

**Executive Summary of the Comprehensive Final Report**

**Grant Number: R40 MC 00325-04/ R40MC00174**

**COMMUNITY-BASED VIOLENCE PREVENTION FOR HIGH RISK YOUTH**

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### **COMMUNITY-BASED VIOLENCE PREVENTION FOR HIGH RISK YOUTH**

#### **I. Statement of the Problem**

America's greatest resource is its youth, but that resource is increasingly threatened by violence. A strategy to identify and address the needs of high risk youth on the individual, family, and community levels is imperative. The Healthy People 2000 and 2010 Objectives identify violence reduction as a national priority with many injury-specific targets including reducing homicides, physical fighting, and weapon-carrying.<sup>1</sup> Priorities include the study of “violence involving minority and impoverished youth,” “development and refinement of risk factor surveys,” and exploration into “what interventions are most effective and developmentally appropriate for...modifying predictive behavior.”

Much is known about general risk factors for adolescent injury and delinquency, but less is known about repeat injury among youth presenting to care for intentional injuries. Prior intentional injury is a significant risk factor for subsequent injury. Presentation to an emergency department for an injury may be a sentinel event and opportunity for prevention. The emergency department (ED) has been described as an ideal setting to initiate interventions with assault-injured youth to reduce the risk of re-injury and reactive perpetration. The American Academy of Pediatrics has advocated a system of identification, assessment, and treatment of the physical and psychosocial needs of assault victims. ED efforts to address youth violence have received little study. This project assesses violence prevention interventions initiated in the emergency department.

#### **II. Research Objectives**

- A. To assess violence prevention services provided to assault victims in the emergency department (ED) and after discharge;
- B. To assess the receptiveness of injured youth & their families presenting to the ED to violence prevention interventions;
- C. In a sample of high risk youth presenting to the ED with assault injuries, determine the feasibility and effectiveness of an individualized home-based youth & family intervention with community involvement on outcomes of future injury, fighting, problem behavior, and aggression.

#### **III. Study Design and Methods**

Youth age 10-15 presenting to two large urban hospitals with peer assault injury were recruited and randomly assigned to a violence prevention intervention. This study group developed a unique, theory-based intervention which included 1) youth mentoring and violence avoidance/problem solving curriculum; 2) parental monitoring curriculum; and 3) community service linkage. The intervention included a six session youth curriculum implemented by community mentors, three session parent curriculum implemented by a health educator, and referral to community services. Control families received assessment of service needs and referrals. Assessment of youth and parents were performed at baseline, 6 months and 18 months.

Health educators and mentors completed post-intervention assessments which included information on family and neighborhood characteristics. Focusing on parental supervision and monitoring, youth social skills and self esteem, and community linkage, we targeted assault-injured youth presenting to the ED to reduce future violence and injury.

#### IV. Findings

In two emergency departments, 495 eligible families were identified. We were unable to contact 258 (52%) to complete the consent process. Of the 48% (237) contacted for consent, 55 (23%) refused participation and 182 (77%) consented. 173 families were enrolled with both youth and parent completing baseline interviews. Currently, 118 (68%) 6 month follow-up interviews have been completed and 65 (37%) 18 month follow-up interviews have been completed with more due in the coming months. We plan to complete remaining follow-up assessments and are continuing data entry and cleaning. Data collection and analysis is ongoing and will add to the literature on the effectiveness of a mentoring and parental involvement intervention with assault injured youth and their families. Based on recruitment statistics, most families contacted consented for the study and were receptive to a mentoring and parenting intervention.

Baseline data from this study and pilot studies have described characteristics of assault-injured youth presenting to the emergency department. Three manuscripts have been written, two are in preparation, and six abstracts have been presented related to this study. A case-control study published in **Pediatrics** (2003;112:931-38) describes risk and protective factors for assault injury and locations of contact of intervention. It was found that fighting was common in all groups. Assault-injured youth were more likely to have had previous weapon injuries and were high risk for future injury. Past fights, past fight injuries, and seeing someone else shot were markers associated with assault injury, however, in this high risk population, a universal approach to violence prevention may be most appropriate. It was found that health providers have access to at-risk teens for clinical risk assessment and intervention in primary care and emergency departments.

A second manuscript described circumstances of injury of assault-injured youth and explored whether the injured individual was a perpetrator or victim in the event. We found that most assault injuries among adolescents involve past disagreements with people they know. Many injured youth were mutually involved in conflict prior to their injury similar to the concept of bully-victims. These data inform ED-based interventions to prevent assault injury. A third manuscript explored the mental health of assault injured youth. Our study identified a low prevalence of PTSD symptoms, and a relatively high prevalence of depression symptoms among assault-injured youth. Some aspects of psychological numbing and desensitization to internalizing socio-emotional aspects of violence may be explanatory. Parent perceptions of their child's experiences with PTSD and depression symptoms were highly correlated to youth report. Additional research is needed to understand the complexities of mental health sequelae among assault injured youth.

Two manuscripts in preparation explore predictors of retaliatory attitudes of assault-injured youth with implications for prevention. Another explores the prevalence of attention deficit hyperactivity disorder and conduct disorder symptoms and diagnoses in this population.

Finally, an abstract accepted for presentation at the Pediatric Societies Meeting in May 2006 explores the concept of the emergency department visit as a sentinel event or teachable moment. The emergency department (ED) has been described as a setting to initiate interventions with assault-injured youth to reduce the risk of re-injury and reactive perpetration. Little is known about how youth and parents perceive their injury and whether it is a sentinel

event or teachable moment for intervention. We wished to assess the receptiveness of assault-injured youth and their families to violence prevention intervention. Using a Social Cognitive Theory constructs we found that assault injury leading to an ED visit was a moderate stressor for youth and families. A substantial proportion of youth felt that future injuries were probable and that prevention was difficult. We concluded that the ED may be an important place, and injuries an important context, for augmenting outcome expectations and self efficacy for prevention.

## V. Recommendations

Emergency department protocols exist to address the needs of patients with other types of injuries including child abuse, self-inflicted injury or domestic violence. Youth presenting with interpersonal assault injury have received less attention with limited discussion of injury circumstances and prevention. There is little literature evaluating interventions initiated in the emergency department with this population. We have found that assault-injured youth presenting to emergency departments are at high risk for future injury and certain risk and protective factors can be identified. Further, the emergency department may be an important point of intervention and many families appear receptive to violence prevention efforts initiated from the emergency department. This study adds to the literature on assault-injured youth and interventions to reduce injury recidivism and violence risk factors. Data analysis is ongoing with effectiveness of this randomized intervention yet to be determined. Further research is needed on approaches to reach youth and families and testing of multi-level violence prevention strategies with this high risk population.

## VI. List of Products

### A. Peer-reviewed Articles

1. Cheng TL, Johnson SB, Wright JL, Brenner RA, Scheidt PA, Assault-injured adolescents presenting to the emergency department: proactive or reactive violence? Submitted for publication.
2. Braithwaite K, Wright JL, Menvielle E, Markakis D, Cheng TL. Symptoms of Posttraumatic Stress and Depression Among Assault Injured Youth. Submitted for publication.
3. Johnson SB, Frattaroli S, Wright JL, Fields CB, Ricardo I, Cheng TL. Inner city youths' perspectives on violence and the necessity of fighting. **Injury Prevention**. 2004;10(5):287-91.
4. Cheng TL, Schwarz D, Brenner R, Wright JL, Field CB, O'Donnell R, Rhee P, Scheidt PC. Adolescent assault injury: risk & protective factors and locations of contact for intervention: A matched case-control study. **Pediatrics**. 2003;112(4):931-938.
5. Copeland Linder N, Cheng TL. Retaliatory attitudes among assault-injured youth presenting to the emergency department. In preparation.
6. Anixt J, Cheng TL. Attention Deficit Hyperactivity Disorder among assault-injured youth. In preparation.

### B. Abstracts

1. Cheng TL, Haynie D, Wright JL, Brenner RA, Simons-Morton B, Johnson SB. Assault-Injured Youth Presenting to the Emergency Department: A Sentinel Event/Teachable Moment for Intervention? **Ped Research 2005**. Platform presentation at the Pediatric Academic Societies Meeting, Washington, DC, May 2005.
2. Braithwaite K, Wright JL, Menvielle E, Markakis D, Cheng TL. Symptoms of Posttraumatic Stress and Depression Among Assault Injured Youth. Poster presentation at the American Public Health Association Meeting, Washington, DC, November 8, 2004.

3. Cheng TL, Wright JL, Menvielle E, Markakis D. Randomized Trial of a Case Management Program for Assault-Injured Youth Presenting to the Emergency Department. **Ped Research** 2004;112A. Poster presentation at the Pediatric Academic Societies Meeting, San Francisco, CA, May 2004.
4. Cheng TL, Brenner R, Wright JL, Sprague B, Barry S, Schwarz D, Scheidt PC, and the DC Child/Adolescent Injury Research Network. Recidivism in Adolescent Injury: The Emergency Department as a Location for Intervention. Platform presentation at the World Conference On Injury Prevention And Safety Promotion Conference, Vienna, Austria. June 2004.
5. Solomon B, Wright JL, Menvielle E, Cheng TL. Services Utilization and Needs of Assault-Injured Youth. Poster presentation at the 2003 Pediatric Academic Societies Annual Meeting, Seattle, WA, May 2003.
6. Solomon B, Wright JL, Menvielle E, Cheng TL. Parental Knowledge of Youth Fighting Behavior and Attitudes Toward Interpersonal Violence. Poster presentation at the 2003 Pediatric Academic Societies Annual Meeting, Seattle, WA, May 2003.
7. Cheng TL, Fields C, Brenner R, Wright JL, Schwarz D, Rhee P, Scheidt PC. Assault-injured adolescents presenting to the emergency department: causes and circumstances of injury. **Pediatric Research** 2000. Poster Symposia presentation at the Pediatric Academic Societies Annual Meeting, Boston, MA, May 2000.
8. Cheng TL, Schwarz D, Fields C, Wright JL, Brenner R, O'Donnell R, Rhee P, Scheidt PC. Risk and protective factors for adolescent assault injury: A case control study. **Pediatric Research**. Poster presentation to the 2000 Pediatric Academic Societies Annual Meeting, Boston, MA, May 2000.

