

# Are Surgically Treated Long Bone Fractures in Adolescents Linked to Higher Rates of Substance Use Disorder? A Propensity-Matched Study

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INTRODUCTION:

Adolescents recovering from operatively treated traumatic fractures face significant perioperative challenges, including pain, functional limitations, and psychological distress. Pain management often involves the use of opiates, which may contribute to the subsequent risk of developing substance use disorders (SUDs). This study explores the relationship between surgically treated upper and lower extremity fractures and the subsequent risk of developing SUDs.

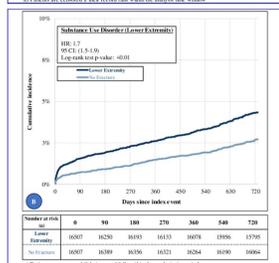
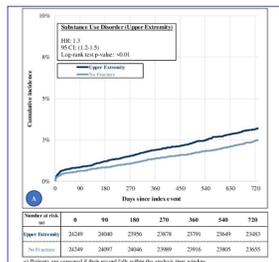
**METHODS:** This retrospective, propensity-matched cohort study utilized the TriNetX US Collaborative database, encompassing over 115 million patient records. Adolescents aged 14-17 with surgically treated upper (n=24,249) or lower extremity (n=16,507) fractures were compared to matched controls without fractures (n=24,249 and n=16,507, respectively). Patients with prior psychiatric, substance use, or insomnia disorders were excluded. Hazard ratios (HR) for SUD diagnoses were calculated over a 2-year follow-up using a Cox proportional hazard model.

## RESULTS:

Adolescents with surgically treated upper extremity fractures have a moderate but significant increase in SUD risk (HR: 1.3) compared to matched controls. Additionally, those with surgically treated lower extremity fractures have a significantly increased risk (HR: 1.7) of developing substance use disorders compared to matched controls.

## DISCUSSION AND CONCLUSION:

Adolescents with surgically treated long bone fractures are at increased risk of developing SUDs, particularly following upper extremity fractures. Early psychological support, careful pain management, and social reintegration strategies are critical to mitigating this risk and fostering recovery.



Patient Demographic Characteristics (Before Match)			
Characteristic	Upper Extremity N (Mean or %)	Not Fracture N (Mean or %)	P
Age at Index	24,249 (15.1 ± 1.1)	32,749,497 (15.2 ± 1.4)	0.972
Sex			
Male	19,209 (79%)	1,650,509 (97%)	<0.01
Female	4,036 (17%)	1,744,226 (53%)	<0.01
Race & Ethnicity			
Hispanic or Latino	3,302 (14%)	414,983 (13%)	<0.01
Asian	808 (3%)	1,074,076 (33%)	<0.01
Black or African American	2,781 (11%)	446,251 (13%)	<0.01
White	18,241 (76%)	1,796,766 (54%)	<0.01
Other Race	1,289 (5%)	345,682 (11%)	<0.01
Diagnosis	488 (2%)	81,188 (2%)	<0.01
Overweight and Obese			
Overweight	488 (2%)	81,188 (2%)	1.00
Obese	488 (2%)	81,188 (2%)	1.00

Patient Demographic Characteristics (After Match)			
Characteristic	Upper Extremity N (Mean or %)	Not Fracture N (Mean or %)	P
Age at Index	24,249 (15.1 ± 1.1)	24,249 (15.1 ± 1.1)	7.50
Sex			
Male	19,209 (79%)	19,209 (79%)	1.00
Female	4,036 (17%)	4,036 (17%)	1.00
Race & Ethnicity			
Hispanic or Latino	3,302 (14%)	3,302 (14%)	1.00
Asian	808 (3%)	808 (3%)	1.00
Black or African American	2,781 (11%)	2,781 (11%)	1.00
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Patient Demographic Characteristics (Before Match)			
Characteristic	Upper Extremity N (Mean or %)	Not Fracture N (Mean or %)	P
Age at Index	16,507 (15.2 ± 1.2)	32,749,497 (15.2 ± 1.4)	<0.01
Sex			
Male	11,861 (72%)	1,650,509 (97%)	<0.01
Female	4,222 (25%)	1,744,226 (53%)	<0.01
Race & Ethnicity			
Hispanic or Latino	2,870 (17%)	414,983 (13%)	<0.01
Asian	461 (3%)	1,074,076 (33%)	<0.01
Black or African American	2,846 (18%)	446,251 (13%)	<0.01
White	10,251 (62%)	1,796,766 (54%)	<0.01
Other Race	1,048 (6%)	345,682 (11%)	<0.01
Diagnosis	624 (4%)	81,188 (2%)	<0.01
Overweight and Obese			
Overweight	624 (4%)	81,188 (2%)	<0.01
Obese	624 (4%)	81,188 (2%)	<0.01

Patient Demographic Characteristics (After Match)			
Characteristic	Upper Extremity N (Mean or %)	Not Fracture N (Mean or %)	P
Age at Index	16,507 (15.2 ± 1.2)	16,507 (15.2 ± 1.2)	7.50
Sex			
Male	11,861 (72%)	11,861 (72%)	1.00
Female	4,222 (25%)	4,222 (25%)	1.00
Race & Ethnicity			
Hispanic or Latino	2,870 (17%)	2,870 (17%)	1.00
Asian	461 (3%)	461 (3%)	1.00
Black or African American	2,846 (18%)	2,846 (18%)	1.00
White	10,251 (62%)	10,251 (62%)	1.00
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Diagnosis	624 (4%)	624 (4%)	1.00
Overweight and Obese			
Overweight	624 (4%)	624 (4%)	1.00
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