

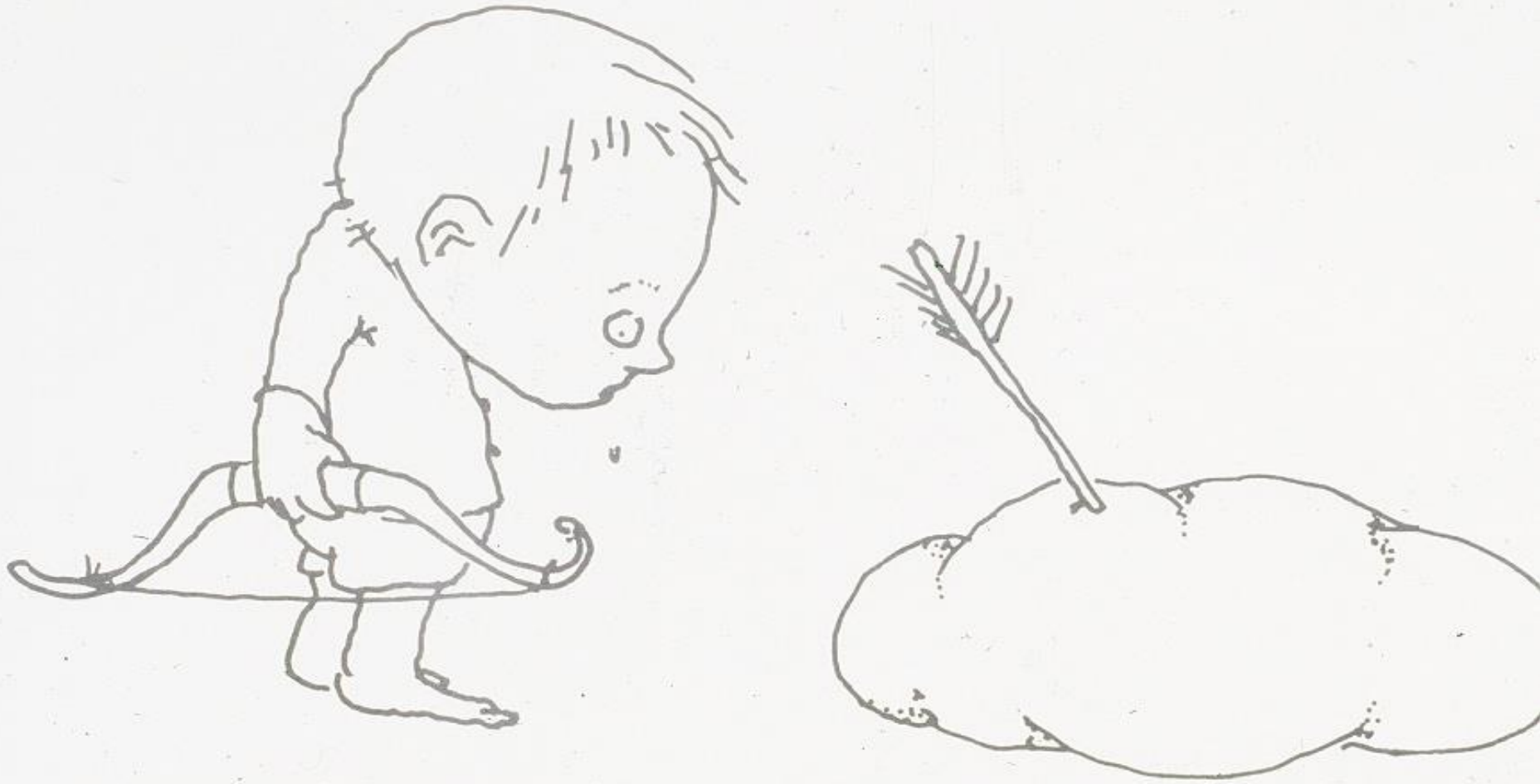
Life is Fragile

The Science of Injury, Violence & Recovery





Story of Injury, Violence & Recovery



Partners

- Charles Branas PhD, Epidemiology
- Joel Fein MD, Pediatrics
- Terry Guerra, Community Partner
- Sara Jacoby PhD, Nursing
- Nancy Kassam Adams PhD, Psychology
- John MacDonald, Criminology
- Catherine C. McDonald PhD, Nursing
- Zackary Meisel MD, Emergency Medicine
- C. William Schwab MD, Surgery
- Justine Shults PhD, Biostatistics
- Laura Tach PhD, Housing Policy/Cornell
- Nicole Thomas, Community Partner
- Douglas Wiebe PhD, Social Ecology



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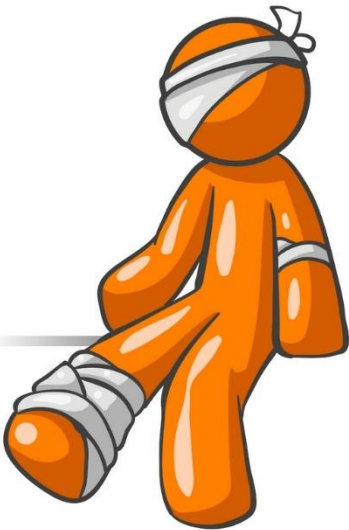
Why Injury Science?



- 1 out of 10 deaths in the world is due to injury
- 1 out of 10 adults seek care each year for injury



How do
people
recover after
traumatic
injury?



Predictors of Short-term Severe Post-injury Disability

Variable	OR	95% CI
Post Traumatic Intrusive Thoughts		
High (IES _{Int} ≥20)	2.9	1.1-7.7
Low (IES _{Int} <19) - ref		
Injury Type		
Extremity	2.9	1.2-6.9
All other - ref		
Education		
Non-HS grad	3.4	1.2-10
HS grad - ref		

N=109, prospective cohort, mean ISS 15.5, predominately MVC & violence

Response by the Surgical Community

“I believe this paper represents the first shot across the bow in the very important subject...I have difficulty with the language...the psychological jargon seems almost surreal to me when I try to relate it to my everyday practice.”

