

Juvenile Delinquency and Adolescent Trauma: How Strong Is the Connection?

Amy Conser, MPH*†; Frederick P. Rivara, MD, MPH†§||; and Irvin Emanuel, MD, MSPM*†§

ABSTRACT. *Objectives.* To determine whether youth convicted of juvenile offenses have a greater risk of injury resulting in hospitalization compared with nonoffending adolescents.

Design. A statewide hospital discharge database was linked to juvenile justice records to identify all hospitalizations occurring at ages 13 to 17 years for juvenile offenders and nonoffenders.

Subjects. Juvenile offenders and nonoffenders in Washington State during 1989 through 1992.

Main Outcome Measures. Incidence of hospitalizations attributable to injury, analyzed by cause of injury and intent.

Results. The prevalence of delinquency was 19.1% of male and 9.5% of female adolescents. Hospitalization for injury was 2.7-fold greater for male and 1.6-fold greater for female offenders compared with nonoffenders. The greatest risk of hospitalization was for intentional injury, especially that attributable to firearms, and for drug overdoses.

Conclusions. Juvenile offenders are much more likely to be hospitalized for an injury than nonoffenders. Admission to the hospital for trauma may serve as an opportunity for health providers to intervene with youth exhibiting high-risk behavior. *Pediatrics* 1997;99(3). URL: <http://www.pediatrics.org/cgi/content/full/99/3/e5>; delinquency, injuries, trauma, hospitalization.

ABBREVIATIONS. CHARS, Comprehensive Hospital Abstract Reporting System; ICD-9, *International Classification of Diseases*, 9th Revision; E-code, external cause of injury system; JUVIS, Juvenile Information System; OR, odds ratio; CI, confidence interval.

Injuries, whether intentional or unintentional, account for nearly 80% of the deaths to adolescents and young adults.¹⁻³ Although other causes of death have been decreasing, deaths from intentional injuries, in particular, have increased over the last few decades.^{3,4}

Concurrent with this increase in injuries and deaths from intentional trauma, there has been an

increase in the number of juveniles arrested for criminal offenses. Between 1985 and 1991, arrest rates for 15- to 19-year-old males increased by 127% while they decreased for those 20 and older.^{5,6}

Because both injuries and offending are common during adolescence, some authors have hypothesized a relationship between the two problems under the rubric of health-compromising lifestyle behaviors.⁷⁻¹⁰ Although the core behaviors in this lifestyle involve substance abuse and delinquency, injuries has been included because of the role of alcohol in trauma etiology, and because those involved with crimes may be victims as well as perpetrators.¹¹ However, the empirical evidence to support the inclusion of injuries is limited and generally weak. This study was therefore undertaken to examine whether youth convicted of juvenile offenses would have a greater risk of serious injury compared with a group of nonoffending adolescents.

METHODS

The Comprehensive Hospital Abstract Reporting System (CHARS) was used to identify all persons with hospital admissions in the State of Washington between 1989 and 1992 who were born between 1971 and 1975, ie, 13 to 17 years of age at the time of hospitalization. The CHARS data set collects information on all admissions to Washington State hospitals, exclusive of Veterans Administration or military hospitals. Because this data set is used for financial purposes, billing records are updated quarterly. State regulations require that the hospital certify that the information in the CHARS data system is complete and accurate to within 95% of the total discharges.¹² Admissions diagnoses and mechanisms of injury are coded in CHARS using the *International Classification of Diseases*, 9th Revision (ICD-9), and the External cause of injury system (E-code) of the ICD-9. Diagnoses were grouped according to ICD-9 specifications¹³ into major diagnostic categories and injury mechanisms.

To identify juvenile offenders among those admitted to the hospital, CHARS data were linked to the statewide Juvenile Information System (JUVIS) database for the years 1984 to 1993. Files were linked using the subject's last and first name and date of birth, as well as aliases, when available. The JUVIS file registers all adjudications for offenses committed in Washington State by individuals under 18 and is managed by the Office of the Administrator for the Courts of Washington State. It offers a complete record of all adjudications that resulted in a finding of guilt, a guilty plea, or a diversion to supervision in the community. Complete data were available on 83% of the records; identifying data were deleted in JUVIS on the remainder because the records were sealed by the courts. For those born in 1974 and 1975, the years chosen for examination allowed complete ascertainment of juvenile offending throughout their entire adolescence (ages 10 through 18). For individuals born in 1971, 1972, and 1973, a history of juvenile offending was available after age 11, 12, and 13, respectively, through age 18.

