

Northampton General Hospital uses Lean to cut turnaround time by 40%, avoids £158,000/year in labour, storage, and inventory costs

Struggling with its workload, the laboratory at Northampton General Hospital engaged ValuMetrix[®] Services to lead it through a Lean initiative. A seven-person team achieved dramatic reductions in turnaround time, allowing the laboratory to restore a comfortable work pace, even with a 20% increase in the volume of blood tubes in blood sciences.

“We had to increase our productivity”

The work was rarely complete by 17:30 at the Pathology Laboratory at Northampton General Hospital. Staff were constantly staying late or refrigerating samples for next-day completion. The environment was often stressful, with absenteeism due to illness at an all-time high. “We are under increasing pressure from Hospital Management to improve our level of service,” says Pathology Directorate Manager Peter Martin. “But we couldn’t recruit staff. We had to increase our productivity.”

The laboratory solicited suggestions from its diagnostic instrument vendors. “We had three very big names in the marketplace come in and look at the way we were handling things,” Peter Martin says. “They basically told us our system was as efficient as it could be. That’s why we looked to ValuMetrix[®] Services, because they had experience with Lean in a healthcare environment.”

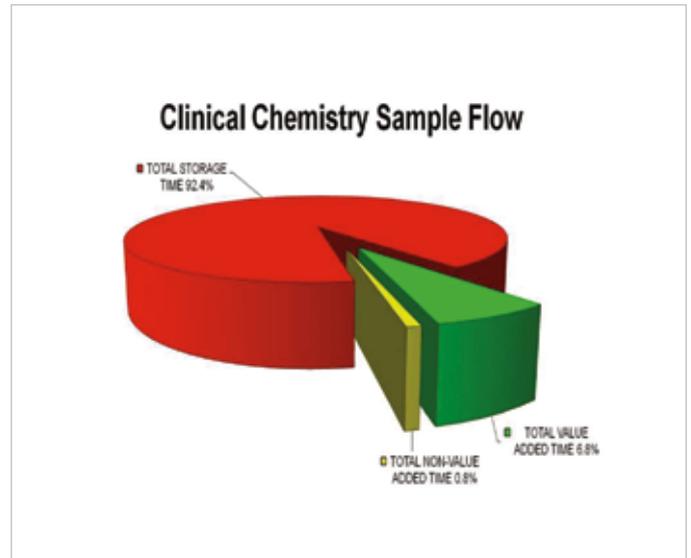
A ValuMetrix[®] Services assessment found room for quick gains in the main reception area. A one-week kaizen event reduced average turnaround time by up to 50 minutes.

But promising opportunities remained in both reception and microbiology. Aiming for deeper, more transformational change, the laboratory requested a full-scale Lean implementation.



Before Lean:

Because work arrived in two large batches during the day, the staff was underutilised during slow periods and overwhelmed during busy periods.



Before Lean:

Processing large batches added wait time to all other samples in the batch, lengthening turnaround time by 92.4% in this example.

Videotaping the product flow and operator activity

Alternating training with work on the project, a seven-person team followed blood samples from hospital wards to the laboratory. They videotaped operator activity and accompanied drivers collecting samples from general practitioners. “That helped us realise the pressure our drivers were under,” says Andrea O’Connell, an Operational Manager in the microbiology laboratory. “Although their main job was picking up samples, they had other tasks like delivering supplies to other areas.” Team members then reviewed their notes and tapes, performing a second-by-second analysis of which steps added value and which were waste.

Large sample batches found to slow average processing time

The analysis uncovered numerous factors that were slowing down the laboratory. For one thing, much of the work arrived in one or two large batches a day. “You’d get a little bit from phlebotomy and the clinics in the morning,” explains Pre-Analytical Manager Isobelle Brooker. “And then all of a sudden at lunch time, drivers would deliver half the day’s samples from the general practitioners. Then you’d get another big batch late in the afternoon.”