### C. Presentations

#### Cheng TL

1. "Violence and the Emergency Department," 2000 National Congress on Childhood Emergencies, Baltimore, MD, March 27, 2000, workshop.
2. "An Educational Intervention to Improve Physician Violence Screening Skills," Robert Wood Johnson Generalist Faculty Scholars Annual Meeting, Carlsbad, CA, December 2000.
3. "Youth Violence Prevention: From Hospital to the Community," Children's National Medical Center Grand Rounds, December 2000.
4. "Youth Violence Prevention: From Hospital to the Community," Johns Hopkins University Department of Pediatrics Grand Rounds, September 2002.
5. "Best Practices in Youth Mentoring," Mentoring Symposium, Johns Hopkins University, January 2003. Conference convener, attendance: 180
6. "Youth Violence Prevention," Johns Hopkins University Welch Center Grand Rounds, February 2003.
7. "Community Mentors in Youth Violence Prevention: Evaluating Effectiveness," Plenary Speaker, Center for Sustainable Health Outreach Annual Meeting, Unity 2003, Biloxi, MS, March 13, 2003.
8. "Risk and Resilience in Youth Violence Prevention," Pediatric Trends Conference, Johns Hopkins University, April 2003.
9. "Youth Violence Prevention: From Hospital to Community," Bloomberg School of Public Health Population and Family Health Science Conference, December 2003.
10. "Youth Violence Prevention: From Emergency Department to Community," Pediatric Trauma Morbidity and Mortality Meeting, March 2004.

11. "Youth Violence Prevention," Mount Washington Hospital Distinguished Speaker Series, Baltimore, MD, July 2004.
12. Policy Briefing "The Power of Family, School and Community Connectedness in Reducing Youth Violence: Strategies That Work." Willard InterContinental Hotel, Washington, DC, November 17, 2004.
13. "Violence Prevention: Translation to Practice and Policy," Symposium: Report of the NIH State-of-the-Science Conference Statement: Preventing Violence and Related Health-Risking Social Behaviors in Adolescents and its implications for Baltimore and Maryland, Johns Hopkins Bloomberg School of Public Health, November 19, 2004.

**Wright JL**

1. "Child Survival: It Takes a Village," Global Youth Health Teleconference (Benin-Ghana-Senegal-Uganda-US), The World Bank and Howard University College of Medicine, 2000
2. "Violence Prevention," Grand Rounds, Department of Pediatrics, University of Illinois College of Medicine at Rockford, Rockford, IL, 2000
3. "The Many Faces of Adolescent Violence," Society for Adolescent Medicine, Arlington, VA, 2000
4. "Violence and the Emergency Department" National Congress on Childhood Emergencies, Baltimore, 2000
5. "The Impact of Hip-Hop Culture on Adolescent Health," Student National Medical Association Regional Conference, 2000
6. "Violence Prevention," Department of Pediatrics Grand Rounds, University of Pennsylvania and the Children's Hospital of Philadelphia, Philadelphia, PA, 2001
7. "EMSC and Violence Prevention," Kansas Pediatric Symposium, Kansas AAP Chapter/Kansas EMS Board, Wichita, KS, 2001
8. "Youth Violence Prevention: Hospital to Community," Emergency Medical Services for Children, Vienna, VA 2001
9. "Bullying Among Children and Youth: A Pediatrician's Perspective," American Medical Association, Washington, 2002
10. "Youth Violence Prevention: Hospital to Community," Pediatric Nursing Conference, Arlington, VA, 2002
11. "Nonfatal Gun Injuries: The Untold Story," Handgun Epidemic Lowering Plan (HELP) Network, Chicago, 2002
12. "Bullying," Amer Acad Pediatrics/Centers for Disease Control -Violence Prevention Symposium, Elk Grove Village, IL, 2003
13. "The Treatment of Intentional Injuries," AAP/CDC - Violence Prevention Symposium, Elk Grove Village, IL, 2003
14. "Bullying and Youth Violence: The Tip of the Iceberg?" Injury Free Coalition for Kids Conference, Fort Lauderdale, FL, 2003
15. "Adolescent Health Issues," 17<sup>th</sup> Annual Maternal and Child Health Conference, Dept of Health, Washington, DC, 2003
16. "Behavioral Issues in Primary Care," Catholic University of America – Behavioral Issues in Primary Care, Washington, DC, 2003
17. "Youth Bullying," 18<sup>th</sup> Annual Maternal and Child Health Conference, Dept of Health, Washington, DC, "Youth Bullying," 2003
18. "Youth Bullying: The Tip of the Iceberg," District of Columbia Department of Mental Health, Washington, DC, 2004

19. "Violence Prevention in the Emergency Department," Pediatric Academic Societies, Ambulatory Pediatrics Association, San Francisco, CA, 2004
20. "Bullying Prevention: What Have We Learned?" AAP National Convention and Exhibition, Washington, DC, 2005

## COMPREHENSIVE FINAL REPORT

**Grant Number: R40 MC 00325-04**

### Community-Based Violence Prevention for High Risk Youth

#### I. Introduction

##### A. Nature of the Research Problem

America's greatest resource is its youth, but that resource is increasingly threatened by violence. A strategy to identify and address the needs of high risk youth on the individual, family, and community levels is imperative. The Healthy People 2000 and 2010 Objectives identify violence reduction as a national priority with many injury-specific targets including reducing homicides, physical fighting, and weapon-carrying.<sup>2</sup> Priorities include the study of "violence involving minority and impoverished youth," "development and refinement of risk factor surveys," and exploration into "what interventions are most effective and developmentally appropriate for...modifying predictive behavior."

The leading causes of death among U.S. children and adolescents are due to injuries.<sup>3</sup> In the United States, unintentional injury is the leading cause of death for youth aged 10-19; homicide is the third leading cause of death for youth 10-14 years and second leading cause of death for those 15-19 years. For African-Americans, homicide is the leading cause of death for males and females ages 15-34.<sup>4,5</sup> The District of Columbia has a higher intentional injury fatality rate for ages 15-19 than any of the fifty states.<sup>6</sup> The District exemplifies many of the characteristics and risk factors attributed to high adolescent mortality, including urban setting, poverty, unemployment, life stress, inadequate housing, lack of social support systems, weapon availability, and high risk health behavior.<sup>7,8,9,10,11,12,13,14</sup> While the number of youth dying from violent injuries is alarming, it represents only a fraction of the injuries that occur in this age group. Preliminary findings from our city-wide surveillance of adolescent injuries have found that for every death due to injury in youth, there were 9 hospitalizations and 129 ED visits (a narrower pyramid compared to other studies).<sup>15,16</sup> Non-fatal injuries represent significant morbidity and may be a sentinel event and opportunity for prevention.

Much is known about general risk factors for adolescent injury and delinquency, but less is known about repeat injury among youth presenting to care for intentional injuries. In 1995-98 the CDC supported the project "Adolescent Violence: A Community-based Strategy" (AVS) which developed the DC Child/Adolescent Injury Research Network and instituted city-wide surveillance of injuries in youth age 10-19. Guided by these findings, the current project extended injury prevention and control to identify causes and risk factors, and develop interventions. This study developed and tested a secondary violence prevention strategy involving a home-based family curricula and linkage to community services for high risk youth ages 10-15. We addressed many "issues/questions" on the Maternal and Child Health Bureau Research Agenda including the priority areas on intentional injuries 8.1.13 studying "the extent to which children who need emergency medical services receive them, with particular attention to care received (or not received) in hospital emergency departments," "...develop positive coping strategies for families living in contexts of violence" (3.4.5), "develop, test, and advance educational and health promoting interventions during women's and men's formative years that help reduce their risk of developing specific disease and conditions in adulthood" (1.2.9, 1.3.5), and "conduct randomized clinical trials of interventions designed to reduce exposure to the risk of injury in the environment" (5.1.7).

## **B. Purpose, Scope, and Methods of the Investigation**

### 1. Objectives:

- a. To assess violence prevention services provided to assault victims in the emergency department (ED) and after discharge;
- b. To assess the receptiveness of injured youth & their families presenting to the ED to violence prevention interventions;
- c. In a sample of high risk youth presenting to the ED with assault injuries, determine the feasibility and effectiveness of an individualized home-based youth & family intervention with community involvement on outcomes of future injury, fighting, problem behavior, and aggression.

2. Methods: A cross-sectional study of assault-injured youth and their families addressed objectives A and B and a randomized controlled trial was conducted for objective C. Youth age 10-15 presenting to two large urban hospitals with peer assault injury were recruited and randomly assigned to a violence prevention intervention. The intervention included a six session youth curriculum implemented by community mentors, three session parent curriculum, and linkage to community services based on family need. Control families received assessment of service needs and referrals. Assessment of youth and parents were performed at baseline, 6 months and 18 months. Health educators and mentors completed post-intervention assessments which included information on family and neighborhood characteristics. Focusing on parental supervision and monitoring, youth social skills and self esteem, and community linkage, we targeted assault-injured youth presenting to the ED to reduce future violence and injury.

