

Discovering a Safer World

Translating Research into Action, Improving Pediatric Health



In the 1990s, Flaura Koplin Winston M.D., Ph.D., a biomechanical engineer and primary care pediatrician at The Children's Hospital of Philadelphia, pioneered a new approach to evaluating and preventing injuries to children. This approach combined her cross-disciplinary skills with others from epidemiology, engineering and behavioral science. Now an associate professor of Pediatrics at The University of Pennsylvania, Dr. Winston and Dennis Durbin, M.D., M.S.C.E., an associate professor of Pediatrics and Epidemiology at The University of Pennsylvania and director of Research in the Division of Emergency Medicine at CHOP, founded a research center dedicated to serving this underserved area of pediatric medicine. The Center for Injury Research and Prevention now enjoys a global reputation for its contributions to the growing field of childhood injury prevention.

Research to Action

The Center's mission is to advance the safety of children and young adults through science. The fundamental idea behind our work is that children (mechanically, psychologically and socially) are not small adults. Therefore, their response to trauma deserves to be examined and understood as a distinct branch of science. Our goal is to reduce the leading cause of death and acquired disability among the young: injury. The best approach is to prevent the events that lead to injury (for example, teen crashes). When these interventions fail, we need back-up strategies to prevent the injuries (such as child restraints and rear seating). When these prevention measures fail, we need to ensure, as a last resort, optimal trauma care and rehabilitation.

The Center includes a group of committed people with expertise in emergency medicine, pediatric trauma, surgery, nursing, social work, pediatric and adolescent medicine, epidemiology and biostatistics, bioengineering, computational engineering, psychology, behavioral science, communications and health education. All our researchers contribute from within our three core discipline structures — epidemiology and biostatistics, engineering and behavioral science — to create a full picture of the often fragmented injury puzzle and insights into solutions. Findings are published in medical journals and translated into recommendations for parents, educators, policymakers and product manufacturers.

Our Core Disciplines

Epidemiology and Biostatistics

Epidemiology is the study of health conditions, such as injury, in a given population. Biostatistics is the application of statistical methods and principles to medical problems. Injury epidemiologists recognize the wide range of variability in humans, and biostatisticians can provide accurate estimates of a hazard's magnitude. They answer the questions about child injury (who, what, where and when). Together, these disciplines identify the nature and magnitude of specific injury problems,

as well as the causes and consequences of injury. University of Pennsylvania faculty members contribute to every initiative. They ensure our methods are scientifically sound and can be replicated in subsequent studies.

Engineering

Injury engineers apply the laws and principles of physics and other basic sciences to systematically analyze injuries to children to identify vehicle- and restraint-design failures. They determine how the injury occurred and recommend prevention strategies. Our crash investigation team performs field investigation of real-world crashes to fuel biomechanics research. Findings on the mechanisms of injury and child kinematics help us quantify both the physical impact of trauma for children and the effects of safety and prevention measures. Computational engineers create detailed models of crashes, child safety seats and other safety devices. These models help us translate real-world data into information for safer product design.

Behavioral Science

Behavioral scientists view the injury from human and social contexts and determine why it happened. They recognize that behavior can never be "engineered out" — that is, technological innovation can't completely replace human choices and responsibility.

Behavioral scientists at the Center study knowledge, attitudes and behaviors that may contribute to injury risk. They develop interventions to help mitigate them, such as boosting parents' use of age-appropriate child passenger safety measures and promoting teen-driver safety. Researchers also study the emotional impact of injury and trauma to promote recovery and prevent long-term psychological distress.

To learn more about the Center for Injury Research and Prevention and its current research projects, visit www.chop.edu/injury.

More details are available at www.chop.edu/injury.