

CASE STUDY | MDS Diagnostics Improves Workflow and Turnaround Time

How Canadian-Based MDS Diagnostic Services leveled its workload, saved overtime hours and cut lab-test turnaround time nearly in half

When an organization is in the early stages of deploying a process improvement strategy, efforts can be highly visible and under intense scrutiny. Projects selected during this phase need to be clearly defined and have a high likelihood for success. One way to rack up early “wins” is to combine the structured problem-solving methodology of six sigma with the “quick hitting” toolset of Lean. Canadian-based MDS Diagnostic Services (MDS Metro in British Columbia) recently demonstrated success using lean six sigma principles early in its deployment process.

The Challenge

At one MDS facility, the Burnaby Reference Laboratory (BRL), more than 30,000 physician-ordered laboratory tests are performed each day. Many of the tests are “routine high volume” screens, such as white blood cell count and electrolyte levels, which help physicians determine a patient’s general level of health.

Specimens are drawn from patients who visit one of the 40-50 different PSCs (Patient Service Centers) across the greater Vancouver area. The specimens

are packaged for courier delivery to BRL that same day. Upon arrival, the BRL analytical support staff unpacks and sorts the specimens, directing them to the appropriate areas of the lab for testing. At the time MDS initiated its improvement efforts, an average of only 28 percent of each day’s total specimens were being delivered to BRL by 1:00 p.m., even though 61 percent of the specimens had already been collected from patients and were ready for pickup. This meant that many of the tests didn’t arrive at the lab until late afternoon, typically in two surges. This pattern contributed to a stressful work environment and the need for lab staff to work late shifts and sometimes put in overtime.

The Process

MDS decided to investigate how it could streamline the flow of specimens from the PSC offices to the BRL facility, and thus reduce employee stress and overtime and improve specimen workflow. John Racher, MDS Director of Business Integration, has been trained in both six sigma and Lean, and was selected to be the Value Stream Owner for the BRL office.



Summary

Organization

- ▶ MDS Diagnostics, Inc.

Industry

- ▶ Healthcare

Business Problem

- ▶ Spikes in number of specimens arriving at lab causing backlog, stress and overtime

Methodology

- ▶ Lean six sigma

Solution

- ▶ Adjust delivery and workload to eliminate spikes and smooth flow

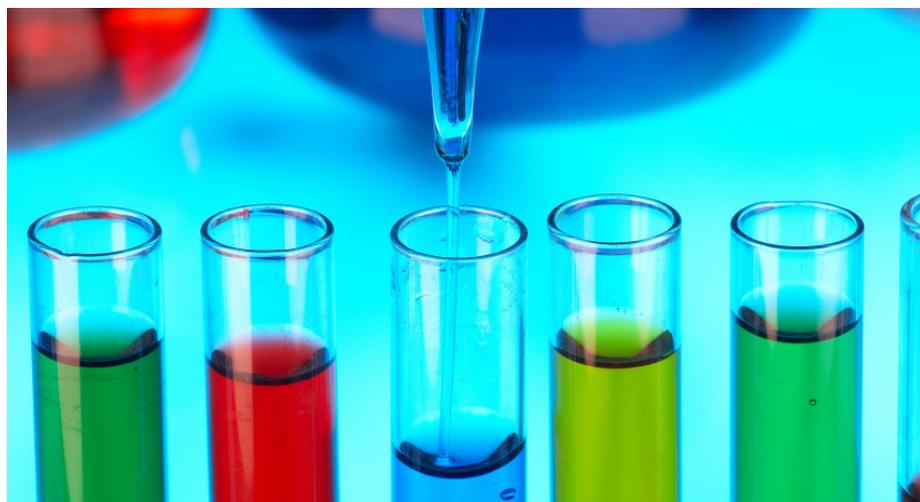
Benefits/Results

- ▶ Balanced workload, less overtime and reduced testing turnaround time

“MDS Diagnostic Services is a leading provider of laboratory services in North America. MDS focuses on diagnostic laboratory testing, transforming laboratory organizations and developing highly sophisticated, automated and intelligent laboratories.

MDS Metro, located in British Columbia, Canada, specializes in the diagnostic testing needs of outpatients, homebound patients and patients in long term care facilities.

Its laboratory testing and information services help physicians diagnose and treat more than 2 million patients every year.



