

# Concerns for Novice Drivers

Nathaniel F. Watson, MD, MSc

President-Elect, American Academy of Sleep Medicine (AASM)

Professor of Neurology

University of Washington (UW)

Director, Harborview Medical Center Sleep Clinic

Co-director, UW Medicine Sleep Center



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1. I do not have any potential conflicts of interest to disclose, **OR**

2. I wish to disclose the following potential conflicts of interest:

Type of Potential Conflict	Details of Potential Conflict
Grant/Research Support	NSF 1344613, 1U50DP004930, ITHS Collaborative Translational Research Grant, ITHS Small Pilot Grants, P30NR011400, Philips Respirationics
Consultant	
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Financial support	
Other	

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# AASM Vision & Mission

## **Vision**

Achieving optimal health through better sleep.

## **Mission**

The AASM improves sleep health and promotes high quality patient centered care through advocacy, education, strategic research, and practice standards.



# National Healthy Sleep Awareness Project



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# THE 5 DEADLY BEHAVIORS



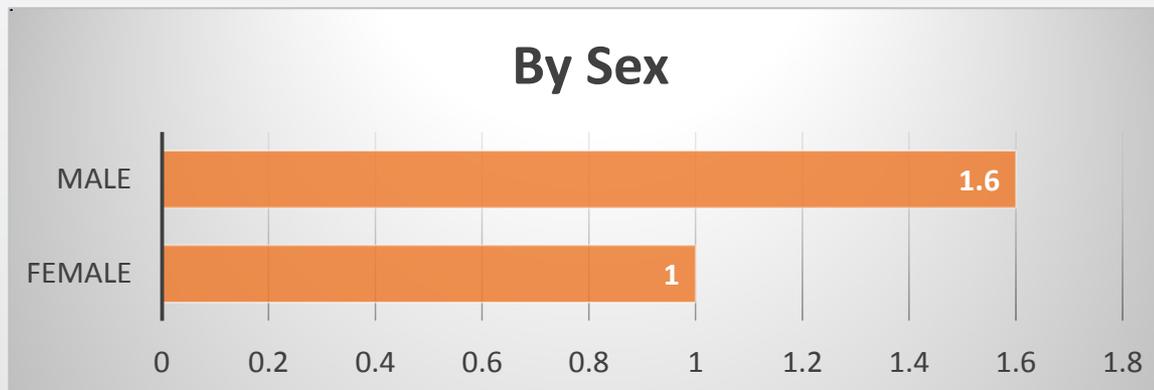
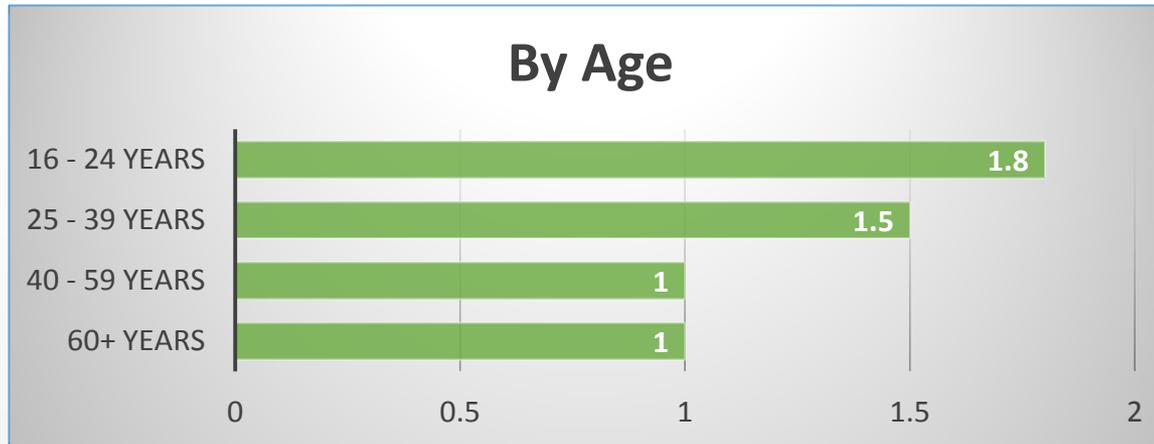
More than 90 percent of all crashes are due to driver error.  
Check out each of the top five driving behaviors killing people on Utah's roads:



