

## **1987 Conference on Injury in America: a Summary**

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**“Introduction” (p. 581).** The 1987 Conference on Injury in America brought together a wide variety of disciplines and diverse groups to address injury control research, interventions, funding, and organizational cooperation. The participants considered five separate aspects of injury—epidemiology, prevention, biomechanics, acute care, and rehabilitation—in attempting to

- Establish visibility for injury control
- Create interdisciplinary information exchange
- Build a broad injury control constituency
- Clarify and strengthen relationships among diverse programmatic and research-oriented interest groups
- Suggest future directions

**“The Injury Problem from Different Perspectives” (p. 583).** Injury research and control programs are disproportionately underdeveloped compared with the economic costs of injury to our society. From an academic perspective, teaching and research in injury control are inadequate because the fundamental causes of injuries are not understood, funding is insufficient, and there are not enough scientists trained in injury control. From the perspective of State government, injury control advocates must sell their programs to legislators who know little about the causes of injury and face many competing demands for funding. In addition, injury control activities are frequently conducted by many different departments with no centralized coordination or leadership. From a research administrator’s perspective, research in injury control has been hampered by an artificial and frequently adversarial distinction between what is most important in injury prevention—changes in environmental factors or changes in human behavior. In fact, progress in injury control is most likely when researchers can study actual injury events, focusing on how environmental factors and

human behavior interact. From a neurosurgeon’s perspective, progress in injury control will occur when biomechanics—the base science that links injury events to injury outcomes—becomes incorporated into the medical school curriculum; and when we have long-term, longitudinal data on the consequences and social meaning of injury. Finally, from a trauma surgeon’s perspective, we need to view trauma care as a system, paying close attention to all five important factors that determine the outcome of such care: the severity of the injury, age of the patient, pre-existing medical conditions of the patient, time from injury to definitive care, and quality of trauma care.

**“Injury Research: States of the Art” (p. 590).** Injury control research is examined in five separate areas. In *prevention*, the National Highway Traffic Safety Administration has invested hundreds of millions of dollars, and tens of thousands of vehicle injury deaths have been prevented through the design and use of occupant restraints and more crash-worthy vehicles. But research on other types of injuries has gone through fluctuating levels of support and has never even approached the levels of funding that were needed to develop the motor vehicle injury control data bases and interventions.

In *epidemiology*, we need to develop systems for classifying injuries, linking records, using registries, and evaluating interventions. In *biomechanics*, automotive research has led to energy-absorbing steering systems, penetration-resistant windshields, and effective occupant restraints. Further progress requires better ways to combine safety systems and the development of anthropomorphic dummies that can accommodate the different tolerances of women, children, and the elderly. Applied to *occupational injuries*, biomechanics can help prevent injuries from slips, falls, and repetitive overexertion. *Acute care* research addresses questions of basic science, such as metabolic disturbances caused by injury, clinical care, resuscitation, and systems of triage and medical care. *Rehabilitation* research addresses the prevention of secondary complications, enhancement of function, psychological and social adjustment, and vocational success.

**“Interventions: Unintentional Injuries—A Behavioral Focus” (p. 605).** Injury prevention strategies

that address behavior change include changes in knowledge and attitudes, increases in resources necessary to enable change, and reinforcement of behavioral changes through social and family support. For the workplace, we need to know more about the roles of environment, workplace design, job task design, and their effects on human performance and behavior. For preventing childhood injuries, however, the most effective methods require changes in public policy to bring about environmental changes, regulation of products, and changes in the behavior of caregivers because the behavioral characteristics and developmental sequence of the child cannot be changed.

**“Interventions: Intentional Injuries—Groups at Greatest Risk” (p. 611.)** Using public health practices to prevent violence can bring new resources into the picture, including public education through media campaigns, health education strategies (particularly those implemented in schools), and the resources provided through health care institutions (for example, the emergency room). Prevention strategies for youth suicide need to address personality and behavioral characteristics of young suicide attempters and other special risk features (family history, close friendship with another who committed suicide). Without improved evaluations of school and community-based prevention strategies, we do not know what is effective and what might actually facilitate suicidal behavior.

