



# EDUCATING YOUTH ABOUT SLEEP AND DROWSY DRIVING

---

STRATEGY  
DEVELOPMENT  
WORKSHOP REPORT





**EDUCATING  
YOUTH ABOUT  
SLEEP AND  
DROWSY DRIVING**

---

**STRATEGY  
DEVELOPMENT  
WORKSHOP REPORT**

*NATIONAL CENTER ON  
SLEEP DISORDERS RESEARCH  
NATIONAL HEART, LUNG,  
AND BLOOD INSTITUTE  
NATIONAL INSTITUTES  
OF HEALTH*

*FOR ADMINISTRATIVE USE ONLY*

*SEPTEMBER 1998*

# CONTENTS

Workshop Participants	.5
Introduction	.9
Overview of the Problem	.10
Sleep and Youth: The State of the Science	.10
Sleep in Adolescence [Dr. Mary Carskadon]	.10
Drowsy Driving and Teens [Dr. Allan Pack]	.12
Drowsy Driving Reports [Dr. Kingman Strohl]	.14
NCSDR and NHTSA Activities	.14
Top Ideas and Recommendations From the Small-Group Discussions	.15
Group 1: Driver Education (private and public sector)	.15
Group 2: High School	.15
Group 3: Middle School	.16
Group 4: Community-Based Programs	.16
Discussion	.17
Appendix A: The Workshop Vision and Objectives	.18
Appendix B: Questions for Small Groups	.19
Appendix C: Workshop Agenda	.20

## WORKSHOP PARTICIPANTS

Anne T. McCartt, Ph.D. (Co-chair)  
Deputy Director  
Institute for Traffic Safety Management  
and Research  
Albany, NY

Richard P. Millman, M.D. (Co-chair)  
Director, Sleep Disorders Center  
Rhode Island Hospital  
Providence, RI

Jesse Blatt, Ph.D.  
Special Assistant  
National Highway Traffic Safety  
Administration  
Washington, DC

Mary Carskadon, Ph.D.  
Professor of Psychiatry and Human  
Behavior  
Brown University  
East Providence, RI

Peggy Connolly, Ed.D.  
Mentorship Coordinator  
Illinois Mathematics and Science  
Academy  
Aurora, IL

Peter W. Cook  
Director of Professional Services  
New England League of Middle Schools  
Topsfield, MA

Gary A. Decker, M.P.A.  
Public Information and Education  
Coordinator  
DMV Safety Group  
Albany, NY

Rick Delano  
Director, Youth Development Programs  
Scholastic, Inc.  
New York, NY

Darrel Drobnich  
Director, Government and Transportation  
Affairs  
National Sleep Foundation  
Washington, DC

Bruce Fuchs, Ph.D.  
Director  
Office of Science Education  
National Institutes of Health  
Rockville, MD

John Hampu, M.Ed.  
Director, Federal Programs and  
Community Services  
Alliance City School District  
Alliance, OH

Susan Hardman  
Director, Bureau of Injury Prevention  
NYS Department of Health  
Albany, NY

John Harvey, M.S.  
Regional Traffic Safety  
Education Coordinator  
Education Service District 101  
Spokane, WA

Sarah James, M.S.  
Clinical Applications Specialist  
Respironics  
Pittsburgh, PA

Murray L. Katcher, M.D., Ph.D.  
Chairperson, Committee on Injury and  
Poison Prevention  
American Academy of Pediatrics  
Madison, WI

Paula Kun  
Director of Public Relations  
National Association for Sport and Physical  
Education  
Reston, VA

Allan I. Pack, M.B., Ch.B., Ph.D.  
Professor of Medicine and Psychiatry  
Hospital of the University of Pennsylvania  
Philadelphia, PA

John W. Palmer, Ph.D.  
Director, Minnesota Highway Safety Center  
St. Cloud State University  
St. Cloud, MN

Jude Pelchat, Ph.D.  
Senior Associate  
Annenberg Institute for School Reform  
Providence, RI

Marcia Rubin, Ph.D., M.P.H.  
Director of Research and Sponsored  
Programs  
American School Health Association  
Kent, OH

Michael Smith  
Research Psychologist  
National Highway Traffic Safety  
Administration  
Washington, DC

Kingman P. Strohl, M.D.  
Professor of Medicine  
Case Western Reserve University  
Cleveland, OH

Michelle Treistman  
Assistant Editor, Special Publications  
National Science Teachers Association  
Arlington, VA