*Image Credit: Utah Teen Driving Task Force*

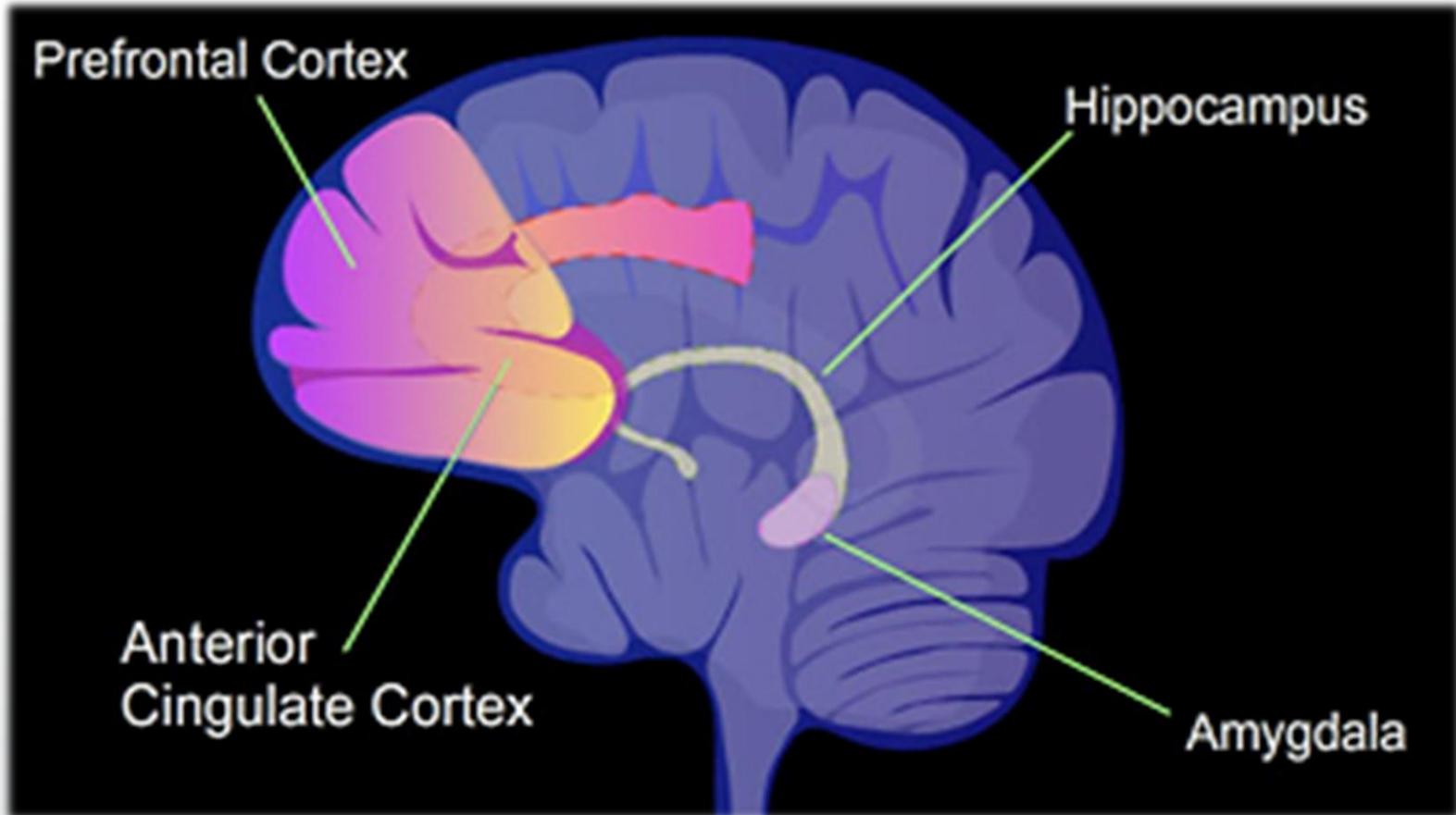
# Drowsy Driving & Novice Drivers

## Prevalence ratio of drowsy driving accidents



Source: Tefft, 2012

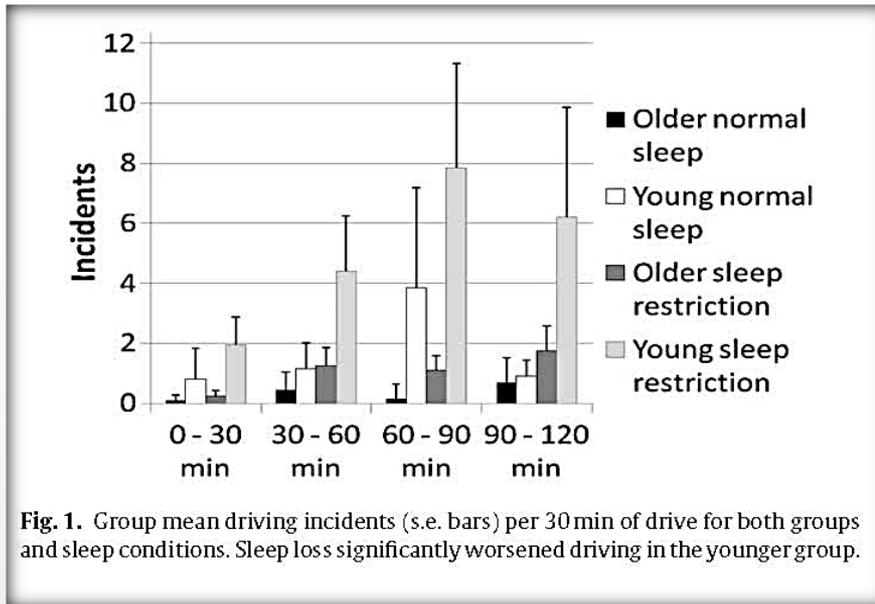
# Decision-Making & the Teen Brain



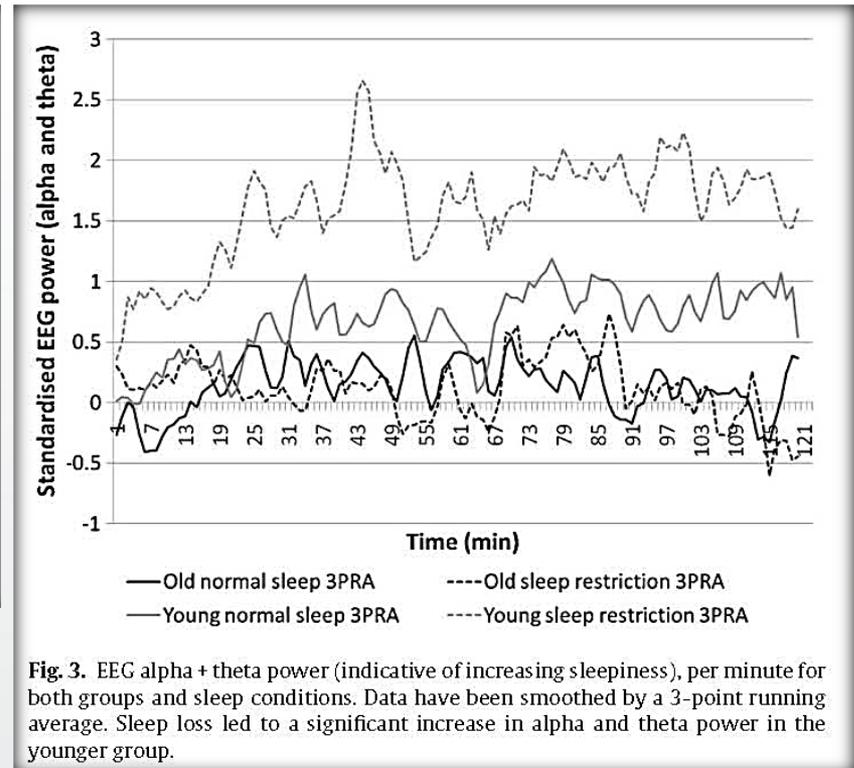
