A Pilot Randomized Controlled Trial Assessing Secondary Prevention of Traumatic Stress Integrated Into Pediatric Trauma Care

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Abstract

Medical settings provide opportunities for secondary prevention of traumatic stress and other sequelae of pediatric injury. This pilot randomized trial evaluated the delivery and effectiveness of a targeted preventive intervention based on best practice recommendations and integrated within acute medical care. Hospitalized injured children were screened for risk of developing posttraumatic stress disorder (PTSD). Those at risk ($N = 85$) were randomized to the intervention ($n = 46$) or usual care ($n = 39$). The preventive intervention did not reduce PTSD or depression severity or increase health-related quality of life, compared to usual care. Both groups improved over time, but 6 months postinjury approximately 10% of each group still met criteria for PTSD, suggesting room for improvement in comprehensive pediatric injury care.

Each year, millions of children sustain an unintentional injury requiring acute medical care (National Center for Injury Prevention and Control, n.d.). Of these, 15%–20% develop persistent posttraumatic stress symptoms that impair functioning, including 5%–10% who meet diagnostic criteria for posttraumatic stress disorder (PTSD; Daviss et al., 2000; Holbrook et al., 2005; Kassam-Adams & Winston, 2004). PTSD is a key predictor of functional outcome postinjury (Holbrook et al., 2005; Zatzick et al., 2008). Medical settings afford unique opportunities for secondary prevention of psychosocial sequelae of pediatric injury, but gaps in provider awareness of injury-related traumatic stress (Sabin, Zatzick, Jurkovich, & Rivara, 2006; Ziegler, Greenwald, DeGuzman, & Simon, 2005) point to the need for a systematic approach. The challenge is to integrate appropriate psychosocial care

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during brief emergency or inpatient treatment while not over-taxing the resources of busy health care teams.

Stepped care systematically matches individual needs to appropriate level of intervention, and can be both clinically sound and cost-effective (Katon, Roy-Byrne, Russo, & Cowley, 2002). In a randomized effectiveness trial, Zatzick et al. (2004) found that a "stepped collaborative care" intervention prevented worsening of PTSD symptoms and reduced postinjury alcohol abuse in injured adults identified during acute surgical care. The intervention included in-hospital assessment of acute distress (PTSD, depression), case management, and additional elements implemented based on specific patient needs (Zatzick et al., 2001). There has not been a careful evaluation of a stepped-care model integrated within pediatric trauma care to prevent PTSD and other psychosocial sequelae of injury.

Best practice recommendations for early intervention after acute trauma exposure call for "watchful waiting" and empirically sound screening to identify, among individuals exposed to trauma, the smaller high-risk group who will benefit from further monitoring or preventive interventions (National Institute for Clinical Excellence, 2005a). The concept of watchful waiting implies that rather than initiating formal intervention for those at risk, professional helpers should check in periodically to assess ongoing needs. Pediatric medical teams are ideally situated to identify injured children at risk for PTSD and to initiate appropriate follow-up as part of physical injury care. This approach is congruent with prevention models (National Institute of Mental Health, 1998) that define levels of intervention (universal, targeted, and indicated) based on need.

For children exposed to acute traumatic events, there is limited empirical evidence regarding effectiveness of early preventive interventions or the optimal means of delivering these interventions to a broad range of children (International Society for Traumatic Stress Studies, 2009). Two randomized controlled trials (RCTs) have now assessed universal single-session interventions for children receiving medical care for road traffic-related injuries. Stallard et al. (2006) examined a single-session debriefing intervention provided approximately 1-month postinjury to children aged 7 to 16 ($N = 158$), and found no effect on child PTSD outcomes compared to usual care. Zehnder, Meuli, and Landolt (2010) examined a single-session intervention delivered 10-days postaccident to children 7 to 16 years old ($N = 99$), incorporating creation of a trauma narrative, modification of trauma-related appraisals, and psychoeducation. The intervention did not reduce child PTSD symptoms, but did reduce depression and behavioral symptoms among younger children. Kenardy and colleagues (Cox & Kenardy, 2010; Kenardy, Thompson, Le Brocque, & Olsson, 2008) have conducted two RCTs ($N = 104$ and $N = 56$) assessing universal informational interventions (print or web-based psychoeducation about trauma and coping) for injured children aged 7 to 16 and their parents. These studies found reductions in child anxiety, but no significant effects on child PTSD.

