

The Safety Net

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Injury Control Research Center*

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How We Got Here

From the Director's Chair:

West Virginia University (WVU) formally established the Injury Control Research Center in September 2004. Despite this relatively recent occurrence, the Center has been built upon a long-standing commitment to injury within the University.



In 1992, WVU established the Center for Rural Emergency Medicine (CREM). Founded and directed by Dr. John Prescott, who was then Chair of the Department of Emergency Medicine and now serves as Dean of the School of the Medicine, CREM's mission was to study and improve the delivery and effectiveness of emergency care in rural environments. Beginning in 1993, CREM received designation as an Injury Control Training and Demonstration Center (ICTDC) and funding from the Centers for Disease Control and Prevention's (CDC) National Center for Injury Prevention and Control (NCIPC) to conduct injury-focused training, intervention programs, and research. The majority of programmatic activities were directed towards the training of rural health care providers (e.g., physicians, dentists, nurses, and physician assistants) and first responders (e.g., firefighters, EMTs). These initiatives included education on primary injury prevention and a variety of programs designed to improve acute care delivery to rural trauma patients. From 1993 through 2004, the WVU ICTDC conducted extensive outreach efforts that included the provision of nearly 3,800 courses, training over 35,000 individuals in the West Virginia region.

While the overwhelming emphasis of the ICTDC over the years was on training, research activities started to pick up in the late 1990s. In collaboration with NCIPC intramural staff, a number of research themes were identified including occupational and recreational injuries, rural emergency preparedness, and emergency department-based alcohol intervention studies.

Faculty and staff with research expertise were recruited to the Center and these investigators quickly established a track record of scholarly work that led to numerous peer-review publications in leading scientific journals.

Our sustained record of accomplishment and productivity led NCIPC to encourage our initial submission of an ICRC proposal in 2004. In addition, this history within the University coupled with a renewed University emphasis on scientific discovery, has provided an ideally supportive environment for the initial success and continued growth of our Center. This anticipated growth has been recognized by the CDC, which has awarded WVU five years of continued funding through July 2012.



Jim Helmkamp

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INJURY CONTROL RESEARCH CENTER

Home Intervention Targets Intimate-Partner Violence

While children may not be the intended victims of intimate-partner violence -- defined as violence perpetrated by a spouse, ex-spouse, boyfriend or girlfriend -- they may suffer devastating consequences, including child abuse and neglect, from living in a family affected by it.

To reduce the incidence of intimate-partner violence among socially disadvantaged, first-time mothers and their children, WVU investigators are collaborating with researchers throughout the United States and Canada to develop an approach to be incorporated into an existing in-home intervention program.

“Children of all ages exposed to intimate-partner violence can experience impairment,” said principal investigator Harriet MacMillan, M.D., M.Sc., F.R.C.P.C., Professor in the Departments of Psychiatry and Behavioral Neurosciences and Pediatrics at McMaster University’s Offord Centre for Child Studies in Ontario. “So we’re trying to both prevent women from experiencing intimate-partner violence, and also children’s exposure to it.”

The project will focus specifically on the prenatal months and the first two years post-partum among women who are already enrolled in the Nurse Family Partnership (NFP). The NFP is an established, nationwide, home-visitation program designed to improve the quality of life for low-income, new parents and their children.

Through interviews with nurses and mothers in the NFP, as well as analyses of the existing literature on domestic violence, investigators plan to develop an in-home intervention for mothers who have been exposed to intimate-partner violence, explained MacMillan.

Three randomized, controlled trials have shown that the NFP program not only improves outcomes for mothers, but for

their children, as well, MacMillan said. Among the benefits for children is a reduction in the rate of child abuse and neglect.

While men also experience intimate-partner violence, which occurs both in heterosexual and homosexual relationships, women are far more likely to report experiencing it, according to a joint survey by the National Institute of Justice and the CDC. Results from the national telephone survey, which was conducted from November 1995 to May 1996, indicate that nearly 25 percent of women and 8 percent of men reported

being victims of intimate-partner violence. Annually, this translates into approximately 1.5 million women being victimized by this kind of violence. For mothers and their children, the results can be devastating.

Aside from taking a physical, mental, and emotional toll on its victims, intimate-partner violence is a tremendous financial burden on society. An estimated \$5.8 billion was spent in 1995 on medical and mental health care, as well as time away from work and related costs, for victims of intimate-partner violence, according to the CDC.