*Image Credit: National Institute of Mental Health*

*Source: Van Leijenhorst, 2010*

# Young Adult Vulnerability to Sleepiness



*Image Credit: Filtness, 2012*



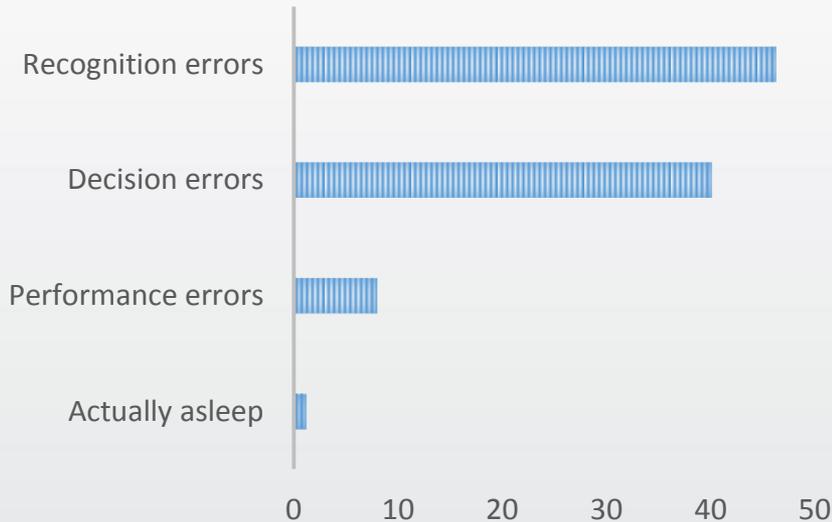
Source: Filtness, 2012; Anund 2008; Otmani, 2005

