

# Research Matters

## Prepared by SAVIR Advocacy and Policy Committee

**Research seeks new knowledge to make a difference in the lives of real people.** Injury and violence researchers have a strong track record of conducting scientific studies that directly impact programs and policies that save lives, reduce suffering and, because treating injuries is so expensive, save dollars too. In medicine, we're familiar with the term "from bench to bedside." What is often missing is the final step – translation from bedside to programs and policy. Injury research does just that, identifying a problem, developing and testing prevention programs and policies, and making sure those that are effective are widely utilized. *Whether it's bench research or population-based public health research, good science takes resources in time, talent and money.*

Three types of research examples are discussed here. The first are those that have already demonstrated an impact on programs and policy. Second are those we consider landmark because they have the potential to transform how we control injuries in the near future. Finally, examples are provided of innovative new research identifying emerging issues of concern to the future of injury and violence prevention. This list is not exhaustive, but these research examples illustrate the potential for strong and lasting impact of injury science.

To advance the science of injury prevention and treatment in the future requires an increased investment in injury research now, assuring translation into programs and policy, and training the future generation of scientists. This investment must be equal to the burden of the problem and at present it is not, either nationally or globally.

Injuries, the leading cause of death from ages 1 to 44, generate \$406 billion in societal costs annually. Although injuries account for more years of potential life lost before age 65 than cancer and heart disease combined, federal research support for injury falls far behind that allocated for either of these conditions. In FY 2008, federal funding for cancer and heart disease research through the National Cancer Institute, CDC, and the National Heart, Lung, and Blood Institute totaled nearly \$9 billion. In contrast, the CDC's National Center for Injury Prevention and Control, the lead federal agency for injury and violence prevention, received \$134 million.<sup>1</sup>

The research highlighted below illustrates how it is possible to reduce the burden of injury if we invest resources into injury control research.

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<sup>1</sup> NIH 2009 enacted appropriation. [Officeofbudget.od.nih.gov/pdfs/FY09/Final%20Conference.pdf](http://Officeofbudget.od.nih.gov/pdfs/FY09/Final%20Conference.pdf); FY 2009 budget submission CDC discretionary all-purpose table (APT), [www.cdc.gov/fmo/PDFs/FY-7-09\\_Functional\\_Table.pdf](http://www.cdc.gov/fmo/PDFs/FY-7-09_Functional_Table.pdf).)

## Programs and Policy

Some notable success stories of research that directly affected programs and policy are provided here:

### Alcohol-Screening and Brief Interventions Reduce Trauma

Alcohol misuse is a significant risk factor for many injuries. It is estimated that more than one-third of traffic fatalities and almost two-thirds of deaths from falls are alcohol-related. More than 40% of patients treated in trauma centers will have been drinking before their injury. Alcohol screening, brief intervention and referral to treatment (SBIRT) programs have been found to reduce both the consumption of alcohol and future alcohol-related injuries. Some of the first evaluation data on SBIRTs in trauma patients was published in 1999 by Gentilello et al. Based on earlier literature suggesting brief motivational interviewing could influence drinking behavior, these researchers conducted the first prospective, randomized controlled trial of brief alcohol interventions in a Level 1 trauma center. They found a significant decrease in alcohol consumption at a one year follow up, and a 47% reduction in the risk of an emergency department or trauma center admission for injury over three years. They also found that this intervention was very cost-effective, saving \$3.81 for every dollar invested in SBIRT. As a result of this and subsequent evaluation studies, SBIRT programs are now recommended by virtually all relevant national organizations, including the U.S. Preventive Services Task Force. The American College of Surgeons Committee on Trauma has mandated that these programs be available for all trauma patients in Level 1 trauma centers throughout the United States.

**Citation:** Larry M. Gentilello, MD, Frederick P. Rivara, MD, MPH, Dennis M. Donovan, PhD, Gregory J. Jurkovich, MD, Elizabeth Daranciang, MPH, Christopher W. Dunn, PhD, Andres Villaveces, MD, MPH, Michael Copass, MD, and Richard R. Ries, MD. Alcohol Interventions in a trauma center as a means of reducing the risk of injury recurrence. *Annals of Surgery* 1999; Vol. 230, No. 4, 473–483

**Funding:** National Institutes of Health, NIAAA, RO1-AAO9045.

**Study Location:** Harborview Injury Prevention and Research Center, Harborview Medical Center, University of Washington

### Comprehensive Graduated Driver Licensing Laws Save Young Lives

High rates of serious fatal and nonfatal crashes among beginning drivers, especially sixteen year-old drivers, is a serious problem that is addressed effectively by graduated driver licensing (GDL). GDL laws, adopted in some form by nearly all U.S. states, allow young drivers to incrementally gain experience and acquire skills in low-risk driving situations. Injury research shows that GDL laws reduce the crash rates of new drivers from about 10% to 30%, depending on the strength of the law, with the most comprehensive laws having the greatest impact. Comparing laws across the states, injury prevention researchers found that the most significant reductions in 16-year-old drivers' fatal crash involvement rates were associated with GDL

programs having  $\geq 5$  components, including age requirements and  $\geq 3$  months of waiting before the intermediate stage, nighttime driving restriction, and either  $\geq 30$  hours of supervised driving or restriction on carrying passengers. This research was used to inform policy decisions in states throughout the country.

