

Citation: Caterino, J. M., Brown, N. V., Hamilton, M. W., Ichwan, B., Khaliqdina, S., Evans, D. C., . . . Shah, M. N. (2016, October). Effect of Geriatric-Specific Trauma Triage Criteria on Outcomes in Injured Older Adults: A Statewide Retrospective Cohort Study. *Journal of the American Geriatrics Society*, 64(10), 1944-1951. doi:10.1111/jgs.14376

Clinical Question: Does geriatric specific trauma triage criteria improve patient outcomes improve patient outcomes?

Background: The state of Ohio implemented a set of criteria directed towards geriatric patients in an attempt to improve outcomes for geriatric patients. “Undertriage,” in other words, patients not being taken directly to a trauma center who qualify for trauma care is a significant problem in the elderly. Previous studies have shown that geriatric patients are more likely to be undertriaged at rates of approximately 40% starting at age 60 and increasing to as high as 60% for patient 90 years old and above. The state of Ohio Department of Public Safety decided to implement a set of geriatric triage criteria, as shown below, on Dec. 29, 2008. This study was designed to evaluate the outcome of this statewide implementation.

Table 1. Differences between Ohio’s 2009 geriatric trauma triage criteria and adult trauma triage criteria for EMS providers.²³

Geriatric Triage Criteria (Age ≥70 Years)*	Corresponding Adult Triage Criteria
Physiologic	
Systolic blood pressure less than 100 mm Hg, or absent radial pulse with carotid pulse present	Systolic blood pressure less than 90 mm Hg, or absent radial pulse with carotid pulse present
GCS score ≤14 in trauma patient with a known or suspected traumatic brain injury	GCS score ≤13
Anatomic	
Fracture of 1 proximal long bone sustained from motor vehicle crash	Fractures of 2 or more proximal long bones
Injury sustained in 2 or more body regions	No corresponding adult criteria
Cause of injury	
Pedestrian struck by motor vehicle	No corresponding adult criteria
Fall from any height, including standing falls, with evidence of a traumatic brain injury*	No corresponding adult criteria

*Traumatic brain injury is defined as decrease in level of consciousness from baseline, unequal pupils, blurred vision, severe or persistent headache, nausea or vomiting, or change in neurologic status.²³

Methods: An observational, retrospective cohort study was performed of individuals in the Ohio Trauma Registry from 2006 to 2011 to give 3 years prior to implementation of the new guidelines and 3 years

after implementation. The registry contains records from 87% of the state's hospitals. Patients were included if they were aged 70 or above who were brought to a hospital by EMS. Patients were excluded if EMS did not initially transport them or there was missing data on sex. To measure final outcome and destination, probabilistic linkages were created to create a single entry for the case when patients were transferred from one hospital to another. EMS data available included reason for transport, vital signs, EMS GCS, and procedures performed. ED data included GCS, procedures in the ED, and ED disposition. Inpatient data included type of hospital (non-trauma, Level I or Level II trauma center), abbreviated injury scale, injury severity score, length of ICU stay, OR visits, ICD-9 codes and discharge dispo. The primary outcomes were inpatient mortality with a secondary outcome was discharge to home.

Results: The final study included 34,499 patient records after excluding records that a linkage between transfers could not be made, those not transported by EMS, those missing data on sex, and those under 70 years of age. Analysis revealed that demographics, mechanism of injury, and injury severity score were similar in both the before implementation and after implementation groups. It was found that 44% of patients met the adult triage criteria indicating need for trauma center care, but the geriatric criteria showed that 58% of patients met the new criteria. Although more patients met criteria for transport to a trauma center under the geriatric criteria, there was no change in transport to a trauma center, with both groups seen 48% of patients being taken to a trauma center initially. It also shows that the percentage of patients transported or transferred to a trauma center at any time did not change, staying at 60% after implementation. Unadjusted mortality did not reach statistical significance of change before and after implementation, showing a change of 7.1% to 6.6% ($p = 0.10$).

Discussion: There has not been significant recent research in geriatric trauma, with the majority of the research appearing to be focused on pre-hospital care. I found it interesting that the state of Ohio decided to implement geriatric specific criteria in addition to the national adult triage criteria. While it does reduce possible the number of geriatric patients that could be undertriaged due to not meeting the adult criteria at the risk of overtriage, the overall rate of undertriage did not change. They commented on this in the article, stating that there could be multiple factors, including: patient preference, EMS bias, EMS under education, or geographic limitations. I do agree with their conclusion at the likely cause of unchanged mortality before and after geriatric criteria implementation is the lack of change in trauma center transports. I do find it difficult to believe that mortality would change significantly as other studies have shown that there are no significant changes in mortality or outcomes in geriatric patients who are transported to a trauma center vs a non-trauma center. The study is also limited by its retrospective nature in that there may be selection bias given patients with hospital stays <48 hours were not included in the registry. They also state that in-hospital mortality may have not been the best outcome to measure for older adults as discharge to an ECF is associated with poor long-term outcomes vs those discharged to home. I think a further study would need to be performed in the future to give more time for the new geriatric criteria to be taught to EMS providers and for them to become more comfortable with it and cognisant of it. This may show a benefit and change in transports to a trauma center at that time.
