



Automation Upgrade Helps Improve Efficiency and Grow Outpatient Business

North Memorial Health Care Moves
to Advanced Automation Solution

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Case
Study



Automation upgrade increases efficiency and helps expand reference laboratory work for North Memorial Health Care

Independent provider relies on agility to better service regional needs

With two hospitals ranked among the nation's elite for superior clinical performance, Minnesota's North Memorial Health Care (NMHC) serves the Twin Cities metropolitan area with a level I trauma center, community-based primary and urgent care, and a reference laboratory that provides vital services to area physician offices, clinics, nursing homes, and other organizations. Independent, locally based, and undaunted by national competitors, NMHC has been improving services and growing its reference testing through a kind of "judo" strategy—winning through intelligence, not brawn. For the power and agility to pursue this plan, NMHC relies on a total lab automation solution that combines Aptio® Automation and the CentralLink® Data Management System with analytical systems and best-practice workflows, all from Siemens Healthcare. Developed, implemented, and maintained in collaboration with Siemens Healthineers, NMHC's lab automation solution shows the advantages of deeply integrated next-generation technology deployed through a strategic vendor relationship. NMHC now has increased capacity, faster and more-consistent turnaround times (TAT), and staffing efficiencies. All these improvements are critical in extending NMHC's leadership as both a community care provider and a revenue-producing reference lab.

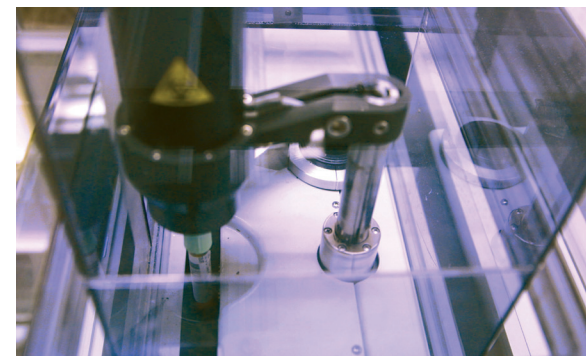
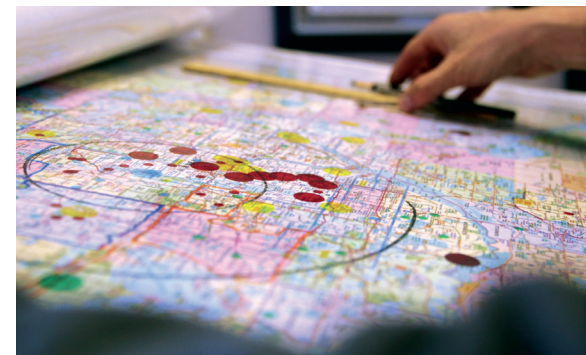
"Being a small, independent healthcare system—the smallest in Minnesota—we have to upset the big guy by using leverage," says Adam Grau, NMHC manager for business development and sales. "The Siemens solution gives us that leverage. We place a national laboratory kind of solution in a local laboratory, and we offer services that rival much bigger systems, with the ability to be nimble and customize our offerings to meet providers' needs. That's a judo strategy."

Challenges: Improve quality and efficiency, reduce cost

The NMHC reference laboratory was among the first in its area to implement automation in 2005, but as the non-Siemens Healthineers system aged and the Affordable Care Act challenged the health center to run lean, the laboratory could no longer meet goals to improve quality, efficiency, and productivity while reducing costs. Too many processes remained manual and therefore prone to error, leading to workflow inefficiency and inconsistent TATs, which in turn forced some testing to be sent off-site. NMHC also aimed to generate revenue by expanding its reference lab but was constrained by a system that could accommodate neither growing demand nor changing test menus.

Defining its upgrade requirements, NMHC wanted total automation, from pre-analytic to post-analytic processes, with the ability to prioritize STAT testing on the track. It sought a consolidated solution that would enable the lab to cross-train technicians to work

where they were most needed. A smaller-footprint solution would occupy less space and also take less time for people and tubes to traverse. And because total automation is a complex undertaking, the health center wanted a vendor that combined high-quality technology with the commitment and expertise to foster success throughout the solution lifecycle.



“From the initial workflow analysis to the final go-live, Siemens provided an experienced team of personnel to address all aspects of the project; Siemens continues to support us long after implementation.”

Nancy King, NMHC chemistry lab supervisor

Project success hinges on planning, communication

The NMHC automation upgrade required orchestration of multiple stakeholders and steps. The existing track, bolted to the laboratory floor, had to be dismantled and removed. To satisfy hospital infection protocols, the flooring had to be replaced in stages behind wooden barriers. Electrical, ventilation, plumbing, and IT lines needed to be upgraded, new chemistry analyzers validated, and staff retrained.

