



CASE STUDY

Hamilton Medical Center Implements a Game Changer — a New Automated Laboratory Testing System Powered by a State-of-the-art IT Platform



When it was time to update their instrumentation, the laboratory at Hamilton Medical Center sought to upgrade to an automated laboratory testing system along with a robust middleware platform. Following a competitive search, they determined Roche provided the best solution for them.

Facility

Hamilton Medical Center
Hamilton Health Care System
Dalton, Georgia

Annual test volume

- 800,000 billable tests annually

Challenges

- Need for updated laboratory analyzers and LIS system
- Increased volume, especially outreach
- Inefficient workflow
- Diminishing labor force
- Homegrown IT solution for QC and sample retrieval

Objectives

- Upgrade clinical chemistry and immunoassay analyzers along with a comprehensive IT solution
- Improve specimen routing
- Achieve auto-validation in QC process
- Expand testing capability

Solution

Roche **cobas**® 8000 analyzer series platform connected to pre-analytics with the **cobas** 8100 automated workflow series, along with **cobas** infinity laboratory solution, to seamlessly integrate the entire sample flow, from pre- to post-analytics, on a single platform.

Hamilton Medical Center

Hamilton Health Care System is a not for profit, fully united system of care serving the northwest Georgia region. The Dalton-based flagship of the system, Hamilton Medical Center, is a 255-bed regional acute-care hospital which offers major medical, surgical and diagnostic services, including award-winning, accredited stroke and chest pain centers.

Known for its advanced care and personalized service, Hamilton Health Care System offers innovative treatment options in state-of-the-art facilities while maintaining a compassionate, friendly and tranquil healing environment.

The laboratory at Hamilton Medical Center performs over 800,000 billable tests annually.

HAMILTON MEDICAL CENTER LABORATORY GOALS

Operational Efficiency

- Consistent results
- Faster turnaround times
- Automate QC
- Increase productivity
- Expand testing capability

System Requirements

- Auto-verification of results
- Integrated QC data access
- Automation (with bi-directional communication)
- Streamlined workflow

“Before, we were logging points by hand on the computer. We had to enter all the results. It would take an hour to and an hour and a half. And now, especially with quick running tests, we’re up and going in 15-20 minutes. Now they come through and if it’s green, we’re good to go. No more manual transmission”

– Melody Voyles, Lead Chemistry Technologist



A competitive, thorough selection process identified the optimal automation solution, top-notch middleware and an ideal partner.

Increasing volumes in laboratory testing at Hamilton Medical Center were straining their equipment and pushing the limits on the life expectancy of their aging chemistry instrumentation. Their Data Innovations® (DI) software was only being used as pass-through to Sunquest. A recently retired internal IT resource had developed a “homegrown” software to facilitate QC and sample retrieval. The time had come to upgrade to an automated laboratory solution and robust integration software. A search team was formed, including the director of laboratory services, laboratory manager, shift supervisors and leads from chemistry.

Over an 18-month selection process, the team evaluated a myriad of vendors, including Roche. They began by inviting the vendors to provide on-site presentations to showcase their automation systems, instrumentation and middleware solutions.

The team then identified their top three vendors and conducted site visits to see the competitive instrumentation and automation at work. At the end of the field visits an evaluation of pros and cons were reviewed and the decision was narrowed down to two. Next the team made presentations to the entire laboratory and had them weigh in on the decision. In the end, Roche was selected not only by the selection team, but by the vast majority of the staff as well.

“Not only was Roche selected by the search team, but also by the vast majority of the staff as well.”

— Kenneth Lowery, Director of Laboratory Services

Why Roche?

Hamilton Medical Center had a long track record with Roche. The strong partnership, excellent service and dependability of their instrumentation gave Hamilton the confidence to be one of the first laboratories in the U.S. to adopt Roche’s newest technology, the **cobas**® 8000 analyzer, **cobas** 8100 automated workflow series and **cobas** infinity into their operation

“We were very excited about moving to infinity, particularly since it is a one-stop shop for so many of the tasks we perform. I can perform my quality control checks, archive the specimens, and complete results for patients, and I no longer have to go to three different places to perform those tasks.”

– Betty Bearden, Core Laboratory Supervisor

“We were well supported (by Roche), especially in the weeks before we chose to go live, in the weeks after, and during the event itself.”

