

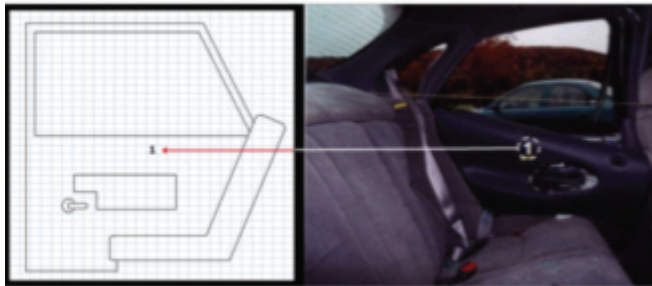
Center for Child Injury Prevention Studies (CChIPS)

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Child Injury Prevention: Enhancing Child Safety In Side-Impact Crashes



Screenshot of program developed to allow researchers to transfer occupant contact points from vehicle photos to a simplified vehicle interior drawing.

Side impact crashes account for 25% of motor vehicle crashes (MVCs), but represent more than 40% of MVC-related injury costs. Toward discovering better ways to protect children in side-impact crashes, a project at the Center for Child Injury Prevention Studies (CChIPS) by Kristy Arbogast sought to document the probable contact points in the vehicle interior in side-impact MVCs to children in child restraint systems (CRS). Two in-depth crash investigation databases, the Crash Injury

Research and Engineering Network and the Partners for Child Passenger Safety Study, were queried for rear-seated, CRS-restrained children ages 0 to 8 years in side impact crashes who sustained clinically important injuries. A multidisciplinary team of physicians and engineers reviewed the cases to describe injury patterns, injury causation, and vehicle components contributing to the injuries; 41 occupants met the inclusion criteria (average age 2.6 years), with 24 seated near the side of the crash, 7 seated on the far side, and 10 seated in the center. The most common injuries were to the skull and brain, with a greater proportion of skull fractures occurring with increasing age. Lung contusions and spinal injuries were also reported. Near-side head and face contact points occurred along the rear vertical plane of the window and the horizontal plane of the windowsill. Head and face contact points for center- and far-side occupants were along the edges of the front seat back and front seat head restraint.

Economic Impact: Study results will inform innovations in vehicle occupant protection and child restraint designs, features and products. In particular, the findings will lead to new generation child restraints with side wings and energy management features on vehicle door interiors to reduce injuries from MVCs involving children placed in CRS. In addition, the findings could guide enhancements to safety standards that govern restraint performance and occupant protection, ensuring that the resources invested by manufacturers in meeting such standards will lead to safer vehicles and child restraint systems and protection for young occupants in the event of a crash. The results of this project should ultimately lower health care/insurance costs, as side-impact crashes represent a significant portion of MVC-related injury costs.

For more information, contact Flaura Winston or Kristy Arbogast, 215.590.3118.

Collaborative Review of Children's Injuries in Motor Vehicle Crashes

Road traffic injury remains the leading cause of children's death and acquired disability. Multi-disciplinary teams of university-based engineers, scientists, and physicians must collaborate with peers in government and industry to investigate crashes, determine mechanisms of injury, and develop safety technology to prevent similar injuries in the future. Multi-disciplinary expertise is needed to review the circumstances of each crash. This expertise is seldom available at any one institution. This results in the need for remote collaboration. It means that sensitive information from multiple sources needs to be shared via secure transmission lines with strictly controlled access.

With funding from the National Science Foundation and guidance from I/UCRC Industrial Advisory Boards, a team of researchers from two IUCRCs, the Center for Child Injury Prevention Studies at The Children's Hospital of Philadelphia and University of Pennsylvania and the Center for Autonomic Computing at the University of Florida, developed a networking system. It is technology for remote, collaborative review of mechanisms of injury to children in motor vehicle crashes. Referred to as Telecenter, this innovative application of information technology enables: 1) distributed, asynchronous collection of digital content needed for crash case reviews, with consistent organization of content across cases; 2) secure, Web-based, remote participation in review meetings with multi-media sharing of case content via visual images, real-time written and oral communication, and use of Web resources, and; 3) archiving for post-review access and follow-up involving statistics, search and networking.

Telecenter system's design supports conferencing and remote image-sharing. Its capabilities extend beyond existing solutions via: workflow and content organization that is well-suited to traffic injury reviews; spatio-temporal, role-based access control; distributed content management; and seamless integration of services.

Economic Impact: Telecenter was pilot tested to enhance the quality and value of National Highway Traffic Safety Administration (NHTSA) crash injury case reviews through the inclusion of remotely located experts without the burden of additional travel costs. Further leveraging the investment in Telecenter, an adaptation was developed within another public sector: health. Telecenter was reconfigured to meet the needs of state-mandated Child Death Review teams. Similar to crash investigation reviews, Child Death Review teams require multidisciplinary expertise in order to determine how and why children die and plans for action to prevent future child deaths, but this expertise might not be available locally. Initial real world results demonstrated that Telecenter for Child Death Review could help states enhance the quality of reviews without the financial burden of travel for experts while improving efficiency in the timely transfer of information to those who can implement actions to improve the health and safety of children. The collaborative nature of this project spurs innovation, as it promotes involving the appropriate assortment of people on specific projects.

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