

Arrival Time Outside of Standard Work Hours Increases Risk of Avoidable Transfer in Pediatric Trauma

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DISCLOSURE

• Authors have no disclosures



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BACKGROUND



Structured trauma systems:

- Improves outcomes
- Provide timely comprehensive care


Interfacility transfer of severely injured is associated with lower in-hospital mortality

What about the unnecessary use of interfacility transfer in trauma patients?




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BACKGROUND



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AVOIDABLE TRANSFER



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AVOIDABLE TRANSFER


Undergoes an interfacility transfer

+

Length of stay < 48 hours

+

Procedures or invasive interventions




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OBJECTIVE

We aimed to characterize factors of pediatric trauma encounters that were associated with avoidable transfer

Hypothesis

Avoidable transfers would be associated with patient age, injury mechanism and time of arrival.



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METHODS

Retrospective, multicenter study using the LA County trauma registry
January 1, 2010 to December 31, 2021

Avoidable transfer
Interfacility transfer
+
LOS < 48 hours
without
Procedures or invasive
interventions

Non-avoidable transfer
Interfacility transfer
+
LOS > 48 hours
or
Procedures or invasive
interventions



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ANALYSIS

Bivariate analysis: Mann-Whitney U test or chi-square tests

Associated predictors identified using multivariable logistic regression

Sensitivity analysis:
Redefined avoidable transfer as LOS < 24hrs without procedures or
invasive interventions



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RESULTS

Total pediatric trauma activations: N=31,702

Transferred pediatric trauma activations: N=5,805 (18.3%)

Exclusions:
• Missing date and/or time of arrival or discharge: N = 248
• Possible non-accidental trauma: N = 119

Remaining transferred pediatric trauma activations: N = 5,428

Avoidable transfers:
N = 2,187 (40.2%)
LOS <24 hours
N=1,283 (58.7% AT)


Non-avoidable transfers:
N = 3,251 (59.8%)



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DIFFERENT RESOURCE UTILIZATION


	Non-avoidable Transfer N=3251 (%)	Avoidable Transfer N=2187 (%)	p-value
Transport			<0.0001
Ground EMS	2607 (80.2)	1806 (82.6)	
Air EMS	309 (9.5)	112 (5.1)	
Private	14 (0.4)	18 (0.8)	
Other	321 (9.9)	251 (11.5)	
Receiving Department			0.0002
ED	2127 (65.4)	1538 (70.3)	
Direct admit	1071 (32.9)	619 (28.3)	
Injury Severity Score			<0.0001
Median [IQR]	9 [4-12]	5 [4-9]	



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PREDICTORS OF AVOIDABLE TRANSFER


	OR (95% CI)	p-value
Age*	0.95 (0.94 - 0.97)	<0.0001
Mechanism of Injury		
Pedestrian	Ref	
MVC	1.44 (1.05 to 1.98)	0.026
Fall From Elevation*	3.20 (2.35 to 4.39)	<0.0001
Fall at Ground level*	2.48 (1.89 to 3.28)	<0.0001
Assault	1.32 (0.90 to 1.93)	0.1547
Firearm Injuries*	1.74 (1.15 to 2.62)	0.0086
Self-Inflicted	0.62 (0.36 to 1.04)	0.0785
Sports/Recreational *	2.36 (1.78 to 3.16)	<0.0001



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PREDICTORS OF AVOIDABLE TRANSFER


	OR (95% CI)	p-value
Time of Presentation		
Early Hours * (00:00 to 07:59)	1.48 (1.24 to 1.76)	<0.0001
Normal Hours (08:00 to 16:59)	Ref	
Evening Hours * (17:00 to 23:59)	1.75 (1.47 to 2.07)	<0.0001



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LIMITATIONS

- Categorization of injury mechanisms could have resulted in some loss of granularity
- Exclusion of encounters suspected as non-accidental trauma




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SUMMARY

Inverse relationship between patient age and the odds of an avoidable transfer

Mechanism of injury may be a stronger predictor of avoidable transfer than injury severity

Increased odds of avoidable transfer with an arrival outside of standard work hours




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FUTURE INITIATIVES

How do we reduce avoidable transfer of pediatric trauma?
Implementation of collaborations

Improve collaborations and support referring facilities:
Virtual consultations
Align with need of referring facilities



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Thank You
Questions?

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