

Drowsy Driving in Teenagers and Young Adults

M-CASTL Research and Education Conference
6 May 2008

J. Todd Arnedt, Ph.D.

Clinical Assistant Professor of Psychiatry and Neurology

Director, Behavioral Sleep Medicine Program

Sleep and Chronophysiology Laboratory

University of Michigan

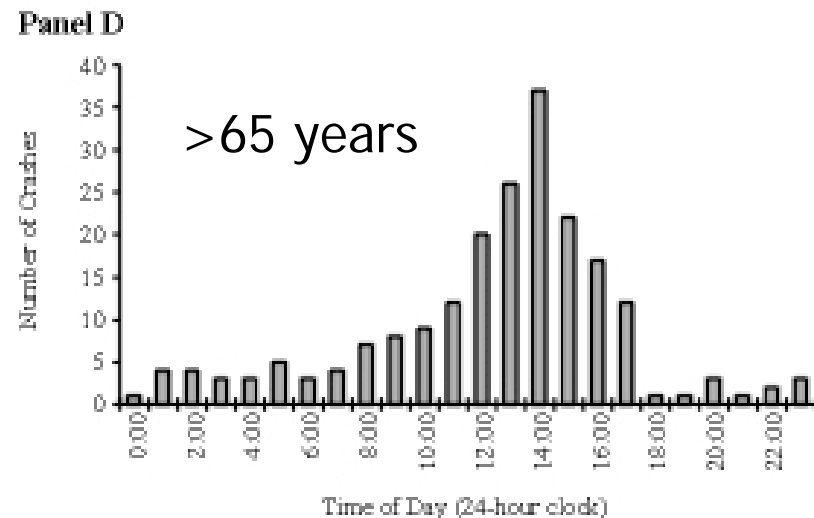
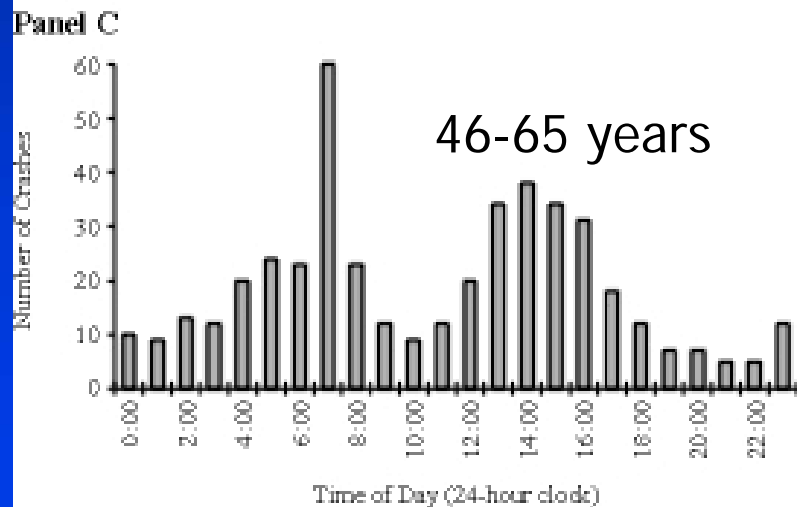
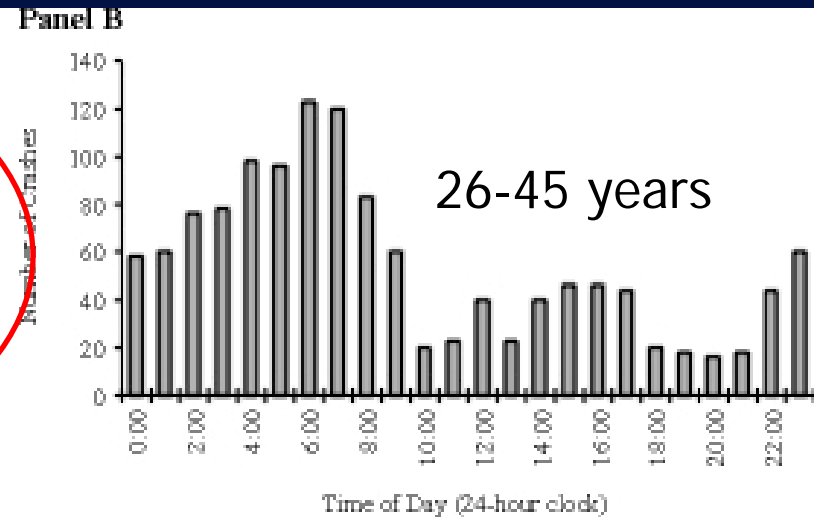
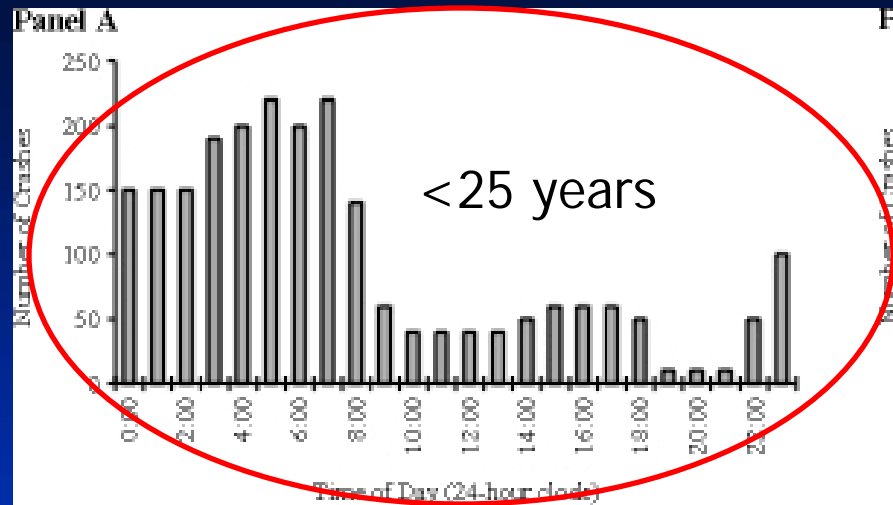


