

INJURY SCIENCE DAY

UNIVERSITY *of* PENNSYLVANIA

March 3rd, 2010
Irvine Auditorium
3401 Spruce Street



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AGENDA

9:00-9:30

Registration, Light Breakfast/Coffee and Review of Student Posters

9:30-9:40

Welcoming Remarks

Marjorie Bowman, Director, Center for Public Health Initiatives

9:40-10:45

Panel Discussion on Current Gaps in Injury Science Knowledge

Scott Burris

Director, Center for Health Law, Policy and Practice, and the Robert Wood Johnson Foundation's Public Health Law Research program

Christopher Mallios

Former Chief, Sexual Assault and Family Violence Unit, Philadelphia District Attorney's Office

Carol E. Thornton

Section Chief, Violence and Injury Prevention Program, PA Department of Health

10:45-11:00

Break: Poster Review Time

11:00-12:00

60-second Science: 14 presenters, one minute each, a world of discussion

Moderator: Steve Fluharty Vice Provost for Research

Kristy Arbogast

Richard Berk

Charlie Branas

Joel Fein

Judith Gold

Alice Hausman

John MacDonald

Terry Richmond

Brian Sennett

Marilyn Sommers

Susan Sorenson

Jennifer Taylor

Doug Wiebe

Beth Winkelstein

12:00-12:15

Announce Winners of Poster Contest and Close Formal Session

12:15-1:00

Lunch: Networking and Final Poster Review

PANELIST BIOGRAPHIES

SCOTT BURRIS is a Professor of Law at Temple University, Director of the RWJ Centers for Law and the Public's Health, and Senior Associate, Johns Hopkins Bloomberg School of Public Health. His work focuses on how law influences public health, and what interventions can make laws and law enforcement practices healthier in their effects. He is the author of over 100 books, book chapters, articles and reports on issues including urban health, HIV/AIDS, research ethics, global health governance, and the health effects of criminal law and drug policy. His work has been supported by organizations including the Robert Wood Johnson Foundation, the Open Society Institute, the National Institutes of Health, the Bill and Melinda Gates Foundation, the UK Department for International Development, and the CDC. He has served as a consultant to numerous U.S. and international organizations including WHO, UNODC and UNDP. Professor Burris is a chair of the board of Prevention Point, Philadelphia's syringe exchange program. He is a graduate of Washington University in St. Louis and Yale Law School.

CHRISTOPHER MALLIOS is an Attorney Advisor for AEquitas: The Prosecutors' Resource on Violence Against Women. As an Attorney Advisor he presents on trial strategy, legal analysis and policy, and ethical issues related to violence against women at the local, state, and national level. Before working at AEquitas, Mr. Mallios worked as a trial attorney and supervisor specializing primarily in the prosecution of crimes involving violence against women for more than 10 years. As the Chief of the Philadelphia District Attorney's Office Family Violence & Sexual Assault Unit, he prosecuted and supervised the prosecution of thousands of cases involving domestic violence, sexual assault, and child physical and sexual abuse. Mr. Mallios also served as an advisor for the Philadelphia Police Department's Special Victims Unit and Internal Affairs Division. The District Attorney selected Mr. Mallios to serve as her liaison to the lesbian, gay, bisexual and transgender community in Philadelphia, and as Hate Crimes Coordinator, he was responsible for training prosecutors and victim/witness coordinators and acting as a liaison to law enforcement and other government and private agencies. In 2009, the Philadelphia Commission on Human Relations honored Mr. Mallios with the award for Human Rights in Law Enforcement.

CAROL THORNTON is the Chief of the Violence and Injury Prevention Program (VIPP) at the Pennsylvania Department of Health. As the Section Chief, she supervises three full-time program administration staff and collaborates with a full-time dedicated statistical analyst for violence and injury prevention. Ms. Thornton is responsible for all activities funded through the Public Health Injury Surveillance and Prevention Program Grant from the CDC. This grant supports the development and implementation of the statewide injury prevention and control plan through the ongoing activities of the Injury Community Planning Group. Included in her ten years of Commonwealth employment, Ms. Thornton worked for the Pennsylvania Department of Transportation as a Safety Press Officer and the Pennsylvania Department of Labor & Industry as a marketing officer for workforce development. Ms. Thornton earned her B.A. in Public Administration from LaSalle University and her Master of Public Administration degree from Penn State University.

60-SECOND SCIENCE PRESENTERS

KRISTY ARBOGAST PHD Engineering Core Director, CHOP Center for Injury Research and Prevention Research; Assistant Professor, Dept of Pediatrics, Penn Medicine

Research to Action: Abdominal Injuries to Children in Crashes

RICHARD BERK PHD Professor of Criminology and Statistics, Penn Arts and Sciences

Forecasting the Perpetrators and Victims of Homicide within Populations of Parolees and Probationers

CHARLIE BRANAS PHD Associate Professor of Epidemiology, UPenn Medicine

Understanding Vacant Land and Violence

JOEL FEIN MD MPH Associate Professor of Pediatrics, Children's Hospital of Philadelphia; Core Director, Philadelphia Collaborative Violence Prevention Center

Safe Neighborhoods, Safe Lives: Things that Prevent or Reduce the Impact of Violence in the Community

JUDITH GOLD SCD Assistant Professor of Epidemiology, Temple University

Texting and Upper Extremity Symptoms in College Students

ALICE HAUSMAN PHD MPH CPHI Visiting Scholar, University of Pennsylvania & Professor of Public Health, Temple University

Communicating Program Impact From the Community's Perspective: Community-defined indicators of successful youth violence prevention programs.

JOHN MACDONALD PHD Jerry Lee Assistant Professor of Criminology, Penn Arts & Sciences

The Effect of Less-Lethal Weapons on Injuries in Police Use-of-Force Events

THERESE RICHMOND PHD FAAN CRNP Andrea B. Laporte Endowed Term Associate Professor of Nursing, Penn Nursing

The effect of post-injury depression on return to pre-injury function: A prospective cohort study

BRIAN SENNETT MD Associate Professor of Orthopaedic Surgery, Penn Medicine

TBA

SUSAN SORENSON PHD Director, Ortner Center on Family Violence, Penn Social Policy & Practice

Justifications for Wife Beating among Iraqi Women

MARILYN SOMMERS PHD RN FAAN Lillian S. Brunner Professor of Medical-Surgical Nursing, Penn Nursing

Screening, Brief Intervention, and Referral to Treatment (SBIRT) for Risky Driving and Problem Drinking

JENNIFER TAYLOR PHD MPH Assistant Professor, Department of Environmental and Occupational Health, Drexel University School of Public Health

Correlations between Organizational Safety Climate, Nurse Injuries, and Nursing Sensitive Patient Safety Events

DOUG WIEBE PHD Assistant Professor, Department of Biostatistics and Epidemiology, Penn Medicine

Military Veteran Mortality Following a Survived Suicide Attempt

BETH WINKELSTEIN PHD Associate Professor, Bioengineering & Neurosurgery, Penn Engineering

Biomechanics of Painful Injuries

POSTER SESSION ABSTRACTS

STUDENT POSTERS

1. DANIEL ADDYSON

University of Pennsylvania, School of Medicine, Master of Public Health Program

Exploratory assessment of faith-based networks' role in promoting farm safety and injury prevention

Although agricultural occupations comprise less than one percent of the US labor-force, farming is one of the most hazardous occupations in the United States, imposing significant economic and social burdens on farm families and communities each year. Previous research has explored the effectiveness of safety awareness and injury prevention programs targeted at various farm-related populations, relatively little work focuses on prominent community networks to implement such interventions. The current study examines the role of faith-based networks, an influential component of rural and agricultural communities, in promoting farm safety and reducing injury.

2. CARLY CHORNOBIL

University of Pennsylvania, School of Medicine, Master of Public Health Program

Victims of intimate partner violence: an in depth look at indicators that affect health care utilization

Intimate Partner Violence (IPV) has severe physical and mental health consequences. IPV contributes to a number of chronic health problems and often limits the ability of women to manage these chronic conditions. Although battered women suffer from many of these serious health issues, a critical gap continues to exist in the delivery of health care services provide to them and their children.

3. CHRISTINE FORKE

University of Pennsylvania, School of Medicine, Center for Clinical Epidemiology & Biostatistics/EPI & Children's Hospital of Philadelphia

Adolescent Relationship Violence Outcomes for Childhood Witnesses of Adult Violence in the Home

Additional Authors: Christine M. Forke, MSN, CRNP(1,2), Rachel K. Myers, BA(1,2), Marina Catalozzi, MD(2,3), Abdul Salam, MSc(4), Abbas Jawad, PhD(5), Donald F. Schwarz, MD, MPH(6)

1 Craig-Dalsimer Division of Adolescent Medicine, CHOP; 2 Campus Violence Task Force, Institute for Safe Families; 3 Dept. of Pediatrics, Mailman School of Public Health, Columbia Univ.; 4 CHOP-Westat Biostatistics and Data Management Core and 5 Dept. of Pediatrics, CHOP; 6 City of Philadelphia

Background: Witnessing adult violence as a child increases adolescent interpersonal violence (IPV) risk. It is unclear how the direction of adult violence witnessed (same gender perpetration, opposite gender perpetration, or bi-directional perpetration) impacts adolescent IPV outcomes.

Objective: To compare adolescent IPV victimization and perpetration outcomes by gender and direction of adult violence witnessed.

Design/Methods: Cross-sectional survey of random classes at 3 urban colleges assessed childhood witnessing of adult violence at home; direction of the violence; and adolescent IPV victimization and perpetration. There were 4 unique categories of adolescent IPV (outcome): no IPV, victim only (victim),

perpetrator only (perpetrator), and both victim and perpetrator. Multinomial forward stepwise regression models stratified by gender included adolescent IPV as the dependent variable. Current age and direction of violence witnessed (same-gender perpetration, opposite-gender perpetration, bidirectional perpetration) were covariates. Adjusted odds ratios (OR) and 95% confidence intervals (CI) are reported. Results: 854/910 (94%) students who completed surveys had complete exposure and outcome data and were included in analyses. Students were 17-22 years old; 57% were female and 60% were White. 469/854 (54.9%) adolescents experienced no IPV, 238 (27.9%) were victims, 24 (2.8%) were perpetrators, and 123 (14.4%) were both. Of 178 (21%) witnesses, 45 (25.3%) witnessed same-gender perpetration, 74 (41.6%) witnessed opposite-gender perpetration, and 59 (33.1%) witnessed bidirectional perpetration. Males who reported witnessing same-gender perpetration as a child were more likely than non-witnesses to perpetrate adolescent IPV (OR=8.5, CI: 2.9, 25.1). In other words, boys who witnessed their fathers perpetrating violence as a child were more likely to perpetrate adolescent IPV. Males who witnessed bi-directional perpetration were more likely than non-witnesses to become both victims and perpetrators of adolescent IPV (OR=3.8, CI: 1.1, 13.1). Thus, boys who witnessed their fathers in the dual role of victim and perpetrator (bi-directional category) also became victims and perpetrators of IPV during adolescence. Females who witnessed bi-directional perpetration were more likely than non-witnesses to become victims of adolescent IPV (OR=3.2, CI: 1.4, 7.3). In other words, those who witnessed their mother in the dual role of victim and perpetrator were more likely to become victims of adolescent IPV. All female witnesses, regardless of the direction of violence witnessed, were between 3.3 and 6.8 times more likely than non-witnesses to become both victims and perpetrators of adolescent relationship violence ($p < 0.05$).

Conclusions: Childhood witnessing of adult violence in the home is a strong indicator of adolescent exposure to IPV. For males, same gender witnessing increases perpetration, and bi-directional witnessing increases risk of being both a victim and perpetrator. For females, any witnessing increases risk for being both victims and perpetrators during adolescence, and bi-directional witnessing increases risk for adolescent victimization. Early interventions addressing family violence may reduce subsequent IPV for childhood witnesses.