Through it all, the laboratory needed to keep running.

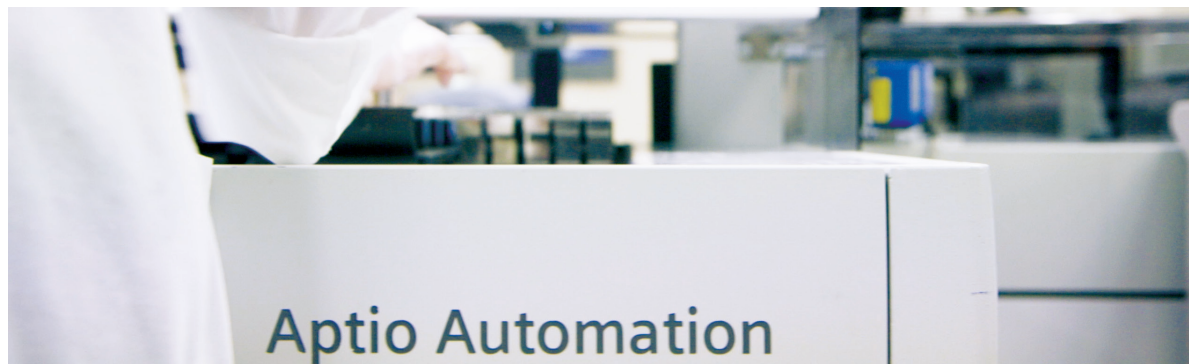
“The key to a successful outcome in such a complex undertaking is planning and communication,” says Nancy King, NMHC chemistry lab supervisor. Siemens Healthineers helped NMHC stay on target,

beginning with a workflow analysis by Siemens Healthcare consultants to optimize track design, menu balance, and load balance. Months before the first piece of equipment was delivered, the first of many pre-implementation meetings introduced the Siemens Healthineers team, set expectations, answered questions, and provided a timeline. Siemens Healthineers project-managed the installation to ensure everything was in place to support smooth implementation and trained North Memorial staff on the new system. Now, post-implementation, Siemens Healthineers supports ongoing workflow optimization with regular health checks. Online and live training, as well as always-ready technical services and support, keep the technology running smoothly and the staff up to date.



North Memorial Health Care at a glance

- Level I trauma center at North Memorial Medical Center
- North Memorial Medical Center: 543 beds
- Maple Grove Hospital: 130 beds
- Reference laboratory
 - 24 x 7 operations
 - 2.3 million tests annually
 - 88 FTE laboratory staff





"Aptio Automation with the CentraLink system offers robust capabilities so we can expand and offer more services locally than ever before—while delivering consistent, affordable, high-quality test results."

Dr. Betty Pakzad, medical director, North Memorial Health Care Laboratory

“The staff loves the solution’s smaller footprint—they get around the lab a lot easier, and they can monitor patient and quality-control results for multiple instruments from a central command station.”

Patti Smith, NMHC laboratory manager

The solution: next-generation automation

At NMHC, Aptio Automation unifies connectivity to chemistry and immunoassay systems; having analyzers on both sides of the track makes the footprint compact. Diagnostic analyzers on NMHC’s automation track include one ADVIA Centaur® XP Immunoassay System and two Dimension Vista® 1500 Intelligent Lab Systems featuring auto-calibration, auto-maintenance, automated quality control, and built-in nephelometry. To streamline workflows, the laboratory deployed Aptio Automation modules for tube input/output, centrifugation, decapping, sealing, resealing, and refrigerated storage and retrieval. With guidance from Siemens Healthineers, NMHC designed its track with a “T” at one end to accommodate more instruments for a seamless transition when the lab integrates additional test disciplines in the future.

Aptio Automation provides point-in-space aspiration directly from the primary sample on the track to speed processing, streamline workflows, and reduce the need

to remove the samples from the track for aspiration, which can affect TAT. “Excellent onboard capabilities and extended analytical measurement ranges,” King says, “have virtually eliminated the need to manually dilute samples.” A puck-based system with RFID enables individual sample routing and tracking, as well as STAT prioritization.

The ability to use primary tubes eliminates the need to pour off samples. This saves time, speeds TAT, avoids biohazard exposure, and increases throughput. Automatic receipt of samples into Aptio Automation using bar codes eliminates the need for a technician to manually handle samples and also enables tube loading in small batches. In all, the automation eliminated about 50 manual steps, reducing the lab’s exposure to error and biohazards.