The multi-center collaboration includes McMaster University, Ohio State University, University of Colorado, University of Western Ontario, and WVU. Co-principal investigators include Jeffrey Coben, M.D., Professor in the WVU Departments of Emergency Medicine and Community Medicine, and Director of the University’s Center for Rural Emergency Medicine, and David L. Olds, Ph.D., Professor of Pediatrics, Psychiatry and Preventive Medicine, Director of the Prevention Research Center for Family and Child Health at the University of Colorado at Denver and Health Sciences Center, and co-founder of the NFP.



Harriet MacMillan

Research Update

With our new funding cycle, the WVU ICRC will begin two new projects described below:

Development and Evaluation of an Intervention for Intimate Partner Violence in the Context of Nurse Home Visits (Harriet MacMillan, M.D., M.S., Professor, Departments of Psychiatry and Behavioural Neurosciences and Pediatrics, Offord Centre for Child Studies, McMaster University); Aug. 2007 -- Jul. 2012.

Intimate partner violence (IPV) is a widespread public health problem with devastating health and social consequences for women and children. The overall aim of this five-year core project is to develop and evaluate an intervention to improve quality of life and reduce IPV among low-income women during pregnancy and in the first two years postpartum. It has the following aims: Project

1: a) to develop a model of in-home IPV intervention (IPVI) for mothers enrolled in the Nurse-Family Partnership (NFP) home visitation program who are exposed to IPV (NFP + IPVI), using a qualitative case study methodology; b) to test the feasibility and acceptability of the intervention in a small sample of NFP clients and nurses. Project 2: to conduct a cluster randomized controlled trial of NFP+IPVI compared with NFP alone, to estimate the intervention’s effect on NFP clients’ quality of life and recurrence of IPV. Multilevel growth curve analysis will be used to estimate program effects. Expected outcomes of this study include the development of an IPV intervention that is theoretically-grounded, and preliminary evidence regarding its effectiveness. These results will be important because they will improve our understanding of IPV interventions, address a critical need of home visitation programs, and significantly advance the field of family violence prevention.

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Investigators Study Long-term Effects of First-time Injury on the Elderly

After an elderly person suffers an injury, we often hear his or her friends and relatives say: “She hasn’t been the same since she broke her hip,” or “it was all downhill after his car accident last year,” and other similar phrases.

While we know that injury can have devastating consequences among older people, what remains unclear is exactly how large a toll a first-time injury takes in terms of overall monetary and quality-of-life costs, and what factors influence recovery.

To assess the long-term effects of sentinel, or first-time, injury among people age 65 and older, WVU ICRC investigators are conducting a three-year study examining how socio-demographic and environmental factors affect recovery after serious injuries such as major falls, car accidents, or injuries related to medical care. The study is examining the effects on recovery of pre-existing medical conditions, as well as environmental factors such as whether the home is designed to accommodate older inhabitants.

Mary Carter, Ph.D., Assistant Professor of gerontology in WVU’s Department of Community Medicine and the Center on Aging, is the principal investigator on the study, which started this past August. Using the Medicare Current Beneficiary Survey data set, which is released by the Centers for Medicare and Medicaid Services, Carter is analyzing billing records from hospital visits, emergency room treatment, nursing and home health care, as well as any other services that would result in a bill covered by Medicare. In addition to these administrative records, the data includes personal answers to a health survey from a representative group of Medicare beneficiaries, Carter explained.

“From this data, I can extrapolate to the nation,” Carter said. “The data are a tremendously rich source of information on individuals who participate in the Medicare program, which captures more than 95 percent of the older adult population.”

Using the billing records and self-reports from the survey participants, Carter and co-investigator Frank Porell, Ph.D., professor and senior fellow in gerontology at the University of Massachusetts, Boston, will be able to identify if and when a sentinel injury occurred. They will then analyze participants’ health status prior to the injury, as well as their well being after the event.



Mary Carter

The state of declining health that occurs among some older people after an injury -- coined a “cascade of dependency” by Dr. Morton Creditor in 1993 -- sometimes leaves older people in a worse state than they were before the injurious event occurred, Carter explained. She added that, “the type of changes aren’t fully explained by the event itself. We have lots of theories about why that is, but no specific explanation.”

While injury-associated morbidity is common among older people, some individuals are able to resume normal activity with no apparent lingering effects. Carter and Porell hope to use the information from the Medicare Current Beneficiary Survey to clarify why the cascade of dependency occurs among some people, but not others.

“We’re trying to understand why two people fall and have similar injuries, but one person returns to pre-injury functioning levels and another person doesn’t,” Carter said.

What is different about this study, compared to previous ones that focused primarily on injury-related costs, is that it is examining the costs of other treatments not directly associated with the injury. The investigators hypothesize that older people who suffer sentinel injuries use more healthcare services and have higher medical costs covered under Medicare in comparison with similar individuals who do not have an injury, according to Carter.