4. CATHERINE McDONALD

University of Pennsylvania, School of Nursing, PhD student & Philadelphia Collaborative Violence Prevention Center

Living Healthy in Philadelphia: The Role of Family for Youth in Violent Environments

Additional Authors: Douglas J. Wiebe PhD, University of Pennsylvania, School of Medicine
Nicole Thomas MBA, University of Pennsylvania, School of Medicine & Philadelphia Area Research Community Coalition
Terry Guerra MS, Philadelphia Area Research Community Coalition, AchieveAbility
Therese S. Richmond PhD, CRNP, University of Pennsylvania, School of Nursing
All authors are affiliated with the Philadelphia Collaborative Violence Prevention Center

Background: High violence levels in Philadelphia affect youth and pose substantial challenges for healthy development.

Purpose: Test the hypothesis that healthy family functioning serves to enhance youth's self-esteem and to decrease the use of confrontational coping in neighborhoods with prevalent community violence.
Methods: A paper and pen survey was administered to 110 youth (10-16 yrs; 54% female) recruited from community settings and recreation centers in three Philadelphia communities. Standardized questions assessed participants' community violence exposure (CVE), family functioning, peer self-esteem, school self-esteem, and use of confrontational coping. Data were analyzed using multinomial least-squares regression.

Results: Over 97% of youth reported some type of CVE, with 35% reporting disproportionately high CVE, and 52% of youth reported healthy family functioning. Controlling for age, gender, and CVE, healthier family functioning was associated with significantly ($p < 0.05$) higher levels of school and peer self-esteem and decreased use of confrontational coping. Using the regression model to derive mean predicted values among subgroup of our sample, youth with healthy family function had significantly higher levels of peer self-esteem than did youth with unhealthy family function (3.4 vs. 2.9 respectively, $p < 0.05$), and significantly higher levels of school self-esteem as well (3.5 vs. 2.8 respectively, $p < 0.05$). Youth from homes with healthy family functioning relied less often on confrontational coping (0.8 vs. 1.5, $p < 0.05$). Conclusions: The role of the family can be a protective factor in environments of pervasive community violence. Findings suggest that in preventing youth violence and augmenting healthy development, the family can be a point of intervention.

5. KRISTIE THOMAS

University of Pennsylvania, School of Social Policy & Practice

Intimate Partner vs. Non-Intimate Murder: Differences in Legal, Situational, Clinical and Personal Characteristics

Additional Authors: Melissa E. Dichter, PhD (Center for Health Equity Research and Promotion (CHERP), Philadelphia VA Medical Center) and Jason Matejkowski, MSW (School of Social Policy & Practice, University Of Pennsylvania).

Previous research has identified risk factors for being murdered by an intimate partner but we know little about the extent to which those who murder an intimate partner differ from those who murder a non-intimate. Uncovering differences between these two groups may inform targeted violence prevention efforts. Using an integrated database of personal, situational, legal, and clinical characteristics derived from correctional, health, and court system documents for all persons convicted of murder (knowingly or intentionally killing another human being) in Indiana between 1990-2002, we compared those convicted of murdering an intimate partner ($n=71$) to those convicted of murdering someone other than an intimate ($n=291$). Men who murdered an intimate and men who murdered a non-intimate were similar in histories of childhood abuse, substance abuse, and prior arrests. Men who murdered an intimate were significantly more likely than men who murdered a non-intimate to have: been employed at the time of the offense (73% vs. 45%), graduated high school (49% vs. 30%), ever been married (67% vs. 28%), a history of suicide attempts (27% vs. 16%) or severe mental illness (26% vs. 12%). Intimate murders were more often committed: without an accomplice (96% vs. 56%), via methods of strangulation or suffocation (21% vs. 7%), and with a motivation of "rage" (87% vs. 31%). The findings suggest that the context of intimate partner homicide is largely different from non-intimate partner homicide, at least for intentional killing, and, therefore, the prevention efforts should be appropriately tailored to the unique risk factors.

6. AKIRA TOH

School of Engineering and Applied Science, Undergraduate Program, Bioengineering & Center for Injury Research and Prevention

Applicability of CPR-based Thoracic Stiffness and Damping Properties to the Motor Vehicle Crash Environment

Additional Authors: Dr. Kristy B. Arbogast Matthew R. Maltese

A biofidelic ATD is essential for developing crash safety systems for occupants. The ubiquitous Kroell blunt hub impacts to the thoraces of PMHS have formed the biofidelity requirements for the adult-sized ATD thorax. Recently collected thoracic force-deflection data from cardio-pulmonary resuscitation patients offer a large dataset of biomechanical data across a broad age range. However, the applicability of

this CPR data to inform ATD biofidelity requirements is unknown. Thus, the objective of this study was to evaluate the performance of CPR-derived thoracic stiffness and damping properties in a mathematical model of blunt thoracic impact validated to the Kroell experimental data.

A previously validated (Neathery 1971) spring-mass-damper (SMD) model of the adult chest during thoracic impact was recreated in MatLab. The model was modified (SMD-CPR), with mass and flesh stiffness from SMD, and thorax stiffness and damping from CPR. Comparison of the two models revealed that the damping constant from CPR was too low to produce a model that could be validated to the Kroell experiments. Thus, we created a third model (SMD-CPR-K), by changing the damping of SMD-CPR model back to the value from SMD model. During blunt hub impact simulations, the SMD-CPR-K model yielded a 48.78% increase in chest deflection from the SMD model, over impact velocities of 7.1 m/s.

The SMD-CPR-K model was then parameterized to quantify the mass, stiffness and damping effects on the force-deflection response. Increases to sternum mass or flesh stiffness led to increased force only in the first 40 mm of deflection. Increased thorax stiffness led to increased maximum thorax deflection only. Finally, increased thorax damping led to increased force in the first 40 mm of deflection and decreased maximum deflection.

These results indicate that stiffness but not damping characteristics from CPR are compatible with the impact environment.

FACULTY/STAFF POSTERS

7. LAURIE BACH

Center for Injury Research and Prevention

Dangerous Passengers?: Teen risk perceptions and behaviors

Additional Authors: Lela S. Jacobsohn, PhD (1) , Alana Vivolo, MPH (1) , Flaura K. Winston, MD, PhD (1, 2)

(1) The Center for Injury Research and Prevention, The Children's Hospital of Philadelphia, Philadelphia, PA

(2) Department of Pediatrics, University of Pennsylvania School of Medicine, Philadelphia, PA

Motor vehicle crashes are the leading cause of death among U.S. teens; a single passenger doubles the risk of fatal car crashes for teens, and 3 or more passengers increases the risk by 4-5 times. A better understanding of the relationship between teen driver's risk perceptions related to passengers and actual driving behaviors with dangerous passenger activity can inform design of critical prevention programs and policies. In this study, 625 14-17 year-olds from Pennsylvania or New Jersey participated in an online survey in 2008. Studied constructs included perceived risks of passenger behavior (i.e. of a passenger who is drunk and of driving with many teen passengers, or "piling"); frequency of driving with passengers; and frequency of driving with risky passenger behavior (i.e. driving friends who are using alcohol or marijuana, and piling). Correlation analyses showed significant relationships between risk perceptions and behaviors. Among licensed teen drivers, the perceived risk of a drunk passenger was significantly associated with frequency of driving friends who were using alcohol or marijuana ($r=0.214$, $p<0.01$). Those who perceived piling as dangerous were significantly less likely to drive with piling in the car ($r=0.397$, $p<0.001$). Possible opportunities to decrease teen drivers' acceptance of risky passenger behavior may involve targeting risk perceptions of these behaviors. The significant relationship between perceived risk and frequency of the studied driving behaviors can be used to inform intervention design and dissemination strategies. Successfully addressing risky passenger behavior may substantially contribute to prevention of future teen injuries and fatalities from motor vehicle crashes.

8. LAURIE BACH

Center for Injury Research and Prevention

Associations of Outcome Expectancies and Cell Phone Use While Driving Among Adolescent Drivers

Additional Authors: Jessica S. Hafetz, PhD (1), Lela S. Jacobsohn, PhD (1), Felipe Garcia-Espana, PhD (1), & Flaura K. Winston, MD, PhD (1,2)

(1) The Center for Injury Research and Prevention, The Children's Hospital of Philadelphia, Philadelphia, PA

(2) Department of Pediatrics, University of Pennsylvania School of Medicine, Philadelphia, PA

Motor vehicle crashes are the leading cause of death and injury for adolescents; mainly due to driver inexperience (IHS, 2005). Adolescent cell phone use while driving leads to increased crash risk (Neyens & Boyle, 2008). Cognitions associated with adolescent driver cell phone use were identified via nationally representative survey data.

Summary: Novice driver inexperience coupled with distractions escalates crash and injury risk. Distractions due to cell phone use, hands-free devices included, are related to attention lapses that compromise driving performance (Beede & Kass, 2006; Consiglio, 2005; Kass, Cole, & Stanny, 2007; Treffner & Barrett, 2004). Identification of antecedents of cell phone use among novice drivers is necessary to inform critical prevention programs and policies.

Methods. Secondary data analysis was conducted of a school-based nationally representative survey of 9th-, 10th-, and 11th graders (N = 5665) from 68 high schools collected in spring 2006. Survey content and language was informed by two stages of focus groups with adolescents, using nominal group technique (Ginsburg et al., 2008). Selected survey items for the present analysis included cell phone ownership, perceived positive and negative consequences related to cell phone disuse, perceived factors that could lead to cell phone disuse, descriptive norms related to cell phone use and perceived influencers of cell phone behaviors. Analysis Plan. Univariate and ANOVA means analyses were conducted in Phase I of analysis with data weighted to represent the U.S. population, using SAS 9.2. Phase II includes multivariate analyses, including adjusted risk ratios and logistic regression as appropriate to the nature of the data. Analyses are driven by relationships specified by the Theory of Reasoned Action (Fishbein & Ajzen, 1980).

Results. 75% of respondents reported owning a cell phone. Among adolescents, dominant positive perceived outcome expectancies for not using a cell phone while driving include: paying better attention to driving (72% agree or strongly agree); less likely to get into an accident (67%); following the law (59%). Dominant perceived negative consequences of this behavior include: wouldn't be able to tell people where I am or when I will arrive (63%); couldn't check with someone if I get lost or forget something (63%); mom or dad couldn't call me when they need me (61%). Self-reported influencers of cell phone use were limited to two parties: parents (72%) and friends (51%). Others including siblings, teachers, doctors, driving instructors, insurance agents, grandparents, or other non-familial adult were widely considered non-influential. Cell phone use while driving was significantly associated with positive consequence beliefs $F(2,4031) = 207.1; p < .001$ and with negative consequence beliefs $F(2,3988) = 82.2; p < 0.001$. Adolescents who rarely or never used a cell phone while driving reported the strongest beliefs about positive consequences of not using a cell phone while driving, ($M = 4.33, SD = 0.06$) and the weakest beliefs about negative consequences of this behavior ($M = 2.98, SD = 0.06$)

Discussion. Cell phone ownership is unsurprisingly prevalent among adolescent drivers. Possible opportunities to influence the behavior of adolescent cell phone disuse while driving may involve targeting beliefs about consequences of this behavior. Indeed, the significant relationship between beliefs about positive consequences and the behavior can be used to inform intervention development and dissemination strategies. Additionally, this finding indicates theoretical relevance and practical utility of the application of the Theory of Reasoned Action in the context of this behavior.

9. JOSEPH KAY

Center for Injury Research and Prevention; The Children's Hospital of Philadelphia

What's to know? The important skills, concepts, common problems and ways teens learn to drive according to parents

Additional Authors: Kay, Joseph; Hafetz, Jessica; Center for Injury Research and Prevention; The Children's Hospital of Philadelphia

Introduction: Parents play a critical role in teaching teens to drive but receive no formal training or support. Some families have access to driver education, while parents of teens without driver education shoulder the burden of providing or finding instruction for their teens. Parent-focused educational tools and interventions are needed to support parents in this endeavor.

Methods: Qualitative methods were used to explore parents' perceptions about the learning-to-drive process. Parents were asked to: 1) identify the important skills and concepts that all teens need to know before licensure and why they are important, 2) explain how teens learn these skills and concepts, and 3) identify common problems teens have when learning to drive.