**Citation:** Chen LH, Baker SP, Li G. Graduated driver licensing programs and fatal crashes of 16-year-old drivers: A national evaluation. *Pediatrics* 2006; 118:56-62

**Funding:** National Highway Traffic Safety Administration (DTNA22-03-H-5123) and National Center for Injury Prevention and Control of the Centers for Disease Control and Prevention, (CCR302486)

**Study Location:** The study was conducted using a National Data Set

## Landmark

**Cutting edge research has great potential for transforming how we prevent injuries and how we treat trauma victims in the near future.**

### **Booster seats offer a sound return on investment**

More than 1,000 children 12 and younger in passenger vehicles die in crashes every year, and more than 100,000 are injured. When children outgrow car seats, booster seats are designed to elevate children so that adult safety belts will fit properly. This research analyzed the societal benefit of booster seats and laws requiring their use in the U.S. Such seats decrease the risk of serious injury by 59% compared to putting children this age in seat belts alone. The costs associated with booster seat legislation, purchase, use and maintenance are nearly 10 times less than the costs of injuries when not using a booster seat. This new knowledge has great potential to increase access to and utilization of booster seats in the future.

**Citation:** Miller TR, Zaloshnja E, Hendrie D. Cost-outcome analysis of booster seats for auto occupants aged 4 to 7 years. *Pediatrics*. 2006; 118:1994-1998

**Funding:** Children's Safety Network Economic and Data Analysis Resources Center, the Maternal and Child Health Bureau, Health Resources and Services Administration, US Department of Health and Human Services (240-98-0006)

**Study Location:** The study was conducted using a National Data Set

### **Trauma centers reduce the risk of death**

When a serious injury occurs, the public has come to expect effective trauma care. Trauma centers are expected to provide these life saving services, but their benefits compared with care provided in other non-trauma center hospitals had not been systematically demonstrated before the National Study on the Costs and Outcomes of Trauma (NSCOT). This study identified differences in mortality outcomes among patients treated in 18 hospitals with a level 1 trauma center and 51 hospital non-trauma centers located in 14 states. Researchers found that a

severely injured patient's chance of surviving is 25% greater if taken to a level 1 trauma center. This study provided some of the first and strongest evidence supporting trauma center care. Results have been used to promote more regionalization in the trauma care delivery system in the U.S.

**Citation:** MacKenzie EJ, Rivara FP, Jurkovich GJ et al. A national evaluation of the effect of trauma-center care on mortality. *New England Journal of Medicine* 2006; 354:366-378

**Funding:** National Center for Injury Prevention and Control of the Centers for Disease Control and Prevention R49/CCR316840 and National Institute on Aging of the National Institutes of Health RO1/AG20361

**Study Location:** The study was a collaboration between two CDC funded Injury Control Research Centers, the Johns Hopkins Center for Injury Research and Policy and the Harborview Injury Prevention and Research Center. It was conducted in 15 regions defined according to contiguous Metropolitan Statistical Areas in 14 states. The Metropolitan Statistical Areas were selected from among the largest such areas in 19 states (Arizona, California, Colorado, Florida, Illinois, Indiana, Iowa, Maryland, Massachusetts, Michigan, New Jersey, New York, North Carolina, Oregon, Pennsylvania South Carolina, Virginia, Washington, and Wisconsin)

## Emerging

### **Innovative emerging research is shaping the future of injury and violence prevention**

#### **Parental voice smoke alarms work better to warn children**

Smoke alarms are proven to save lives in residential fires, but standard residential smoke alarms fail to awaken the majority of sleeping children. In a recent study incorporating a parent's voice as a personalized smoke detector warning, 96 % of child subjects age 6-12 years old awakened to the parental voice alarm compared with 58% with the standard tone alarm. The median time for awakening was 20 seconds in the voice alarm group compared with three minutes in the tone alarm group. These findings are a first and suggest fundamental changes in smoke alarm design to address the unique developmental needs of children.

**Citation:** Smith GA, Splaingard M, Hayes JR and Xiang H. Comparison of a Personalized Parent Voice Smoke Alarm with a Conventional Residential Tone Smoke Alarm for Awakening Children. *Pediatrics*.2006; 118:1623-1632

**Funding:** Ohio Department of Public Service and Ohio Emergency Medicine Service Board

**Study Location:** Columbus, Ohio

#### **Workplace programs reduce violent crime and robberies in retail and service industry**

The retail industry accounts for almost half of all workplace homicides and nearly 20 percent of non fatal assaults. Robberies are a major reason for these statistics. A comprehensive violence

and robbery prevention program aimed at changing the worksite and administrative policies was made available to small retail and service-based businesses in the Los Angeles area. This prevention program was structured around the premise that modification of the environment can control or deter criminal activity. Intervention initiatives included maintaining a minimal amount of cash on hand, improving visibility in and out of the business, maintaining good lighting systems, controlling access to the premises, training employees in crime prevention, and posting obvious security decals indicating low cash availability and lack of employee access to safes. For those businesses with high compliance to the program's initiatives, violent crime and robberies were reduced by 26 percent and 41 percent respectively when compared to control business receiving no intervention. This study was the first of its kind to offer small service-based businesses a comprehensive workplace violence prevention program and show decline in violent crime and robberies.

**Citation:** Casteel C, Peek-Asa C, Greenland S, et al. A study of the effectiveness of a workplace violence intervention for small retail and service establishments. *JOEM* 2008; 50:1365-1370

**Funding:** National Institute for Occupational Safety and Health of the Center for Disease Control and Prevention (R18 OH03412)

**Study Location:** The study was conducted in Los Angeles City, California

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