

# HemoCell workcell approach brings efficiencies to coag

## Anne Paxton

November 2019—Total laboratory automation solutions, with their integrated, comprehensive approach, have meshed well with the goals of many central labs. But with HemoCell, the first lab automation solution designed for hemostasis testing, Instrumentation Laboratory has shifted gears toward a more specialized solution: a workcell to improve quality and efficiency through process standardization. IL's HemoCell integrates the company's ACL Top 750 LAS testing systems, HemoHub Intelligent Data Manager, and HemosIL reagents with Thermo Fisher Scientific's TCAutomation track.

The company's initial customer base for HemoCell has been in Europe, Asia (particularly China), and South America. Now IL hopes to bring the benefits of HemoCell to more U.S. labs. The first HemoCell customers in the U.S., the core laboratory at Barnes-Jewish Hospital in St. Louis and the clinical laboratory at UMC Health System in Lubbock, Tex., say they are witnessing more consistent turnaround time and more efficient use of staff with the workcell automation approach of HemoCell.

Historically, IL has had two lab testing offerings: standalone analyzers or a connection to TLA. "Now HemoCell offers a third option for our customers at high-routine to extremely specialized facilities," says Jennifer Flietstra, IL product manager for hemostasis lab automation.

Flexibility is one feature that sets HemoCell apart from competitors, Flietstra says. "HemoCell was the first to enter the market with a workcell specific to hemostasis. It has a much smaller footprint when compared to the TLA systems on the market and broad flexibility in layout. And we can adapt the number and setup of ACL Top instruments to the volume and spatial requirements of customers."

HemoCell meets the requirements of on-demand and batch specialty testing based on customer needs, she says, through custom rules in IL's data management solution, HemoHub Intelligent Data Manager. "It's an internally developed product and a key differentiator in our workcell solution," Flietstra says.

Barnes-Jewish Hospital's core laboratory has used automated hematology for about 15 years, says assistant manager of the lab Jeanne Anderson, MBA, MLS(ASCP). When the laboratory relocated to a new space four years ago with an automated system for hematology and chemistry, the system didn't accommodate the coagulation line. "Previously we had a similar setup with a centrifuge, inlet and outlet buffers, and two ACL Top instruments. The HemoCell, installed a year ago, has combined the inlet and outlet, so there is now one buffer unit." The new footprint is far smaller, she says. "We gained some space with HemoCell. It is a lot more compact—centrifuge and decapper sit side by side and almost to the back of the buffer."

The lab's volume in coagulation, about 450 tubes a day, has remained about the same, as has turnaround time, since the laboratory already had automation before installing HemoCell. The main benefit of HemoCell at Barnes-Jewish, Anderson says, has been the step-saving software, HemoHub. Now all instrument data are viewable on one screen. Reflex testing is also automatic based on rules written by the lab for moving the sample back to the instrument. "Previously, the automated line would run the samples and then store them. It would bring them off if they had an add-on, but the technologist would still have to go to the individual instrument to find the clot curve."

"If you can imagine three instruments in about 40 feet of area, if there was a test that didn't have a result, the technologist would have to go to each instrument, look up the number, see if the sample was run there, and, if not, then move to the next instrument or the next one. I called it 'hunt and peck' because they were looking for a sample on three analyzers. Now they have one central location and they can see when a sample is in the centrifuge or where it is on the line."

In coagulation and chemistry, centrifuges have to run at different speeds. "You can't spin coag samples with chemistry samples unless you adjust them at one speed and validate. Should you have a dedicated coag

centrifuge and a dedicated chemistry centrifuge? You have to figure how to handle that. And then, the more things you put on your robotic line, the longer it is. The techs have to walk all the way around to get to the other side. So having the HemoCell nice and compact means the techs aren't walking so much."

Saving technologist time has been important because specialty coagulation now is a larger volume of the core lab's testing—about 10 percent. "When we moved to this new lab, we became the core lab for the 13-hospital system." As a result, Anderson says, "we are getting a lot more specialty tests than before. Without that, we could have gone down by one tech in our staffing, but instead we are doing more specialty tests."

One of the HemoCell automation showcase installations is at VHLabs, located at Vall d'Hebron University Hospital in Barcelona. It became the largest laboratory in Spain after its merger with two primary care hospitals in 2013 and it is one of the largest labs in Europe. To accommodate the increased volume, space limitations, and new turnaround time demands, VHLabs chose to organize around a series of individual workcells with advanced automation rather than a total lab automation solution.