Kyla L. Wahlstrom, Ph.D.  
Associate Director, Center for Applied  
Research and Educational Improvement  
University of Minnesota  
Minneapolis, MN

Deitra Wengert, Ph.D.  
Board Member  
American Association for Health  
Education  
Towson, MD

David P. White, M.D.  
Director, Sleep Disorders Program  
Brigham and Women's Hospital  
Boston, MA

David Willis  
President  
AAA Foundation for Traffic Safety  
Washington, DC

**NATIONAL HEART, LUNG, AND BLOOD  
INSTITUTE STAFF**

James P. Kiley, Ph.D.  
Director, National Center on Sleep  
Disorders Research  
National Heart, Lung, and Blood Institute  
National Institutes of Health  
Bethesda, MD

Susan D. Rogus, R.N., M.S.  
Coordinator, Sleep Education Activities  
National Heart, Lung, and Blood Institute  
National Institutes of Health  
Bethesda, MD

Ellen Sommer, M.B.A.  
Public Affairs Specialist  
National Heart, Lung, and Blood Institute  
National Institutes of Health  
Bethesda, MD

**SUPPORT STAFF**

Pamela A. Christian, R.N., M.P.A.  
R.O.W. Sciences, Inc.  
Rockville, MD

Susan T. Shero, R.N., M.S.  
R.O.W. Sciences, Inc.  
Rockville, MD

# STRATEGY DEVELOPMENT WORKSHOP ON EDUCATING YOUTH ABOUT SLEEP AND DROWSY DRIVING

## INTRODUCTION

The Strategy Development Workshop on Educating Youth About Sleep and Drowsy Driving was convened by the National Heart, Lung, and Blood Institute's National Center on Sleep Disorders Research (NCSDR) as part of a collaborative effort with the National Highway Traffic Safety Administration (NHTSA) to develop information on drowsy driving and promote educational activities. The purpose of this workshop was to identify priorities, methods, and messages for educating youths about drowsy driving. The workshop was chaired by Dr. Richard Millman, Professor of Medicine at Brown University School of Medicine, Providence, Rhode Island, and Dr. Anne McCartt, Deputy Director of the Institute for Traffic Safety Management and Research in Albany, New York.

The objectives of the workshop were (1) to identify strategies and recommend priorities for educating youths about the importance of sleep and the dangers of drowsy driving, and (2) to identify opportunities for partnering among organizations interested in educating youths about sleep and sleep deprivation. The workshop's intended outcomes were to increase awareness that: youths and those around them should become more knowledgeable about the importance of adequate sleep to good health and the consequences of sleep deprivation; youths should obtain adequate sleep; drowsy driving needs to decrease among youths;

and youths' support systems must be well informed about the sleep needs of youths and the consequences of sleep deprivation, especially the dangers of drowsy driving (see appendix A).

Recognizing that drowsy driving is a crosscutting issue involving the disciplines of highway safety, public health, and education, the organizers of the workshop invited individuals who represent many disciplines and areas of interest.

The workshop began with presentations by experts in sleep medicine on the state of the science in the area of sleep and youth. This provided the participants a common understanding of the issues upon which to launch their discussions. Following the presentations, the workshop participants divided into four small groups to focus on the following environments: driver education programs, high school curricula and programs, middle school curricula and programs, and community-based programs. Each of the small groups considered specific questions for their environment (see appendix B). The small groups then generated ideas for integrating sleep education messages into their particular environment and considered which organizations might be needed to implement the ideas. Each small group presented its "top ideas" to the full group for further discussion and refinement of the priority activities (see appendix C).

## OVERVIEW OF THE PROBLEM

Over the past two decades, the field of highway safety has evolved into the current model in which States and localities, in partnership with NHTSA, other Federal agencies, and the private sector, take a comprehensive approach that encompasses education, enforcement, legislation, and engineering improvements to vehicles and roadways. Drowsy driving differs in some respects from other highway safety issues. For example, given the low level of public awareness of drowsy driving and the problems inherent in identifying the role of drowsiness in a crash, there are difficulties in developing and applying legal sanctions against drowsy driving. There is a general recognition among the highway safety community that educational initiatives are a primary mechanism for reducing drowsy driving. Furthermore, although drowsy driving is a highway safety issue, it is important also to recognize that it is a public health issue. Thus, education about the effects of sleepiness on driving performance may be most effective when coupled with more general education about the health and performance benefits of good sleep hygiene.

