

**A Novel Tool to Assess Impairment from Alcohol in Emergency Department Patients—the HII score**

Jason Hack<sup>1</sup>, Eric Goldlust<sup>2</sup>, Dennis Ferrante<sup>1</sup>, Natalija Farrell<sup>1</sup>, Brian Zink<sup>1</sup>

<sup>1</sup>*Brown University, Providence, RI, USA*, <sup>2</sup>*Santa Clara Hospital, Kaiser Permanente, Santa Clara, CA, USA*

**Background:** Emergency Departments (EDs) care for over 35 million alcohol impaired (AI) patients annually. There is no standard ED assessment of AI patients. We sought to evaluate a novel standardized assessment of AI — Hack’s Impairment Index (HII score).

**Methods:** A retrospective chart review was performed for all AI patients seen in our busy urban ED over 24 months. Trained nurses evaluated AI patients with both “usual” and HII testing every 2 hours. Patients were stratified by frequency of visits for AI during this time: high ( $\geq 6$ ), medium (2-5), and low (1). Within each category, comparisons were made between HII scores, measured ethanol levels, and healthcare providers’ (HCPs’) general assessment of AI. Changes in HII scores over time were also evaluated.

**Results:** 8074 visits from 3219 unique patients were eligible for study, including 7973 (98.7%) with ethanol levels, 5061 (62.7%) with complete HII scores, and 3646 (45.2%) with HCP assessments. Correlations between HII scores and ethanol levels were poor (Pearson’s  $R^2 = 0.09$ , 0.09, and 0.17 for high-, medium-, and low-frequency strata). HII scores were excellent at discriminating HCPs’ assessment of AI, while ethanol levels were less effective. Omitting extrema, HII scores fell consistently by an average 0.062 points per hour, throughout patients’ visits.

**Conclusions:** The HII score use applied a quantitative, objective assessment of alcohol impairment. HII scores were superior to ethanol levels as an objective clinical measure of impairment. The HII declines in a reasonably predictable manner over time, with serial evaluations corresponding well with HCP evaluations.