Fred Rogers MD
Respondent

“For the seat-of-the pants trauma surgeons who have difficulty with the psychobabble, we can handle trauma jargon so we can handle psych jargon I am sure...If I have been able to educate my trauma surgeon colleagues at HUP, I am sure that there is hope for the rest of the world.”

Terry Richmond

Richmond TS et al. (1998). A prospective study of predictors of disability at 3 months following non-central nervous system trauma. *J Trauma*, 44, 635-643.

The Changing Landscape

“We are remiss if we do not address acute psychological responses with the same steely resolve that we address airway, breathing, and circulation. No longer can psychological assessment be viewed as a ‘nice add-on.’ It must be integrated into the very essence of trauma care if we are to improve the outcomes of survivors of serious injury.”

Richmond TS. (2005). Editorial commentary. *J Trauma*, 59, 1335.

Predictors of Psychological Distress Following Serious Injury

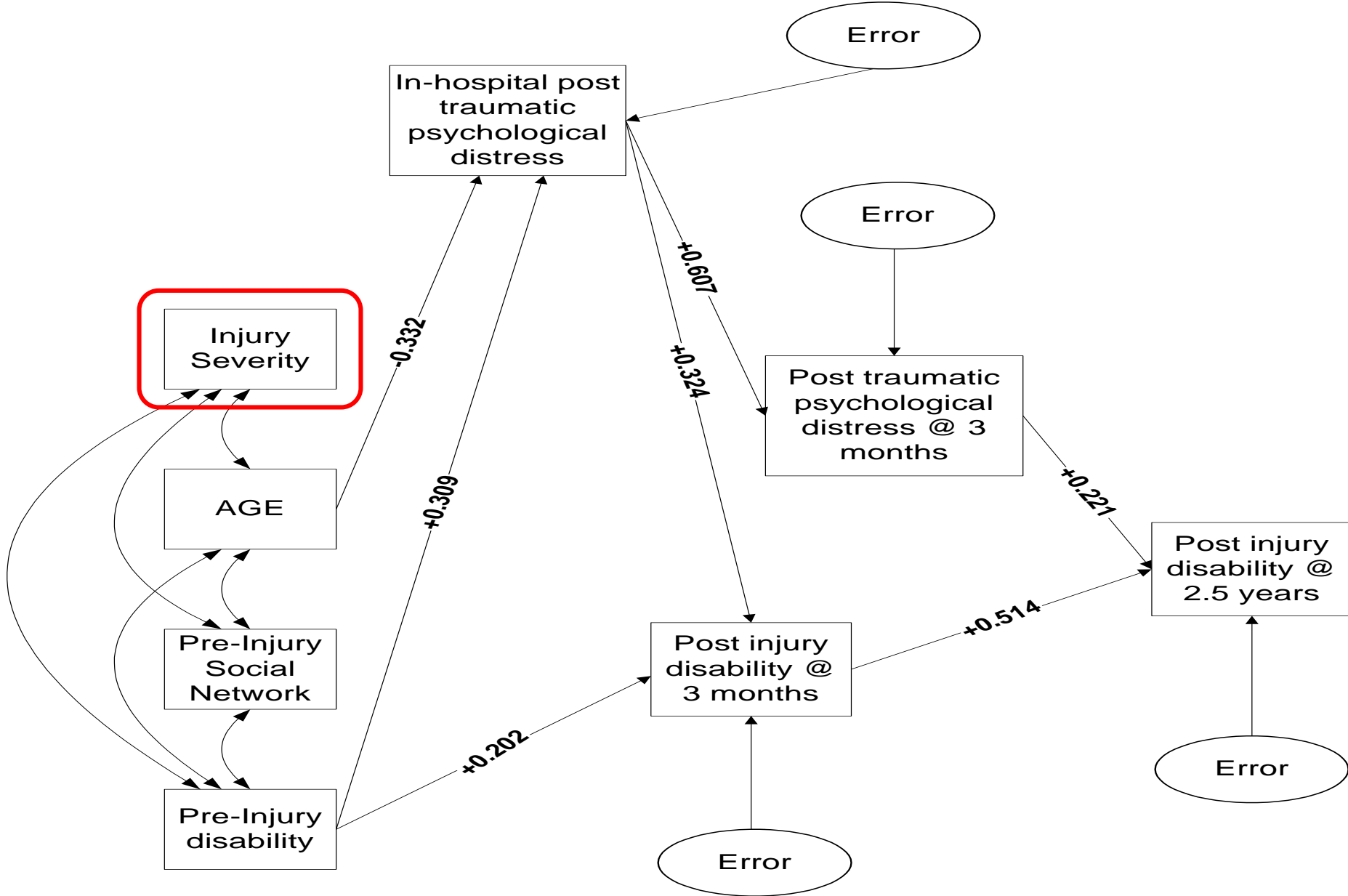
Therese S. Richmond^{1,3} and Donald Kauder²

Table 4. Variables Explaining Short-Term Postinjury Psychological Distress as Measured by the Impact of Event Scale ($N = 109$)

Variable	<i>B</i>	<i>SE B</i>	β
Impact of Event Scale, Time 1	0.62	0.09	.51*
Positive drug/alcohol screen	8.07	2.79	.21*
Age	-0.18	0.09	-.16*
Anticipate problems returning to activities	-5.78	2.69	-.15*
Sickness Impact Profile, Psychosocial dimension, Time 1	0.31	0.17	.13
Lives alone	-6.31	3.80	-.12
Social network, Time 1	-0.72	0.72	-.07
Body system with most serious injury	0.96	1.11	.06

Note. $R^2 = .52$; adjusted $R^2 = .49$, $F(7, 101) = 13.7$, $p < .01$.