Only two published RCTs have assessed targeted preventive interventions for children. A recent trial by Berkowitz, Stover, and Marans (2010) compared a four-session parent–child intervention to supportive individual counseling. Children aged 7 to 17 ($N = 106$) were enrolled if they endorsed at least one severe traumatic stress symptom within 30 days of

a traumatic event (traffic crash, assault, disclosure of sexual abuse, witnessing or threats of violence, injury). Intervention focused on parent–child communication and specific skill modules based on individual need. At 3 months, the parent–child intervention group had lower rates of PTSD, and less severe traumatic stress and anxiety symptoms. In a recent pilot RCT, Nugent et al. (2010) examined an early pharmacological intervention targeting injured children aged 10 to 18 ($N = 29$) at risk based on a screening measure. A 10-day propranolol regimen, initiated within 12 hours of hospital admission, did not reduce PTSD symptoms at 6 weeks compared to placebo; among treatment-adherent children there was a trend for lower PTSD severity in boys and higher PTSD severity in girls (Nugent et al., 2010).

The current study addresses a gap in the current literature by evaluating the feasibility and effectiveness of a targeted preventive intervention model integrated within hospital care for acutely injured children via a randomized controlled trial. Stepped Preventive Care incorporates universal screening for risk of persistent PTSD symptoms, and targeted provision of additional assessment and intervention. To optimize integration of this model into medical care settings, screening and most intervention elements were designed to be implemented by members of the health care team (e.g. nurses and hospital-based social workers) who are not traumatic stress specialists, after brief training. The intervention adapts core aspects of the Zatzick et al. (2004) stepped collaborative care model for a pediatric injury population. One notable difference is a central role for parents, given their importance in supporting child recovery. We hypothesized that among injured children at higher risk for developing PTSD, the Stepped Preventive Care intervention would reduce the presence and severity of PTSD symptoms at 6-weeks and at 6-months postinjury, in comparison to a control group receiving usual care. Secondary hypotheses were that the intervention group would have lower depression symptoms and higher health-related quality of life at follow-up.

METHOD

At a large urban level I pediatric trauma center in the northeastern United States, hospitalized injured children were enrolled for screening and potential inclusion in the randomized trial. After obtaining parent consent and child assent, the child completed a brief screening protocol, and the child and one parent each completed additional baseline measures. Baseline assessments were always completed within 2 weeks of injury ($M = 2.3$ days, $SD = 2.1$). Screening measures were scored immediately; children screening positive were eligible for the randomized trial, and study personnel opened a sealed envelope to reveal assignment to the intervention or to usual care (randomization schedule based on random number list generated via SAS statistical software). Posttraumatic stress disorder and depression symptoms and health-related quality of life were evaluated at 6-weeks and 6-months postinjury by assessors unaware of the child's risk status or study condition. The study was conducted in accordance with an institutional review board-approved protocol.

Participants

Children were eligible for inclusion if they were between ages 8 and 17, admitted for treatment of an unintentional injury, the family had telephone access, and the child and

parent spoke English. Children were excluded if their current medical status precluded interview participation, or if they had a moderate to severe head injury (Glasgow Coma Score   12).