Patients admitted to the hospital were grouped according to the presence (offender) or absence (nonoffender) of an adjudication while an adolescent, determined by whether or not they linked to

From the *Maternal and Child Health Program, Departments of †Epidemiology and §Pediatrics and the ||Harborview Injury Prevention and Research Center, University of Washington, Seattle, Washington.

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Address correspondence to: Frederick P. Rivara, MD, MPH, Harborview Injury Prevention and Research Center, Box 359960, 325 Ninth Ave, Seattle, WA 98104-2499.

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the JUVIS file. The frequency-of-injury mechanism was noted by using the first two E-codes for all admissions up through the fourth for each subject.

Analysis was performed using the statistical program SAS (SAS Institute, Cary, NC). In all analyses, males and females were examined separately, due to their different hospital admission and delinquency profiles. For the calculation of prevalence rates, the denominators for the offending group consisted of the total number of male or female juvenile offenders born between 1971 and 1975 whose records were complete enough for a CHARS linkage attempt. The denominator for the nonoffender group was calculated using census estimates of the gender- and birth-year-specific average number of persons living in Washington State between 1989 and 1992, for each single birth-year cohort of individuals born between 1971 and 1975,¹⁴ minus the offender population in each gender and age group.

RESULTS

A total of 4064 males and 2929 females aged 13 to 17 from the 1971 to 1975 birth cohort were discharged from a CHARS participating hospital during the 4-year period from 1989 to 1992 due to an injury severe enough to warrant their admission. Admitted patients consisted of 1262 male offenders (31.0% of male admissions), 2802 nonoffending males, 523 female offenders (17.9% of female admissions), and 2406 nonoffending females. Conversely, the offending cohort had a slightly higher rate of admission during the study period than did the nonoffending cohort for both male and females (Table 1). The delinquency rate, defined as the number of males and females with at least one adjudication during the years 1984 to 1993, was 19.1 per 100 males and 9.5 per 100 females, per year.

Injuries accounted for approximately ¼ of hospitalizations for both male offenders and nonoffenders, but less than 10% of hospitalizations among their female counterparts (Table 1). Offenders had a prevalence of injury admissions per 100 000 population that was 2.7-fold greater among males and 62% higher among females as compared with nonoffenders.

Information on mechanism of injury (E-code) was available for 89.9% of injuries to male juvenile delinquents, 86.9% of injuries to female juvenile delinquents, 88.7% of injuries among male nonoffenders, and 84.4% of injuries among female nonoffenders. Male juvenile delinquents compared with male nonoffenders had higher rates for most mechanisms of injury, except for falls, injuries attributable to environmental causes, and submersions (Table 2). There was almost a fourfold difference in the rates of unintentional poisonings, including a fivefold difference for drug poisonings (odds ratio [OR] = 5.3; 95% confidence interval [CI] 2.8, 10.2). Self-inflicted injuries were 2.3 times more common among the delinquent group, with the greatest differences in self-

woundings with cutting instruments (OR = 4.6; 95% CI 1.9, 11.9). Male juvenile offenders experienced a threefold increased risk of an injury due to interpersonal violence (OR = 3.4; 95% CI 2.7, 4.4). Assaults resulting in gunshot wounds and stabbings were 4.9 times and 5.3 times more likely, respectively, among offenders. In fact, being the victim of a gun injury, whether it be intentional, unintentional, or of undetermined intent, was 322.8% in excess of the rate for nonoffender males. The overall rate of any intentional injury was almost threefold greater for male juvenile delinquents as compared with nonoffenders (Table 2), while the rate of unintentional injuries was nearly the same.

For female delinquents, the results were similar, although the events were less common (Table 3). Female delinquents had lower rates than nondelinquents only for injuries involving environmental causes and falls. As with males, poisoning admissions were very different between the two groups, with unintentional drug poisonings 3.4-fold more likely for female delinquents than nondelinquents. Self-inflicted injuries were nearly twice as common among delinquent females than among nonoffenders. The largest excess risks of injury for female delinquents involved injuries due to interpersonal violence. The rate of admission for an injury due to interpersonal violence for female delinquents was 674.6% in excess of this rate for nonoffenders, and any injury involving a fight, brawl, or rape was 8.8 times more common among this group, compared with nonoffending adolescents (OR = 8.8; 95% CI 3.1, 25.4) (Table 3).

