

# Norton Healthcare partners with Ortho Clinical Diagnostics to transform laboratory performance... for the long-term.

How an integrated solution, combining advanced technology and process improvement services, enabled Norton Healthcare's central laboratory to redesign its facility, improve service levels and establish a culture of continuous improvement.



## **An Opportunity to Improve Efficiency**

With test volumes growing due to an increase in outreach business, Bob Schaefer, director of Norton Healthcare's Central Laboratory, was clear an upgrade to their instruments was needed: "Our volume had increased substantially, but our existing analyzers weren't able to keep up with the specimen flow. They were frequently breaking down and just weren't quite up to the job." He knew they needed to increase instrument reliability but he also wanted to move to an integrated platform, with one instrument to perform both chemistry and immunochemistry testing.

At the same time, Mr. Schaefer recognized there were other issues to address for the laboratory to handle its increased volume. "We realized we also needed to look at our pre-analytic processes. We had a bottleneck in our specimen processing area, which was causing us significant problems, particularly during our morning runs when we receive 400-500 specimens. We knew that to meet the system's quality and financial goals, we had to resolve the pre-analytic issues before the instruments came through the door."

## An Integrated Solution

Ortho Clinical Diagnostics combines the consulting expertise of ValuMetrix® Services with the capabilities of advanced equipment and technology. This comprehensive approach is designed to address laboratory priorities, and help meet clinical, operational and financial goals — over the long term.

### Advanced Technology

- High-quality analyzer and test methodologies
- >95% reportable result efficiency<sup>1</sup>
- Minimal system maintenance

### Product Optimization

- Process flow to and through testing systems
- Layout and workstation design

### Consulting Services

- Lean process improvement— value stream approach
- Knowledge transfer— training, education, cycles of learning

### Measurable Outcomes

- Increased quality
- Improved service levels
- Reduced Costs

“We knew what we needed to do. **But knowing what you have to do and knowing how to fix things are two different things.**”

### Selecting the Right Partner

Norton Healthcare included process improvement support as part of their vendor selection process. The ValuMetrix® Services consultant conducted a 2 day assessment — a ‘work practice analysis’ — of the laboratory operation providing recommendations to improve turnaround time and overall efficiency. “We were impressed with the consultant - how well they seemed to understand things, and how quickly they produced data that was meaningful,” notes Mr. Schaefer. He also realized that making the necessary changes identified by the analysis would require additional expertise to redesign the pre-analytic processes before installation of the instruments. Expertise that could only be provided by an outside consultant.

Ortho Clinical Diagnostics provided a comprehensive proposal which combined three elements: Lean consulting services from ValuMetrix® Services to redesign pre-analytic processes and layout, three VITROS® 5600 Integrated Systems, and ValuMetrix® P3 Solutions® to ensure optimization of instruments following installation. “That really appealed to us,” notes Mr. Schaefer, “because we knew we needed to change something, and we knew you just can’t do a two-day study and change things.” Norton Healthcare agreed to move ahead with services and instruments from Ortho Clinical Diagnostics with the goal of fixing the pre-analytical processes before the instruments were installed.

1. Data on file

## Initial Assessment Identifies Variability and Inefficiencies

The initial assessment of specimen and order entry had revealed there was considerable variation in sample delivery to laboratory departments, with little standardization for handling specimens. There were excessive touch points, batching of samples, interruptions, rework, and redundant steps. As Mr. Schaefer observes, “We had too many people touching specimens too many times, they were going to too many places and there was too much variability.” These inefficiencies resulted in inconsistent turnaround times, frequent phone calls from customers looking for results, and staff frustration.

## In-depth Analysis Leads to Significant Changes

The challenge now was to determine what changes to make and then to implement them. An internal Lean team of five people was formed from different functional areas in the laboratory to work with the ValuMetrix® Services consultant.

This was an important aspect of the project, as Mr. Schaefer wanted to establish a core team who would gain Lean process improvement experience and drive continuous improvement after the project’s completion. The consultant trained them in Lean principles and data collection, so they could perform an active role in analyzing processes and implementing changes.

Every step in the pre-analytical process was timed, videotaped and analyzed. As well as documenting overall turnaround times, the team examined every aspect of a specimen’s journey from receipt to delivery: how long it waited at each stage, how many times it was handled and the distance it traveled.

