

Pediatric Train Injuries: A 10 Year Review from the Pennsylvania Trauma Outcomes Study Database

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p e n n s y l v a n i a
**TRAUMA
SYSTEMS**
f o u n d a t i o n



**St. Christopher's
Hospital for Children**

Disclosures

- None

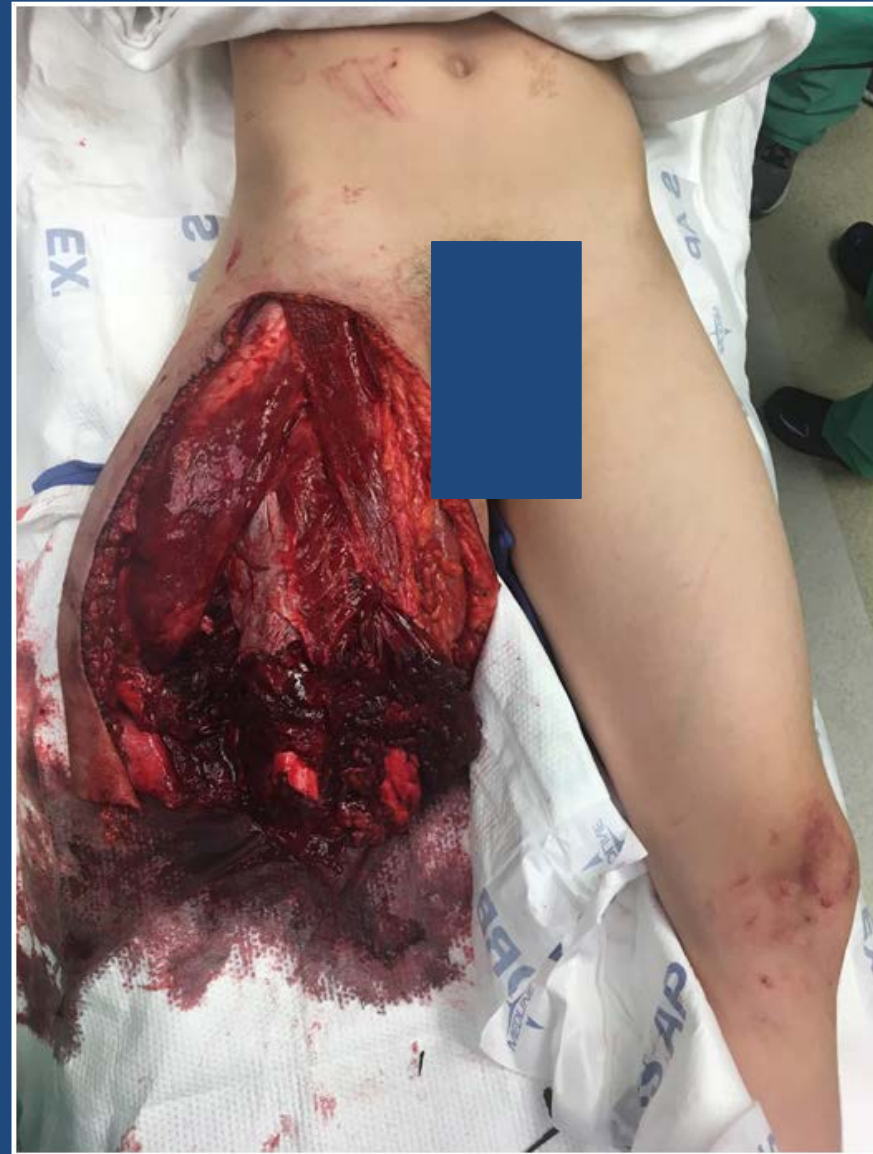
Background

- 9,070 railroad injuries in 2015
- 791 railroad deaths in 2016
- Adult literature suggests:
 - Young men at greatest risk
 - Orthopedic injuries are common
 - Pedestrians struck, MVC, “Train surfing”



Project Impetus

- 14M attempted to “Train Surf”
- Traumatic above knee amputation
- Serial debridement and wound closure with STSG
- Discharged home on HD 35

