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Timing of Mental Health Service Use after a Pediatric Firearm Injury

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Contributors' Statement

Dr. Hoffmann provided substantial contributions to conception and design, provided substantial contributions to analysis and interpretation of data, and drafted the manuscript.

Dr. Pulcini, Dr. Hall, Ms. De Souza, and Drs. Alpern, Chaudhary, Fein, Ehrlich, Fleegler, Goyal, Hargarten, Jeffries, and Zima provided substantial contributions to conception and design, provided substantial contributions to analysis and interpretation of data, and revised the manuscript critically for important intellectual content.

All authors provided final approved of the version to be published and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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Abstract

Objectives: To examine how timing of the first outpatient mental health (MH) visit after a pediatric firearm injury varies by sociodemographic and clinical characteristics.

Methods: We retrospectively studied children aged 5–17 years with a nonfatal firearm injury from 2010–2018 using the IBM Watson MarketScan Medicaid database. Logistic regression estimated the odds of MH service use in the 6 months after injury, adjusted for sociodemographic and clinical characteristics. Cox proportional hazard models, stratified by prior MH service use, evaluated variation in timing of the first outpatient MH visit by sociodemographic and clinical characteristics.

Results: Following a firearm injury, 958/2,613 (36.7%) children used MH services within 6 months; of these, 378/958 (39.5%) had no prior MH service use. The adjusted odds of MH service use after injury were higher among children with prior MH service use (aOR 10.41, 95% CI 8.45–12.82) and among non-Hispanic White compared with non-Hispanic Black children (aOR 1.29, 95% CI 1.02–1.63). The first outpatient MH visit after injury occurred sooner among children with prior MH service use (adjusted hazard ratio 6.32, 95% CI 5.45–7.32). For children without prior MH service use, the first MH outpatient visit occurred sooner among children with a MH diagnosis made during the injury encounter (adjusted hazard ratio 2.72, 95% CI 2.04–3.65).

Conclusions: More than 3 in 5 children do not receive MH services after firearm injury. Prior engagement with MH services and new detection of MH diagnoses during firearm injury encounters may facilitate timelier connection to MH services after injury.

Article Summary

Medicaid claims data were used to identify sociodemographic and clinical factors associated with the timing of mental health service use after a pediatric firearm injury.

Firearm injuries are the leading cause of death among children age 10–17 in the United States.[1,2] For every child who dies, four children survive their injuries, resulting in 11,258 nonfatal injuries in 2020.[1,3] Children who survive firearm injuries are at risk for adverse mental health (MH) outcomes.[4–7] One in 12 children receives a new MH diagnosis during the firearm injury encounter itself, while one-quarter receive a new MH diagnosis in the year after injury.[8] Compared with uninjured children, firearm-injured children are 40% more likely to use MH services in the year after injury.[5] New MH diagnoses are often trauma-related disorders, substance use, and disruptive disorders.[8–10] Growing evidence suggests that early identification and timely connection to MH services after injury can improve MH outcomes.[11,12] On this basis, the 2022 American College of Surgeons standards require pediatric trauma centers to screen for MH problems after injury and refer children at high risk.[13]

Nevertheless, access to MH services after injury is often inequitable. New MH service use after a firearm injury occurs more often among children enrolled in Medicaid and with complex chronic conditions.[8] One recent study found that Black children are more likely to

access MH services after a firearm injury,[5] which contrasts with earlier research suggesting that Black children have more limited access to MH services relative to White children.[14–18] Data are also limited on how MH service use after firearm injuries differs among children with and without prior MH service use. Children who do not have an established source of MH care might experience more difficulty obtaining timely treatment.[16] Additionally, little is known about when children first receive outpatient MH services after injury or whether the timeliness of follow-up MH care differs by sociodemographic and clinical characteristics.

Using a large sample of Medicaid-enrolled children, our study objectives were: 1) to examine sociodemographic and clinical characteristics associated with MH service use after a nonfatal firearm injury, and 2) to determine how the timing of the first outpatient MH visit after injury varies by sociodemographic and clinical characteristics. We hypothesized that children with prior MH service use[16,19] and children with a new MH diagnosis recognized during the firearm injury encounter, compared to those who did not, would be more likely to access MH services and to receive more timely MH care after injury.