To develop better interventions to prevent homicide among minorities, we should study the decline in homicides among minorities since 1980 to identify social, economic, psychological, and cultural factors that may have led to this improvement.

**“Interventions Targeted at Substance Abuse” (p. 617).** The degree to which drinking and drugs actually cause injury is difficult to assess without knowing the effects of drinking and drugs on motor skills and inhibitions, without knowing whether a crash would have occurred if a driver had not been drinking, and without knowing more precisely how alcohol and drugs affect violent behaviors.

Although studies show a much higher rate of unintentional injury for people who take sedatives, little is known about the specific effect of prescription drugs on injury rates. Large numbers of prescriptions are written for sedatives, and many of them affect the central nervous system. There

are no good data on the number of people driving under the influence of drugs, in part because people often abuse drugs in combination with alcohol. Also, police officers are trained to spot symptoms of alcohol intoxication but not drug abuse.

Legislative attempts to deter automobile injuries related to alcohol have focused on deterring or punishing the offender, regulating servers, and holding the server liable. Deterrence has been hampered by a low risk of punishment, whereas the regulatory approach has seen some success in Federal encouragement of laws prohibiting sales of alcohol to persons under age 21, prohibiting sales of beer in convenience stores, and prohibiting happy hour sales. The impact of server liability is yet to be assessed.

Drugs and violence are related in several different ways. Acute or long-term use of drugs alters some people’s behavior so that they act violently or are more likely to be victims of violence. Others turn to crime (that occasionally results in violence) to support their drug use. Some simply are caught up in the violence inherent in a system of drug use and distribution.

**“Interventions: Other Approaches” (p. 629).** Studies show that 20 to 30 percent of trauma deaths are preventable with regionalization of services, emergency care protocols for personnel, and trained emergency room physicians and nurses all contributing to the efficacy of emergency medical services.

In addition, many lives have been saved through the Federal testing and standards program which has given us collapsible steering columns, safety belts, and air bags. Federal standards also require dual braking systems, side door beams, roof crush strength, fuel tank integrity, and head restraints.

There is a great need to develop better ways and adequate resources to evaluate the effectiveness of interventions. One approach is to establish community-based, active, long-term surveillance for morbidity, mortality, and the effectiveness and cost of interventions.

In some cases, litigation may be an intervention that can help force an issue or strengthen the argument for change. Litigation has been advocated to promote the availability of air bags and to decrease the availability of handguns to criminals and terrorists. Because advocacy is important in the making of laws, schools of public health need to train people to promote injury control in the legislature.

**“Costs of Injuries” (p. 634).** In 1985, injuries cost our economy about \$107.3 billion. The National Safety Council estimated that unintentional injury alone cost \$31.2 billion in lost wages (for fatally injured persons only), \$17.8 billion in medical expenses, \$14.2 billion in insurance administration costs, and \$19.3 billion in property damage to vehicles. In addition, the National Fire Protection Association estimated \$7.3 billion in fire losses, and there were \$17.5 billion in indirect losses from occupational injuries.

These estimated costs do not include costs of “pain and suffering” and other unmeasured societal costs of injury. A “social consequences” model of loss is needed that would include economic and societal losses from injury.

The costs of violence and intentional injury extend well beyond the costs associated with unintentional injury. The costs of family violence, for example, include costs of psychiatric and psychological services; police, legal, and social services; imprisonment and institutionalization; and the costs of other violence and crime committed by those abused in childhood.

Workers’ compensation for injury has become a major cost to States because of a growing number of cases in litigation, rising medical costs, and increased awards. Compensation needs to be found that provides for injured workers without creating disincentives for rehabilitation and returning to work.

We need much more research on the economic cost of injuries of farm workers, an occupation with the second highest rate of work-related mortality. The high level of agricultural injuries may reflect that 90 percent of U.S. farms are not covered by government regulations, and that very little Federal money has been allocated for agricultural safety programs.

The costs of alcohol abuse, one of the most expensive health problems in the United States, were estimated to be \$90 billion in 1980 and include significant injury-related costs: decreased productivity, motor vehicle crashes, and part of the costs of violent crime.