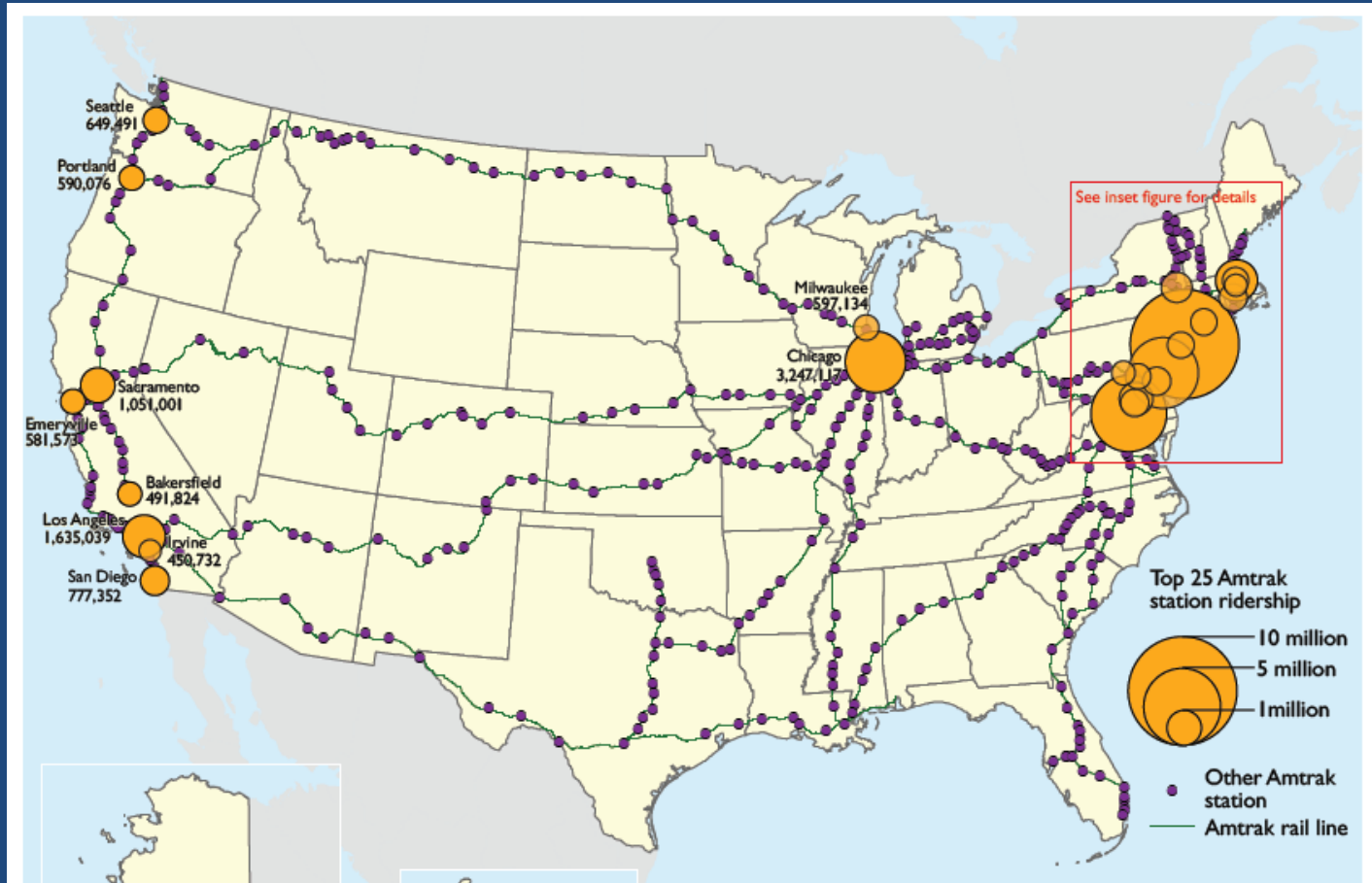


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Passenger Train Use 2017



- North East Corridor—Greatest station-density in US
- 6,388 miles of railway track in PA

Research Goals

- Determine
 - Incidence of train-related injuries requiring hospitalization in pediatric patients
 - At-risk pediatric populations
 - Patterns and severity of injuries
 - Health resource utilization
 - Clinical outcomes of children injured by trains

Methods

- PTOS Query:
 - Patients <21 years
 - January 1, 2007 – December 31, 2016
 - ICD9 or ICD 10 codes for injuries involving trains:

ICD 9 Codes	ICD 10 Codes
E800.0-807.9 E810.0-810.9	V05, V15, V25, V35, V45, V55, V65, V75, V81, V87.6, V88.6

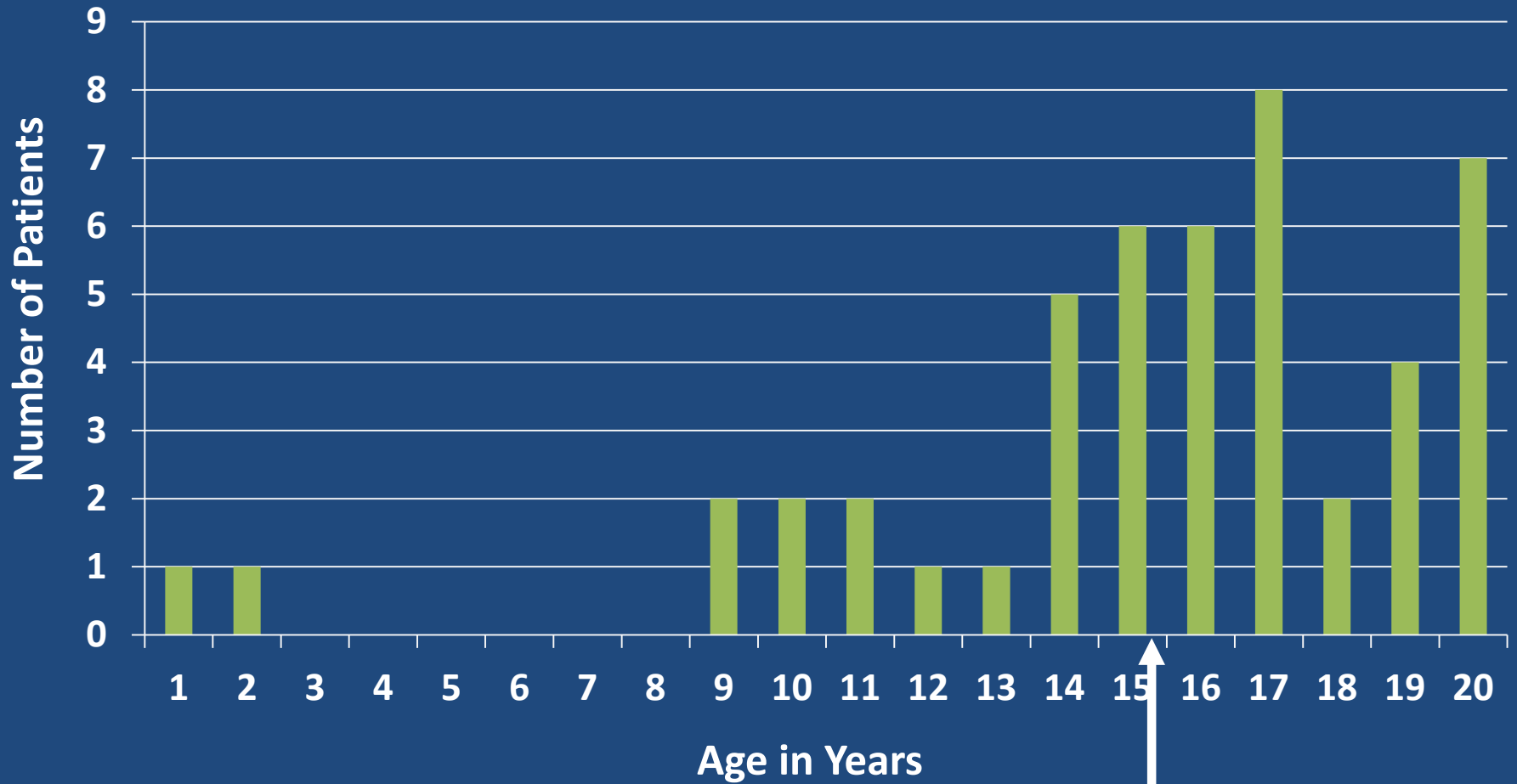
- Demographics, patterns of injury, resource utilization, and outcomes extracted