The cohort of delinquent individuals accounted for far more injury admissions, whether they be unintentional, intentional, or of undetermined intent, than expected, given their proportion in the population—19.1% of males and 9.5% of females (Table 4). More than half of all male adolescents discharged due to an unintentional poisoning, hanging, stabbing, assault, or for any injury whose intent was undetermined were, or would be, adjudicated as a juvenile. Male juvenile offenders accounted for approximately two thirds of all gunshot wounds and one third of motor vehicle crashes, the most common causes of injury deaths in this age group. For female delinquents, 56% of all hospital discharges to adolescent girls for an interpersonal attack were among juvenile offenders. Although there were few gun-related incidents, more than half of hospital discharges for this cause to females were among offenders. Delinquent females accounted for one in three unintentional poisonings, one in three injuries of un-

TABLE 1. Admissions to the Hospital for Male and Female Juvenile Offenders and Nonoffenders in Washington State, 1989–1992

	Male		Female	
	Offenders	Nonoffenders	Offenders	Nonoffenders
Number admitted	1262	2802	523	2406
Percentage of cohort admitted	4.0	3.6	3.6	3.2
Percentage of admissions that are injuries	27.0	24.8	7.7	8.9
Prevalence of injury admissions per 100 000 population	1428.3	532.3	700.8	432.1

TABLE 2. Circumstances Surrounding Injury Admissions for Male Juvenile Offenders and Nonoffenders: Number, Population Prevalence Rates per 100 000, and Odds Ratios for Admission

Injury Circumstance	Juvenile Offenders		General Population		Odds Ratio	(95% Confidence Interval)
	n = 908		n = 1639			
	N	Rate	N	Rate		
Motor vehicle, or other vehicle type	349	279.8	759	246.5	1.1	(1.0, 1.3)
Poisoning	46	36.9	31	10.1	3.7	(2.3, 5.9)
Poisoning with drug	32	25.7	15	4.9	5.3	(2.8, 10.2)
Fall	161	129.1	503	163.4	0.8	(0.7, 1.0)
Fire or flames	12	9.6	19	6.2	1.6	(0.7, 3.4)
Environmental cause	4	3.2	20	6.5	0.5	
Submersion event	3	2.4	23	7.5	0.3	
Self-inflicted or suicide attempt	131	105.0	144	46.8	2.3	(1.8, 2.9)
Poisoning (liquid or solid)	102	81.8	114	37.0	2.2	(1.7, 2.9)
Poisoning (gas)	1	0.8	1	0.3	2.5	
Hanging or strangulation	4	3.2	3	1.0	3.3	
With firearms or explosives	5	4.0	12	3.9	1.0	
With cutting instrument	15	12.0	8	2.6	4.6	(1.9, 11.9)
Jumping	2	1.6	2	0.6	2.5	
Interpersonal violence or homicide	166	133.1	120	39.0	3.4	(2.7, 4.4)
Fight, brawl, or rape	53	42.5	62	20.1	2.1	(1.4, 3.1)
With firearm or explosive	46	36.9	23	7.5	4.9	(2.9, 8.4)
With cutting instrument	32	25.7	15	4.9	5.3	(2.8, 10.2)
Legal Intervention	3	2.4	0	0.0		
All undetermined intent	33	26.5	20	6.5	4.1	(2.3, 7.4)
Undetermined intent with firearms	16	12.8	4	1.3	9.9	
Total gun-related	67	53.7	39	12.7	4.2	(2.8, 6.4)
Summary of Intent in Injuries						
Unintentional	575	460.9	1355	440.1	1.1	(1.0, 1.2)
Intentional	300	240.5	264	85.7	2.8	(2.4, 3.3)
Unknown	33	26.5	20	6.5	4.1	(2.3, 7.4)

determined intent, and one in five self-inflicted injuries.

Overall, intentional injuries accounted for 33% of injury admissions for male offenders and 50.5% for female offenders compared with 15.6% and 41.9%, respectively, of their nonoffending counterparts (Table 5).

DISCUSSION

This study of Washington State adolescents involved with the juvenile justice system documents an increased risk of admission for injuries compared with the general population of adolescents.

The juvenile offenders in this study were more often the victims of both unintentional injuries and intentional violence, both assault and self-inflicted injury. These findings are in agreement with other studies in the literature. Lewis and Shanok¹⁵ conducted a retrospective case-control study in 1977 of 109 matched pairs of juvenile delinquents and non-delinquents; emergency room visits and admissions for injuries at some time in the past were more common among the delinquent adolescents. In a study by Lauritsen et al,¹⁶ delinquents were 2 to 3 times more likely to be victimized by assault and robbery than nondelinquents.