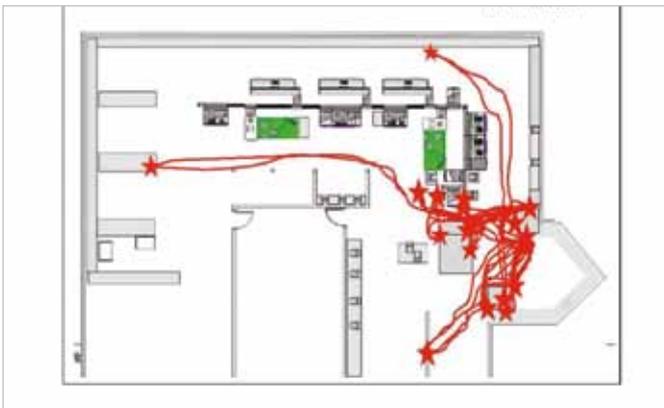
That midday batch (more than 1,100 specimen bags in one observed instance) often arrived during the lunch break, so processing might not begin until 1.00 p.m.

The late-afternoon batch might arrive just as the staff were preparing to leave. To add further delay, reception staff handled telephone enquiries while they worked, leaving samples idle as they followed up on customer requests.

Poor placement of equipment and inventory adds unnecessary walking

The location and management of inventory also caused needless waste and walking “We had several storerooms, some on the other side of the hospital,” Samantha Martin explains. “You’d look at what you had and think, ‘I need a bit more of this, some more of that.’ We’d end up with loads of things we don’t use and not enough of the things we do use.”

Downstairs, a large room was used to store histopathology slides and wax blocks, but it had also become a dumping ground for old equipment, furniture, and assorted “junk”. The Trust was quoted £20,000 per year to store its slides in a secure environment, with additional costs for retrieving them. Storage conditions were so poor, pathology was seriously considering this option.



Before Lean:
Because instruments and supplies were scattered all over the laboratory, this technologist walked 585 feet over an 18-minute period.

Lack of standardisation

Finally, the videotapes revealed that different staff members performed the same work in different ways. And some approaches were less efficient than others. For example, if a test has a longer incubation time, this should be performed first and not delayed until other tests that require shorter incubation time are undertaken, so resulting in a more efficient process.

Organising inventory management

Once the causes of waste were understood, the Lean team could formulate appropriate solutions. The first step was to clear the storage areas of broken equipment and outdated journals. The team implemented a kanban system, inserting a laminated card at a pre-set reorder point and outdated journals. The team implemented a kanban system, inserting a laminated card at a pre-set reorder point for each supply item.



After Lean:
A laminated card has been inserted at a pre-set reorder point for each inventory item. The card provides all the necessary ordering information.



Before Lean:
It wasn't always clear when an item should be replenished, so staff members over-ordered “just in case”.



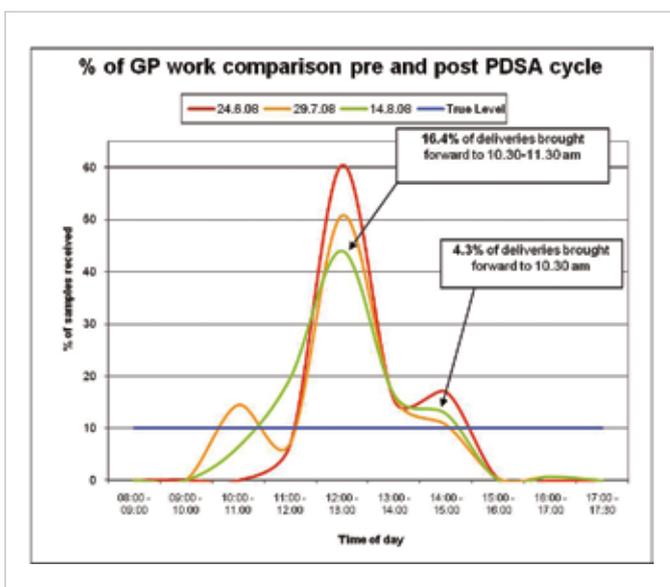
After Lean:
Upon reaching the reorder point, a staff member simply drops the card into this collection bin.

