

<p><b>TITLE</b> (capital letters)</p>	<p>DISCRIMINATIVE ABILITY OF NEW INJURY SEVERITY SCORE TO PREDICT OUTCOMES AFTER FRACTURE REPAIRED SURGERY</p>
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<p><b>Abstract</b>  (do not indent; must include: OBJECTIVES, METHODS, RESULTS, CONCLUSION  Maximum: 300 words).</p>	<p><b>OBJECTIVES:</b> New injury severity score (NISS) is the simple sum squares of the three most severe injuries (highest abbreviated injury scales) regardless of body region. It is shown to be predictive of survival after injury. Elixhauser comorbidity index (ECI) have been used as risk-adjustment tools in quality and safety data. This study aims to investigate whether NISS should be included in addition to ECI for postoperative outcomes prediction following fracture repair surgery.</p> <p><b>METHODS:</b> Through a partnership with Mercy Technology Services, a retrospective database analysis of Mercy electronic health records was conducted. Patients 18 years and older who underwent fracture repair surgery between 2011-2018 were identified. Postoperative outcomes assessed included: (1) 3-months infection after surgery, (2) all-cause 3-months readmissions, (3) one-year all-cause mortality, (4) extended LOS (<math>\geq</math> 3days) and (5) skilled nursing/rehabilitation discharge. For each outcome, four multivariable logistic regression models were constructed: 1) Age+gender+BMI, 2) Age+gender+BMI+ECI, 3) Age+gender+BMI+NISS and 4) Age+gender+BMI+ECI+NISS. The predictive performance was assessed using area under the curve analysis (AUC) derived from these models.</p> <p><b>RESULTS:</b> A total of 14,044 fracture repair patients were included in the analysis (age median: 65, IQR, 47-81, 59% female). NISS outperforms ECI in the prediction of extended LOS and skilled nursing/rehabilitation discharge. The model AUC of baseline, ECI, NISS, ECI+NISS for extended LOS were 0.72(0.72-0.73), 0.76(0.75-0.76), 0.84(0.83-0.84), and 0.85(0.85-0.86) respectively. The model AUC of baseline, ECI, NISS, ECI+NISS for skilled nursing/rehabilitation discharge were 0.85(0.85-0.86), 0.867(0.86-0.87), 0.89(0.885-0.896), and 0.898(0.893-0.903) respectively. NISS did not add significant additional discrimination ability to ECI models for infection, mortality and readmission.</p> <p><b>CONCLUSION:</b> In addition to traditional ECI comorbidity predictor, NISS adds significant additional discrimination ability for length of stay and discharge status prediction following fracture repair surgery. The use of NISS may help setting up appropriate patient expectation after surgery.</p>