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# Introduction

## Teen Driving

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### Introduction

**Y**oung drivers are substantially overrepresented in traffic crashes. In the U.S. in 2004, drivers aged 16 to 20 were only 6.3% of the licensed drivers but accounted for 13.3% of the drivers in fatal crashes and 17.9% of the drivers in all crashes.<sup>1</sup> The deadly consequences are that traffic crashes cause 39% of the deaths of adolescents aged 16–20.<sup>2</sup>

Traffic safety experts have been aware of these grim facts for some time and have developed and implemented strategies that attempt to improve the safety of beginning young drivers. The strategies use two of the traditional traffic safety “three Es”—education and enforcement—in ways that apply specifically to beginning young drivers. (The third E, engineering, has produced safer roads and vehicles, which have improved safety for everyone.) Driver education came first, and although it may have successfully taught some driving skills, it did not produce safer drivers.<sup>3,4</sup> Enacting and enforcing laws that affect only young drivers came next: a national minimum drinking age of 21, followed by zero tolerance laws in each state that revoke or suspend the license of a driver under 21 who has been drinking. These two laws are the major reason why the number of fatal crashes involving alcohol-involved drivers under the age of 21 dropped 62% from 1982 to 2004.<sup>5</sup>

Most recently, the three-phase graduated driver licensing (GDL) system for beginning young drivers combines both education and enforcement. A learner’s permit allows driving only while supervised by a fully licensed driver. An intermediate license allows unsupervised driving under certain restrictions, typically including limits on driving at night or with teenaged passengers. Both the learner’s permit and the intermediate license must be held for a specified minimum period of time before a full license is granted. Numerous evaluations have demonstrated that GDL reduces crashes for beginning drivers.<sup>5</sup>

Some young driver strategies were developed and implemented without serious consideration or perhaps even knowledge of adolescent development issues. Driver education treats adolescents as children, expect-

ing formal classroom instruction to provide knowledge and to change attitudes and behavior. Laws and enforcement treat adolescents as adults, aware of the consequences of violating the laws and willing to change behavior to avoid these consequences.

However, a substantial and growing body of knowledge (as well as the experiences of parents whose children have survived the teenage years) makes it perfectly clear that adolescents differ in many ways—physically, mentally, psychologically, and socially—both from older adults and from younger children. Perhaps a better understanding of these differences would lead to more effective strategies to improve young drivers’ safety.

This observation prompted the IOM’s Board on Children, Youth, and Families and the Transportation Research Board to sponsor a workshop—Preventing Teen Motor Crashes: Contributions from the Behavioral and Social Sciences—in May 2006. The workshop brought together experts in traffic safety and in adolescent physical, mental, psychological, and social development to share information. Specifically, the workshop sought to understand:

- What does behavioral science tell us about teen driver risk and protective factors?
- What are the implications of the behavioral sciences for prevention, program, and policy interventions to improve young drivers’ safety?
- What research and interventions are most likely to improve young drivers’ safety over the short and long run?

The workshop’s agenda, attendees, and a brief summary are available from the Transportation Research Board.<sup>6</sup>

This supplement to the *American Journal of Preventive Medicine* expands the workshop summary by allowing several of the workshop speakers to present their thoughts in greater detail. As in the workshop itself, the articles concentrate on presenting knowledge and insights on adolescent development issues that may affect young drivers and on suggesting how interventions can best take advantage of these insights and knowledge. The articles fall into the following four main areas, with some overlap.

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## Overviews and Organizing Principles

Two papers,<sup>7,8</sup> by authors who have worked in both adolescent development and traffic safety, provide an overall context for the collection by integrating the language and concepts of adolescent development and traffic safety.

Shope and Bingham<sup>7</sup> set the stage by summarizing current and historical data on young drivers' crashes. They then present a seven-category conceptual framework of young driver risk factors, ranging from specific driving behaviors to issues of personality and demography. While some factors are difficult to change, others present potential intervention opportunities not yet explored.

