

Impact of Modified Geriatric Trauma Activation Criteria at a Level I Trauma Center on Cost

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BACKGROUND

- With the aging population, there is an increase in the proportion of geriatric trauma patients.
- The geriatric population is vulnerable to traumatic injuries and is often undertriaged resulting in increased mortality.
- ACS-COT recommends a lower threshold for trauma team activation for the geriatric population, elevating the level of activation by one tier based on age. This was defined as Modified Geriatric Trauma Activation Criteria (MGTAC).
- Our institution implemented MGTAC on 3/1/2017, upgrading patients meeting limited-level activation criteria to highest-level activation based on age over 65.
- Objective is to determine the impact of MGTAC on total cost of care.

METHODS

- This is a retrospective cohort study of prospectively collected database from 2015 to 2019. Eligible patients included adults ≥ 65 seen as highest-level activation, limited-level activation or trauma consultation.
- Variables including patient characteristics, mechanism of injury, comorbidities, level of trauma activation, LOS, ISS, interventions and cost at 24- and 48-hours of admission were collected.
- ANOVA was used to compare LOS and ISS, while chi-square test was used to compare the frequency of outcomes. Statistical significance was set at an alpha of 0.05. Statistical analysis was carried out with Strata v16.1.

RESULTS

Table 1: Characteristics and Cost Before and After Implementation of MGTAC

	Standard Trauma Activation	Modified Geriatric Trauma Activation	Total	p-value
Demographics				
Number of patients, N (%)	614 (51.7)	574 (48.3)	1188 (100.0)	
Age, Mean (SD)	79.4 (8.6)	79.0 (9.2)	79.2 (8.9)	0.40
Comorbidities, N (%)	577 (93.4)	541 (93.0)	1118 (93.2)	0.78
ISS, Mean (SD)	11.7 (7.7)	12.1 (8.0)	11.9 (7.8)	0.35
Highest-level activation, N (%)	58 (9.4)	145 (25.3)	203 (17.1)	
Limited-level activation, N (%)	359 (58.5)	244 (42.5)	603 (50.8)	
Trauma consultation, N (%)	196 (31.9)	185 (32.2)	381 (32.1)	
High Resource Utilization Interventions				
Transfusions, N (%)	82 (13.2)	62 (10.7)	144 (12.0)	0.17
Operative intervention within 24 hours, N (%)	75 (12.2)	75 (13.1)	150 (12.6)	0.70
IR intervention, N (%)	15 (2.6)	9 (1.6)	24 (2.1)	0.21
ICU admission, N (%)	145 (23.4)	104 (17.9)	249 (20.7)	0.02
Consultations, N (%)	529 (85.5)	513 (88.3)	1042 (86.8)	0.15
Outcomes				
Mortality, N (%)	49 (8.0)	59 (10.3)	108 (9.1)	0.17
LOS, Mean (SD)	8.1 (50.9)	5.6 (6.2)	6.9 (36.8)	0.25
Cost of Care				
Cost in first 24 hours in dollars, Mean (SD)	12,481.9 (9,010.0)	14,210.5 (13,302.0)	13,488.7 (11,728.1)	0.03
Cost in first 48 hours in dollars, Mean (SD)	18,517.5 (14,476.1)	19,692.6 (17,334.4)	19,204.8 (16,211.1)	0.28

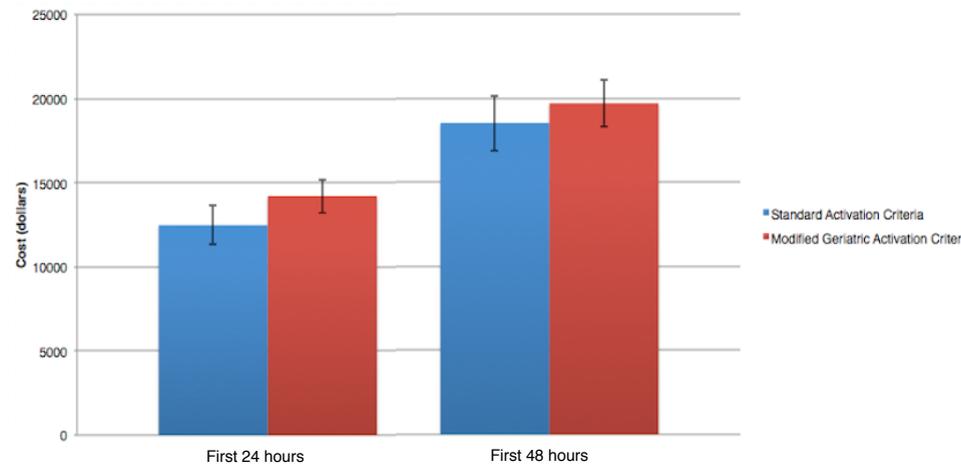


Figure 1: Total cost in dollars within first 24 hours and first 48 hours of admission by trauma activation criteria and 95% confidence intervals, $p=0.03$ and $p=0.28$, respectively.

CONCLUSION

- Implementation of MGTAC increased the total cost of patient care in the first 24 hours without improving survival. This difference was not seen when extended to 48 hours.
- There was no statistically significant difference in mortality, LOS or high resource utilization interventions on admission such as operative intervention, IR intervention or number of consultations.
- There was a statistically significant decrease in ICU admissions with implementation of MGTAC, which suggests improvement in undertriage. However, further analysis will need to be performed.
- This is a single institution study analyzing 1188 patients. Further studies will need to be conducted with expanded number of patients to validate our findings prior to determining whether MGTAC should continue to be implemented at our institution and beyond.

REFERENCES

- Ortman, JM, Velkoff VA, and Hogan H. *An Aging Nation: The Older Population in the United States*, Current Population Reports, P25-1140. U.S. Census Bureau, Washington, DC. 2014.
- Kozar RA, Arbabi S., Stein DM, et al. *Injury in the aged: Geriatric trauma care at the crossroads*. J Trauma Acute Care Surg. 2015; 78(6): 1197-1209.
- American College of Surgeons. *ACS TQIP Geriatric Trauma Management Guidelines*. Committee on Trauma. 2013.
- Calland JF, Ingraham AM, Martin N, et al. *Evaluation and management of geriatric trauma: An Eastern Association for the Surgery of Trauma practice management guideline*. J Trauma Acute Care Surg. 2012; 73(5): S345-350.
- StataCorp. College Station, TX: StataCorp LLC; 201.



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