Facts and Figures

- **60%** of all adults surveyed reported driving a car or other vehicle while feeling drowsy in the prior year (NSF 2005).
- **37%** report ever falling asleep at the wheel; **30%** within the past year (NHTSA 2002).
- approximately **100,000** police-reported crashes annually (about 1.5% of all crashes) involve drowsiness/fatigue as a principal causal factor; **55%** of these crashes occur in adults <25 years old.
- Conservative estimates suggest drowsiness accounts for **1,550** fatalities (4% of all traffic crash fatalities) and **71,000** injuries annually.
- NHTSA estimates these crashes represent **\$12.5 billion** in monetary losses each year.



Driving Accidents by Age Group



Pack AI et al. *Accid Anal Prev* 1995;27(6):769-75.

Characteristics of Drowsy Driving Crashes

- Young males predominantly
- Timing follows circadian pattern
- Single vehicle/driver alone
- Monotonous, rural roads
- Higher speed roads, drive-off-the road; no evasive action taken by driver
- High fatality rate



Sources of Drowsiness in Young Drivers

- Insufficient sleep – weekday/weekend discrepancy
- Circadian factors – erratic sleep schedules
- Increased wakefulness interacts with high risk time for drowsy driving crashes
- Interaction with alcohol, sedating licit and illicit drugs
- Presence of other sleep disorders
- Underappreciation of severity of impairment



Countermeasures Used by Young Drivers

Countermeasure	%
Turn up radio volume	72.6
Open the window	48.8
Talk to one's self or passenger	19.0
Drink caffeine	16.7
Move, dance, stretch	9.5
Stop the car to nap	7.1
Stop driving	2.4
Let someone else drive	2.4