Research was conducted at three Philadelphia area Departments of Motor Vehicles with parents of teens waiting to get their learner's permits. Three interviewers conducted 52 research sessions (semi-structured interviews and open-ended surveys); two sessions included a mother and a father (dyad). 54 subjects participated [17 male; 49 white, 2 Asian, 1 black/African American and 1 mixed race (1 did not disclose race); 1 Hispanic/Latino; ages ranged from 33-69 (average: 47.8) years old (2 did not disclose age)]. Emerging themes were identified and examined through team discussions.

Results: Five categories of important skills and concepts emerged: 1. Specific Driving Skills (e.g. parking), 2. General Driving Concepts (e.g. managing distractions and "awareness"), 3. Physical Health (e.g. good eye sight), 4. Driving Knowledge (e.g. "rules of the road") and 5. Personality/Character Traits (e.g. maturity, patience). Parents described the learning process to unfold through hands-on experience, explicit instruction and teen observation. Finally, parents described three categories of common problems: 1. Skill Deficits / Lack of Experience, 2. Errors of Omission (e.g., not listening to parents or being distracted) and of Commission (e.g., aggressive driving).

Discussion: Parents tended to list basic driving skills (e.g. turn signals, parallel parking) and general topics (e.g. "defensive driving"), and not the more advanced skills (e.g. hazard detection) needed for driver safety. This indicates that parents have a good grasp of the basics but lack knowledge of advanced driving skills. Parents described teen learning in general terms and did not provide specific learning strategies. Common problems were also discussed generally, typically focusing on distraction and personality/character traits. This study provides a starting point for the development of educational tools and driving interventions to help parents understand and teach the specific skills teens need to drive safely.

10. JANET LIOY, M.D.

Penn School of Medicine/Children's Hospital of Philadelphia

Sudden Cardiac Death in Youth Baseball: The Impact of Education on Behavior

Additional Authors: Andrew Greubel (St. Andrew School, Newtown, PA)

Youth baseball is the 2nd most common sport played aside from basketball with approximately 8 million children between the ages of 6 and 17 participating per year. However, little attention has been devoted to serious, life threatening injuries that occur such as Commotio Cordis. Commotio Cordis, or sudden cardiac death due to blunt cardiac trauma resulting in a fatal arrhythmia, has been cited as the second leading cause of death in young athletes. Within the Commotio Cordis registry, the number of cases have risen to over 200 and nearly half occur during competitive sports. Heart guard protection and the use of automated external defibrillators may improve the outcome and save lives during this devastating injury.

We will describe the results of a randomized, blinded control survey of a group of participants in Little League baseball in a suburban Philadelphia setting. A group of 60 participants, (divided into 2 groups of 30 each: 10 youth players; 10 parents; 10 coaches in each group were given a 10 question survey on injury awareness; prevention and the use of automated external defibrillators, (A.E.D.'s) during sudden blunt injury to the heart with cardiac arrest. Group 1 was given the survey without any education. Group 2 viewed a set of 3 short instructional videos and an information fact sheet about Commotio Cordis and A.E.D.'s and then took the identical survey. All participants were selected randomly by an outside party in a blinded fashion. All results were analyzed by Group assignment and were blinded to the investigators.

Results show that both groups relied on their coaches to supply safety instructions and guidance during baseball games. Additionally, both groups demonstrated a significant overall lack of knowledge of serious sports injuries in youth baseball and rarely was any heart protective gear worn. Group 1 was unaware of Commotio Cordis injuries and was not comfortable with using an A.E.D. in an emergency situation. Most striking is that although most people knew what an A.E.D. was, both groups did not know where they are located in their school or playing field environment. However, after receiving education, Group 2 was significantly more likely to use an A.E.D. in an emergency and also use heart protection during youth baseball after the survey. Conclusion: There is a serious need for education of all participants in youth baseball to become knowledgeable about sudden cardiac death during youth baseball, encourage heart protection and A.E.D. awareness and usage. Mandatory education should be provided for all parents, coaches and players in youth baseball before the playing season begins.

COMPENDIUM of Injury Science Research

KRISTY ARBOGAST

Engineering Core Director, Center for Injury Research and Prevention, CHOP

Comparison of Kinematic Responses of the Head/Spine for Children & Adults

Additional Presenters: Sriram Balasubramanian, Thomas Seacrist, Matthew R. Maltese, J. Felipe García-España (Children's Hospital of Philadelphia); Terrence Hopely, Eric Constans (Rowan University); Francisco J. Lopez-Valdes, Richard W. Kent, (University of Virginia); Hiromasa Tanji, Kazuo Higuchi (Takata Corporation)

Oral Presentation, Stapp Car Crash Conference, November 2-4, 2009

Previous research has suggested that the pediatric ATD spine, developed from scaling the adult ATD spine, may not adequately represent a child's spine and thus may lead to important differences in the ATD head trajectory relative to a human. To gain further insight into this issue, the objectives of this study were, through non-injurious frontal sled tests on human volunteers, to 1) quantify the kinematic responses of the restrained child's head and spine and 2) compare pediatric kinematic responses to those of the adult. Low-speed frontal sled tests were conducted using male human volunteers (20 subjects: 6-14 years old, 10 subjects: 18-40 years old), in which the safety envelope was defined from an amusement park bumper-car impact. Each subject was restrained by a custom-fit lap and shoulder belt system and photo-reflective targets were attached to a tight-fitting cap worn on the head or adhered to the skin overlying skeletal landmarks on the head, spine, shoulders, sternum, and legs. A 3-D near-infrared target tracking system quantified the position of the following markers: head top, external auditory meatus, nasion, opisthocranium, C4, T1, T4, and T8. Trajectory data were normalized by subject seated height and head and spine rotations were calculated. The Generalized Estimating Equations method was used to determine the effect of age and key anthropometric measures on marker excursion.

For all markers, the normalized forward excursion significantly decreased with age and all spinal markers moved upward due to a combination of rigid body rotation and spinal flexion with lesser upward movement with age. The majority of the spine flexion occurred at the base of the neck not in the upper cervical spine and the magnitude of flexion was greatest for the youngest

subjects. Additional flexion occurred in the thoracic spine as well. Our findings indicate that the primary factor governing the differences in normalized head and spinal trajectories between the various age groups was decreasing head-to-neck girth ratio with increasing age. Other factors, such as muscle response and cervical vertebral structural properties, may also contribute to the differences, but were not evaluated in this paper. These results can serve as a data set for validating the responses of restrained ATDs and computational human models to low severity frontal collisions.

SRIRAM BALASUBRAMANIAN PHD

Biomechanics Research Engineer, The Children's Hospital of Philadelphia

Head and Spinal Trajectories in Children and Adults Exposed to Low Speed Frontal Acceleration

Additional Presenters: Thomas Seacrist, MS; Matthew R. Maltese, MS; Kristy B. Arbogast, PhD; Terrance Hopely, BS; Eric Constans, PhD; Robert Sterner, PhD; Hiromasa Tanji; Kazuo Higuchi

Oral Presentation, 21st Enhanced Safety Vehicles Conference, June 15-18, 2009, Stuttgart, Germany

Head injuries are the most common injuries sustained by children in motor vehicle crashes. Prevention of these injuries through advances in vehicles and restraint systems requires a biofidelic anthropomorphic test device (ATD). Pediatric ATDs are primarily developed from scaling down adult volunteer and cadaver impact test data. Limited experimental data exist on pediatric head and neck kinematics in order to evaluate the biofidelity of the ATDs. The aim of the current study was to evaluate the head and spinal kinematics of pediatric and adult volunteers in response to a dynamic low-speed frontal sled test. Low speed volunteer testing of five male subjects in each of two specific age groups (9-12, and 18-30 years) were performed using a pneumatically actuated – hydraulically controlled sled. Safe limits were established from measurement of bumper car accelerations at an amusement park ride (4.9 g, 55.7 msec rise time, 110 msec duration), which we believed to be sub-injurious to the adult and child amusement park population. We subsequently recreated the bumper car environment in the laboratory, by developing a low-speed hydro-pneumatic sled. As an added measure of safety, our average maximum cart acceleration was 3.59 g for children and 3.78 g for adults, thus producing occupant loads that are approximately 25% less than the bumper car amusement park ride. Spherical reflective markers were placed on the head, neck, torso, upper and lower extremities and tracked using a 3D motion analysis system. An angular rate sensor was mounted to a bite plate of an athletic mouth guard to measure the head rotational velocity. Electromyography sensors were attached to key muscle groups to measure the muscle response of the subjects to the loading environment. Each subject was subjected to six sled runs. Head and neck trajectories were compared between the adult and pediatric subjects. In addition, the effect of habituation on kinematic response was examined by comparing within subject changes in kinematics throughout the series of six sled runs.

RICHARD BERK

Professor, Departments of Statistics and Criminology

Forecasting the Perpetrators and Victims of Homicide within Populations of Parolees and Probationers

Oral Presentation, Injury Science Day, 3/3/2010

In some major U.S. cities, about 2 in 100 individuals on probation or parole commit a homicide or attempted homicide, or are a victim of homicide, within 18 months of intake. If these events could be accurately forecasted, it might be possible to intervene and prevent the violence. Recent work in which machine learning is applied to forecasting has recently produced forecasts with a useful level of skill. In one city, the high risk group identified were accurately forecasted to have a “failure rate” of nearly 80%. In this group, nearly 80 out of every 100 individuals in fact committed a homicide or attempted homicide, or were a victim of homicide, within 18 months of intake. In another city where the outcome was only perpetration, about 50 out of 100 individuals in the high risk group committed a homicide or an attempted homicide within 2 years of intake. In both cases, the results reflect actual forecasts. The forecasting procedures were constructed on one data set and their accuracy tested on another data set. Both sets of forecasting procedures are being implemented by the relevant criminal justice agencies.

Berk, Richard A., Lawrence Sherman, Geoffrey Barnes, Ellen Kurtz, and Lindsay Ahlman. 2009. Forecasting murder within a population of probationers and parolees: a high stakes application of statistical forecasting. *Journal of the Royal Statistical Society(Series A)* 172, Part 1: 191-211.

Berk, Richard A. 2009. “The Role of Race in Forecasts of Violent Crime,” *Race and Social Problems*, 1(4): 231-242, 2009.

KATHLEEN BREWER-SMYTH PHD

Associate Professor, University of Delaware

Neurobiological relationships with suicidal and homicidal behaviors of females

Poster, American Public Health Association, November, 2009

Background: It is critical to identify risk factors for homicidal and suicidal behaviors of females since the increase in female suicide bombers world-wide.

Objective: To define neurobiological correlates of homicidal and suicidal behavior of females.

Methods: An exploratory cross sectional investigation of qualitative and quantitative data from private interviews and examinations of 133 female minimum and maximum security prison inmates and 12 non-criminal females were analyzed with descriptive, graphical, and linear regression analyses to define neurobiological relationships to homicidal and suicidal behavior.

Results: Poverty, limited access to filtered water, known actual and potential lead and other toxin exposure, poor nutrition, childhood physical and sexual abuse, neglect, and neurological impairment were prevalent problems throughout the prison population. Risk factors of childhood physical and sexual abuse, abuse-related hospital visits, and neurological abnormalities were related to youth suicidal behaviors and adult homicidal behavior. Greater severity and frequency of childhood sexual abuse was related to higher childhood physical abuse scores ($p=.000$), greater number of incarcerated adult family members per subject ($p=.000$), hospital visits for abuse-related injuries ($p=.045$), neurological examination abnormalities ($p=.042$), traumatic brain injuries (TBI) ($p=.000$), more recent abuse in adulthood ($p=.002$), abnormal neuroendocrine cortisol production ($p=.028$), suicide attempts ($p=.000$), and greater likelihood of having committed homicide ($p=.008$).

Conclusions: To prevent suicidal and homicidal behaviors, female children of incarcerated adults who live in poverty must be protected from potential neurological and neuroendocrine correlates of childhood poverty, abuse and neglect that could lead to suicidal and homicidal behaviors. Childhood sexual abuse must be taken seriously.

Preventing Neurological Decline in Women at Risk

Additional Presenters: Gabriel Bucurescu, MD MS, Staff Neurologist, US Department of Veterans Affairs; Dennis L. Kolson, MD, PhD, Associate Professor of Neurology, University of Pennsylvania

Women's Health 2009: The 17th Annual Congress, March, 2009

Background: The increasing prevalence of aging individuals with disabilities from neurological decline is expected to significantly impact health care resources. The number of women over age 65 has increased significantly in recent decades and is expected to continue to increase, with many having functional limitations requiring community assistance. Up to 96% of women cycling in and out of prison were found to have neurological abnormalities as the number of female prisoners increased rapidly since the closure of many mental health facilities.