The high cost of trauma care has created problems for hospitals with heavier than normal caseloads of trauma patients when they depend on reimbursement from Medicare or other third party payers. We need to know whether patients treated in a trauma center system fare significantly better than those in nontrauma systems. We need to assess how much the improved outcomes are worth and to develop mechanisms to fund such systems.

**“Sources of Funding” (p. 658).** In 1986 and 1987, Congress appropriated \$10 million for a research grant program in injury prevention and control that would follow the suggestions of “Injury in America” and be administered through the Centers for Disease Control (CDC). The response by those interested in injury control was tremendous—420 applications were received (39 academic center proposals and 381 research and demonstration projects). Using a two-step peer review system, CDC awarded grants to 5 injury prevention research centers and to 31 research and demonstration projects. Reviewers highlighted aspects within the various injury areas that warranted further research:

- **Acute care:** Need to direct attention to all components of the acute care system including medical care technology, training, communications, triage, transportation, prehospital and hospital care, rehabilitation, and evaluation of the outcomes of acute care.
- **Biomechanics:** Need to develop a scoring system for describing injury in quantitative rather than in qualitative terms (minor, severe); need to apply principles of biomechanics to injuries at work and home; and need to convey the significance of biomechanics to the public and the injury prevention community.
- **Epidemiology:** Need to determine causative factors amenable to intervention and need to study the interaction between human and environmental factors.
- **Prevention:** Need to begin setting priorities with emphasis on injuries that have a high potential for prevention, and need to include complex problems of intentional violence and suicide.
- **Rehabilitation:** Need to design studies that focus on the rehabilitation process, emphasizing continuity of care from emergency care through physical and vocational rehabilitation, community services, and return to society.

Support for injury control at the State health department level grew in the 1980s with the recognition that injuries were preventable. But Federal cuts in nondefense spending are forcing health departments to explore alternative sources of funding for injury control programs, including cooperative ventures with other public and private organizations and programs supported by grants.

Many types of support for injury control are provided by the Federal agencies that are involved in injury control through their regulatory func-

tions, direct injury control programs, surveillance systems, or provision of technical assistance. These agencies include the lead Federal agency for injury control, CDC, as well as the National Institutes of Health; Health Resources and Services Administration; Alcohol, Drug Abuse, and Mental Health Administration; and the Office of the Assistant Secretary for Health, all in the Department of Health and Human Services. The National Highway Traffic Safety Administration (NHTSA) in the Department of Transportation focuses on transportation-related injuries. The Consumer Product Safety Commission protects the public from product-associated injuries. The Department of Justice works in the area of crime and intentional injury. The National Institute on Disability and Rehabilitation Research in the Department of Education seeks ways to minimize medical, social, economic, and family consequences of disabling injuries.

The lack of a clinically based patient classification system that appropriately identifies trauma patients has interfered with equitable reimbursement for trauma care and has inhibited the evaluation of the effectiveness of trauma centers in terms of patient outcomes and costs. The diagnosis-related groups (DRGs) used by most payment systems do not classify patients effectively, especially the severely injured who are likely to have multiple problems.

The insurance industry provides only a small amount of money to support research in injury control but contributes to injury control programs as the largest underwriter of workers' compensation.

**“Advocacy Groups and Key Organizations in Injury Control” (p. 665).** Consumer advocates have concentrated on preventing injuries and death by changing the design of consumer products to make them safer. This choice—to change product design rather than changing human behavior—is pragmatic; changing product design can often improve safety faster than changing human behavior. From an injury perspective, priority must go to the products that kill or injure the most people—alcohol and motor vehicles.

Advocates for injury victims have also worked actively for comprehensive care and rehabilitation of the patient, including the psychological care of the injured and his or her family.

Within the government, several agencies oversee the work of injury control from different perspectives. NHTSA has been instrumental in reducing

highway deaths by implementing the Federal Motor Vehicle Safety Standard, the passive restraint standard, and the National Minimum Drinking Age Law. CDC is committed to administering innovative public health programs at local, State, and Federal levels. The National Association of Governors' Highway Safety Representatives is responsible for conducting Statewide and community-based highway safety programs, in large part through the management of Federal grant money and coordination of highway safety activities. For the past 30 years, the Department of Defense research laboratories and their programs have been the focus of experimental work in biomechanics, particularly on injury mechanisms and biodynamic responses.

