

Troponin Workflow Modifications to Meet the Stroke Policy and Decrease Emergency Department Length of Stay



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Background: As the only primary stroke center in Queens, New York certified by the Joint Commission and by the NY State Dept. of Health, Mount Sinai Queens (MSQ) closely monitors laboratory Turn-Around-Time (TAT) especially Troponin.

Aim: To reduce Troponin TAT from Collection to final lab report that meets the Stroke Policy of ≤ 45 mins. from door to result and decrease ED median LOS for all patients.

Strategy for Change: Systematic review of the specimen workflow and different variables in all phases of laboratory testing which includes the Pre-analytical (specimen collection, handling transport), Analytical (instrument accuracy and precision, good laboratory techniques) and Post-analytical (Calculations, interpretations and proper delivery or reports).

ED Troponin Total TAT (mins.) From Collection to Final Report

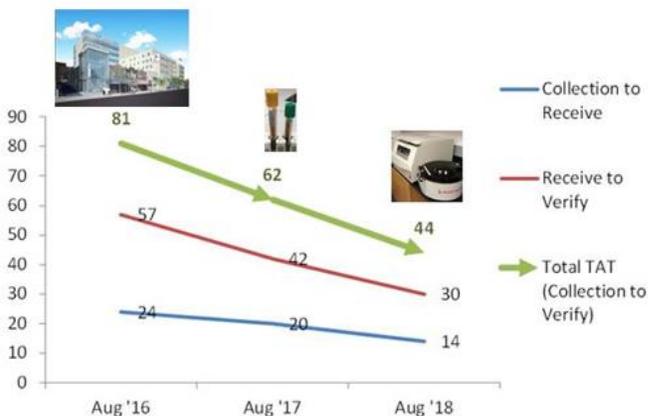


Figure 1. The graph depicts how changes in the location, specimen requirements, and type of centrifuge in the past three years have decreased the ED Troponin Total TAT.

interpretations and proper delivery or reports).

Tests performed before action was taken: Correlation studies were performed to validate the switch from Regular centrifuge (10 mins.) to STAT centrifuge (3 mins.) yielding correlation coefficient of 0.9995 and repeated runs of high Troponin results yielding correlation coefficient of 0.9997.

Action Taken: (1) Serum Separator Tubes (SST) changed to Green Top Tube on July 26, 2017.

(2) Downtime requisition forms discouraged in favor of electronic orders in the Hospital Information System (HIS).

(3) STAT centrifuge replaced the regular centrifuge on June 25 2018; (4) initiated on July 9, 2018 the joint ED/Lab PIP in Pre-analytical intervention using Order Status Monitor (OSM); and finally (5) the instrument auto-repeat function for high Troponin levels was disabled on August 17, 2018. Monthly TAT statistics were reported to ED Leadership Team and discussed issues and trends. ED Director and ED Nurse managers collaborate regularly with Laboratory Director and QA/LIS supervisor. The laboratory shared daily e-mail updates on the challenges in collection workflow including suboptimal specimen integrity.

Median ED Length of Stay in Minutes



Figure 2. The graph shows decreased ED LOS in two years.

STAT Centrifuge Validation

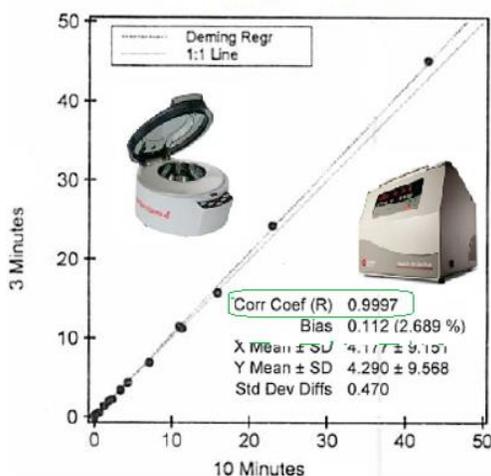


Figure 3. Scatter plot describes strong correlation between results obtained from samples spun in regular (ten-minute) centrifuge and STAT (three-minute centrifuge).

Troponin Reruns

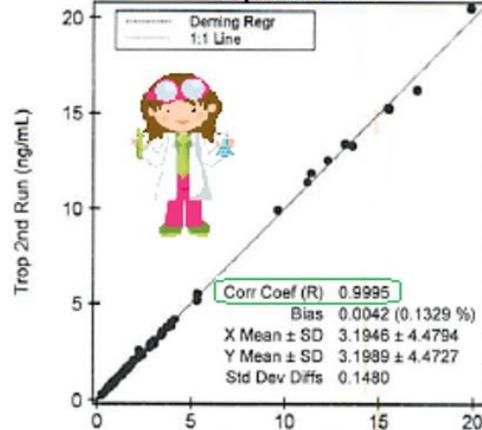
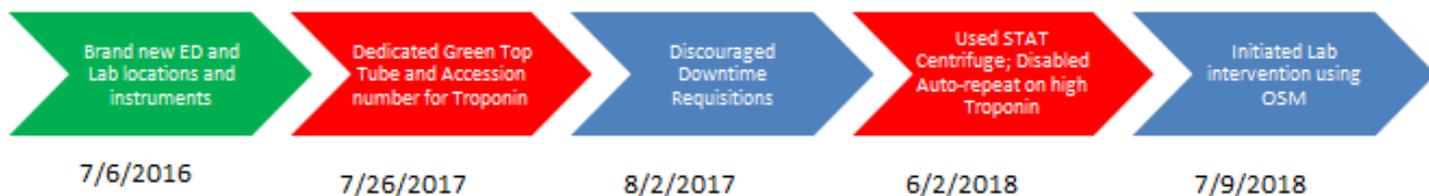


Figure 4. Scatter plot describes the results of the first runs of Troponin being precisely the same as the respective specimens' second runs.



Summary: Collaborative interdisciplinary meetings exposes outdated processes that require improvement. Target TAT for Stroke protocol was reached after (1) discouraging downtime requisitions over electronic orders in HIS; (2) Conversion from serum to plasma saved seven minutes in centrifugation time and eliminate clotting time (20-30 minutes) required by SST before centrifugation and more importantly, eliminated the risk of clogging instruments caused by fibrin formed by inadequate clotting of SST; (3) Conversion from regular centrifuge to STAT centrifuge saved seven minutes in centrifugation time; (4) Lab intervention on collected specimens but not received in the lab reduced the mean TAT of Collection-to-Receive from twenty minutes to fourteen minutes; (5) Disabled instrument auto-repeat on high Troponin values saved 15 minutes from Collection-to-Final Troponin Report. Total Troponin TAT on August 2018 was 44 minutes which met the MSQ goal of ≤ 45 minutes from door to result. Furthermore, median ED LOS for all patients decreased from 234 minutes in June 2016 to 218 minutes in August 2018.