Our study found the greatest differences in the rates of admission for intentional trauma, being 2 to 9 times more common among offenders than nonof-

fenders. Conversely, assault victims are much more likely to be offenders than are victims of unintentional injury. In a recent study, Rivara et al¹⁷ reviewed the police records of 1734 assault cases treated in an accident and emergency department between July and December 1991. Of their youth sample, 16.3% of intentional injury victims 10 to 16 years of age were later convicted of a crime, while only 2.5% of the 80 unintentional injury patients of the same ages were convicted.

Among individuals of all ages, Sims et al¹⁸ found that criminality was common among admissions for intentional injuries in Detroit. Of the patients admitted during a 2-year period for treatment of a stab wound, an assault, or a gunshot wound, 54% had criminal records over the following 5-year period. Of all individuals admitted for trauma over that 2-year period, 5.3% were found in the database as homicide victims during the next 5 years, and 14.4% were located as serious offenders after their injury. Substance abuse among this population was documented to be 60%.¹⁸

One of the core elements in the cluster of health-compromising behaviors is substance abuse.¹¹ The fact that poisoning with drugs was fivefold more common among male and threefold more common among female delinquents than nondelinquents supports the hypothesis that high-risk adolescents have more than one such high-risk behavior. Although the

TABLE 3. Circumstances Surrounding Injury Admissions for Female Juvenile Offenders and Nonoffenders: Number, Population, Prevalence Rates Per 100 000, and Odds Ratios for Admission

Injury Circumstance	Juvenile Offenders		General Population		Odds Ratio	(95% Confidence Interval)
	n = 402		n = 1517			
	N	Rate	N	Rate		
Motor vehicle, or other vehicle type	124	216.2	547	155.8	1.4	(1.1, 1.7)
Poisoning	22	38.4	46	13.1	2.9	(1.7, 5.0)
Poisoning with drug	17	29.6	31	8.8	3.4	(1.8, 6.3)
Fall	33	57.5	236	67.2	0.9	(0.6, 1.3)
Fire or flames	2	3.5	4	1.1	3.1	
Environmental cause	1	1.7	13	3.7	0.5	
Submersion event	2	3.5	10	2.8	1.2	
Self-inflicted or suicide attempt	175	305.1	613	174.6	1.8	(1.5, 2.1)
Poisoning (liquid or solid)	154	268.5	565	160.9	1.7	(1.4, 2.0)
Poisoning (gas)	0	0.0	3	0.9	0.0	
Hanging or strangulation	2	3.5	3	0.9	4.1	
With firearms or explosives	1	1.7	3	0.9	2.0	
With cutting instrument	16	27.9	39	11.1	2.5	(1.4, 4.6)
Interpersonal violence or homicide	28	48.8	22	6.3	7.8	(4.3, 14.1)
Fight, brawl, or rape	10	17.4	7	2.0	8.8	(3.1, 25.4)
With firearm or explosive	4	7.0	2	0.6	12.2	
With cutting instrument	4	7.0	6	1.7	4.1	
Legal intervention	0	0.0	0	0.0		
All undetermined intent	15	26.1	26	7.4	3.5	(1.8, 6.9)
Undetermined intent with firearms	1	1.7	0	0.0		
Total gun-related	6	10.5	5	1.4	7.4	(2.0, 27.6)
Summary of intent in injuries						
Unintentional	184	320.8	856	243.8	1.3	(1.1, 1.6)
Intentional	203	353.9	635	180.9	2.0	(1.7, 2.3)
Unknown	15	26.1	26	7.4	3.5	(1.8, 6.9)

prevalence of alcohol use on admission for injury was not assessable, alcohol use is a frequent cofactor in injuries involving motor vehicles and interpersonal violence.¹⁹

