

The Teenage Driver

Committee on Injury and Poison Prevention and Committee on Adolescence

ABSTRACT. Motor vehicle-related injuries continue to be of paramount importance to adolescents. This statement describes why teenagers are at particularly great risk, suggests topics suitable for office-based counseling, describes innovative programs, and proposes steps for prevention for pediatricians, legislators, educators, and other child advocates.

MAGNITUDE OF THE PROBLEM

Motor vehicle-related crashes remain the leading cause of death in youth from 16 through 20 years of age, resulting in more than 5000 such deaths annually. This age group constitutes only 7% of the US population yet accounts for 14% of all motor vehicle-related deaths.¹ Youth 16 through 19 years of age constitute 5% of all licensed drivers and 3% of all vehicle miles traveled, yet teenage drivers are involved in 15% of the crashes in which they or other occupants are killed. The motor vehicle fatality rate of teenagers is higher than that of any other age group; on a per-mile-driven basis, 16-year-old drivers are more than 20 times as likely to have a crash as is the general population of drivers, and 17-year-old drivers are more than 6 times as likely.² Young men are at especially high risk, having nearly twice the risk of fatality as young women.³ For every adolescent killed in a motor vehicle crash, about 100 non-fatal injuries occur.¹ Crashes are a leading cause of disability related to head and spinal cord injuries in this age group.

ADOLESCENT RISK FACTORS

Two main factors, the lack of driving experience and the risk-taking behavior of adolescents, account for their increased risk of crashing. Five principal reasons are commonly cited^{4,5}:

1. The adolescent, as a novice driver, lacks the experience and ability to perform many of the complex tasks of ordinary driving. Compared with experienced drivers, the adolescent is less proficient in detecting and responding to hazards, controlling the vehicle, and integrating speed. The adolescent's overall judgment and decision-making ability may not yet be fully developed. Although such deficiencies disappear gradually with driving experience and age, years of behind-the-wheel experience are required. These factors imply that driver education programs, which usually pro-

vide only 6 hours of behind-the-wheel experience, do not constitute sufficient training and cannot replace supervised driving by parents and other adults.

2. The adolescent's driving habits and propensity to take risks may be particularly influenced by emotions, peer group pressure, and other stresses.⁶
3. Nighttime driving is inherently more difficult and challenging for novice drivers. As a group, teenagers drive fewer hours than adults overall, but they drive disproportionately more at night and have a much higher nighttime crash fatality rate. A teenager is more than four times as likely to be killed while driving at night than during the day.⁷
4. The use of alcohol and other drugs by adolescents puts them at particularly great risk. Alcohol use is implicated in about one third of all fatal crashes involving teenagers.¹ Small amounts of alcohol impair the driving abilities of adolescents more than those of older drivers.⁸ Drunk and drugged driving remains a major problem for American teenagers. In one study, an estimated 6% to 14% of drivers younger than 21 years who were stopped at roadside sobriety checkpoints had been drinking.⁹ Drugs other than alcohol are involved in 10% to 15% of teenage fatalities.^{10,11} The combination of alcohol and marijuana is particularly popular and deadly.¹²
5. The low rate of safety belt use by teenagers increases their risk of injury in a crash. Youth 10 to 20 years old use safety belts only about 35% of the time, the lowest observed use rate of any group. Less than one fourth of high school students report always wearing a safety belt when another person is driving.¹³ Without restraints, the risk of injury to the teenage occupant involved in a severe crash more than triples.¹ Air bags alone are insufficient. They may not adequately restrain and therefore may not protect the occupant, particularly in side-impact, rear-impact, or rollover crashes. In rare cases, an occupant may be hurt or killed by the rapidly deploying air bag used without a seat belt. The seat belt holds the occupant in place while the air bag deploys and then deflates.