## SLEEP AND YOUTH: THE STATE OF THE SCIENCE

### Sleep in Adolescence [Dr. Mary Carskadon]

It is now recognized that sleep is obligatory and getting optimal sleep enhances performance, cognition, and mood. Major developmental trends occur during adolescence, including (1) a decrease in the amount of sleep obtained, (2) a delay in the timing of sleep (going to bed later), and (3) an increase in the school night/weekend night discrepancy in the sleep schedule. Numerous psychosocial and biological factors influence the sleep patterns of adolescents, including parents, peers, jobs, and school:

- Parents' role changes during their child's teen years. Parents of preadolescents usually set bedtimes. By the time their children are of high school age, parents retreat from setting bedtimes and instead focus on waking them in the morning.

Parents may think that older children need less sleep than they did previously, when in fact they need at least as much or more sleep.

- Peers may influence the amount of sleep obtained relative to social activities, television viewing, and the Internet. This area needs further exploration.
- Careful sociological studies indicate that most teens work to buy personal consumables (such as clothing) and to pay for entertainment, rather than to contribute to family income. Most are employed in entry-level positions or in jobs requiring unskilled labor. Many teens work on the weekends and on weeknights after school. Those who work 20 or more hours per week tend to have a later bedtime, shorter sleep period, more falling asleep in class, and more oversleeping.
- For most teens, the school start time means a nonnegotiable wake-up time. Most adolescents would sleep significantly longer if they could. Preliminary data indicate a trend over the past 25 years toward earlier school start times, with high schools starting earlier than middle and elementary schools.

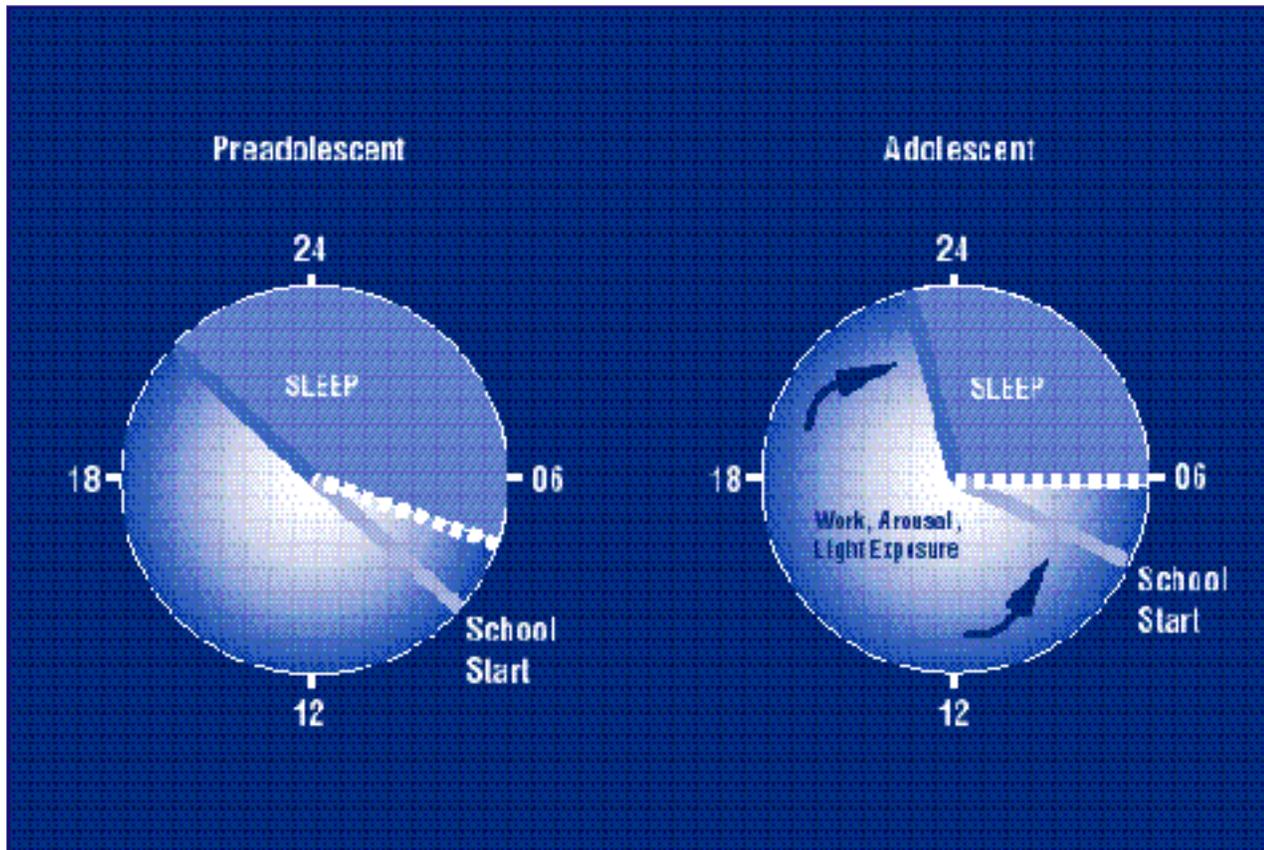
New studies show that the well-known adolescent sleep patterns of going to bed later and rising later may have a biological as well as a psychosocial basis. A study with sixth graders showed a preference for phase delay that is related to puberty. Recent data indicate that the circadian clock in adolescence is "ticking" somewhat slower than that in adults, thereby accounting for the phase-delay preference.