Other studies have documented the significant relationship between substance abuse and juvenile offending. The national youth survey found that drug-using adolescents were disproportionately offenders: 25% of those admitting to heroin or cocaine use were responsible for 40% of index crimes.²⁰ Substance abuse, predominantly alcohol abuse, is also a known risk factor for future offending in adulthood.²¹ The review of Bradford et al²¹ listed six studies in which the prevalence of alcohol use was 45% to 80% among persons who committed homicide. Another study showed that 23% of all delinquents in Illinois satisfied diagnostic criteria for alcohol abuse, with a higher percentage of substance abusers among the more serious offenders.²² In our study, 49% of drug dependency admissions for boys and 30% of admissions for girls were to adolescents who were, or would be, adjudicated for an offense. Because fairly effective treatment exists for persons with substance abuse problems, substance abuse screening among adolescent hospital admissions, especially among those with injuries, and subsequent in-hospital treatment or treatment referrals may be fruitful in the prevention of future criminal behavior. One study²³ which instituted an in-depth referral system for trauma admissions co-diagnosed as alcoholics found

that the hospital admission, along with staff efforts and family involvement, was a successful impetus to initiate substance abuse treatment for these individuals. Early substance abuse treatment may also prevent the revolving emergency room door phenomenon and high mortality rates, which have been described among certain substance-abusing populations.^{18,19,24}

Another preventable cause of injury, firearms, is much more common among youthful offenders than nonoffenders. Although the use of handguns in crimes committed by adults has remained fairly stable over the last two decades, the use of handguns in crimes by adolescents was almost three times more common in 1992 than in 1976.²⁵ The ease with which an adolescent can get a gun is probably underestimated by the majority involved in public health. In Seattle, a city with a relatively low rate of youth violence, one survey of 11th-grade students found that 34% reported easy access to firearms, with 11.4% of males reporting owning a handgun. Ownership was more common among adolescents with problem behaviors.²⁶ Findings from the National Youth Risk Behavior survey indicated that 20% of high school students carried weapons to school for self-protection during the previous month.²⁷ Besides the obvious implications of firearms in interpersonal injuries, a handgun in the home has been found to be a strong risk factor for adolescent suicide.^{28,29}

TABLE 4. Proportion of Admissions by Mechanism Accounted for by Male and Female Juvenile Offenders 1989–1992

	Male		Female	
	Admissions (N)	% Offenders	Admissions (N)	% Offenders
Motor vehicle, or other vehicle type	1108	31.5	671	18.5
Poisoning	77	59.7	68	32.4
Poisoning with drug	47	68.1	48	35.4
Fall	664	24.2	269	12.3
Fire or flames	31	38.7	6	33.3
Environmental cause	24	16.7	14	7.1
Submersion event	26	11.5	12	16.7
Self-inflicted or suicide attempt	275	47.6	788	22.2
Poisoning (liquid or solid)	216	47.2	719	21.4
Poisoning (gas)	2	50.0	3	0.0
Hanging or strangulation	7	57.1	5	40.0
With firearms or explosives	17	29.4	4	25.0
With cutting instrument	23	65.2	55	29.1
Jumping	4	50.0	0	0.0
Interpersonal violence or homicide	286	58.0	50	56.0
Fight, brawl, or rape	115	46.1	17	58.8
With firearm or explosive	69	66.7	6	66.7
With cutting instrument	47	68.1	10	40.0
Legal intervention	3	100.0	0	0.0
All undetermined intent	53	62.3	41	36.6
Undetermined intent with firearms	20	80.0	0	0.0
Total gun-related	106	63.2	11	54.5
Summary of intent in injuries				
Unintentional	1930	29.8	1040	17.7
Intentional	564	53.2	838	24.2
Unknown	53	62.3	41	36.6

Limitations

Important methodological considerations related to misclassification lead us to believe that the rates in this study are underestimates. First, information on the delinquency status of individuals who had hospital admissions was limited by the availability of identifiers; 12% of all JUVIS individuals did not have identifiers on their files, because their records had been legally sealed. Some of these adolescents were probably admitted to the hospital for injuries.

Second, court referrals for an offense are not the only indicator of delinquency. For offenses committed by adults, National Crime Survey responses suggested that only about half of all crimes are ever reported to the police. Of crimes reported to the police, only 25% to 35% of most crimes result in an arrest.³⁰ It can be estimated, then, that less than 20% of offenses that adolescents commit will be recorded in court files. This implies that a substantial number of adolescents never appeared in the juvenile justice

TABLE 5. Distribution of Causes of Injury Admissions in Male and Female Offenders and Nonoffenders, 1989–1992

