

HEALTH PROMOTION/DISEASE PREVENTION: SEAT BELT USE

A Statement

of the

AMERICAN COLLEGE OF PHYSICIANS

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INTRODUCTION

Medicine involves not only treatment, but also prevention, of disease. Physician activity in health promotion and disease prevention is limited by the state of knowledge concerning the benefits and risks of a given activity and by the extent of dissemination of that knowledge. Therefore, the American College of Physicians believes it prudent that health promotion and disease prevention activities be analyzed for benefits and risks and is thus studying a number of primary and secondary prevention efforts. Each report will highlight a specific activity, analyze the known data about benefits and risks, and recommend specific strategies for individual physicians to employ.

This report highlights seat belt use in passenger vehicles and discusses their effectiveness in reducing deaths and injuries from traffic accidents.

POSITION

Seat belt use produces a substantial reduction in the numbers of automobile related deaths and injuries and in the severity and costs of automobile related injuries. The American College of Physicians supports legislation that mandates seat belt use in all motor vehicles, including public conveyances. The College urges physicians to use seat belts, to counsel patients to use seat belts, and to take part in public education campaigns about seat belt use. The College encourages medical input in interdisciplinary research to discover the reasons for the low frequency of seat belt use.

BENEFITS

Automobile related injuries are the largest cause of death and disability among young adults and children (1,2,3). Data from the National Safety Council (4) indicate that in 1982 the majority of automobile related deaths and injuries (73.8%) occurred within 25 miles of the victims' homes.

The use of restraining devices, such as seat belts, substantially reduces the risk of death and injuries. Exact estimates vary due to differing methodologies. Estimates of the degree of reduction of the risk of death or injury by seat belt use range from 28% to 72% according to the Office of Technology Assessment (OTA)(5). The OTA report states that "with both the lowest and the highest figures, biases may be exaggerating the estimates" (5, p. 24). One of the causes of variation in the studies is the adaptation of the Abbreviated Injury Scale (AIS), which runs from minor injuries (AIS=1) to fatalities (AIS=6). Categorization of injuries and manipulation of the scale can result in distorted data. The figure preferred by the OTA is a 50% to 60% effectiveness rate.

The studies on the use of seat belts present two clear and well-documented conclusions. The first is that they are an extremely effective way to reduce automobile related deaths and injuries (5). The second is that, in the absence of legal mandate, they are used by a small minority of drivers and passengers. For example, one study of 600 drivers found that only 5.2% used seat belts (2), while another, conducted prior to passage of state laws mandating car seats for children, found that 93% of child passengers were not restrained (6). The largest estimate of the percentage of seat belt users is that reported by the OTA of between 10% to 15% (5). Despite the variation among estimates, it is reasonable to conclude that far too few drivers and passengers wear seat belts.

RISKS

There are a relatively small number of studies concerned with negative effects of seat belts, although these effects appear trivial when contrasted with the severity of risks taken by failing to use the belts (1,5). Indeed, it has been advocated that the energy spent in studying the adverse effects of belts would be more profitably spent in devising ways to increase their use (2). It is difficult to make a definitive statement concerning the risks associated with seat belt use. The National Highway Safety Administration, Division of Safety Standards, explains that this difficulty is due to the low number of seat belt users and also to the fact that post facto investigations of automobile injuries and deaths can not always distinguish between injuries caused by the crash and injuries caused by the belt. There do exist some anecdotal data indicating that a seat belt can cause abdominal and spinal injuries. Most of these data concern the now outmoded inflexible belt, and in some cases improper use of the belt may have caused or exacerbated the injury. Regarding the often quoted fear of being trapped by the belt in a burning vehicle, the National Safety Council reports that fewer than 1% of all accidents involve being trapped in a car that is burning or submerged in water. The National Safety Council also reports that the chances of being killed are 25% greater if one is thrown from a car than if one is trapped inside it.