Methods: Preliminary studies were conducted to define risk factors and consequences of neurological impairment in 144 female prisoners and 13 non-criminal females in order to plan neurological decline prevention studies.

Results: Logistic regression analysis revealed that women with greater neurological impairment were more likely to have been victims of childhood physical and sexual abuse (OR 1.075, $p=.003$), have incarcerated adult family members (OR 1.407, $p=.015$), abuse substances (OR 1.895, $p=.04$), attempt suicide (OR

1.92 $p=.029$), engage in HIV risk behaviors ($r=.874$, $p=.001$), and commit a violent crime including murder (OR 2.279, $p=.041$).

Conclusion: Neurologically impaired females are frequently incarcerated and released after short sentences returning to the community where they often live in poverty and engage in high risk behaviors. It is imperative that efforts focused on prevention of neurological decline include prevention of childhood abuse that has been related to abuse in adulthood, hospital visits for abuse-related injuries, traumatic brain injuries (TBI), and high risk behaviors for further neurological decline including infectious processes of the central nervous system.

Funding: NIH - 2 P20 RR016472-04, •NIH - T32 NR07036, University of Delaware General University Research Fund, University of Delaware Research Foundation

MELISSA DICHTER

Philadelphia VA Medical Center, Center for Health Equity Research and Promotion

Domestic Violence Interventions: Survivors' Desire for Mental Health Services

Oral Presentation, American Public Health Association Annual Meeting, November 7-11, 2009

Domestic violence often has severe mental health impacts that may manifest in depression and/or trauma symptomatology, including Post-Traumatic Stress Disorder. Survivors of domestic violence may turn to drugs or alcohol to cope with the experience, attempt suicide, or use violence themselves as defense or protection, or as a result of uncontrolled stress and anger. These effects have implications for survivors' health and well-being, and may lead to consequences in criminal, civil, and family courts, from being convicted of a criminal offense to losing child custody. This presentation focuses on female domestic violence survivors' interest in, and need for, mental health services, including counseling, drug/alcohol treatment, stress management, and anger management programs, as related to their experiences with violence. Findings are based on a study with women ($n=173$) who have had police intervention for domestic violence with a male partner. Data are from quantitative self-report questionnaires and supplemented with qualitative data from in-depth interviews with the same population of women. Funding was provided by the Centers for Disease Control and Prevention, National Center for Injury Prevention and Control.

Victims' and Service Providers' Perceptions of Dropping or Filing Charges Against an Intimate Partner: Fear as a Motivator

Additional Presenters: Fran Barg, Catherine Cerulli, Cathy Kothari, Karin Rhodes

Oral Presentation, Academy of Criminal Justice Sciences Annual Meeting, March 10-14, 2009

Domestic violence victims may benefit from using the criminal justice system to gain the power they lack in their relationships, as well as protection from further violence. Engaging with criminal prosecution against an abusive partner may also present a victim with challenges and risks. Through the use of "freelists," a qualitative methodology that asks participants to list words associated with given concepts, we identified the primary motivators identified by victims and service providers for filing or dropping charges against an abusive partner. Both groups identified fear as a primary salient motivating factor for both filing as well as dropping charges.

JOEL FEIN MD, MPH

Director and PI, The Philadelphia Collaborative Violence Prevention Center

Safe Neighborhood Tips: Philadelphia Collaborative Violence Prevention Center

Oral Presentation, Penn's Injury Science Day, 3/3/2010

In 2008, the Philadelphia Collaborative Violence Prevention Center (PCVPC) began to craft evidence-based tips for non-academic, non-research audiences that could be used to prevent violence and build community. The goal of these tips was to provide tangible actions, rooted in research evidence, which could be adopted to improve lives in our partner communities and neighborhoods. We solicited suggestions for tips from both our Center's academic members and community partners. All suggested tips were reviewed by community and academic partners for relevance and appropriateness of content and language. We then reviewed the existing literature to obtain documentation of the scientific evidence supporting each tip. To date, we have developed 55 Safe Neighborhood Tips which have been disseminated through a variety of venues including community events, websites, and bookmarks targeted to youth. We are currently working with the nine other CDC Academic Centers of Excellence on Youth Violence Prevention to evaluate the evidence supporting each tip based on their expertise, as well as gather their ideas for dissemination. These tips provide a novel venue for translating research results into actionable behaviors that can engage partners to build strong communities that support youth and families.

JUDITH GOLD

Assistant Professor, Department of Public Health, Temple University

Texting and Upper Extremity Symptoms in College Students

Additional Presenters: Venk Kandadai, Temple University; Alexandra Hanlon,, Temple University, University of Pennsylvania

Poster, American Public Health Association Conference, November 2009

The use of hand-held computers (PDAs) is increasingly common in occupational settings. There are no published studies which examine an association between PDA exposure and musculoskeletal symptoms. The objective of this study was to determine if there was an association between self-reported musculoskeletal discomfort and number of text messages sent per day in college students. A questionnaire inquiring about number of text messages sent per day (4 categories: 0, 1-10, 11-20, 21+ messages) was administered to a convenience sample of college students (n = 138) at a large urban university. A body map for noting any discomfort was also included. Upper extremity/back (UE/back) symptoms included all regions above the waist (excluding chest). Separate generalized linear models determined prevalence ratios (PR) for UE/back, shoulder, and neck symptoms. Gender and age were potential confounders. For the total cohort, there was an association between shoulder discomfort and number of daily text messages (PR = 1.40, 95%CI: 1.05, 1.86). When stratifying on gender, an effect was observed in males (PR = 1.94, 95%CI: 1.22-3.06), but not in females (PR = 1.10, 95%CI: 0.76-1.60). Similarly, there was effect modification by gender for neck discomfort (PR = 2.52, 95%CI: 1.16-5.46 males; PR = 0.93, 95%CI: 0.61-1.43 females). There was no association with age in any model. Number of daily text messages sent may increase the risk of shoulder or neck discomfort, particularly in males. Further research is necessary to confirm these findings. It may be prudent to monitor musculoskeletal symptoms in workers exposed to handheld devices.

Characterization of Postures and Comfort in Laptop Users in Non-desk Settings

Additional Presenters: Jeffrey B. Driban, Temple University; Vanessa R. Yingling, Temple University; Eugene Komaroff, Temple University

Oral Presentation, Marconi Conference, January 2010

Laptop computers may be used in a variety of postures not coupled to the office workstation. Using passive motion analysis, this study examined mean joint angles during a short typing task in college students ($n = 20$), in up to seven positions. Comfort was assessed after task execution through a body map. For three required postures, joint angles in a prone posture were different than those while seated at a couch with feet either on floor or on ottoman. Specifically, the prone posture was characterized by comparatively non-neutral shoulders, elbows and wrists, and pronounced neck extension. Significantly greater intensity and more regions of discomfort were marked for the prone posture than for the seated postures. It is recommended that the prone posture only be assumed briefly during laptop use. Exposure to laptops outside of the office setting should be assessed in future epidemiologic studies of musculoskeletal complaints and computer use.

ALICE HAUSMAN

Temple University & CPHI

Communicating Success from the Community Perspective

60 seconds, Injury Science Day, 3/3/2010

Introduction: Program evaluations focus on outcomes defined by the academic and policy community and rarely include measures that reflect the community's perspective on the issue being addressed. This gap in information may result in a failure to communicate "return on investment" to community supporters, leading to poor program support, participation and sustainability. If program advocates cannot communicate the value of participation to supporting agencies or targeted consumers, then even the most effective programs will fail. Objective: This study derived locally defined and measurable indicators of youth violence prevention program success that reflect effectiveness from the community perspective. Methods: Results from four focus groups and other community engagement activities conducted to plan the prevention program revealed a total of 43 indicators that reflected community perceptions. Quantitative data that could track changes in the community-defined dimensions were identified for 25 of those indicators. Specifically, measures from publicly available data and established psychometric scales being used in the evaluation of a local prevention program were matched to the community-derived indicators through a process of community and academic review. Results: Data were accessed and analyzed for 7 of the indicators: 2 through existing public data sets and 4 through data collected by the local intervention program. This presentation presents the statistical evidence of the reliability and validity of these measures and describes a replicable process that can help meet information needs for dissemination and implementation of best practices.

Closing the Loop: Identifying, translating, and demonstrating community expressed indicators of successful violence prevention using community based participatory research

Additional Presenters: Bernadette Hohl, Charlie Branas, Nicole Vaughn, Nicole Thomas
Poster, Society for Prevention Research, 5/27/2009

Community based participatory research (CBPR) has become a standard of practice in public health. One strength of this method is that it relies on the expertise of each partner to create change within the community. Community residents bring a diverse range of expertise to a collaborative project, for example; they are the first to identify markers of change, either good or bad, in their neighborhoods. Focusing on this expertise, a study was conducted as part of a larger, ongoing violence prevention initiative funded by the CDC, to identify, translate and demonstrate community expressed indicators of successful violence prevention programs. In the first phase, data were collected through focus group sessions held within the high risk participating neighborhoods. Next, these indicators were matched with available data in an effort to translate them into scientifically measurable variables. In the final stage

demonstrated here, associations were explored between matched indicators such as cleaner streets, decreased truancy, and more businesses in the community and traditional markers of violence with GIS maps to accompany analyses where possible. Different formats for presentation and communication of the data to the community residents and project partners have been developed. Options for presentation included feature articles published in local neighborhood papers and presentations at community meetings. This paper reports the process of “closing the loop” of information gathering from and presentation back to the community.

NANCY KASSAM-ADAMS PHD

Assoc. Director for Behavioral Research, Center for Injury Research and Prevention - Children's Hospital of Philadelphia

Stepped preventive care after acute pediatric injury

Oral Presentation, European Conference on Traumatic Stress, June 2009

A promising approach to secondary prevention of PTSD in acutely injured children is to embed screening and stepped intervention within the medical care setting. This presentation will describe the development and evaluation of a model of “stepped preventive care” that aims to reduce PTS symptoms and other psychological sequelae of injury, and improve health and functional outcomes in injured children admitted to hospital. The intervention is designed to be delivered by nurses and social workers who are members of the regular health care team. This stepped preventive care model incorporates screening for risk of persistent distress. Those determined to be at higher risk receive two standard follow-up contacts, and psychoeducation to promote effective coping assistance from parents. Based on assessed needs, decision rules guide the provision of additional elements such as specific support for adherence to follow-up medical care, or provision of evidence-based treatment if PTS or depression symptoms persist. The model is being evaluated in a randomized controlled trial in a large urban pediatric hospital. This presentation will summarize findings regarding feasibility and implementation, as well as preliminary data regarding 6 week outcomes.

The structure of PTSD symptoms in injured children and adolescents

Additional Presenters: Meghan Marsac, PhD; Carla Cirilli, MA

Oral Presentation, International Society for Traumatic Stress Studies, November 2009

Understanding the underlying dimensions of child PTS symptoms and their potential impact on functional outcomes is of vital importance in creating clinically useful diagnostic systems. The aim of the current analyses was to examine the factor structure of PTSD symptoms in two groups (n=479 and n=204) of school-age children and adolescents. Participants were assessed approximately 6 months after experiencing an acute injury. Confirmatory factor analyses were used to evaluate the fit of five different factor models for PTSD symptoms. Additional analyses examined the specificity of PTSD symptoms in relation to depression or general distress, and the association between each PTSD factor and functional impairment. A 3-factor model consistent with the DSM-IV PTSD symptom clusters fit the data well, but a 4-factor model separating effortful avoidance from emotional numbing received stronger support. Findings support the conceptualization of traumatic stress reactions as a specific entity distinct from depression or generic emotional distress, but also suggest that non-specific distress and dysphoria may play an important role in the clinical presentation of post-traumatic reactions and their impact on child functioning.