Potentially eligible injured patients were identified from patient census and admission lists ($n = 1, 330$; from April 2007 to October 2008; see Figure 1). Study recruitment was staffed 7 days per week, including evenings and weekends. Of 845 eligible children, 149 (17.6%) refused participation. Another 406 (48.0%) were not approached by study personnel, usually due to limited parent availability during brief hospital admissions. The 290 children enrolled for risk screening did not differ in age, sex, or race from the 555 eligible children not enrolled. Among these 290 children, 85 (29%) scored positive on one or more screening measures (described below), and were randomly assigned to receive usual care ($n = 39$) or usual care plus the Stepped Preventive Care intervention ($n = 46$). Demographic and injury treatment data are in Table 1. Groups were compared (via Pearson's χ^2, t test, or Wilcoxon tests, as appropriate) and did not differ in age, race, injury circumstances or severity, prior trauma, baseline traumatic stress, baseline depression, or preinjury health-related quality of life (see Table 2). However, the intervention group included a higher proportion of girls χ^2 $(1, N = 85) = 4.18$, $p = .04$ and of children who had recent mental health treatment χ^2 $(1, N = 85) = 8.75$, $p = .003$.

Measures

The Screening Tool for Early Predictors of PTSD (STEPP) is administered during acute trauma care to identify injured children at risk for persistent traumatic stress (Winston, Kassam-Adams, Garcia-España, Ittenbach, & Cnaan, 2003). The child STEPP screen is positive when at least four of eight items are endorsed. In a development sample, the STEPP had excellent sensitivity (.88), and moderate specificity (.48) in predicting later posttraumatic stress. The STEPP was administered at baseline (prerandomization) as part of the Stepped Preventive Care screening protocol.

The Child PTSD Symptom Scale (Foa, Johnson, Feeny, & Treadwell, 2001) is a 24-item self-report instrument that yields both a continuous severity score and a determination of likely PTSD diagnostic status according to symptom presence. Seventeen items correspond to *DSM-IV* symptom criteria (and are summed to yield a PTSD symptom severity score; range = 0 to 51); seven items assess impairment from those symptoms. The Child PTSD Symptom Scale has shown excellent internal consistency, test-retest reliability, and convergent validity with clinical interviews for PTSD (Foa et al., 2001). In the current study, internal consistency was excellent ($\alpha = .86, .87, .91$ at baseline, 6 weeks, and 6 months, respectively). The 17 symptom items were administered at baseline (prerandomization) as part of the Stepped Preventive Care screening protocol, with a score of 15 or greater considered a positive screen for PTSD risk. The 24-item scale was administered at 6 weeks and 6 months postinjury to assess traumatic stress symptom outcomes.

The Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) is a 20-item self-report measure of depression symptoms that yields a total severity score (range = 0 to 60). Clinical cutoff scores (24 for youth) have been empirically established (Dierker et al., 2001; Radloff, 1977). The CES-D has been validated in adults and children 10 and

over as an effective screen for depression, and has been successfully used with children as young as 8. In the current study, internal consistency was excellent (α = .86, .86, .90 at baseline, 6 weeks, and 6 months, respectively). The CES-D was administered at baseline (prerandomization) as part of the Stepped Preventive Care screening protocol, and at 6-weeks and 6-months postinjury to assess depression symptom outcomes.

The Pediatric Quality of Life Inventory (Varni, Seid, & Rode, 1999) is a well-validated measure of child health-related quality of life. Children completed this measure at baseline to report on preinjury functioning, and at 6-weeks and 6-months postinjury regarding current functioning. Current analyses utilize the 8-item Physical health/Physical functioning subscale. Scores range from 0 to 100; higher scores indicate better functional outcomes.

Parent and child baseline assessments each included a single item regarding prior child trauma. For the current analyses, prior trauma exposure is considered positive if either child or parent indicated the child had experienced a prior traumatic event. Parents completed a questionnaire regarding health services utilized by their child in the 6-months preinjury, including whether the child received mental health treatment during this period.

Injury and treatment information, including Injury Severity Score (ISS; Baker, O'Neill, & Haddon, 1974) was abstracted from medical records and the hospital's trauma registry. The ISS is a well-recognized measure of overall injury severity, derived from standard ratings of the individual's three most severely injured body regions. The ISS scores range from 1–75, with scores over 16 generally representing severe injury.

An intervention intensity score for each intervention case was derived from a review of all case notes. Two expert raters (NKA, MM, and/or CB) independently scored intensity for each case and any discrepancies were resolved via discussion.

