EFFICACY AND SAFETY OF HIGH-SENSITIVITY TROPONIN I ASSAY FOR RULING OUT ACUTE CORONARY SYNDROME OVER A ONE-YEAR PERIOD

Kelly Perryman BS (Medical Student), Elizabeth Warren RN,
Brandon Allen MD FACEP

Department of Emergency Medicine, UF College of Medicine

BACKGROUND

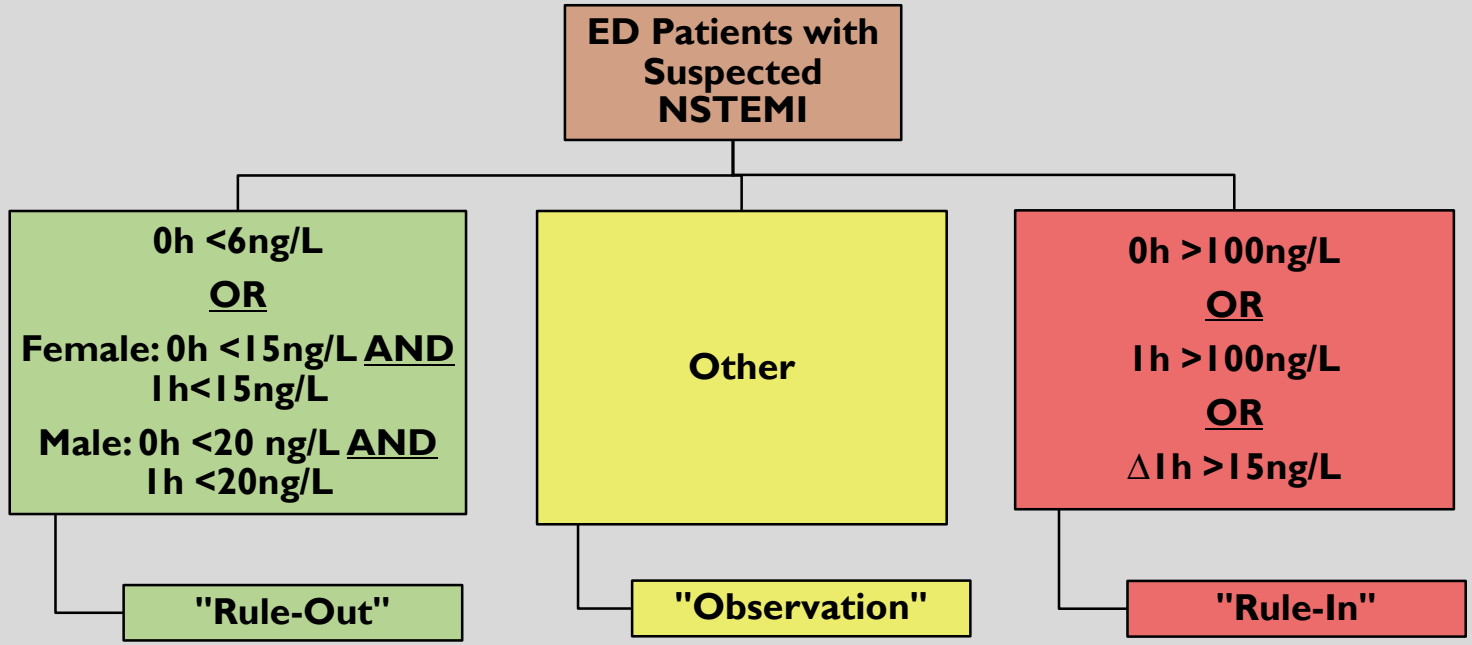
- This institution's current strategy using high sensitivity troponin I (hs-TnI) assays is to perform an initial assay and then repeat at 1 and 3 hours.
- UF Health was one of the first hospital systems to adopt the Beckman Coulter hs-TnI assay, and large scale studies on safety and efficacy are still needed.
- UF Health was also one of the first hospital systems in the United States to implement a hs-TnI 0/1-H algorithm, a more efficient protocol which can rule MI out in as early as one hour. Further research is needed to determine the safety and efficacy of utilizing this algorithm to improve healthcare utilization and health outcomes.

STUDY OBJECTIVE

- The evaluate the efficacy and safety of using a protocol requiring two high sensitivity cardiac troponin I (hs-cTnI) measurements to rule out patients with suspected NSTEMI at the UF Health ED.