With a detailed picture of the current layout and processes the team developed a vision for an improved future state and moved ahead to implement the changes.

These consisted of:

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## 1 Single piece flow

The specimen flow was changed so that instead of each technician handling every step in processing a sample, technicians were assigned specific roles: one to manage the pneumatic tube system, one to enter data into the laboratory information system and one to perform the actual processing required. A “runner” was assigned to take the completed racks to the chemistry or hematology department every five minutes. As Mr. Schaefer explains, “We designed it so there was a steady flow of product into the analyzers, rather than waiting for 20 to 30 samples and then taking them to the back. That made it a whole lot better for the people who were in the chemistry department because they weren’t waiting for a processor to bring back a huge batch of specimens which simply slowed them down once they arrived.”

Smaller batches enable more efficient flow and help reduce turnaround time.



BEFORE



AFTER

“Everybody was doing their own thing and it wasn’t really standardized. **How a specimen was handled depended on who was working there that day.**”

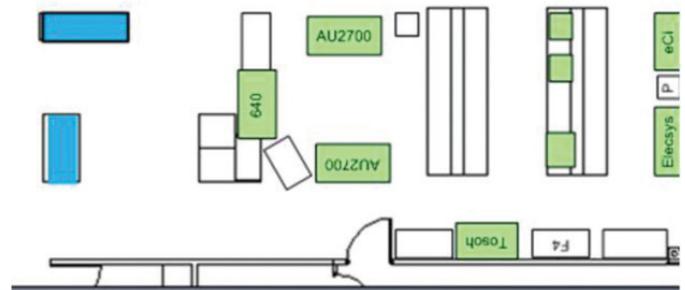
## 2 Redesigned layout

The team developed a layout to maximize productivity and efficiency, and optimize the use of the new VITROS® instruments.

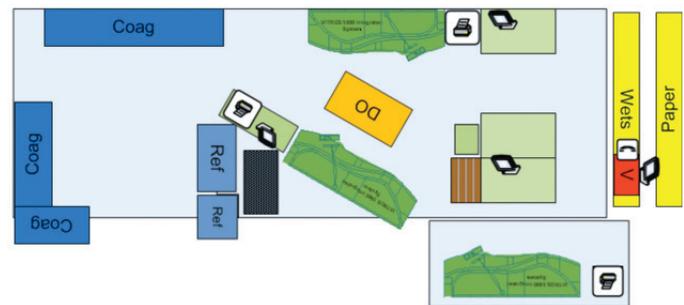
Changes to the physical plant included removing part of a wall, which was blocking access into the processing area and obstructing the view. This opened up the area, allowed technicians in both departments to see each other, and created a better visual working environment.

Eight workstations were reduced to three. The three VITROS® 5600 Integrated Systems are set-up as one workstation and can be operated by just three people. The other two workstations handle specialized testing. “Basically we’ve gone from having people assigned to eight different benches down to three, notes Mr. Schaefer.”

BEFORE



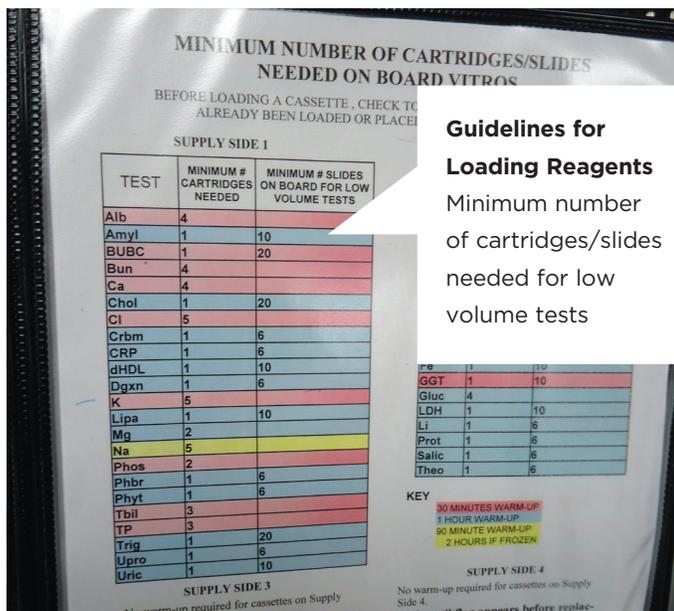
AFTER



Workstations reduced from 8 to 3. Layout enables efficient flow of specimens.

