

Automation at Work: At Scarborough General Hospital, Lab Uses LH 1500 Series to Deliver Accurate Results Quickly and Consistently

Laboratory Profile

Scarborough General Hospital, Toronto, Ontario, Canada

- Laboratory open 24 hours a day, seven days a week
- Lab employs approximately 45 technologists
- Reports total of 2.5 million test results per year; roughly 750,000 hematology tests
- Laboratory equipped with LH 1511 Hematology Automation System, Power Processor, two SYNCHRON LX®20 PROs, two Access® 2 Immunoassay Systems, one ELECTRA® 1400C and one ACL® Advance Coagulation Analyzer

To understand the demands on the laboratory at Scarborough General Hospital in Toronto, Ontario, Canada, consider the emergency and clinical day unit. There, roughly 100,000 patients pour through the doors every year – and into tight quarters, says David Wu, Lab Manager.

“We have to keep everything moving in order to minimize patient backlog,” he says. “It’s our job to help the physicians make quick, accurate diagnoses.”

To provide a high level of service, the laboratory has taken several steps to streamline processes and speed turnaround time. But recently, the lab took its biggest leap of all: they acquired the LH 1511 hematology automation system and completely revamped the laboratory. The LH 1511 is just one of the many configurations of the LH 1500 Series systems which can connect LH 700 series analyzers with or without slide making and slide staining capabilities.

Now, turnaround times are shorter, accuracy is improved, and the lab is making the most of limited resources. “Our expectations were high,” says Wu, “but the LH 1511 exceeded them.”

In Pursuit of Two Goals

With almost 500 complete blood counts (CBCs) per day, and a test volume that’s increasing roughly five percent annually, the laboratory at Scarborough General Hospital is a busy place. But it’s also well organized, says Gus Bajwa, Patient Care Director, Lab Services.

“Our response times have been good,” he says. “We are able to deliver urgent results quickly and keep samples moving through the lab.”

Previously, the laboratory streamlined work with a Power Processor system that automatically sorted hematology samples into COULTER® Gen•S cassettes. It was an effective system, but in order to achieve its goals, the laboratory knew it needed something more.

“We had two main goals,” says Wu. “First, we wanted to absorb future workload increases. Second, we wanted to guarantee a turnaround time to physicians – particularly in the emergency department.”



Laboratory Goals	Laboratory Results
Deliver fast and consistent turnaround times	<ul style="list-style-type: none"> • With the LH 1511, the lab has reduced turnaround time for hematology tests by an average of 30 percent across the board. • The laboratory has also established strict protocols for turnaround time and is able to consistently meet its aggressive goals.
Reduce manual labor steps	<ul style="list-style-type: none"> • Technologists simply load tubes onto the LH 1511 inlet rack – no other manual intervention is required. Before the LH 1511, technologists had to manually transport tubes to and from the analyzers, as well as search for and retrieve tubes for re-testing.
Take on more work without hiring new staff members	<ul style="list-style-type: none"> • Because of the LH 1511's automation, the laboratory will be able to absorb a five percent year-over-year increase in testing volume without hiring new technologists.

The laboratory soon acquired the LH 1511, a system that automates the entire hematology testing process from pre-analytical sorting and loading of samples to post-analytical retrieval. The instrument required an adjustment of the lab's layout, but the time was well invested, says Wu.

Once the LH 1511 came online, workflow in the lab permanently changed – and impressive results followed.

A Smoother, Faster Process

At the pre-analytical stage, the LH 1511 made a streamlined process even faster and more efficient. Now, instead of physically transporting sample tubes from the Power Processor to the hematology analyzer, laboratorians simply load samples directly on to the LH 1511 rack and walk away. The LH 1511 automatically sorts tubes and routes them to the connected LH 750 or LH 755 analyzers.

After testing, tubes move along the tracks to a stockyard for longer-term storage – no manual intervention is required. “We used to manually remove tubes from the analyzer and store them in separate racks,” says Wu. “Now we don't have to worry about that.”

And if technologists need to re-run a sample for reflex or repeat testing, they simply enter the bar code number. A robotic arm can retrieve the tube and send it to the correct analyzer.

With this end-to-end automation, the laboratory was able to meet one of its top priorities: guaranteed turnaround time for test results.

Fast Turnaround Improves Patient Care

The laboratory's turnaround time was already quick, but Wu recognized an opportunity to improve even further.

