

# Outcome Disparity Among African Americans Following Colon Trauma

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## Background

- Colon trauma represents a major cause of morbidity and death in the United States with mortality rates of 13.5% for blunt injury and 10.2% for penetrating injury.
- African Americans (AA) compared to white trauma subjects experience:
  - Increased risk of penetrating trauma
  - Increased risk of violent crimes
  - Lack of health insurance
  - Poorer clinical outcomes and increased mortality
- Previous comparison of AA and white males with penetrating colon trauma identified less morbidity in the AA group and no difference in mortality, stoma creation or transfer to rehab

## Objective

- Outcomes in AAs following colon injury requiring surgery are assessed in the current study.

## Methods

### Population

- Trauma Quality Improvement Program (TQIP)
- Subjects requiring colon surgery within 24 hours of admission
- 2017-2019

### Primary Outcome

- Mortality

### Secondary Outcomes:

- Intensive care unit (ICU) days
- Length of hospital stay (LOS) days
- Ostomy creation

### Statistics

- Wilcoxon rank-sum test, Chi-squared test
- Outcome multiple regression controlling for:
  - Age, Gender, Race, Ethnicity, Initial HR, Initial systolic BP, ISS, Head AIS, Mechanism of Injury, Units of pRBCs transfused (first 4 hours)
- Ostomy creation multiple regression controlling for:
  - Age, Gender, Race, Ethnicity, Initial HR, Initial systolic BP, ISS, Mechanism of Injury, Units of pRBCs transfused (first 4 hours), Colon anatomical location of injury, Worst defined colon injury

## Results

	N	Overall	N	African American	N	Non-African American	P
<b>Demographics</b>							
Age	10868	31 (23, 44)	3932	28 (22, 37)	6936	33 (23, 48)	<0.0001*
Gender	10898		3939		6959		<0.0001*
Female				542 (14%)		1782 (26%)	
Male				3397 (86%)		5177 (74%)	
<b>Initial Vital Signs</b>							
Initial Heart Rate	10725	96 (81, 114)	3866	95 (80, 110)	6859	97 (82, 115)	<0.0001*
Initial Systolic BP	10648	122 (102, 140)	3841	125 (105, 143)	6807	120 (100, 138)	<0.0001*
<b>Injury Characteristics</b>							
<b>Mechanism of Injury</b>							
Blunt				683 (17%)		3940 (57%)	
Penetrating				3248 (83%)		2932 (43%)	
Burn				0 (0%)		3 (<1%)	
Firearm Injury	10845	4895 (45%)	3932	2820 (72%)	6913	2075 (30%)	<0.0001*
Injury Severity Score	10898	17 (10, 26)	3940	17 (10, 25)	6958	17 (10, 27)	<0.0001*
Abdominal AIS	10899	3 (2, 4)	3940	3 (2, 4)	6959	3 (2, 4)	<0.0001*
Colon Injury Severity Score	9336	4 (3, 5)	3519	5 (3, 5)	5817	4 (3, 5)	<0.0001*
<b>Anatomical Location of Colon Injury</b>							
Right Colon	10260		3716	1360 (37%)	6544	2259 (35%)	<0.0001*
Transverse Colon				1110 (30%)		1820 (28%)	
Left Colon				1246 (34%)		2465 (38%)	
Blood Products Transfused	10412	0 (0, 4)	3746	0 (0, 4)	6666	0 (0, 4)	0.9732

**Table 1.** Demographics and injury characteristics in African Americans with colon trauma compared to others presented in median (IQR) or count (%)

	N	Overall	N	African American	N	Non-African American	P
Mortality	10899	941 (9%)	3940	274 (7%)	6959	667 (10%)	<0.0001*
ICU Days	7605	5 (3, 10)	2613	4 (3, 9)	4992	5 (3, 11)	<0.0001*
Hospital Days	10789	10 (7, 19)	3897	10 (7, 18)	6892	10 (6, 19)	0.0603
Stoma Creation	10899	1215 (11%)	3940	759 (11%)	6959	456 (12%)	0.2879

**Table 2.** Outcome data in African Americans with colon trauma compared to others presented in median (IQR) or count (%)

	N	β-Coefficient	Odds Ratio	P
Mortality	9602	0.01 (0.13, -0.11)	1.02 (0.81, 1.23)	0.8558
ICU Days	5314	0.35 (0.05, 0.64)	n/a	0.0226*
Hospital Days	9517	0.66 (0.28, 1.05)	n/a	0.0007*
Stoma Creation	7775	0.09 (0.00, 0.18)	1.19 (0.99, 1.4)	0.0567

**Table 3.** Multiple logistic regression analysis of outcome data in African Americans with colon trauma compared to others presented as β-coefficient (95% CI) and odds ratio (95% CI)

## Discussion

- Consistent with previous studies, we find that African American race is associated with:
  - Penetrating trauma
  - Firearm-related trauma
  - Increased injury severity

## Discussion

- African American race was associated with increased ICU days and hospital stay, but not increased mortality or stoma creation when controlling for demographics and injury characteristics
- Previous studies have suggested that disparities in outcome following traumatic injury are minimal when controlling for shock
  - Controlling for shock we find an increase in ICU days and hospital days associated with AA
  - A limitation of this study is the use of systolic blood pressure on admission as a surrogate for shock. Base deficit is likely more accurate.
- Socio-economic factors are likely major contributors, although recent evidence suggests that genetic predisposition may influence outcome in African Americans following traumatic injury.

## Conclusion

- While uniform evidence-based protocols are commonplace in the management of traumatic injury, we find that disparities related to Race persist.
- Further study is warranted to identify the factors driving these disparities so that they can be adequately addressed.

## References

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