One field study showed that many 10th graders attending school at 7:20 a.m. were sleepy, and some had sleep abnormalities similar to those seen in narcolepsy. Another recent study evaluated the amount that teens slept during the school week. The average amount of sleep was about 6 1/2 hours, with the longest sleeper getting less than 8 hours. There was some increase in weekend sleep, but not enough to compensate fully.

When a person does not get enough sleep, even on one night, a “sleep debt” begins to build and increases until enough sleep is obtained. Problem sleepiness occurs as the debt accumulates. If too much sleep has been lost, sleeping in on the weekend may not completely reverse the effects of not getting enough sleep during the week. In general, preadolescents may be getting sufficient sleep, particularly if parents help “protect” sleep times. Older adolescents, however, are staying up later, rising earlier, and incurring sleep debts. As a result, teachers end up with sleepy students, and teens live under a “dark cloud of insufficient sleep” that may include microsleeps, attention lapses, decreased reaction times, impaired divergent thinking skills, impaired mental functioning, low mood, and a higher rate of accidents and injuries (see chart).

### Bibliography

- Carskadon MA. Sleep disturbances. In: Friedman SB, Fisher M, Schonberg SK, Alderman EM, eds. *Comprehensive Adolescent Health Care*. Second Edition. St. Louis: Mosby, 1997;805-814.
- Carskadon MA. Patterns of sleep and sleepiness in adolescents. *Pediatrician* 1990;17:5-12.
- Carskadon MA. Factors influencing sleep patterns of adolescents. In: Carskadon MA, ed. *Adolescent Sleep Patterns: Biological, Social, and Psychological Influences*. New York: Cambridge University Press, 1998 (in press).



Carskadon MA, Acebo C, Richardson GS, Tate BA, Seifer R. An approach to studying circadian rhythms of adolescent humans. *Journal of Biological Rhythms* 1997;12(3):278-289.

Carskadon MA, Dement WC. Daytime sleepiness: quantification of behavioral state. *Neuroscience and Biobehavioral Reviews* 1987;11:307-317.

Carskadon MA, Manusco J, Rosekind MR. Impact of part-time employment on adolescent sleep patterns. *Sleep Research* 1989;18:114.

Carskadon MA, Wolfson AR, Acebo C, Tzischinsky O, Seifer R. Adolescent sleep patterns, circadian timing, and sleepiness at a transition to early school days. *Sleep* 1998 (in press).

Dahl R, Carskadon MA. Sleep and its disorders in adolescence. In: Ferber R, Kryger M, eds. *Principles and Practice of Sleep Medicine in the Child*. Philadelphia: W.B. Saunders, 1995;19-27.

Wolfson AR, Carskadon MA. Early school start times affect sleep and daytime functioning in adolescents. *Sleep Research* 1996;25:117.

Wolfson AR, Carskadon MA. Sleep schedules and daytime functioning in adolescents. *Child Development* (in press).

### **Drowsy Driving and Teens [Dr. Allan Pack]**

There is a discrepancy between police-reported crash data and self-reported data. Police-reported data show that drowsy driving-related crashes comprise 1 percent of all crashes and 4 percent of crashes in which a fatality occurs. The number of self-reported drowsy driving-related crashes is much higher. Some of the factors that likely contribute to this discrepancy include:

- Not all sleep-related crashes are reported to the police, since many are drive-off-the-road crashes.
- Police may not recognize the crash as drowsy-driving related.
- Police may be reluctant to code a crash as the “fall-asleep” sort without physical evidence to support it in court.
- Standardized reporting for drowsy driving does not exist.

