

Large Centralized Lab Realizes Dramatic Reductions in Turnaround Times by Embracing Process Improvement Techniques

Case Study

The Florida Hospital System

Perspective by Patrick J. O'Sullivan MS, MT (ASCP) SBB
Laboratory Operations Director



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Challenge	Solution	Impact
To improve efficiency and reduce TATs at a centralized microbiology lab serving a large IDN with 7 hospitals and a geographical footprint of over 50 miles.	Working with bioMérieux’s Performance Solutions LEAN LAB assessment team, the lab reorganized its process in order to provide culture reading 24-hours a day and provide results to clinicians much more quickly.	<ul style="list-style-type: none"> • New culture-reading process is ongoing 24-hours/day • Improved overall positive TATs by 12-24 hours • Freed up time equivalent to 4 FTEs, allowing staff to perform work of higher clinical value and greater impact in patient outcomes

Challenge

- The Florida Hospital System is part of Adventist Health Systems and includes 7 hospitals and 2,188 beds. In addition to the Orlando hospital—where the centralized lab is located—the other sites are East Orlando, Altamonte, Apopka, Celebration and Kissimmee. The Florida Hospital System includes the Walt Disney Pavilion at Florida Hospital for Children and nationally recognized centers of excellence in metabolic medicine, bariatric surgery, neuroscience, oncology, orthopaedics, heart disease and translational research for metabolic disease and diabetes.

Like all labs, the Florida Hospital System’s lab faces significant challenges, including the constant pressure to do more with less, decrease turnaround times (TATs), and contribute to decreased length of stays. In addition to these, the Florida Hospital Orlando Lab receives batch samples from a geographically large and populous area. All plating is done locally at each hospital, batched and shuttled to Orlando.

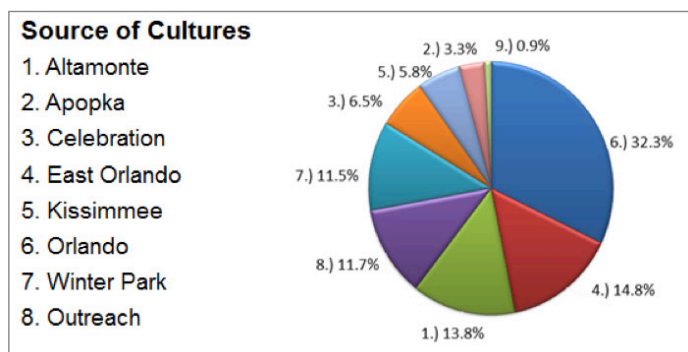


Figure 1: Lab work breakdown by facility.

According to, Patrick J. O’Sullivan MS, MT (ASCP) SBB, Laboratory Operations Director, the LEAN process with bioMérieux began in May of 2010 with a clear set of goals, including:

- Create value in health care delivery
- Avoid delays in treatment
- Provide timely positive results, as well as negative results
- Improve the efficient use of resources
- Appropriate staffing
- Level loading of work
- Avoid rework
- Optimize the availability of expertise within the lab

“We turned to bioMérieux for LEAN lab assessment at a time when we thought we could improve our service in microbiology,” said O’Sullivan. “What we really wanted to do was create a new system of values that would provide a quicker output for our results and that’s where bioMérieux came in. After initial conversations with them, we felt they could help us with our journey.”

Solution

- O'Sullivan and his staff began a search for the right partner to help them with their unique needs. The committee that was formed had some strict requirements for a LEAN LAB partner. The decision would be based on a partner who:
 - Could intelligently guide them on key decisions
 - Offered a strong statistical analysis and workflow
 - Could engage the staff and relate to them
 - Encouraged the staff to offer feedback and to actively participate in the improvement of their work and their lab
 - Could explain the process in terms that would be understandable to lab scientists and, therefore, build immediate trust

"I think the trust of the staff and of the team that comes in to do the LEAN assessment is critical," said O'Sullivan. "I had meetings with the staff before we brought in the bioMérieux LEAN assessment team to outline where we wanted to go and the staff agreed that there were improvements that needed to be made in efficiency and the speed in which we could improve our turnaround times to results."