Eventually, the information obtained from this study could be used to target preventive services to at-risk groups, thereby reducing morbidity and controlling medical costs.

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Understanding the Long-term Consequences of Injury among Older Adults (Mary Carter, Ph.D., Assistant Professor, WVU Department of Community Medicine, WVU Center on Aging; Aug. 2007 – Jul. 2010)

The goal of this three-year project is to conduct a longitudinal investigation to determine the extent to which individual-level factors (e.g., sociodemographic attributes, preexisting medical conditions) and environmental factors (e.g., living arrangements, home modifications) affect the

long-term outcomes of older adults experiencing an injury. Specific aims include (1) to describe the longitudinal trajectories of functional status, healthcare service use and costs, (2) to examine the marginal effects of sentinel injuries on healthcare services use and aggregate medical costs, and (3) to investigate the effect of individual characteristics and environmental factors on the risk of injury and the medical service use and costs that follow such events. A secondary analysis of the Medicare Current Beneficiary

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Student Benefits from Diverse Educational Experiences

Spotlight on Ekta Choudhary

As a graduate student in environmental microbiology at Panjab University in northern India, Ekta Choudhary knew that one day she wanted to study in a foreign country.

"I knew that I wanted to go somewhere abroad to see how different the educational system is, and how much I could learn there," Choudhary explained.

What she didn't know then was where she wanted to study. It wasn't until Choudhary attended a seminar by Dr. Ashok Bidwai -- another Panjab University alumnus, who is now a professor in West Virginia University's Biology Department -- that she knew she wanted to go to WVU.

In 2005, Choudhary, who is originally from Chandigarh, India, completed a master's in biology at WVU. In 2006, she received a master's in public health (M.P.H.) from the University, and last year she became one of the first five students to enroll in WVU's Department of Community Medicine's new Ph.D. program in public-health sciences.

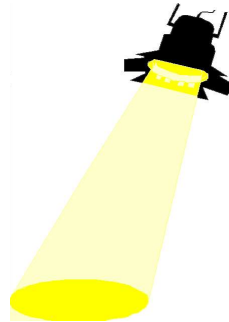
Students in the program complete a series of core courses during their first year. By their second year, they have chosen one of two concentrated tracks, which include population epidemiology and biostatistics, and behavioral sciences. Choudhary, who is working in the population epidemiology and biostatistics track, said that her main interest is in large data-set analysis related to injuries and health care.

Now in year two of the four-year program, Choudhary is analyzing data from the Behavioral Risk Factor Surveillance System, which is maintained by the CDC. In collaboration with Robert Bossarte, Ph.D., Assistant Professor in WVU's Department of Community Medicine and Jeffrey Coben, M.D., Professor in the WVU Departments of Emergency Medicine and Community Medicine, and Director of the University's Center for Rural Emergency Medicine, Choudhary is trying to identify the differences in health status between males and females after sexual victimization.

"We saw some interesting patterns among males, and there are very few studies that look at male victimization with regards to sexual assault," Choudhary said. "Our basic purpose is to look at how health outcomes differ [among males], or if they are different from females at all."

Choudhary and her advisors are now exploring other data sets to obtain information on long-term effects, including medical costs, of sexual victimization. They also are trying to obtain data specifically for West Virginia.

When asked about the differences between her educational experience in India and at WVU, Choudhary says that the programs aren't drastically different, but that students here



Ekta Choudhary with the poster she presented this month at the 135th Annual Meeting of the American Public Health Association in Washington, D.C.

have more choices when it comes to selecting their area of concentration.

"When I came here, there were more options, more flexibility, in what you can choose," Choudhary explained. "I wanted to shift from biology because I knew I wanted to do something in epidemiology, so I did my master's in biology and took the M.P.H. You can learn more because you have both experiences -- from how you were taught from the beginning to how you learn here."

She said that she feels lucky to have been one of the first students in the fledgling program because she had the opportunity to choose her projects and collaborating professors. Choudhary credits the personal attention and support from the faculty of the Department of Community Medicine and its ICRC among the program's main strengths.

"As a student, I have had so many opportunities to present at conferences," she said. "It's just a wonderful environment working at the ICRC and in Community Medicine. Obviously, I have experienced some different educational backgrounds, and this is probably one of the best that I have had."

Another five students matriculated into the Ph.D. program last August, bringing the current number of students to 10. Choudhary points out, however, that an increase in the student population has not changed the program's emphasis on personal attention.

Choudhary's goal upon completing the program is to work in academia. Her ideal job, she said, would be as a professor in a university conducting research and teaching.

