John T. Mather Memorial Hospital Takes Its Process from Good to Great with New Chemistry Analyzers, REMISOL Advance and Automation Upgrades.

AUTOMATION — THEN AND NOW

John T. Mather Memorial Hospital’s initial automation journey began in January 2001 with a fully automated system that streamlined many labor-intensive tasks, such as sample preparation, analysis and sample storage. That early system consisted of the Power Processor for sample preparation, two UniCel DxC 800 chemistry analyzers, one UniCel DxI 800 immunoassay analyzer and a refrigerated 3,000-tube stockyard, as well as a generic outlet for sneaker-net delivery to other workstations.

Twelve years later, as part of the hospital’s LEAN philosophy and continuous pursuit of perfection, the lab implemented its second automation system in January 2013.

The transformation began with a new robotic line consisting of the Power Processor with a new dynamic inlet, including an integrated tube decapper/recapper to minimize biohazard exposure risk and repetitive motion injuries. Another big change came by adding two new fully automated AU680 chemistry systems, which each offer speeds of up to 1,200 tests per hour and feature direct point-in-space sampling, thus saving time and eliminating the need for transfer stations. The lab also acquired a UniCel Dxl 800 immunoassay system and a new 5,000-tube refrigerated stockyard to store samples for longer periods of time, plus a generic outlet for sneaker-net delivery to other workstations. This combination offers excellent speed, throughput, efficiency and improved sample management.
The lab also implemented REMISOL middleware, a powerful system that consolidates and manages information through one single workstation. With REMISOL, the lab was able to increase its efficiency and deliver faster turnaround time (TAT) by implementing user-defined autovalidation verification rules.

Completing the picture, the lab also went live with a pneumatic tube system from the emergency department to the lab, further driving efficiencies in sample management.

“After having been automated for the past 12 years, we had already demonstrated a very good process,” said Denise Uettwiller-Geiger, Ph.D., Administrative Director. “Yet after implementing our new automation system, we achieved a faster processing time that is even more predictable and standardized than before.”

**A NEW WAVE OF PERFORMANCE IMPROVEMENTS**

Armed with new automation technology, the lab soon witnessed a number of outstanding performance results.

Prior to the automation change, only 26% of Basic Metabolic Panel (BMP) samples from the Emergency Department (ED) met the total TAT goal of 60 minutes or less (from order to release of results); yet after the automation upgrade (in Feb.), 46% of BMP samples met that goal; and by August, that number had increased to 64%.

Drilling down further, the lab also examined its compliance goals for just the in-lab analytical TAT, from receipt to delivery of test results for BMPs. Prior to the automation change, only 29% of BMP samples from the ED met the 30-minute TAT goal. However, after the automation change, that number increased to 71%, representing a significant improvement.

“TAT outliers (in the 41-45 minute range) by 76%”

Prior to the automation change, a monthly average of 267 BMP samples (Nov. through Jan.) were completed within 31-35 minutes, while after the automation change, that number dropped to a monthly average of 135 samples (Feb. through Aug.), representing a 50% improvement in outliers.

In the 36-40-minute TAT interval, a monthly average of 147 BMP samples (Nov. through Jan.) exceeded our compliance goal of 30 minutes, while after the automation change, this number dropped to a monthly average of only 35 samples (Feb. through Aug.), representing a dramatic 76% decrease in outliers.

For the 41-45 minute TAT interval, a monthly average of 79 samples (Nov. through Jan.) exceeded our compliance goal of 30 minutes, while after the automation change, this number dropped to a monthly average of only 31 samples (Feb. through Aug.), representing a significant 61% decrease in outliers.

**LOOKING AT LACTATE**

In terms of lactate—and the new Sepsis Collaborative (affecting New York state)—the lab’s automation transformation couldn’t have come at a better time. According the new law, laboratories must complete lactate tests within 30 minutes or less; otherwise, lactate should be performed as a point of care test. Fortunately, the lab’s upgraded automation system is allowing it to achieve this compliance goal.

Before the automation change, only 50-60% of lactate samples met the compliance goal; but post-change, compliance rates have continued to rise, and in August, the lab’s lactate compliance rate was 90%.

**STRONGER AUTOMATION, RAPID RESULTS**

“Thanks to our latest automation technology and middleware, our lab is bringing enhanced value to the healthcare delivery team by leveraging new enabling technologies that dramatically decrease TAT and provide an accurate, consistent and predictable process,” said Dr. Uettwiller-Geiger. “We’ve very happy with our new solution.”