

Suburban Hospital Increases Outreach Testing Revenue and Improves Patient Care through Lab Automation

Laboratory Profile:

- Serves 231-bed Suburban Hospital in Bethesda, Maryland, USA
- Operates 24 hours a day, seven days a week
- Employs 21.6 FTEs
- Conducts 2 million reportable tests per year
- Integrated Automation Systems: Power Processor sample-processing system with two centrifuge units, decapper, recapper, aliquotter and 3,060-tube refrigerated stockyard connected to two SYNCHRON LX®20 Clinical Systems and one UniCel® DxI 800 Access® Immunoassay System; COULTER® LH 1500 Series Hematology Automation System with two COULTER LH 750 analyzers
- Additional Systems: DL2000 Data Manager; Access 2 Immunoassay System, UniCel DxI 800 Access Immunoassay System, UniCel DxI 800 Synchron® Clinical System.

The laboratory at Suburban Hospital faced a dilemma: Outreach testing was growing, but the lab's infrastructure couldn't support the volume. Laboratory Director Dave Hornbeck encouraged the staff and administration to look at the laboratory as a manufacturing operation and develop a solution.

Automation was the answer – and today the laboratory has more than enough capacity to absorb the 40 percent growth in outreach business. In fact, as outreach testing increases at its present rate, the lab could generate an additional US\$1 million or more in revenue over the next two years. But most important, says Hornbeck, patients in the community are receiving the best laboratory care possible.

Reaching Capacity

Suburban Hospital is situated near the border of Washington, D.C., just a few miles north of the United States Capitol building. The 231-bed, acute-care facility is the cornerstone of the Suburban Hospital Healthcare System, and frequently partners with the National Institutes of Health and renowned Johns Hopkins Medicine.

The Suburban laboratory began soliciting outreach tests nearly 15 years ago, growing the program over time through word of mouth. Lately, says Hornbeck, the pace of that growth has accelerated.

"We saw an opportunity to bring in more outreach testing," he says. "But we didn't have enough capacity to increase testing volume."

John Ng, Laboratory Operations Manager, adds, "We could only bring in so many tests so fast. We needed to be sure we could handle the work, because we wanted long-term relationships with our customers."

The laboratory took a close look at its workflow – and asked the same questions any manufacturing organization might ask: What are the value-added steps? Where is the waste? What can be done to improve operations?

"Most labs face the same pressures and limitations as manufacturing-based companies," explains Hornbeck. "By viewing our situation from this standpoint, we were able to see process-improvement opportunities."

For instance, the laboratory saw a chance to minimize the distance samples would travel in the lab. It also wanted to reduce setup time and ensure analyzers would need very little supervision.

In addition, it wanted technologists to focus on value-added work, such as reviewing abnormal results – not on activities

Laboratory Goals	Laboratory Results
Improve productivity and capacity	Increased test volume by 200 samples per day, while the number of FTEs decreased by 25 percent, saving more than US\$400,000 per year. The lab now runs at 50 percent capacity, enabling it to take on more work.
Increase revenue through more outreach testing	With increased capacity, the lab is positioned to bring in up to US\$7 million in outreach testing revenue.
Improve test turnaround time and quality	The lab delivers cardiac troponin I results in an average of 45 minutes, down from 60 minutes previously; 91 percent of CBCs within 30 minutes; and 87 percent of routine chemistry tests in 35 minutes. Quality has improved, since automation has standardized testing protocols and minimizes the risk of error.



like accessioning, centrifuging, decapping and sorting samples.

The solution boiled down to one word: automation. With some automated technology already in place, the lab selected Beckman Coulter as its automation provider, since 80 percent of the laboratory's equipment was already Beckman Coulter. Plus, says Ng, the lab wanted to work with the leading provider of clinical laboratory automation solutions.



Left, Dave Hornbeck, Laboratory Director, and John Ng, Laboratory Operations Manager, at Suburban Hospital.

Now, nearly every step of hematology, chemistry and immunoassay testing is connected to an automation system – all within the laboratory's current footprint.

"We aren't a large hospital, but automation was the right move for us," says Hornbeck. "We have been able to reduce our cost

structure, improve productivity, support our outreach business and – most important – improve patient care."

Transforming the Profit Picture

Today, the laboratory is a picture of efficiency. At the front end, samples are automatically accessioned and sorted. Then they slide along automated tracks to one or more analyzers. On the back end, they are automatically stored in the connected 3,060-tube refrigerated stockyard, where samples may be quickly and easily retrieved for reflex or repeat testing.

"With improved efficiency, we've lowered our overall cost structure," says Ng. "For instance, we have less training, decreased inventory, faster setup time and less maintenance. With automation, we also reduce the risk of error, and this saves the hospital money because it leads to more accurate diagnoses."

In addition, through attrition, the staff has reduced full-time equivalents (FTEs) from 29 to 21.6, saving more than US\$400,000 per year. Meanwhile, testing volume is up by 200 samples per day – with more capacity to spare. "We are running at about 50 percent of our capacity now," says Ng.

With its automated line, Suburban is able to return outreach test results within four hours of receiving a sample.

Delivering Better Patient Care

Patients benefit from improved quality as well as faster turnaround time. More than 80 percent of results are

auto-verified based on parameters programmed by the lab in DL2000 Data Manager. With auto-verification, normal results are sent directly to physicians, without manual intervention. This frees technologists to focus attention on abnormal samples.

In addition, with the automated line, there is far less variation in testing procedures and interpretation. No matter when a test is run, the same processes apply. There are also fewer missing or delayed samples, which can impact diagnoses.

False positives have been reduced as well, particularly in the area of myocardial infarction. Using Beckman Coulter's AccuTnI® cardiac troponin I assay, the lab is able to accurately diagnose acute myocardial infarctions (AMI) in low-risk groups.

The laboratory delivers AccuTnI results in an average of 45 minutes, down from 60 minutes previously. Meanwhile, 91 percent of complete blood counts (CBCs) are finished within 30 minutes, and 87 percent of chemistry tests (electrolytes) are complete in 35 minutes.

For stat electrolytes, the average turnaround time is just 26 minutes, while 87 percent of inpatient routine electrolytes are delivered within 35 minutes.

In addition, the laboratory now conducts immunoassay tests and urine drug screenings around the clock, not just during the day shift.

Hornbeck points out that this improved service is possible even in the face of a labor shortage.

"The market is very tight," he says. "It's hard to find qualified medical laboratory technologists. But with automation, we can grow testing volume without adding staff. And at the same time, the increased workload allows us to retain the staff we have."

By all signs, the staff is satisfied with automation. Technologists are able to focus on meaningful work, and the automated line makes it easy to track and locate samples. For instance, with DL2000 the staff can monitor chemistry tests from multiple instruments.

"Very few staff members have left since we automated," says Ng. "Once they experience automation, they don't want to be without it."

Today, Suburban Hospital is recognized as a leader, with a higher level of automation than any other lab in the area. And through the laboratory's outreach testing, the hospital not only increases revenue, but also ensures its name is top-of-mind with physicians in the community.

While return on investment is expected in 2.5 years, it may occur earlier if the outreach business continues to grow. Already, customers are lining up to use Suburban's lab.

"We are very pleased with the results," says Hornbeck. "We are delivering better patient care, better laboratory testing and a better application of existing sciences. At the end of the day, this means better service to our community — and that's our goal."