Data from a 1995 study conducted in North Carolina showed the following characteristics of crashes that police attributed to the driver falling asleep:

- Crashes were predominantly drive-off-the-road types.
- Crashes were often serious because no corrective action was taken.
- The times of occurrence were late at night and midafternoon (siesta time).

The data from this study further showed that most of the crashes were predominantly among young people. Fifty-five percent of all crashes occurred among those under age 26. There was a difference in the time of occurrence of these crashes among drivers of different ages (see table on page 13).

A major risk group that was identified comprises young males driving alone at night. A question that needs to be addressed is: Why are young males driving alone at night? Questions concerning social factors, lifestyles, and employment practices—and

## DRIVER AGE/TIME OF CRASH OCCURRENCE

Years of Age	Time of Occurrence
16-25	.most crashes at night
25-45	.crashes less frequent; still mostly at night
45-65	.not as many crashes at night; peak time 7:00 a.m.
>65	.few crashes at night; mid-afternoon peak

whether these crashes are more common in sleep-deprived youth—need to be examined.

A recent study showed that self-reported tiredness while driving at night correlated with slowed reaction times. With the addition of alcohol, the reaction times in all drivers decreased significantly. Even small amounts of alcohol when combined with sleep deprivation had major detrimental effects on reaction times and driving performance. Based on studies that used a driving simulator, even moderate amounts of alcohol combined with sleep deprivation have a major deleterious effect on driving performance.

Another issue that needs to be addressed is whether the effects of alcohol should be incorporated into drowsy-driving messages, since there clearly is an interaction between alcohol and sleepiness. Previous focus group studies showed that drivers did not want the messages combined. The focus group participants offered two observations: some of the public have been saturated with drunk-driving messages, and the drowsy-driving message may be lost if combined with messages about alcohol.

Another issue to consider is whether efforts should focus on prevention or on coping strategies. Preventive strategies seek to decrease the incidence of drowsy driving among youth. Examples of preventive strategies might include employing graduated licensing as a mechanism to decrease nighttime driving among youth, or educating youth

about good sleep hygiene. On the other hand, coping strategies encompass measures that can be employed if a driver becomes drowsy while driving. Examples of effective coping strategies are pulling off the road to take a short nap or drinking a caffeinated beverage. Education about effective coping mechanisms is needed because many ineffective strategies, such as opening a window or turning up the volume on the radio, are currently reported as being used by drivers.

### Bibliography

- Knipling RR, Wang J-S. Crashes and fatalities related to driver drowsiness/fatigue. Research Note. NHTSA, U.S. Department of Transportation, 1994.
- Pack AI, Pack AM, Rodgman E, Cucchiara A, Dinges DF, Schwab CW. Characteristics of crashes attributed to the driver having fallen asleep. *Accid Anal Prev* 1995;27(6):769-775.
- Roehrs T, Beare D, Zorick F, Roth T. Sleepiness and ethanol effects on simulated driving. *Alcohol Clin Exp Res* 1994;18(1):154-158.

### **Drowsy Driving Reports [Dr. Kingman Strohl]**

The American Medical Association's (AMA) Council on Scientific Affairs recently released a report that will help focus attention on drowsy driving relative to policy and medical issues. The report, "Sleepiness, Driving, and Motor Vehicle Crashes," was published in the June 17, 1998, issue of the *Journal of the American Medical Association*. This report provides a good review of the literature and discusses key drowsy driving-related recommendations passed by the AMA House of Delegates in 1996.

The NCSDR and NHTSA have also recently finalized a major report on drowsy driving. An expert panel (chaired by Dr. Strohl) was convened to review the literature and describe the key issues involved in the problem of driver fatigue and sleepiness. The panel's report is designed to provide direction to an NCSDR/NHTSA educational campaign to combat drowsy driving. A copy of the report, "Drowsy Driving and Automobile Crashes," is available on both agencies' Web sites at [www.nhtsa.dot.gov](http://www.nhtsa.dot.gov) and [www.nhlbi.nih.gov](http://www.nhlbi.nih.gov).

The expert panel identified three broad population groups to be at the highest risk for drowsy driving:

- Younger people (ages 16 to 29), especially males;
- Shift workers whose sleep is disrupted by night work or long or irregular work hours; and
- People with untreated sleep apnea syndrome and narcolepsy.