# Teen Distraction & Risky Behavior

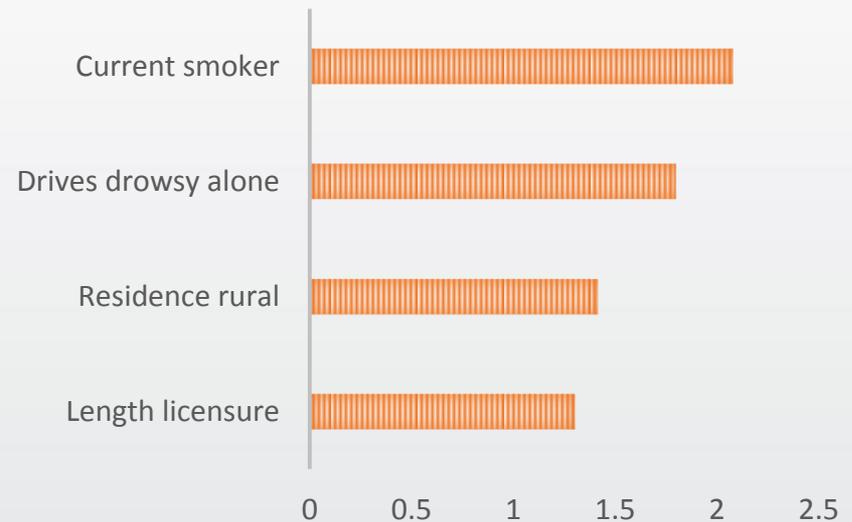
**Crashes involving 15-18 year old drivers**  
Driver error: 95.6% of crashes