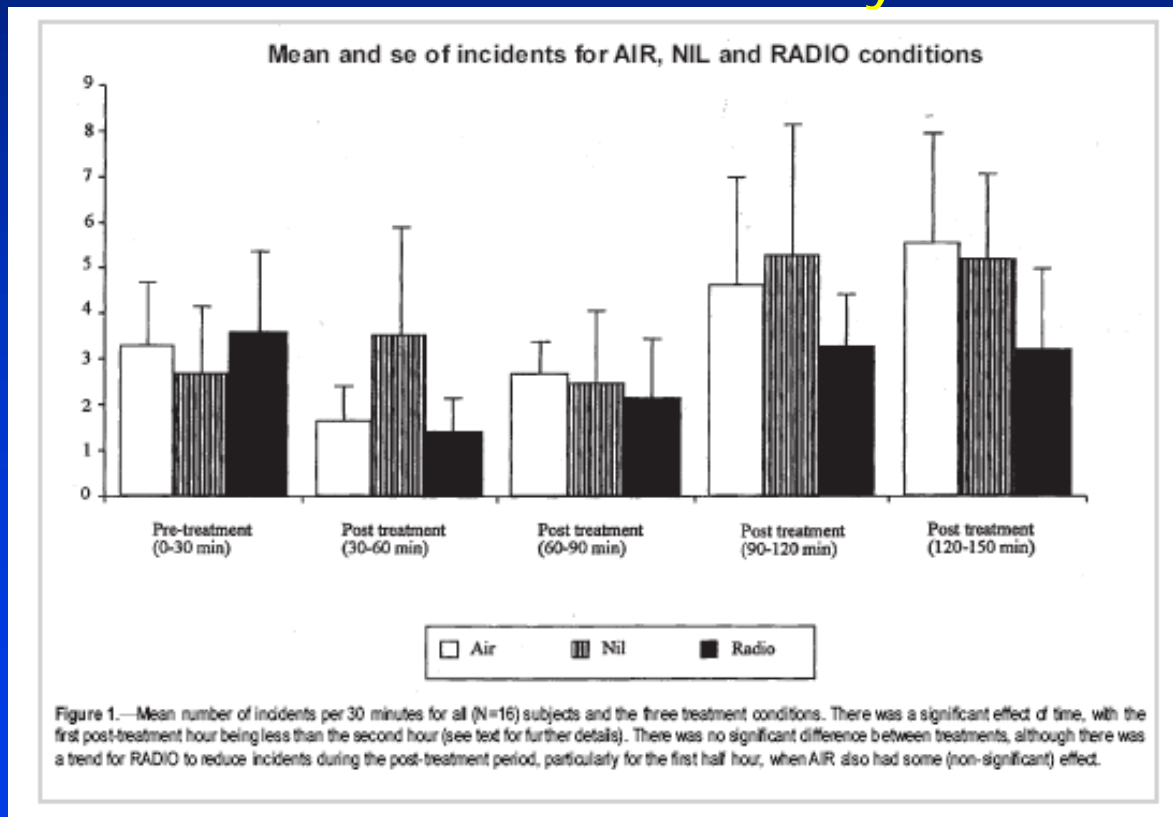
n=486

Carskadon MA, 1994



Ineffective Countermeasures

N=16 sleep-deprived young adults exposed to AIR, RADIO, or NIL during 2.5-hour afternoon simulated drive on monotonous roadway