Methods

Study Design and Data Source

We conducted a retrospective cohort study of Medicaid-enrolled children with nonfatal firearm injuries, using the injury date as an anchor point to identify MH service use during the 6 months before and after injury. We used the IBM Watson Marketscan Medicaid claims database, which contains de-identified patient-level demographic, enrollment, and health care claims data for Medicaid enrollees in 11 geographically dispersed and de-identified states.[20] This study was deemed exempt by the lead author's institutional review board.

Eligibility Criteria

We included children aged 5–17 years[1,21] with a firearm injury encounter between 2010–2018 who were enrolled in Medicaid for at least 5 of 6 months prior to injury and for 6 months after injury. Firearm injury encounters were defined as emergency department (ED) or inpatient encounters with a firearm injury diagnosis code (Supplemental Table 1).[22] To study acute injuries, we excluded children with firearm injury diagnoses in the prior year (Supplemental Figure 1).

Measures

We defined MH service use as any outpatient, ED, or inpatient encounter with a primary diagnosis code in the Child and Adolescent Mental Health Disorders Classification System (CAMHD-CS)[23,24] by any provider type, including primary care physicians. We determined the MH service type (outpatient, ED, or inpatient) by place of service codes. We defined intensity of MH service use as the number of MH encounters during the 6-month period before or after injury.

Sociodemographic characteristics were age group (5–9, 10–14, 15–17 years),[1] sex, race and ethnicity (Hispanic, non-Hispanic Black, non-Hispanic White, other), and insurance type

(fee-for-service or managed care Medicaid). Using a health equity framework, race and ethnicity were considered social constructs rather than biologic determinants.[25] We included race and ethnicity in the analysis due to previously described inequities in access to MH services.[14] Clinical characteristics included location of bodily injury (traumatic brain injury/back/spinal, extremity, torso, >1 location, other, unknown),[26] injury severity score,[27] firearm injury encounter level of care (ED, observation or non-intensive care inpatient, intensive care), having a MH diagnosis during the firearm injury encounter, and new complex chronic condition[28] in the 6 months after injury, as a marker of probable new physical health disability. A complex chronic condition is one that is expected to last at least 12 months, involves several different organ systems, and requires ongoing specialty pediatric care.[28]

Analysis

We described rates of MH service use, along with type and intensity of MH service use, before and after injury. We described frequency of MH diagnosis groups before and after injury based on CAMHD-CS classification,[23,24] considering a new MH diagnosis group as one that was not present before injury.

We used multivariable logistic regression to determine sociodemographic and clinical characteristics associated with MH service use in the 6 months after injury. We constructed a model using the full cohort and then performed stratified analyses among children with and without prior MH service use.

Among children with any outpatient MH service use in the 6 months after firearm injury, we evaluated variation in the time to first outpatient MH visit using Cox proportional hazards multivariable models, adjusted for sociodemographic and clinical characteristics. We constructed models using the full cohort and then stratified analyses by prior MH service use. We performed all analyses using SAS 9.4 (SAS Institute, Cary, North Carolina), and p-values < 0.05 were considered statistically significant.

Results

Study Sample

We identified 2,613 children with firearm injuries during the study period (Table 1). Approximately two-thirds (64.5%) were age 15–17 years and non-Hispanic Black (68.7%). Most children (73.1%) were discharged from the ED, while 5.5% required intensive care. The most common location of injury was the extremities (52.6%). In the 6 months after injury, 6.8% of children had a new complex chronic condition.

Mental Health Service Use Before and After Firearm Injury

In the 6 months before injury, 29.9% (n=781) of children accessed MH services. Of children with firearm injuries, 28.6% received prior outpatient MH services, 3.5% had prior MH ED visits, and 1.7% had prior MH hospitalizations. Of children who used outpatient MH services before injury, the median number of visits was 6 (interquartile range [IQR] 2, 22) over 6 months. The most frequent MH diagnoses before injury were attention-deficit/hyperactivity disorder (ADHD) (12.9%, n=337) and disruptive, impulse control, and conduct

disorders (10.2%, n=266) (Supplemental Table 2). A MH diagnosis was documented during the firearm injury encounter for 15.9% (n=416) of children, of which 44.0% (n=183) had no prior MH service use.

