

# Repeat Victims of Violence

## Report of a Large Concurrent Case-control Study

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**Hypothesis:** Repeat victims of violence (violence victim recidivism) is a phenomenon known throughout the nation by those who work in hospital emergency departments. A level I trauma center in Baltimore, Md, conducted this study to investigate the postulated risk factors for repeat victims of violence, ie, unemployment, limited educational attainment, and involvement with illicit drug use or drug dealing.

**Design:** A case-control study identified 200 cases and 224 controls during a 16-month period. Cases were persons admitted with traumatic injury secondary to violent assault who had been previously hospitalized for a similar reason. Controls were a random selection of eligible age- and sex-matched patients admitted for reasons unrelated to violent injury.

**Results:** Prominent risk factors associated with recidivism were African American male, median age 31 years, unemployed, lacking medical insurance, annual income less than \$10000, current drug user, past or present drug dealer, and a positive test for psychoactive substances on admission to the hospital. One hundred seventy-two (86%) of the cases felt that disrespect (called “dissing” in the local vernacular) was involved with their injury.

**Conclusions:** The multiplicity of risk factors and the fact that they are interrelated mandate a comprehensive approach to the difficult problem of violence recidivism. Experiments in hospital-based intervention strategies are needed.

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**V**IOLENCE AND its sequelae have become major public health problems in the United States, particularly in urban neighborhoods of large cities. Homicide is the leading cause of death nationally among African American males aged 15 to 34 years.<sup>1</sup> In Baltimore, Md, population 712209 (1995), the statistics are equally grim.<sup>2</sup> In 1998, the city of Baltimore reported 7605 nonfatal assaults and 315 homicides, 50% involving handguns.<sup>2</sup> New information concerning the rate of repeated hospital admissions suggest it is inaccurate to consider trauma a single lifetime event; it is a recurrent problem for many individuals.<sup>3,4</sup> Repeated violence-related trauma, or recidivism, constitute between 10% and 45% of all trauma admissions caused by violence.<sup>4,5</sup>

Limited information exists concerning the “revolving door” phenomenon experienced at trauma centers. A few studies have attempted to identify group differences between trauma victims with 1 trauma admission and those with 2 or more trauma admissions (recidivism). In some studies, data on risk factors have been gathered using medical record

abstraction following discharge from the hospital.<sup>3,4,6-8</sup> Others used patient interviews to obtain needed information (**Table 1**).<sup>4,9,10</sup>

### See Invited Critique at end of article

The violent trauma recidivists tend to be African American males, between the ages of 25 and 29 years, unemployed, and uninsured.<sup>4,6,7,10,11</sup> One study found that the cost of care for violent trauma recidivists was significantly higher than those for first-time trauma victims.<sup>4</sup> Cases also tend to exhibit more violent behaviors providing support for other studies that suggest that the victim may also be a perpetrator of crime.<sup>12,13</sup> An increasing number of violent trauma incidents seem to be related to increasing rates of substance abuse.<sup>3,11</sup>

Dowd et al<sup>8</sup> discussed hospitalizations for injury in New Zealand and examined prior injury as a risk factor for assaultive injury. Their population differed from those studied in the United States because it consisted of preponderantly white individuals. The proportion of unemployed was higher in the assaultive injury group than other groups exam-

## PATIENTS AND METHODS

The goal of the study was identification and investigation of risk factors for repeated hospitalization caused by violent injury using the case-control method. Another aim of the investigation was to gain information to help the subsequent design of effective intervention and prevention programs.

Cases were defined as patients aged 18 years or older who were admitted to the University of Maryland Medical System—R. Adams Cowley Shock Trauma Center (UMMS-STC), Baltimore, for injury secondary to violent assault between June 22, 1995, and October 31, 1996, and who had been hospitalized previously for violent injury.

Eligible controls were patients admitted for unintentional, nonviolent trauma chosen at random from the UMMS-STC daily admission log. The controls were frequency-matched to the cases based on an expected distribution estimated from a previous pilot study. Controls were individually matched to cases by age ( $SD = \pm 3$  years) and sex.