Recent Publications

1. Helmkamp JC, Coben JH, Furbee PM, Tadros A. All-terrain vehicle-related hospitalizations in the United States, 2000-2004. *American Journal of Preventive Medicine*. (In press, Jan 2008).
2. Choudhary E, Coben JH, Bossarte RM. Gender and Time Differences in the Associations between Sexual Violence Victimization, Health Outcomes, and Risk Behaviors. *American Journal of Men's Health*. (In press).
3. Helmkamp, JC. Family fun- family tragedy: ATV-related deaths involving family members. *Injury Prevention*. (In press, Dec 2007).
4. Bossarte RM, et al. Injury, violence, and risk among participants at a mass gathering of the Rainbow Family of Living Light. *Journal of Healthcare for the Poor and Underserved*. (In press).
5. Bossarte RM, Simon TR, Swahn MH. Clustering of suicide and dating and peer violence among high risk adolescents. *Journal of Interpersonal Violence*. (In press, 2008).
6. Swahn MH, Simon TR, Arias I, Bossarte RM. Measuring gender differences in physical and psychological violence within dating relationships and same-sex peer relationships. *Journal of Interpersonal Violence*. (In press, 2008).
7. Swahn MH, Bossarte RM, Sullivan E. Age of alcohol use initiation and suicide attempts, peer and date violence, victimization, and perpetration among high risk adolescents. *Pediatrics*. (In press).
8. Carter MW, Gupta S. Characteristics and outcomes of injury-related ED visits among older adults. *American Journal of Emergency Medicine*. (In press).
9. Rockett IRH, Wang S, Lian Y, Stack S. Comorbidity among U.S. male and female Suicides: A Multiple Causes of Death Analysis. *Injury Prevention*. (In press).
10. Wu B, Mao Z, Rockett IRH, Yue Y. Socioeconomic status and alcohol use among urban and rural residents in China. *Substance Use and Misuse*. (In press).
11. Aitken ME, Mullins SH, Lancaster VE, Miller BK. "Cubs click it for safety": A school-based intervention for tween passenger safety. *Journal of Trauma*. 2007; 63(3):S39-S43.
12. Tilford JM, Aitken ME, Goodman AC, Fiser DH, Killingsworth JB, Green JW, Adelson PD. Child health-related quality of life following neurocritical care for traumatic brain injury: An Analysis of Preference-Weighted Outcomes. *Neurocritical Care*. 2007; 7(1): 64-75.
13. Swahn MH, Bossarte RM. Gender, early alcohol use, and suicide ideation and attempts: Findings from the 2005 Youth Risk Behavior Survey. *Journal of Adolescent Health*. 2007; 41:175-181.
14. Bossarte RM, Brown MJ, Jones RL. Blood lead misclassification due to defective LeadCare® blood lead testing equipment. *Clinical Chemistry*. 2007; 53(5): 994-995.
15. Hazen AL, Connelly CD, Edleson JL, Kelleher KJ, Landverk JA, Coben JH, Barth RP, McGeehan J, Rolls JA, Nuszowski MA. Assessment of intimate partner violence by child welfare services. *Child and Youth Services Review*. 2007; 29(4): 490-500.
16. Nuszowski MA, Coben JH, Kelleher KJ, Goldcamp JC et al. Training, co-training and cross-training of domestic violence and child welfare agencies. *Families in Society*. 2007; 88(1): 35-41.
17. Helmkamp JC, Lawrence BA. The economic burden of all-terrain vehicle-related pediatric deaths in the U.S. *Pediatrics*. 2007; 119(1): 223-225.
18. Coben JH, Steiner CA, Miller TR. Characteristics of motorcycle-related hospitalizations: Comparing states with different helmet laws. *Accident Analysis and Prevention*. 2007; 39:190-196.

Research Update

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Survey files linked with data from the Area Resource File is proposed. Data will be aggregated to the respondent level and will permit multiple cohorts of Medicare beneficiaries to be tracked. Descriptive techniques will be used to describe trajectories of ADL/IADL functioning, self-reported health, healthcare service use, and healthcare costs following

injury. Multivariate linear growth models will be used to estimate trajectories of service use, costs, health and functional status. Survival models will be used to estimate the marginal effect of sentinel injuries on risk of institutionalization and death, while Markov outcome models will be used to estimate the effect of individual characteristics and environmental

factors on risk of state transitions between injury free and injured states, over time. From a public health perspective, greater understanding of the significant risk factors of and long-term outcomes following injury among older adults will assist in improving strategies aimed at preventing injuries, targeting services and controlling costs.