### 3 Standard Work

A standard work guide was developed for processing samples. This helps ensure a consistent approach is taken by all technicians and reduces the level of variability.



### Impact

The impact of these changes led to greater efficiencies, which translated to improved customer service.

#### Faster processing

The steady flow of samples allows the instruments to run more efficiently and has reduced the amount of downtime.

#### Improved Turnaround Times, Increased Consistency

The changes have enabled the laboratory to meet its goal of more consistent turnaround times. “We’ve always had good average turnaround times but there was a lot of variation,” says Mr. Schaefer. “It was the outliers that were causing our problems. When you get a phone call and somebody’s upset, it’s because of an outlier. If you can decrease the number of outliers, it’s a big thing.”

At Norton any test taking longer than 74 minutes from receipt to result is considered an outlier. The number of CBCs taking longer than 74 minutes declined from 18 at the beginning of the project to 5 at the end — a 72% improvement. Even more dramatically, the number of chemistries in that category went down from 360 to 37 — a 90% reduction.

With improved levels of service and greater consistency Mr. Schaefer is no longer getting regular calls from people complaining. “That’s how to measure your success,” he says. “People don’t call you as much.”

### Continuing To Improve

After installation of the instruments the ValuMetrix® consultant returned to review the changes and help with additional improvements in the chemistry area, as well as with the laboratory’s second shift and its outreach business. And with its own Lean team the laboratory now has an internal resource to help lead changes in the department.

Additionally Mr. Schaefer has seen a change in his staff’s attitude and approach.

“We think a lot differently now and we’re a lot more efficient in how we do things,” he notes. “The Lean culture has spilled over into everything we do such as keeping things organized and keeping minimal amounts of supplies around. We’re always looking for opportunities to eliminate waste.”

### 4 Organizing supplies

Old supplies were removed, together with redundant equipment. “Using Lean principles, we looked at every item and questioned whether it was needed, in what quantity and in what location. Why did we have 12 of something when we only used one a month? Anything that was extraneous we got rid of.”



#### Reagent Cart

Added number guides and made boxes to contain only the allowed number of cartridges

**CLIENT** Central Laboratory, Norton Hospital,  
Louisville, Kentucky

## VITALS

- Serves Norton Hospital, a 700+ bed hospital, and Kosair Children's Hospital. Serves as a primary reference lab to other hospitals in the Norton Healthcare system, the largest healthcare provider in Louisville and Southern Indiana.
- Processes 2.5 million billable tests per year
- 150 FTEs

## PROJECT GOALS

- Achieve consistent turnaround times
- Redesign the laboratory's pre-analytical processes and layout to increase efficiency and optimize the new instruments
- Consolidate from 8 to 3 workstations, incorporating 3 VITROS<sup>®</sup> 5600 Integrated Systems
- Increase teamwork and staff satisfaction

## PROCESS

A 2 day work-practice assessment to identify potential improvements to processes and layout. ValuMetrix<sup>®</sup> consultant worked with a 5 person Lean team over six weeks to analyze the pre-analytical processes, and implement changes to workflow, layout and work practices. After installation of 3 VITROS<sup>®</sup> 5600 systems, the ValuMetrix<sup>®</sup> Services consultant returned to review improvements and make additional changes to the chemistry area. They provided monitoring and management tools to help sustain and extend the gains.

## RESULTS

- Tests completed in longer than 74 minutes was reduced by 90% (Chemistry), 72% (CBC) and 50% (PT)
- Improvements in Average Turnaround times: Chemistry 32%, CBC 20%, PT 38%
- Number of workstations reduced from 8 to 3.
- Chemistry specimen storage time reduced by 50%. Value added time increased 76%

## RESPONSE

*“We didn't have the expertise to do this ourselves. An outside consultant brings knowledge and experience gained at many different facilities, which helps them know what's going to work in yours. It was well worth the time and effort, and we were very pleased with the way it turned out.”*

*Bob Schaefer MS MT(ASCP)  
Director, Central Laboratory  
Norton Healthcare  
Louisville, Kentucky*

Combining world-class process improvement services with leading technology, Ortho Clinical Diagnostics provides an integrated approach to transform laboratory performance.

## Ortho Clinical Diagnostics