Evaluating screening and secondary prevention in the pediatric medical setting

Oral Presentation, International Society for Traumatic Stress Studies, November 2009

Embedding secondary prevention within medical care settings may be an effective way to identify and provide appropriate follow-up for injured children at risk for traumatic stress. This presentation will describe the evaluation of a stepped preventive care model that aims to reduce traumatic stress and other psychological sequelae, and improve health and functional outcomes, in acutely injured children. In the current study, 290 hospitalized injured children were screened for current distress and risk of persistent traumatic stress symptoms. Those screening positive (n=85; 29%) were randomized to receive usual care or stepped preventive care. The intervention included two standard follow-up contacts and psychoeducation; decision rules guided the provision of additional elements (e.g., support for adherence to medical care, provision of evidence-based treatment for persistent psychological symptoms) based on assessed needs. Outcomes (PTSD, depression, health-related quality of life, adherence to recommended medical treatment) were assessed at 6 weeks and 6 months. Preliminary analyses of 6 week data indicate that screening was effective in identifying children at risk for PTSD or depression, but do not show a difference between treatment groups for PTSD or depression.

Secondary prevention of traumatic stress: web-based information for parents of injured children

Additional Presenters: Flaura Winston, MD, PhD

Meghan Marsac, PhD

Oral Presentation, European Conference on Traumatic Stress, June 2009

The AfterTheInjury.org website provides practical information for parents of injured children about post-injury care, traumatic stress and other reactions. The aim of the site is to provide parents of acutely injured children with information and tools to help them help their children. The site presents information via text and multi-media elements (video, brief audio clips). A set of interactive tools allows parents to rate their child's emotional reactions and generate a personalized care plan. Development of the site was grounded in available evidence regarding child traumatic stress, parent responses, and effective secondary prevention. Parent feedback and multiple rounds of formal usability testing helped to hone the site's accessibility and acceptability for parents. Evaluations currently underway are assessing the site's effectiveness in increasing parent knowledge and awareness about child reactions to injury, parents' actual provision of effective coping assistance, and eventual child outcomes. Our team has also begun to test dissemination methods for optimal reach and impact with parents of acutely injured children.

AfterTheInjury.org: Evaluating impact on parent knowledge and coping assistance for injured children

Additional Presenters: Meghan Marsac, PhD; Flaura Winston, MD, PhD

Oral Presentation, First International E-Mental Health Summit, October 2009

Background: Pediatric injury is an unfortunately common experience, affecting many millions worldwide. In the US, more than 10 million children each year receive emergency or hospital care for an injury, and 15% - 20% develop persistent posttraumatic stress (PTSD) symptoms that can interfere with full recovery. AfterTheInjury.org promotes secondary prevention of PTSD in injured children - by providing parents with engaging information and interactive tools to help them help their child. Grounded in the empirical literature regarding child PTSD development, the site targets specific parent knowledge, skills, and behaviors related to secondary prevention of posttraumatic stress.

Research questions / objectives: Does use of the AfterTheInjury website increase parent knowledge (of child traumatic stress reactions), self-efficacy (re: helping child cope), and behavioral intentions (re: monitoring child reactions, encouraging active coping, discouraging avoidance)?

Target group: Parents of recently injured children

Methodology: Pre- and post- evaluation of knowledge, self-efficacy, and behavioral intentions in parents (N=25) before and after guided use of the website for approximately 20 minutes.

Results: Significant pre-post differences were observed in the specificity and accuracy of parent knowledge about child traumatic stress reactions; and in parent self-efficacy and knowledge about helping their child.

Conclusions and recommendations This preliminary evaluation suggests that use of the site can improve parents' awareness of child stress reactions and how to help their child. Ongoing studies are assessing the site's impact on parents' actual provision of effective coping assistance, and on child outcomes (PTSD symptoms) over a six week follow-up period.

Secondary prevention after acute medical trauma in children

Oral Presentation, 15th Zurcher Psychotraumatologie-Tagung (15th Annual Trauma Symposium), April 2010

Potentially traumatic medical events are frequent occurrences for children. Each year approximately one in four children receives medical care for injury, resulting in millions of emergency department visits and hospitalizations. Burns, sickle cell disease, diabetes, and severe asthma, and cancer affect large groups of children, and every day children undergo painful procedures and frightening treatment experiences as part of medical care.

Illness, injury, and frightening medical procedures can result in traumatic stress for children and their parents, and health care settings provide an important opportunity to respond to children with recent trauma exposure. This presentation will provide an update on current work in several countries to promote "trauma-informed" practice by pediatric health care providers, and to develop and evaluate practical methods for screening and secondary prevention in the health care setting that can be delivered by health and mental health care providers.

Several teams and investigators have been actively developing and evaluating evidence-based screening and treatment approaches that are practical for integration into the pediatric health care setting. These efforts include the development of risk screening tools for injured children to identify those at risk of persistent traumatic stress, as well as the development of preventive interventions to prevent persistent PTSD symptoms or address early traumatic stress responses. Many of these approaches are targeted not only for ill or injured children, but also for their parents and family members. In addition to face to face services, several teams are developing and testing models for broad provision of information and psychoeducation - via print, video, and web - to children and parents. Several studies have found promising results for increasing parent knowledge and decreasing child or parent PTSD symptoms.

Promising models for information provision, screening and early prevention / intervention have been developed and evaluated. The cutting edge of current research and practice in this area is systematic examination of which interventions work, for whom, at different time periods post-trauma, and determining how these can best be integrated into the health care delivery context.

JANET LIOY MD

Associate Professor of Clinical Pediatrics, University of Pennsylvania-SOM, Director of Neonatal Outreach-CHOP, University of Penn-SOM; CHOP

Sudden Cardiac Death in Youth Baseball: The Impact of Education on Behavior.

Additional Presenters: Andrew John Greubel, St. Andrew School, Newtown, PA

Poster, Injury Science Day, 3/3/2010

Youth baseball is the 2nd most common sport played asided from basketball with approximately 8 million children between the ages of 6 and 17 participating per year. However, little attention has been devoted to serious, life threatening injuries that occur such as Commotio Cordis. Commotio Cordis, or sudden cardiac death due to blunt cardiac trauma resulting in a fatal arrhythmia, has been cited as the second leading cause of death in young athletes. Within the Commotio Cordis registry, the number of cases have risen to over 200 and nearly half occur during competitve sports. Heart guard protection and the use of automated external defibrillators may improve the outcome and save lives during this devastating injury.

We will describe the results of a randomized, blinded control survey of a group of participants in Little League baseball in a suburban Philadelphia setting. A group of 60 participants, (divided into 2 groups of 30 each: 10 youth players; 10 parents; 10 coaches in each group were given a 10 question survey on injury awareness; prevention and the use of automated external defibrillators, (A.E.D's) during sudden blunt injury to the heart with cardiac arrest. Group 1 was given the survey without any education. Group 2 viewed a set of 3 short instructional videos and an information fact sheet about Commotio Cordis and A.E.D.'s and then took the identical survey. All participants were selected randomly by an outside party in a blinded fashion. All results were analyzed by Group assignment and were blinded to the investigators.

Results show that both groups relied on their coaches to supply safety instructuons and guidance during baseball games. Additionally, both groups demonstrated a significant overall lack of knowledge of serious sports injuries in youth baseball and rarely was any heart protective gear worn. Group 1 was unaware of Commotio Cordis injuries and was not comfortable with using an A.E.D. in an emergency situation. Most striking is that although most people knew what an A.E.D was, both groups did not know where they are located in their school or playing field environment. However, after receiving education, Group 2 was significantly more likely to use an A.E.D. in an emergency and also use heart protection during youth baseball after the survey. Conclusion: There is a serious need for education of all participants in youth baseball to become knowledgable about sudden cardiac death during youth baseball, encourage heart protection and A.E.D. awareness and usage. Mandatory education should be provided for all parents, coaches and players in youth baseball before the playing season begins.

JOHN MACDONALD

Jerry Lee Assistant Professor, University of Pennsylvania

The Effect of Conductive Energy Devices on Injuries in Police Use of Force Events

Oral Presentation, Injury Science Day, 3/3/2010

Objective: We investigated the effect of less-lethal weapons, conductive energy devices (CEDs), on the incidence of injuries to police officers and civilians in use of force encounters.

Methods: We examined monthly injury rates for two police agencies before and after their adoption of CEDs.

Results: The monthly incidence of injuries in two police departments declined significantly, by 25% to 62%, after the adoption of CED devices.

Conclusions: Injuries from police use of force incidents affects thousands of police officers and civilians in the US each year. The incidence of these injuries can be reduced dramatically when law enforcement agencies responsibly employ less-lethal weapons in lieu of physical force.

MATTHEW MALTESE

Director, Biomechanics Research, Department of Anesthesiology and Critical Care Medicine, CHOP

In-depth Field Investigations of Belt-Restrained Children in Far-side Crashes

Additional Presenters: Caitlin M. Locey; Jessica S. Jermakian; Kristy B. Arbogast

21st International Technical Conference on the Enhanced Safety of Vehicles, June 15-18, 2009

Successful development of side impact safety systems for rear row child occupants requires an understanding of injury causation and mitigation. Recent attention has focused on adults in farside crashes but little attention has been given to children in farside crashes. Thus, we sought to elucidate Injury Causation Scenarios (ICS's) in children in center and farside seat positions. Crash investigation cases were drawn from the Partners for Child Passenger Safety Crash Investigation database, and the Crash Injury Research and Engineering Network database. Included in the study were children aged 4 to 15 years, involved in a side impact crash, seated on the center or farside in the rear rows, restrained by a seat belt alone (no booster seats or side airbags) and who received an AIS 2+ injury. Excluded cases were those where the only documented AIS 2+ injury was an altered state of consciousness (concussion, amnesia, or brief loss of consciousness). Seventeen cases met the inclusion criteria for this study. The three most frequently injured body regions to receive an AIS 2+ injury were: head, abdomen, and thorax. Intracranial injuries included cerebral contusions, subarachnoid hematoma/hemorrhage, edema, and extradural/epidural hematoma. Skull and facial injuries consisted of vault, orbit and maxillary fractures. Eight occupants had torso injuries: lung contusion, clavicle fracture, spleen laceration or rupture, liver laceration or contusion, and laceration or contusion to the digestive tract organs of the lower abdomen. Our results indicate that injury patterns and mechanisms are unique to children, and thus require a mitigation approach different than the adult. Of note, thoracic injuries, which are rare in pediatric farside crashes, are the predominant injury in adult farside crashes. Farside abdominal injury patterns suggest a lap belt submarining mechanism in children, injuring primarily the intestinal viscera, whereas the adult patterns suggest shoulder belt injury pattern, primarily inducing liver-injury.

MEGHAN MARSAC

Behavioral Researcher, Children's Hospital of Philadelphia

Initial evaluation of a web-based PTSS prevention tool for parents of injured children

Additional Presenters: Nancy Kassam-Adams, Ph.D.; Kristen Kohser, M.S.W.; Flaura Winston, M.D., Ph.D.

Oral Presentation, International Society for Traumatic Stress Studies Annual Meeting, November 2009

The majority of youth are exposed to a potentially traumatic physical injury at some time point during their childhood. Gaps in awareness and detection of injury-related traumatic stress as well as resources often result in a failure to detect and to treat the majority of children's psychological reactions to injury. Thus, our team developed a web-based, interactive traumatic stress prevention tool kit for parents (www.AfterTheInjury.org) which aims to present evidence-based information and tips in a format that is maximally accessible to a broad range of families. This presentation will review early findings tapping the ability of the website intervention to increase parental knowledge specific to children's anticipated reactions to injury and to influence parental coping assistance intentions. We will discuss implications of findings as they apply to the implementation of the web-based program on a universal level for the post-injury population as well as to future research.