**Survey of 506 young licensed drivers**  
41% reported a crash as driver

## CRITICAL TEEN DRIVER ERRORS



## ODDS RATIO OF CRASH INVOLVEMENT



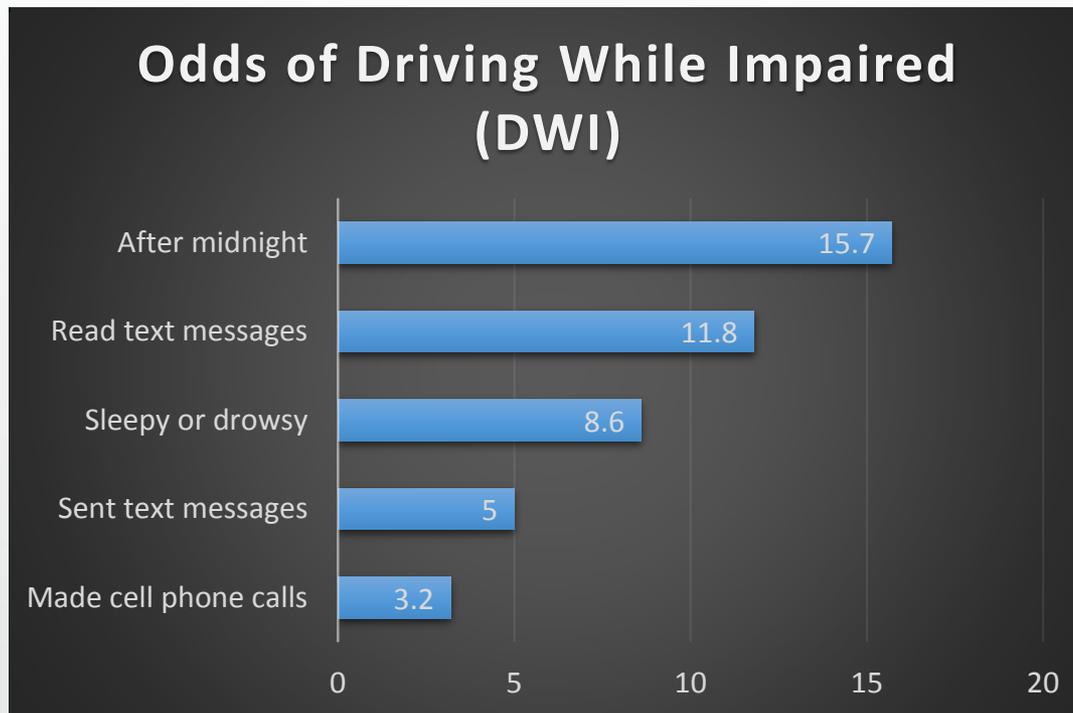
*Source: Curry, 2011*

*Source: Hutchens 2008*

# Teen Distraction & Risky Behavior

## 11<sup>th</sup> Grade Students:

- 13% DWI at least once in past 30 days
- 24% RWI at least once in past year



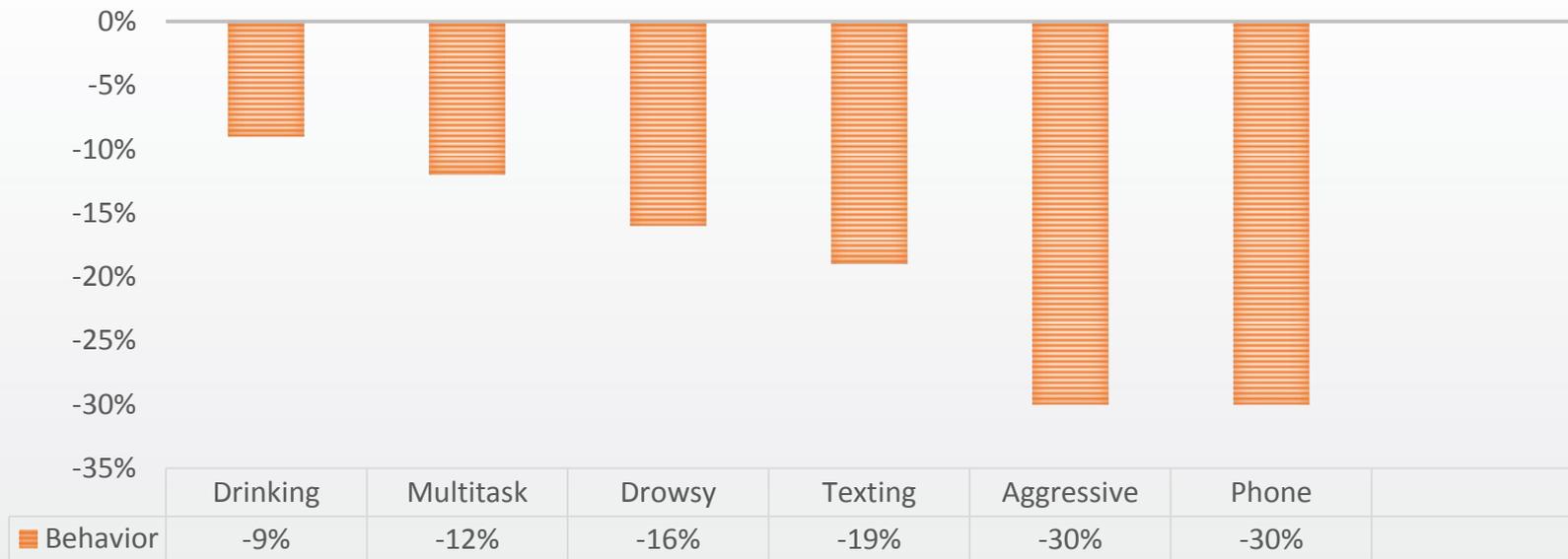
Source: Li, 2013; Beck, 2007;  
Anderson, 2013

# AASM Strategy: Advocacy and Education



# The Impact of Drowsy Driving Education

## BEHAVIOR CHANGE AT 1-MO FOLLOW-UP



Source: Murphy, 2013

# State Driver's Education Curricula



## Teens and Sleep

Why are young drivers more likely to drive drowsy?

- Teens need at least 8 to 9 hours of sleep each night
- Teen's internal biological clocks keep them awake later in the evening and keep them sleeping later in the morning
- Lifestyle habits (socializing, video games, etc.)



Click to begin video.

### MONTANA TEEN DRIVER CURRICULUM GUIDE

#### Module 6.3 – Drowsy Driving - Lesson Plan

##### Student Objectives:

The student examines the effect of fatigue on the physical and mental condition of drivers; describes behaviors indicating driver fatigue; explores the hazards associated with driving while fatigued; and explains methods to delay or avoid driving while fatigued and drowsy.

The student is expected to describe:

- a) the physical and mental effect of fatigue on driver behavior;
- b) the importance of sleep and its effect on performance;
- c) the physical and mental symptoms of fatigue on the driving task;
- d) methods to prevent driving while fatigued and drowsy.

##### Materials Needed:

1. Module 6.3 PowerPoint Presentation
2. Module 6.3 Fact and/or Work Sheets (printed for each student)
3. Module 6.3 Lesson Plan/Teacher Commentary (printed out)

##### TEACHER COMMENTARY

The following are questions you can ask during the presentation to engage students and have them develop key concepts related to Drowsy Driving.

Representation of the module slides are provided to allow you to connect the materials, data, and questions with the presentation.