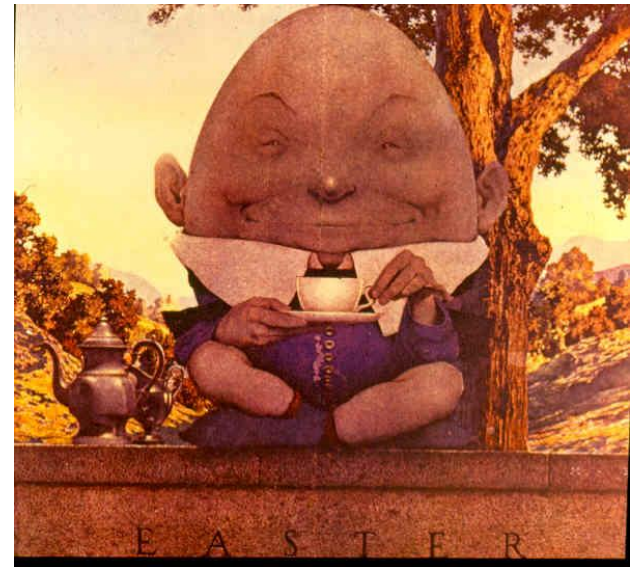
* $p < .05$.



Richmond TS et al. (2003). Early predictors of long-term disability after injury. *AJCC*, 12, 197-205.

Recovery from Injury

- Recovery from injury is not just physical
- Psychological effects are significant
- Those with psychological fallout have worse recovery



Journey towards recovery following physical trauma

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Posttraumatic Stress Confirmed



The biggest issue was one of confronting a near death experience...I had a difficult time confronting that. I'm careful about how I spend my time...my options have narrowed.

I'm thoughtful of where I walk in the city – it's a real part of my perspective. I was walking through ___ Square at night. I was scared, my heart rate was up.

A Surprise!

“...bouts with depression. I wouldn't get out of bed. I would only do the things I had to do.”

“[the traumatic event] had a sobering effect. It was emotionally draining. I've recovered from the physical injuries. Emotionally it has done a number on me.”

“It dramatically changed my life to a point that I got depressed. Wanted to kill myself-I got help.”

Depression & Injury

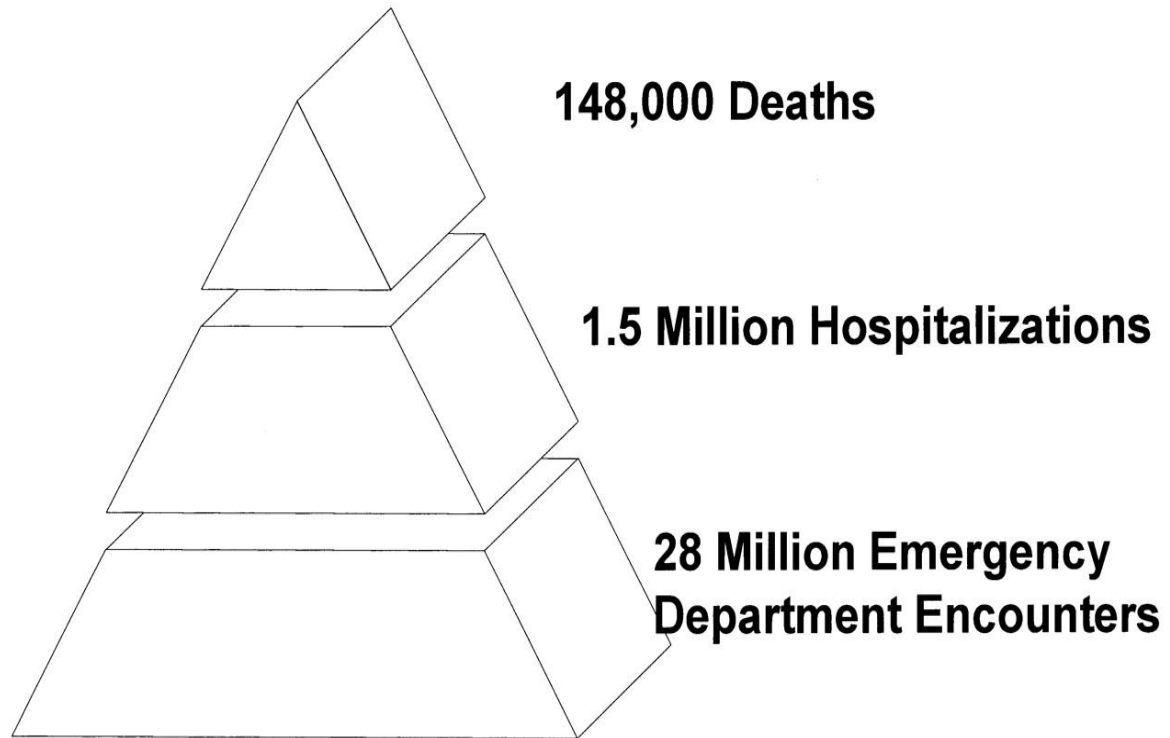
Major Depression after Minor Injury

NIH-R01MH63818

PI: Richmond

Why Minor Injury?

- Injury severity does not drive disability
- Injury severity does not drive psychological responses
- Psychological responses significantly affect recovery



Segui-Gomez, M. et al. Epidemiol Rev 2003 25:3-19.

