Impact of High-Sensitivity Troponin Assays on ED Length of Stay For Discharged Cardiac Patients

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Background

- The Troponin protein is a marker for cardiac damage and is used in the diagnosis and management of cardiac conditions
- New high-sensitivity Troponin (hsTPN) assays have improved sensitivity and accuracy compared to standard Troponin (sTPN) assays
- Through more accurate testing, it should lead to quicker decision-making and improved disposition in the emergency department.
- Lehigh Valley Health Network (LVHN) began implementation of hsTPN assyas on 12/20/2021 at 7 AM.

Problem Statement

The transition from a sTPN assay to a new Siemens hsTPN assay is an opportunity to improve emergency department effectiveness and minimize ED-LOS for low and intermediate risk patients with chest pain.

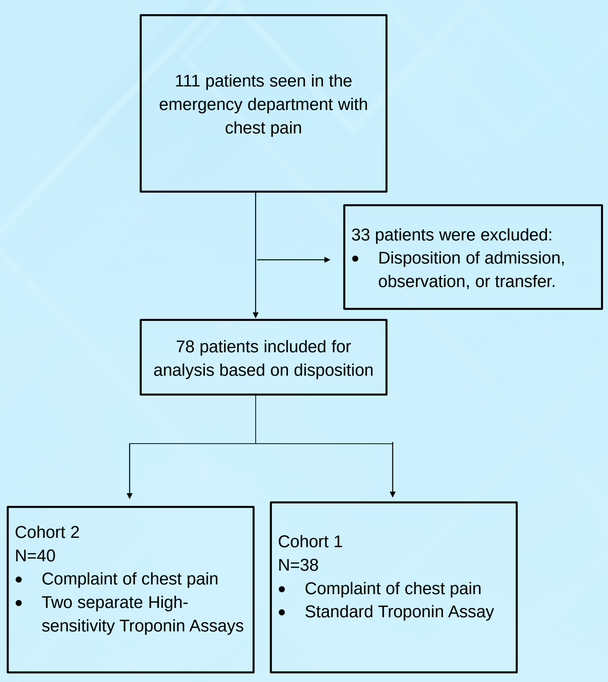
Methods

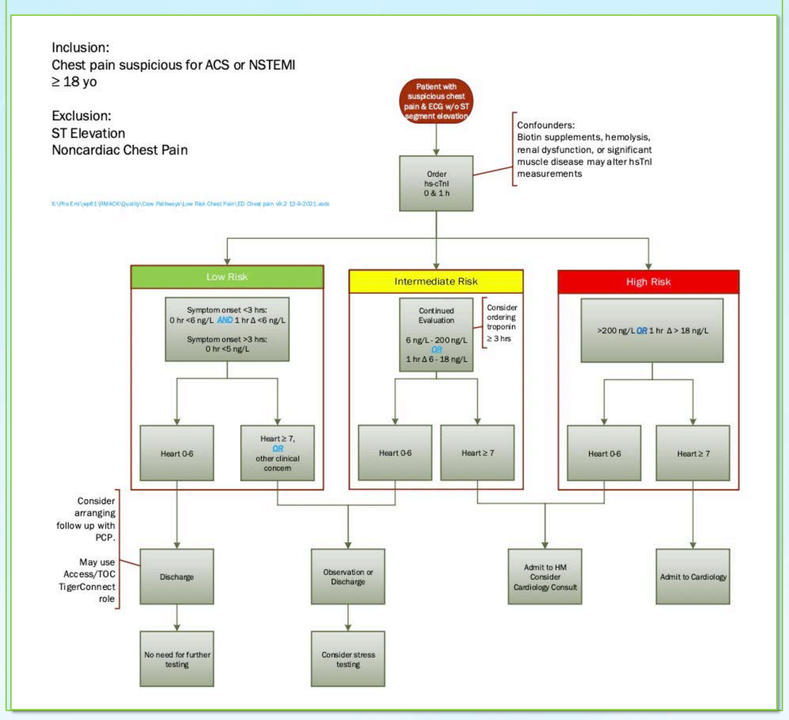
- A two-week period of data was collected from 12/30/2021 to 1/13/2021 from LVHN-Hazelton hospital, 10 days post-implementation.
- This data set was compared with a data set from 2020-2021 as a part of a pre-/post-study.
- The data was stratified into patients with the sTPN and hsTPN.
- Patients were required to fit the inclusion criteria of:
  1. ED Diagnosis of chest pain
  2. Initial hsTPN < 200 ng/L or 1 hour Δ < 18ng/L
  3. Final disposition of discharge
- Patients that had a final disposition of admission, observation, or transfer to another facility were excluded.
- Patients that fit the inclusion criteria were evaluated to ensure that the discharge was compliant with the LVHN hsTPN clinical pathway through hsTPN test results and HEART scores to ensure they correctly classified as low or intermediate risk.

Results

- Based on the data received from LVHN-Hazleton, there were 38 patients with sTPN assay and 40 patients with hsTPN assay that fit the criteria and were compliant with the clinical protocol.
- The average ED-LOS for low and intermediate risk cardiac patients were 4.8 hours with the sTPN assay and 6.1 with the hsTPN assay.
- These results were statistically significant ($p<0.05$).

	Pre-hsTPN	Post-hsTPN	Absolute % Difference
Discharge	38 (73.1%)	40 (88.9%)	+15.8%
Observation	7 (13.5%)	1 (2.2%)	-11.3%
Admission	7 (13.5)	4 (8.9%)	-4.6%





Discussion

- There was a significant increase in the ED-LOS for patients that received the hsTPN assay.
- While the exact reason for this is not yet known, it is likely due to a multitude of factors:
  - Adoption of new change
  - Lack of educational penetrance and difficulties with outreach
  - The pressures of the ongoing COVID-19 pandemic
  - Variability in blood test draw time by nursing staff
  - Provider understanding of test
  - Laboratory delays of test

Conclusions

- Our data suggests an increase in ED-LOS for patients that received the hsTPN assay compared to the sTPN that was both statistically and clinically significant.
- While we expect the ED-LOS to eventually decrease due to the characteristics of the hsTPN, continual data monitoring with be needed.
  - Dashboard is currently being created to monitor continual process, allowing for continued PDCA
- As we gain more knowledge about the factors causing increased ED-LOS, we can use that information to target the SELECT cornerstone of quality improvement.
  - Using this information to streamline efficiency will improve both patient satisfaction and provider satisfaction, leading to higher quality of care.
- Self-directed learning was completed with the research of new papers on this subject and familiarizing oneself with the logistics and applicability of this new laboratory test.