PROPOSED INTERVENTIONS

Graduated Licensing Systems

Problems of inexperience and risk taking can be addressed by revising driver's licensing systems. Each state regulates its own motorists. All states but Connecticut use the well-known, two-stage approach: a learner's permit followed by a regular driver's license. The learner's permit allows the novice to drive only when accompanied by an adult who has a driver's

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license. In most states, a teenager can apply for a full, unrestricted driver's license 6 months later. However, this short interval between restricted and unrestricted driving exposes novice drivers to the most severe risk factors before they have acquired the skills and judgment needed for independent driving.

A solution, proposed and endorsed by several federal agencies and motor vehicle safety advocacy groups, is the adoption of a graduated licensing system.^{14,15} Such systems have three sequential stages: a learner's permit, an intermediate or provisional license, and a regular driver's license. Each stage has specific components, restrictions, and minimum time requirements. Depending on the features adopted by the legislature of each state, a graduated licensing system could require a parent or other licensed adult to supervise the teenager during high-risk hours, to establish a nighttime curfew, to establish "zero alcohol tolerance" for teenagers, to restrict the number and/or ages of passengers, to require driver education, or to impose other restrictions. To graduate to the next stage, the teenage driver would have to spend a required period at the lower stage, acquire and demonstrate proficiency in driving skills, and not incur a violation for a defined period. Time spent at a lower stage could be extended if any violation or crash occurs. Teenagers could be required to attend additional driver education classes or have their licenses revoked more easily than adults.

The National Highway Traffic Safety Administration has suggested a minimum age of 15½ years to obtain a learner's permit, 16 years for a provisional license, and 18 years for a full license.¹⁵ Although no state thus far has adopted all proposed elements of the provisional stage, 11 states have zero alcohol tolerance laws (defined as blood alcohol concentration [BAC] <.02%), and nine states prohibit driving by teenagers for some period of nighttime—Idaho, Illinois, Louisiana, Maryland, Massachusetts, New York, Pennsylvania, South Carolina, and South Dakota.¹⁶ Evaluations of provisional licensing systems in several states have shown promising results. After implementation of provisional licensing in California and Maryland, the crash rate for 15- to 17-year-old drivers was reduced by approximately 5%, whereas in Oregon, the crash rate for adolescent male drivers decreased 16%.¹⁷

Driver Education and Training Classes

Driver education programs teach the basic mechanics of operating a motor vehicle, traffic rules and regulations, safe driving practices, occupant safety, risks of drunk driving, and other behavioral issues. They do not, however, provide sufficient time to acquire enough road experience to learn to deal with multiple fields of attention simultaneously or acquire other advanced driving skills, and they do not teach judgment.¹⁸ One study even suggested that driver education classes may be counterproductive, leading to an increased crash rate because teenagers learned to drive sooner than they would have otherwise done.¹⁹ In any event, parents should expect that teenagers completing a driver education course will need considerable additional one-on-one, behind-the-wheel training. Further formal

instruction after licensure might also be valuable; in fact, some advocate that it be included as a part of a graduated licensure system.¹⁵

Alcohol-related Measures

Two types of alcohol-related regulations exist: minimum drinking age laws and drunk driving laws. The latter include zero alcohol tolerance laws and regulations for administrative licensure suspension or revocation. Minimum drinking age laws, which prohibit the sale of alcohol to anyone younger than 21 years, have been credited with reducing by 40% the number of alcohol-related crashes occurring between 1982 and 1992.¹ However, such laws could still be more effective if loopholes were closed. Because many minimum drinking age laws apply only to the sale of alcohol, in some states it is still legal for a minor to purchase, possess, or consume alcohol and even to drive after drinking, provided the BAC does not exceed the state's legal limit for adults (usually .10%). Furthermore, better enforcement of existing laws could enhance their effectiveness. Store clerks may not observe the law. For example, a study in Washington, DC, demonstrated that 19- and 20-year-olds could purchase beer in 97% of attempts.²⁰

