

## National Study Center Hosts CIREN Public Meeting

The Baltimore CIREN (Crash Injury Research and Engineering Network) center hosted the 13th quarterly meeting at the University of Maryland-Baltimore on November 4. Over 100 attendees from throughout the country participated in the program. The presentations covered a variety of highway safety topics including extrication, roll-overs, vehicle mismatch, and child booster seats. The highlight of the day was a presentation given by Marybeth Billing who sustained a severe injury to her right foot and ankle several years ago as the result of a motor vehicle crash. She shared her story and the obstacles she has had to overcome during her recovery. Our partnership with the mid-Atlantic office of the National Highway Traffic Safety Administration enabled us to receive excellent coverage from local media.

## An Assessment of Crash Culpability Relative to Substance Use

In 2002 the National Study Center for Trauma and EMS (NSC) was funded by the Substance Abuse Policy Research Program of the Robert Wood Johnson Foundation to assess motor vehicle crash culpability among Maryland drivers relative to the use of alcohol and other drugs of abuse. The \$100,000, 2-year effort was proposed as a retrospective study of injured drivers who were treated at the R Adams Cowley Shock Trauma Center (STC) during calendar years 1997 through 2001.

Two hypotheses were tested. The first was that crash culpability is associated with the abuse of drugs, in addition to alcohol. The second hypothesis stated that, relative to alcohol, crash culpability will be directly related to increases in blood alcohol concentration (BAC), including BACs that are currently not illegal in most states. In order to test these hypotheses, five years of data were linked, using probabilistic linkage techniques, from two sources: hospital discharge records from the Health Services Cost Review Commission (HSCRC) and police reports from the Maryland Automated Accident Reporting System (MAARS). In addition, alcohol and drug data were ascertained from a database of toxicology screens of STC patients which, to our knowledge, is the largest clinical toxicology trauma database in existence. Following the linkage, the resulting database included information on 6,518 drivers who were hospitalized at the STC. Approximately 85% (n = 5,573) of the 6,518 Shock Trauma Center (STC) patients were drivers of automobiles, limousines, pick-up trucks, vans and recreational vehicles. Motorcycle operators (n = 547) were analyzed separately.

Analysis included a comparison between those with and without complete toxicology screens to ascertain selection bias among the injured drivers and motorcycle operators. Preliminary results among injured drivers indicated that crash culpability varied by type of drug, BAC level, and positive or negative toxicology. In addition, the odds among injured drivers for being culpable with a positive toxicology screen relative to a negative toxicology screen varied according to age group and seatbelt use. It is anticipated that these and other results from the culpability project will be disclosed by NSC investigators in early 2005.

## Play it Safe During the Holidays

The Centers for Disease Control and Prevention (CDC) reported that about 5,800 people end up in U.S. emergency rooms each year as the result of decorating injuries. During the holiday season, injuries due to falls account for 12% of emergency room visits compared to 9% during the rest of the year.

*Colin Mackenzie, MD  
Director*

### **Board of Advisors**

*Elizabeth Baker, PhD  
NHTSA Region III*

*Robert Bass, MD  
Executive Director  
MIEMSS*

*Peter Beilenson, MD  
Baltimore City Health  
Department*

*William Bronrott  
Maryland State Delegate,  
District 16*

*James P.G. Flynn, MD  
University Specialty Hos-  
pital*

*David Fowler, MD  
Chief Medical Examiner*

*Jack Joyce, Esq.  
Motor Vehicle Admin.*

*Hon. Joseph Kaplan  
Judge, Circuit Court for  
Baltimore City*

*Ellen MacKenzie, PhD  
JHU Center for Injury  
Research and Policy*

*Unless otherwise  
noted, information  
presented in Injury  
Watch is based on  
research and analysis  
conducted by National  
Study Center staff.*

**THE CHARLES MCC MATHIAS  
NATIONAL STUDY CENTER FOR TRAUMA AND**

701 West Pratt Street  
Box 001  
Baltimore, MD 21201

Phone: 410-328-5085  
Fax: 410-328-3699  
Email: tkerns@som.umaryland.edu  
Web: <http://nsc.umaryland.edu>



Injury Watch Editors:  
Timothy Kerns, Database Engineer  
Joseph Kufera, Statistician

*"To prevent death and disability from injury and sudden illness through interdisciplinary research..."*

If you would like to receive this newsletter on a regular basis, please provide your address using the contact information on the left.

