Customer Success Story

Vancouver Coastal Utilizes Instrument Manager to Achieve 95% Autoverification in Haematology and Reduce Turn Around Time by 34%.

Vancouver CoastalHealth

DATA INNOVATIONS®
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Vancouver General Hospital (VGH) is an 800-bed, academic health science centre that is part of the Vancouver Coastal Regional Health Authority. VGH is fully affiliated with the University of British Columbia. VGH has programs in Neurosurgery, Orthopedics, General, Organ Transplant Centre, Leukemia as well as Bone Marrow Transplant Centres and a Trauma Centre. Being affiliated with The British Columbia Institute of Technology Medical Lab Science Training Program, we accept about 18 Medical Lab Technologist students a year.

Vancouver General Facts:

- 800 Bed Hospital
- Academic Health Science Centre
- LIS: Sunquest Laboratory
- Processing 1,200 CBC's a Day
- Autoverification 95%+

Given the size and specialties of our organization, our daily volume is approximately 1,200 CBC's a day with about 140 slides and fair amount of Cerebral Spinal Fluid (CSF) and other body fluid counts. We also perform about 450 INR / Activated Partial Thromboplastin Time (APTT) daily.

The Perfect Storm

Like many other hospitals, we were experiencing the perfect storm of labour shortages, tightening budgets and growing volumes. Against this backdrop, we decided to pursue Autoverification.

We defined the objectives for the Haematology Autoverification project upfront to guide our decision making process.Our goals were to:

- Integrate our CBC analyzers, diff keyboard, and our CellaVision® into one 'IT' platform. One integrated result work area would provide a vastly improved and more efficient workflow.
- Decrease the number of reporting errors.
- Achieve a rate of Autoverification of 90%+.
- Minimize misinterpretation of results handling
- Improve Turnaround-Time (TAT) for CBC results
- Adopt a 'paperless' system approach

In addition, it was understood by everyone that the laboratory wanted control of the solution we decided on.

The Right Tool

VGH was notified that our current middleware product, Sysmex SIS system, was being discontinued and based on the defined objectives, the current LIS system (Sunquest Laboratory™) was not able to achieve our goals given the complex environment. We explored our options through the CAP® TODAY annual middleware survey and the AACC annual conference. We narrowed the selection to two options: Sysmex® WAM™ and the Data Innovations® (DI) Instrument Manager™. We ultimately decided that the DI Instrument Manager™ middleware product was a better overall solution given the project goals.

'Laboratory Has Control'

As we looked through options, it was clear that we wanted a middleware product that the laboratory had the ability to control. We wanted to be able to prioritize modifications to our rules, as needed, versus depending on our LIS/IT teams. We were also concerned about inefficiencies and delays between the lab and the LIS/IT department or vendors on requirements gathering, writing of rules and validation/testing. It was therefore important that the product was flexible and easy to use.

We spoke with several Data Innovations customers. The first customer, we spoke to, self-educated themselves on the system. They also built and deployed their own Instrument Manager™ system. Another customer site, prior to building their system, took advantage of DI training which they indicated was good. Both sites repeatedly said they could easily modify or 'tweak' their system as business conditions changed and / or wanted to continue to improve the utilization of their system. Both sites had all of their instruments running through Instrument Manager™ and overall they were very satisfied. Generally, their IT department or laboratory staff could solve all the IT issues and this gave us greater confidence that we could truly have a tool that would meet our objectives, was expandable beyond what we defined and most importantly was not reliant on outside departments and vendors.

Reduce Reporting Errors and Minimize Misinterpretation of Results Handling

Every laboratory writes Standard Operating Procedures (SOPs) and trains their staff on how to properly use them. But no matter how well you write your SOPs, how much

you train your staff and try to reinforce the importance for consistency, you will always have as many different interpretations, as slight as they may be, as you have people. Rotating or cross-training staff, different shifts, varying years of experience, differing styles made reporting errors a constant issue before Autoverification.

When we implemented Autoverification, two critical outcomes occurred. The first outcome was that a very large percentage, in our case 95% of the specimens, were automatically reviewed consistently against our rule set and the results were sent immediately to the requesting physician. The second outcome was that we wrote the rules in such a way that when a specimen was held for further review, we could include instructions on what the technologist should do with that specimen. This provided clear guidance for those technologists who were new, cross training departments or more casual in their approach. With Autoverification, the vast majority of the specimens were consistently and automatically processed by a standardized methodology and the remaining small percentage that required manual intervention were provided specific guidance on how to process that specimen. This ultimately and significantly reduced the reporting errors that were occurring previously.

