

Predicting Mortality and Inpatient Complications: The Score for Trauma Triage in the Geriatric and Middle-Aged (STTGMA) Orthopaedic Trauma Patient



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Background

- Each trauma patient is assigned an Injury Severity Score (ISS) upon discharge from the hospital.
- However, on admission, there is no ISS to assist in the treatment and care of middle-aged and geriatric trauma patients.¹
- Triage of each trauma patient varies depending on the mechanism of injury.
- There is no ISS that separates patients by low-energy (eg. falling from standing) vs. high-energy (eg. motor vehicle accident, falling from height, pedestrian struck) mechanism of injury.²
- We developed a novel injury severity score specific to geriatric trauma: Score for Trauma Triage in the Geriatric and Middle-Aged (STTGMA) orthopaedic trauma patient.

Objectives

- To create a new model to predict mortality and inpatient complications for middle-aged and geriatric trauma patients in the Emergency Department setting.
- To customize the STTGMA formula for the JHMC patient population.
- To optimize patient triage to the ICU or floor and to reduce costs.
- To initiate a Palliative Care consult earlier for high-risk patients.

Methods

- Inclusion criteria: patients ≥ 55 years with blunt trauma.
- STTGMA variables were collected for 6 months on orthopaedic and trauma surgery consults.
- STTGMA variables: age, pre-existing conditions, injury severity, neurological status.
- Additional variables: anticoagulation status (COAG), albumin level (ALB), ambulatory status (community, household, non-ambulatory) (AMB), assistive device (walker, cane, wheelchair) (AD).
- Inpatient complications and mortality were monitored.
- Hospital cost was calculated to determine if utilizing early palliative care consults³ resulted in hospital cost savings.
- Logistic regressions were used to formulate a JHMC-specific algorithm and area under receiver operator curve (AUROC) statistics were used to measure specificity and sensitivity of STTGMA_{JHMC}.

Results

- 94 high energy (HE) patients, 6 deaths (7.4%)
- 154 low energy (LE) patients, 6 deaths (3.9%)
- $HE-STTGMA_{JHMC} = HE-STTGMA + AD + AMB + ALB$
- $LE-STTGMA_{JHMC} = LE-STTGMA + AD + AMB + COAG$
- HE-STTGMA and HE-STTGMA_{JHMC} showed ability to predict complications (Figure 3)
- STTGMA_{JHMC} stratified patients by mortality (Figure 1,2)
- Estimated reduction in hospital costs over 1 year using STTGMA_{JHMC} + palliative care consult on admission
 - LE= \$205,984
 - HE=\$192,416
 - Total=\$398,400

Figure 2: Patient Distribution and Relative Risk of Mortality in High-Energy Patients using STTGMA_{JHMC} Scale

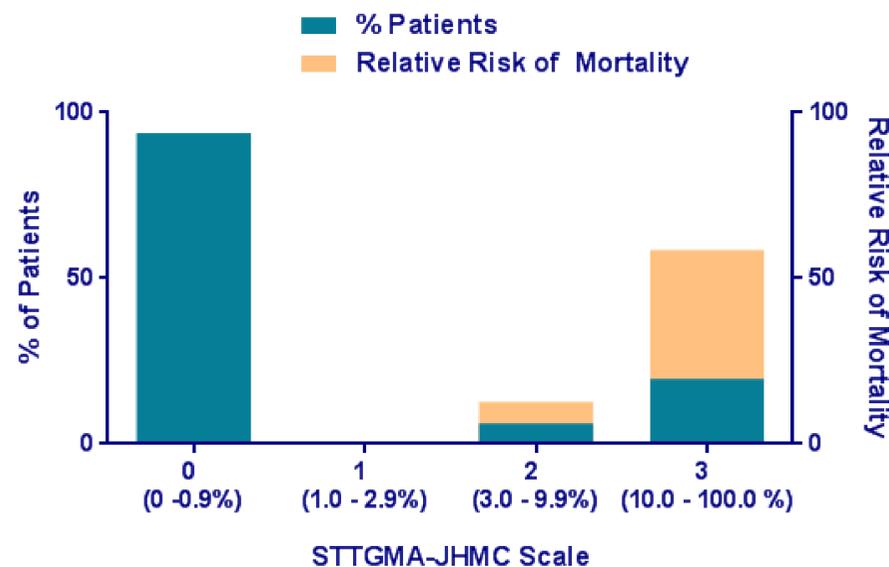


Figure 2: Stratification of HE patients by their STTGMA_{JHMC} score. Percentage refers to relative risk of inpatient mortality.