“But thanks to Lean, we can absorb the added work. **We are finishing on time now and on good days, slightly early. We’ve taken the stress out of the process.**”

— Peter Martin, Pathology Directorate Manager

Standardising the optimal way to perform each task

What about the differing personal approaches to common tasks? Working with the staff, the Lean team defined the optimal way to complete each one. It streamlined the workstation layout so that the equipment and supplies for each step are close at hand. “Every table is laid out the same way and everything you need is within arm’s reach,” says Samantha Martin. “You can sit at any station and know exactly where to look for things. And you never have to get up to reach them.”



Before Lean:

After two rounds of “Plan, Do, Study, Act,” disruptive surges in volume at noon and 2 p.m. (red line) were spread out more evenly to the early morning period (green line).

The Lean team outlined the steps for each task in standard work guidelines, which have proven to be useful for training new staff. “Standard work explains exactly what work needs to be undertaken, and an explanation of the processes. And when the Lean evaluation was over, the standard work provided a critical reminder on how to best organise the day,” says Clare Wood, a BMS Team Leader in Histopathology. “And once they’re on their own, they have that written reminder of how they should organise their day.”

Shifting deliveries to slower times of the day, reducing batching

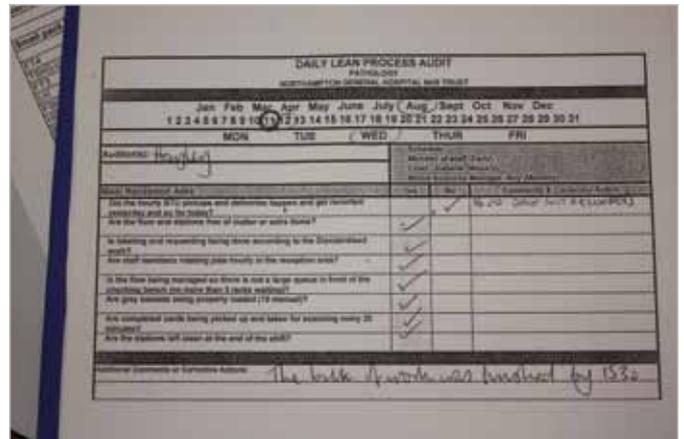
The next goal was to “level load” the work by shifting sample deliveries to slower times of the day. The team identified surgeries that had samples ready by 10 a.m. It conducted two rounds of PDSA (Plan, Do, Study, Act) to test earlier collection from these practices. When the results showed clear gains, the laboratory added motorbike runs to collect samples more frequently throughout the day. It revised the reception staff work schedule to ensure better coverage during the noon influx of samples.

To further reduce batching delays, reception staff were instructed to process 10 samples at a time on a first-in-first-out basis. “The idea is to get samples into the analytical stage straight away,” says Samantha Martin, “as opposed to sitting down with an hour’s worth of work and happily going through it while patients are waiting.”

The laboratory designated a person to handle phone enquiries, freeing the rest of the staff to continue processing samples.

ValuMetrix® Services consultant helps keep the project on track

Throughout the Lean project, the ValuMetrix® Services consultant “kept the project moving and made sure we didn’t get diverted from our objectives,” says Peter Martin. The consultant shared his experience with methodologies from other organizations. He also made sure, according to Mr. Martin, that the team “didn’t just implement Lean for its own sake but had a clearly defined project process and clearly defined targets.”



After Lean:

The ValuMetrix® Services consultant helped design an auditing process to ensure that the Lean gains are sustained.