Protocol Description: Screening, Intervention, and Usual Care

Systematic screening was conducted with eligible injured children. The screening protocol included three brief measures: current traumatic stress symptoms (Child PTSD Symptom Scale), current depression symptoms (CES-D), and risk of persistent PTSD (STEPP). Children screening positive on one or more measures were included in the randomized trial.

The Stepped Preventive Care intervention was delivered by a team of one nurse and two social workers, each with clinical experience in pediatric settings but without prior specialized training in traumatic stress. Fidelity of implementation was ensured via training and supervision by a doctorate-level psychologist (NKA). If needed, based on the intervention protocol, a second doctorate-level psychologist (CB) was available to provide psychological assessment or trauma-focused psychotherapy, and psychopharmacological assessment and treatment was available via the institution's child psychiatry service.

Two standard sessions incorporated assessment and psychoeducation. In session 1, during the child's hospital stay, the interventionist (nurse or social worker) identified the parent's and the child's top concern (Zatzick et al., 2001) and conducted a semistructured assessment and discussion of (a) current distress (pain, fears, and worries; review of PTSD or

depression symptoms endorsed on baseline measures), (b) factors that promote or hinder the effectiveness of the child's existing support systems (parent distress, family stressors), and (c) child or parent questions about medical treatment. Families were given a binder including tip sheets, workbooks ("Helping You Help Your Child: Tools for Parents" and "Coping with Injury: Tools for Kids"), information on postinjury medical care, and a place to keep track of follow-up appointments and questions for the doctor. In session 2, approximately 2-weeks postdischarge, the interventionist spoke with the child and parent (usually by telephone) and used a semistructured brief interview to review progress and concerns regarding distress/symptoms, support systems, follow-up medical care, then arranged further contact or additional services if needed. At each session, decision rules guided the provision of additional elements, including (a) additional contact with family; (b) contact with medical providers to promote care coordination, assist family in adherence with medical follow-up, or promote provider awareness of child emotional recovery; (c) provision of a brief parent–child intervention to promote a shared perception of child needs and help parents support adaptive coping; (d) evaluation by a psychologist or psychiatrist; and (e) trauma-focused cognitive–behavioral therapy for severe or persistent PTSD symptoms.

The usual psychosocial care provided at the pediatric hospital where this study was conducted was judged to be a reasonable, if ambitious, standard against which to evaluate the impact of a new psychosocial intervention protocol. During the period in which the study was conducted, a social worker for the trauma surgery program provided services to injured patients and their families 4 days per week, and the hospital's social work department provided 24-hour on-call coverage. Social work services generally included assessment of psychosocial functioning, counseling for medical care planning and decision making, and community resource planning. In addition, nursing staff and treating physicians informally assessed psychosocial concerns, and could request consultation from other hospital-based psychosocial services (e.g., psychiatry, psychology, child life, chaplain) as they deemed appropriate.

Data Analyses

After examining descriptive analyses for demographic and injury, baseline and follow-up symptom measures, and for the nature and intensity of intervention elements delivered, we examined intervention outcomes for all cases as randomized (intent-to-treat). The primary outcome of interest was traumatic stress symptom severity (Child PTSD Symptom Scale total score). Secondary outcomes were depression symptoms (CES-D total score) and health-related quality of life (Pediatric Quality of Life Inventory Physical subscale score). For each outcome we fitted generalized linear models separately. To take into account the correlated responses derived from the longitudinal design of the study, and to use all available observations, a generalized estimating equations (GEE) approach, with an auto-regressive correlation matrix, was applied. A GEE approach allows the inclusion of all cases with baseline data, even those with missing data at one or both follow-up points. GEE models require that data be missing completely at random. We considered and ruled out potential violations of this assumption; we found no association between retention to follow-up and age, gender, mental health treatment history, or baseline traumatic stress, depression, or quality of life scores. The models included group (intervention vs. usual care),

time (baseline, 6 week, 6 month) as a categorical variable, and their interaction (Group ×
Time). Age, sex, and recent mental health treatment (yes/no) were included as covariates.

