



## The Power of Process™ in Action

### St. Mary's Hospital Center Takes The Next Step Toward Total Automated Efficiency

#### Laboratory Profile

- St. Mary's Hospital Center, Montreal, Quebec
- 414-bed, acute-care hospital
- 2,400,000 reportable results per year
- Hours of operation: 24 hours a day, seven days a week
- Process Solution: Integrated Automation



*St. Mary's Hospital Center, a 414-bed acute-care hospital, has made great strides in improving its efficiency through automation. At the core of St. Mary's solution is Beckman Coulter's Power Processor system — a system designed to accommodate a lab's growing needs over time by offering modules that can be added as workload and automation needs increase.*

*For St. Mary's Hospital Center, Beckman Coulter's progressive automation approach has enhanced productivity, walk-away capabilities, operator safety and accuracy, and also reduced labor costs.*

#### Preanalytical Automation – Phase 1

In September 1996, the hospital implemented the first core lab in the province of Quebec. After 18 months of utilizing the core lab, the lab's volume of reportable tests had increased by 85%, the staff had decreased by 16%, the number of patients had almost doubled, the lab space had decreased by 20% and the cost per reportable result decreased by 53%.

In 1998, the lab further advanced its efficiency by acquiring a Power Processor pre-analytical automation system, an inlet unit, a centrifuge, a decapper and two sorting outlet stations.

"With front-end automation, our lab achieved considerable improvements in turnaround time and efficiency," says Ralph Dadoun, vice president of corporate and support services.

- STAT chemistry TAT improved by 28 percent
- Immunoassay TAT improved by 47 percent
- Overall productivity improved by 30 percent

Essentially, the first phase of St. Mary's solution standardized and eliminated the non-value-added steps of the analytical process: receiving specimens, sorting to work areas, centrifugation, decapping and manually loading the analyzers' instrument specific racks.

#### Preanalytical Automation – Phase 2

When St. Mary's test volume increased, the lab upgraded its Power Processor in May 2000 with a Hematology Outlet, which enabled the system to accept multiple tube sizes and incorporated an outlet for noncentrifuged samples.

According to Dadoun, these improvements eliminated many additional sample-handling processes. For example, instead of batching samples, the laboratory now has a continuous process so samples are processed immediately.

After accessioning, sorting and centrifugation processes are completed, a technologist picks up the analyzer racks from the outlet and loads them onto the appropriate analyzer.



"Today, 90 percent of blood samples sent to our lab are placed on the automation system, eliminating manual sample accessioning and sorting," he says. "Currently, only blood gases and blood bank samples are not processed on the system."

"Our laboratory management information system auto-verifies 80 percent of the specimens," says Dadoun. "Technologists manually validate results for the remaining 20 percent and also perform an occasional rerun or reflex test."

Automation has also played a critical role in decreasing turnaround time (TAT). During the laboratory's first phase of automation, it significantly improved the TAT of the overall analytical process of all specimens.

It wasn't until Phase 2, when the number of manual steps decreased, that both TAT and variability decreased significantly.

### Effects On Transition Time

According to Dadoun, the lab also improved transition time — the time that elapses between each step in the analytical process.

"This is where automation performs best," says Dadoun. "It only takes one minute from the time the tube is accessed to the time it's loaded into the centrifuge. As soon as the centrifuge stops, tubes are immediately unloaded, then decapped — always with the same reliable and reproducible transition time. This explains the drastic decrease in the variability of the TAT, which led to fewer outliers, fewer phone calls to the lab — from more than 25 calls per day to less than five calls per day — and better service to our physicians."

### Conclusion

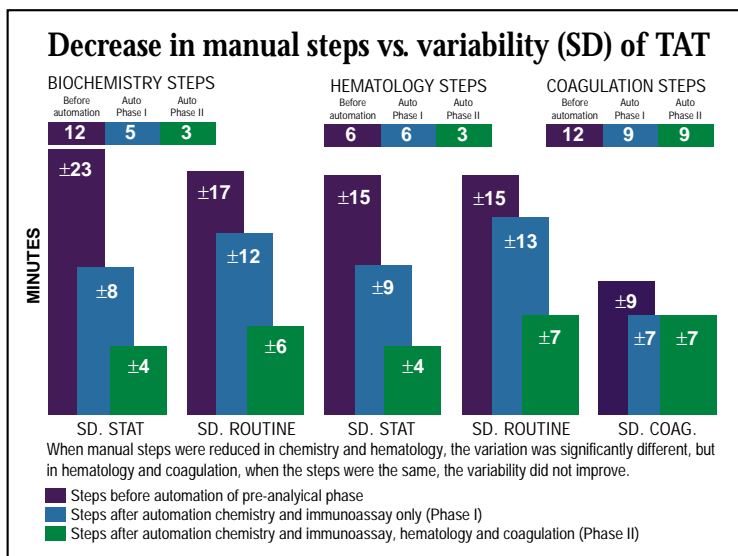
In the future, the laboratory is adding an automated aliquotting module and a CHEMExpress upgrade (which connects chemistry systems directly to the Power Processor via an automated track).

"As economic factors and the shortage of medical technologists continue to drive the healthcare industry, our laboratory is well prepared for the future," says Dadoun.

"Automation played a crucial role, financially and helped us provide better service to our community," he adds. "Staffing issues have also improved. Performing fewer mundane tasks led to higher job satisfaction and lower turnover rates. The cross-training of staff coupled with the benefits of automation have turned out to be a good retention strategy and have placed us in the advantageous position of being able to manage efficiently a large amount of work with minimal staffing."

Dadoun says, "By progressively automating more steps in the process, our ultimate goal remains unchanged: to improve our quality while remaining one of the most efficient laboratories in the area."

Clearly, St. Mary's Hospital Center is a classic example of how laboratories can add automation capabilities to meet their changing needs over time.



When the second phase was implemented (adding the Hematology Outlet), the number of manual steps decreased further. The number of manual steps required to perform a hematology test decreased by 50 percent — from six to three.

In addition, automation dramatically effected the lab's variability of test results. As the number of manual steps required for chemistry testing decreased in Phase 1, the lab's variability of results decreased as well, as shown in the chart. During Phase 1, even though TAT for hematology tests improved significantly, variability did not decrease.



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