Data on potential risk factors for violent injury were collected prospectively by personal interview and medical record abstraction. The study coordinator and a UMMS-STC physician performed case selection, interviews, and medical record abstractions. Potential cases were identified through systematic checks of the UMMS-STC computerized daily admission log, which showed the nature of the injury (related to violence vs unrelated to violence). All patients with violence-related injury were considered potential cases. The status of each patient was monitored closely by periodic visits until the interviewer judged recovery was sufficient to permit an interview after informed consent was obtained from the patient. Patients sustaining self-inflicted injuries or severe head injuries that led to brain damage and patients with a history of severe psychiatric disorder were ineligible for inclusion in the study. Eligibility (recidivism) was assessed by asking the patient a series of preliminary questions related to the cause of their current injury and their history of

hospitalization because of violence-related injury. Patients whose current injury was confirmed to be a result of violence and who had a history of hospitalization(s) for violence-related injuries were asked to participate in the study. Enrollment entailed informing the patients about the goals of the study, reading them a consent form (approved by the university institutional review board), and assuring the confidentiality of information gathered. All interviews were completed before hospital discharge and data were encrypted to assure confidentiality.

Face-to-face interviews were conducted with both cases and controls. The previously pilot-tested questionnaire, consisting of 112 questions, required approximately 40 minutes to administer. It was designed to collect detailed information on patient demographic characteristics, employment history, place of residence and neighborhood characteristics, family background, history of childhood abuse, substance abuse, incarcerations, past violence-related experiences, relationship of victim to perpetrator, and other relevant data. Victims were also asked how they might reduce their chance of future violence-related injury.

Psychoactive drug use was detected from the routine toxicologic screening for other drugs and alcohol carried out on all trauma victims on hospital admission. The tests screened for ethanol, acetaminophen, barbiturates, tricyclic antidepressants, acetone, methyl alcohol, isopropyl alcohol, amphetamine, cannabinoids, cocaine, methadone, opiates, phencyclidine, phenothiazine, salicylate, and propoxyphene. In addition, the personal interview captured current and past substance abuse patterns, including substance use at the time of the incident.

Risk factors for repeated violent trauma were identified by calculating odds ratios (ORs) and a 95% confidence interval. Univariate statistics were computed and significance tests applied:  $\chi^2$  for categorical variables and  $t$  test for continuous variables.<sup>14</sup> Stratified variables were analyzed using the Mantel-Haenszel  $\chi^2$  test.<sup>15</sup> The Statistical Analysis Software (SAS Inc, Cary, NC) system was employed for all statistical calculations.

ined in the study. Dowd et al<sup>8</sup> concluded that hospitalization as a result of interpersonal violence was a significant marker of risk for subsequent hospitalization (likely to occur within 30 days of the initial injury). The likelihood of recidivism has been shown to increase with the number of repeated admissions for violent trauma.<sup>10</sup> Thus, eg, an individual who has been admitted thrice for violent trauma has a much higher probability of being admitted for violence-related trauma in the future than an individual who has been admitted only twice.

The studies cited were helpful in providing information about the relatively new social phenomenon of violent trauma recidivism. Most studies obtained information solely from medical records, which limits the amount of information gained concerning patient life experiences, the neighborhood in which he or she lived, and other personal information.<sup>3,4,6-8</sup> The 2 studies that used patient interviews to obtain information had few subjects.<sup>4,9</sup> Designing effective intervention programs requires detailed personal information about victims of recurrent trauma and much of this information can only be obtained by personal interview.

**Table 1. Studies of Recidivism by Source, Type, and Size**

Source, y	Method of Data Collection	No. of Recidivists in Study
Weisbeski-Sims et al, <sup>3</sup> 1989	Retrospective medical record review	715
Morrisey et al, <sup>7</sup> 1991	Retrospective medical record review	127
Smith et al, <sup>6</sup> 1992	Retrospective medical record review	342
Goins et al, <sup>4</sup> 1992	Retrospective medical record review	76
Dowd et al, <sup>8</sup> 1996	Historical cohort medical record review	289
Reiner et al, <sup>9</sup> 1990	Concurrent case-control (with patient interviews)	32
Goins et al, <sup>9</sup> 1992	Prospective (with patient interviews)	35
Schwarz et al, <sup>10</sup> 1994	Prospective medical record review	1259

To our knowledge, our study is the largest concurrent case-control investigation of the recidivism problem that comprehensively interviews each victim of vio-