3. Findings: We found that assault-injured youth presenting to emergency departments are at high risk for future injury and certain risk and protective factors can be identified. The emergency department may be an important point of intervention and many families appear receptive to violence prevention efforts initiated from the emergency department. This study adds to the literature on assault-injured youth and interventions to reduce injury recidivism and violence risk factors. Data analysis is ongoing with effectiveness of this randomized intervention yet to be determined. Further research is needed on approaches to reach youth and families and testing of multi-level violence prevention strategies with this high risk population.

## **II. Review of the Literature**

### **A. Risk Factors for Youth Interpersonal Injury and Violence**

High rates of injury are associated with behavior patterns and risk factors common to adolescent development.<sup>17</sup> These include male gender, previous injuries, alcohol/drug use, conflict with parents, pattern of parental supervision, weapon-carrying, delinquency, and pubertal development.<sup>18,19,20,21,22,23,24,25,26,27,28,29</sup> Co-varying risk factors for violent behavior are similar: male gender, poor mental health, drug use, lack of parental affection and support, weapon-carrying, school drop-out, exposure to violence, victimization, and delinquency.<sup>30,31,32,33</sup> Careful attention must be given to the context in which injuries occur, with focus on interventions targeted at factors that are modifiable.

We postulated that strategies for intervention would differ depending on injury cause, injury circumstances, and risk and protective factors. The unique combinations of risk and protective factors of the injured individual may influence the likelihood of future violence and injury. Different risk profiles among youth may require different intervention strategies. One study followed a sample of youth over time (median 5.2 years) and found that certain risk factors predicted violence-related injuries.<sup>34</sup> Three items, school status, drug use, and fighting history, were most predictive of future violent injury. Individuals with all three risk factors had a seven-

fold increase in violence-risk. The National Television Violence Study has classified youth into seven categories based on three variables: history of weapon-carrying, initiating fights, and involvement in fights.<sup>35</sup> They propose that these seven audiences may respond to different types of preventive messages. Many youth violence programs assume that “one size fits all” and the same behavioral intervention would be effective for all youth.

Nonfatal violence often precedes fatal violence in youth;<sup>36</sup> prior injury is a significant risk factor for subsequent assaultive injury. Recurrent intentional injury rates have been estimated to range between 35 and 49% in selected populations.<sup>37,38,39,40</sup> A population-based analysis of this risk factor found that assault victims experience a recurrent injury risk 88 times that of unexposed individuals.<sup>41</sup> Findings from our previous Adolescent Violence Study (AVS) revealed that over 2 years at least 16% of adolescents presented to a District ED for more than one injury and those with intentional injuries returned more frequently with more than 20% returning with an injury. These data suggest that secondary prevention with injury victims presenting to an ED is a logical targeted approach to reduce the overall rate of violent injuries in youth.

Studies of juveniles have found that hospitalization for injury was 2.7 fold greater for male offenders and 1.6 fold greater for female offenders compared to non offenders.<sup>42</sup> Other studies linking criminal justice records with injury data have demonstrated that intentionally injured youth were significantly more likely to be offenders compared to those unintentionally injured.<sup>43</sup> Literature suggests that bullying and victimization should not be thought of as opposing behaviors as these groups have similar risk profiles and the majority of bullies report being victims as well.<sup>44</sup> Victimization and witnessing violence have been found to be independent risk factors for fighting and perpetration.<sup>45,46,47</sup> Others have noted that victimized children were more likely to develop difficulties with social information processing, including failure to predict violence, hostile attribution, and deficient behavioral strategies to solve interpersonal problems.<sup>48</sup> While we do not wish to “victim-blame,” we recognize the sequelae of victimization and implemented an individualized intervention to address future safety, using the hospital as a point of contact.

## **B. Current Approaches Initiating Intervention Among Injured Youth**

The success of violence intervention strategies has been highly variable and, in some instances, community-specific. Youth violence intervention programs have been divided into five categories according to mechanism of action and theoretical framework: individual, proximal interpersonal systems, peers, proximal social settings, and societal macrosystems.<sup>49</sup> The effectiveness of many of these programs in reducing violence is yet to be evaluated. Like many interventions, there is a paucity of outcome data and narrow range of outcomes (e.g. self-report change in attitudes) in youth violence prevention. A comprehensive review of controlled studies aimed at analyzing youth violence prevention programs has been undertaken by multiple groups including the Centers for Disease Control and Prevention, National Institutes of Health State-of-the-Art Consensus Conference in 2004, and others. CDC’s Best Practices in Youth Violence Prevention have focused on four strategies offering promise: parenting, mentoring, social cognitive and home visitation strategies.<sup>50</sup> This study incorporated all four aspects of these best practices with early adolescent assault-injured youth.

Many problems of fighting, weapon-carrying, and delinquency have been associated with maladaptive parenting styles, family dysfunction, and poor monitoring and communication. Approaches that incorporate the family and the individual have been successful in improving family functioning and reducing problem behaviors in youth.<sup>51,52,53,54,55,56,57,58,59,60,61</sup> The American Academy of Pediatrics Task Force on Violence emphasizes age-appropriate violence

prevention interventions including assessment of families and promotion of appropriate parenting skills at all developmental stages.<sup>62</sup> In a group of pre-adolescents, we implemented a family and community-based approach which is individualized to their needs. Most populations targeted in youth violence prevention have been children in school, victims of violence, juvenile offenders, or high risk communities like public housing. This study targeted a different high risk group: assault injured youth.

The emergency department (ED) has been described as an ideal setting to study injury and initiate interventions.<sup>63,64,65</sup> Yet ED efforts to address youth interpersonal assault have received little study. For victims of child abuse, suicide attempts, and sexual assault, efforts are made in the ED to identify and treat patients utilizing standardized, multi-disciplinary protocols. Recent work in intimate partner violence has resulted in greater efforts to intervene after presentation to the ED. Other intentional injuries have not received the same attention. For assaults, medical needs are addressed, but psychosocial needs or prevention of future violence may not be discussed.<sup>66,67,68</sup> The American Academy of Pediatrics (AAP) developed a model protocol to reduce the risks of re-injury and reactive perpetration starting in the ED.<sup>69</sup> The protocol involves a system of identification, assessment, and treatment of the physical and psychosocial needs of assault victims. To date, no ED-initiated protocol evaluations have been published.<sup>70,71</sup> Taking the AAP's lead, we plan to identify and intervene with high risk youth and their families. Initiation of intervention after an injury and ED visit can take advantage of a "teachable moment." Defined as the time immediately after an injury when the victim is acutely aware of what has happened and may be more open to preventive messages, the teachable moment is a theoretical construct that warrants evaluation.<sup>72</sup>

### III. Study Design and Methods

#### A. Explanations of Concepts and Working Definitions

Violence is the "threatened or actual use of physical force or power against another person, against oneself, or against a group or community which either results in, or has a high likelihood of resulting in injury, death, or deprivation. Violence includes suicidal acts as well as interpersonal violence such as rape, domestic violence, child abuse, elder abuse, or assault."<sup>73</sup>

Injury is defined as "physical damage to an individual that occurs over a short period of time as a result of acute exposure to one of the forms of physical energy in the environment or to chemical agents or the acute lack of oxygen."<sup>74</sup> "Injury...refers to the health outcome being addressed."<sup>75</sup>

Prevention refers "to efforts to reduce the risk or severity of injury."<sup>76</sup>

Family-centered involves "maximum possible involvement of families...attention to the psychological needs of all family members; cultural competence of providers; consumer (parental) involvement in planning and needs assessment..."<sup>77</sup>

Community represents a geographic area with defined boundaries, or, more generally describes a group with shared characteristics, interests, values, and norms.<sup>78</sup>

Community-based refers to both a location and an intervention method including a systems approach that involves a "coordinated political, medical, individual, and community effort."<sup>79,80</sup>

Parent, for the purpose of this study refers to the biologic parent, adoptive parent, or guardian.

#### B. Theoretical Framework

1. Epidemiological Framework: Our theoretical framework begins with the public health model for injury control.<sup>81</sup> The first component of this model is to define the problem through surveillance and epidemiology. The previous Adolescent Violence Study (AVS) surveillance defined the scope of the violence problem in the District and provides a basis for study and

evaluation of the problem. An epidemiological grounding from the AVS project was the underpinning for our methodological approach.

2. Risk Factors and Causal Theories: Known risk/protective factors for involvement in violence and injury may be viewed as associations that identify at-risk individuals or as contributing mediators or co-factors to the outcome.<sup>82</sup> Regardless of the degree of causality, ascertainment of epidemiologically associated factors can identify a sub-group at risk for violence and its adverse consequences. Many advocate a proactive, preventive approach that identifies escalating problem behavior early for interruption and intervention. Thus, we focus on pre-teens presenting with violent injuries.

The theory that a cluster of co-varying problem behaviors contribute to and comprise a pattern of risk was articulated by Jessor & Jessor more than two decades ago<sup>83</sup>, and is confirmed by the CDC Youth Risk Behavior Survey<sup>84</sup> and the World Health Organization survey of Health Behavior in School Children.<sup>85</sup> As Jessor points out, a number of structural factors are related and interact with adolescent risk behaviors in both risk enhancing and protective ways.<sup>86</sup> These include biological characteristics, personality and social environment. The literature recognizes that “not all youth violence is of the same form or cause or will best be addressed by the same response.”<sup>87</sup> In their review of interventions for youth violence, Tolan and Guerra<sup>88</sup> distinguish four types of violence by their apparent cause: a) situational, acute environment stress or acute social stress independent of individual characteristics; b) relationship causes such as interpersonal disputes; c) predatory violence such as mugging and gang assaults; and d) psychopathological violence. However, Huesmann and Guerra point out that the literature strongly suggests a multitude of factors contribute to an individual’s propensity to behave aggressively.<sup>89</sup> An acknowledgement of this multifactorial reality forms the conceptual basis for our proposed assessment of multiple risk factors and for our use of individualized intervention.