According to Ernesto Casis, PhD, director of clinical laboratories, in a case study of VHLabs reported by IL, "Workcells provide less saturation of automation across the lab and customization to maximize performance in each sector without compromising other diagnostic areas." The workcell model enabled the lab to retain specialty expertise in all sectors, relocate personnel to previously outsourced testing areas, decrease the overall laboratory budget by 23 percent, and recover the investment cost for instruments and installations in 1.5 years.

After the HemoCell installation, VHLabs announced efficiencies across the entire network from 2013 to 2016: a 62 percent reduction in the number of instruments, a 206 percent increase in samples analyzed per instrument, and an 89 percent reduction in manual maintenance time annually. Staff productivity also improved markedly, with a 72 percent increase in samples analyzed per laboratorian.

Over the same three-year period, VHLabs was able to handle a 47 percent increase in the number of samples tested (from 17,550 samples analyzed monthly in 2013 to 25,885 monthly by May 2016). At the same time, average TAT per sample was reduced by 40 percent for routine and stat testing.



Zachary

Lubbock's University Medical Center found HemoCell to be the solution to automating coagulation after the laboratory discovered in 2018 that its coagulation analyzers could not be connected to the laboratory's automated line, says Jayton Zachary, MT(ASCP), the laboratory's hematology section manager.

"We quickly began the process with IL to bring the HemoCell system to our lab, and now our hemostasis is set up separately with its own automated system. Our routine and even stat coag specimens are processed on an automated line, and that frees up our staff to work on our extensive special coag menu," Zachary explains.

Another benefit of HemoCell has been more consistent turnaround times for the emergency center and other sources of stat orders such as the cancer center. "These would vary depending on when our processing staff would bring the coag specimens over to hematology. Once we received the specimens in hematology, a technologist would have to spin them in a centrifuge, take them out of the centrifuge, decap the specimen, put the specimen in a rack, and front-load the rack on the analyzer. With automating these steps on the HemoCell, we have seen a more consistent TAT with all routine and stat coag specimens, and we are meeting our 30-minute TAT goal for our EC coag testing."

Meanwhile, as at Barnes-Jewish, specialty coagulation has been on the increase. “At the same time we implemented the HemoCell, we were able to add four more tests to our special coag menu of already 18 tests. These four tests were routinely sent out, and we wanted to save money by bringing them in-house. To do that, we had to have the automated capabilities of the HemoCell system so we wouldn’t be bogged down with routine coag specimens.”

With HemoCell, the laboratory has also noticed fewer phone calls from the emergency center, the cancer center, and the cardiac catheterization lab. “These departments do a lot of procedures in the morning and we used to consistently receive phone calls around 7:30 or 8:00 AM, looking for coag results. Now, with the consistent TATs brought on by an automated process, we have seen a significant decrease in these calls. Our cath lab and interventional radiology departments are able to start their procedures on time, our cancer center patients are able to start chemotherapy on time, and our emergency center is able to make quick treatment decisions with these more consistent TATs,” Zachary says.

The only validation required of HemoCell involved confirming that the system would route samples correctly. “The IL people we worked with were very hands-on with us in developing these routing rules because we had so many special tests. Even though it wouldn’t perform those special coag tests, it can still route them to a place where we can pick up all our special coag specimens and then aliquot and freeze them.”

The HemoHub software that connects the HemoCell, analyzers, and laboratory information system has streamlined coag monitoring. Previously, “we monitored our coag testing in Cerner and on the analyzers. Now we can monitor our coag testing on the HemoHub at any computer in the laboratory. With one screen on HemoHub, we are able to see how our coag specimens and analyzers are doing, making sure everything is running okay.”

Volume has not risen yet, but Zachary says the laboratory is now prepared. “Every year we see a certain percentage of growth in hemostasis testing. At some point you are going to need more equipment and additional FTEs to handle the increase in volume. Putting the HemoCell system in place for coag has allowed us to handle any increases that may happen throughout the years without adding additional FTEs.”

Greater efficiency is the key advantage the lab has gained from HemoCell, he says. “The preanalytic steps have been automated and we are spending less hands-on time with the specimens, allowing more freedom of time for staff to work on other tasks.” He expects the laboratory will be able to report that savings from HemoCell are allowing the lab to achieve its return on investment within one year of installation.

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