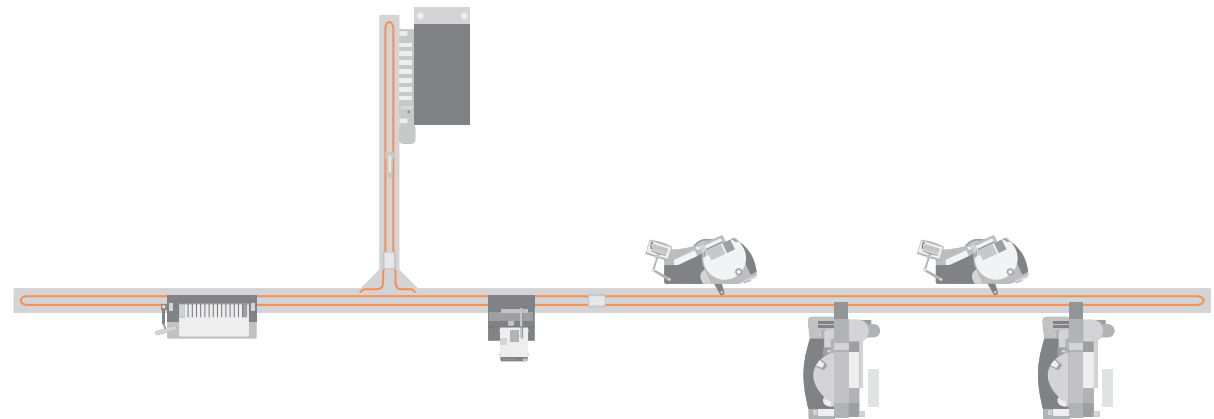
Aptio Automation with CentraLink Data Management System

Pre-and Post-Analytical Modules:

- Input/Output Module
- Centrifuge Module
- Decapper Module
- Tube Sealer Module
- Tube Desealer Module
- Refrigerated Storage & Retrieval Module (9000)

Diagnostic Systems:

- Dimension Vista 1500 Intelligent Lab System (2)
- ADVIA Centaur XP Immunoassay System (2)



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CentraLink system centralizes data management

The CentraLink Data Management System integrates data from the automation track, connected analyzers, and NMHC's lab information system (LIS) to intelligently and consistently automate workflow and result management, improving efficiency and quality.

“The staff loves the solution's smaller footprint—they get around the lab a lot easier, and they can monitor patient and quality-control results for multiple instruments from a central command station,” Laboratory Manager Smith says. “If there's anything wrong with an analyzer, a flag will pop up for the tech to take care of versus having to walk around to find the problem or the test.”

The CentraLink system also eases reflex testing, she says. In the past, a technician would have to manually pull out a tube to determine whether a test could be added. The CentraLink system eliminates this step, applying built-in, preset rules to automatically reflex certain positive results to secondary testing.

In addition, add-on tests can easily be ordered by clinicians via the hospital and laboratory information systems; Aptio Automation will automatically retrieve the tube, route it to the correct analyzer(s), and then return it to refrigerated storage. For physicians serving patients in the community, this capability often eliminates the need to schedule additional office visits for another blood draw.

“Physicians often want to add tests days or maybe a week out. We're able to meet those needs and enable physicians to better treat their patients,” Smith says. “The health center as a whole is better able to provide compassionate care to patients while serving the greater community with fast, high-quality test results.”

Results: faster TAT, fewer send-outs, and a 12% increase in outpatient testing

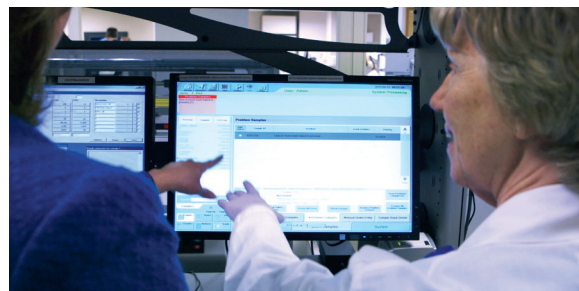
With Siemens Healthineers automation, basic metabolic panel (BMP) TAT dropped 19%, from 32 to 26 minutes, and troponin TAT is down 17%, from 35 to 29 minutes.



Overall lab test volume grew approximately 30%.

NMHC meets its 40-minute TAT window for troponins 97% of the time. Test volume grew 12% in the reference laboratory in the year after Aptio Automation was deployed, and overall lab test volume grew approximately 30%. Yet NMHC was able to accommodate staffing attrition while also redirecting technologists to deal with more-complex problems or difficult specimens. This improves TAT, sometimes by days, reduces courier and testing costs and, in a community that is very environmentally conscious, eliminates waste. Patients and physicians alike report higher satisfaction with the laboratory, which in turn supports expansion goals.