The report recommends that the two Federal agencies focus their efforts on three priority areas:

- Educating young males about drowsy driving and how to reduce their lifestyle risks;
- Promoting shoulder rumble strips as an effective countermeasure for drowsy driving and;
- Educating shift workers about the risks of drowsy driving and how to reduce them.

### **NCSDR AND NHTSA ACTIVITIES**

Dr. James Kiley, director of the National Center on Sleep Disorders Research (NCSDR), and Dr. Jesse Blatt of the National Highway Traffic Safety Administration (NHTSA) commented that, in response to the expert panel's recommendations, both agencies are launching educational activities aimed at combating drowsy driving. The NCSDR is focusing its efforts on young people, and NHTSA's focus is on shift workers, including young males. This workshop is an initial activity of the NCSDR to identify priorities in educating youths. Another activity completed by the NCSDR in the spring of 1998 was the development and distribution of an educational insert in several Scholastic, Inc. magazines targeted to high school students. Major messages included the need for adequate sleep, teens' need for more sleep as compared with younger children and most adults, and the dangers of inadequate sleep, especially the danger of drowsy driving. Future educational efforts by the NCSDR will continue to focus on school-age youths with messages about the relationship between sleep and health and performance, and the consequences of sleep deprivation. Specific future educational activities remain to be determined. NHTSA's efforts include the award of approximately 15 pilot grants to address the issue of drowsy driving among shift workers. The grants will be available to a wide variety of organizations, from private businesses to community-based traffic safety programs.

## TOP IDEAS AND RECOMMENDATIONS FROM THE SMALL-GROUP DISCUSSIONS

In developing their ideas and recommendations, the small groups considered the current focus on sleep education in each environment, as well as target audiences, primary messages, and factors that might help or hinder incorporating sleep education into the environment (see appendix B). In most cases, no widespread sleep-related programs or curricula could be identified. However, there are some limited-scope programs in place around the United States that could possibly serve as models for larger scale, national initiatives.

### **Group 1: Driver Education (private and public sector) Facilitator: Dr. John Palmer**

*It is estimated that approximately 50 percent of novice drivers go through a formal driver education program. Educational efforts will need to address the fact that driver training currently is taking place in a multitude of environments.*

Recommendations:

1. Develop a national model curriculum package for students/novice drivers, parents, and teachers. Curriculum vendors, the traffic safety community, the sleep community, and school administrators would be involved in contributing to the content or disseminating the product. A primary message is that sleep is not a waste of time.
2. Hold symposia on sleep deprivation for the driver education community. Traffic safety and sleep experts should develop the content for the symposia.
3. Develop self-assessment tools for novice drivers. A consortium of driver education, traffic safety, and sleep organizations should implement this idea.

4. Develop an electronically based curriculum package and supplements for novice drivers, instructors, and parents.
5. Create a Web-based resource directory for practitioners, students/novice drivers, parents, teachers, vendors of curricula, safety/traffic organizations, and sleep communities.
6. Develop a driver's manual and knowledge exam for novice drivers.

### **Group 2: High School Facilitator: Dr. Jude Pelchat**

*Education in the high school environment needs to be addressed at three levels:*

- *Curriculum and supplemental materials—fundamental ideas about sleep deprivation need to be worked into curricula or supplemental materials.*
- *Special programs—activities and information from special initiatives such as National Sleep Awareness Week and the High School 2000 Task Force should be incorporated into high school educational efforts.*
- *High-risk circumstances—high-risk times for students, such as exam week, prom season, and spring break, should be addressed.*

Recommendations:

1. Offer sessions at the annual meetings of relevant education organizations, such as the National Science Teachers Association and the National Association of Secondary School Principals.
2. Develop and publish sleep-related articles in popular teen magazines, such as *Seventeen* and *Nintendo Power*.
3. Sponsor essay/poster contests on sleep to raise awareness. The Sleep Research Society already does this—other organizations could do something similar.

4. Develop interactive curricular materials for teachers and students, including a sleep bibliography.
5. Develop partnerships and distribution channels that provide support to professional organizations.

