



The Power of Process™ in Action

The Ohio State University Medical Center Relies On Comprehensive Laboratory Automation To Reduce Errors And Improve Efficiency

Laboratory Profile

- Ohio State University Medical Center, Columbus, Ohio
- 900-bed academic medical center
- Operates 24 hours a day
- Critical Care Laboratory performs more than 4,200 specimens per day
- 8,200 billable orders per day
- 4.2 million reportable results per year (2001)
- Utilizes Beckman Coulter Progressive Automation Solutions – a full spectrum of flexible, scalable components for automation. Other lab equipment includes two SYNCHRON LX®20 systems, two COULTER® Gen•S™ hematology analyzers and one COULTER® Ac•T diff™ hematology analyzer

Ohio State University Medical Center is a 900-bed academic hospital located in Columbus, Ohio. The hospital's Critical Care Laboratory processes 4.2 million reportable results per year.

The laboratory was seeking a way to increase overall efficiency, decrease turnaround time, reduce errors and increase operator safety. In order to automate its high-volume testing and achieve key efficiency goals, the laboratory implemented Progressive Automation Solutions.

According to Michael Bissell, M.D., Ph.D., professor and vice chairman of pathology, "We looked at automation solutions that were available at the time, but we felt the best choice was Beckman Coulter's Progressive Automation Solutions. We preferred the single tube transportation format and open architecture, which gave us complete flexibility in choosing our analytical instruments."

"We also needed to automate both our pre-analytical process and our post-analytical process," added Kevin Shively, Assistant Director of the Clinical Labs. "Many of our physicians request add-ons and repeat tests. We needed a system that offered refrigerated stockyards and the ability to retrieve specimens on the back-end of the testing process for greater efficiency."

Process Improvements

After what Dr. Bissell describes as "a textbook implementation," the lab went live with its automation system in 1999. The system includes a sample processing area, a comprehensive sample track and direct online connections with the chemistry, immunoassay, hematology, coagulation and urinalysis analyzers.

"Our automation solution performs virtually all of our urinalysis, chemistry, hematology and immunoassay testing, which accounts for 90 percent of our testing volume," said Dr. Bissell.

The system automatically loads and unloads the centrifuges, performs aliquotting, decaps and recaps specimens, loads samples onto instruments and automatically retrieves specimens that need to be retested from the online refrigerated storage stockyards.



“Automation has helped us decrease our TAT dramatically - from an average of 42.7 minutes to 21.9 minutes,” added Shively.

“Another unique aspect of our testing process is the fact that we aliquot all of our specimens from the primary tube into daughter tubes,” said Shively. “This ensures that every time we send a specimen to any one of our analyzers – whether it be online or at an outlet station – we know we have sufficient volume and a clean sample that’s free from clots and fibrin strands.”

This streamlined process has led to many workflow efficiencies and cost savings within the lab.

“We are very proud of the fact that our lab no longer maintains a distinction between STAT and routine specimens, as both are equally fast,” said Dr. Bissell. “Our improvements in turnaround time also helped us provide better service to the requesting physicians.”

“Automation has helped us decrease our TAT dramatically – from an average of 42.7 minutes to 21.9 minutes,” added Shively. “We also expanded our test menu in the process, including PSA, CEA, Total T3, Total T4, TSH, Free T3, Free T4, direct HDL and direct TIBC.”

Future Efficiencies

In the future, Ohio State University Medical Center plans to make additional changes that will help maximize its newfound efficiency. By upgrading its COULTER® Gen•S™ hematology analyzers to high-volume COULTER® LH 755 hematology workcells, the lab can automate its slide-making and slide-staining processes.

“Our automation system performs all centrifuging, aliquotting, sample decapping, recapping and test verification. This allows our medical technologists to perform the job they were trained to do – troubleshoot abnormal results – instead of spending their time on mundane processes,” said Shively. “Not only are we more efficient today, our staff satisfaction and retention have increased ten-fold. We’re very happy with our automation solution and proud of our results.”

Dramatic Results

Compared to the lab’s pre-automation processes, sample processing efficiency increased 115 percent, analytical productivity increased 53 percent and productivity in handling requisitions increased 111 percent. Meanwhile, test volume increased 18 percent, and yet the number of opportunities for human error decreased by 71 percent. Also, the number of exposures to biohazards decreased by 88 percent.

In addition, Ohio State University Medical Center experienced significant labor savings, including a decrease in paid labor hours by 18 percent and a reduction of 10 FTEs.

Laboratory Goals	Laboratory Results
• Increase overall efficiency	• Reduced the total number of workstations; standardized sample tubes • Sample processing efficiency increased 115 percent
• Decrease TAT	• Decreased average receipt-to-result TAT by nearly 50 percent
• Minimize human interaction	• Eliminated manual steps associated with centrifugation, aliquotting, decapping, recapping and specimen retrieval
• Reduce errors; increase operator safety	• Eliminated routing, sorting, pour-off errors • Decreased biohazard exposures by 88 percent • Decreased opportunities for human error by 71 percent



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