“Standard work explains exactly what work needs to be undertaken, and an explanation of the processes. **And when the Lean evaluation was over, the standard work provided a critical reminder on how to best organise the day.**”

“We process 3,000 tubes a day. If a single Lean improvement saves 30 seconds on each tube, **we save 25 hours in a day’s processing.**”

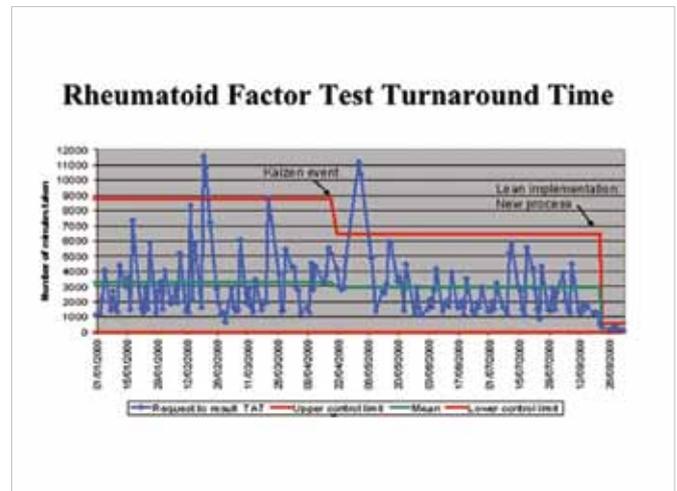
— Peter Martin, Pathology Directorate Manager

40% reduction in turnaround time for selected tests, avoiding £158,000 a year in labour, storage, and inventory costs

Within two weeks of the Lean changes, the laboratory staff noticed that they were leaving on time. Average test turnaround time for selected microbiology serology tests was reduced by 40%. Average time to complete a rheumatoid factor test dropped from 734 minutes to 251 minutes, a 66% reduction.

“Clinicians are getting results more rapidly,” says Peter Martin. “That’s helped them organise bed management within the trust and facilitate discharges.” More than 90% of specimens are now processed within 24 hours.

The productivity gains allowed the laboratory to reassign four employees, which has translated to an annual savings of approximately £138,000.



After Lean:

Striking gains from a one-week kaizen event prompted a full-scale Lean project, which soon reduced turnaround time even further.

These improvements continued even as the work volume grew by 20% over the subsequent months. “We haven’t increased our staff,” says Peter Martin. “But thanks to Lean, we can absorb the added work. We are finishing on time now and on good days, slightly early. We’ve taken the stress out of the process.” Bearing that out, the rate of absence in the reception area due to illness has fallen from 19% to 5% .

Meanwhile, the new kanban inventory system has enabled the laboratory to save money by maintaining a smaller standing inventory. “We’ve had no stockouts in a year,” says Samantha Martin.

The formerly cluttered storage area now houses pathology samples safely, avoiding the £20,000 annual storage cost. This has brought the total annual cost avoidance to £158,000.

Subsequent projects yield further gains

Two years after its initial kaizen project, Northampton General is “moving forward with Lean and still learning from it,” according to Clare Wood. “We’re looking at all the areas within pathology and the different benches and sections. We’re gradually tackling each one to review the process, introduce standard work, and reinforce the Lean culture.”

The Lean engagement provided a sufficient foundation for the laboratory to conduct these follow-up projects independently. “With the training and support that ValuMetrix® Services gave us, we can manage them on our own,” Peter Martin states. “Lean wasn’t done to us. We participated in the process and learned from it.” A recent “mini-kaizen” in the Cytology Department’s data entry and screening process was able to reduce average turnaround by over 40%.