RESULTS

Feasibility and Delivery of the Intervention

The first intervention session was conducted as soon as possible after enrollment and
randomization ($M = 3.0$ days postinjury, $SD = 2.8$). Session 1 was completed for 41
(89.1%) of the 46 intervention cases. In five cases (10.9%), the child was discharged before
session 1 could be conducted and attempts to reach the family were unsuccessful. Session
2 was conducted for 25 (54.3%) of the 46 intervention cases, an average of 22.9 days after
session 1. For 21 (45.7%) cases, the team was unable to complete session 2 despite repeated
attempts to reach the family. Interventionists recorded the duration of each family contact or
other intervention-related task (e.g., talking with medical team about specific psychosocial
care needs). Session 1 ranged from 10 to 75 minutes duration ($M = 29.1$ minutes); session
2 ranged from 10 to 50 minutes ($M = 17.7$ minutes). Additional time spent per case ranged
from 0 to 110 minutes ($M = 10.9$ minutes). Intensity of the stepped intervention (delivered
based on assessed need) was generally low: 35 (85.4%) of 41 cases were rated as low
intensity, 5 (12.2%) as moderate, and 1 case (2.4%) as high. Only three intervention cases
were judged to need formal mental health assessment or treatment. In one of these cases
the interventionist coordinated with the child's existing mental health provider to ensure that
trauma-specific issues were addressed within ongoing treatment, in one case we provided
formal assessment and facilitated the child's entry into trauma-focused psychotherapy closer
to the family's home, and in one case the child was in ongoing treatment and parents refused
any additional intervention or case coordination.

Results of Intervention Trial

Both usual care and intervention groups showed improvement in traumatic stress symptoms
over time (see descriptive results in Table 2). Analyses including all randomized cases
(intent-to-treat) did not show a difference between treatment groups for PTSD symptoms at
6-week or 6-month follow-up. (Completer analyses showed similar results.) We examined
potential interactions of age, sex, and prior trauma exposure with treatment effects and did
not find evidence for any significant interactions.

Fitting a generalized linear model for our primary outcome of interest, PTSD symptom
severity (Child PTSD Symptom Scale total score), there was no significant group by time
interaction (Wald $\chi^2 = 4.15$; $df = 2$; $p = .13$). However, significant interactions were found
for secondary outcomes: depression symptoms (CES-D total score; Wald $\chi^2 = 6.31$, $df = 2$,
$p = .04$; baseline to 6-month coefficient $= -6.6$, $SE = 2.6$) and health-related quality of life
(Pediatric Quality of Life Inventory Physical subscale score; Wald $\chi^2 = 6.37$, $df = 2$, $p =
.04$; 6-week to 6-month coefficient $= 16.5$, $SE = 6.6$). The usual care group had significantly
lower scores on the CES-D scale as compared to the intervention group; the usual-care
group decreased 5.4 points between baseline (adjusted mean $= 17.2$, $SE = 1.8$) and 6 months
(adjusted mean $= 11.8$, $SE = 1.8$), and the intervention group had increased by 1.2 (baseline
$= 14.0$, $SE = 1.4$, 6 month $= 15.2$, $SE = 2.1$).Mean depression scores in both groups were

well below clinical range. The mean Pediatric Quality of Life Inventory Physical subscale score was similar for intervention and usual care groups at baseline (adjusted mean = 88.7, SE = 1.8 vs. 87.1, SE = 3.0), but the intervention group was higher at 6 weeks (adjusted mean = 66.5, SE = 4.5 vs. 56.2, SE = 4.6) and lower at 6 months compared to the usual care group (74.5, SE = 3.9 versus 80.7, SE = 4.0).