**Table 2. Descriptive Statistics by Case-control Status**

Variable	No. (%)		P*	Odds Ratio (95% Confidence Interval)†
	Cases (n = 200)	Controls (n = 224)		
Demographics				
Race				
African American	167 (83.5)	56 (25.0)	.001	15.2 (9.4-24.6)
White	33 (16.5)	166 (74.0)		...
Other	0	2 (1.0)		...
Age, y (median)	31 (9.9)	30 (9.9)	.99	...
Married	22 (11.0)	70 (25.0)	.001	0.27 (0.2-0.5)
Any children	124 (62.0)	108 (48.2)	.004	1.8 (1.2-2.6)
Live with children	46 (33.1)	74 (60.7)	.001	0.32 (0.2-0.5)
Never completed high school	97 (49.0)	46 (20.5)	.001	3.7 (2.4-5.7)
Unemployed	126 (63.0)	58 (25.9)	.001	4.9 (3.2-7.4)
Income in thousands, \$				
<10	80 (47.3)	22 (11.1)		12.1 (6.6-22.1)
>10 but <30	54 (31.9)	61 (20.7)		
≥30 (reference)	35 (20.7)	116 (58.3)	.001	1
Relationship with parents				
Raised by 1 parent/extended family	128 (64.0)	47 (21.0)	.001	6.7 (4.4-10.3)
Housing				
Public/subsidized housing	62 (32.6)	9 (4.0)	.001	11.6 (5.6-24.1)
Length of time at residence <5 y	127 (63.5)	118 (52.7)	.02	1.5 (1.1-2.3)
Health insurance/public assistance				
No health insurance	138 (70.8)	71 (32.3)	.001	5.1 (3.3-7.7)
Social services benefits	53 (26.5)	31 (13.8)	.001	2.3 (1.4-3.7)
Prior convictions				
Ever in jail	159 (80.3)	66 (29.5)	.001	9.8 (6.2-15.4)
Length of jail time, median (SD), mo	6 (45.1)	0.6 (22.1)	<.01	

\*From  $\chi^2$  for categorical variables and from analysis of variance for continuous variables.

†Ellipses indicate no data available.

lence and a control group. Specifically, our investigation gathers information about the characteristics of violent trauma recidivists, the details of the violent incident, and the patients' views on how they might decrease their risk of future hospitalization for violent trauma.

## RESULTS

Data collection for 200 cases and 224 controls was completed on October 31, 1996. Descriptive statistics for cases and controls are given in **Table 2**. Of the 200 cases, 84% were African American and the median age of the case group was 31 years. Only 22 cases (11%) were married. One hundred twenty-four cases (62%) acknowledged having children, but only 41 cases (33%) of the 62% lived with their children. By contrast, 56 controls (25%) were married, 107 controls (48%) had children, and 137 controls (61%) lived with their children ( $P=.001$ ). Ninety-eight cases (49%) never completed high school compared with 47 controls (21%) ( $P=.001$ ). The cases were 5 times more likely to be unemployed compared with controls. Cases were 12 times more likely to live below the poverty level with an annual income of less than \$10000 ( $P=.001$ ). Only 72 cases (36%) were raised by both of their parents compared with 177 controls (79%) ( $P=.001$ ). Sixty-six cases (33%) lived in public or subsidized housing compared with only 9 controls (4%) ( $P=.001$ ). Cases were 5 times more likely than the controls to be uninsured. One

hundred sixty cases (80%) had been previously incarcerated for a mean length of 6 months. Sixty-seven controls (30%) had been incarcerated for a mean length of 18 days ( $P=.001$ ). The corresponding ORs reveal cases were 10 times more likely to have ever been in jail than controls.

Most of the violent incidents occurred in the evening, outdoors, and on the street for both cases and controls. One hundred two cases (51%) were admitted while under the influence of alcohol or other drugs at the time of injury in contrast with 43 controls (19%). One hundred fifty-two cases (76%) stated that they thought the perpetrator was under the influence of alcohol or other drugs. The most common anatomical site of injury for the cases was the head followed by chest, lower extremities, and abdomen.

In 170 cases (85%) the assault was known to the police, and 176 cases (88%) were assaulted with a weapon. Two percent of the incidents were committed by a spouse, 4% by a boyfriend or girlfriend, 1% by a relative, and 41% by an acquaintance, coworker, or other known assailant. One hundred four cases (52%) claimed that they did not know their attackers (**Table 3**).