All states define legal blood alcohol limits for adults. Additionally, 36 state laws specify that in teenagers, all but a minimum BAC is illegal—the so-called zero tolerance laws.¹⁶ Drunk driving for teenagers is defined as a BAC of less than .02% in 10 states, .02% to .03% in 22 states, and .04% or more in 4 states. These laws are effective. In Maryland, after drivers younger than 21 years arrested with .02% BAC became subject to a 1-year suspension of their driver's licenses, underage alcohol-related crashes decreased by at least 11%.²¹ Administrative license suspension or revocation, which exists in 39 states, is a useful supplement to this law.¹⁶ Under administrative license suspension or revocation, the arresting roadside officer, at the time of offense, can remove the license from any driver who fails or refuses a chemical test for alcohol. The National Transportation Safety Board recommends coupling administrative license suspension or revocation with a state's zero alcohol tolerance law for underage drinking drivers. Under such a measure, any blood alcohol level present (functionally $\geq .02\%$ BAC to allow for instrument error²²) would prompt license suspension or revocation. Recent federal legislation, passed as a measure accompanying elimination of the mandatory 55-mph speed limit, has made adoption of zero alcohol tolerance legislation by the states more likely.

Improved Safety Belt Laws

Nineteen percent of high school students report that they rarely or never use a safety belt.²³ When the number of intermittent users is added to this, the problem is sizable. Although all but one state have laws mandating the use of safety belts, they may not apply to passengers in all positions. For example, many states have laws that do not require passengers sitting in the back seat to wear safety belts. The ability of a police officer to cite an offender may be restricted. Failure to wear a safety belt is a secondary

offense in many states, meaning that an officer can cite the occupant for a safety belt violation only if the vehicle is stopped for another traffic infraction.

Nighttime Driving Restrictions (Curfews)

The teenage injury fatality rate was reduced by 23% in cities with night curfews.²⁴ The key period of increased risk seems to be between midnight and 5 AM, although additional saving of lives may occur by extending the curfew from 9 PM to 6 AM. The National Highway Traffic Safety Administration and the National Transportation Safety Board recommend the use of curfews for novice drivers.^{14,15}

Parent-Peer Initiatives

Whenever possible, parents of teenagers in a peer group should decide together what peer group rules they support. If all teenagers in a group have the same rules, the opportunity for negative peer pressure is less. Teenagers want to be like, not unlike, their friends. Peer initiatives provide a method for parents and teenagers to encourage alternatives to alcohol consumption and high-risk driving. Alcohol-free high school dances and college rush parties are a clear departure from group behaviors of past years. Students Against Driving Drunk and other organizations sponsor alcohol-free social events for teenagers. For other events, adults chauffeur teenagers to dances and parties. In doing so, the judgment and driving skills of adults are substituted for those of adolescents during the high-risk period of late-night driving. Parents should actively determine whether such organizations and events support a zero tolerance philosophy for all participants, not just a "no drinking and driving" position.

RECOMMENDATIONS

Because motor vehicle crashes pose a major, continuing threat to the health of teenage youth, the American Academy of Pediatrics recommends the following:

Anticipatory Guidance by Pediatricians

Pediatricians are encouraged to emphasize to parents and teenagers repeatedly the paramount importance of safe driving behavior. During office visits, pediatricians can address risk factors, especially driving while impaired by alcohol or other drugs and nighttime driving. Pediatricians are encouraged to counsel parents that adolescents, despite their physical maturity, are still developing their driving skills and need time to master this complex task by practicing while supervised in a low-risk environment. The pediatrician should address the tendency of some parents to deny that their teenagers might be unsafe drivers.

Community Advocacy by Pediatricians

Pediatricians are encouraged to become involved in community efforts that support parent-peer initiatives and to advise parents of the merits of these efforts. Such programs include alcohol-free social events, chauffeuring for high-risk events such as proms, and parent-teen contracts. These contracts

should clearly define the expectations of the parents and teenager and should encourage an adolescent who has been drinking or whose driver has been drinking to request a ride home with a nonjudgmental, safe adult.