**“Future Directions: Where Do We Go From Here” (p. 671).** The future holds great promise for more technical improvements in vehicle design and in the creation and enforcement of laws that will help reduce crash-related injury. But improvements in these areas will require organizational cooperation. All groups working in specialized areas of injury control must adopt a broader view, share data and a common vocabulary, and create a diffusion of ideas throughout the scientific community to achieve the high level of success that is possible.

Although motor vehicle safety researchers continue to focus on driver behavior and automotive design, we must not forget that roadway modifications in the past 10 years have been very effective in reducing highway injuries: warnings at railroad crossings, left-hand turn lanes, no-pass stripes at high-collision areas, guard rails at high-risk areas, and four-way stops. A portion of funds designated for the new construction of roads must be allocated to implementing these measures of proven effectiveness as well as to developing new and safer roadway design features.

We can reduce occupational injuries by implementing the existing national strategies for reducing injuries in the workplace. These include improving surveillance, disseminating information obtained through investigations and research, and developing programs in education and training. Reducing occupational injuries will require the cooperation of regulators, labor, management, State and local health departments, lawyers, and citizens.

Continued improvements in other areas of unintentional injury will depend on continuously better data collection—we must continue to learn in

greater detail how injuries occur and why. We must have data to convince physicians and health care providers that we need their help. We need data to help unravel competing priorities and help researchers identify the relative contribution of each component of the host-agent-environment complex to the problem under study.

Preventing intentional injury will require convincing those making policy decisions to give this problem its share of attention. As unintentional

injury has been an underattended public health problem, so intentional injury has been a much neglected part of the injury problem. There is no reason why interpersonal violence and suicide should continue at their current unacceptably high levels. There must be an effective, planned interdisciplinary approach to the problem, and we must study further the agents and the psychological consequences of violence.

## Introduction

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### Injury Prevention: CDC Will Coordinate the Approach

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ON FEBRUARY 17-19, 1987, the Centers for Disease Control (CDC), in conjunction with the National Highway Traffic Safety Administration, sponsored the 1987 Conference on Injury in America. This conference for the leaders in the injury control field was a major step toward implementing the recommendations outlined in "Injury in America. A Continuing Public Health Problem" (1) and could only have been possible with the support of the American Public Health Association and the Association of State and Territorial Health Officers.

"Injury in America" focused national attention on the need to provide increased resources for research in injury control. This landmark publication also set the stage for the national agenda for injury prevention, epidemiology, biomechanics, rehabilitation, and acute care by awakening us to the enormity of the injury problem in the United States.

Injury causes the loss of more years of life than cancer and heart disease combined and is the leading cause of death up to age 44. More than 80,000 persons each year receive permanently disabling brain and spinal cord injuries. Injuries are the leading reason for seeking physician care in the United States and are estimated to cost this economy more than \$100 billion annually. Moreover, many injuries are preventable.

This conference addressed five major areas of injury research: epidemiology, prevention, acute

care, rehabilitation, and biomechanics. For each area, conferees examined the current state of efforts, major issues that must be addressed to make progress, and future directions in injury control. The conferees also examined other significant issues in injury control, especially programmatic issues related to State and local health agencies, the academic community, practitioners, and others.

CDC proudly notes that it has taken very seriously the charge of the Committee on Trauma Research, author of "Injury in America," to establish itself as the focus and leader of a coordinated approach to the prevention of injury.

#### Reference .....

1. Committee on Trauma Research: Injury in America. A continuing public health problem. National Academy Press, Washington, DC, 1985.

### Injury Control: Synergistic Efforts Will Help To Make It Work

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INJURY CONTROL INITIATIVES have moved rapidly toward implementation since their inception in 1983, when the National Academy of Sciences' Committee on Trauma Research was set up to examine the need for a comprehensive Federal approach to combat the threat of trauma to the American people. But the movement has