In the 6 months after injury, 36.7% (n=958) of children received any MH services, of which 39.5% (n=378) had no prior MH service use. Of children with firearm injuries, 34.0% received outpatient MH services, 4.6% had MH ED visits, and 3.9% had MH hospitalizations in the 6 months after injury. Of 781 children with prior MH service use, 70.9% (n=554) received outpatient MH services, 8.2% (n=64) had MH ED visits, and 6.3% (n=49) had MH hospitalizations after injury. Of 416 children with a MH diagnosis during the firearm injury encounter, 63.7% (n=265) received outpatient MH services, 10.8% (n=45) had MH ED visits, and 7.2% (n=30) had MH hospitalizations after injury. Of 1,832 children with no prior MH service use, 17.6% (n=323) received outpatient MH services, 3.0% (n=55) had MH ED visits, and 3.0% (n=54) had MH hospitalizations after injury.

Children who received outpatient MH services had a median of 4 visits (interquartile range [IQR] 1, 12) in the 6 months after injury, with more visits among children with prior MH service use (median 6 visits; IQR 2, 17) than children without prior MH service use (median 2 visits; IQR 1, 5). The most common new MH diagnoses after injury were substance-related and addictive disorders (11.1%, n=289) and trauma and stressor-related disorders (7.4%, n=194). After injury, the percentage of children diagnosed with bipolar disorder, schizophrenia spectrum disorders, and suicidal ideation/self-injury nearly doubled (from 1.5% to 2.2%, 0.7% to 1.2%, and 1.2% to 2.4%, respectively).

Factors Associated with Mental Health Service Use after Firearm Injury

Non-Hispanic White children had higher adjusted odds of MH service use after injury (adjusted odds ratio [aOR] 1.29, 95% CI 1.02, 1.63) compared with non-Hispanic Black children. The adjusted odds of MH service use after injury were higher among children with prior MH service use (aOR 10.41, 95% CI 8.45, 12.82), among children with a MH diagnosis during the firearm injury encounter (aOR 3.07, 95% CI 2.34, 4.02), and among children with a new complex chronic condition after injury (aOR 1.99, 95% CI 1.36, 2.92) (Table 2).

In stratified analyses, among children with prior MH service use, the adjusted odds of MH service use after injury were higher among non-Hispanic White children (aOR 1.55, 95% CI 1.01, 2.39) compared with non-Hispanic Black children, and among children with a MH diagnosis during the firearm injury encounter (aOR 3.28, 95% CI 2.09, 5.14) (Supplemental Table 3).

Among children without prior MH service use, the odds of MH service use after injury did not differ by race and ethnicity. There were higher adjusted odds of MH service use among children with observation or non-intensive inpatient care (aOR 1.36, 95% CI 1.00, 1.85) compared with those discharged from the ED, among children with a MH diagnosis during the firearm injury encounter (aOR 3.11, 95% CI 2.21, 4.37), and among children with a new complex chronic condition after injury (aOR 2.30, 95% CI 1.50, 3.52) (Supplemental Table 4).

Timing of Mental Health Service Use after Firearm Injury

Among 887 children with outpatient MH service use in the 6 months after injury, 55.0% (n=488) had their first outpatient MH visit within 1 month of injury, 24.7% (n=219) between 1–3 months, and 20.3% (n=180) from 3–6 months. Of 564 children with prior MH service use, 65.1% (n=367) had their first outpatient MH visit within 1 month of injury. Of 323 children without prior MH service use, 37.5% (n=121) had their first outpatient MH visit within 1 month of injury.