– Nikki Shoemaker, Operations Manager

The Value of the Roche

Pre-Analytics: cobas® 8100 workflow series

- Upfront integrity checks confirm sample volume and quality, remove high-touch manual steps, and identify errors within first 15 minutes for earlier intervention
- Multi-level, bidirectional tube transportation, throughput of 800 tubes/hour
- Ability to run both primary tubes and make aliquots to run in mixed mode— workflow flexibility
- Ability to use all sample tube sizes in mixed mode, single-tube transport with radio-frequency identification (RFID)

cobas 8000 Analyzer Series Platform

- Turnaround time of less than 45 minutes using one standard process
- Mid-term storage for hands-free add-on/repeat testing and archiving
- Fewer processing steps, even when starting from a partially automated laboratory
- Integrated Middleware — true auto-verification, no enter/edit needed, tracks turnaround time
- Broadest menu in one consolidated platform with small sample volume requirements

Roche Value Drivers

- Flexible training options
 - On-site at customer facility
 - Roche Indianapolis campus
 - Roche Diagnostics University
- Virtual online environment
- Proactive support
- Customizable dashboards
- Data drives real versus perceived improvement

The Value of **cobas** infinity

cobas infinity laboratory solution introduces an adaptive workflow design that determines the most effective route for patient samples. By evaluating and accounting for everything occurring in your laboratory ecosystem—made up of your analyzers, IT, quality control status, and sample volumes—you gain invaluable visibility into the everyday inner workings of your lab.

cobas infinity

As the only IT solution developed from the ground up together with system validation in mind, **cobas** infinity laboratory solution allows the laboratory to automate time-intensive tasks from the very start.

▪ **Workflow Engine**

Optimize turnaround time with an intelligent engine that automatically adjusts to the changing laboratory conditions reducing staff intervention and overall complexity

▪ **Lean Result Validation**

Eliminate the reliance on complex rules by achieving the majority of autoverification with out-of-the-box parameters

▪ **Integrated Quality**

Built-in quality modules measure trends over time and immediately detect even subtle quality issues

▪ **Browser Based**

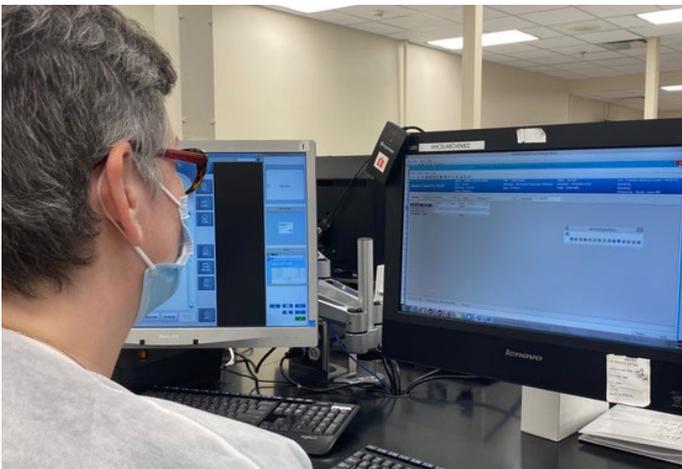
Easy browser-based implementation reduces security concerns and preserves space by eliminate the need for a dedicated workstation

The Implementation Process – a staggered approach. Introducing the new integrated software first, then the automation equipment.

PHASE 1: INFINITY

By implementing **cobas**[®] infinity first, the staff was able to focus on mastering the capabilities of the software before the new instrumentation was introduced. A soft go-live allowed the staff to experience new middleware in a controlled environment.

“We did two to three days of soft go-lives when we went live in a controlled environment for a couple hours during daytime, and then flipped back to our old processes for our off shifts while we worked through issues. By the time we were officially live in a 24-hour environment, the system had been well vetted, and lots of communication and training had been carried out.” shared Nikki Shoemaker, Operations Manager.



Setting up Autoverification

cobas infinity takes a different approach to autoverification. It removes the need to write complex rules to manage sample automation. Kenneth Lowery, Director of Laboratory Services, shared, “If we built the rules in our lab computer system, which for us was Sunquest, and we knew we were switching to Cerner, we’d have to rebuild the rules in Cerner. But by building them in the infinity middleware, we built it once and now it points to the system we’re using.”

“infinity is designed to be easy. It’s pretty basic, and what you see is what you get, and there you go.”