Methods



Table 2. *Frequency of Axis I disorders present in the year after injury*

Disorder	Proportion of total sample (<i>n</i> = 248) <i>n</i> (%)	Diagnosed disorder as proportion of those with Axis I disorders (<i>n</i> = 57) <i>n</i> (%)
Mood	45 (18.1)	45 (78.9)
Major depression disorder		12/45 (26.7)
Depression, NOS		18/45 (40.0)
Dysthymia		15/45 (33.3)
Anxiety	7 (2.8)	7 (12.3)
PTSD		6/7 (85.7)
Generalized anxiety		1/7 (14.3)
Substance abuse	9 (3.6)	9 (15.8)
Alcohol		6/9 (66.7)
Drug		3/9 (33.3)

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

Results

<u>Outcome</u>	<u>Depressed</u>	<u>Adjusted Odds Ratios (95% Confidence Intervals)</u>		
		3 months	6 months	12 months
ADL lower than pre-injury	Yes	3.17 (1.25, 8.01)*	4.09 (1.80, 9.27)***	8.37 (3.78, 18.53)****
	No	Reference	Reference	Reference
IADL lower than pre-injury	Yes	1.56 (0.64, 3.81)	3.20 (1.48, 6.93)*	3.25 (1.44, 7.31)**
	No	Reference	Reference	Reference
Fewer social activities than pre-injury	Yes	1.98 (0.83, 4.75)	3.98 (1.89, 8.38)***	3.08 (1.42, 6.70)**
	No	Reference	Reference	Reference
Social interaction lower than pre-injury	Yes	9.34 (2.26, 38.6)**	3.41 (1.29, 9.02)*	6.48 (2.35, 17.89)****
	No	Reference	Reference	Reference
No return to work (n=171)	Yes	1.08 (0.91, 1.28)	3.30 (1.20, 8.90)*	3.60 (1.30, 9.90)*
	No	Reference	Reference	Reference

*p<.05; **p<.01, ***p<.001; ****p<.0001

Results

<u>Outcome</u>	<u>Depressed</u>	<u>Adjusted Odds Ratios (95% Confidence Intervals)</u>		
		3 months	6 months	12 months
More bed days due to illness/injury – month before interview	Yes No	2.66 (1.11, 6.37)* Reference	3.59 (1.62, 7.95)** Reference	2.41 (1.15, 5.07)* Reference
More days-cut down on usual activities for $\geq \frac{1}{2}$ day in month before interview	Yes No	2.64 (1.16, 6.02)* Reference	1.39 (0.64, 3.04) Reference	2.89 (1.30, 6.45)*** Reference
Connects less frequently with friends or relatives than pre-injury	Yes No	2.43 (0.96-6.12) Reference	1.18 (0.53, 2.63) Reference	2.36 (1.02, 5.49)* Reference

Adjusted for age, gender, marital status, education, injury type, injury intent, injury location, pre-injury level of function, past and current DSM IV disorder, number of injuries treated in ED over life, social network, satisfaction with social support and anticipation of problems due to injury

*p<0.05; **p<0.01; *** p<0.001



CLINICAL SCHOLARSHIP

The Effect of Postinjury Depression on Quality of Life following Minor Injury

Therese S. Richmond, PhD, CRNP, FAAN¹, Wensheng Guo, PhD², Theimann Ackerson, MSSW³, Judd Hollander, MD⁴, Vicente Gracias, MD⁵, Keith Robinson, MD⁶, & Jay Amsterdam, MD⁷

Table 1. Comparison of Depressed and Nondepressed Patients on Quality of Life Index (QLI) Scores at 3, 6, and 12 Months Postinjury

Variable	Depressed mean (SD)	Nondepressed mean (SD)
	3 mo, <i>n</i> = 30	3 mo, <i>n</i> = 210
	6 mo, <i>n</i> = 42	6 mo, <i>n</i> = 189
	12 mo, <i>n</i> = 45	12 mo, <i>n</i> = 190
Total QLI score		
3 mo	17.2 (5.44)*	23.4 (4.41)
6 mo	16.8 (5.97)*	24.7 (6.31)
12 mo	18.1 (5.35)*	24.1 (4.13)

Higher QLI scores reflect higher levels of quality of life. Significance: **p* < .001.

Table 2. Multivariate General Estimating Equation Model of Quality of Life Index Scores in the Year Following Injury

Variable	Beta estimate	Standard error	95% Confidence interval
Depression			
Yes	-4.2072	0.7225	-2.7910, -5.6234 ^c
No (ref)			
Time	0.0161	0.0061	0.0041, 0.0280 ^a
Anticipate problems after discharge			
No	1.7377	0.4459	0.8638, 2.6117 ^c
Yes (ref)			
Satisfaction with pre-injury health			
Very dissatisfied	-4.4553	1.4493	-7.2960, -1.6147 ^a
Dissatisfied	-6.1067	1.1183	-8.2986, -3.9148 ^c
Not sure	-4.125	0.8662	-5.8262, -2.4308 ^c
Very satisfied (ref)			
No. of days where activities were cut down because of health in the month before injury	0.2650	0.0839	0.1005, 0.4295 ^b
Social network	1.6739	0.4684	0.7559, 2.5919 ^b

Note. Referent Group = . ^a*p* < .01, ^b*p* < .001, ^c*p* < .0001.