The strongest predictor of timing of the first MH outpatient visit after a firearm injury was prior MH service use. Children with prior MH service use had a shorter time to first MH outpatient visit after injury (adjusted hazard ratio [aHR] 6.32, 95% CI 5.45, 7.32) compared with children without prior MH service use (Table 3; Figure 1). Among children without prior MH service use, the time to first MH outpatient visit was shorter for children with a MH diagnosis during the firearm injury encounter (aHR 2.72, 95% CI 2.04, 3.65) and for children with a new complex chronic condition after injury (aHR 1.66, 95% CI 1.14, 2.42). Among children with prior MH service use, receipt of intensive care was associated with a longer time to first outpatient MH visit (aHR 0.64, 95% CI 0.42, 0.97) compared with an ED discharge.

Discussion

Among Medicaid-enrolled children with nonfatal firearm injuries, more than three out of five did not receive any MH services in the 6 months after injury. Children with MH diagnoses detected prior to or during the firearm injury encounter were more likely to access MH care and receive more timely care after injury. In particular, children with a new MH diagnosis identified during the firearm injury encounter had over twice the odds of timely connection to outpatient MH care. Some of these children likely had undetected MH conditions preceding the injury, while others may have a new onset MH condition following injury, such as acute stress disorder.[29] For some children, dedicated MH screening during injury encounters, as recommended by the American College of Surgeons, may have facilitated more timely connection to MH care.[30,31] Together, these findings suggest that greater efforts are needed to connect children without an established medical home for their MH care with MH services after injury.

Findings from this study also suggest a relatively high rate of preceding MH service use among firearm-injured children, with approximately 30% having prior MH service use, which is double the rate of MH service use among U.S. children generally.[32] The most frequent MH diagnoses before a firearm injury were ADHD and disruptive behavior disorders, which may increase injury risk due to associated impulsivity.[33,34] Additionally, one in seven Medicaid-enrolled children had new MH service use in the 6 months after a firearm injury. These rates are higher than after hospitalization for any traumatic injury,[35] but lower than previously described rates of MH service use after firearm injuries, which have ranged from 18–26% in the year after injury.[8,9] Our shorter follow-up time frame of 6 months may be one reason for this difference. Medicaid-enrolled youth often face multifactorial barriers to accessing MH services after a firearm injury, including under-

recognition of need,[35] competing time and financial priorities of families,[36] and workforce shortages of MH professionals.[37]

While rates of severe mental illness (bipolar disorder, schizophrenia, and suicidal ideation/self-injury) nearly doubled post injury, the most frequent new MH diagnoses after injury were substance use and trauma-related disorders. In a study comparing pediatric firearm injuries against motor vehicle collisions, increased rates of substance use and trauma-related disorders were also identified after firearm injuries.[9] Thus, pediatricians might consider prioritizing screening for these conditions after firearm injuries. An example of an evidence-based approach to identify substance use is Screening, Brief Intervention, and Referral to Treatment (SBIRT).[38,39] For trauma-related disorders, brief screening tools include the Childhood Stress Disorders Checklist-Short Form (CSDC-SF),[31,40] the Screening Tool for Early Predictors of PTSD (STEPP),[41] and PsySTART.[42] Screening for MH sequelae of firearm injuries may facilitate greater detection of needs and more prompt initiation of treatment.

Among children with preceding MH service use, MH service use dropped after injury, with only three-quarters of children continuing to receive MH services. A prior study similarly found that children with high outpatient MH expenditures before a firearm injury experienced a decline in outpatient MH utilization and expenditures post-injury.[7,43] Perhaps some families may prioritize physical health needs over MH care after injury. Also, some children, such as those with severe traumatic brain injuries, may no longer be able to participate meaningfully in MH services after injury. However, in our study, we did not find an association between bodily location of injury and subsequent MH service use.

Children without prior MH service use who developed a new complex chronic condition (which may indicate a new physical health disability) were also more likely to access MH services and receive more timely MH care. This could be due to adverse MH outcomes associated with developing a new disability.[44] In addition, children with complex chronic conditions have more frequent interaction with the health system,[45] yielding more opportunities to detect MH symptoms and initiate MH services.