METHODS

- **Study Design:** Retrospective analysis of 3,157 patients presenting to UF Health ED between 5/20/2019 to 5/31/2020 with symptoms concerning for acute coronary syndrome (ACS)
- **Inclusion criteria:** symptoms concerning for ACS, troponin levels measured at T0 and T1
- **Exclusion criteria:** STEMI, left AMA, left without being seen, eloped
- **Outcomes measured:** NSTEMI at index ED visit, Cardiac-related death within 30 days



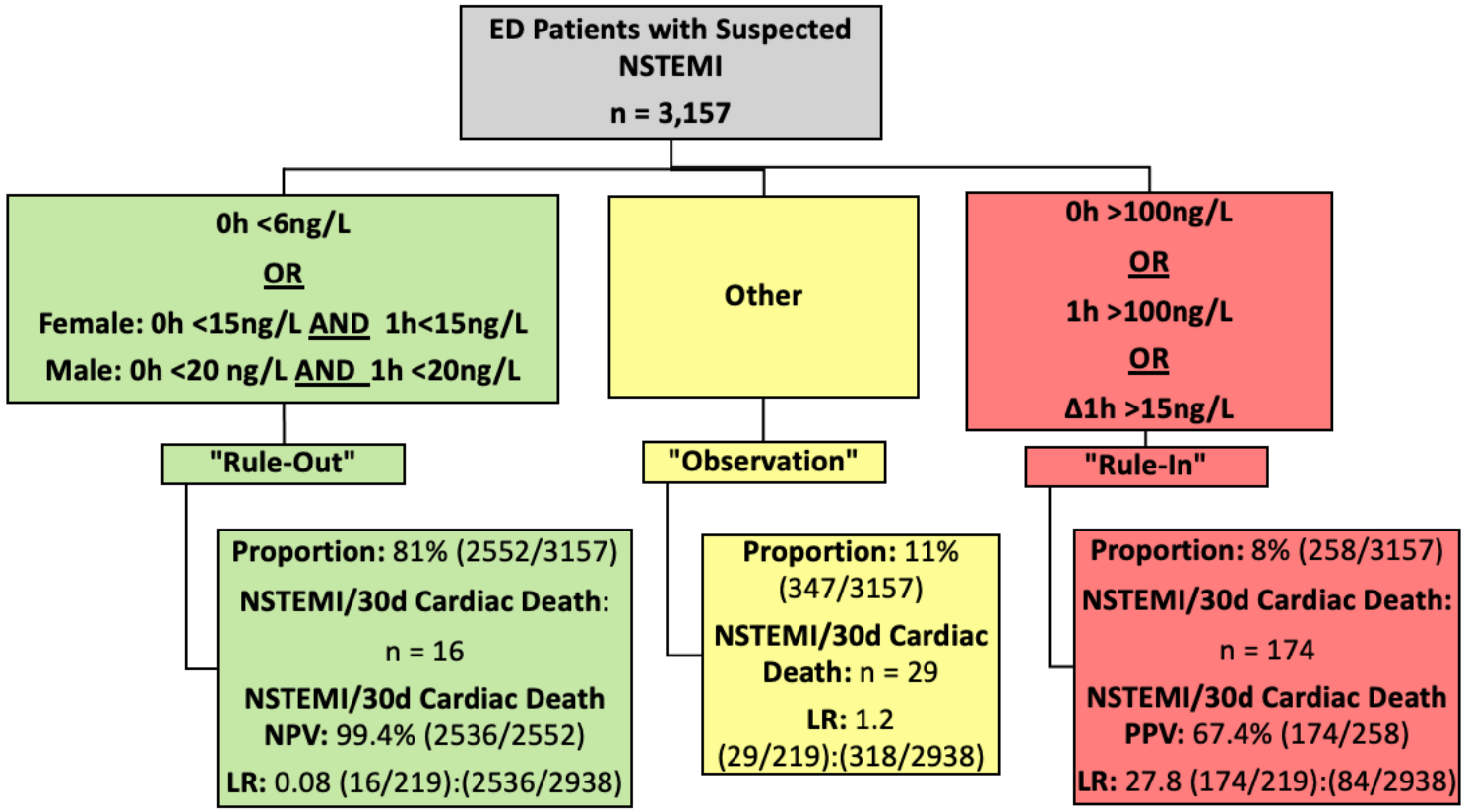
RESULTS

Of the 2,552 patients placed in the rule-out group,

- 10 (0.39%) had an index MI*
- 6 (0.24%) experienced cardiac-related death within 30 days of their index visit*

*All 16 of these patients missed by the algorithm were admitted by the ED physicians and none were discharged to home.

Diagnostic Performance of hs-cTnI 0/1-h Algorithm



Disease	Rule-Out	Observation	Rule-In	Total
No NSTEMI/30d Cardiac Death	2536	318	84	2938
NSTEMI/30d Cardiac Death	16	29	174	219
Total	2552	347	258	3157

CONCLUSIONS

- The NPV for using this protocol (with hs-cTnI at T_0 <6ng/L; or females with T_0<15ng/L and T_1<15ng/L; or males with T_0<20ng/L and T_1<20ng/L) was 99.4% (95% CI, 99.0-99.6%).
- The negative likelihood ratio was 0.08 (95% CI, 0.05-0.14).
- Utilizing this T_0/T_1 hs-cTnI protocol is a safe decision with a NPV greater than 99% for index MI and cardiac-related death at 30 days no matter the patient's time of symptom onset.

FUTURE DIRECTIONS

- This study's conclusions are limited due to being a retrospective analysis of patients seen only at UF Health ED, ICD-10 diagnosis codes for outcomes, and no known follow-up outside our health system.
- Future directions could include prospective analysis or evaluating the protocol in broader patient-populations.