Injury Circumstance	Males				Females			
	Offenders	%	Nonoffenders	%	Offenders	%	Nonoffenders	%
Motor vehicle or other vehicle type	349	38.4	759	46.3	124	30.8	547	36.1
Poisoning	46	5.1	31	1.9	22	5.5	46	3.0
Fall	161	17.7	503	30.7	33	8.2	236	15.6
Fire or flames	12	1.3	19	1.2	2	0.5	4	0.3
Environmental cause	4	0.4	20	1.2	1	0.2	13	0.9
Submersion event	3	0.3	23	1.4	2	0.5	10	0.7
Self-inflicted or suicide attempt	131	14.4	144	8.8	175	43.5	613	40.4
Interpersonal violence or homicide	166	18.3	120	7.3	28	7.0	22	1.5
Legal intervention	3	0.3	0	0.0	0	0.0	0	0.0
Undetermined intent	33	3.6	20	1.2	15	3.7	26	1.7
Total E-codes listed for group	908	100.0	1639	100.0	402	100.0	1517	100.0
Summary of intent in injuries								
Unintentional	575	63.3	1364	83.2	184	45.8	856	56.4
Intentional	300	33.0	255	15.6	203	50.5	635	41.9
Unknown	33	3.6	20	1.2	15	3.7	26	1.7
Total	908	100.0	1639	100.0	402	100.0	1517	100.0

system, even though they were juvenile offenders. In addition, about 5% of offenders younger than 18 in a national survey were tried in adult courts.³¹

Admissions of these adolescents—those who had hospital admissions and whose JUVIS records had been sealed, those who were offenders but never were adjudicated, and those who were tried as adults and had no juvenile adjudications—would appear as nonoffender admissions. Furthermore, some of the adolescents born in 1971, 1972, or 1973 may have had an adjudication at a very early age (10, 11, or 12) and none thereafter. These early offenses for those cohorts of children would not have been identified due to the nature of data available. This latter group of juvenile offenders, while probably small in magnitude, would have been misclassified as nonoffenders. Because injury was more common among offenders, and unidentified offenders were undoubtedly counted in the nonoffender numerator, the results reported here would be underestimates of the true associations.

Third, because this research was limited to Washington State offenders and Washington State hospital admissions, the impact of migration should be addressed. In-migration and out-migration during the adolescent years might have resulted in some changes in the rates calculated. Because there is some support to the theory that a propensity to offend is associated with a history of migration,³² some adolescents who were offenders in other states and had hospital admissions but no adjudications in Washington would be counted as never-offenders. Likewise, adolescents who had admissions here and moved out of state where they became offenders would be recorded as never-offenders. Individuals with adjudications may also be more likely to leave the state after their adjudication. It is thus likely that the in-migrant adolescents were disproportionately offenders and that the out-migrants were also disproportionately offenders. In the former case, unless these adolescents were also adjudicated at some point in Washington State, their hospital admissions would be included in the nonoffender group. In the latter case, the denominator for the rates of admission among offenders would be an inflated estimate of the true numbers of offenders at risk for a Washington State hospital admission. This again would result in underestimates of the true associations.

CONCLUSIONS

Besides documenting excess injury rates for juvenile delinquents, this study suggests that the hospital may be a useful site for identifying high-risk youth. In this population, less than 4% of juvenile delinquents were admitted to a Washington State hospital for an injury during a 4-year period. Yet, this figure accounted for more than one of every two admissions for certain injury mechanisms. For individuals in whom hospitalization precedes arrest for delinquent behavior, the injury event may serve as a marker for youth who would potentially benefit from intervention. Among youth presenting with specific injuries, screening and in-hospital services—which refer these adolescents to agencies that work

with troubled youth or which counsel youngsters and their parents about the dangers of risky behaviors and how to change them—may have some impact on reducing subsequent criminality. One such in-hospital intervention in Boston works with young victims of interpersonal injuries to review the incident, to teach conflict resolution, to develop a strategy for future safety, and to make referrals. Substance abuse and firearm interventions are likely to hold promise in reducing recidivism among delinquents and in reducing both unintentional and intentional injuries among the adolescent population as a whole. For individuals in whom the arrest precedes any hospitalization for injury, rehabilitation of the juvenile may serve to prevent subsequent serious injuries such as motor vehicle collisions or gunshot wounds.

Although this article points to the utility of the hospital in secondary prevention of juvenile delinquency, such interventions are probably of less value than primary prevention. Strong predictors of delinquency emerge much earlier in childhood,^{8,33,34} and include poor scholastic performance, early behavior problems, a history of poor parenting, and adverse family and living conditions. The predictive value of non-health-care-based screening tests, such as those administered in the schools, should not be underestimated.²⁶ Interventions that take place much earlier hold greater promise in reducing the numbers of children who initiate delinquent behaviors. Thus, this study proposes that preventing offending is also a wise step in preventing injuries among young adults.

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