However, no matter how likeable and experienced the LEAN team was, there was one crucial characteristic that the entire staff agreed on: the consultant had to understand microbiology and include trainers who had worked in the lab themselves.

"The LEAN team from bioMérieux brought a surprising technical expertise to the microbiology lab," O'Sullivan said. "We've had LEAN assessments before and often it's done by people from industry, such as manufacturing, who are not familiar with hospitals and laboratory work, so we were very pleased that bioMérieux actually had microbiologists as part of their team. As a result, the LEAN Assessment team spoke our language and had no problem relating well with our staff. This led to an immediate sense of trust. In fact, the lab staff was very eager to interact with the bioMérieux team to see how things could be improved."

Impact

- The assessment quickly revealed room for improvement regarding urine TATs. The lab provided some key data including workload data, LIS timestamps, staffing and scheduling data. From this, it was determined that the urine median TAT, from receiving to results was 47 hours. A quarter of all urine tests took over 58 hours.

The median TAT for negative urine results was 31 hours. A quarter of all negative TATs did not get reported before the 35-hour mark. And only 7 percent were reported within 72 hours.

The existing process included culture reading on the day shift only and batch processing for negative cultures. Positive cultures were reported on the first shift. The positive culture reading was not optimized. These cultures were looked at every 18 hours. If there was not growth in that first 18 hour incubation, another read did not occur for another 18 hours. The solution was to reorganize staff so that trained culture readers were available 24 hours and positive results could be reported as soon as growth began.

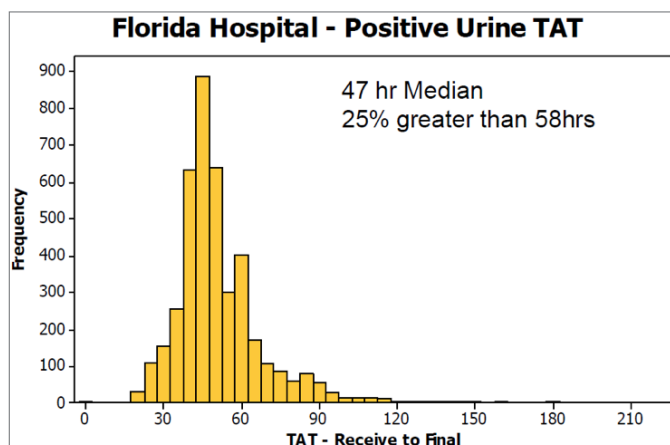


Figure 2: Pre-LEAN positive urine TAT averages.

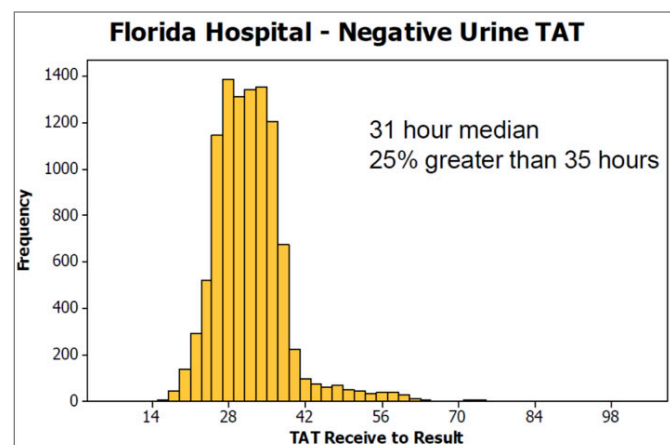


Figure 3: Median negative urine TATs prior to the LEAN assessment.

bioMérieux recommended delaying plating to the incubator for all urine samples, converting to multiple sorts, entering the negatives only after the positives (no growth batch), and implementing a two-step identification and sensitivity setup.

The blood culture recommendations included switching to four plates to avoid rework, labeling and worksheet sorting, and to eliminate the movement to separate ID stations.