The Problem



Carolee Bennett Sherwood

Predictive Screener

BEFORE THIS INJURY:	Yes	No	Depression	PTSD
Has there ever been a time in your life you have been bothered by feeling down or hopeless, or lost all interest in things you usually enjoyed for more than 2 weeks?	1	0		
WHEN YOU WERE INJURED OR RIGHT AFTERWARDS:				
Did you feel really helpless?	1	0		
Did it seem unreal or like it was happening in a dream or slow motion?	1	0		
SINCE YOUR INJURY				
Have you wanted to (or tried hard to) stay away from things that remind you of what happened?	1	0		
Have you been staying away from people, even people you are usually close to?	1	0		
Are you worried about money because of what happened?	1	0		
Since you were hurt, have you been worried because you had trouble keeping your mind on things?	1	0		
Is there someone who has responded badly when you told them about what happened?	1	0		
Total (Sum the number in each column)				
			≥2 is positive for Depression	≥3 is positive for PTSD

Predicting the future development of depression or PTSD after injury[☆]

Therese S. Richmond, Ph.D, C.R.N.P.^{a,*}, Josef Ruzek, Ph.D^b, Theimann Ackerson, M.S.S.W.^c,
Douglas J. Wiebe, Ph.D^d, Flaura Winston, M.D., Ph.D^e, Nancy Kassam-Adams, Ph.D^e

T.S. Richmond et al. / General Hospital Psychiatry 33 (2011) 327–335

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Table 5

Performance of the predictive screener at set cut points for both significant symptoms of each disorder and for diagnosis of each disorder

	Sensitivity	Specificity	Positive predictive value	Negative predictive value	ROC (95% CI)
Significant depressive symptoms	0.73	0.71	0.38	0.92	0.78 (0.71–0.84)
Depression diagnosis	0.81	0.71	0.34	0.95	0.81 (0.75–0.87)
Significant posttraumatic stress symptoms	0.85	0.74	0.38	0.96	0.84 (0.78–0.89)
PTSD	1.00	0.66	0.07	1.00	0.81 (0.74–0.86)

In development sample, 37% would have screened positive for depression; 36% for PTSD, & 25% for both

Scholarly Calling Card

DISCUSSION PAPER

A model to advance nursing science in trauma practice and injury outcomes research

Therese S. Richmond & Leanne M. Aitken

Accepted for publication 26 Apr

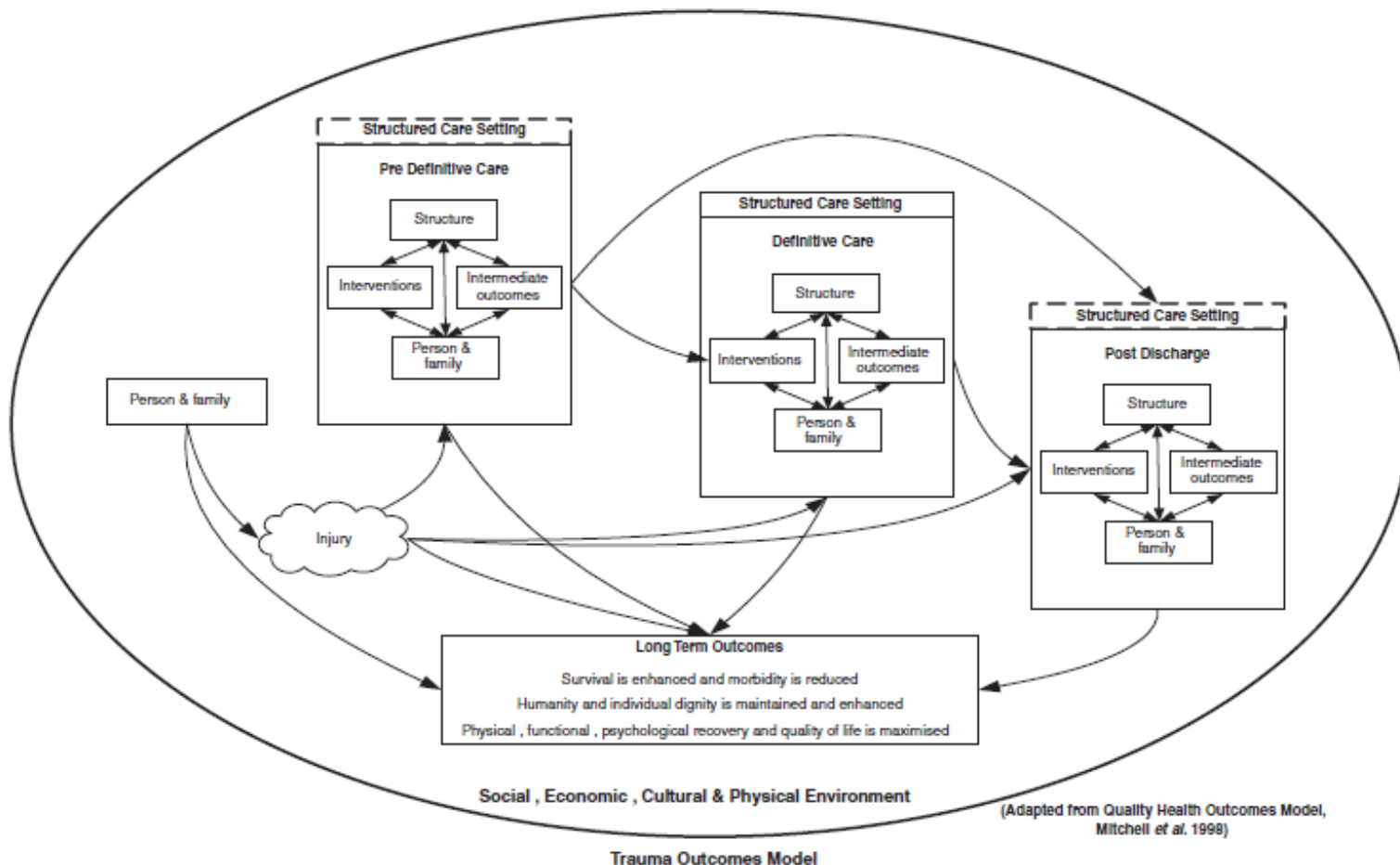


Figure 1 Trauma outcomes model.