Demographics

Total Patients Identified (N)	48
Age (mean, range)	15.3 years (1 - 20)
Race <ul style="list-style-type: none">• White• Black or African American• Other	60.4% 35.4% 4.2%
Sex <ul style="list-style-type: none">• Male• Female	77.1% 22.9%
Drug Use	20.8%*
Alcohol Use	12.5%*
ISS (mean, range)	17.3 (4 - 59)

*Drug and alcohol use data available for 35.4% and 50.0%, respectively

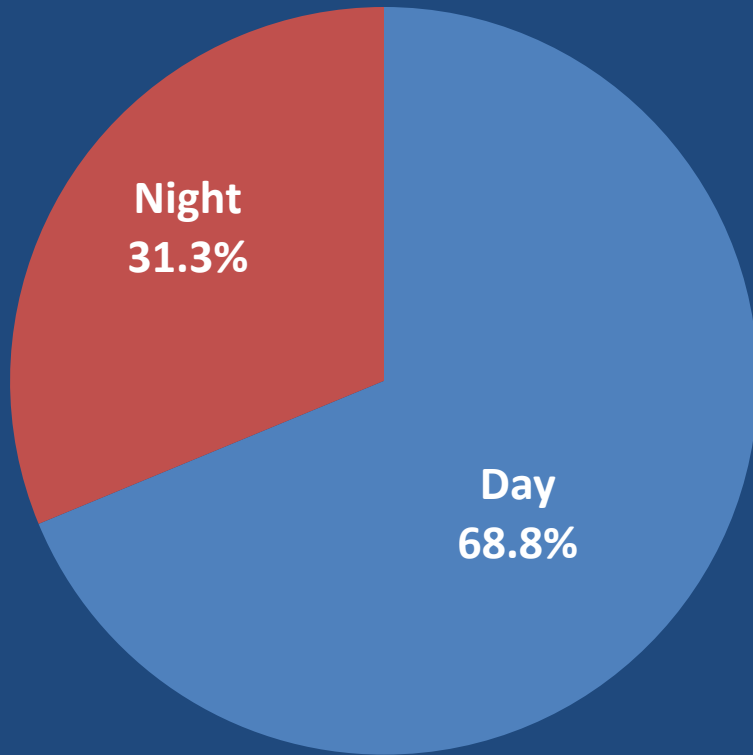
Ages of Train-Injured Patients



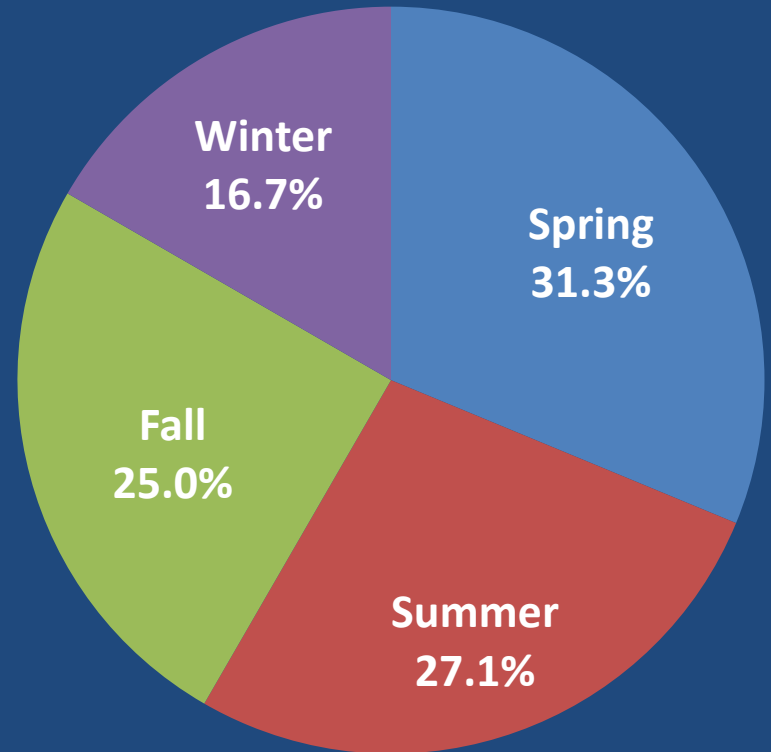
Mean = 15.3 years

Timing of Injuries

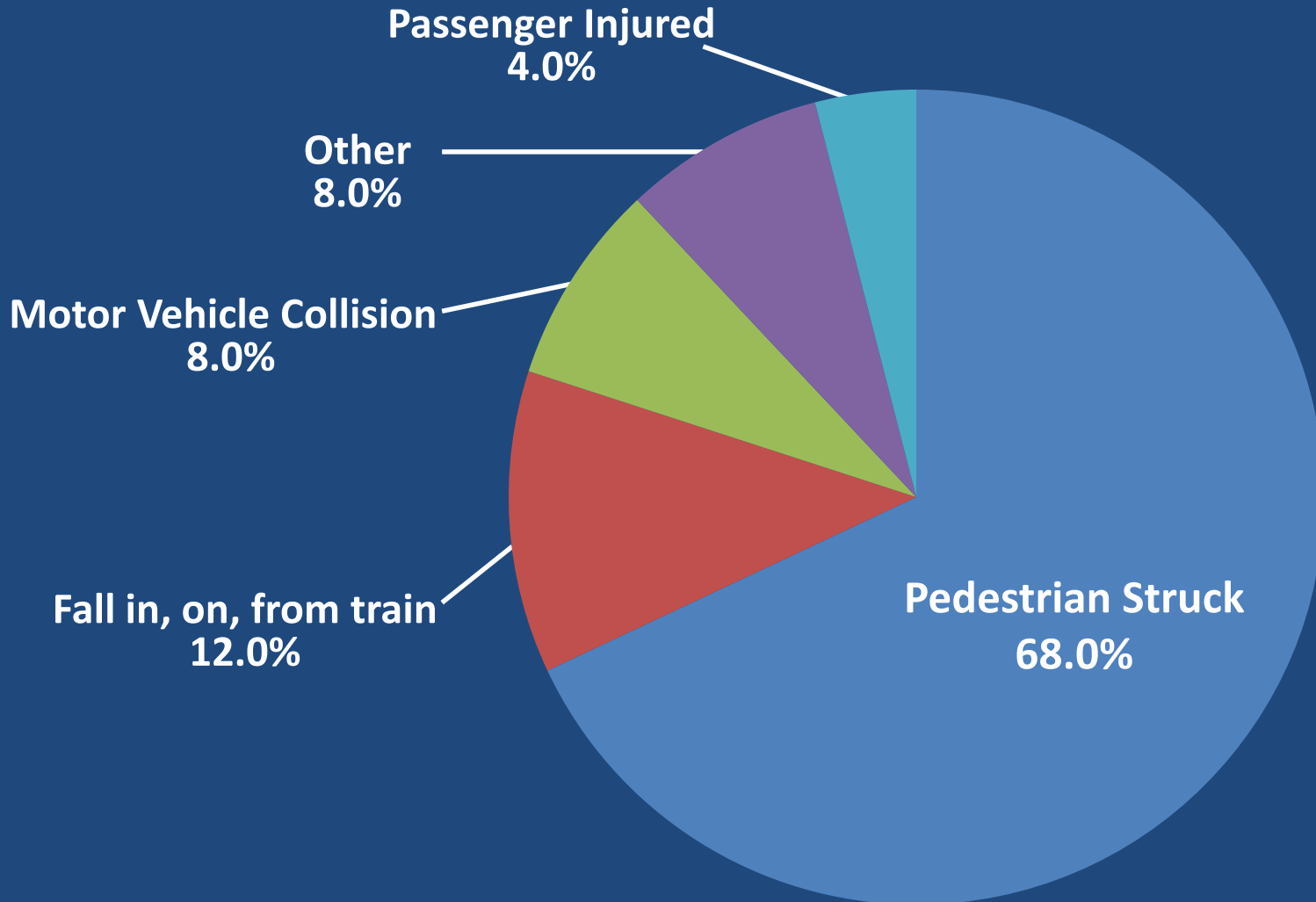
Time of Day



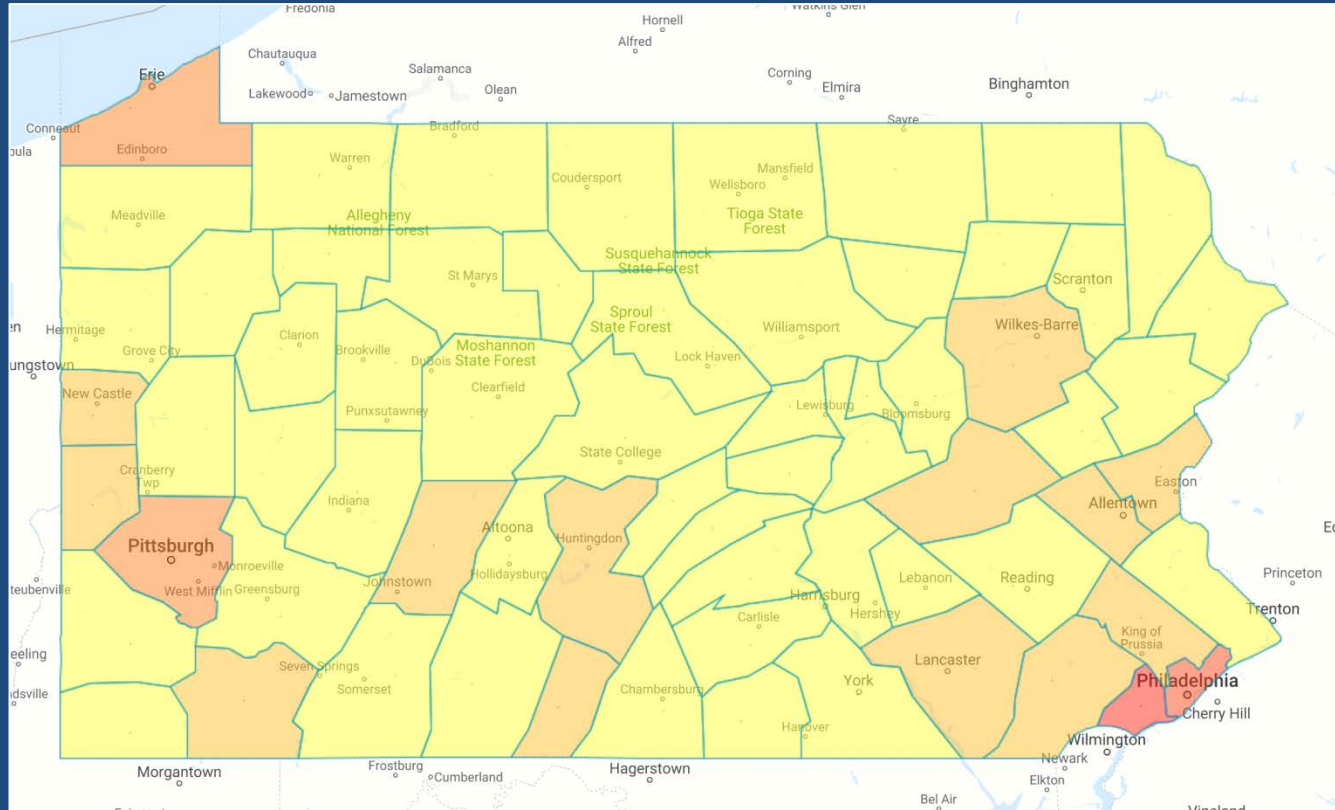
Seasons



Mechanisms of Injury



Train Injuries by County



Delaware County	Philadelphia County	Allegheny County	Erie County
9	7	5	4

Patterns of Injury

Fracture	45.8%
• Long Bone	31.3%
• Pelvic	20.8%
• Facial	14.6%
Concussion	27.7%
Intracranial Hemorrhage	25.5%
Pneumothorax	20.8%
Traumatic Amputation	16.7%
Solid Organ Injury	14.6%
• Spleen	8.3%
• Liver	6.3%
• Kidney	6.3%