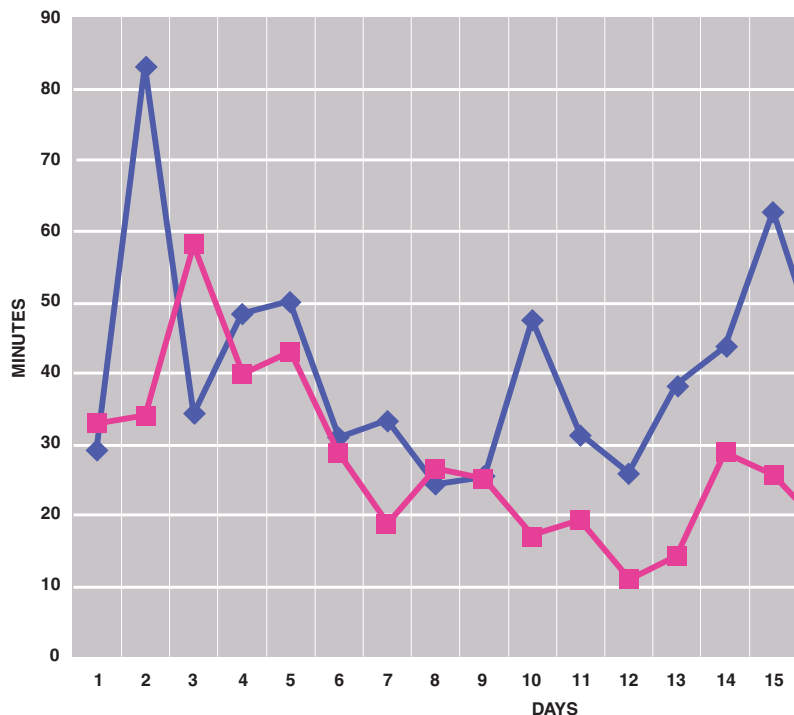
“Anywhere you have manual processes, there is an opportunity for error or delay – and since people have different ways of working, the process is not standardized,” he says. “We recognized that there was no way we could achieve the turnaround we wanted unless we introduced a higher level of automation.”

To document the lab's improvements, Wu spent a month tracking performance metrics. With the LH 1511, the laboratory achieved an average 30 percent improvement in turnaround time for hematology testing. “It exceeded our expectations,” he says.

Today, the laboratory reports 95 percent of all CBCs in less than 29 minutes – with an average turnaround time of 18 minutes. The lab has established specific windows of time for other tests as well, so physicians will know when they can expect a result.

In addition, by using the decision rules on the LH 750, the lab has decreased its slide review rate. As a result, laboratorians can now spend more time attending to the samples that truly require manual review – and this reduces the backlog and speeds turnaround time.

LH 1500 Series Turnaround Time



The laboratory is also in the process of implementing autoverification on the LH 750, which will allow hematology results to be released to physicians even faster. With autoverification, normal results are automatically sent to the hospital information system – no manual release is required. Normal results are determined by decision rules programmed in the LIS by the lab technologists.

But speed isn't the only benefit the lab has experienced. With the LH 1511, the lab delivers results that are more reliable and accurate than ever.

Results Physicians Can Count On

At Scarborough Hospital's lab, the LH 1511 incorporates one LH 750 hematology analyzer and one LH 755 (an LH 750 with a SlideMaker and SlideStainer). The LH 750 analyzers employ advanced proprietary technology for the enumeration of white blood cells, NRBCs, red blood cells and platelets as well as for the differential analysis of white blood cells.

The technology also corrects white blood cell counts for interferences caused by NRBCs, platelet clumps or giant platelets, decreasing the time spent on manual procedures. And, says Wu, the lab has more confidence in the results because there are fewer false positives.

"With a decrease in false positives, we are conducting fewer manual differentials and retests," he says.

"The LH systems are also more sensitive, which helps improve the quality of results we deliver."

The lab also benefits from the reliability of the LH 750 analyzers. Not only is the system up and running smoothly, the decrease in false positives has helped increase productivity in the lab.

Doing More With Less

All of these improvements – from turnaround time to accuracy and reliability – position the lab to deliver outstanding service, even in the face of workload increases.

"Our hospital is absorbing the oncology unit of a sister hospital," says Bajwa, "so we will see more demand in that area. In addition, the hospital's dialysis program is driving considerable growth in our testing volume."

He notes that the lab can accommodate this growth without compromising its service. And because technologists aren't tied to the analyzers, they can devote time to abnormal results and meeting the many rules and regulations outlined by the Ontario Lab Accreditation (OLA), as well as other agencies.

"There are a lot of other activities that go on in the lab, other than testing," says Wu. "Now we have the time to manage quality control issues and other important activities that require technologists' involvement."

Because it is more productive, the lab is also able to shoulder a heavier workload – and it can better manage a wide fluctuation in daily workload. "Over the long term, that equates to a significant efficiency," says Bajwa.

Turning Heads

For years, Scarborough Hospital has run a tight ship when it comes to lab testing; the LH 1511 was a natural step in the laboratory's evolution. Already, the lab's exceptional service has captured attention at high levels.

"The Medical Advisory Committee (MAC) formally recognized the lab for providing excellent service," Bajwa says. "It is uncommon for the MAC to single out an area for this recognition, so it means a lot to us."

Wu agrees, adding, "Our lab has been using Beckman Coulter equipment for a long time, so we knew we could trust the performance of the system and the customer service. This is a long-term solution for us, and it will help us deliver outstanding service for years to come."

"Our expectations were high, but the LH 1511 exceeded them."

David Wu
Lab Manager,
Scarborough General
Hospital





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