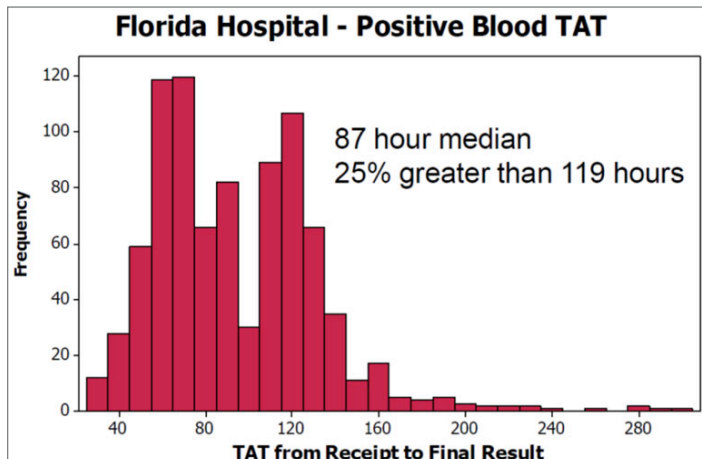


Figure 4: Pre-LEAN, the media blood culture TAT was 87 hours, 25% of which took longer than 119 hours.

“bioMérieux suggested setting all four plates at once to save time. Even if all four are not needed, this redundancy provided us with a very beneficial ‘quick win’ in our blood process improvement effort,” said O’Sullivan.

“One of the inevitable reactions to change is: ‘well, we’ve always done it that way,’” said O’Sullivan. “Even when a consultant comes in and tells you there’s a better way to do it, people have a tendency to want to stay at their comfort level. However, bioMérieux contrasted what we were doing with how it could be—including numbers, statistics and real metrics on what we could accomplish. This forward-looking approach provided the impetus to actually make change. Change is never easy, but we found, in the end, that the future improvements that bioMérieux said we could accomplish really did come true.”

The Journey Continues

- LEAN is not a destination, but an ongoing process, so the Florida Hospital is constantly looking to introduce LEAN into its processes. The lab recently engaged the LEAN team to pilot new daily staff priorities processes. This staff “pull” approach is key to continuous process improvement which is the cornerstone principle of the Kaizen LEAN model. From this daily priorities effort, the lab has seen an overall positive TAT reduction of 12-24 hours. It also freed up the time of two full-time equivalents (FTEs) so they can do more vital work. The next step in the continuous improvement effort is the development of a daily management and overall workflow. “What we were able to do is to establish LEAN methods with long-term sustainability and adaptability,” said O’Sullivan. “It’s not always a fast process, nor is it always a quick win, but in the long run, we are where we need to be to provide value as a modern microbiology lab.”

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In the lab’s phlebotomy/blood collection services, LEAN helped the team to identify unnecessary transportation of blood tubes and people. This has directly benefited patient care because it keeps staff on the nursing units where they are needed. The lab also decreased process steps by changing workflow patterns and adding some automation including electronic cross-matching of samples.

The LEAN team also:

- Designed a new blood, urine and wound sample process with redesigned workstations and workflows
- Targeted respiratory, genital and stool sample process with an average decrease in TATs for these samples of 4-12 hours
- Redesigned the inbound work area, which has improved plating processing.
- Introduced LEAN workflow movement principles
- Brought in additional automation, specifically the bioMérieux Bact/ALERT® 3D, which made the redesign of the lab’s physical space possible because of its small footprint.
- Implemented a distributed specimen process model instead of the consolidated model used for years. The impact is still being measured, but the lab hopes to see a decrease in contamination rates, as well as a reduction in plate rework and plate streaking labor time.

Looking forward, the LEAN team is about to develop a Kaizen module for the pre-analytic and prep phase for respiratory, stool and genital samples and believe this will also squeeze inefficiency and time out of this process.

“The ability to use a consultant to help us achieve all of this at an accelerated rate is a key point,” said O’Sullivan. “We kind of knew what needed to be done, but, as I like to say, we needed a kick in the pants and some coaching to help us get started and to stay the course. When the bioMérieux consultants came in and told us what we could achieve, it really helped us to move along much more quickly to achieve our desired outcomes.”