Child coping and parent coping assistance following a potentially traumatic injury

Additional Presenters: Donlon, Katharine; Kassam-Adams, Nancy, & Winston, Flaura

Poster, International Society for Traumatic Stress Studies Annual Meeting, November 2009

Physical injury is one of the most common potentially traumatic events for children, with a significant number of injured children developing persistent posttraumatic stress symptoms (PTSS) or posttraumatic stress disorder (PTSD). Parents play an important role in helping children cope with these stressors. However, the role of coping following injury remains unclear. The purpose of these analyses was to examine data from three studies (evaluating variables related to PTSS after injury) to begin to understand the type and amount of coping typically used when encountering a medical trauma. Findings suggest that children use multiple coping strategies, and the reliance on more strategies is related to more PTSS. Parents plan to utilize coping assistance strategies including talking with their children, providing comfort, and alleviating their children's fears following discharge from the hospital. Findings indicate that parents most frequently provide coping assistance in the forms of distraction and helping children return to normal activities. Parent coping assistance is associated with more severe child avoidance after the injury. Thus, while additional research is necessary, these initial findings suggest that child coping and parent coping assistance following a medical trauma might be important factors to consider when designing secondary injury prevention programs.

Psychometric Properties of the FACES-IV in a Pediatric

Additional Presenters: Alderfer, Melissa

Poster, National Conference on Child Health Psychology, April 2009

Background The Family Adaptability and Cohesion Evaluation Scales IV is the latest revision of a self-report instrument designed to assess key components of the Circumplex Model of Marital and Family Systems. This model holds that adaptability and cohesion are important, orthogonal aspects of family functioning and families on the extremes of these dimensions (e.g, rigid or chaotic; enmeshed or disengaged) will have more difficulty coping with stress and will exhibit more dysfunction. Unlike past versions of this instrument, the FACES-IV includes six subscales: two measuring "balanced" or moderate levels of adaptability and cohesion and one measuring each of the "unbalanced" extremes of these dimensions. **Purpose** The purpose of the current study was to examine the structure and psychometric properties of the FACES IV within a pediatric oncology population. **Methods** As part of a larger study on families of children with cancer, 126 parents (112 mothers) and 126 siblings (66 girls) of youth within two years of cancer diagnosis, or currently on treatment provided data. Participating children ranged in age from 8 to 18 ($M = 13.4$, $SD = 2.9$). The majority of the participants were Caucasian (85%) and the length of time since the cancer patient's diagnosis ranged from 4 months to 4 years ($M = 1.3$, $SD = .6$). Parents completed the FACES IV measure, the Perceived Parental Self-Efficacy Scale (PPSES), the Perceived Collective Family Efficacy Scale (PCFES), the Family Assessment Device (FAD), and the parent version of The Revised Children's Report of Parental Behavior Inventory (CRBPI-30). Youth completed the Perceived Collective Family Efficacy Scale (PCFES), the Family Assessment Device (FAD), The Revised Children's Report of Parental Behavior Inventory (CRBPI), the Perceived Filial Self-Efficacy Scale (PFSES), and the Child and Adolescent Social Support Scale (CASSS). **Results** Planned analyses for the current study were to examine psychometric properties of the FACES IV by assessing reliability and validity and by attempting to replicate the factor structure suggested by Olson and colleagues (2006). While subscales maintained acceptable levels of internal consistency (Balanced Cohesion $\alpha = .77$, Balanced Flexibility $\alpha = .74$, Disengaged $\alpha = .79$, Enmeshed $\alpha = .65$, Rigid $\alpha = .73$, Chaotic $\alpha = .75$), the factor structure of the measure was not replicated. The new factor structure suggested five subscales instead of six: two balanced scales (with slight differences in item placement) and three unbalanced subscales (i.e., Disconnected, Controlled, Chaotic). A single factor (Controlled) emerged from items on the original Enmeshed and Rigid subscales. Correlations with other family measures suggested adequate validity for both the original subscales and the subscales resulting from the new factor structure. **Conclusions** The FACES-IV appears to maintain acceptable internal consistency and validity within a pediatric oncology

population. However, the factor structure of the measure is less clear. Results from the current study presented a different structure, which could possibly be attributed to the uniqueness of families within the pediatric oncology population. Further research should be conducted to determine if Olson et al.'s suggested structure can be replicated and generalized to other populations.

Screening and identifying

Additional Presenters: Kassam-Adams, Nancy; Kosher, Kristen; & Winston, Flaura

Poster, Regional Child Health Conference, April 2009

Background Data suggests that 1 in 6 children hospitalized for unintentional injury develops persistent traumatic stress symptoms, and that traumatic stress is associated with poorer health and functional outcomes. The acute medical setting offers opportunities for secondary preventive interventions, but hospital stays are brief and the health care team's skill and comfort in providing psychosocial screening or intervention is variable. The purpose of the current study was to describe characteristics of a pediatric injury sample and to implement a stepped intervention to prevent the development of post-traumatic stress symptoms. Methods A stepped preventive intervention was designed to be delivered to children and families in the hospital following a child's injury. The intervention was delivered by nursing and social work staff and combines systematic screening of injured patients with targeted follow-up for those at risk, and evidence-based interventions that are matched to individual need. A randomized controlled trial (n=293) evaluated the impact of the intervention on psychosocial (PTSD and depression symptoms) and health outcomes (adherence to medical discharge instructions, health-related quality of life), and will provide preliminary data concerning cost-effectiveness and subsequent health service utilization. Results This presentation will describe the results of screening for PTSD risk in this large inpatient injury sample and the nature and course of stepped care provided for those who were randomized to treatment. Descriptive analysis of the post-injury sample (patient and family), and differences in between the low-risk (n = 207), at-risk usual care (n = 40), and at-risk intervention groups (n = 46) will be presented. Conclusions Providing routine screenings during inpatient hospital stays can be beneficial for the medical team and families to help determine when additional services are indicated. Discovering specific characteristics unique to the child injury population is essential for the further development of in-hospital screeners and interventions. Further, the identification of which characteristics differ between low-risk and at-risk individuals will be beneficial in developing and evaluating future programs targeting positive adjustment post-injury.

Preventing and responding to traumatic stress: The development and evaluation of web-based tools for parents and health care providers

Additional Presenters: Kassam-Adams, Nancy; Kosher, Kristen; Grant, Caitlyn, & Winston, Flaura

Poster, Regional Child Health Conference, April 2009

Background Each year, 1 in 4 US children sustains an injury that requires medical treatment. However, for many, it is not physical recovery but psychosocial sequelae (e.g., posttraumatic stress) that determines functioning after injury. Among injured children, 15–20% develop persistent posttraumatic stress symptoms (PTSS) that impair functioning, including 5–10% who meet diagnostic criteria for posttraumatic stress disorder (PTSD). Parents report similar symptom levels, and parent reactions are important mediators of child outcomes. Unfortunately, there are gaps in health care providers' awareness and detection of injury-related traumatic stress, and the majority of children's psychological reactions to injury go undiagnosed and untreated. Purpose The objective of the current project is to develop evidence-based websites to that provide parents and medical providers with empirically-based information and tools (e.g., education specific to reactions to injury, promotion of positive coping skills) that will enable them to assess and to prevent the development of post-traumatic stress symptoms in children and parents following a child's injury. To this end, our team has developed the "After the Injury" website for parents, with the aim of

supporting parents' role in secondary prevention of traumatic stress after injury. This site integrates information on injury and traumatic stress, video and audio segments, and interactive features that guide parents to rate their child's reactions and create an individualized care plan. A website for pediatric health care providers is now under development and evaluation. The provider site is designed to deliver broad access to practical tools for addressing medical traumatic stress in children, and to provide skills training in "trauma-informed" pediatric health care. Methods Evaluation of the parent site has included two rounds of usability testing as well as qualitative and quantitative evaluations of the site's impact on parents' understanding of child reactions and their ability to provide optimal coping assistance. Ongoing quantitative research is exploring if exposure to the website increases practitioner knowledge of typical reactions to injury and of trauma. Results Preliminary results suggest that parents find the website both user-friendly and helpful in providing tips specific to helping their child cope upon discharge from the hospital. Assessments of practitioner knowledge of typical reactions to injury and of trauma symptoms through the use of the provider website are forthcoming. Additionally, we will describe the progress and challenges in developing web-based information and/or interventions, and in evaluating the usability and effectiveness of multi-component websites for lay or professional audiences. Conclusions Parents are an essential resource for emotional recovery in acutely injured children, and yet parents often are unaware or unsure of how best to help their child with emotional recovery and how to provide optimal assistance for the child's own coping. Web-based psychoeducational tools have the potential to provide easily accessible and "just-in-time" psychoeducation and practical tools for coping to a wide range of parents seeking to help their children in the aftermath of a traumatic injury. By providing medical professionals with web-based resources we expect to improve knowledge to facilitate "trauma-informed" care.

TERESE RICHMOND

Andrea B. Laporte Endowed Term Associate Professor, School of Nursing, University of Pennsylvania

Depression after Minor Injury increases Disability

Additional Presenters: Jay Amsterdam; Wensheng Guo; Judd Hollander; Vicente Gracias; Theimann Ackerson; Keith Robinson

Oral Presentation, SAVIR: Society for the Advancement of Violence & Injury Research, March, 2009

Background: Millions of people seek emergency department care for injuries each year; the majority for minor injuries. Little is known about the effect of psychiatric co-morbid disorders that emerge after minor injury on functional recovery and quality of life (QOL). This study examined the effect of post-injury depression on return to pre-injury levels of function and quality of life (QOL).

Method: This was a longitudinal cohort study with follow-up at 3, 6, and 12 months post-injury. 275 adults were randomly selected from those presenting to the emergency department with minor injury; 248 were retained over the post-injury year. Function was measured with Functional Status Questionnaire; QOL was measured with the Quality of Life Index. Psychiatric disorders were diagnosed using the Structured Clinical Interview for DSM IV-TR disorders.

Results: Findings are reported on 234 patients (57% black, 40% white; 40.4yrs). Eighteen percent (95%CI 13.3, 22.9) were diagnosed with depression post-injury. Of this group (n=45), 26.7% had major depressive disorder, 40% had depression NOS, and 33.3% had dysthymia. Adjusting for demographic, injury, and pre-injury function covariates, the depressed group was less likely to return to pre-injury levels of activities of daily living (OR 8.37, 95%CI 3.78 – 18.53) and instrumental activities of daily living (OR 3.25, 95%CI 1.44 – 7.31); less likely to return to work (OR 3.60, 95%CI 1.30 – 9.90); more likely to spend days in bed because of health (OR 2.81, 95%CI 1.24 – 6.40); and reported lower QOL (OR 4.21 95%CI 2.79 – 5.62) than the non-depressed group.

Conclusions: Depression was the most frequent psychiatric diagnosis in the post-injury year. Individuals with depression did not return to pre-injury levels of function and had lower QOL in the post-injury year. Depression has a negative effect on recovery after minor injury, indicating the importance of screening for and treating this disorder after injury.

Funder: NIMH R01MH63818

Living Healthy in Philadelphia: How Youth Deal with the Stress of Living in Violence Communities

Additional Presenters: Ann Teitelman, Catherine McDonald, Terry Guerra, Nicole Thomas, Nancy Kassam-Adams

Oral Presentation, APHA: American Public Health Association Meeting, October, 2008

Background: High levels of violence in Philadelphia affect youth directly and provide substantial challenges that can interfere with healthy development.

Purpose: To learn from youth as they describe their exposure to violent environments and their assets in dealing with these stressors.

Methods: Semi-structured, audio-taped interviews were conducted with youth, ages 10-16, living in West/Southwest Philadelphia. Data analysis (descriptive coding and within-case/across-case analysis) was concurrent with data collection. Preliminary findings informed subsequent interviews.

Results: Youth described their environment as both safe and unsafe social and physical locations and most were able to describe ways in which they moved about the neighborhood to feel safe. Youth explained how they avoided perceived unsafe places by traveling with others, avoiding nighttime movement, and being aware of known violent places. Youth identified strategies to deal with stressors including: strategies for safety, stress, disagreements, disrespect, and success. Avoidance was a strategy for safety as youth consider where they go, how they continuously monitor their surroundings and assess social situations, and modify behavior to maximize safety. Strategies for stress included talking with others and prayer. Strategies for disagreements included walking away or talking. Strategies for success included going to school, being a leader, and staying involved. All youth identified significant others on whom they could rely and confide.

Conclusions: Youth are able to identify stressors and dangerous areas in their neighborhood and invoke assets that help them be safe and healthy. Findings inform prevention efforts by integrating the natural methods used by youth to cope with stress.