Runyan and Yonas<sup>8</sup> conclude with another conceptual framework. They start with the Haddon injury prevention matrix, the 3 × 3 cross-classification of causal agent (driver, vehicle, physical environment) by time (pre-crash, crash, and post-crash) used to organize traffic safety injury prevention strategies. To this they add factors and dimensions drawn from the social ecologic framework of developmental psychology. This article provides a good introduction to young driver issues in the language of psychologists and sociologists. It also suggests new opportunities for interventions.

## Adolescent Development and Sociology

Three articles,<sup>9–11</sup> written by adolescent development specialists, present important insights into how developmental issues affect adolescents' driving.

Keating and Halpern-Felsher<sup>9</sup> provide an excellent overview of adolescents' physical, cognitive, and social development and implications for driving. They point out that expertise in driving, as in many other tasks, requires extensive guided practice, that parents can help supply both practice time and overall guidance, and that peers can be distracting—three issues addressed by GDL.

Allen and Brown<sup>10</sup> discuss how peers can influence adolescent drivers in three ways: as passengers in the driver's car, as drivers and passengers in other cars on the road, and as pedestrians or others not in cars, perhaps in contact via cell phones or text messages. The authors suggest several potential approaches to reduce the risky influence of peers and to promote positive peer interactions.

Dahl<sup>11</sup> reviews recent research on adolescent brain development—in particular, the gap between physical maturity (largely complete by the time teens reach driving age) and mental and cognitive maturity (not complete until a decade later). He observes how this mismatch affects social interactions and risk-taking behavior. He uses the well-documented sleep deprivation of many adolescents as a specific example.

## Teen Driving

These articles,<sup>12–14</sup> written by traffic safety experts who specialize in behavioral issues, discuss three intervention strategies in some detail.

Williams and Mayhew<sup>12</sup> provide an excellent overview of GDL's history, structure, and components. They discuss how GDL can be strengthened and made more effective by enacting good GDL laws in every jurisdiction and by increasing compliance with GDL provisions through the efforts of parents, law enforcement, and teens. They also suggest ways that driver education and driver's license examinations can be integrated more effectively with GDL.

Lonero<sup>13</sup> reviews driver education's role in different jurisdictions and recent trends in its program standards, structure, content, and delivery. He summarizes research on its effectiveness. He notes that driver education has been asked to improve safety, not just teach driving skills and knowledge—a demanding task for any educational program by itself. To hope to achieve this, driver education must be more firmly based on the principles of adolescent development than it is at present.

Simons-Morton et al.<sup>14</sup> discuss the role of parents in managing their beginning drivers by guiding, monitoring, and setting limits. GDL encourages parental management through its supervised practice requirement and its intermediate license restrictions. The authors describe experimental programs that encourage and guide parents to increase and improve their management activities.

## Opportunities for Interventions

Most articles in this issue offer recommendations for interventions. In particular, Williams and Mayhew<sup>12</sup> discuss how GDL, the most effective strategy currently in use, can be strengthened.

One article concentrates on an important but neglected intervention opportunity. D'Angelo and Halpern-Felsher<sup>15</sup> present a strong case for physicians and other healthcare providers to take an active role in screening, educating, and counseling their adolescent patients on safe driving.

## What Have We Learned?

The May 2006 workshop and these articles suggest four conclusions regarding adolescent development and young driver safety.

1. Research on adolescent development explains much about why adolescents drive, and crash, as they do.
2. Perhaps fortuitously, GDL is based on sound principles of adolescent development. It delays licensure, allowing adolescents' cognitive development to be more fully in line with their physical development. It

provides both a structure and a requirement for the guided practice that's needed to develop safe driving skills and the ability to apply these skills in challenging situations. It encourages parents to monitor and guide their adolescents as they begin driving. It tempers the influence of peers by restricting teenage passengers of beginning drivers.

3. The most effective strategy to improve young driver safety in the short run is to strengthen and improve GDL so that every jurisdiction's GDL system includes the key components and to encourage greater compliance with GDL requirements.
4. Additional research that builds on current knowledge of adolescent development may provide opportunities for interventions to improve young drivers' safety in the longer run. Key areas include peers, parents, and even sleep.

As you read these articles you certainly will draw other conclusions and identify important research needs. Enjoy them both for what they are—a welcome blend of disciplines that have not interacted enough, and for what they suggest—new strategies to improve the safety of young drivers.

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