Further, use of MH services after a firearm injury varied by race, with higher odds of MH service use after injury among White compared with Black children. Our finding contrasts with a study using propensity matching that found Black children were 1.6 times more likely to use MH services in the year after a firearm injury than White children.[5] Overall, in the U.S., Black children are less likely than White children to have MH visits and to receive psychotropic medications.[21,46,47] Mechanisms underlying these inequities may include stigma and costs related to accessing care, limited diversity in the mental health workforce, and shortages of mental health professionals in areas where Black children live.[14] Attention is needed to address barriers at the individual, health system, and societal levels that may prevent Black youth from accessing MH services.

Overall, our findings suggest opportunities are available for trauma centers and pediatricians within the medical home to take a comprehensive approach to post-injury care that uses a broader definition of recovery, encompassing psychosocial health and wellbeing.[48–50]

Trauma centers can employ brief screening tools that prompt referrals for early treatment, or they may choose to include a dedicated mental health professional on the interdisciplinary trauma team.[31,42] For pediatricians, evidence-based screening practices for MH conditions should be prioritized after firearm injuries.[51] Treatment approaches involving stepped collaborative care are effective in reducing PTSD and substance use following traumatic injuries.[29,52]

This study has several limitations. The data source was Medicaid claims; thus, misclassification may have occurred for race and ethnicity or the reason for visit. Severity of mental illness was missing, which could influence prioritization for MH services. Similarly, the extent of misclassification of intent of firearm injury in administrative datasets precluded its inclusion in our models.[53,54] While data from 11 de-identified states across U.S. regions were used, the results may not be generalizable to all states, nor can the results be generalized to children without public insurance. Most importantly, we could not assess need for MH services, or unsuccessful attempts at connection to MH services, as we were only able to measure completed MH service utilization. The need for MH care related to exposure to firearm injuries is also likely underestimated, because this study did not include children who witnessed firearm violence.[55,56] To address these limitations, prospective studies using more complete data sources are needed to understand the impact of poor access and delayed MH care after pediatric firearm injuries.

Conclusion

Comprehensive care for children injured by firearms should address both physical and MH needs. However, our findings suggest that more three out of five children enrolled in Medicaid do not receive any MH services in the 6 months after a firearm injury, and that access to MH care is inequitable. Children identified as having a MH diagnosis prior to or during the firearm injury encounter were more likely to access care and receive more timely care. To mitigate the adverse effects of firearm injuries on child health outcomes, public health strategies should prioritize early detection of MH needs, equitable access to MH care, and timeliness of care.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Abbreviations:

ADHD	Attention-deficit/hyperactivity disorder
CAMHD-CS	Child and Adolescent Mental Health Disorders Classification System
ED	Emergency Department

MH	Mental Health
PTSD	posttraumatic stress disorder

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What's Known on This Subject

After a nonfatal firearm injury, children are at risk of developing adverse mental health outcomes, including new trauma-related disorders and substance use disorders. Timely connection to mental health services may improve long-term outcomes.

What This Study Adds

Children with prior mental health service use or with a mental health diagnosis detected during the firearm injury encounter have higher odds of accessing mental health services and timelier connection with mental health services during the 6 months after injury.