Influence of Research

A NATIONAL TRAUMA CARE SYSTEM

Integrating Military
and Civilian Trauma
Systems to Achieve

Z E R O
Preventable
D E A T H S
After Injury

Committee on Military Trauma Care's Learning Health System :
Its Translation to the Civilian Sector

Donald Berwick, Autumn Downey, and Elizabeth Cornett, *Editors*

Board on Health Sciences Policy

Board on the Health of Select Populations

Health and Medicine Division

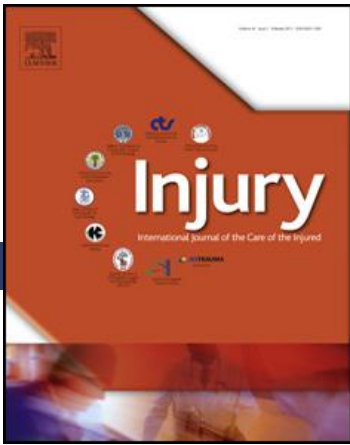
The National Academies of

SCIENCES · ENGINEERING · MEDICINE

Patient-Centered Trauma Care

In a learning health system, the central focus is on those being served. A learning trauma care system ensures patient-centeredness by structuring trauma care around the patient experience and proactively engaging patients, families, and communities. The adoption of a patient-centered approach supports the following long-term outcomes:

- “survival is enhanced and morbidity is reduced;
- humanity and individual dignity are maintained and enhanced; and
- physical, functional, and psychological recovery and [quality of life] are maximized” (Richmond and Aitken, 2011, p. 2748).



Indicators of injury recovery identified by patients, family members and clinicians

Leanne M. Aitken, RN, PhD, Professor^{a,b,c,*}, Wendy Chaboyer, RN, PhD, Director^d, Carol Jeffrey, RN, MHSc, Clinical Nurse Consultant^e, Bronte Martin, RN, MNurs, Nursing Director (Trauma & Disaster)^f, Jennifer A. Whitty, BPharm(Hons) GradDipClinPharm PhD, Professor^{g,h,i}, Michael Schuetz, FRACS, Dr.med. Dr.med.habil., Professor and Chair for Trauma- and Reconstructive Surgery & Director of the Centre for Musculoskeletal Surgery^j, Therese S. Richmond, PhD, CRNP, FAAN, Andrea B. Laporte Professor of Nursing, Associate Dean for Research & Innovation^k

▪ Purpose

- To determine what patients, families & clinicians considered indicators of successful recovery after hospitalization for acute injury and how these changed over 3 months

▪ Design

- Prospective, follow-up using qualitative methods
- Individual interviews
 - 33 patients
 - 22 family members
- Focus groups
 - 40 clinicians