Legislative Advocacy by Pediatricians

Pediatricians and parents are encouraged to be public advocates for state and local legislation designed to reduce the incidence of motor vehicle crashes among young novice drivers. Such legislation includes:

- Graduated licensing systems that mandate: (1) supervision by a parent or responsible adult for at least the first 6 months when the teenager is first learning to drive; (2) nighttime driving curfews (at least between midnight and 5 AM); (3) an initial limit of one nonadult passenger; (4) use of safety belts by all occupants; (5) prompt imposition of remedial driver education for violators; (6) a documented safe driving record before full licensure is granted; and (7) zero alcohol tolerance and provisions for administrative license revocation.
- Improved minimum drinking age laws that eliminate deficiencies and loopholes concerning the purchase, possession, and consumption of alcohol by adolescents. States should be encouraged to more vigorously enforce existing laws that prohibit minors from purchasing alcohol, misrepresenting their ages, and using false identification.
- More rigorous safety belt laws that specify primary enforcement and mandatory use by all occupants in all seats of the vehicle.

Advocacy for Continued Research

Pediatricians should encourage research and funding concerning the identification of risk factors for crashes involving teenagers. This includes supporting the development, evaluation, and dissemination of programs aimed at reducing risk-taking behavior and possible environmental solutions designed to reduce the incidence of crashes, injuries, and fatalities.

Communication of Parental Responsibilities

Pediatricians should advise parents that their parenting responsibilities include the following:

- Setting a good driving example (eg, no drinking and driving, no speeding, and requiring all occupants to use safety belts);
- Establishing driving behavior limits on their teenagers, such as limiting the number and age of passengers, restricting nighttime driving for novice drivers, and delaying the onset of unsupervised driving as they see fit;
- Showing that they expect responsible driving behavior from their teenagers and imposing penalties for irresponsible actions;
- Supervising novice drivers in a vehicle; and
- Ensuring the mechanical safety of any car used by a teenager.

Parents should be advised that in 32 states, they have the authority to request that the Department of Motor Vehicles revoke the license of their minor child.

Involvement of the Alcoholic Beverage and Entertainment Industries in Encouraging Responsible Behavior

The American Academy of Pediatrics recommends that the alcoholic beverage industry eliminate advertising aimed at youth. Because the media provide powerful role modeling for adolescents, the entertainment industry is encouraged to avoid portrayal of speeding and reckless driving in contexts that invite imitation and to show universal use of safety belts.

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Canadian Paediatric Society
Deborah Tinsworth
US Consumer Product Safety Commission

SECTION LIAISON

James Griffith, MD
Section on Injury and Poison Prevention

CONSULTANTS

Julie Russell, PhD
National Center for Injury Prevention and Control
Centers for Disease Control and Prevention
David Sleet, PhD
National Center for Injury Prevention and Control
Centers for Disease Control and Prevention
Michael Brownlee
National Highway Traffic Safety Administration
Patricia F. Waller, PhD
University of Michigan Transportation Research Institute

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American Academy of Child and Adolescent Psychiatry