**Group 3: Middle School  
Facilitator: Mr. Gary Decker**

*Teaching students about sleep and sleep deprivation in middle school can set the stage for further learning during the high school years. It may also be easier to get sleep-related materials into the middle school curricula. During the middle school years, an important part of students' development is learning to make choices. Making choices about sleep allows teens to have some control over their schedules.*

**Recommendations:**

1. Raise awareness about sleep and sleep-related issues among the pertinent national organizations, such as the National Middle School Association, National Science Teachers Association, and the New England League of Middle Schools. The National Institutes of Health (NIH) and NHTSA should support this effort by establishing a science base for educational messages.
2. Develop classroom materials for teachers and students. Involvement of various professional sources will be needed to implement this idea, including teachers' organizations (both general and specialty), national and State education departments, principals' associations, National Parent-Teacher Association, NIH, sleep organizations, and curriculum coordinators.
3. Begin sleep education in elementary school to provide a platform on which to build in later years.
4. Expand the current knowledge base by increasing research on sleep and sleep deprivation using longitudinal, descriptive, cross-sectional, and interventional studies. Sleep-related organizations, research organizations, and foundations will be needed to implement this idea.

5. Develop a federally funded national public relations campaign focused on youth and sleep. The campaign could include mass media such as radio, television (MTV), print, and Scholastic, Inc., materials.

**Group 4: Community-Based Programs  
Facilitator: Ms. Susan Hardman**

*Educational messages should be packaged in a way that promotes something new, something interesting, and something people want to read or learn about. Community-based programs should include the law enforcement sector, other government sectors, the education community, community and advocacy groups, health professionals, and the private sector. Ideally, educational materials should be culturally sensitive and multilingual.*

**Recommendations:**

1. Support police training to recognize and properly report drowsy-driving crashes. State and local police, the criminal justice system, police benevolent societies, and highway authorities need to be involved to foster further police training.
2. Support public policy initiatives such as rumble strips, delayed school start times, and safe rest areas. Organizations needed include legislators, school boards, law enforcement agencies, divisions of motor vehicles, parent-teacher associations, and community groups.
3. Develop a public education and information campaign targeted to parents, children, professionals, and others about sleep and drowsy driving. This initiative needs to be supported by Federal, State, and local governments; the traffic safety community; the public health community; the medical community; the media; the private sector; and service organizations.

## Discussion

Strategies were discussed for implementing the small groups' recommendations for educating youth about sleep and drowsy driving. The following three possible goals were discussed:

- Continue and build on specific programs and initiatives already under way.
- Bring efforts to the State level, using pioneer States such as New York and Washington as models.
- Develop a national strategy in which a Federal agency or agencies or other national organizations would lead, coordinate, and oversee efforts to develop and implement educational initiatives for young people.

There was a general consensus that youthful drowsy driving is an important issue. There was also agreement that much more needs to be done to provide sufficient education on sleep and drowsy driving to young people and their support systems, including educators and parents. It was also acknowledged, however, that there is no mechanism for providing the necessary leadership and coordination to expand current efforts and to develop and implement new initiatives. The interested organizations need a mechanism for communicating what they are doing; establishing joint priorities; sharing information, programs, materials, and other resources; developing collaborative efforts; and identifying funding.

Participants suggested a number of possible methods for increasing communication among organizations. It was also pointed out that while State and local governments are the primary mechanism for delivering programs in highway safety, the Federal government plays a critical role in establishing national priorities, providing technical assistance, conducting and sponsoring research, and providing funding. At present, no single government agency has primary responsibility for conducting research and developing programs on drowsy driving. The important roles of nonprofit organizations and foundations in advancing this issue were also stressed.

In the course of its deliberations, the group identified the following as issues to be addressed in all the environments considered:

- While a great deal is known about sleep and sleep deprivation and the effects of sleepiness on driving performance, and there is an appropriate basis for action, more research is also needed. Educational messages must be credible and based on science in order to be effective and persuasive.
- Infrastructures for the dissemination of information exist in many environments for youth, including schools; local, State, and national government agencies; business and industry; and professional, educational, highway safety, and public health associations.
- The focus of sleep education differs from that of disease-based entities—it may require a different approach and strategy than are traditionally used for educating about disease-based topics.
- Developing partnerships among key national organizations will be necessary to ensure the successful implementation of these ideas. In particular, it is important that NHTSA and the NCSDR continue to expand their collaborative efforts.

# APPENDIX A: THE WORKSHOP VISION AND OBJECTIVES

## VISION

- 1) That youth and those around them become more knowledgeable about the importance of adequate sleep to good health, and the consequences of sleep deprivation;
- 2) That youth obtain adequate sleep;
- 3) That drowsy driving decreases among youth, including that
  - a) They avoid getting into a drowsy driving situation, and that
  - b) They know what to do if faced with a drowsy driving situation;
- 4) That youths' support systems (including parents, teachers, coaches, employers, school health personnel and others) are well informed about sleep needs and the consequences of sleep deprivation, especially the danger of drowsy driving.