DISCUSSION

This pilot study is one of the first randomized trials to assess the feasibility and efficacy of brief secondary prevention of traumatic stress, targeted based on systematic screening of acutely injured children, and implemented during hospital trauma care. Strengths of the current study include its operationalization of recommended watchful waiting or screen-and-treat prevention approaches. Screening and a brief preventive intervention protocol were integrated into medical care in a busy tertiary care pediatric trauma unit. Results of this trial did not demonstrate an effect of the preventive intervention for the primary outcome of interest, PTSD symptom severity, nor for depression symptoms or health-related quality of life. In these children at higher risk for ongoing psychological sequelae, both usual care and intervention groups improved over time. Nonetheless, at 6-months postinjury approximately 10% of each group still met symptom criteria for PTSD, suggesting that there is room for further improvement in comprehensive care for these pediatric patients.

The intervention protocol put into practice current recommendations for preventive interventions in the immediate aftermath of trauma: watchful waiting, providing information, and building upon and strengthening naturally occurring social support systems (Litz, Gray, Bryant, & Adler, 2001). It may be, however, that such low-intensity follow-up is not potent enough to achieve early reduction in traumatic stress symptoms among those at risk, beyond that afforded by a trauma-informed medical team.

The study sheds light on issues of feasibility and timing in implementing preventive interventions with pediatric medical trauma patients. The intervention team was not able to approach all eligible patients. One key reason for missing patients was the combination of short hospital stays with the need for research staff to approach each eligible patient at a time when a parent was available to give research consent. Based on our experience with similar programs, this barrier would be significantly reduced if the intervention were delivered by nurses and social workers as part of normal care, rather than in the context of a research study. Once patients were enrolled, the intervention was fairly easily integrated into care within the hospital, but the intervention team was able to complete a second session (targeted for 2-weeks postdischarge) for only half of intervention cases. In contrast, the research team was able to reach 80% of patients for follow-up assessments completed 6-weeks postinjury. An alternate care model might be to screen during acute hospital care but wait longer to follow-up (i.e., 6 weeks) with those at higher risk, utilizing this later assessment as the critical decision point for offering additional services, which could include parent–child preventive interventions (Berkowitz et al., 2010; Kenardy, Cobham, Nixon, McDermott, & March, 2010), or trauma-focused treatment if severe traumatic stress symptoms are observed (National Institute for Clinical Excellence, 2005b). In the immediate aftermath of injury, watchful waiting might include web-based resources for

parents (Marsac, Kassam-Adams, Hildenbrand, Kohser, & Winston, 2011) or children (Cox & Kenardy, 2010) that allow family members to gauge their own emotional recovery and promote adaptive responses.

Most other RCTs of early preventive interventions for acute child medical trauma have enrolled children after their discharge from acute medical care, requiring parents to return to the hospital (Berkowitz et al., 2010; Stallard et al., 2006; Zehnder et al., 2010) or to complete and return questionnaires (Cox & Kenardy, 2010), prior to randomization and inclusion in the trial, with 27% to 73% of eligible cases dropping out prerandomization. One strength of the current study is its inclusion of a wider range of children and parents by completing enrollment, screening, and randomization during the child's acute medical care.

The participant pool was thus likely more representative of the population of children at risk, but included more families who could have difficulty engaging in ongoing intervention. Methods for reaching this broadest group of children and their parents require further refinement, but may entail systematic screening during acute hospital care with follow-up convenient to child and parent (e.g., integrated into follow-up medical care, delivered via email or telephone). Broad public availability of effective self-screening and self-help tools (e.g., on the Internet) might also help reach this broadest group.

Limitations

This study must be considered a pilot examination of the intervention. The sample size achieved only 62% power to detect the medium effect size we believed would be clinically meaningful, and limits our ability to examine potential subgroup differences (interactions) with confidence. Screening and a baseline research assessment were a common element in both study conditions. This assessment process may have provided parents and children with help in framing and discussing emotional reactions to the injury. Future studies might include a comparison group that is not assessed at baseline, to ascertain whether early assessment procedures affect later traumatic stress. Usual care (rather than an attention placebo or an alternate intervention) was judged to be an appropriate comparison condition, given current evidence regarding effective preventive interventions for children. The study was conducted in the midst of normal clinical care, and as it was not possible for hospital staff to be "blinded" as to study condition, this could have affected their interactions with patients. Finally, we did not exclude children with recent or ongoing mental health treatment. Unfortunately, our randomly assigned groups differed greatly in this regard: 12 of the 13 children with recent mental health treatment were assigned to the intervention condition. This imbalance precludes assessing the impact of mental health history on intervention effects; future trials might stratify sampling by this variable.