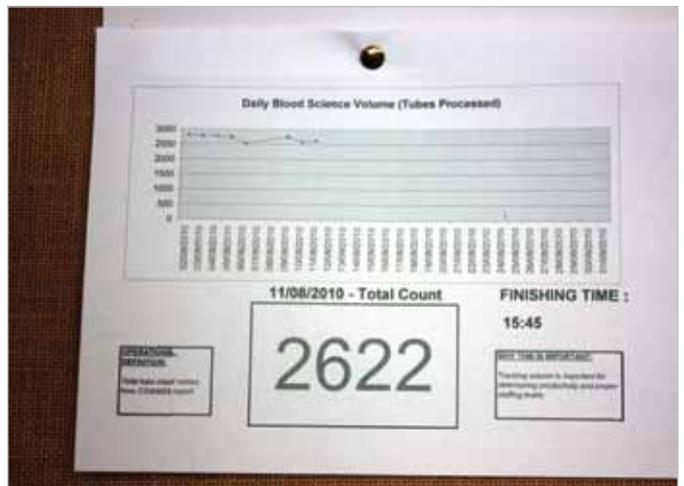
To maintain a constant flow of ideas, the laboratory maintains a suggestion board where ideas are raised, evaluated at weekly meetings, and tracked through to implementation.

One suggestion involved a practice of double-labelling histology samples. “Somebody put a note on the board asking, ‘Do we really need to label this twice?’” recalls Clare Wood. The step proved to be a lingering requirement from a computer system replaced four years earlier. “It was no longer necessary, so we changed it straight away,” she says.



After Lean:

The entire staff is able to track the progress of suggested improvements.



After Lean:

Ongoing monitoring helps the laboratory sustain its gains and uncover new opportunities for improvement.

CLIENT

The Pathology Laboratory at Northampton General Hospital, Northampton, UK

VITALS

- Processes 2,800 – 3,100 blood tubes per day
- 12 whole-time employees in reception
- 202 staff in total (mixture of part and full time)

PROJECT GOAL

- Reduce specimen turnaround time
- Reduce labour costs through attrition
- Increase capacity in anticipation of work volume increases
- Improve staff morale and engagement
- Reduce inventory levels and spending on supplies

PROCESS

Under the guidance of a ValuMetrix[®] Services consultant, a seven-person team analysed the laboratory's product flow and operator activity. The team identified batch processing, informal inventory management, and lack of standardisation as primary causes of waste. The laboratory arranged for more frequent deliveries of smaller batches. It instituted a formal inventory management process and formalised optimal standard work procedures.

RESULTS

- Average turnaround time for selected microbiology serology tests fell 40%.
- Average time to complete a rheumatoid factor test dropped from 734 minutes to 251 minutes, a 66% reduction.
- More than 90% of specimens are now processed within 24 hours.
- The laboratory reassigned four employees, avoiding approximately £138,000 a year in labour costs.
- The laboratory was able to avoid an outside storage arrangement that would have cost £20,000 a year.
- Morale in the reception area improved, with absence due to illness falling from 19% to 5%.

RESPONSE

“Lean, with the support of ValuMetrix[®] Services, helped us realise that we needed to look at our total process to maximize our efficiency. It didn't just help us improve turnaround time and increase our productivity. It also helped us improve the quality of the service we are providing to our patients.”

*Peter Martin
Pathology Directorate Manager
Northampton General Hospital NHS Trust*

Healthcare institutions of any size may reduce expenses and enhance their revenue with ValuMetrix[®] Services. To ensure permanent gains, we work closely with your management and staff to institutionalize the changes. Best of all, we train, mentor, and certify your personnel, giving them the knowledge, tools, and skills to make further improvements on their own.

Ortho Clinical Diagnostics
a *Johnson & Johnson* company

Johnson & Johnson
50 - 100 Holmers Farm Way, High Wycombe
Buckinghamshire HP12 4DP, United Kingdom
+44 (0) 1494 658 685 | www.orthoclinical.com

ValuMetrix[®] is a consulting service offered by Ortho Clinical Diagnostics. Individual results may vary.

ValuMetrix[®] is a registered trademark of Ortho Clinical Diagnostics.

© Ortho-Clinical Diagnostics, Inc. 2010 OCXXXX-A4