-shoulder seat belt restraints. Unlike other improvements, seat-belt effectiveness depends directly on their correct use; in most states, despite legislation, only about two thirds of the population use seat belts. (3) Groups with lower use of seat belts are often young drivers, drinking drivers, and those who disobey other traffic laws. (4)

Description of Public Policy Measure
The effectiveness of three-point restraint type seat belts (lap-shoulder combination) in reducing morbidity and mortality from automobile crashes has been repeatedly demonstrated in observational studies and controlled experimental conditions. (5-7) According to the National Highway Traffic Safety Administration, the reduction in fatalities with correct use of lap-shoulder belts is estimated at 43%, with a 50% reduction in severe injuries. (8) Results from the Crash Outcome Data Evaluation System show safety belts are
52% effective at preventing injury and 89% effective at reducing fatalities. (8) Mandatory seat-belt use laws (MSBUL) are the norm in the United States; however states differ in their level of enforcement and penalties. As of 1996, 49 states (all but New Hampshire) and the District of Columbia have passed some type of MSBUL. Similarly, all states require the use of approved child safety seats for infants and young children. These laws, however often do not apply to all seating positions or types of vehicles. In standard (also known as primary) enforcement states (e.g., California, Connecticut, District of Columbia, Georgia, Hawaii, Iowa, Louisiana, New Mexico, New York, North Carolina, Oklahoma, Oregon, and Texas), state and local police can pull a vehicle over simply for noncompliance with seat-belts laws. In secondary enforcement states, drivers may be cited for seat-belt violations only when stopped for some other reason. In most states, enforcement is limited to front-seat passengers in specific vehicle types. Fines vary from state to state, averaging about $25, but range from none (Wyoming) to $95 (Oregon). Some states penalize drivers with "demerit" points as well as fines for violation of child passenger protection laws (although penalties are waived with acquisition of safety seats in most cases). (3)

**Evidence of Effectiveness**

Although seat belts are known to reduce injury, there is still some controversy regarding the effectiveness of MSBUL. Most studies find an increase in seat-belt usage (from 10%-20% to 45% -77%) (3,6,10-12) as well as a reduction in mortality or serious injury with MSBUL. (12-15) Some studies, however, do not report such reductions and some report increased accidents or fatalities. (16-20) It has been suggested that some drivers who wear seat belts because of MSBUL may feel their increased protection allows them to take more risks on the road, which can result in more injuries to pedestrians and bicyclists or other passengers, (17) although other studies refute these claims. (12-14) Most studies that fail to report protective associations between MSBUL and mortality/injury are hampered by limited time periods of data collection and overly simplistic statistical techniques that are unable to separate the impact of the public policy intervention from other factors influencing accident rates and mortality.(14) Reduction in mortality may also be limited because those who comply with legislation requiring seat belts may represent safer drivers than those who refuse. (12)

In addition, publicity surrounding enactment of MSBUL, public perception of enforcement and penalty, standard versus secondary enforcement practices, and educational and media campaigns significantly influence seat-belt usage rates. (3,14,21) In comparison to secondary enforcement, standard enforcement is
associated with higher rates of seat-belt usage (77% versus 60%) and greater fatality reductions (9.9% versus 6.8%). (3) The addition of demerit point penalties in Ontario, Canada, was associated with a 7-percentage point rise in seat-belt usage. (3) A North Carolina program recently combined safety belt checkpoints and driver/passenger safety belt education with systematic enforcement resulting in a compliance rate of 80% - preventing approximately 45 fatalities in the first 6 months. (22) Child safety seats are even more effective than seat belts at reducing fatalities (estimated 71% reduction) and serious injuries (estimated 67% reduction). (3) Recent publicity surrounding deaths of children caused by air bag deployment (23) sparked recommendations (24) against the use of rear-facing child safety seats in front seats of cars with passenger side air bags and favor of children riding properly restrained in rear seats, as this is the safest seating position. (25)

**Public Policy Considerations**
Because of their disproportionate affect on younger populations, the cost of traffic injuries to this country is staggering, both in lives lost and health care costs. One Iowa study estimated that their state's direct and indirect costs were reduced by almost $70 million annually as a result of safety belt legislation. (26) Results of the multi state Crash Outcome Data Evaluation System estimate between a 55%-408% increase in inpatient hospitalization costs for those not using seat belts. (8) Even with mandatory seat-belt laws, up to half the population does not comply and drivers at highest risk (e.g., those who drink or speed) are less likely to comply with the law and more likely to be involved in collisions. (18) However, combining legislation with other policies and educational campaigns improves compliance. Other factors to consider include the balance between individual rights and government regulations and the possibility that enforcement of seat-belt laws may come at the expense of other crime-fighting activities. However, many laws impinge on personal rights in the name of safety, and costs of police activities may be offset by revenues collected from tickets. Overall the 30% increase in seat-belt use with the enactment of seat-belt laws have been estimated to decrease traffic fatalities by 14%, saving 5,700 lives/year. (9) Seat belts may be even more effective in light of recent raising of speed limits.

**Recommendations of Other Groups**
Multiple health and medical organizations have teamed with the National Highway Traffic Safety Administration to promote seat-belt usage. Highway patrol organizations, automobile associations, President Clinton and the U.S. Surgeon General recommend mandatory seat-belt laws.
**Rationale Statement**

Ample evidence suggests that seat-belt usage reduces morbidity and mortality from automobile collisions. Without MSBUL, seat belt use is only 10% - 20%, and MSBUL have been shown to increase usage rates two to three times. Standard enforcement is associated with compliance rate of 77% compared to 60% in secondary enforcement states. Passage of various types of MSBUL across the majority of the United States as well as other countries has been demonstrated to reduce overall traffic fatalities and severity of injuries. However, it appears that MSBUL increase seat-belt use among mostly "safer" drivers, which limits their effectiveness at further reductions in morbidity and mortality associated with traffic collisions. Greater use of seat belts will improve the effectiveness of air bags, which are increasingly common in U.S. vehicles.

**Recommendations of the American College of Preventive Medicine**

The American College of Preventive Medicine recommends that all states pass standard (primary) enforcement MSBUL and that this legislation be combined with public education campaigns to increase compliance. The College supports the Model Standard Safety Belt Law, developed by the National Committee on Uniform Traffic Laws and Ordinances. (27) Existing state regulations should be standardized to eliminate exemptions for some passengers and vehicles from compliance. Use of lap-shoulder belts should be required for both front and rear seat passengers. Infants and children should be correctly placed in restraints appropriate for their age and size and such restraints should be used in the back seat of the vehicle as this is the safest position. The incorporation of higher fines, as well as demerit points, may increase compliance with these laws. However, in light of the limits on the effectiveness of these laws, the College supports further technological innovations in automobiles and roads to reduce injuries from motor vehicles, combined with continued health promotion campaigns.

Dr. Ferrini is supported by an American Cancer Society Physician Training Award in Preventive Medicine.

**REFERENCES**


From the University of California/California State University General Preventive Medicine Residency Program,
San Diego, California.

Address reprint requests to Melissa Devlin, American College of Preventive Medicine, 1660 L St. NW, Suite 206, Washington, DC 20036 -5603.

Published: American Journal of Preventive Medicine September/October 1997;13(5):401-403

Adult Immunizations

Cervical Cancer Screening

Childhood Immunization

Screening Asymptomatic Women for Ovarian Cancer

Screening for Prostate Cancer

Screening for Skin Cancer

Screening Mammography for Breast Cancer

Skin Protection from Ultraviolet Light Exposure
Tobacco-Cessation Patient Counseling