Indicators of Recovery

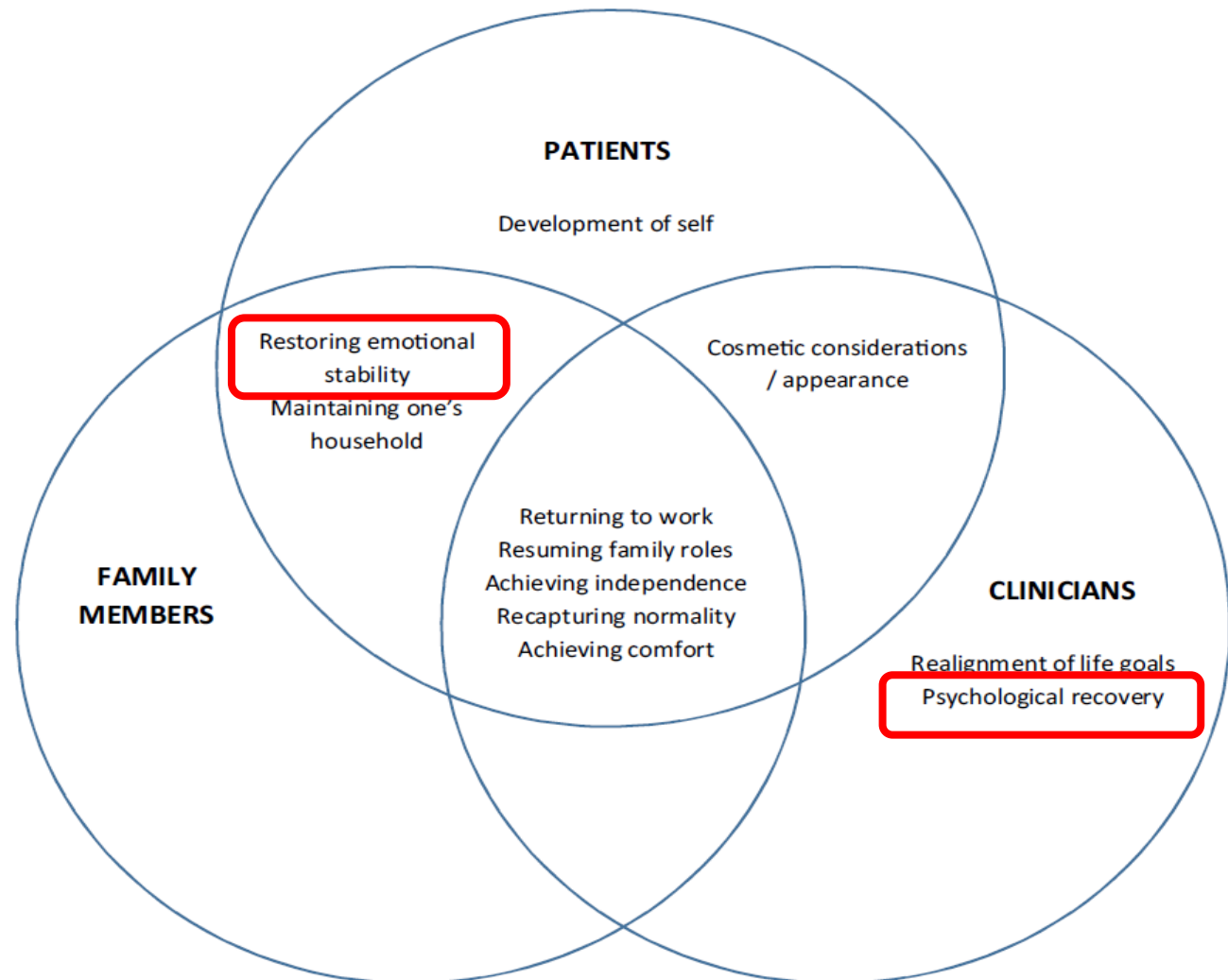
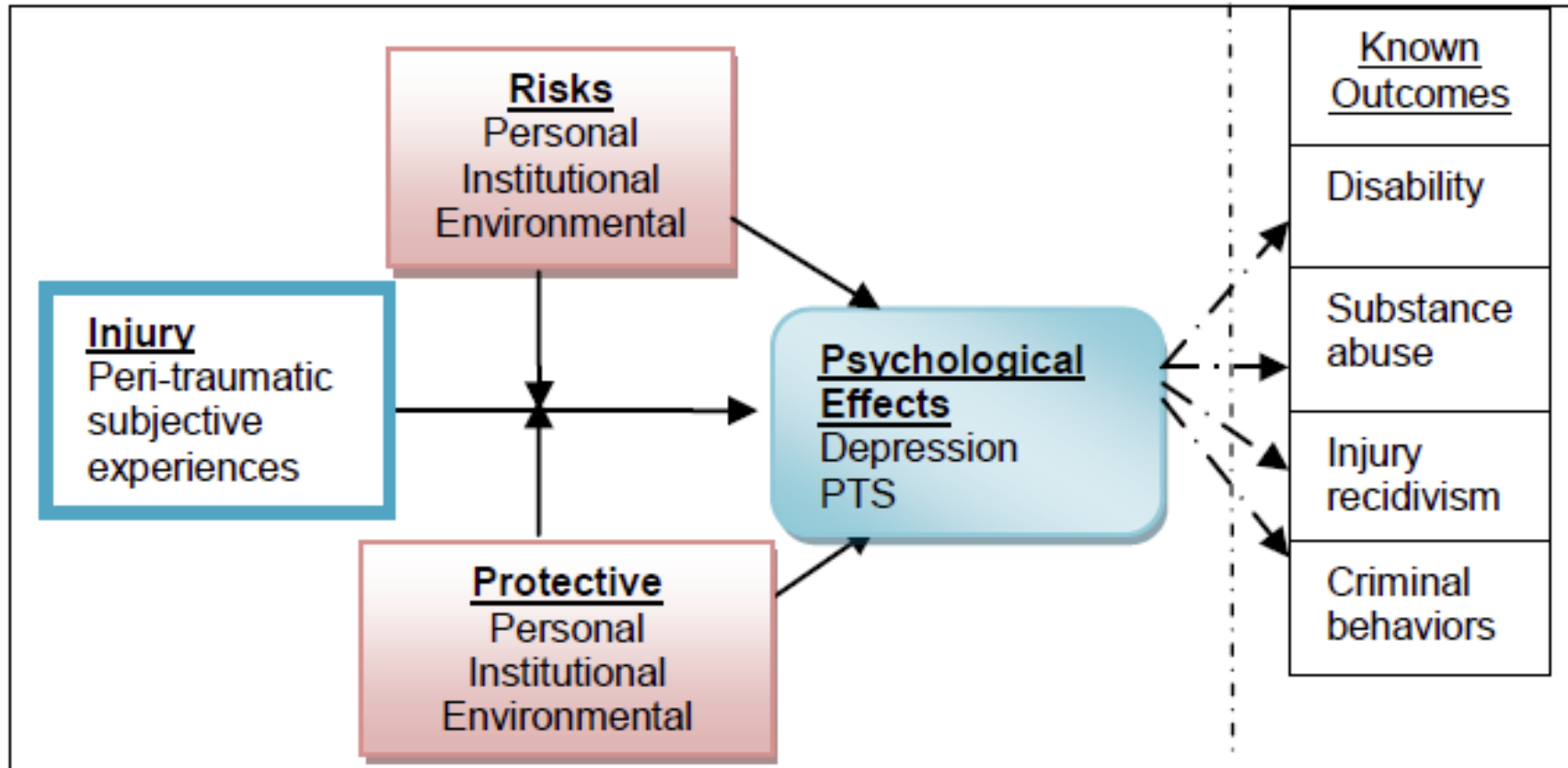


Fig. 1. Priorities of recovery identified by stakeholders.

Psychological Effects of Injuries in Urban Black Men



NIH R01NR013503, PI: Richmond

Injury - Not An Isolated Event



- Previous trauma
 - Community violence exposure
 - Adverse Childhood Experiences (ACEs)
 - Sexual assault
 - Domestic violence
 - War
 - Previous injuries

Early Childhood Trauma

▪ Purpose

- To identify the burden of ACEs in seriously injured urban Black men
- To examine the contribution of adverse childhood experiences (ACEs) to PTSD & depression

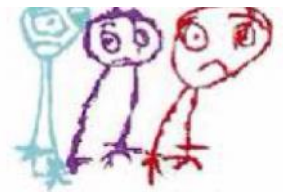
▪ What are ACEs?