## OBJECTIVES

- 1) To identify strategies and recommend priorities for educating youth regarding the importance of sleep and the danger of drowsy driving for the NCSDR and other organizations to consider.
- 2) To identify opportunities for partnering and coordination among organizations having an interest in the education of youth about sleep and sleep deprivation.

## APPENDIX B: QUESTIONS FOR SMALL GROUPS

### **Part 1:**

The small groups will consider the following questions for their particular program area (i.e., driver education, high school curricula/programs, middle school curricula/programs, or community-based programs).

- 1) What is the current focus on sleep/sleep deprivation in this environment?
- 2) Where would sleep education naturally fit into this environment?
- 3) What audiences need to be reached in this environment?
- 4) What messages are needed?
- 5) What factors\* exist that would **help** to incorporate sleep education (or to achieve adequate sleep) in this environment?
- 6) What factors\* exist that would **hinder** sleep education (or the attainment of adequate sleep)?
- 7) Which organizations could be involved in implementing sleep education in this environment?

\*Some factors to consider:

- a) Knowledge and attitudes (of students, teachers, parents, others)
- b) School schedules
- c) Athletics
- d) Employment
- e) Driver licensing/curfews/regulations
- f) Others (specify)

### **Part 2:**

The small groups will brainstorm about ideas for integrating sleep education messages into their program area, as well as possible organizations to implement activities. They then will score and rank the ideas according to: a) the idea's likelihood of success (1-10 points where 1= not very likely to succeed and 10= very likely to succeed); and b) its ease of implementation (1-10 points where 1= not at all easy to implement and 10= very easy to implement).

The four small groups will present their "top" ideas, and possible organizations to implement them, to the full group in the afternoon for general discussion and further refinement.

# APPENDIX C: WORKSHOP AGENDA

## NATIONAL CENTER ON SLEEP DISORDERS RESEARCH STRATEGY DEVELOPMENT WORKSHOP ON EDUCATING YOUTH ABOUT SLEEP AND DROWSY DRIVING

Omni Shoreham Hotel  
Washington, DC  
June 5, 1998

8:00 - 8:20	Welcome and Introductions .....Dr. Millman/Dr. McCartt Purpose of Workshop .....Ms. Rogus
8:20 - 8:50	Sleep in Adolescence .....Dr. Carskadon
8:50 - 9:30	Drowsy Driving and Teens .....Dr. Pack/Dr. Strohl
9:30 - 9:45	BREAK <b>NOTE:</b> Participants will be assigned to four small groups for the remainder of the morning to focus on the following specific program areas: <ul style="list-style-type: none"> <li>• Driver Education Programs</li> <li>• High School Curricula/Programs</li> <li>• Middle School Curricula/Programs</li> <li>• Community-Based Programs</li> </ul>
9:45 - 10:45	Part 1: Current Opportunities for/Obstacles to Incorporating Sleep Education Into Program Area .....Small Groups
10:45 - 11:45	Part 2: What Can Be Done to Integrate Sleep Education Into Program Area? .....Small Groups
11:45 - 1:00	LUNCH
1:00 - 4:15	Top Ideas for Successful Integration of Sleep Education Into: .....Small Group Presentations/ Large Group Discussion <ul style="list-style-type: none"> <li>1:00 - 1:45 .....Driver Education Programs</li> <li>1:45 - 2:30 .....High School Curricula/Programs</li> <li>2:30 - 2:45 .....BREAK</li> <li>2:45 - 3:30 .....Middle School Curricula/Programs</li> <li>3:30 - 4:15 .....Community-Based Programs</li> </ul>
4:15 - 4:30	Summary
4:30	Adjournment

Discrimination Prohibited: Under provisions of applicable public laws enacted by Congress since 1964, no person in the United States shall, on the grounds of race, color, national origin, handicap, or age, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity (or, on the basis of sex, with respect to any education program or activity) receiving Federal financial assistance. In addition, Executive Order 11141 prohibits discrimination on the basis of age by contractors and subcontractors in the performance of Federal contracts, and Executive Order 11246 states that no federally funded contractor may discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. Therefore, the National Heart, Lung, and Blood Institute must be operated in compliance with these laws and Executive Orders.

U.S. DEPARTMENT OF HEALTH AND  
HUMAN SERVICES

Public Health Service  
National Institutes of Health  
National Heart, Lung, and Blood Institute

September 1998