– Melody Voyles, Lead Chemistry Technologist

Managing Quality Control

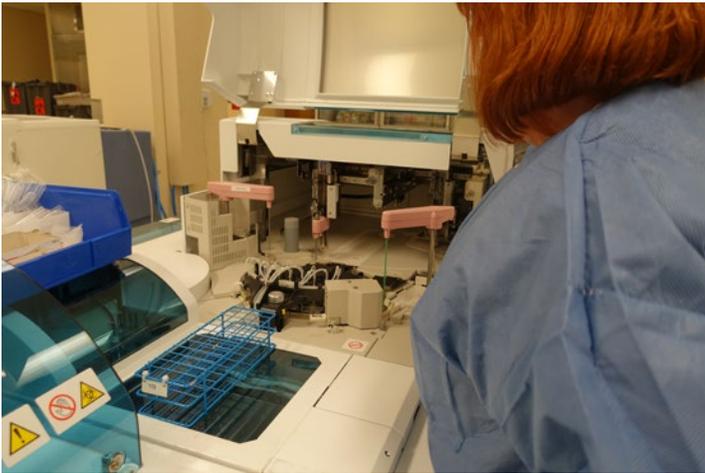
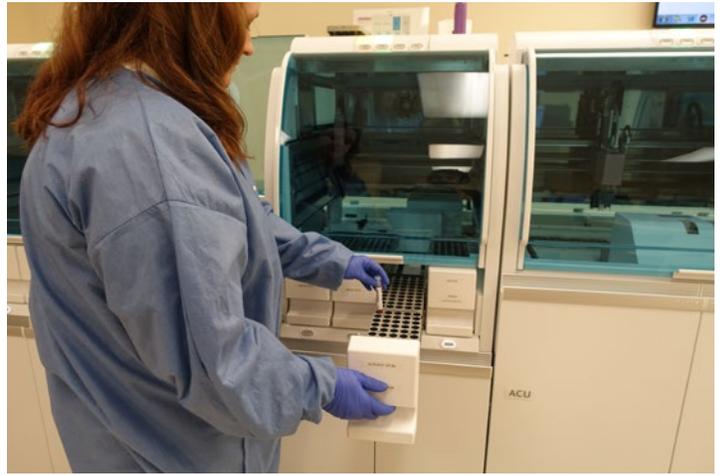
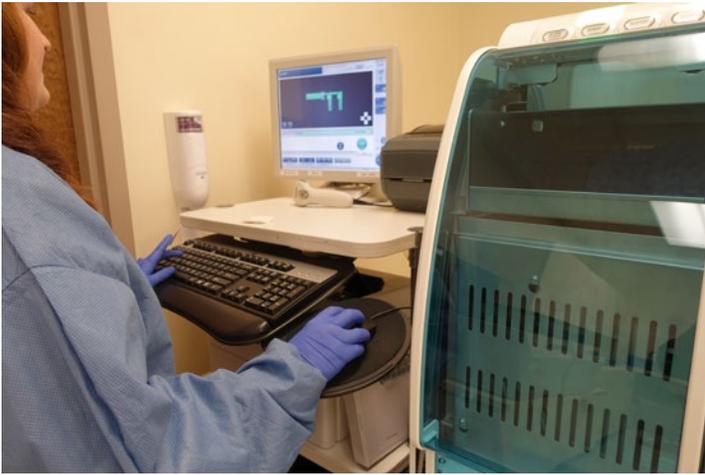
Hamilton pushed heavily on the QC module. Before infinity, they were manually entering all their QC data. With infinity all QC and data are managed on the analyzer and infinity has a built-in mechanism so the opportunity to miss something has been eliminated.

“infinity offers features that we did not have before. For example, if QC goes out, there is a lockout feature that stops the analyzer from running the analyte after so many hours. It made me feel comfortable, that should we have human error, which is normal, the system would work for us and suddenly it would just stop running the analyte, because technically the QC has been out for over 24 hours.”

– Nikki Shoemaker, Operations Manager

PHASE 2: INTRODUCING AUTOMATION

The transition from the **cobas**[®] 6000 to the **cobas** 8000 with Roche pre-analytics was practically seamless; the new pre-analytical laboratory automation system provides the ability to auto receive specimens into the system.



“There was a lot of manual handling of specimens prior to this project. We didn’t have any automation, so there was quite a bit of manual decision making, and manual processes.”

– Nikki Shoemaker, Operations Manager

“We used to have 400,000 touches a month as far as the time we touched a tube. It was because you had to take the cap off, put in on the lab analyzer, take it back off, put the cap back on. If the tube had to be put back on, you had to do it again. And each time you’re opening the specimen. The 8100 take the caps off. It’s been wonderful, we are not decapping anymore. And it’s safer.”