Implications for Research and Practice

Targeted preventive interventions that address posttraumatic mental health for children at risk have the potential to improve both physical health and emotional well-being after a traumatic injury. What is not yet clear is the optimal timing and nature of professional responses to reduce problematic sequelae of injury (and other traumatic events) for children. Further work is needed to determine whether there are effective means of hastening the

reduction of PTSD symptoms, the optimal timing of such strategies, and how best to reach pediatric injury patients with those interventions. Recent evidence (Berkowitz et al., 2010) suggests parent–child interventions as a promising means of reducing traumatic stress, but has not yet resolved the challenge of reaching all those at risk. Reaching the broadest range of children at risk for PTSD after acute pediatric trauma may require systematic screening and engagement during emergency medical treatment or brief hospital admission. The current results contribute to our understanding of the process of integrating a systematic, conceptually grounded model of preventive care within the busy acute pediatric care setting.

Acknowledgments

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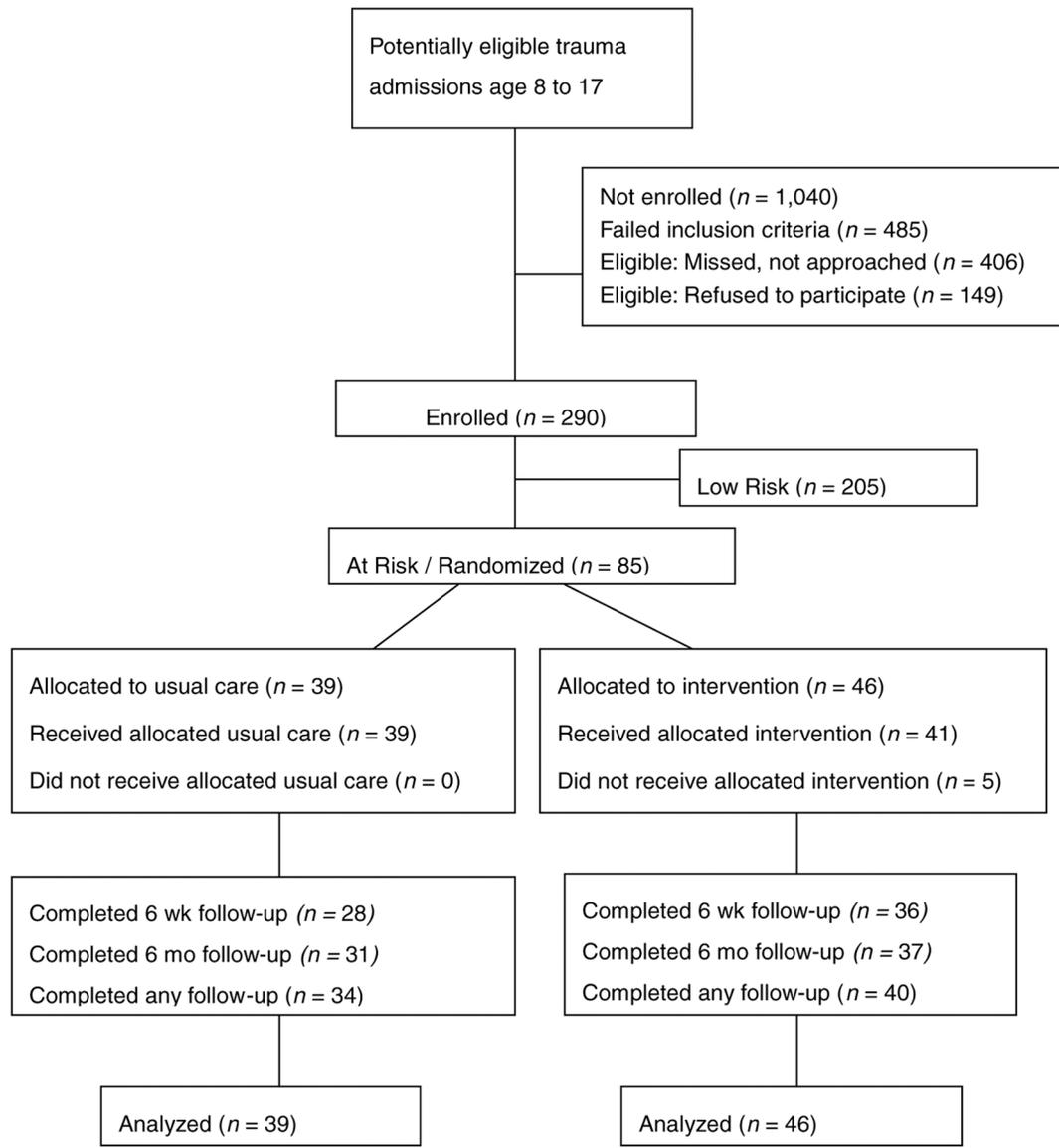
Figure 1.
CONSORT diagram: Patient flow for randomized trial.