Improved Turn-around Time (TAT) for Complete Blood Count (CBC)

We wanted to quantify our success on this project. To reduce variables for comparison, we took Hemoglobin Testing and benchmarked our turnaround time for a specific patient type, in this case inpatients. We used our largest facility (Vancouver General Hospital - VGH) since this is where a majority of the specimens come from. We also defined the time measurement from receipt of the specimen in the laboratory to results reported for all specimen priority levels. The outcome was significant.

"The outcome was significant."

	Pre-Middleware January 2011	Post-Middleware April 2011	
Percentile	**Minutes**	**Minutes**	**Delta**
25th	7.50	7.00	-6.7%
50th	13.00	9.50	-26.9%
75th	18.00	13.00	-27.8%
90th	26.00	19.00	-26.9%
100th	214.00	40.00	-81.3%
Average	*16.90*	*11.04*	***-34.7%***

After a few months and further refinements, we then took the same benchmarking factors from before and compared VGH inpatients for all wards against delivery for the Emergency Locations which have tighter TAT requirements.

	ED Locations September 2011	Pre-Middleware January 2011
Percentile	**Minutes**	**Delta**
25th	5.00	-33.3%
50th	6.00	-53.8%
75th	8.00	-55.6%
90th	10.00	-61.5%
100th	26.00	-87.9%
Average	*6.84*	***-59.5%***

We were clearly pleased with the outcomes and so were the physicians and nurses whom we serve. It also illustrated that by allowing the laboratory to have control of the middleware, we could continue to provide even further improvements on outcomes as needed without waiting on outside stakeholders.

59.5% TAT reduction for specimens from Emergency Locations

Paperless Workspace

Instrument Manager™ was able to retrieve images from the Sysmex Haematology instruments, provide tight integration with the CellaVision® instrument, provide the ability to view patient, specimen and test demographics, enter manual diffs, instantly show previous results, display multiple runs that are grouped together the way we define and provide for second-level review if desired. We achieved the real paperless Haematology workspace that we were looking for.

Conditions Changed and So Did We (Easily)

In July 2013, our laboratory changed from a Sysmex-based XE-automation line to one of the first Sysmex® XN9000 automation lines. Even though the interfacing was very different and this was a new generation of instrumentation and automation, our key staff were able to change our existing Autoverification rules themselves in approximately 3 weeks, leveraging the work we had already done over the last few years and making the change quickly.

The Sysmex® XN9000 automation line comes with its own middleware (WAM), however its functionality is 'turned off' and Data Innovations Instrument Manager™ is what drives our results production.

What Have We Done Since Then?

Taking the key objectives from our Haematology project, in June 2013 we implemented Autoverification in Coagulation at three sites with the ACL TOP instrumentation. Using our same knowledge of Instrument Manager™ rule writing we were able to implement Autoverification in Coagulation achieving 90% Autoverification rates. Like the customer sites we spoke with during the initial research for Haematology, we found Instrument Manager™ to be very flexible for use in all the major disciplines of the clinical laboratory.

Not stopping there, in September 2013 we connected our Luminex Autoimmune Testing instruments with microtiter plates housing Multiplex Antibody florescent beads. The florescence is read and the Luminex system generates a spreadsheet with all the readings. Traditionally we would have had to manually type all the readings into our LIS.

Leveraging the flexibility of Instrument Manager™ we were able to use a unique driver from the DI driver library that reads files generated by the Luminex instrumentation. This eliminates tedious and error-prone work. We were also able to develop any unique rules needed allowing 100% Autoverification for autoimmune testing.

In the end, the Data Innovations Instrument Manager™ was the right choice. We had a complex, highly sophisticated Haematology workarea with lofty goals that have successfully been met. In addition, we have taken Instrument Manager™ far beyond our original intent as our Haematology environment changed. We were able to leverage the system across multiple areas of our lab that we did not originally envision years ago when making the initial Haematology decision.

About Data Innovations

Founded in 1989, Data Innovations (DI) is the world's largest, most successful clinical and blood laboratory middleware company. With a focus solely on laboratory data management, DI offers the most complete middleware system in the market to manage laboratory operations, including pre-analytical, analytical, and post-analytical sample processing and non-clinical tasks such as equipment maintenance and specimen archiving.

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