##### Slide 2: Objectives – Drowsy Driving

Students will understand and be able to explain:

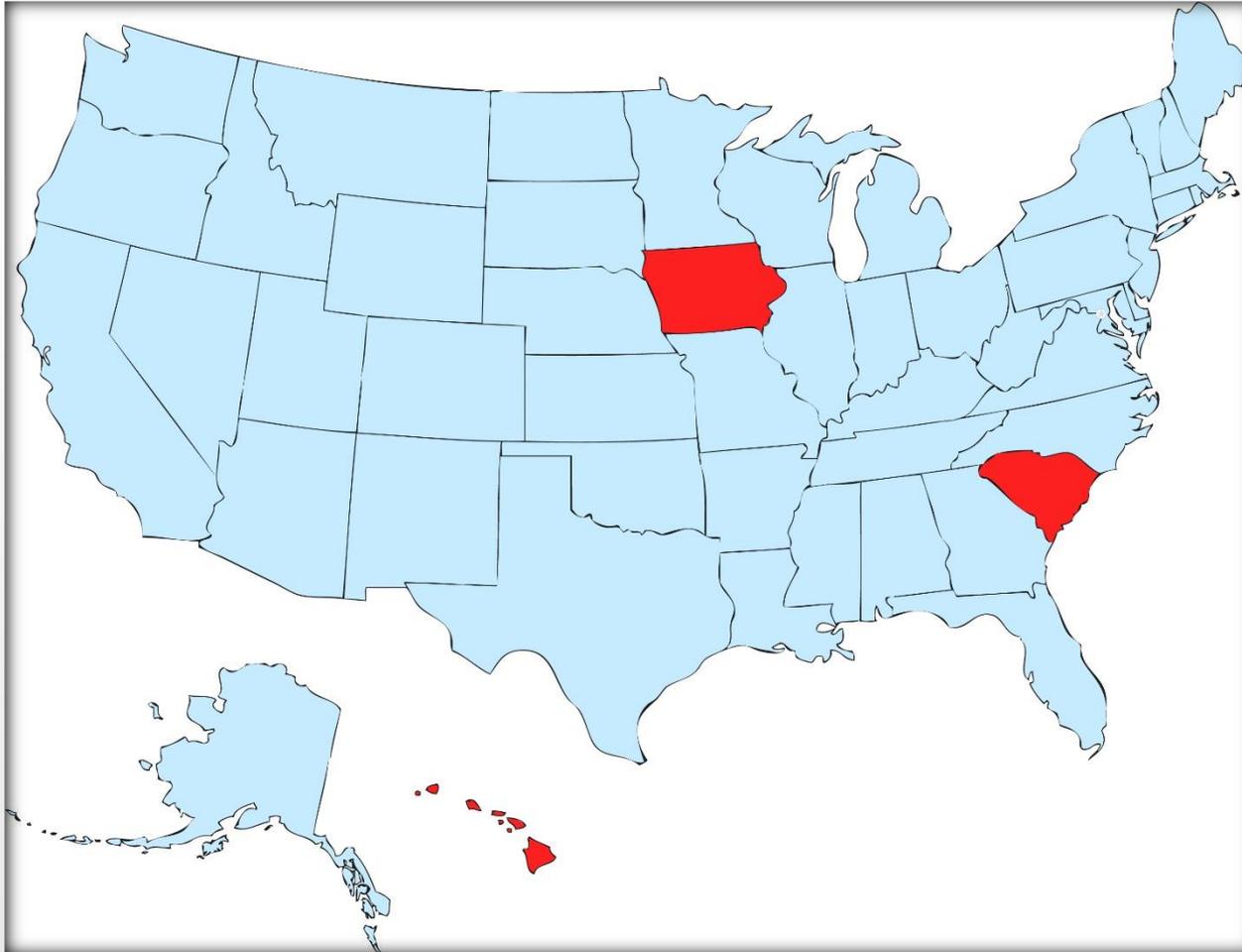
- the physical and mental effects of fatigue on driver behavior;
- the importance of sleep and its effect on driving performance;
- the physical and mental symptoms of fatigue on the driving task;
- the driving hazards associated with drowsy driving;
- and methods to delay or avoid driving while fatigued and drowsy.

##### Objectives – Drowsy Driving

For each of the following, describe the effect on driver behavior:

- the physical and mental effects of fatigue on driver behavior;
- the importance of sleep and its effect on driving performance;
- the physical and mental symptoms of fatigue on the driving task;
- the driving hazards associated with drowsy driving;
- and methods to delay or avoid driving while fatigued and drowsy.