Have a suggestion for future topics? Let us know.

*The Charles McC. Mathias, Jr., National Study Center for Trauma and Emergency Medical Systems (NSC) is an academic research organization dedicated to studying the causes, treatment, and outcomes of traumatic injury and sudden illness. The NSC is located on the campus of the University of Maryland, Baltimore. Since its creation in 1986, the NSC has earned an international reputation as a leader in trauma and emergency medicine research. The Center's strength resides in its teams of investigators and their expertise in study design, database linkages, interpretation of results, and application of findings. Results of NSC studies have been used to enhance patient care, to improve vehicular safety, to develop public education programs for the prevention of trauma, and to support state and federal legislation regarding injury prevention.*

## Predictors of Functional Recovery Among Motor Vehicle Crash Survivors

Most vehicular occupants involved in high energy crashes survive, yet many suffer from long-term consequences of their injuries. In a recent cohort study conducted at the NSC, drivers injured in vehicles with modern restraint systems and admitted to the R Adams Cowley Shock Trauma Center were identified as part of the Crash Injury Research and Engineering Network (CIREN). Subjects were interviewed to determine progress toward functional recovery at one year after hospital discharge.

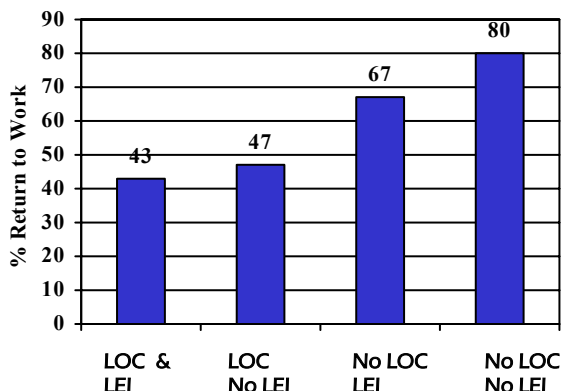
The mean age of the 161-patient cohort was 39 years. Sixty-three percent experienced loss of consciousness at the scene or were amnesic to the event (LOC), and 76% suffered a lower extremity injury (LEI). Upon admission, 82% had a Glasgow Coma Scale score of 15, indicating normal cognition. Regression analysis indicated that occupants who were younger than age 50 (odds ratio [OR]=4.57), had an ISS score below 25 (OR=3.58) and did not experience LOC during the crash (OR=4.39) were significantly more likely to return to employment by one year post-injury. Sixty-eight percent of subjects without LOC had returned to work at one year, versus 45% of those who had experienced LOC. The occurrence of LEI did not affect outcome; 54% with LEI and 54% without LEI were working within one year.



Despite protection afforded by seatbelts and/or airbags, a large proportion of injured motor vehicle occupants identified in this project were unable to return to pre-injury functional status at one year. Those most likely to recover included younger subjects and those who did not experience the combined insult of LOC and LEI. Occupants experiencing LOC should be evaluated for possible treatment of mild brain injury.

Results from this study were presented in June 2004 at the 7<sup>th</sup> World Conference on Injury Prevention and Safety Promotion in Vienna, Austria.

### Combination of LOC and LEI Delays Return to Work at 1 Year



### NSC in Print

Three manuscripts written by NSC personnel were published in peer-reviewed journals this fall. NSC Director Colin Mackenzie's article entitled "Artificial oxygen carriers for trauma: myth or reality?" was published in the October 2004 issue of *Hospital Medicine*. Epidemiologist Elisa Braver produced a publication in the same journal, entitled "Older drivers and motor vehicle crashes". Also in October, the *Journal of Trauma* published "Life-altering outcomes after lower extremity injury sustained in motor vehicle crashes", written by social worker Kathy Read and members of the Baltimore CIREN team. Congratulations!