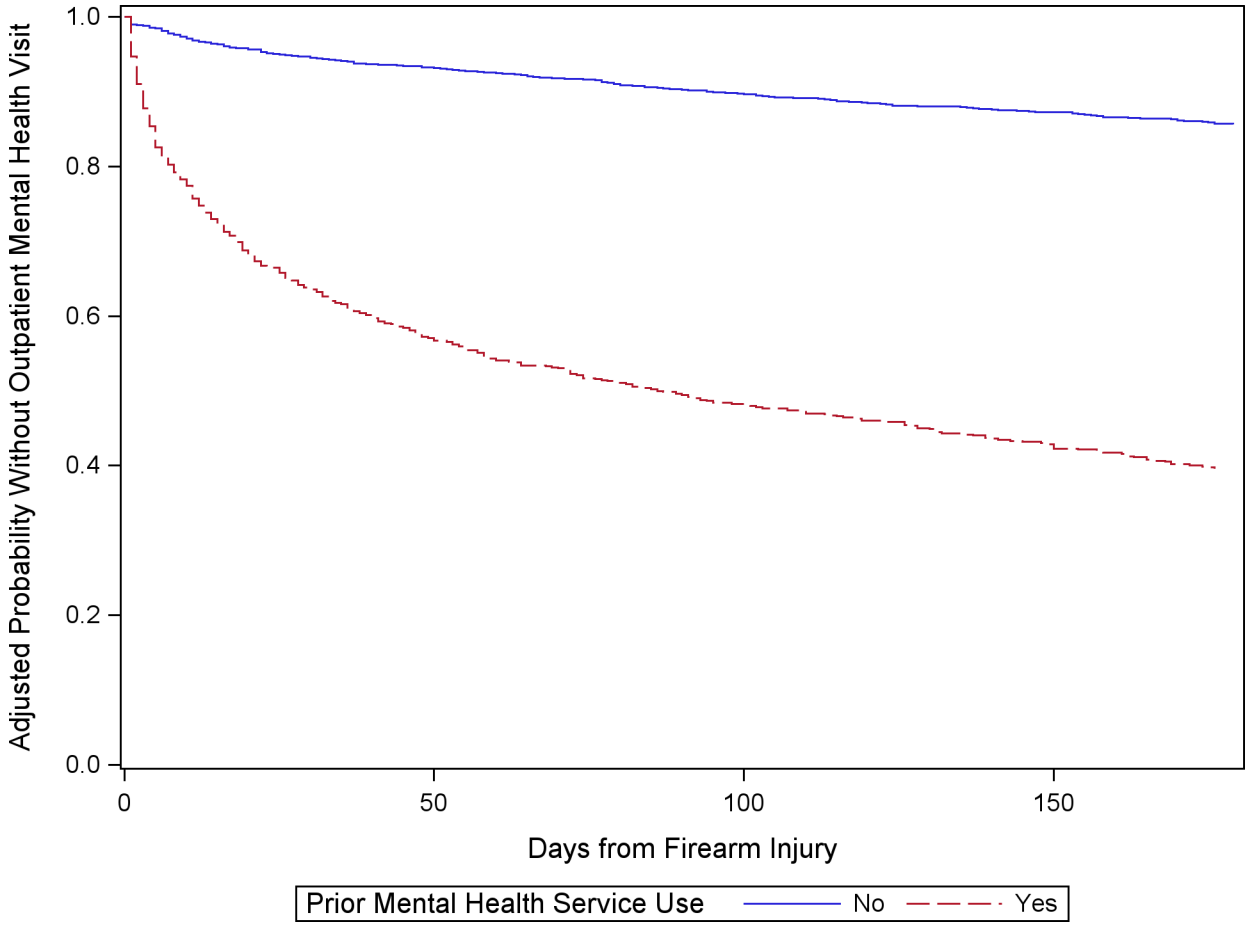

Figure 1. Kaplan-Meier Survival Curve for Timing of First Mental Health Outpatient Visit after Firearm Injury

Children with prior mental health service use had a shorter time to first mental health outpatient visit after a firearm injury (adjusted hazard ratio 6.30, 95% CI 5.44, 7.30) compared with children without prior mental health service use, after adjusting for age, sex, race and ethnicity, insurance type, location of bodily injury, injury severity score, injury encounter level of care, whether a mental health diagnosis was made during the index firearm encounter, and presence of a new complex chronic condition after injury.

Table 1.

Characteristics of Medicaid-enrolled children with a firearm injury, with and without prior mental health service use