The most common injury for the cases was a gunshot wound (92 cases [46%]), followed by beating (52 cases [26%]), and stabbing (40 cases [20%]). The "other" category included incidents such as "run down by a car" and "pushed out of a window." In only 54 cases (27%) were the attackers trying to take something from the vic-

tims. One hundred seventy-two cases (86%) felt that disrespect (called “dissing” in the local vernacular) was involved in their attack. Many cases stated that the violent incident occurred because they showed disrespect to another man by looking at his girlfriend

or because they bumped into someone at a bar. Cases believed they were more likely to experience another violence-related injury within the next year compared with their peers of the same age and sex. When asked what factors increased their chance of personal injury, most cases said involvement in drug use or drug distribution increased their chance of future violence-related injury. Fifty-four cases (27%) said living in a bad neighborhood and alcohol use (32 cases [16%]) might result in a future injury (**Table 4**). Friends who are a “bad influence” accounted for 7% (14 cases) of the responses. Forty-four cases (22%) reported other reasons such as no job, no skills, uneducated, and others (Table 3).

When the study participants were asked to state what might decrease their chance of future violence-related injury, the most common answer was “to move out of the neighborhood” (27%), followed by “stop using drugs” (20%), “stop drinking” (16%), and “stop dealing drugs” (1%). Thirty-six (reported other reasons including get a job, get a High School Equivalency Certificate, go to school for a specific trade, and others.

The odds of a case drinking alcoholic beverages daily was 3 times that of a control (**Table 5**). Of those who imbibed alcoholic beverages daily, 24 (12%) of the cases and 9 (4%) of the controls consume 6 or more alcoholic drinks daily. Cases were more likely to have injured themselves while drinking alcoholic beverages than controls. Cases were 20 times more likely than controls to have lost a job because of heavy alcohol consumption.

Ninety-four cases (47%) and 20 controls (9%) admitted to current drug use ( $P = .001$ ). Cases were 9 times more likely to report current drug use than controls. Toxicology screening for other drugs and/or alcohol revealed 126 cases (63%) compared with 38 controls (17%) ( $P = .001$ ) screened positively for other drugs and/or alcohol at admission. The corresponding

**Table 3. Details of Incident Pertaining to 200 Cases Only**

Variable	No. (%) of Cases
Self-reported data	
Relation of attacker to victim	
Neighbor, coworker, acquaintance, or stranger	74 (37.0)
106	(53.0)
Type of injury	
Gunshot wound	92 (46.0)
Stabbing	40 (20.0)
Beating	51 (25.5)
Other	17 (8.5)
Disrespect involved	162 (85.7)
Attacker tried to take something	51 (27.1)
Factors related to future injury	
Perceived chance of experiencing future violence-related injury compared with peers	
Much more likely	42 (35.3)
Somewhat more likely	28 (23.5)
Average	33 (27.7)
Perceived factors that increase personal chances of future violence-related injury	
Other drugs	48 (27.4)
Alcohol	29 (16.6)
Bad neighborhood	48 (27.4)
Bad influence of friends	12 (6.9)
Other	38 (21.7)
Perceived factors that decrease personal chances of future violence-related injury	
Stop using drugs	30 (20.0)
Stop dealing	2 (1.3)
Stop drinking alcoholic beverages	24 (16.0)
Move out of neighborhood	40 (26.7)
Other	54 (36.0)

**Table 4. Alcohol and Other Drug Use by Case-control Status**

Alcohol and Other Drug Use	No. (%) of Cases (n = 200)	No. (%) of Controls (n = 224)	P*	Odds Ratio (95% Confidence Interval)
Drink alcoholic beverages daily	49 (24.5)	22 (9.8)	.001	3.0 (1.7-5.1)
>6 Drinks daily	24 (12.0)	9 (4.0)	.002	3.3 (1.5-7.2)
Ever failed in responsibilities because of drinking	32 (16.0)	16 (7.1)	.004	2.5 (1.3-4.7)
Drinking ever resulted in injury to self or others	37 (18.5)	22 (9.8)	.01	2.1 (1.2-3.7)
Ever lost a job because of drinking	16 (8.2)	1 (0.5)	.001	19.7 (2.6-150.2)
Current drug use				
Self-report	94 (47.0)	21 (9.4)	.001	8.6 (5.1-14.5)
Toxicology report for other drugs and/or alcohol	126 (63.0)	39 (17.4)	.001	8.1 (5.2-12.7)
Past drug use	157 (78.5)	130 (58.0)	.001	2.6 (1.7-4.1)
Current or past use of				
Marijuana	148 (75.5)	130 (61.1)	.003	1.9 (1.3-3)
Cocaine	108 (55.1)	67 (31.8)	.001	2.6 (1.8-4)
Heroin	85 (43.4)	15 (7.1)	.001	10 (5.5-18.2)
Crack cocaine	52 (26.5)	26 (12.3)	.001	2.6 (1.5-4.3)
Methadone	25 (12.8)	11 (5.2)	.007	2.7 (1.3-5.6)
Morphine	24 (12.2)	7 (3.3)	.001	4.1 (1.7-9.7)
Drug dealing				
Current	18 (9.0)	1 (0.5)	.001	22.1 (2.9-166.8)
Past	91 (45.5)	25 (11.2)	.001	6.6 (4-11)