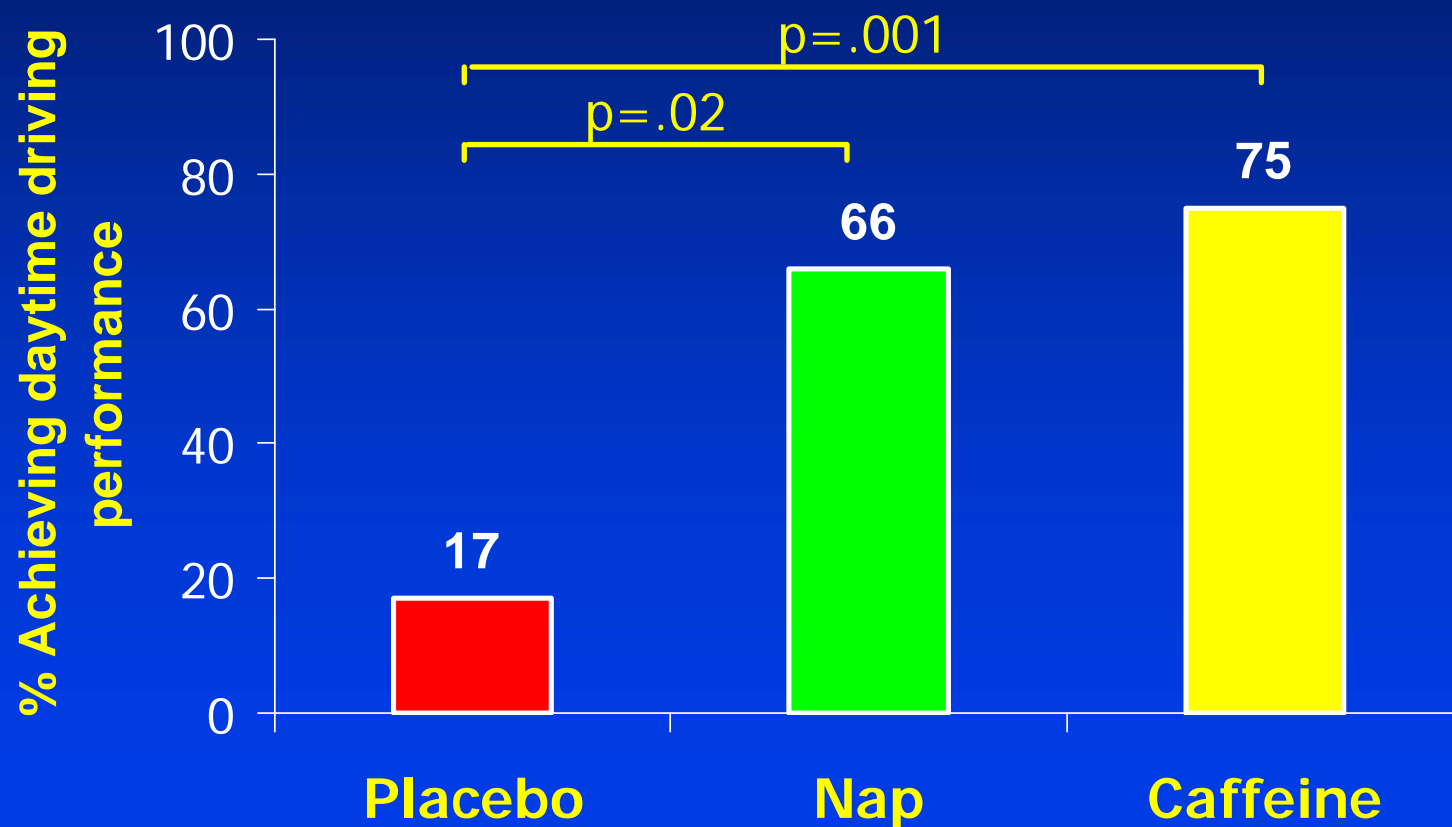


Reyner LA & Horne JA. *Sleep* 1998;21(1):46-51.



Effective Countermeasures

12 young adults drove 125 miles from 1800-1930 hours (daytime) or 0200–0330 hours after napping (30 minutes), caffeine (200 mg), or placebo.



Philip P et al. *Ann Intern Med* 2006;144:785-91.



Approaches to the Drowsy Driver Problem

1. **Educational Campaigns** – incorporated into existing driver education and traffic safety programs to sensitize young drivers to risks associated with drowsy driving and appropriate countermeasures
2. **Technological Devices** – in-car countermeasure systems based on scientific information about driving behavior when drowsy
3. **Legislative Efforts** – effective legislation to assign responsibility to drowsy drivers who are the cause of motor vehicle accidents/fatalities (“Maggie’s Law” [NJ] and 8+ states with legislation pending)