	All children with firearm injury, N=2613	No prior mental health service use[a], N=1832	Prior mental health service use[a], N=781	P-value
Age, N (%)				0.002
5–9	292 (11.2)	226 (12.3)	66 (8.5)	
10–14	636 (24.3)	461 (25.2)	175 (22.4)	
15–17	1685 (64.5)	1145 (62.5)	540 (69.1)	
Sex, N (%)				0.011
Male	2185 (83.6)	1510 (82.4)	675 (86.4)	
Female	428 (16.4)	322 (17.6)	106 (13.6)	
Race and ethnicity, N (%)				0.414
Hispanic	63 (2.5)	45 (2.5)	18 (2.4)	
Non-Hispanic Black	1747 (68.7)	1240 (69.6)	507 (66.6)	
Non-Hispanic White	642 (25.2)	433 (24.3)	209 (27.5)	
Other	91 (3.6)	64 (3.6)	27 (3.5)	
Insurance type, N (%)				0.039
Fee-for-service	656 (25.1)	439 (24)	217 (27.8)	
Capitated	1957 (74.9)	1393 (76)	564 (72.2)	
Location of bodily injury				0.378
Traumatic brain injury, back, spinal	180 (6.9)	125 (6.8)	55 (7)	
Extremity	1375 (52.6)	971 (53)	404 (51.7)	
Torso	188 (7.2)	134 (7.3)	54 (6.9)	
>1 Location	754 (28.9)	531 (29)	223 (28.6)	
Other	19 (0.7)	13 (0.7)	6 (0.8)	
Unknown	97 (3.7)	58 (3.2)	39 (5)	
Injury severity score, geometric mean (SD)	3.1 (2.5)	3.1 (2.4)	3.1 (2.5)	0.751
Injury encounter level of care				0.953
Emergency department	1910 (73.1)	1342 (73.3)	568 (72.7)	
Observation or non-intensive care inpatient	560 (21.4)	391 (21.3)	169 (21.6)	
Intensive care	143 (5.5)	99 (5.4)	44 (5.6)	
Hospital length of stay, days, geometric mean (SD)	2.6 (2.3)	2.5 (2.3)	2.7 (2.3)	0.387
Mental health diagnosis during index firearm encounter	416 (15.9)	183 (10)	233 (29.8)	<0.001
New complex chronic condition [b]	177 (6.8)	116 (6.3)	61 (7.8)	0.169

SD: Standard deviation

[a] Prior mental health service use defined as any outpatient, emergency department, or inpatient encounter in the 6-month period before the firearm injury.

[b] New complex chronic condition in the 6-month period after firearm injury.

Table 2.

Sociodemographic and clinical characteristics associated with mental health service use in the 6 months after a firearm injury

	No mental health service use[a] after injury, N=1655	Mental health service use[a] after injury, N=958	aOR (95% CI)
Age, N (%)			
5–9	190 (11.5)	102 (10.6)	1.29 (0.92, 1.79)
10–14	408 (24.7)	228 (23.8)	1.12 (0.88, 1.43)
15–17	1057 (63.9)	628 (65.6)	Ref
Sex, N (%)			
Male	1377 (83.2)	808 (84.3)	1.00 (0.76, 1.31)
Female	278 (16.8)	150 (15.7)	Ref
Race and ethnicity, N (%)			
Hispanic	38 (2.3)	25 (2.7)	1.31 (0.71, 2.40)
Non-Hispanic Black	1138 (70.2)	609 (66.1)	Ref
Non-Hispanic White	383 (23.6)	259 (28.1)	1.29 (1.02, 1.63)
Other	62 (3.8)	29 (3.1)	0.75 (0.43, 1.29)
Insurance type, N (%)			
Fee-for-service	398 (24)	258 (26.9)	1.10 (0.88, 1.38)
Capitated	1257 (76)	700 (73.1)	Ref
Prior mental health service use [b]	201 (12.1)	580 (60.5)	10.41 (8.45, 12.82)
Location of bodily injury			
Traumatic brain injury, back, spinal	119 (7.2)	61 (6.4)	0.77 (0.51, 1.15)
Extremity	889 (53.7)	486 (50.7)	Ref
Torso	120 (7.3)	68 (7.1)	0.95 (0.64, 1.41)
>1 Location	462 (27.9)	292 (30.5)	1.14 (0.90, 1.43)
Other	12 (0.7)	7 (0.7)	0.98 (0.30, 3.16)
Unknown	53 (3.2)	44 (4.6)	1.16 (0.59, 2.27)
Injury severity score	3.1 (2.5)	3.2 (2.5)	1.00 (0.97, 1.03)
Injury encounter level of care			
Emergency department	1241 (75)	669 (69.8)	Ref
Observation or non-intensive care inpatient	331 (20)	229 (23.9)	1.17 (0.90, 1.52)
Intensive care	83 (5)	60 (6.3)	0.93 (0.58, 1.47)
Mental health diagnosis during index firearm encounter	136 (8.2)	280 (29.2)	3.07 (2.34, 4.02)
New complex chronic condition [c]	84 (5.1)	93 (9.7)	1.99 (1.36, 2.92)

[a] Mental health service use defined as any outpatient, emergency department, or inpatient encounter in the 6-month period after firearm injury.