\*From  $\chi^2$  for categorical variables and from analysis of variance for continuous variables.

**Table 5. Weapon Use and History of Violent Experiences by Case-control Status**

	No. (%) of Cases (n = 200)	No. (%) of Controls (n = 224)	P*	Odds Ratio (95% Confidence Interval)
<b>Weapon use and history of aggression</b>				
Currently own a gun	26 (13.1)	79 (35.2)	.001	0.28 (0.2-0.5)
Ride with gun in car	24 (12.4)	5 (2.2)	.001	6.2 (2.3-16.5)
Carry weapon	34 (17.1)	21 (9.4)	.02	2 (1.1-3.6)
Fight in past year	112 (56.6)	42 (18.8)	.001	5.6 (3.6-8.7)
Ever beaten anyone up	151 (76.3)	113 (50.5)	.001	3.2 (2.1-4.8)
Ever shot anyone	37 (18.8)	11 (4.9)	.001	4.5 (2.2-9.1)
Ever threatened to shoot someone	51 (25.9)	14 (6.3)	.001	5.2 (2.8-9.8)
Ever stabbed anyone	35 (17.8)	7 (3.1)	.001	6.7 (2.9-15.5)
Ever threatened to stab someone	43 (21.8)	7 (3.1)	.001	8.7 (3.8-19.8)
Ever hurt anyone with other weapons	63 (31.8)	29 (13.0)	.001	3.1 (1.9-5.1)
Ever threaten to hurt with other weapons	41 (20.7)	7 (3.1)	.001	8.1 (3.5-18.5)
<b>Neighborhood</b>				
Scale of neighborhood safety, mean (SD), points†	5.9 (3.3)	2.9 (2.4)	<.001	.. ‡
Observed violence in neighborhood	144 (73.5)	70 (31.3)	.001	6.1 (4-9.3)
How often per year, median (SD)	52 (43.3)	0 (9.7)	<.001	...
<b>History of abuse and psychologic trauma</b>				
Emotionally abused as a child	50 (25.4)	25 (11.2)	.001	2.7 (1.6-4.6)
Physically abused as a child	30 (15.3)	13 (5.8)	.001	2.9 (1.5-5.8)
Sexual abuse while growing up	10 (5.1)	5 (2.2)	.11	2.4 (0.8-7)
Parents abused one another	45 (30.2)	31 (14.7)	.001	2.5 (1.5-4.2)
Murder in immediate family	49 (25.3)	12 (5.4)	.001	5.9 (3-11.5)
<b>Substance abuse in family</b>				
Parents drank alcoholic beverages excessively	77 (39.5)	51 (22.8)	.001	2.2 (1.5-3.4)
Excessive drug use in immediate family	28 (15.1)	10 (4.6)	.001	3.7 (1.8-7.9)
<b>Incarceration and psychiatric care</b>				
Immediate family member ever imprisoned	82 (42.5)	28 (12.7)	.001	5.1 (3.1-8.3)
Immediate family member ever admitted for psychiatric care	39 (20.1)	22 (10.0)	.004	2.3 (1.3-4)

\*From  $\chi^2$  for categorical variables and from analysis of variance for continuous variables.

†Likert self-rated scale with 1 indicating strongly agree and 5, strongly disagree.

‡Ellipses indicate no data available.