SECTION LIAISON

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Section on School Health

REFERENCES

1. National Highway Traffic Safety Administration. *Traffic Safety Facts 1992: A Compilation of Motor Vehicle Crash Data From the Fatal Accident Reporting System and the General Estimates System (Revised 1992 Data)*. Washington, DC: National Highway Traffic Safety Administration; 1994. US Dept of Transportation publication HS-808-022
2. Cerelli EC. *Research Note: Crash Data and Rates for Age-Sex Groups of Drivers, 1994*. Washington, DC: US Department of Transportation, National Highway Traffic Safety Administration; 1995
3. Insurance Institute for Highway Safety. *Crash Problem on a Per Mile Basis*. Washington, DC: Insurance Institute for Highway Safety; 1992;11:1-8
4. Young K. *Workshop to Identify Training Requirements Designed to Reduce Young Driver Risk Taking and Improve Decision Making Skills*. Washington, DC: National Highway Traffic Safety Administration; 1993; US Dept of Transportation publication HS-808-066
5. Predicting young driver crashes. In: Mayhew DR, Simpson HM, eds. *New to the Road: Prevention Measures for Young or Novice Drivers. Key Findings and Implications From an International Symposium; February 17-20, 1991; Halifax, Nova Scotia*. Ottawa, Canada: Traffic Injury Research Foundation of Toronto; 1991
6. Psychosocial development and proneness for risky driving. In: Mayhew DR, Simpson HM, eds. *New to the Road: Prevention Measures for Young or Novice Drivers. Key Findings and Implications From an International Symposium; February 17-20, 1991; Halifax, Nova Scotia*. Ottawa, Canada: Traffic Injury Research Foundation of Toronto; 1991
7. Williams AF. Nighttime driving and fatal crash involvement of teenagers. *Accid Anal Prev*. 1985;17:1-5
8. Zador PL. Alcohol-related relative risk of fatal driver injuries in relation to driver age and sex. *J Stud Alcohol*. 1991;52:302-310
9. Wells JK, Preusser DF, Williams AF. Enforcing alcohol-impaired driving and safety belt use laws, Binghamton, New York. *J Safety Res*. 1992;23:63-71
10. Rafaelsen L, Christrup H, Bech P, Rafaelsen OJ. Effects of cannabis and alcohol on psychological tests. *Nature*. 1973;242:117-118
11. Dott AB. *Effect of Marijuana on Risk Acceptance in a Simulated Passing Task*. Washington, DC: Public Health Service, Department of Health, Education, and Welfare; 1972. HSM publication 72-10010
12. Brookoff D, Cook CS, Williams C, Mann CS. Testing reckless drivers for cocaine and marijuana. *N Engl J Med*. 1994;331:518-522
13. Centers for Disease Control and Prevention. Safety-belt and helmet use among high school students—United States, 1990. *MMWR*. 1992;41:111-114
14. National Transportation Safety Board. *Safety Recommendation: Youth Accident Experience*. Washington, DC: National Transportation Safety Board; 1993
15. National Highway Traffic Safety Administration. *Research Agenda for an Improved Novice Driver Education Program. Report to Congress*. Washington, DC: National Highway Traffic Safety Administration; 1994
16. Fleming A. Young driver laws. In: *State Law Facts, 1995*. Arlington, VA: Insurance Institute for Highway Safety; 1995
17. Jones B. The effectiveness of provisional licensing in Oregon: an analysis of traffic safety benefits. *J Safety Res*. 1994;25:33-46
18. Waller PF. Graduated licensing: Rx for motor vehicle injury prevention. Presented at the Annual Meeting of Lifesavers; March 15-16, 1993; Chicago, IL
19. Robertson LS. Crash involvement of teenaged drivers when driver education is eliminated from high school. *Am J Public Health*. 1980;70:599-603
20. Preusser DF, Williams AF. Sales of alcohol to underage purchasers in three New York counties and Washington, DC. *J Public Health*. 1992;13:306-317
21. Blomberg RD. Lower BAC limits for youth: evaluation of the Maryland .02 law. *Transportation Res Circular*. 1993;413:25-27
22. American Academy of Pediatrics, Committee on Substance Abuse. Alcohol use and abuse: a pediatric concern. *Pediatrics*. 1995;95:439-442
23. Centers for Disease Control and Prevention. Youth risk behavior surveillance—United States, 1993. *MMWR*. 1995;44(SS-1):1-56
24. Preusser DF, Zador PL, Williams AF. The effect of city curfew ordinances on teenage motor vehicle fatalities. *Accid Anal Prev*. 1993;25:641-645