Patterns of Injury

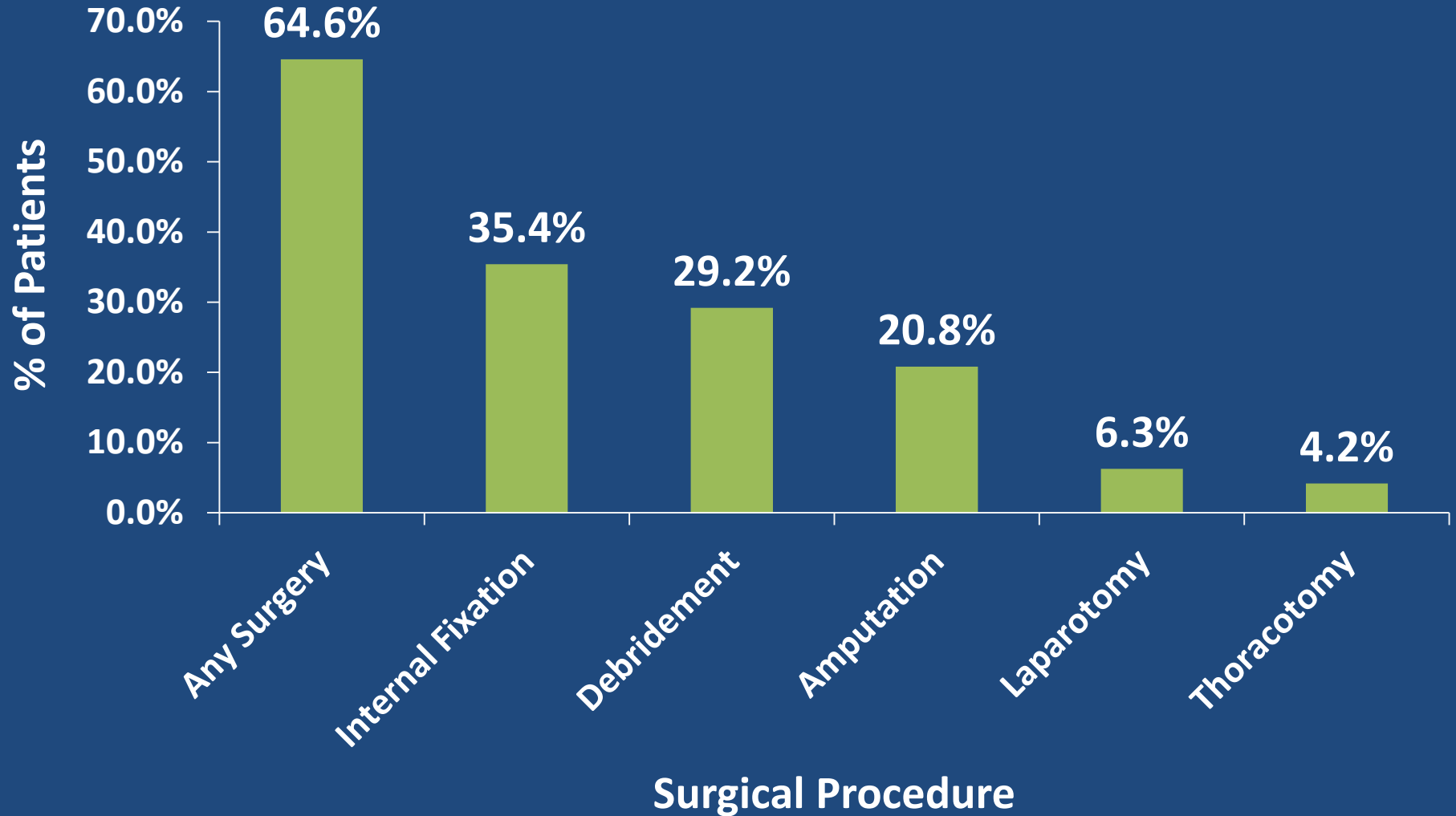
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49% experienced 2 or more of these injuries

Resource Utilization

Length of Stay (mean, range)	12.4 days (0 – 121)
Intubated on Admission	25.0%
ICU Admission	56.3%
ICU Days (mean, range)	5.3 days (1 – 18)
Consulting Services (mean, range)	7.1 services (0 – 15)
• PT/OT	64.6%
• Social Services	60.4%
• Orthopedics	52.1%
• Neurosurgery	47.9%

Surgical Interventions



Outcomes

Mortality	10.4%
Discharge to rehab/long-term care	37.2%
FIM Score (mean, range)	16.3 (5 - 20)

Functional Independence Measures (FIM):

- Standard score of functional status (5-20)
 - Feeding
 - Locomotion
 - Emotion
 - Transfer mobility
 - Social Interaction

Take Home

- Adolescent, Caucasian males
- Orthopedic and traumatic brain injuries are common
- Pediatric train-trauma is uncommon, but serious:
 - Most patients survive (10% mortality)
 - 77.8% of survivors:
 - Required surgery
 - Discharged to rehab/long-term care

Questions?