ORs show cases are 8 times more likely to have a positive toxicology report than controls. One hundred fifty-eight cases (79%) and 130 controls (58%) admitted to past drug use ( $P=.001$ ). Cases were more likely to report current or past use of cocaine ( $P=.001$ ,  $OR=3$ ), heroin ( $P=.001$ ,  $OR=10$ ), crack cocaine ( $P=.001$ ,  $OR=3$ ), and morphine ( $P=.001$ ,  $OR=4$ ) than controls. Eighteen cases (9%) and 2 controls (1%) stated they were dealing drugs ( $P=.001$ ). Cases were 22 times more likely to be current drug dealers and 7 times more likely to have dealt drugs in the past.

Twenty-six cases (13%) and 78 controls (35%) owned a gun ( $P=.001$ ); however, 24 cases (12%) and 4 controls (2%) said they carried their weapons in their car. Most of the cases who owned guns, owned handguns, while the controls mainly owned registered hunting rifles. Thirty-four cases (17%) and 20 controls (9%) usually carried some type of weapon with them other than a gun, ie, a knife, straight-edged razor, or similar weapon.

The cases reported more violent behavior than controls ( $P=.001$  in all of the following instances). They were asked the following: Have you ever:

- beaten anyone up?
- shot or threatened anyone with a gun?
- stabbed or threatened anyone with a knife?
- hurt or threatened anyone with any other type of weapon?

The corresponding ORs ranged from 3 to 9, again showing that cases were more likely to have performed violent acts compared with controls.

The next set of questions related to the neighborhood in which the victim lived (Table 5). Study participants were asked to rate their neighborhood on a scale of 1 to 10 (1=safe, 10=dangerous). The cases rated their neighborhoods as more dangerous than the controls at 6 and 3, respectively ( $P=.001$ ). One hundred forty-eight cases (74%) compared with only 69 controls (31%) had observed violence in their neighborhood and both cases and controls who lived in violent neighborhoods felt that illicit drug dealing and/or illicit drug use were the main cause of violence. Cases were 7 times more likely to have had a close friend injured or murdered because of neighborhood violence than controls. Fifty cases (25%) reported they had been emotionally abused, 30 (15%) physically abused, and/or 10 (5%) sexually abused. Sixty cases (30%) had parents who physically abused each other vs 37 controls (15%). Fifty cases (25%) and 11 controls (5%) have had someone in their family murdered ( $P=.001$ ). Eighty cases (40%) and 51 controls (23%) reported that at least one of their parents drank excessively ( $P=.001$ ). Excessive drug use by a family member was reported by 30 cases (15%) and 11 controls (5%) ( $P=.001$ ). Eighty-six cases (43%) reported a family member had been imprisoned compared with 29 controls (13%) ( $P=.001$ ,  $OR=5$ ).

Most patients were interviewed between 1 and 6 days of their hospital stay. Those interviewed later than 6 days were generally too sick to be interviewed or were intubated and/or unconscious during the first 6 days of hospitalization. All cases had a history of trauma, with the median number of prior admissions being 2 (SD=8).

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#### COMMENT

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The risk factors for repeated victimization caused by violence are not surprising given previously reported studies. A grim environment of poverty, dangerous and declining neighborhoods, illicit drug and alcohol abuse, unemployment, drug dealing, and prior incarceration is the milieu in which repeated violence thrives.

Clearly, such a complex social problem as violence cannot be approached by focusing on only a single risk factor. An integrated intervention is probably needed to be successful. There is no vaccine for violence. The task is enormous and at times seems too large to grapple with. Poverty, drug dealing, other drug and alcohol addiction, and carrying handguns will not be eliminated quickly even if massive government programs attack these evils. However, the results of this study are in some ways encouraging since many risk factors are amenable to change as they are behaviors rather than structural factors and may be responsive to intervention and evaluation.

The prevalence of substance abuse and drug dealing is probably underestimated in our investigation since there are legal penalties and social sanctions connected with admitting to these activities. The toxicology screen showed greater recent other drug and alcohol use than was admitted to by the respondents. Detoxification and rehabilitation centers are scarce nationally and there is more demand than supply in most cities. Drug dealing is one of the few lucrative vocations for the inadequately educated urban poor. Various suggestions, designed to reduce drug dealing, have been put forth such as the legalization of addictive drugs, strongly promoted by the former mayor of Baltimore Carl Schموke.

The role of perceived disrespect or dissing in episodes of violent assault leading to multiple UMMS-STC admission is striking and was cited in more than 80% of the episodes. "Showdown" confrontations where the participants may lose social status if they back down or flee to avoid the confrontation seem common in our study group. Several educational programs are available in grade schools of different cities with curricula designed to teach conflict resolution skills. The rationale for such programs is supported by our study. However, the efficacy of this approach is unclear.