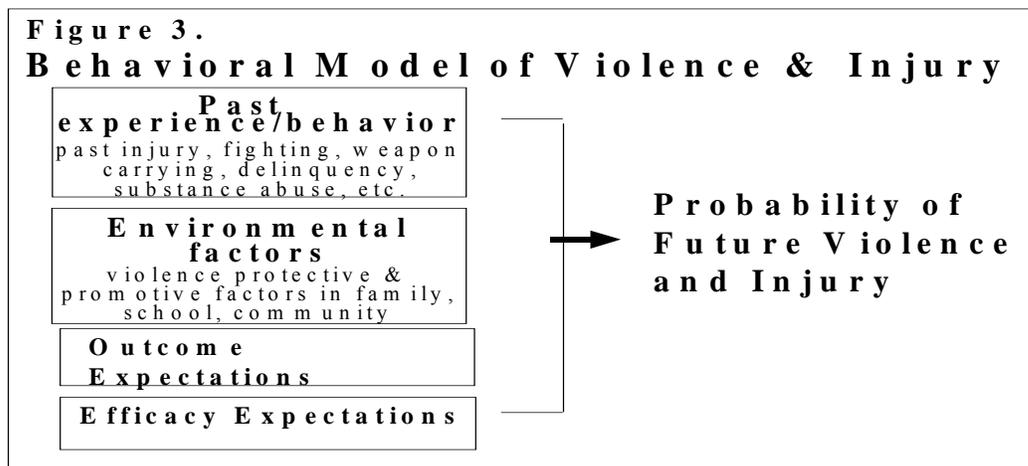
3. Intervention Theories: The risk of serious violence increases with the progression of adolescence.<sup>90</sup> Indeed, in parallel fashion for over 20 years Kandell, Patterson and others have described a pattern of developmental maturation of drug use and delinquency through adolescence into adulthood.<sup>91,92,93,94</sup> This “Gateway Theory” progression to increasingly severe deviance suggests that for violence too, pre and early adolescence are probably the best times to influence situational and interpersonal violence patterns. Early adolescence is a time of dramatic increase in problem behavior in all industrialized nations and is a reasonable time to intervene to prevent escalation in later adolescence and young adulthood.<sup>95,96</sup>

The proposed study targeted youth age 10-15 years. It is felt that pre-adolescents at ten years can fully participate in the proposed curricula and allow reliable assessment of outcomes through interviews. Loeber suggests that intervention in a period of relatively high malleability is more likely to succeed than in a period of reduced malleability, and children’s malleability to behavior change probably decreases in adolescence.<sup>97</sup> Early adolescence is marked by rapid physical maturation, concrete thinking, early moral development, and strong peer influence.<sup>98</sup> Intervention before or at this time offers the opportunity to affect these developing cognitive and social processes. Our proposed intervention addresses concrete issues germane to their everyday lives, as opposed to requiring the more abstract and long term thinking developed later in adolescence. Parental involvement emphasized in this program is most appropriate with pre-teens, prior to the need for emotional separation from parents which develops later.



We propose a combination of individual and environmental-level approaches that involve the child, family, and community.

We proposed a behavioral model of violence and injury as a focus for assessment and intervention (Figure 3). We postulate that the probability of future injury and violence is predicted by **past experience** including risk behavior; **environmental factors** including violence protective and violence promotive factors in the family, school, and community such as problem behaving friends or neighborhood gangs; **outcome expectations** including perceived risks and benefits of violent behavior and violence prevention behavior, and perceptions of subjective norms; and **efficacy expectations** relating to participant perceptions of confidence in their ability to successfully engage in violence prevention or avoidance actions. This model is based on theories of risk behavior and resiliency and Social Cognitive Theory. These domains are assessed in evaluating the individualized intervention. Our intervention was designed to influence environmental factors in addressing parenting, outcome expectations, and efficacy expectations through a youth and family program with community support.



### C. Study Design

There are two related components of this study - the cross-sectional component that assesses service provision and receptiveness to services and the intervention trial which evaluates the effectiveness of an intervention. Aims A-B describe a cross sectional study which is an important first step to assess current service provision and assess receptiveness and need for intervention. In the area of peer violence there has been little study of the effectiveness of violence prevention services for injury victims. Aim C tests the effectiveness of an individualized intervention in a randomized controlled trial. Potential weaknesses of this design include selection bias and difficulty showing effect if the intervention is not delivered in a uniform fashion. This design, however, most rigorously evaluates the effect of intervention, minimizes selection bias and allows statistical inference.

Interpersonal injuries that are severe enough to result in a visit to an ED might be viewed as a sentinel event in a young person's life. Youth and parents are often vulnerable and introspective following an injury event, and may be particularly receptive to intervention. Since some victims of assault may not be connected to schools or primary care physicians, a hospital-based intervention offers a unique opportunity. The strategy is similar to that used in smoking cessation or alcohol abuse<sup>100,101</sup> whereby, on identification of the problem the physician counsels on the risks of the behavior and writes a "prescription" for referral to more intensive counseling or behavioral management. The physician recontacts the patient at some future point in time to

ascertain adherence with the prescribed treatment. Analogously, the “problem” in the proposed study would be the circumstances that led to the injury and the “prescription” would be the referral, by hospital personnel to the individualized intervention proposed. This approach is appealing in that it takes advantage of the “teachable moment” and the authoritative role of the hospital personnel while offering more in depth counseling than can be provided during the brief hospital visit.

Convincing high risk youth and families to participate in prevention initiatives is a challenge. Accepting and following through on “treatment” for prevention of injuries may involve significant barriers including transportation, time, finance, and ambivalence about perceived need. A focus group study of teens found that “they reacted negatively to the idea of on-site intervention by emergency personnel in emotional issues related to violence, but were positive about community...outreach efforts by medical professionals.”<sup>102</sup> Teens in our focus groups have suggested that services may be accepted by youth and parents if recommended by a professional and extended outside the hospital setting. In a pilot study we asked a sample of intentionally injured teens and their parents whether they would seek help “if a doctor in the hospital recommended that you/your child see someone who would help in avoiding violence and fighting.” In a ED sample of 45 parent/teen pairs, 93% of parents and 88% of teens said they would be interested. A goal of this study was to evaluate the receptiveness and participation of youth and their families to ongoing intervention following an injury event, and to target intervention with injured youth.

Though the ED allows identification of a high risk group with enhanced receptivity to intervention, the proposed study takes the intervention to the family in their natural environment. Studies of prenatal and early childhood nurse home visiting have found lower rates of child abuse and neglect, injuries, and delinquency among those in the intervention group versus controls.<sup>103,104,105,106</sup> These programs focus on positive health-related behaviors, parenting education, and linkage with needed services. Though effective, these programs focus on high risk mothers and are costly. We extended this type of family-centered home visitation intervention to a pre and early adolescent age group of at risk youth to test a more targeted intervention. In addition, we included linkages to community-based services (e.g. school programs, after school programs, youth programs, family support programs, local health and human services). Some have speculated that the success of home visiting programs may have a stronger effect if there were efforts to engage families in the wider social settings in which they live.<sup>107</sup> Therefore, this study tested the feasibility and effectiveness of a hospital-initiated family-centered intervention with community linkages. This project studied a targeted home-based intervention may be an alternative prevention strategy.

## **D. Population Studied**

### **1. Inclusion Criteria**

A consecutive sample of youth presenting to the ED or hospitalized for interpersonal assault injuries were recruited. 173 patient/parent pairs were enrolled.

**Injury:** interpersonal intentional injuries (E960.0, 961-966, 968-9) excluding child abuse, sexual abuse, and sibling fights.

**Age:** youth age 10-15 years (i.e. up to the 16th birthday) and their parents or guardians.

**Mental/Physical Status:** youth and parents had the cognitive ability to participate in an early intervention curriculum. Those with severe psychopathology or inability to comprehend questions were excluded.

## 2. Study Sites

Study sites included the Children's National Medical Center (CNMC) and Johns Hopkins Hospital (JHH) emergency departments. The original plan was to recruit from DC General Hospital which was closed early into the study. With Dr. Cheng's move to Johns Hopkins University, Johns Hopkins University was a logical second recruitment site. CNMC and JHH are private, nonprofit hospitals with trauma centers.

## E. Sample Selection/ Study Procedure

### 1. Study Process

We tested the feasibility of an individualized intervention in a sample of pre-adolescents presenting to the ED with interpersonal intentional injuries. The ED notified the project of eligible patients while project staff simultaneously reviewed ED and ward logs and computer print-outs for eligible families. A consecutive sample was recruited. Whenever possible, families were approached by the home visitor for enrollment while still in the ED or the inpatient ward. Patients that are missed or presented on days that staff were not available were contacted by phone. Eligible families then underwent the consent process (parent consent, youth assent) for the study. Families who refused consent were asked to complete an abbreviated assessment and asked about reasons for refusal.

Those eligible and consenting were randomized to intervention or control group by drawing a sealed envelope with the random assignment by gender following the baseline assessment. The baseline assessment was performed during a home visit soon after the emergency department visit. For the intervention group, another appointment for a home visit was made as soon as possible. The intervention group received services tailored to their needs through a home-based youth and family approach with community linkage. Control families received a list of community resources and a CNMC or Johns Hopkins social worker contact (as is the current practice in the ED if services are requested). Both intervention and control groups had home visit assessments at baseline, 6, and 18 months. Assessments consisted of interviewer questioning and spoken response and Walkman questions with written response.

