
Can We Fully Implement What We Know About Safe Driving During Adolescence?

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Motor-Vehicle Crashes: The Data

Motor-vehicle crashes remain the number one cause of death in the U.S. for adolescents and young adults. They account for 31% of the mortality and are followed distantly by homicide and suicide in young adults aged 15–24 years.¹ For several decades we have known that motor-vehicle crashes disproportionately contribute to the mortality and morbidity of adolescents and young adults when compared with older adults.^{1–3} In spite of the downward trends over the past decade in motor-vehicle mortality for adolescents and young adults, the rate still remains unnecessarily high when we examine the factors that contribute to teen crashes.⁴ A recent mid-course analysis of the 2010 Healthy People Objectives for the Nation focusing on the 21 Critical Health Objectives for Adolescents and Young Adults⁵ pointed out that mortality rates for motor-vehicle crashes, both alcohol-related and non-alcohol-related have increased slightly since 2000. By contrast, two behavioral objectives associated with vehicular use (for high school students only) show major improvement: The percentage of adolescents who report “riding in a car with a driver who had been drinking alcohol” has decreased, and now exceeds the 2010 improvement target; and seatbelt use has increased and is well on pace to meet the 2010 target.^{5,6} Beyond mortality, unintentional injuries represent the number one reason for visits to hospital emergency rooms and of these injuries, traffic injuries account for 25% of the visits.⁷

The papers that appear in this supplement to the *American Journal of Preventive Medicine* shed some new light on the problem of motor-vehicle crashes during adolescence and offer a comprehensive roadmap for all of us as we try to mitigate the negative impact of driving on the health and safety of our novice adolescent drivers.^{4,8–16} These papers build on the IOM report and the supplement in the *Journal of Safety Research* published in the last year.^{17,18} The strategy is multifactorial and involves all sectors including public health, law enforcement, insurance, families, licensing require-

ments and restrictions, alcohol-/substance-use programs, neuroscientists, and the clinical healthcare systems.

Factors in the Decrement of Adolescent Mortality

The major improvement behind the decrement in mortality over the past decade is the enactment of graduated driver licensing (GDL) programs.^{12,18,19} Other factors playing a role include the increased use of seatbelts by drivers and their passengers, the imposition of zero tolerance for alcohol use by adolescents while driving, the improvement of auto safety devices, and the decrement in the number of adolescents choosing to get their licenses.

Full Implementation of GDL

With GDL programs in place throughout North America, the question remains how to increase the downward slope of the mortality and morbidity curves. GDL programs as they currently exist are often viewed as the endpoint but they should be viewed as guidelines that can be built upon to achieve full implementation of a safe environment. As pointed out by Williams and Mayhew,¹² the GDL laws need to be enhanced and there needs to be the full participation of parents, law enforcement, state licensing agencies, driver education programs, and the medical/public health community. The engagement of parents during middle adolescence may be viewed as problematic because it is at a critical development period when the adolescent is striving for increased independence in his/her decision-making. But as Simons-Morton and colleagues¹¹ highlight, parents play the most critical role in supporting the GDL programs and placing limits on driving during the first year of licensing, the most dangerous year of driving for adolescents.

Given that the scientific community has provided us with the evidence that parents make a difference in crash rates, the public health community has been remiss in advocating for parents to play an active role in decreasing adolescent crashes. In fact, most parents first learn about GDL as their son or daughter prepares for the first steps of obtaining a license. Parents need to be brought in as full partners earlier in the licensing process. We need to encourage an interdependent

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relationship between the parent and the adolescent driver not an independent relationship that has been supported in the past. With regard to law enforcement, Williams and Mayhew¹² highlight some novel ways to alert law enforcement about recognizing the novice teen driver—we need to have some trials to test the effectiveness of these interventions.

Initially GDL programs were based on epidemiologic data regarding motor-vehicle crashes; these data provided the licensing community with the information necessary to begin the implementation process. Over the past decade, there has been a further expansion in understanding risky behavior during adolescence and young adulthood by both developmental psychologists and neuroscientists. Gardner and Steinberg²⁰ used a simulated driving videogame to study risky behavior and decision-making from adolescence through adulthood under experimental conditions. Their findings indicate that risk-taking and risky decision-making decrease with age, and that participants in their simulated driving situations took more risks when peers observed them performing the tasks than when they were alone. Overall, adolescents took greater risks than young adults and adults under the same conditions.

Giedd and others^{9,21} shed more light on the developing brain during the second decade of life; Giedd has hypothesized that the frontal lobe may play a role in inhibiting risky behavior. Using magnetic resonance imaging to measure brain growth and development, he has demonstrated that the prefrontal cortex is not fully developed until early adulthood. The definitive relationship between brain development and behavior during adolescence has yet to be confirmed but the science of neuroimaging coupled with the examination of risk behaviors provides further support for a better understanding of the relationships between brain maturity and dangerous driving.^{9,20,21} These new data provide more substantive support for the full implementation of GDL with further limitations on passengers in car, prolonged periods of supervision, and zero tolerance for the use of electronic devices such as I-pods or cell phones, for example. The licensing requirements need to embrace the new scientific knowledge.

The clinical medicine community has been absent in the field of driving safety. Given that motor-vehicle crashes are the number one cause of death and disability for adolescents and young adults, the question remains: *Where has Medicine been?* Clinical preventive services developed by a number of health organizations have not included an emphasis on safe driving practices as one of the core behavioral areas for screening or anticipatory guidance.^{22,23} Only recently has the American Academy of Pediatrics (AAP) developed a policy regarding driving safety.²⁴ Perhaps they feel that they do not have a role. Given the lack of full implementation of the existing recommended battery of clinical preventive services in a number of studies monitoring

this issue, it is not surprising that the medical community has not played a key role.^{25,26}

In spite of the gloomy past, there is optimism in the air as outlined by D'Angelo and Halpern-Felsher in this issue of *AJPM*.¹³ As they highlight in their paper, 70% of adolescents have at least one visit/year with a physician, that clinicians are often viewed as an important resource for information, that clinicians have been effective at giving key messages in critical areas, and that messages that are consistent with public health are more effective at achieving positive results.^{27–29} In our own work, we have demonstrated that anticipatory advice around seatbelt use at a well-care visit for adolescents increased the use of seatbelts 1 year later.^{30,31} We need to embrace screening to improve health promoting driving behaviors.

The full implementation of an expanded GDL program requires further expansion of the positive partnerships that have been developed among public health, law enforcement, policymakers, the scientific community, medicine, traffic safety, the insurance industry, and the licensing agencies.³² As we protect the lives of our adolescents and young adults, we should remember that we are facilitating the development of a cohort of better adult drivers who will decrease mortality throughout their lives.

No financial disclosures were reported by the author of this paper.

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