PREVENTION STRATEGIES

The widespread failure to use seat belts, in view of their enormous proven preventive potential and low rate of risk, points to the need to develop and implement effective means of increasing usage.

Mandatory Use

The proven and most effective way of increasing seat belt use is to make it mandatory. Cross-cultural studies of mandatory systems show high rates of compliance together with substantial reductions in the numbers of auto related deaths and injuries and reduced health care costs (5,7). Examples include Australia, one of the first countries to introduce mandatory seat belt laws. A study on the results of this law in the state of Victoria showed a compliance rate of about 75% and a reduction of road fatalities by 20% in urban areas and 10% in rural areas (5). Data from the Netherlands and Sweden indicate that seat belt use is effective in reducing the numbers and severity of skull, brain, and thoracic injuries (7), and the Swedish experience provides empirical evidence to support the claim that seat belt use reduces health care costs (7). The Canadian provinces of Quebec and Ontario passed laws that permitted the public to avoid shoulder belts, due to con-

cern about discomfort. These laws are reported to produce compliance rates of 40% to 50%, whereas the reported compliance rate in New Zealand is 80% to 90% (5, chap. 3). Undoubtedly different enforcement policies account for a great deal of the variation in compliance rates (7).

Mandatory use, whether by penalty of law or by the introduction of passive systems (i.e., automatic belts and air bags), faces serious obstacles in this country. One obstacle is the "traditional American sense of independence" (5, p. 16), which is clearly manifested in the successful repeal of laws mandating crash helmets for motor cyclists (8,9) and by the attempts of cyclists to have such laws declared unconstitutional. This precedent substantially reduces the possibility of success of mandatory systems. A second obstacle is the automobile industry, which for cost reasons has been resisting attempts by federal agencies to introduce passive restraints (of which there are two types: 1) the air bag, which inflates automatically upon impact, and 2) the automatic seat belt, which protects the rider immediately upon entry). Nevertheless, the federal government has attempted, with varying degrees of effort, to introduce passive restraints into motor vehicles since the passage of Federal Motor Vehicle Standard (FMVS) 208 in 1977. The implementation of the above standard has been fraught with conflict involving the Department of Transportation, the motor vehicle industry, and consumer groups. The result of this conflict has been delay, and although the standard was revoked in 1981, the issue remains active and controversial. In June 1983, the US Supreme Court overturned the revocation of FMVS #208, ordering the Department of Transportation to consider the issue further or to issue a new regulation based on fact. In July 1984, the Department of Transportation issued a rule requiring the installation of automatic restraints in all new cars beginning with model year 1990 unless, prior to that time, state mandatory belt usage laws are enacted that cover at least two-thirds of the US population.

In the meantime, the majority of states have passed laws mandating the use of car restraints for young children. New York State recently became the first state to enact legislation requiring all drivers and front-seat passengers (including adults) to wear seat belts or risk a \$50 fine. Most laws cover children up to and including four years of age. A study on usage rates, using a national sample, found a 68% compliance rate for infants (aged 0-1) and a 35% to 37% compliance rate for toddlers (aged 1-4) (10). The actual rates are probably slightly higher, as the sample included the six states where restraints are not mandatory. Massachusetts has shown that compliance rates can be increased. That state has very strict enforcement of its laws, together with public education campaigns and "loan-a-seat programs" (in which low income families receive the use of car seats for their young children). Its compliance rates of 81% for infants and 55% for toddlers are substantially higher than the national rates (10).

These data indicate that even a mandatory law will not produce 100% compliance. On the other hand, mandatory use together with additional incentives, public education, and stringent enforcement procedures can increase the compliance rates.

Public Education

Public education, one of medicine's traditional roles in prevention (11), comprises two types: multi-disciplinary media campaigns and patient counseling. Hospitals, communities, industry, and federal agencies are becoming

increasingly active in educational campaigns in various areas of preventive health, including the use of seat belts. The Department of Health and Human Services has exhorted the medical profession to become active in preventive medicine, mentioning specifically the role of physicians in public education (11).