Sample attrition was a significant concern in long term follow-up. We addressed this by: 1) obtaining complete address and phone numbers for the subject, parents, friends, relatives. 2) Cash or gift incentives will be offered for the initial assessment (control and intervention groups) and for the follow-up assessments at 6, and 18 months. 3) Frequent contact was made with subjects including home visits, calls, mailings with stamped addressed return envelopes, and seasonal cards.

Mechanisms to ensure quality in data collection and analysis included a detailed procedure manual, intensive training of staff, close supervision by senior investigators, use of standardized forms, systematic review of ED logs, eligibility/enrollment logs, enrollment/follow-up logs and assessment instruments, review of random assignments, and range and consistency checks of data.

**2. Study Intervention:** An individualized family plan was developed for those in the intervention group. Youth received a mentor-implemented six session curriculum at their home or in the community. Parents received three home-based counseling sessions conducted by a trained psychologist or health educator and community referrals. The parent sessions reviewed concepts in the youth curriculum, discussed parental involvement and monitoring and addressed the needs of the family with the resources of the program and the community.

Social Cognitive Theory (SCT)<sup>108</sup> incorporates environmental, personal and behavioral factors as important determinants of personal action and is useful as a framework for addressing

aggressive and violent behavior. This theory departs from unitary approaches based on behavioral conditioning, knowledge acquisition, or purely biological bases. It acknowledges that “one size does not fit all.” Social Cognitive Theory (SCT) guided development of the home-based intervention and was particularly appropriate for the proposed program which attempted to influence the family environment and youth cognitions.

SCT suggests that in order for youth fighting behavior to change, they must 1) recognize stressors and potentially risky situations for violence (situational perception), 2) possess the knowledge and skills to perform conflict resolution or avoidance (behavioral capability), 3) believe that changing behavior regarding conflict resolution or avoidance will have beneficial consequences (outcome expectations), 4) value the expected consequences of conflict resolution or avoidance (outcome expectancies), and 5) possess confidence in their abilities to avoid conflict (self efficacy). From the SCT explanatory constructs, specific intervention objectives and activities were derived. Many of the objectives were adapted from existing programs described below. Concepts from the youth and parent curricula including the Straight Talk About Risks (STAR) gun violence program, Adolescent Transitions Project (ATP), and Shepherd Mentoring curriculum made up the final curricula.

The individualized home-based program included a minimum of 6 visits with youth and a minimum of 3 visits with parents scheduled over a 2-6 month period. Sessions included discussion of specific objectives, presentation of a problem-solving activity, practice and role playing skills, and summation of concepts and objectives.

#### 1. STAR Gun Violence Prevention Program:

Intervention families will be offered an early intervention curriculum for youth and their parents borrowing concepts from the Straight Talk About Risks (STAR) gun violence prevention curriculum, the Adolescent Transitions Program and other programs. STAR was developed by the Center to Prevent Handgun Violence for school-age children (grades pre Kindergarten to 12). One of the few curricula specifically addressing firearm violence, this program raises awareness among youth and parents and integrates problem-solving skills with behaviors. An independent organization, Education Development Center, has completed an in-depth process evaluation of the curricula implemented in Los Angeles and New York City with positive results<sup>109</sup>

#### 2. Adolescent Transitions Program (ATP):

ATP addresses problem behavior in middle school years including negative peer relations, fighting and drug use and includes parent and youth components.<sup>110,111</sup> The parent-focused curriculum is based on family management skills determined by 20 years of clinical and research investigations critical for healthy child adjustment: prosocial fostering, limit setting, and problem solving.<sup>112</sup> The youth intervention incorporates a social learning approach to behavior change involving setting realistic goals, developing small steps to attainment, developing peer support for prosocial and abstinent behavior, setting limits and learning problem-solving skills. Step-wise, skill-based approaches include exercises, discussion topics, and videos which highlight and model key skills. Though designed for groups, we feel that the concepts were adaptable to an individualized process. Applied individually, the negative effects of the intervention hypothesized to emanate from aggregation of high-risk youth into groups would be avoided.<sup>113</sup> The program “offers positive solutions for important social and interpersonal issues by enhancing parenting skills, empowering youth to better manage their lives and building self-esteem.” The program had been tested in groups including urban minority youth. Randomized evaluation results have shown immediate beneficial effects on observed and reported family conflict and behavior problems at school.<sup>114</sup>

#### 3. Community Involvement:

In addition to the home-based program, the intervention involved linkage to community services and specific referrals. Intervention families received appropriate community referrals that included substance abuse, mental health, after-school, or other programs as identified by the intake assessment.

In summary, the conceptualization of this intervention rested on several unique components: 1) the opportunity of a “teachable moment” after injury and the important role of hospital personnel in recruiting families to prevention programs; 2) the potential power of a family intervention among pre-and early adolescents; 3) the potential power of a mentoring relationship; 4) the strength of proven parent and youth curricula; and 5) the added and continued benefits of referral to existing community resources. The literature supports the potential for violence prevention through influencing parental monitoring and support, youth mentoring, and youth attitudes and skills regarding self control and violence avoidance.

## F. Study Instruments

Study instruments included an eligibility/enrollment log, enrollment/follow-up tracking form, medical record abstraction form, baseline, 6, and 18 month assessments for both parents and youth, and mentor and health educator assessment forms for the intervention families. A tracking form documented all families enrolled in the study (intervention group and controls), their adherence and participation in scheduled home visits, referrals and services offered, and adherence with referrals and follow-up interviews. Community referrals were documented to assess the contact and contribution of this component to the process.

Assessment of the intervention included: Process outcome variables - participation in the study, adherence with follow-up (number of appointments kept and completion of program for intervention group, initiating referral contacts and follow-through with referrals and interviews for both groups), satisfaction with intervention, perceived impact of intervention; impact outcome variables - self control, outcome expectations for problem behaviors and increased authoritative parenting, parenting knowledge, and parental monitoring; terminal outcome variables - fighting, aggression, interpersonal injury, weapon carrying. Predictor (independent) variables included constructs of our model above including past experience/behavior, environmental factors, outcome expectations, efficacy expectations, and severity and type of injury, intensity of intervention, and type of referral.

Measurement will include youth and parent assessments, and ED chart abstraction. **Youth & Parent Assessment:** This assessment included detail on cause of injury and the factors included in our behavioral model of violence presented above (past experience risk factors, protective factors, perceived risk, and self-efficacy). Most all study instruments had been tested in large samples of youth and/or parents thereby allowing comparison to other populations. Though not all instruments had been tested among youth of the study age range, we pretested these instruments prior to use. The attached measures table outlines the instruments used. Some important instruments included:

1. Youth Risk Behavior Survey (YRBS) Middle School Questionnaire: The YRBS is a self-report questionnaire for youth developed by the Centers for Disease Control and Prevention as part of the Youth Risk Behavior Surveillance System, and is a widely used instrument.<sup>115</sup> The middle school version is a 54-item questionnaire developed for youth 10-15 years. This proposed study will utilize questions on fighting, past injury, weapon carrying, substance abuse, and other risk behaviors. Test-retest reliability on the four questions relating to weapon carrying and fighting range from 50.5-76.3%.<sup>116</sup> Use of this instrument allows comparison of our outcome variables to regional and national samples. We pretested questions in pre-teens.

2. Child Behavior Checklist (CBCL): The CBCL is the most widely utilized parent-rated measure to classify behavioral and emotional adjustment of children.<sup>117</sup> The form for youth age 4-18 contains 118 items with three scales (internalizing, externalizing, problem) and eight subscales including withdrawal, somatic problems, anxiety/depression, delinquency, aggression, social problems, thought problems and attention problems. Extensive literature documents its psychometric strengths and limitations. This instrument is used in the evaluation of the Adolescent Transitions Project<sup>118</sup> and Olds' nurse home visitation program described below. It was used to screen for attention deficit disorder, depression, and other mental health problems that may need referral. Subscale on aggression will define this outcome variable.
3. Adolescent Violence Study Interview, Patient Questionnaire: This questionnaire was developed by the principal investigators of this proposal and has been administered to over 300 injured youth (appendix). It gathers detailed information on circumstances of the injury event, intentionality, mutuality, and risk and protective factors including extracurricular activities. It was extensively pretested prior to fielding and is undergoing test-retest reliability testing. The proposed study will utilize youth questions on circumstances of injury and prevention possibilities (12 items) and mutuality of fighting (12 items). Questions were adapted for parent response. Parent and youth responses will be compared. These measures assess predictor variables relating to circumstances of the injury.
4. Going Places Instrument: Going Places is a problem behavior prevention project for school age youth led by Dr. Bruce Simons-Morton, EdD, MPH at the National Institutes of Child Health and Human Development, a co-investigator on this proposal. Measures to evaluate the intervention include youth and parent reports in three domains of psychosocial and school functioning and parenting. Constructs measured include self control, direct and indirect peer influence, outcome expectations, deviance acceptance, social competence, parent-child conflict, parental expectations, authoritative parenting, parent knowledge, minor risk-taking, and school adjustment.<sup>119</sup> These items were used to assess impact outcomes of the proposed intervention. In the psychosocial domain some items included outcome expectations (5 items, alpha=.71), friends' problem behavior (7 items, alpha=.86), peer pressure (8 items, alpha=.84), deviance acceptance (8 items, alpha=.87), self control (7 items, alpha=.85), social competence (9 items, alpha=.78), depressive symptoms (6 items, alpha=.81), and minor risk-taking (6 items, alpha=.81). School questions include school adjustment (11 items, alpha=.87), school climate (11 items, alpha=.91). Parenting questions include parent-adolescent conflict (4 items, alpha=.83), parental support (5 items, alpha=.86), knowledge about child (6 items, alpha=.82), expectations (6 items, alpha=.82), authoritative parenting style (16 items, alpha=.93).
5. Children's Perceptions of Environmental Violence is a 51 item survey developed by Hope Hill, PhD, a consultant on this project, that assesses a school-age child's experience with violence in the home, school and neighborhood.<sup>120</sup> Three variables assess violence perception including violence apprehension, witnessing, and sense of retaliation (alpha = .75).<sup>121</sup> Other domains include revenge/retaliation, witnessing violence, safety/vulnerability, and hope for the future. The scale had been tested in pre-adolescents in urban Washington, DC and cover important motivational and affective factors not covered in other instruments. The revenge/retaliation and safety/vulnerability domains relate to impact outcomes of the intervention.
6. National Health Interview Survey (NHIS) parent questions on past injuries and use of medical and mental health services from the Child Health section of the National Center for Health Statistics NHIS were included. In the NHIS parents are asked "During the last 12 months did (child's name) have an accident, injury or poisoning that required medical attention?" Further questions asked about the number of events and specifics about each event. In addition, questions address whether they have a regular medical provider and whether they have been

referred to mental health services. These questions allow for national comparison and control for access to care in our sample. In addition, it is important to know about current service use to optimize service use and community referrals.