Funding: Centers for Disease Control/National Center for Injury Prevention and Control to Philadelphia Collaborative Violence Prevention Center (U49 CE001093)

The Effect of Psychiatric Symptom Severity on Return to Work and Bed Days at One Year after Minor Injury

Additional Presenters: Sara Jacoby; Theimann Ackerson

Oral Presentation, ENRS: Eastern Nursing Research Society, March, 2010

Purpose: To examine the contribution of psychiatric symptom severity to return to work and bed days at 1 year after minor injury.

Theoretical Framework: Nagi's theory of the disabling process which posits disability results from the complex interaction of pathological, psychological, social and environmental factors.

Methods: A secondary analysis of a data set derived from a longitudinal cohort study of patients with minor injury presenting to the ED at a large urban hospital. The dataset included 275 randomly selected subjects (52% men; 48% women) who were representative of the general ED population in ethnicity, marital status, income and education. CNS injury, injury requiring care in the past 2 years or resulting from domestic violence, and those with major depression or psychosis were excluded. Psychiatric symptom severity, using the Hamilton Rating Scale for Depression (HAM-D) and Anxiety HAM-A) was collected within 2 weeks of the ED visit. Outcome measures were collected at 1 year after injury included work performance (using the Functional Status Questionnaire) and bed days (days spent in bed in the prior month). Patients were categorized as having no/mild depression vs. moderate/severe depression symptoms and no/mild anxiety vs. moderate/high anxiety symptoms using the 2 weeks post-injury data. Groups (no/low vs. moderate/high) were compared for the 1 year outcomes of worsened work status and increased bed days using logistic regression.

Results: Of 235 participants for whom follow-up data were available, 47(20%) reported more days spent in bed. Adjusting for clinical/demographic covariates, those with moderate/severe symptom severity for depression were over 3 times more likely to report more bed days at 1 year (OR 3.54, 95% CI 1.32-9.54). Of 164 participants working pre-injury, 76 (46%) reported worsened work-score. Adjusting for clinical/demographic covariates, those with moderate/severe symptom severity for depression were more than 5 times more likely to have a worsened work performance score at 1 year (OR 5.77, CI 1.49-22.37).

Conclusions and Implications: Moderate/severe depression symptoms (but not anxiety) early after minor injury predict poor outcomes at 1 year after injury. Short standardized questionnaires such as the HAM-D can be administered in the ED or at early follow-up to screen for patients at higher risk for poor outcomes 1 year after injury allowing resources for intervention to be targeted to a smaller high risk group.
Funder: NIMH R01MH63818; Master's Mentored Research Award University of Pennsylvania School of Nursing

THOMAS SEACRIST

Biomechanical Research Engineer, Center for Injury Research and Prevention, Children's Hospital of Philadelphia

COMPARISON OF PASSIVE CERVICAL SPINE FLEXION IN CHILDREN AND ADULTS

Additional Presenters: Jami Saffioti, Dept of Mechanical Engineering, Rowan University
Sriram Balasubramanian, Center for Injury Research and Prevention, CHOP
Jennifer Kadlowec, Dept of Mechanical Engineering, Rowan University
Robert Sterner, Dept of Health & Exercise Science, Rowan University
J. Felipe Garcia-Espana, Center for Injury Research and Prevention, CHOP
Kristy B. Arbogast, Center for Injury Research and Prevention, CHOP
Matthew R. Maltese, Center for Injury Research and Prevention, CHOP

Oral Presentation, Enhanced Safety of Vehicles Conference, June 15-18, 2009

Head trauma is the most frequent injury sustained by children in car crashes, and the neck plays a key role in governing head kinematics during the crash. Pediatric anthropomorphic test devices (ATDs) are used to assess the risk of head injury, yet the pediatric ATD neck is a size-scaled model of the adult ATD neck, with no consideration for the tissue properties and morphological changes during human development. To help understand the effects of maturation on the changes in neck flexion biomechanics, this study compared the passive cervical spine flexion of children to adults in specific age groups (6-8, 9-12, 20-29, 30-40 years). Subjects with restrained torsos and lower extremities were exposed to a 1g inertial load in the posterior-to-anterior direction, such that the head-neck complex flexed when the subject relaxed their neck musculature. Surface electromyography with audio feedback was used to coach the subjects to relax their neck musculature. A multicamera 3-D target tracking system was employed to capture the motion of

specific landmarks on the head (Frankfort Plane) and thoracic spine (T1 and T4). Neck flexion angle with muscles relaxed was calculated for each subject. Neck flexion angle significantly decreased with age, with changes in head-to-neck girth ratio partially explaining the decrease. A statistically significant increase in cervical spine flexion was found in adult females compared to adult males. Data also illustrate this trend in children, but it was not statistically significant. In summary, these results demonstrate an increased passive cervical spine flexion in children compared to adults, and females compared to males. These data will help guide the development and validation of pediatric ATDs.

MARILYN SOMMERS

School of Nursing

Screening, Brief Intervention, and Referral to Treatment for Risky Driving: Preliminary Findings

Additional Presenters: Jamison Fargo, Jean Shope, Michael Lyons, Michael Fleming

Oral Presentation, 2008 State of the Science Conference, 10/2/2008

Background: Risk-taking behaviors such as problem drinking and risky driving are known to contribute to injury. Healthy People 2010 set goals to reduce deaths caused by injury: to increase the use of seat belts and reduce driving while impaired from alcohol. A hospital Emergency Department (ED) visit may be the only contact with a healthcare provider that some people have each year. We conceptualized the ED visit as a “teachable moment” in which patients might be more receptive to health-promoting, risk-reducing advice than during other times and contexts. The specific aim of this randomized controlled trial was to test the effectiveness of a brief intervention delivered during an ED visit and developed to change risky driving behaviors (risky driving practices, lack of seat belt compliance) and problem drinking. Methods: Young adults 18 to 44 years who screened positive for problem drinking and risky driving were randomized into two groups: Contact Control Group (CCG; screened at baseline, 3, 6, 9, and 12 months but received no intervention), and a Brief Intervention Group (BIG: screening and brief intervention with booster intervention and data collection points at 3, 6, 9, and 12 months). Main outcome variables included the number of times/month participants drove over the speed limit and drove through a yellow light as it turned to red, and the number of standard drinks consumed during a typical week. Results: Following screening, 257 participants (83 females; 174 males) were randomized into two groups. Mean age for the CCG was 28.0 years (SD = 7.3) and for the BIG group was 28.6 (SD=6.8). A set of three Poisson longitudinal mixed-effects models was tested to evaluate whether the change over time in each of these variables differed between intervention and control groups. Results suggested a significant difference between groups in terms of their trajectories over time for running red lights ($p < .001$), while results approached significance for both speeding ($p = .079$) and drinking ($p = .062$). However, for all variables, a significant difference emerged between the BIG and CCG at 12-month follow-up, with the BIG demonstrating fewer risky behaviors. Conclusions: The preliminary analyses demonstrated that screening and intervention in the ED for problem drinking and risky driving may be effective in reducing risky behaviors at the end of 12 months.

Societal Costs of Risky Driving:

Additional Presenters: Benjamin Sommers; Jamison Fargo; Jean Shope; Michael Lyons

Oral Presentation, Midwest Nursing Research Society, April, 2010

The concept of risky driving is not well articulated, and less well-known is the societal burden imposed by risky driving behaviors – such as speeding, aggressive lane changes, and ignoring traffic signals. These behaviors lead to significant injury and mortality to the U.S. population and to young adults in particular. Objectives: We estimated the societal cost burden associated with risky driving, drinking-driving, and substance use, among young adults exhibiting both high-risk driving behavior and problem drinking.

Methods: A sample of Emergency Department patients aged 18-44, who screened positive for risky driving and problem drinking (n = 313), were surveyed regarding driving behaviors, injuries, healthcare utilization, legal problems, and traffic crashes over the previous year. These self-reported data, supplemented by police crash reports, were used to estimate annual societal costs. Univariate and multivariate regressions were used to detect associations between costs and risky driving, drinking-driving, and substance use. **Results:** Societal costs related to driving behavior and substance use averaged \$23,340 per person, annually. Risky driving was consistently associated with higher criminal justice costs and total costs in univariate and multivariate models. Substance use was associated with increased injury, crash, and healthcare costs. Drinking-driving was not associated with increased costs in multivariate models. Compared to average drivers in our sample, the riskiest drivers imposed increased legal costs of \$700 and increased total societal costs of \$2,450, annually. **Conclusions:** Risky-driving imposes significant costs on society, even controlling for substance use and drinking-driving behavior. Healthcare and other interventions to reduce risky-driving are likely to be both life-saving and cost-saving to society

Injury from Rape and Consensual Sexual Intercourse: Role of Skin Color and Time to Exam

Additional Presenters: Jamison Fargo; Janine Everett

Oral Presentation, Boston College Forensic Conference, Spring, 2009

Rape is a global health risk for women. We are exploring the role of skin color in the management of rape injury. **Aims:** 1) To estimate the prevalence of genital injury after consensual sexual intercourse (CSI); 2) To determine whether injury prevalence varies by ethnicity and skin color; 3) To evaluate whether recent (≤ 24 hours) CSI increases injury from baseline. **Methods:** A cross-sectional design was used for phase I (n=120) and repeated measures design for phase II (n=38). In phase I, participants underwent a forensic exam following CSI, and in phase II participants had a baseline exam, followed by CSI and a follow-up exam. **Results:** In phase I, 55% of the sample had ≥ 1 genital injury; percentages significantly differed for White (68%) and Black (43%) participants ($p=.02$). While ethnicity was a significant predictor of injury occurrence ($OR=3.15; RR=2.94$), skin color confounded the original relationship between ethnicity and injury. In phase II, change in genital injury prevalence and frequency from exam 1 to 2 was modeled using logistic and negative binomial regression. Outcomes included specific injury type and observation of any injury during exam 2. Injury observed during examination 1 was the key predictor, adjusted for age, ethnicity, time since intercourse, duration of intercourse, degree of lubrication, frequency of intercourse, number of lifetime partners, and skin color. Results showed significant increases in redness as well as increased frequency of any external genital injury. **Conclusions:** The rape forensic examination should be sensitive to skin color, time since last intercourse, and baseline injury.

SUSAN SORENSON

Professor, UPenn - SP2, Health & Societies

Justifications for Wife Beating among Iraqi Women

Oral Presentation, American Public Health Association, Nov. 7-11, 2009

Background. Little is known about attitudes toward domestic violence in low- and middle-income countries. Less yet is known about such attitudes in the Middle East.

Methods. Data are from Iraq's 2006 Multiple Indicator Cluster Survey (MICS3), an in-person representative sample survey. Response rates were high: 98.6% of the selected households and 98.6% of the selected 15-49 year old women participated. Women (N=27186) were asked whether a husband would be justified in beating his wife under five specific circumstances. Simple frequencies and multivariate logistic regressions were calculated.

Results. Nearly 60% of study participants said that a husband was justified in beating his wife: 48.8% if she goes out without telling him, 42.9% if she neglects the children, 37.5% if she argues with him, 34.2% if she refuses sex, and 20.6% if she burns the food. AORs indicate that women's beliefs that a husband is justified in beating his wife in each of these circumstances were higher among those who were married, less educated, and from rural areas. Among the married, those who were less educated, from rural areas, married to a blood relative (59.0% of the sample) were more likely and those who were over the age of 22 when married (26.8% of the sample) were less likely to report that a husband is justified in beating his wife.

Conclusions. Iraqi women appear to support wife beating most when the woman has violated her traditional role as a woman, a mother, and lastly, as a wife.

Couples

Additional Presenters: Kristie A. Thomas

Oral Presentation, Conference of the Society for the Advancement of Violence and Injury Research, March 5-6, 2009

Introduction. Little is known about injury among the millions of gay and lesbian people in the U.S. It does appear that their experience of intimate partner violence (IPV) is similar to that of heterosexual women. Community norms about same-sex intimate relationships and about IPV are changing. The present investigation focused on the intersection of these two topics.

Objectives. We investigated four research questions: 1) Does sexual orientation of the couple affect judgments about IPV?, 2) Does victim gender enter into judgments about IPV in same-sex and opposite-sex relationships?, 3) Do victim sexual orientation and gender affect the contextual characteristics that are taken into consideration in judgments about IPV?, and 4) What respondent characteristics are related to their judgments about IPV in same- and opposite-sex relationships?