Figure 1: Patient Distribution and Relative Risk of Mortality in Low-Energy Patients using STTGMA_{JHMC} Scale

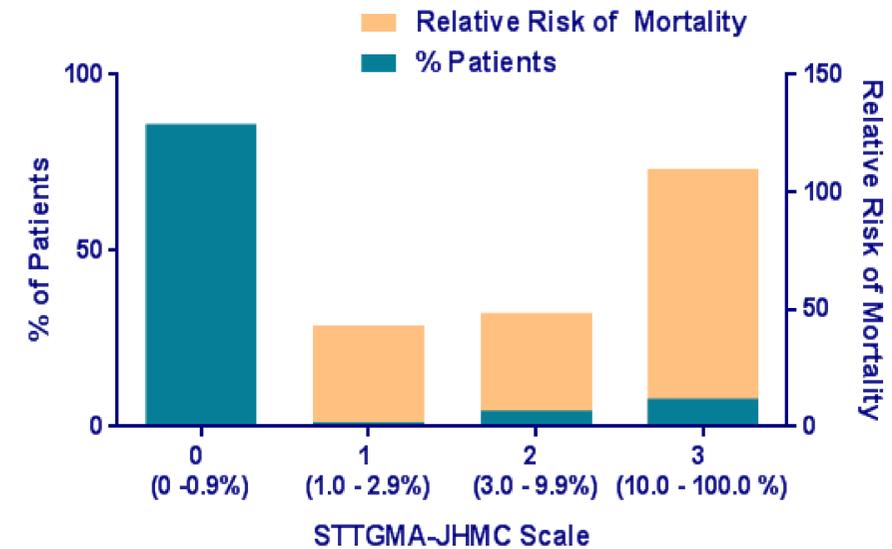


Figure 1: Stratification of LE patients by their STTGMA_{JHMC} score. Percentage refers to relative risk of inpatient mortality.

Figure 3: The Ability of the Original STTGMA vs. Modified STTGMA_{JHMC} to Predict In-Hospital Complications

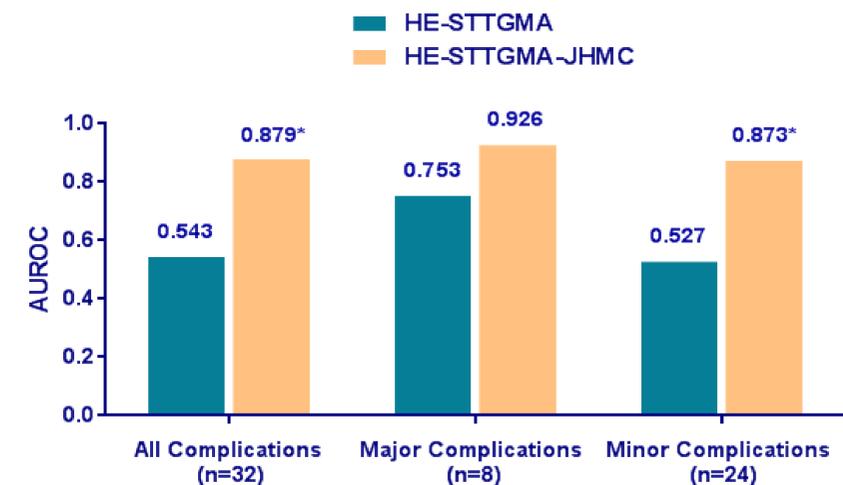


Figure 3: Ability of the HE-STTGMA to predict inpatient complications using AUROC. * - denotes statistically significant improvement in ability of HE-STTGMA-JHMC to predict complication compared to the original HE-STTGMA.

Conclusions

- HE-STTGMA and LE-STTGMA can be modified for a hospital's patient population to predict inpatient complications and mortality.
- STTGMA_{JHMC} accurately stratifies patients into STTGMA levels regarding patient mortality.
- STTGMA Scale can be used to lower hospital costs by including Palliative Care earlier in the admission process.

References

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