### **Emergency Department Chart Abstraction**

Chart abstraction was performed on all eligible patients to analyze findings by severity and type of injury, confirm eligibility, assess non-participation bias, and assess baseline ED identification and treatment of violence prevention needs. The chart abstraction form included information on injury type and recorded cause, severity of injury, disposition, and documented referrals. This form was adapted from the AVS surveillance abstraction form.

## **G. Statistical Techniques**

### **1. Sample Size**

For this study we enrolled families in the control group and families in the intervention group over 2.5 years. The primary outcome for this intervention study was the number of fights in the control and intervention groups over the 6 and 18 month follow-up. Secondary endpoints include time to repeat injury, aggression, and incidence rates of fighting and weapon-carrying. We assume continuous variables to be normally distributed. An appropriate transformation (e.g., square root or natural logarithm) will be applied if necessary.

From our AVS interview study of intentionally injured youth, the mean number of fights in the last year was 2.07 (standard deviation = 2.14, range 0-13 fights). Let the control group mean number of fights,  $mean_1 = 2.07$ . Assuming that the intervention effect was deemed clinically significant if it decreased by 1.00 fight or more over the control mean, i.e.,  $mean_2 = mean_1 - 1.00 = 1.07$ . If  $effect-size = \frac{abs(mean_2 - mean_1)}{standard\ deviation\ (SD)} = \frac{abs(1.07 - 2.07)}{2.14} = \frac{abs(-0.47)}{2.14} = 0.47$ ,  $alpha = 0.05$  (two-tailed) and  $beta = 0.20$ , then one would require a random sample of  $N=73$  patients per group from a population. However, if the Gaussian distribution assumption is violated and a nonparametric test, such as the Wilcoxon-Mann-Whitney rank-sum test is used, then the required sample size would be 5% larger ( $N = 77$  per group).

### **B. Data Analysis**

Data entry and cleaning are ongoing. Preliminary data analyses have been completed. Analyses have been performed by using the SAS Institute SAS/STAT Software 6.12; 1997 package. Demographic and injury information of participants and non-participants has been collected and will be compared to assess bias.

Participant and injury characteristics and violence prevention services provided to assault victims in the ED and after discharge were assessed in Aim A with findings presented below. Aim B assesses the proportion of families receptive to violence prevention interventions. Youth and parent interest in participating in violence prevention programs and their actual participation and adherence with the study intervention were assessed. Bivariate analyses assessed whether receptiveness to services and perceived needs differ based on the predictor variables described above.

For the Aim C randomized intervention trial, process outcome variables, impact outcome variables, terminal outcome variables, and predictor (independent) variables are previously outlined. We proposed a feasibility study prior to investing resources in a large study of terminal outcomes. In a feasibility study we recognize we may not have the power to show large changes in terminal outcomes, but trends and change in impact outcomes may be identified. This study will provide important information on feasibility, magnitude of program impact, and baseline

data on outcome measures for future power calculations. As a result of this study, we have documented lessons learned, what worked and what didn't work, and plan to report on the feasibility of this approach and future directions.

Outcome variables (aggression score [CBCL], frequency of past fighting) and predictor variables in our model (past experience/behavior: past injury, weapon carrying, substance abuse, mental health service use, risk/protective factors: parent and school connectedness, school performance, social affiliation, perceived risk of future violence and injury, self efficacy to prevent future violence, injury severity and type, and the age of youth) were measured. Summary statistics such as mean, standard deviation, standard error of the mean, range, proportion and 95% confidence intervals describe continuous and/or nominal or categorical variables from the perspective of the youth and their parents. Comparison of attitudes of the child versus parent have been assessed by the paired-sample t-test for continuous variables and for discrete variables by the McNemar test. Risk and protective factors associated with fighting and aggression have been analyzed. This has been assessed retrospectively (e.g. do youth with previous injuries have a greater likelihood of weapon carrying?) and will be assessed prospectively over 18 months (e.g. are youth with risk factors like substance abuse more likely to be injured in the future?) The intervention and control groups will be analyzed together for retrospective analyses and separately for longitudinal analyses.

Demographic characteristics and risk and protective factors of the child and family between the intervention and control groups have been assessed to assure that randomization was provided and maintained. Outcomes for the intervention and control groups have been compared in preliminary analysis:

Statistical Comparisons at Baseline: Continuous data were summarized by univariate summary statistics such as mean or median, standard deviation, 95% confidence limits, and range. Nominal data will be summarized by frequency distributions and 95% confidence intervals. Statistical comparisons were performed to compare treatment groups with respect to efficacy outcomes and important prognostic factors at baseline. For Gaussian variables, t-test and Analysis of Covariance (ANCOVA) were applied to adjust for stratification variables and baseline covariates. When appropriate nonparametric tests, such as Kruskal-Wallis test and/or Wilcoxon-Mann-Whitney rank-sum test, were used to make the pairwise comparisons at each of the time points. For discrete variables, standard techniques for categorical data<sup>122</sup> were applied, including Fisher's exact test and  $\chi^2$  procedures, as well as weighted least squares<sup>123</sup> and logistic regression analysis<sup>124</sup> to adjust for baseline covariates and stratification variables.

Covariates: The following strategy will be applied for determining which baseline covariates to include as predictor variables in the various linear models. First, any variable used to stratify the design at baseline will be included in all models (i.e. gender). For interval-scale and ratio-scale outcome measures, the baseline value of that variable, centered about its sample mean, will be entered to increase precision. In our experience, the baseline value is the most important predictor of the response post-randomization, and once it has been entered into the regression model, it is unusual for other baseline covariates to attain statistical significance. Otherwise, important prognostic factors identified a priori, as well as covariates for which there are clinically meaningful imbalances at baseline, may also be entered.

Repeated Measures Data: Efficacy variables will be recorded at baseline, 6 and 18 months. Because these outcomes are expected to be (approximately) Gaussian random variables, standard linear models for repeated measures data<sup>125</sup> can be applied. This includes the random-effects model of Laird and Ware<sup>126</sup> and the generalized estimating equation (GEE) model of Liang and Zeger<sup>127</sup> if appropriate.

Survival Analyses: Time to withdrawal from intervention/therapy or drop-out will be analyzed using the standard techniques for survival data.<sup>128</sup> Survival distributions will be estimated using the Kaplan-Meier method. The Cox proportional hazard model will be used to compare the survival curves across the study factors, controlling for stratification variables and baseline covariates. A check will be made for proportionality in the hazard function over follow-up time, and remedial action will be taken if required.

#### **IV. Presentation of Findings**

##### **A. General Status**

In two emergency departments, 495 eligible families were identified. We were unable to contact 258 (52%) to complete the consent process. Of the 48% (237) contacted for consent, 55 (23%) refused participation and 182 (77%) consented. 173 families were enrolled with both youth and parent completing baseline interviews. Currently, 118 (68%) 6 month follow-up interviews have been completed and 65 (37%) 18 month follow-up interviews have been completed with many due in the coming months. We plan to complete remaining follow-up assessments and are continuing data entry and cleaning. Data collection and analysis is ongoing and will add to the literature on the effectiveness of a mentoring and parental involvement intervention with assault injured youth and their families. Based on recruitment statistics, most families contacted consented for the study and were receptive to a mentoring and parenting intervention.

##### **B. Risk and Protective Factors for Assault Injury**

Baseline data from this study and pilot studies have described characteristics of assault-injured youth presenting to the emergency department. Three manuscripts have been written, two are in preparation, and six abstracts have been presented thus far regarding intervention with this population. A case-control study published in *Pediatrics* (2003;112:931-38) described risk and protective factors for assault injury and locations of contact of intervention. Objectives of the study were: 1) To assess risk and protective factors for adolescent assault injury compared to two control groups of youth with unintentional injuries and non-injury complaints presenting to the emergency department. 2) To assess locations of contact with assault-injured youth for prevention programs. Face-to-face and phone interviews were conducted with systematic samples of youth age 12-19 presenting to the emergency department with assault injury, unintentional injury, and non-injury complaints. Youth with intentional injuries were matched to youth in the two control groups on age  $\pm$  1 year, gender, race, and residency. 147 assault-injured youth completed interviews. 133 assault-injured youth were matched to 133 unintentionally injured and 133 non-injured youth presenting to the emergency department. Compared to the two control groups, assault-injured youth were more likely to have had more fights in the past year (OR 3.91, CI 2.02, 7.58; OR 4.00, CI 2.23-7.18) and fights requiring medical treatment (OR 35.49, CI 8.71-144.68; OR 80.00, CI 11.13, 574.80). 80% of assault-injured youth had been in one or more fights in the last 12 months compared to 55% and 46% in unintentional and non-injured controls respectively. Assault-injured youth were more likely to have had previous weapon injuries (OR 9.50, CI 3.39, 26.6; OR 8.50, CI 3.02, 23.95) and have seen someone shot (OR 2.00, CI 1.12, 3.58; OR 2.00, CI 1.12, 3.58). 86% of assault-injured youth had a regular health care provider with 82% reported a visit within the last year. There were no differences between cases and controls with regard to physician contact, extracurricular activity involvement, school or church attendance, police contact, weapon access or weapon carrying, or witnessing non-weapon-related violence.