Methods. Using a fractional factorial (experimental vignette) design, we conducted random-digit-dialed interviews in four languages with 3,679 community-residing adults.

Results. Multivariate analyses of responses to 14,734 vignettes suggest that IPV against gay male, lesbian, and heterosexual women is more likely than that against heterosexual men to be seen as illegal, that it should be illegal, police should be called, and a stay-away order should be issued. Regardless of gender and sexual orientation, the type of abuse and whether a weapon was displayed are the most important predictors of respondents' judgments about whether a specific abusive behavior is illegal and merits a range of societal interventions. Respondent characteristics were largely unrelated to their judgments about the IPV.

Conclusions. Findings imply that gay male and lesbian victims of IPV, rather than face additional stigma from the community at large, may be able to anticipate support similar to that extended to heterosexual women who are victims of IPV. Special considerations remain, namely, equity in access to stay-away orders, risk of dual arrest, and appropriate service provision.

Age is but a number: Intimate partner violence against women

Additional Presenters: Kristie A. Thomas, Manisha Joshi

Poster, Conference of the Society for the Advancement of Violence and Injury Research, March 5-6, 2009

Background: Adolescence is a high risk period for physical and sexual assault at the hands of an intimate. An important collaborator for adolescent intimate partner violence (IPV) injury prevention is non-medical first responders given the wealth of data they gather, their importance in intervention, and the expected severity of the IPV that comes to their attention.

Objectives: To assess the frequency and nature of IPV perpetrated against women aged 15-17 years and to compare it to IPV perpetrated against women aged 18-22 years.

Methods: Data from the Compstat system of a large U.S. city were reviewed for January through September 2005. Variables were created from the officer incident narratives and descriptive analyses were conducted on 1,607 cases of IPV against 15- to 22-year old women.

Results: Although the absolute numbers are lower for younger women, 15-17 year olds' experiences of IPV are remarkably similar to those of 18-22 year olds. For 15-17 year olds, bodily force is the most common type of assault (94.4%), and most assaults (75.0%) occur in a private residence, out of public view. The relationships of adolescent victims to their abusers are more like those of adults than the dating relationships of their same-aged peers: 9.0% were married, 31.3% cohabiting, and 20.2% have a child in common. A higher proportion of younger (vs. older) women were the victim of aggravated (vs. simple) assault.

Conclusions: There are more commonalities than differences in adolescent and young adult women's experiences of IPV. Screening for IPV should begin by age 15. Given adolescents' relative lack of experience with intimate relationships and the attendant knowledge and skills, the role of adults is of particular importance in reducing IPV during adolescence.

JENNIFER TAYLOR PHD, MPH

Drexel University School of Public Health

Correlations between Organizational Safety Climate, Nurse Injuries, and Nursing Sensitive Patient Safety Events

Oral Presentation, Injury Science Day,

This study investigated the possibility of organizational risk factors common to both patient and nurse safety outcomes. This study demonstrated that the SAQ is an effective tool for studying hospital climate and its impact on both patient safety and occupational health outcomes. Our results suggest that patient and nurse safety are not separate silos, but are in fact united under the single rubric of organizational culture. Organizational safety climate is a broad construct that affects not only the final product of healthcare delivery (patient outcomes), but the entire delivery process, including the safety of the workforce dedicated to ensuring patient health.

ANNE TEITELMAN PHD, CRNP

Assistant Professor, School of Nursing, Univ. of Pennsylvania

Adolescent girls' perspectives on partner abuse and safe sex: Identifying barriers and suggestions for strengthening HIV prevention programs

Additional Presenters: Loretta S. Jemmott, PhD, RN, FAAN; Therese Richmond, PhD, CRNP, FAAN; Annet Davis-Vogel, RN, MSW, CCRC; John B. Jemmott, PhD

Oral Presentation, American Public Health Association, November 7-11, 2009

Adolescent girls are at high risk for sexually transmitted infections (STIs), including HIV, and African-American girls are disproportionately affected. Prior research indicates partner abuse can be a barrier to safer sex practices. In order to develop appropriate interventions, this study used focus groups to understand how partner abuse influences safer sex practices from the perspective of African American adolescent females.

African-American girls (ages 14-17) were recruited from family planning and prenatal clinics in a large urban area in the US. Forty – six girls completed a brief survey and were invited to participate in one of four focus groups. Content analysis was used to examine focus group transcripts.

Twenty-seven girls had experienced abuse (either physical or verbal or both). Participants identified a sexual double standard that rewarded young men and stigmatized young women for having multiple partners, but many challenged this norm. Girls who did not follow this norm could face physical abuse by a partner. Girls thought those in abusive relationships were less likely to use condoms due to forced sex, physical abuse, fear a partner might leave or hit her, partner control and condom sabotage. Unwanted unprotected sex was seen as a form of abuse. Most indicated it was not possible to practice safer sex in an abusive relationship. Girls suggested programs should include males with both gender-specific and combined sessions and offer HIV/STI testing.

HIV/STI prevention programs for African-American adolescent females can be strengthened by addressing gender norms, providing information about partner abuse, including testing, and involving males.

AKIRA TOH

Undergraduate, Center for Injury Research and Prevention

Applicability of CPR-based thoracic stiffness and damping properties to the motor vehicle crash environment

Poster, Injury Science Day at the University of Pennsylvania, 3/3/2010

A biofidelic ATD is essential for developing crash safety systems for occupants. The ubiquitous Kroell blunt hub impacts to the thoraces of PMHS have formed the biofidelity requirements for the adult-sized ATD thorax. Recently collected thoracic force-deflection data from cardio-pulmonary resuscitation patients offer a large dataset of biomechanical data across a broad age range. However, the applicability of this CPR data to inform ATD biofidelity requirements is unknown. Thus, the objective of this study was to evaluate the performance of CPR-derived thoracic stiffness and damping properties in a mathematical model of blunt thoracic impact validated to the Kroell experimental data.

A previously validated (Neathery 1971) spring-mass-damper (SMD) model of the adult chest during thoracic impact was recreated in MatLab. The model was modified (SMD-CPR), with mass and flesh stiffness from SMD, and thorax stiffness and damping from CPR. Comparison of the two models revealed that the damping constant from CPR was too low to produce a model that could be validated to the Kroell experiments. Thus, we created a third model (SMD-CPR-K), by changing the damping of SMD-CPR model back to the value from SMD model. During blunt hub impact simulations, the SMD-CPR-K model yielded a 41.9% to 47.0% increase in chest deflection from the SMD model, over impact velocities of 4.9 to 7.1 m/s.

The SMD-CPR-K model was then parameterized to quantify the mass, stiffness and damping effects on the force-deflection response. Increases to sternum mass or flesh stiffness led to increased force only in the first 20 mm of deflection. Increased thorax stiffness led to increased maximum thorax deflection only. Finally, increased thorax damping led to increased force in the first 20 mm of deflection and decreased maximum deflection.

These results indicate that stiffness but not damping characteristics from CPR are compatible with the impact environment.

NICOLE VAUGHN

Assistant Professor, Co-PI PCVPC Centerpiece Project, Drexel University, The Philadelphia Collaborative Violence Prevention Center

Building Strong Community Leaders: Working to Prevent Youth Violence in Philadelphia through a Focus on Leadership Skills Development

Additional Presenters: Nicole A. Thomas, Joel Fein, Julie P. MacEvoy, Stephen Leff, Thomas Henry, John A. Rich, Ayana Bradshaw, Courtney Scrubbs, Nigell Hester, Solomon Evans

Oral Presentation, American Public Health Association, 11/9/2009

Youth violence is a complex public health problem involving a myriad of individual, family, and community factors. Individuals who exhibit certain leadership characteristics such as positive social orientation, intolerance toward deviance, and a commitment to social engagement with peers experience less violence in their lives (WHO, 2002). Although many violence prevention programs focus on conflict resolution and anger management, few interventions targeting African American youth include leadership skill development. Through our work with the CDC-funded Philadelphia Collaborative Violence Prevention Center (PCVPC), we have worked within a community-based participatory research framework to build and support youth and community leaders. Feedback from community partners suggested that the programs expand beyond conflict resolution and anger management. Consistent with the transformational view of leadership, key community partners emphasized that youth need leadership skills with specific strategies for making positive decisions on a daily basis. PCVPC researchers and community members allocated resources to develop strategies and additional tools to expand its leadership skill development efforts. Leadership-focused activities included: facilitated youth workshops, community symposia highlighting the accomplishments of youth, community mobilization workshops developed by youth, hiring and training of youth community outreach workers and interns, and a violence prevention photo/drawing contest. Empowering youth from the community to take on leadership opportunities may assist in sustaining collaborative efforts to build strong community-based aggression prevention programs. In addition, by training youth to become future leaders, they will be able take a more active role in their community which may prove an effective way to prevent violence.

Constructing a community mobilization team in a CBPR framework: How do you build collaboration, connection and capacity from within the community?

Additional Presenters: Nicole Thomas, Stephen S. Leff, Kimyatta Gallman, Maurice Stewart; Crystal Wyatt, LaVelle King.

Poster, American Public Health Association, 11/9/2009

Community-based participatory research (CBPR) as an approach to empower communities and engage academics in meaningful collaborative work has increased in the past decade. CBPR public health projects have varied from focusing on specific diseases to intervention strategies for prevention. Two key principles of CBPR involve ensuring that co-learning is promoted and capacity is built among all partners, and that strengths and resources from the community are capitalized. Through our work with the CDC-funded Philadelphia Collaborative Violence Prevention Center (PCVPC), a community mobilization team (CMT) was developed as a fundamental component of the intervention study. Based on feedback from our community partners, team construction would be vital to the research project being received and sustained in the community. Traditional community outreach workers typically recruit research participants and disseminate information to communities. By distinction, our CMT is held to a higher level of responsibility and

involvement in research design and implementation. Essential responsibilities of the CMT at each of the six intervention sites are: successful development & maintenance of relationships, assisting with site specific needs (i.e., targeted workshops), attending invited events, remaining flexible and scheduling regular in-person meetings to discuss the research process (i.e., rationale, randomization, and measures) during pre-intervention phases. This process was paramount to remaining transparent and responsive to community and academic concerns. Partners that engage in this work must recognize the need for resources, trainings, and support for the CMT. By strengthening community capacity through CMT members, relationships are solidified and co-learning occurs all while balancing pressing community needs.

DOUGLAS WIEBE

Assistant Professor, Department of Biostatistics and Epidemiology

Military veteran mortality following a survived suicide attempt

Additional Presenters: Janet Weiner MPH; Joseph Conigliaro MD MPH; Therese S. Richmond PhD FAAN

60 second, Injury Science Day

Background: All-cause mortality is higher among military veterans than the general population and suicide is a leading mortality cause. The strongest predictor of suicide is a past suicide attempt, and suicide attempters have multiple physical and mental comorbidities that put them at risk for all causes of death. We examined mortality among US military veterans after hospitalization for attempted suicide.

Method: A retrospective cohort study was conducted with all military veterans receiving inpatient treatment during 1993-1998 at United States Veterans Affairs (VA) medical facilities following a suicide attempt. Deaths occurring between 1993-2002 were identified through VA Beneficiary and Records Locator System data and National Death Index data. The causes and rate of death were compared to those in the US adult population overall.

Results: During 1993-1998, 10,163 veterans were treated and discharged at a VA medical center after a suicide attempt (mean age=44 years; 91% male). There was a high prevalence of diagnosed alcohol abuse (32%), drug abuse (22%), psychoses (21%), depression (19%) and hypertension (14.2%). A total of 1,836 (18%) veterans died during follow up (2,941.4/100,000 person years). The cumulative survival probability after 10 years was 78.0%. As such, the mortality rate was 7.2 times greater than we expect would have occurred in a general population group with the same sex-age distribution. Leading causes were heart disease (20.2%), suicide (13.1%), unintentional injury (12.7%), and malignant neoplasm (11.1%).

Conclusion: Veterans who have attempted suicide face elevated risks of all-cause mortality and suicide. This represents an important population for prevention activities.