- Psychological abuse by an adult
- Physical abuse by an adult
- Sexual abuse by an adult or person at least 5 years older
- Substance abuser in household
- Mental Illness/suicide attempt in household
- Domestic violence in household
- Criminal behavior in household

Richmond et al., ACES contribute to psychological recovery in injured Black Men. (Abstract). National Institute of Minority Health & Disparity.

Preliminary Results

- Sample (n=320)
 - mean age 36.8 years
 - Mechanism
 - Intentional 50%
 - Unintentional 50%
 - Education
 - 50% HS graduation
 - 28% more than HS
 - Income
 - 46% <\$20,000/year
 - Employed
 - 50% full-time or part-time
- Number of Aces
 - 81% reported at least 1 ACE
 - 45% reported ≥ 3 ACEs
- ACEs independently associated with
 - More severe depression symptoms
 - More severe PTSD symptoms



"It shouldn't hurt to be a child."

Big Picture: What we know

- Recovery from injury is not just physical
- Psychological effects are significant
- Those with psychological fallout have worse recovery

- Injury does not occur in isolation – a lifetime of experiences affects outcomes
 - Care processes should take this into account - Do they?

Seriously Injured Urban Black Men's Perceptions of Clinical Research Participation

Marta M. Bruce¹ · Connie M. Ulrich¹ · Nancy Kassam-Adams² · Therese S. Richmond¹

Human connection	Bottled up, let it out, talk to someone, tell my story, share my story, share my experiences, express myself, good to tell someone about it, let you know how I felt
Altruism/community	to help, my community [family, other victims, other people, others in this situation, other crime victims, others who have been through this], pass it forward, for future research
Self-improvement	heal, recovery, improve myself, get better, change, grow
Gaining knowledge	understand [learn, discover] about injuries [wounds, brains], how do wounds heal, how do brains recover, learn about research studies
Compensation	gift card, groceries, money, assistance, financial
Reciprocity	because you were nice [kind, pleasant] to me, because you [the study, the research] helped me
Low risk	no harm in it, could not hurt, I would not do [needles, medicines, drugs, procedures, tests, experiments] but I would do this again [answer questions, talk to researcher, participate in a study]

Emotional Symptoms & Help-seeking

I can't do nothing. I feel like I'm helpless.
I feel like, damn, then I had thoughts.
I wasn't thinking about suicide...
I was thinking about 'yeah I want to live'
and sometimes I was like 'nah'.
It's just crazy. Like sometimes I don't.

I wake up and like have anxiety
attacks in the middle of night.
I just be thinking about it.
My mind is going to a thousand
and one places.

I don't want to end up in a strait
jacket.
Or someone telling me I'm crazy....
That I'm a harm to myself or others.
Because I'm not.

Jacoby...Richmond. "Sharing things with people that I don't even know: Help-seeking for psychological symptoms in injured Black men in Philadelphia. Under review.

Trauma-informed Care

- ▶ Goal: reduce the impact of emotional & psychological trauma on all people within a system of care
- ▶ Four central elements:
 - Realize the widespread impact of trauma
 - Recognize how trauma may affect patients, families, staff, and others in the system
 - Respond by applying TIC knowledge into practice
 - Prevent retraumatization

Universal Precautions

Universal precautions means

Observing “Universal Precautions” means you consider all human blood and certain human fluids infectious for all blood borne pathogens.



Universal Precautions means

Observing “Universal Precautions” means you consider all individuals presenting for health care to have experienced trauma in the distant or recent past.



Injury is not just Physical

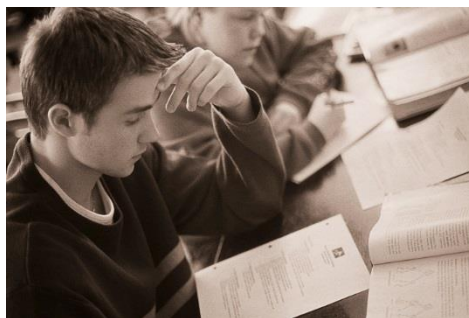
- What is the impact of living in violent communities?
- Does place matter?



Living in Pervasively Violent Communities



Increased risk of violent offending¹



Poorer Academic Performance



Increased depression, suicidal ideation, suicide attempts²

¹Nofziger & Kurtz. (2005). *J of Research in Crime & Delinquency*. ²Lambert et al. (2008). *J Adolescent Health*.

Community Violence Exposure and Positive Youth Development in Urban Youth

Catherine C. McDonald · Janet A. Deatrick ·
Nancy Kassam-Adams · Therese S. Richmond

- Convenience Sample of 110 youth between the ages of 10-16 year
 - 96% African American; Girls (54%), Boys (46%)
 - Mother in the home (80%), Father in the home (31%)
- Child's Report of Exposure to Violence (CREV)¹
 - Hearing
 - Witnessing
 - Experiencing

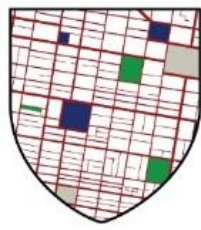
Table 1 Community violence exposure percentages by type

Type of CVE	<i>n</i> (%)
<i>Total CVE</i>	102 (97%)
Hearing about	103 (95%)
Hearing about stranger	102 (93%)
Hearing about familiar	102 (93%)
Witnessing	95 (87%)
Witnessed stranger	84 (77%)
Witnessed familiar	85 (78%)
Direct victimization	58 (54%)
Never been victimized	50 (46%)
Victimized once	17 (16%)
Repeated victimization (≥ 2 times)	41 (38%)

Nursing Science

Injury accounts out of 1 out of every 10 deaths

- Prevent injuries
- Preempt negative effects
- Personalize interventions
- Address both the physical and psychological trauma



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<http://www.penninjuryscience.org>