It was found that fighting was common in all groups. Assault-injured youth were more likely to have had previous weapon injuries and were high risk for future injury. Past fights, past

fight injuries, and seeing someone else shot were markers associated with assault injury, however, in this high risk population, a universal approach to violence prevention may be most appropriate. The study found that health providers have access to at-risk teens for clinical risk assessment and intervention in primary care and emergency departments.

### **C. Circumstances of Assault Injury Presenting to the Emergency Department**

A second manuscript described circumstances of injury of assault-injured youth and whether the injured individual was a perpetrator or victim in the event. The study objective was to describe the causes and circumstances of conflict leading to assault injury, and the patient's role in the event. In-person and phone interviews were completed with a convenience sample of 143 youth ages 12-19 presenting to one of two urban emergency departments with an interpersonal assault injury. Patients were interviewed about the nature and circumstances of their injury. We performed descriptive analysis, including stratified analysis by gender, age (12-15 vs. 16-19), and weapon involvement. We found that 70% of patients knew or knew of the person(s) who injured them; most were friends, classmates or acquaintances. More than half of injuries (56%) were related to a past disagreement, with 53% of these patients reporting they felt the disagreement might lead to a fight. Of those related to a disagreement, 33% had previous arguments with their assailant, 16% had previous fights, and 14% had previous weapons threats. Twenty nine percent had been previously threatened and 11% of injured patients had previously threatened their assailant. Twenty-eight percent of patients felt they helped to cause the injury by provoking a fight or letting down their guard. Nearly two-thirds (64%) felt there were things they could change to prevent future injury including staying away from dangerous situations or bad influences or controlling their temper.

We found that most assault injuries among adolescents involve past disagreements with people they know. Many injured youth were mutually involved in conflict prior to their injury similar to the concept of bully-victims. These data inform ED-based interventions to prevent assault injury.

### **D. Mental Health of Assault-Injured Youth Presenting to the Emergency Department**

A third manuscript explored the mental health of assault injured youth. The purpose of this study was to investigate the prevalence and predictors of symptoms of posttraumatic stress disorder (PTSD) and depression among assault-injured youth. Youth age 12-17 presenting to a large urban hospital emergency department with peer assault injuries were recruited. Youth and parents were interviewed at baseline (0-2 months post-injury) and follow-up (4-12 months) to assess symptoms of PTSD (PTSD Checklist), depression (CESD), and risk behavior of the youth. The sample included 85 families; and 44 (51%) completed both youth and parent follow-up interviews. At baseline very few youth (3%) and parents (4%) reported diagnostically significant symptoms of PTSD in the youth; and only 1% of youth and 9% of parents reported symptomatology at follow-up. Predictors of PTSD symptoms were youth weapon carrying, hospitalization for treatment, and parent report of youth symptoms. Regarding depression, at baseline 28% of youth and 25% of parents reported at least mild symptoms in the youth. At follow-up 14% of youth and 21% of parents reported these symptoms. Significant predictors of depression were parent report of youth's symptoms and youth weapon carrying.

Our study identified a low prevalence of PTSD symptoms, and a relatively high prevalence of depression symptoms among assault-injured youth. Some aspects of psychological numbing and desensitization to internalizing socio-emotional aspects of violence may be explanatory. Parent perceptions of their child's experiences with PTSD and depression symptoms were highly correlated to youth report. Additional research is needed to understand

the complexities of mental health sequelae among assault injured youth.

### **E. Assault Injury in the Emergency Department: A Sentinel Event?**

Finally, an abstract accepted for presentation at the Pediatric Societies Meeting in May 2006 explored the concept of the emergency department visit as a sentinel event or teachable moment. The emergency department (ED) has been described as an ideal setting to initiate interventions with assault-injured youth to reduce the risk of re-injury and reactive perpetration. Little is known about how youth and parents perceive their injury and whether it is a sentinel event or teachable moment for intervention. We wished to assess the receptiveness of assault-injured youth and their families to violence prevention intervention. Youth age 10-15 presenting to two large urban hospitals with peer assault injury were recruited. Face-to-face and Walkman interviews were conducted with both youth and a parent in their home soon after their ED visit. We assessed Social Cognitive Theory constructs influencing preventive behavior change. 147 youth and their parents completed interviews. Average youth age was 12.9; 64% male; median time from ED visit to interview was 54 days. On importance of the event, 37% of youth and 49% of their parents felt that their injury was very serious. Compared to other stresses in their life, the event was rated 5.2 by youth and 6.6 by parents on a scale of 1-10 with 10 being most stressful. On susceptibility, 37% of youth felt it was very or somewhat likely that they may have another injury in the future; 29% of youth felt they may have another fight related to the one that led to the ED visit. On outcome expectation, 47% of youth and 76% of parents felt that the situation that led to the ED visit definitely could have been prevented. Finally, on self efficacy, 63% youth and 65% parents felt they definitely could avoid another injury like this. Youth who were hospitalized were more likely to report that they might have another fight related to the incident that led to their ED visit (58% hospitalized vs 23% non-hospitalized,  $p=.002$ ). Parents of younger children and older youth were more likely to feel that the situation leading to the injury was preventable ( $p=.01$ ,  $p=.02$ ).

Using a Social Cognitive Theory constructs we found that assault injury leading to an ED visit was a moderate stressor for youth and families. A substantial proportion of youth felt that future injuries were probable and that prevention was difficult. The ED may be an important place, and injuries an important context, for augmenting outcome expectations and self efficacy for prevention.

### **F. Manuscripts in Progress**

Two manuscripts in preparation explore predictors of retaliatory attitudes of assault-injured youth with implications for prevention. Another explores the prevalence of attention deficit hyperactivity disorder and conduct disorder symptoms and diagnoses in this population. Finally, data collection and analysis is ongoing regarding the feasibility and effectiveness of a home-based intervention with assault-injured youth and their families.

## **V. Discussion of Findings**

### **A. Conclusions to be drawn from findings**

Assault-injured youth presenting to emergency departments are at high risk for future injury and certain risk and protective factors can be identified. Further, the emergency department may be an important point of intervention and many families appear receptive to violence prevention efforts initiated from the emergency department. This study adds to the literature on assault-injured youth and interventions to reduce injury recidivism and violence risk factors. Data analysis is ongoing with effectiveness of this randomized intervention yet to be

determined. Findings on the effectiveness of home visitation, mentoring, and parental involvement strategies are forthcoming.

### **B. Explanations of limitations or possible distortion of findings**

Cross sectional studies using baseline data from interviews with youth and parents suffer from the inability to prove causality. However, planned analyses using longitudinal data collected in this study will strengthen findings. In addition, our sample included patients from two urban emergency departments and findings may not be generalizable to other cities or populations. Other limitations for the cross-sectional and randomized control trial components of the study include potential bias from non-participation. A fair proportion of youth and families could not be contacted or could not complete the consent process and a smaller subgroup refused participation.

### **C. Comparison with findings of other studies**

Few studies have focused on assault-injured youth presenting to the emergency department. One of the few evaluated programs of hospital-based youth violence intervention is the Boston Violence Prevention Project (VPP).<sup>129</sup> A violence prevention trauma team addressed the medical and psychological needs of violently injured youth (12-17 years) in a counseling session during their hospital stay. This randomized evaluation has not shown effectiveness thus far, suggesting the need for more intensive interventions and focus on a younger age group.<sup>130</sup> Zun et al. have studied the effect of an assessment and case management intervention with 10-24 year old patients with interpersonal violence presenting to the ED. They found no change in attitudes of youth toward violence<sup>131</sup> but some increase in referral to social service agencies.<sup>132</sup> Our study characterizes the population and injury circumstances of assault-injured youth and will add to the literature on intervention effectiveness.

### **D. Possible application of findings to actual MCH health care delivery situations**

Findings from this study have important implications for youth violence prevention. This study adds to the literature on 1) characteristics and circumstances of injury among assault-injured youth; 2) the emergency department as a location to initiate intervention; and 3) feasibility and effectiveness of community-based intervention strategies involving mentoring and parenting support.

Currently, emergency department protocols exist to address the needs of patients with other types of injuries including child abuse, self-inflicted injury or domestic violence. Youth presenting with interpersonal assault injury have received less attention with limited discussion of injury circumstances and prevention. There is also little literature evaluating interventions initiated in the emergency department with this population. Findings of risk and protective factors for assault injury and feasibility of intervention initiated in the emergency department have important implications for health care to youth in primary care and emergency care settings.

Finally, much has been learned about implementation of a home and community-based intervention with pre and early adolescents and their parents. In addition, evaluation of the mentoring and parent involvement components of the intervention are important contributions of this study.

### **E. Policy Implications**

Potential policy implications include influence on 1) emergency department protocols and policies and 2) youth violence prevention strategies. As noted previously, protocols are needed to address the needs of assault-injured youth presenting to the emergency department just

as protocols exist for children with other injuries such as child abuse, self-inflicted injury or domestic violence. This study adds to the literature on home visitation, mentoring and parenting interventions, all “best practices” strategies identified by the Centers for Disease Control and Prevention. As these strategies are further tested and disseminated, this study contributes valuable experience with an important age population and sample.

