

Prominent Swedish Hospital Automates Lab to Improve Productivity and Patient Care

Laboratory Profile

Malmö University Hospital
Malmö, Sweden

- Serves Malmö University Hospital (800 beds) and Trelleborg Hospital (120 beds)
- Performs 4.2 million tests annually
- Integrated Automation System: Power Processor sample-processing system connected to four SYNCHRON LX®20 Clinical Systems, two UniCel® DxI 800 Access® Immunoassay Systems, two centrifugation units and a 3,020-tube refrigerated stockyard
- Additional Instruments: two COULTER® LH 750 hematology analyzers and an Access Immunoassay System
- Special Chemistry Lab: SYNCHRON LX20 Clinical System for drugs-of-abuse testing, two IMMAGE® Immunochemistry Systems and a Paragon CZE® 2000 Clinical Capillary Electrophoresis System

Per Simonsson, M.D., Ph.D., head of the laboratory at Malmö University Hospital in Sweden, knew his laboratory needed automation to keep up with growing testing demands and improve efficiency. But first he'd have to justify the benefits of automation to hospital administration, senior medical staff and lab technologists. "Is automation the right solution?" they asked. Today, with 80 percent of the biochemistry laboratory automated, the answer is clear. Processes are more efficient, morale is higher and – most important – patient care is better than ever.

Making a Case for Automation

To rationalize the capital investment in automation, Dr. Simonsson and his team closely analyzed the lab's practices and identified how they could be improved. Working with Beckman Coulter, the lab quantified key benefits, then projected how automation would reduce manual steps, offer faster and more consistent results with less variability, and reduce sample processing errors.

Outlining the benefits was critical, because Dr. Simonsson's proposal meant significant change for the hospital's stakeholders, from clinicians to lab staff to the patients themselves.

"I involved the staff in these planning decisions right from the start, so everyone understood the benefits and did not consider this a threat," he explains. "They saw that patients would benefit from automation. That made it easier for them to make big changes to their day-to-day routines."

Dr. Simonsson selected a Beckman Coulter integrated automation system, since its flexibility would accommodate many instruments – and it was powerful enough to handle the lab's workload of 4.2 million tests annually.

For their part, hospital administrators recognized that demand for laboratory services was escalating dramatically – and lab automation would allow the lab to take on more work.

Laboratory Goals	Laboratory Results
Improve test turnaround time	Reduced turnaround time for both stat and routine testing.
Lower costs	Reduced number of FTEs needed for analytical and pre-analytical work from 14 to eight. Eliminated non-productive labor requirements, freeing staff for more value-added work. Consolidated workstations, which reduced overall instrument and reagent costs.
Improve efficiency	Increased number of tubes analyzed by each technologist by 150 percent.

The lab's automation solution includes a Power Processor to handle front-end processes. The system sorts samples, loads and unloads samples into two connected centrifugation units, decaps tubes as needed, then moves the specimen tubes along a sophisticated track system connected to four SYNCHRON LX®20 Clinical Systems. From there, the lab can perform more than 100 different chemistry tests.





Also connected to the automation line are two UniCel® Dxl 800 Access® Immunoassay Systems, which deliver highly accurate cardiac, cancer and other specialty test results. Once testing is completed, the automation line automatically transfers sample tubes to a 3,020-tube refrigerated storage unit.

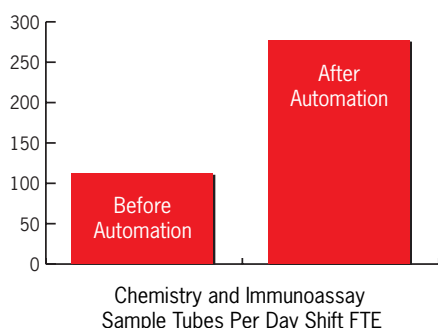
“We knew Beckman Coulter had the skills and commitment to build a long-term relationship with us.”

Dr. Per Simonsson

“The beauty of the automation system is that it operates seamlessly as one analyzer,” says Dr. Simonsson.

Operating at Peak Efficiency

With automation, the laboratory at Malmö has accommodated a 50 percent increase in its overall workload. When the project started five years ago, 14 technologists were engaged in the pre-analytics and the analysis of general and immunochemistry. Today, eight FTEs are needed to operate the same processes. Meanwhile, the number of tubes processed daily by each technologist has increased from 110 to 260.



But the most visible benefits came during the peak hours of the day. The laboratory not only receives samples from the 800-bed Malmö University Hospital, but also from numerous general practitioners – and these samples tend to come in two waves. During these periods of heavy workload, turnaround time is critical.

Now, with automation, the laboratory can manage these peaks smoothly, with samples continuously flowing

through the system. Plus, the system's open architecture allows additional modules or analyzers to be added to the automation line as lab test volume grows.

“As the demand increased, we had to add a fourth SYNCHRON LX20 to the automation line,” says Dr. Simonsson.

Of the 3,000 serum and plasma samples handled daily, the lab runs 2,500 on the automation line, which provides both stat and routine testing. The risk of errors has decreased, since automation eliminated nearly all of the manual steps.

Improving Turnaround Time and Quality

Test turnaround time (TAT) has improved across the board. The lab has halved the number of stat tests that took more than an hour to process. In addition, the lab reduced TAT variability and is able to quickly deliver routine test results to the hospital. As routine tests are processed more rapidly, the demand for stat tests is continuously decreasing.

Laboratorians also value the improved efficiency in the lab. For instance, the system handles time-consuming processes such as re-runs and reflex testing – processes that fell to technologists in the past. And the sophisticated bar-coding technology has greatly reduced common errors, including lost or mislabeled tubes.

Free from repetitious manual steps, laboratorians have taken on new and more interesting work – and this boosts productivity and morale. Among other value-added activities, lab technologists spend more time in the wards, training people to properly collect samples.

“Now we can make sure the chance for error is significantly reduced – even before the samples reach us,” says Dr. Simonsson. “The number of tubes with pre-analytical errors has been reduced from 13 to 1 percent.”

The success at Malmö has captured attention from other laboratories in Europe – and teams from various hospitals have toured the laboratory to learn more. They are looking to achieve similar results – and they are especially impressed with the strong morale in Malmö's lab.

“What strikes everyone is the way that our technicians have supported the change,” says Dr. Simonsson. “We have a great team delivering impressive results with advanced automation. Ultimately, we are saving the hospital money, but our patients are the ones who benefit most.”



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