[b] Prior mental health service use defined as any outpatient, emergency department, or inpatient encounter in the 6-month period before the firearm injury.

[c] New complex chronic condition in the 6-month period after firearm injury.

Table 3.

Timing of first mental health outpatient visit after firearm injury by sociodemographic and clinical characteristics

	Timing of first mental health outpatient visit, adjusted hazard ratio (95% CI)		
	All children with firearm injury	**Prior mental health service use[a]**	**No prior mental health service use[a]**
Age, N (%)			
5–9	1.20 (0.96, 1.51)	1.15 (0.85, 1.56)	1.26 (0.88, 1.82)
10–14	1.10 (0.93, 1.3)	1.04 (0.84, 1.29)	1.22 (0.92, 1.61)
15–17	Ref	Ref	Ref
Sex, N (%)			
Male	0.99 (0.82, 1.2)	1.06 (0.83, 1.35)	0.89 (0.66, 1.20)
Female	Ref	Ref	Ref
Race and ethnicity, N (%)			
Hispanic	1.12 (0.74, 1.71)	0.96 (0.54, 1.72)	1.46 (0.78, 2.71)
Non-Hispanic Black	Ref	Ref	Ref
Non-Hispanic White	1.17 (1.00, 1.37)	1.16 (0.95, 1.41)	1.16 (0.88, 1.52)
Other	0.70 (0.47, 1.04)	0.50 (0.28, 0.88)	1.13 (0.64, 2.01)
Insurance type, N (%)			
Fee-for-service	1.15 (0.99, 1.35)	1.16 (0.96, 1.41)	1.09 (0.84, 1.42)
Capitated	Ref	Ref	Ref
Prior mental health service use [a]	6.30 (5.44, 7.30)	--	--
Location of bodily injury			
Traumatic brain injury, back, spinal	0.87 (0.65, 1.17)	0.94 (0.66, 1.35)	0.79 (0.47, 1.32)
Extremity	Ref	Ref	Ref
Torso	0.90 (0.68, 1.19)	0.89 (0.62, 1.27)	0.90 (0.57, 1.44)
>1 Location	1.11 (0.95, 1.31)	1.10 (0.90, 1.35)	1.09 (0.84, 1.42)
Other	1.25 (0.59, 2.65)	1.33 (0.49, 3.62)	1.71 (0.54, 5.39)
Unknown	1.02 (0.64, 1.63)	1.10 (0.63, 1.92)	0.95 (0.39, 2.34)
Injury severity score	1.00 (0.98, 1.02)	0.99 (0.96, 1.01)	1.03 (1.00, 1.05)
Injury encounter level of care			
Emergency department	Ref	Ref	Ref
Observation or non-intensive care inpatient	0.92 (0.77, 1.10)	0.79 (0.62, 1.01)	1.18 (0.89, 1.58)
Intensive care	0.78 (0.57, 1.07)	0.64 (0.42, 0.97)	1.14 (0.70, 1.84)
Mental health diagnosis during index firearm encounter	1.99 (1.69, 2.33)	1.84 (1.52, 2.22)	2.73 (2.04, 3.65)

	Timing of first mental health outpatient visit, adjusted hazard ratio (95% CI)		
	All children with firearm injury	**Prior mental health service use[a]**	**No prior mental health service use[a]**
New complex chronic condition [b]	1.26 (0.98, 1.61)	1.08 (0.77, 1.51)	1.66 (1.14, 2.42)

[a.] Prior mental health service use defined as any outpatient, emergency department, or inpatient encounter in the 6-month period before the firearm injury.

[b.] New complex chronic condition in the 6-month period after firearm injury