Title: Which poisoned patients require treatment in the intensive care unit? A pilot study of the INTOXICATE Clinical Decision Rule

Backgrdound: Our overall goal is to reduce unnecessary admissions to the intensive care unit (ICU). INTOXICATE (ex-TOXIC-Europe study) is a clinical decision rule developed in the Netherlands to predict which poisoned patients will require ventilatory or vasopressor support. INTOXICATE reduced ICU admissions for poisoned patients by one-third in the Netherlands.

Objective: Determine the applicability of INTOXICATE to poisoned patients in the US.

Methods: We conducted a secondary analysis of data from the ongoing DOTS trial (Drug Overdose Toxicosurveillance Study). DOTS is a multisite prospective cohort study that aims to identify the substances that patients with life-threatening poisonings from opioids or stimulants intended to use and the substances they actually ingested. Our measure of interest was the inter-rater reliability between the clinical decision rule and the treating physician's decision. This study was granted an exemption from review by the Institutional Review Board.

Results: We included 49 patients, median age 35 years, interquartile range [31-56]; 80% male. None identified as non-binary. We excluded 21 patients because their discharge presentations were ultimately determined not to be related to poisoning or they were not hemodynamically unstable or in respiratory failure at the time of presentation. Of the remaining 28 patients, 9 were admitted to the ICU, 5 to the floor, and 14 discharged. INTOXICATE predicted that all 9 patients admitted to the ICU should be admitted to the ICU. It predicted that 3 of the 5 patients admitted to the floor should be admitted to the ICU. None of these 3 patients admitted to the floor that INTOXICATE predicted needing ICU level of care were transferred from the floor to the ICU or Stepdown Unit. All 3 had a length of stay in the Emergency Department greater than 6 hours, were on naloxone infusions. One also received octreotide. We did not calculate the inter-rater reliability because we obtained too few samples to accurately estimate Cohen's kappa. All records contained the fields needed to calculate the INTOXICATE risk score and inter-rater reliability.

Conclusions: In this small sample, INTOXICATE identified all patients who required admission to the ICU, but predicted that some patients required ICU care when they did not, increasing ICU utilization. Our sample size was too small to calculate inter-rater reliability. Future work can do so on a larger sample.