# State Driver's Manuals



# State Driver's Manuals

## Sample: Arkansas

*“When you are tired, you cannot drive as safely as when you are rested and you do not see as well nor are you as alert as when you are rested. It takes you more time to make decisions and you do not always make good decisions. You can be more irritable and can get upset more easily. Lastly, when you are tired, you could fall asleep behind the wheel and crash.”*

Source: Arkansas Driver License Study Guide, April 2012

# State Driver's License Exams

## Sample Practice Question (New York)

On long trips you can prevent drowsiness by:

- Turning on your car radio.
- Slowing down so you can react better.
- Stopping at regular intervals for a rest.
- Moving your eyes from side to side.



# Strategy: Insurer Discount Programs

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2345

High Schools registered to date.

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# Strategy: Public Safety Campaign

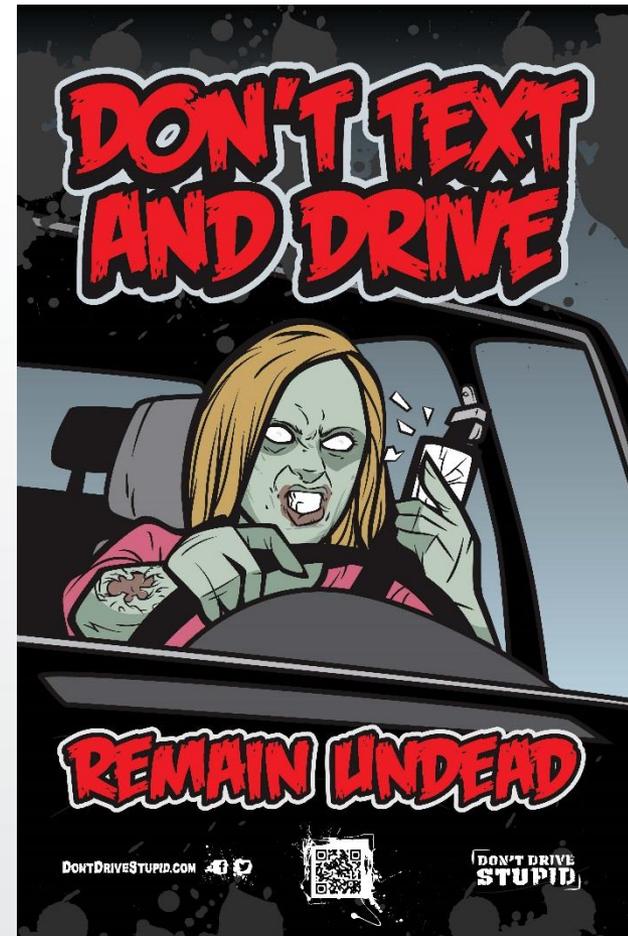


Image Credit: Utah Teen Driving Safety Task Force

# Strategy: Public Safety Partnerships

## TEEN DRIVER SAFETY WEEK 2014



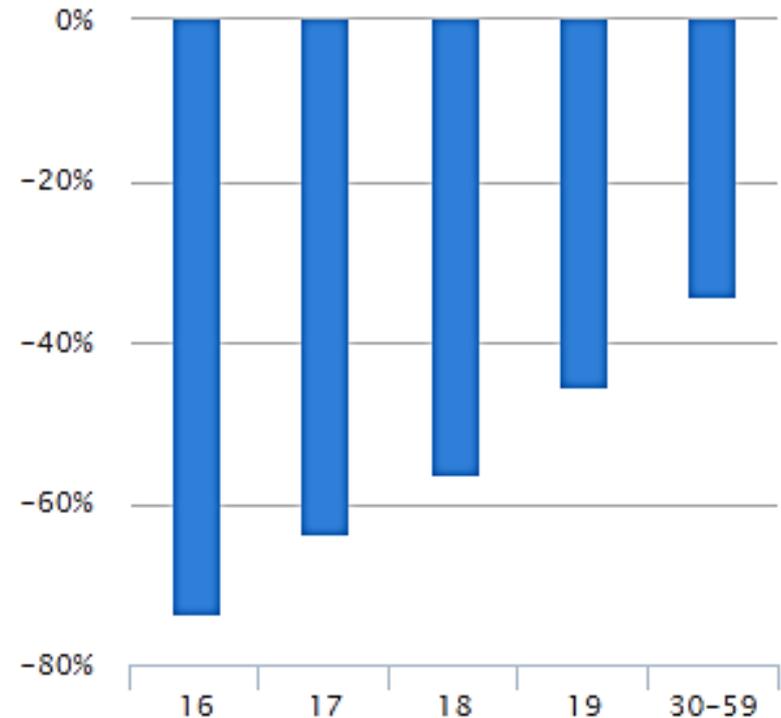
- No Cell Phones While Driving
- No Extra Passengers
- No Speeding
- No Alcohol
- No Driving or Riding Without a Seat Belt