Unemployment experienced by our study group undoubtedly plays a role in encouraging drug dealing and hanging around the streets in dangerous neighborhoods. There are federally funded efforts to try to prepare poorly educated young men to enter the mainstream workforce. However, it has been hard to measure the efficacy of these programs that have been seriously challenged by some economists and thought underfunded by others.

Risk factors for recidivism may have been underestimated to some extent in previous case-control studies

because of the matching variables used in the design when selecting controls. If one matches on neighborhood or race, one is essentially also matching on correlated variables of interest, ie, unemployment, educational level, or drug use. We selected controls from the UMMS-STC patient admission logs and frequency matched only on age and sex. Eligible controls were then chosen using a random selection procedure. Many controls were in the hospital for trauma caused by vehicular crashes. Many, but not all, of the controls lived in the same general neighborhood as the cases. Since the catchment area of the UMMS-STC is wide (a helicopter rescue service is frequently employed) rural and urban areas are represented in the patient population. We believe this method of control selection gives a more accurate picture of the risk factors for repeated violence. We recognize that we may err in the direction of overestimation, whereas, matching on neighborhood, race, and similar correlated variables err on the side of underestimation of risk factors because of overmatching.

The multiplicity of risk factors and the fact that they are interrelated mandate a comprehensive approach to the difficult problem of violence and particularly for recidivist victims. To be successful, such programs must be community based and must deal with all the factors affecting recidivism: poverty, substance abuse, unemployment, dysfunctional families, violent neighborhoods, and confrontational attitudes and behaviors.

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#### CONCLUSIONS

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Experiments with intervention strategies with a solid research design are needed. Shepard and Farrington<sup>16</sup> discussed possible intervention strategies that are hospital- and family practice-based that could develop outside the criminal justice system. We believe it is important that the site of intervention begin within the hospital because health care professionals are frequently the first, and sometimes the only caregivers to come in contact with victims of intentional violent injury. The hospital can serve as a portal of entry to needed services through: identification of the cases, treatment and follow-up, improving coordination and linkages between health care institutions and services in the community, increasing practitioner knowledge, and organizing medical, nursing, and psychiatric efforts to deal with violence.

Many victims of violence believe that they have been given a second chance at life when they have survived a violent attack. These victims tend to be more receptive to an intervention to prevent future violence-related injury if they are approached immediately in the hospital.

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## Invited Critique

Violence is a major public health problem and violence prevention is a maturing discipline. Areas in which progress has been made can be compared with areas of continuing concern when considering thoughtful interventions.

The good news is that national data from 1993-1997 show a decline in nonfatal/fatal firearm-related injury rates that was substantial and consistent by sex, race/ethnicity, age, and intent of injury. This was consistent with a 21% decrease in violent crime during this same period.<sup>1</sup> Data from the Youth Risk Behavior Survey between 1991 and 1997 would similarly indicate that violent behavior among US adolescents has been declining, including a 25% decrease in carrying guns and 9% decrease in engaging in a physical fight on school grounds.<sup>1</sup> Evidence-based comprehensive strategies that have contributed to declines in violence include gun-oriented policing, gang-based interventions, the Brady Handgun Violence Prevention Act and Bureau of Alcohol, Tobacco, and Firearms initiatives to track guns used in crime to identify purchasers and traffickers.<sup>2</sup>

The bad news is that violence victim recidivism is the end result of a cascade of events that begins long before adulthood. Recent data from the National Institute on Drug Abuse suggests that annually over 1 million children are exposed to alcohol and/or illicit substances during gestation, resulting in subsequent high rates of depression, anxiety, aggressive behavior, thought problems, and impulsivity.<sup>3</sup> Children who are raised in a family in which illicit drugs are being used or alcohol is abused are at high risk for abuse, neglect, and behavioral problems. Further, lethal and nonlethal violent victimization is increasingly recognized as a major cause of morbidity and mortality among infants, children, and youth in the United States.<sup>4</sup> Exposure to violence and the perpetration of violence are related; aggressive behavior in childhood is persistent over time and associated closely with juvenile and adult criminal convictions.

Channeling repeated victims of violence into community-based programs is an opportunity. This population can be viewed as the breeding ground for the next generation of victims.

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