Public education about health promotion and disease prevention can result in large scale, collaborative multimedia efforts, such as the well known anti-smoking campaigns. Some of these efforts appear to be successful; for example, a community-sponsored media campaign about heart disease managed to bring about measurable changes in targeted health-related behaviors, including smoking (12). Another media campaign directed to diabetics succeeded in reducing their hospitalization rates (12). Other educational programs, however, especially those aimed at increasing seat belt use, appear to be less successful. An evaluation of the National Safety Council's media efforts found the campaign to have no effect (5), and cross-cultural studies confirm this (5). Another evaluation of television and magazine advertisements concluded that they were not successful in increasing the amount of seat belt usage (1). The findings to date, although negative, are not conclusive.

The Public Health Service provides educational and promotional material in written and audiovisual forms to those state health departments that request it, and block grant money for state-based promotional campaigns is available from the Department of Health and Human Services. Not all states, however, take full advantage of these opportunities (7).

Most major automobile manufacturers have included in their television and print advertisements a plea to use seat belts. No studies on the efficacy of these advertisements are available. The College feels that these efforts should be supported and other industries be encouraged to fulfill their role in public education about seat belt use. For example, the television industry could insist that all modern characters be portrayed using seat belts.

Prevention strategies should be based on valid data rather than doubtful and unprovable assumptions. Investigative efforts reveal that there seems to be a distinct type of person who takes the advantage of the benefits offered by seat belt use (5). A study of adult belt-users showed that users differed significantly from non-users on factors of general education (users have more), the degree of discomfort experienced (users perceive less), smoking, and "tailgating" or driving closely behind another vehicle (users indulge less in both behaviors) (5). The overall picture that emerges is that non-users take more risks than users.

Another study showed that parental insistence on children's use of belts is affected by the child's age as well as the parents' amount of education concerning seat belt use (13). It has been claimed that the most efficient method of education is direct physician-patient counseling (6,14), but a comprehensive review of studies found conflicting results and concluded that the question of the efficacy of physician counseling is unanswered, especially in the cases of adults and older children (3). It is possible that the most important causal variable is the individual's risk-taking propensity. Perhaps low risk-takers use seat belts and visit their doctors more than high risk-takers, thereby increasing the frequency of counseling opportunities and creating a spurious correlation between counseling and seat belt use.

Few physicians consistently counsel their patients to use seat belts. Pediatricians predominate among the small proportion of physicians who actively counsel their patients in the use of seat belts, and it has been claimed that "only a small percentage of pediatricians...routinely recommend car restraints for children" (12). One study of California pediatricians puts the figure at 3% (14) and another at less than 25% (3). Another, however, found that 70% of the four hundred and fifty pediatricians studied recommend car restraints (15). The validity of these studies cannot be assessed without knowledge of the exact methodology and access to the raw data; therefore, the most appropriate resolution of these conflicting findings is to accept the conclusion of the majority of the studies, i.e., that the percentage of pediatricians routinely counseling the use of restraining devices is low. It is logical to assume that other specialists do not counsel more than pediatricians, since pediatrics is the specialty with the greatest awareness of the issue of seat belts (as indicated by the frequency of articles on this subject in specialty journals and by the active role played by the American Association of Pediatrics [AAP] in promoting the use of car restraints by children and adults).

The issue arises of ways to increase physician counseling about seat belt usage. It appears that physicians who use seat belts themselves do more counseling about use than physicians who don't (15). Nevertheless, physicians appear no more swayed by media campaigns than nonphysicians. It has been demonstrated that exposing pediatricians to an informational film on the use of seat belts increased the frequency of their counseling but not of their use (15). This study supports the overall conclusion regarding the ineffectiveness of impersonal educational methods in changing personal behavior while demonstrating that this method can change professional behavior. In the absence of empirical data, the study concluded that it is important to increase physician use of seat belts (15).