# State GDL Laws: An Example of Effectiveness

INSURANCE INSTITUTE FOR HIGHWAY SAFETY  
HIGHWAY LOSS DATA INSTITUTE  
HIGHWAY SAFETY RESEARCH & COMMUNICATIONS

Change in per capita fatal crash rates by driver age, 1996-2012



- Crash rates have dropped among teens
  - Fewer crashes per miles driven
  - Less driving
  - Less nighttime crash involvement
- Overall teen crash rates remain elevated compared with middle-aged drivers

Sources: IIHS, March 2014; Zhu, 2013

Image Credit: IIHS

# Summary/Next Steps

- Convene the AASM Transportation Safety Task Force
- Assemble information from states regarding:
  - Drowsy driving instruction in driver's education curricula
  - Drowsy driving information in driver's manuals
  - Drowsy driving questions on driver's license exams
- Improve accuracy and consistency of this content across states
- Develop insurer discount program
- Develop strategy for public safety campaign for drowsy driving
- Develop public safety partnerships

# References

Anderson C, Horne JA. Driving drowsy also worsens driver distraction. *Sleep Med.* 2013 May;14(5):466-8. Epub 2013 Mar 22.

Anund A, Kecklund G, Peters B. Driver impairment at night and its relation to physiological sleepiness. *Scand J Work Environ Health.* 2008 Apr;34(2):142-50. Epub 2008 Apr 29.

Beck KH, Yan F, Wang MQ. Cell phone users, reported crash risk, unsafe driving behaviors and dispositions: a survey of motorists in Maryland. *J Safety Res.* 2007;38(6):683-8. Epub 2007 Nov 13.

Curry AE, Hafetz J, Kallan MJ, et al. Prevalence of teen driver errors leading to serious motor vehicle crashes. *Accid Anal Prev.* 2011 Jul;43(4):1285-90. Epub 2010 Nov 19.

Dahl RE. Biological, developmental, and neurobehavioral factors relevant to adolescent driving risks. *Am J Prev Med.* 2008 Sep;35(3 Suppl):S278-84.

Filtness AJ, Reyner LA, Horne JA. Driver sleepiness-comparisons between young and older men during a monotonous afternoon simulated drive. *Biol Psychol.* 2012 Mar;89(3):580-3. Epub 2012 Jan 20.

Herrmann US, Hess CW, Guggisberg AG, et al. Sleepiness is not always perceived before falling asleep in healthy, sleep-deprived subjects. *Sleep Med.* 2010 Sep;11(8):747-51. Epub 2010 Jul 31.

Hutchens L, Senserrick TM, Jamieson PE, et al. Teen driver crash risk and associations with smoking and drowsy driving. *Accid Anal Prev.* 2008 May;40(3):869-76. Epub 2007 Oct 26.

# References - Continued

- Keating DP, Halpern-Felsher BL. Adolescent drivers: a developmental perspective on risk, proficiency, and safety. *Am J Prev Med.* 2008 Sep;35(3 Suppl):S272-7.
- Li K, Simons-Morton BG, Hingson R. Impaired-driving prevalence among US high school students: associations with substance use and risky driving behaviors. *Am J Public Health.* 2013 Nov;103(11):e71-7. Epub 2013 Sep 12.
- McCartt AT, Teoh ER. Insurance Institute for Highway Safety. Tracking progress in teenage crash risk in the United States since the advent of graduated driver licensing programs. 2014 March. Available at [www.iihs.org](http://www.iihs.org).
- Otmani S, Rogé J, Muzet A. Sleepiness in professional drivers: effect of age and time of day. *Accid Anal Prev.* 2005 Sep;37(5):930-7.
- Stewart TC, Polgar D, Girotti MJ, et al. Evaluation of an adolescent hospital-based injury prevention program. *J Trauma.* 2009 May;66(5):1451-9; discussion 1459-60.
- Tefft BC. Prevalence of motor vehicle crashes involving drowsy drivers, United States, 1999-2008. *Accid Anal Prev.* 2012 Mar;45:180-6.
- Van Leijenhorst L, Zanolie K, Van Meel CS, et al. What motivates the adolescent? Brain regions mediating reward sensitivity across adolescence. *Cereb Cortex.* 2010 Jan;20(1):61-9.
- Wahlstrom K, Dretzke B, Gordon M, et al. Examining the impact of later school start times on the health and academic performance of high school students: a multi-site study. Center for Applied Research and Educational Improvement. 2014. St Paul, MN: University of Minnesota.
- Zhu M, Cummings P, Zhao S, et al. The association of graduated driver licensing with miles driven and fatal crash rates per miles driven among adolescents. *Inj Prev.* 2014 Feb 13. [Epub ahead of print]