Table 1.

Demographic, Injury, and Treatment Characteristics for Usual Care and Intervention Groups

Variable	Usual care (n = 39)		Intervention (n = 46)	
	M, Mdn, or n	SD, Range or %	M, Mdn, or n	SD, Range or %
Age: M SD	11.9	2.7	11.2	2.2
Male sex: n %	28	72	23	50
Race / ethnicity				
White n %	19	49	30	65
Black n %	18	46	12	26
Other race / ethnicity n %	2	5	4	9
Circumstances of injury				
Motor vehicle crash n %	11	28	10	2
Fall n %	8	21	13	28
Organized sports n %	9	23	8	17
Other recreation n %	9	23	8	17
Other circumstances n %	2	5	7	15
Injury Severity Score: M SD	6.7	3.7	7.3	5.4
Length of hospital stay: Mdn range	2 days	1 to 9 days	2 days	1 to 24 days
Mental health treatment in 6-months preinjury: n %	1	3	12	26
Prior trauma exposure: n %	20	51	30	65

Table 2.

Traumatic Stress and Depression Symptoms at Baseline, 6 Weeks, and 6 Months

| | Baseline | | | | 6 weeks | | | | 6 months | | | |
| | UC (*n* = 39) | | INT (*n* = 46) | | UC (*n* = 28) | | INT (*n* = 36) | | UC (*n* = 31) | | INT (*n* = 37) | |
Outcome variable	*M* or *n*	*SD* or %	*M* or *n*	*SD* or %	*M* or *n*	*SD* or %	*M* or *n*	*SD* or %	*M* or *n*	*SD* or %	*M* or *n*	*SD* or %
Meet symptom criteria for PTSD *n* %	10	26	8	17	6	21	4	11	3	10	4	11
Traumatic stress symptom severity (CPSS) *M SD*	19.9	9.4	16.5	8.2	13.6	10.7	12.6	10.2	12.2	9.7	12.6	11.6
Depression symptoms (CES-D) *M SD*	16.7	10.7	14.5	19.2	14.0	10.8	15.0	10.7	11.6	9.9	15.6	13.8
Health-related quality of life (PedsQL physical) *M SD*	87.6	17.3	88.5	12.2	57.3	24.5	65.8	27.2	80.2	21.2	74.3	25.5

Note. UC = usual care condition; INT = intervention condition; PTSD = posttraumatic stress disorder; CPSS = Child PTSD Symptom Scale; CES-D = Center for Epidemiologic Studies Depression Scale; PedsQL = Pediatric Quality of Life Inventory.