– Melody Voyles,
Lead Chemistry Technologist

“By the time we went live with the 8100, it was very smooth, which I think surprised Roche because we had never had automation before. We had been talking about it so much that it was an easy transition for the staff. ”

– Nikki Shoemaker, Operations Manager

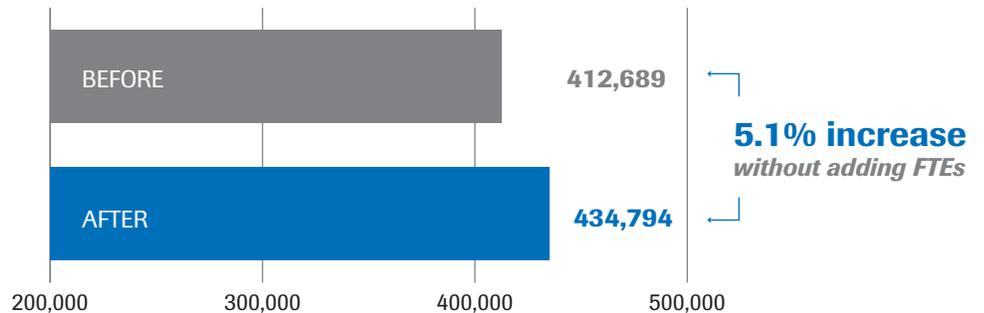
Results

Automation provides consistent turnaround times, reduces standard deviation

Turnaround Time	Median	Min	Max	Standard Deviation
BEFORE	30	5	145	13.1
AFTER	31	5	118	11.8

While the overall **turnaround time** median did not improve with automation, the consistency of the TAT showed a 10% reduction of the standard deviation from 13.1 to 11.8.

Increased Activity



Expanded Test Menu

2018-2019:

- Hepatitis Testing (Send-out to In-house)
- HIV Testing (Send-out to In-house)
- Syphilis (Kit Test to **cobas**[®])

2020:

New tests to Core/Molecular/Point-of-Care in 2020:

- TEG 6S (for Open Heart)
- Acustar HIT by IL (for Open Heart)
- ACT + on IL Signature Elites (for Open Heart)

Directly due to the pandemic:

- SARS COV-2 Antibody Roche **cobas**
- SARS COV-2 PCR (GeneXpert) and SARS COV-2/FLU/RSV PCR (GeneXpert)
- SARS COV-2 PCR (LYRA)
- SARS COV-2 PCR (T2DX)

All while Respiratory was switching from i-Stat ABG to EPOC ABG

*“2020 was the year of the 4 C’s:
COVID, Construction, Cerner go-live,
and Joint Commission.”*

– Nikki Shoemaker, Operations Manager

RESULTS SUMMARY

LABORATORY GOALS	LABORATORY RESULTS
Consistent results from 13.1 to 11.8.	10% reduction of the standard deviation
Increase productivity	5.1% increase in testing volume without adding FTEs.
Expand testing capability	<ul style="list-style-type: none">Hepatitis Testing (Send-out to In-house)HIV Testing (Send-out to In-house)Syphilis (Kit Test to cobas[®]) Plus New tests to Core/Molecular/Point-of-Care iTEG 6S (for Open Heart) <ul style="list-style-type: none">Acustar HIT by IL (for Open Heart)ACT + on IL Signature Elites (for Open Heart) Directly due to the pandemic: <ul style="list-style-type: none">SARS COV-2 Antibody Roche cobasSARS COV-2 PCR (GeneXpert) and SARS COV-2/FLU/RSV PCR (GeneXpert)SARS COV-2 PCR (LYRA)SARS COV-2 PCR (T2DX) All while Respiratory was switching from i-Stat ABG to EPOC ABG

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“On first shift, we primarily receive specimens from inpatients, operating rooms, and the Emergency Department, and there are manageable volumes coming into the lab on a consistent basis. On second shift, however, the lab receives deliveries from outpatient areas for testing, and the volume can be quite high and variable. Now, staff members just put the samples on the 8100, and the system takes care of it. The staff love it.”

– Betty Bearden, Core Laboratory Supervisor

“The laboratory was planning for the opening of a new cancer center that would offer a huge expansion of services to the community. Hamilton was also expanding services to provide open heart surgery— bringing a whole new set of tests to the laboratory. We hadn’t planned for a pandemic. Our new automated laboratory was able to handle the significant increase in volume and manage all three of these substantial events without adding staff to the core laboratory.”

– Nikki Shoemaker, Operations Manager

Roche Diagnostics Corporation
9115 Hague Road
Indianapolis, Indiana 46256
diagnostics.roche.com

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