Study investigators have been involved in the translation of research to policy and practice in by participation in policy briefings, legislative testimony, and organization of symposia bringing practitioners, policy makers and researchers together. For instance, Dr. Cheng organized a half-day symposium on “Best Practices in Youth Mentoring” in 2003 which was attended by almost 200 community program staff, researchers and policy makers.

## **F. Suggestions for further research**

Data analysis from this study is ongoing with effectiveness of this randomized intervention yet to be determined. Further research is needed on approaches to reach youth and families and testing of multi-level violence prevention strategies with this high risk population. Engagement of high risk youth and their families continues to be a challenge and the emergency department may be an important site of contact.

Further research on how to effectively engage high risk youth and parents into interventions is needed. Related to this project, a contract to develop and evaluate a mentor implemented youth intervention in inner city schools was developed by co-investigators on this study from the NICHD Prevention Research Branch. Dr. Cheng responded to the RFA and was awarded the five and a half year contract to extend concepts from this project to an urban school setting.

Finally, continued research is needed on prevention strategies including understanding the relative contributions of intervention components such as mentoring and parental involvement programs. Ultimately, if the study intervention is found to be effective, further work on dissemination strategies will be critical.

## **VI. List of Products**

### **A. Peer-reviewed Articles**

1. Cheng TL, Johnson SB, Wright JL, Brenner RA, Scheidt PA, Assault-injured adolescents presenting to the emergency department: proactive or reactive violence? Submitted for publication.
2. Braithwaite K, Wright JL, Menvielle E, Markakis D, Cheng TL. Symptoms of Posttraumatic Stress and Depression Among Assault Injured Youth. Submitted for publication.
3. Johnson SB, Frattaroli S, Wright JL, Fields CB, Ricardo I, Cheng TL. Inner city youths’ perspectives on violence and the necessity of fighting. **Injury Prevention**. 2004;10(5):287-91.
4. Cheng TL, Schwarz D, Brenner R, Wright JL, Field CB, O’Donnell R, Rhee P, Scheidt PC. Adolescent assault injury: risk & protective factors and locations of contact for intervention: A matched case-control study. **Pediatrics**. 2003;112(4):931-938.
5. Copeland Linder N, Cheng TL. Retaliatory attitudes among assault-injured youth presenting to the emergency department. In preparation.
6. Anixt J, Cheng TL. Attention Deficit Hyperactivity Disorder among assault-injured youth. In preparation.

### **B. Abstracts**

1. Cheng TL, Haynie D, Wright JL, Brenner RA, Simons-Morton B, Johnson SB. Assault-

- Injured Youth Presenting to the Emergency Department: A Sentinel Event/Teachable Moment for Intervention? **Ped Research 2005**. Platform presentation at the Pediatric Academic Societies Meeting, Washington, DC, May 2005.
2. Braithwaite K, Wright JL, Menvielle E, Markakis D, Cheng TL. Symptoms of Posttraumatic Stress and Depression Among Assault Injured Youth. Poster presentation at the American Public Health Association Meeting, Washington, DC, November 8, 2004.
  3. Cheng TL, Wright JL, Menvielle E, Markakis D. Randomized Trial of a Case Management Program for Assault-Injured Youth Presenting to the Emergency Department. **Ped Research 2004**;112A. Poster presentation at the Pediatric Academic Societies Meeting, San Francisco, CA, May 2004.
  4. Cheng TL, Brenner R, Wright JL, Sprague B, Barry S, Schwarz D, Scheidt PC, and the DC Child/Adolescent Injury Research Network. Recidivism in Adolescent Injury: The Emergency Department as a Location for Intervention. Platform presentation at the World Conference On Injury Prevention And Safety Promotion Conference, Vienna, Austria. June 2004.
  5. Solomon B, Wright JL, Menvielle E, Cheng TL. Services Utilization and Needs of Assault-Injured Youth. Poster presentation at the 2003 Pediatric Academic Societies Annual Meeting, Seattle, WA, May 2003.
  6. Solomon B, Wright JL, Menvielle E, Cheng TL. Parental Knowledge of Youth Fighting Behavior and Attitudes Toward Interpersonal Violence. Poster presentation at the 2003 Pediatric Academic Societies Annual Meeting, Seattle, WA, May 2003.
  7. Cheng TL, Fields C, Brenner R, Wright JL, Schwarz D, Rhee P, Scheidt PC. Assault-injured adolescents presenting to the emergency department: causes and circumstances of injury. **Pediatric Research 2000**. Poster Symposia presentation at the Pediatric Academic Societies Annual Meeting, Boston, MA, May 2000.
  8. Cheng TL, Schwarz D, Fields C, Wright JL, Brenner R, O'Donnell R, Rhee P, Scheidt PC. Risk and protective factors for adolescent assault injury: A case control study. **Pediatric Research**. Poster presentation to the 2000 Pediatric Academic Societies Annual Meeting, Boston, MA, May 2000.

### C. Presentations

#### Cheng TL

1. "Violence and the Emergency Department," 2000 National Congress on Childhood Emergencies, Baltimore, MD, March 27, 2000, workshop.
2. "An Educational Intervention to Improve Physician Violence Screening Skills," Robert Wood Johnson Generalist Faculty Scholars Annual Meeting, Carlsbad, CA, December 2000.
3. "Youth Violence Prevention: From Hospital to the Community," Children's National Medical Center Grand Rounds, December 2000.
4. "Youth Violence Prevention: From Hospital to the Community," Johns Hopkins University Department of Pediatrics Grand Rounds, September 2002.
5. "Best Practices in Youth Mentoring," Mentoring Symposium, Johns Hopkins University, January 2003. Conference convener, attendance: 180
6. "Youth Violence Prevention," Johns Hopkins University Welch Center Grand Rounds, February 2003.
7. "Community Mentors in Youth Violence Prevention: Evaluating Effectiveness," Plenary Speaker, Center for Sustainable Health Outreach Annual Meeting, Unity 2003, Biloxi, MS, March 13, 2003.

8. "Risk and Resilience in Youth Violence Prevention," Pediatric Trends Conference, Johns Hopkins University, April 2003.
9. "Youth Violence Prevention: From Hospital to Community," Bloomberg School of Public Health Population and Family Health Science Conference, December 2003.
10. "Youth Violence Prevention: From Emergency Department to Community," Pediatric Trauma Morbidity and Mortality Meeting, March 2004.
11. "Youth Violence Prevention," Mount Washington Hospital Distinguished Speaker Series, Baltimore, MD, July 2004.
12. Policy Briefing "The Power of Family, School and Community Connectedness in Reducing Youth Violence: Strategies That Work." Willard InterContinental Hotel, Washington, DC, November 17, 2004.
13. "Violence Prevention: Translation to Practice and Policy," Symposium: Report of the NIH State-of-the-Science Conference Statement: Preventing Violence and Related Health-Risking Social Behaviors in Adolescents and its implications for Baltimore and Maryland, Johns Hopkins Bloomberg School of Public Health, November 19, 2004.

**Wright JL**

1. "Child Survival: It Takes a Village," Global Youth Health Teleconference (Benin-Ghana-Senegal-Uganda-US), The World Bank and Howard University College of Medicine, 2000
2. "Violence Prevention," Grand Rounds, Department of Pediatrics, University of Illinois College of Medicine at Rockford, Rockford, IL, 2000
3. "The Many Faces of Adolescent Violence," Society for Adolescent Medicine, Arlington, VA, 2000
4. "Violence and the Emergency Department" National Congress on Childhood Emergencies, Baltimore, 2000
5. "The Impact of Hip-Hop Culture on Adolescent Health," Student National Medical Association Regional Conference, 2000
6. "Violence Prevention," Department of Pediatrics Grand Rounds, University of Pennsylvania and the Children's Hospital of Philadelphia, Philadelphia, PA, 2001
7. "EMSC and Violence Prevention," Kansas Pediatric Symposium, Kansas AAP Chapter/Kansas EMS Board, Wichita, KS, 2001
8. "Youth Violence Prevention: Hospital to Community," Emergency Medical Services for Children, Vienna, VA 2001
9. "Bullying Among Children and Youth: A Pediatrician's Perspective," American Medical Association, Washington, 2002
10. "Youth Violence Prevention: Hospital to Community," Pediatric Nursing Conference, Arlington, VA, 2002
11. "Nonfatal Gun Injuries: The Untold Story," Handgun Epidemic Lowering Plan (HELP) Network, Chicago, 2002
12. "Bullying," Amer Acad Pediatrics/Centers for Disease Control -Violence Prevention Symposium, Elk Grove Village, IL, 2003
13. "The Treatment of Intentional Injuries," AAP/CDC - Violence Prevention Symposium, Elk Grove Village, IL, 2003
14. "Bullying and Youth Violence: The Tip of the Iceberg?" Injury Free Coalition for Kids Conference, Fort Lauderdale, FL, 2003
15. "Adolescent Health Issues," 17<sup>th</sup> Annual Maternal and Child Health Conference, Dept of Health, Washington, DC, 2003

16. "Behavioral Issues in Primary Care," Catholic University of America – Behavioral Issues in Primary Care, Washington, DC, 2003
17. "Youth Bullying," 18<sup>th</sup> Annual Maternal and Child Health Conference, Dept of Health, Washington, DC, "Youth Bullying," 2003
18. "Youth Bullying: The Tip of the Iceberg," District of Columbia Department of Mental Health, Washington, DC, 2004
19. "Violence Prevention in the Emergency Department," Pediatric Academic Societies, Ambulatory Pediatrics Association, San Francisco, CA, 2004
20. "Bullying Prevention: What Have We Learned?" AAP National Convention and Exhibition, Washington, DC, 2005

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