He worked with BMGI to assemble a cross-functional team of two MDS Green Belts, as well as staff and management from the PSCs, specimen couriers.

As with any successful improvement project, Racher and his team first developed a specific and measurable problem statement and determined the project scope. Their objective was to increase the number of routine high volume specimens arriving at BRL by 11:00 a.m. from a total of 345 to 1,355. They hoped this would eliminate the first of the two afternoon surges at the lab, and possibly improve test turnaround time as well.

Although the focus of the project was a four-day rapid-improvement event, the team gathered quite a bit of data to help them prepare for the event, including:

- ▶ Analysis of specimen volumes and arrival times at the BRL facility.
- ▶ Analysis of existing specimen delivery routes.
- ▶ An Excel model depicting how changing specimen delivery routes might affect the volume of specimens arriving at the lab.
- ▶ A SIPOC (Supplier Inputs, Processes, Outputs and Customers) diagram for both internal and external customers.

Racher says that the up-front work helped the team approach the rapid-improvement event with a “no surprises” attitude, and reduced work and anxiety during the event. As with many rapid-improvement events, the team had a good idea of what could be done to achieve its goals, and used the event week to test its theories.

The Rapid-improvement Event

The team had two major changes in mind: Add two express courier routes to pick up specimens from the PSC offices and deliver them to BRL earlier in the day. Move the specimen “centrifuge” process from the PSC offices to BRL. The first idea was fairly easy to test. The 17 PSCs selected to participate in the event collected specimens as usual, but packaged them in time for earlier pickups. The courier added two

new high priority routes to its morning schedule.

The second idea was a bit more challenging. The specimen centrifuge process (where red and white blood cells are separated from plasma) must occur within two hours of collection. But first, each specimen has to “settle” for 30 minutes. The team realized that the 30 minute settling period could be done in parallel with the time spent transporting the specimens to BRL.

However, that would mean BRL personnel would have to centrifuge the specimens instead of the PSC staff.

During the first couple days of the event week, the team tested the new centrifuge process. A capability analysis confirmed that it would indeed be possible to centrifuge the specimens at BRL without exceeding the two-hour window for specimen integrity.

On the third day of the event, the PSC offices sent all “unspun” specimens to BRL to be centrifuged. The additional workload was quickly integrated by BRL’s analytical support staff, thanks to having spent the first part of the week applying 5S principles to their work area.

On day four, over 2,500 specimens were delivered to BRL by noon, this was a 104 percent increase over the pre-rapid-improvement flow rate!

The Results

Although the purpose of the rapid-improvement event had been to eliminate the early afternoon surge of specimens delivered to BRL, the changes also reduced the late afternoon spike. Over the next few weeks, MDS tweaked the courier routes and reduced the impact of the late afternoon surge even more. As a result, the company has been able to reduce its overtime expenses, and several BRL employees were able to transition to earlier shifts, translating to financial savings and a boost in morale.

And, although it wasn’t a primary objective of the event, the average turnaround time for routine tests drawn in the early morning has improved from 4.4 hours to 2.8. So what’s the best part? The event was achieved with no operating expense

or staffing increases - an impressive accomplishment for any project, even better for an “early win.” As Racher remarks, “This was a pivotal rapid-improvement event to prove that lean six sigma does work, and it can deliver significant results in a very short amount of time.”

Key Tools Used

Lean

- ▶ 5S
- ▶ Value Stream Map
- ▶ Spaghetti Diagram
- ▶ Standard Work
- ▶ Stakeholder Analysis
- ▶ Stakeholder
- ▶ Communication Plan

Six Sigma

- ▶ Capability Analysis
- ▶ Bar Charts
- ▶ Dot Plots

BMGI’s lean six sigma program has been designed with “speed to efficiency” in mind.

Combining the infrastructure of the DMAIC methodology with the simple waste-reducing tools of Lean gives practitioners the critical skills they need to get up to speed and start effecting positive change within their environment quickly.

BMGI

BMGI enables companies throughout the world to identify and solve their most important business problems, with a strong emphasis on sustainable results. During its long history, BMGI has developed solutions for a broad spectrum of businesses across many industries, driving the success of process-improvement, design and innovation initiatives. Just a few of BMGI’s clients are General Dynamics, TNT Express, Avis Budget Group, China Chemical, Graphic Packaging, Siemens, Hitachi and Philips Electronics. For more information, please visit the BMGI website at www.bmgi.com