Studies on the effectiveness of educational and informational campaigns show that neither large scale media campaigns nor personal counseling is very effective, although personal counseling is preferable. Its effectiveness rises when the patient is a "risk avoiding" type and has the added responsibility of young passengers. Some obstacles that reduce the influence of educational efforts are the public's (erroneous) perception of the low probability of being involved in a serious accident, the perception of seat belts as inconvenient and uncomfortable, and the fear of being trapped by the belt in an accident (5).

It must be kept in mind that studies evaluating the effectiveness of education on increasing the rates of seat belt use are few, so that no conclusive results should be drawn at this stage. Sophisticated experimental or demonstration models have not been developed and tested. The fairly skimpy evidence does suggest that impersonal education (via the mass media) is less effective than personal counseling. The frequency of counseling is low and correlates with low physician use of seat belts. There is evidence that physician counseling rates can be increased by impersonal education although their usage rates do not change. Thus, a review of existing studies supports authorities' call for more research (2,3).

THE ROLE OF THE PHYSICIAN

There are two levels of possible physician involvement--individual and group. On the individual level, physicians can fill the traditional role of

education via patient counseling (3,16,17). Although the effectiveness of such counseling has not been conclusively demonstrated, there is no doubt that it can be more effective (12) simply by increasing its frequency. Physicians can also educate on an individual level by modeling the behaviors encouraged for their patients. Physicians who use seat belts act as role models to their patients and others, and may thereby promote conforming behavior.

On the group level, there are three major areas for professional medical society involvement. First, despite the fact that media campaigns have not been found effective in increasing seat belt use, there is no reason to believe that an effective campaign can not be devised; medical input into such a campaign would be of great value. Input could take the form of endorsement by specialty groups or the provision of information concerning the effects of seat belts in reducing the probability of death and serious injury.

The second major area for group involvement is research (3). A combination of approaches is needed to discover the reasons for the low prevalence of seat belt use and also to devise effective prevention strategies. The role of medicine in such interdisciplinary research is of great potential value. The American College of Physicians encourages research in this area.

The third area in which medical associations can be active is in the support of mandatory legislation. As mentioned above, the AAP, working with other advocates, has been very successful in its campaign to have states enact laws mandating the use of child safety seats (18). The AAP's educational campaign includes a program, "Every Ride a Safe Ride," with the dual goals of mandatory use of child safety seats and the eventual mandatory use of seat belts by adults (19). Notwithstanding the necessity to discover and implement effective means of persuading the public to use seat belts, the superior effectiveness of a mandatory system is undeniable, as shown by studies. Despite cultural and political obstacles, there are ways in which seat belt use can be mandated. Options include penalties for nonuse and financial incentives through reduced insurance rates for drivers of appropriately equipped cars. The American College of Physicians supports laws requiring the use of seat belts. Since the use of restraints is a cost-effective measure and since failure to use seat belts, even when statutorily mandated, results in a large number of unprotected drivers and passengers, the College also urges that mandatory passive restraints be instituted with all possible speed.

SUMMARY

There is no doubt that the use of seat belts can save many lives and prevent serious injuries and handicaps. Another undisputable fact is the very low rates of use by drivers and passengers. There have been few studies on the low usage rates, and reasons for it have not yet been fully uncovered. It is clear that medicine can and should play an active role in discovering the reasons for low use and the motivation for increased use as well as in attempting to increase the use of seat belts. The two ways to increase the rates of belt use are by legal mandate and educational persuasion. Physicians can increase belt use by increasing the frequency of counseling and by acting as role models. Physicians also can work to secure mandatory seat belt use, which has been proven to be a very effective way of increasing use. The American College of Physicians supports efforts to mandate the use of seat belts (and car seats for children up to age four) by all occupants of moving automobiles.

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