“The benefits of Aptio Automation center around reproducibility and reliability,” says Grau, who markets NMHC reference lab services to the



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Twin Cities community. “The Siemens platform allows us to grow the outreach business, because the laboratory can promise something and deliver time after time after time. And the beauty is, with the processes now streamlined and automated, we have excess capacity built in to provide services flawlessly and seamlessly.”

As medical director of the NMHC laboratory, Dr. Betty Pakzad thinks about the health center’s strategic direction in the context of healthcare reform. The Siemens Healthineers relationship, she says, empowers NMHC to reduce costs while fulfilling its vision

of uncompromising community care. “Aptio Automation with the CentralLink system offers robust capabilities so we can expand and offer more services locally than we ever have before—while delivering consistent, affordable, high-quality test results.”

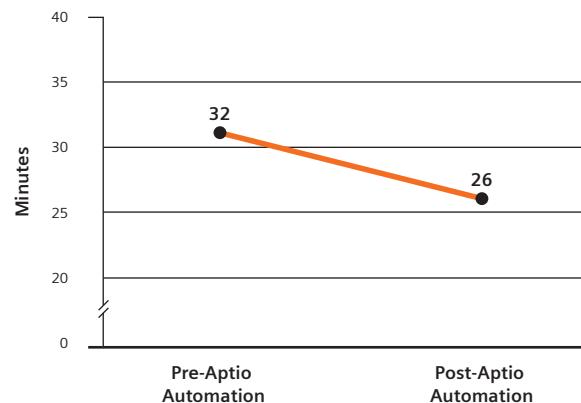
Siemens Healthineers stands out as the right choice

NMHC had used Siemens Healthineers instrumentation with success for two decades. When evaluating automation vendors in 2013, the health center

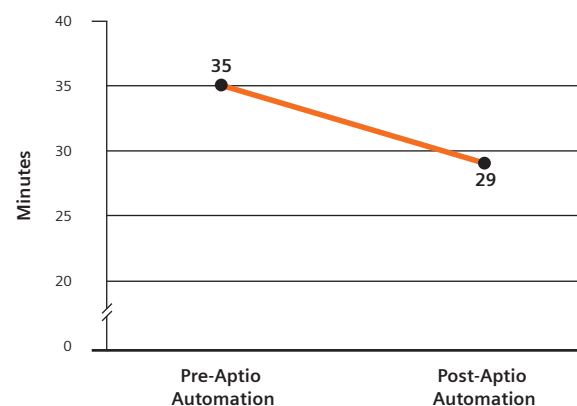
understood that Siemens Healthineers, a leader in total laboratory automation since 1998, was uniquely positioned to deliver an optimal solution—on time, with best-practice project management and dedicated customer support.

“It’s important for North Memorial to partner with a vendor that believes in our mission and our vision—and can back us fully with solutions and expertise,” says Patti Smith, NMHC laboratory manager. “We knew Siemens was the right choice.”

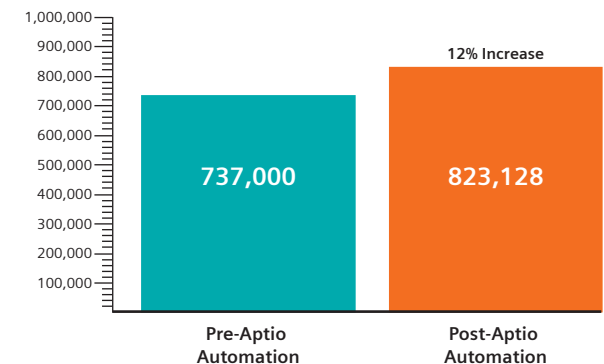
Reduced BMP TAT by 19%



Reduced Troponin TAT by 17%



Annual Volume of Outpatient Samples



At Siemens Healthineers, we pioneer breakthroughs in healthcare. For everyone. Everywhere. By constantly bringing breakthrough innovations to market, we enable healthcare professionals to deliver high-quality care, leading to the best possible outcome for patients.

Our portfolio, spanning from in-vitro and in-vivo diagnostics to image-guided therapy and innovative cancer care, is crucial for clinical decision-making and treatment pathways. With our strengths in patient twinning, precision therapy, as well as digital, data, and artificial intelligence (AI), we are well positioned to take on the biggest challenges in healthcare. We will continue to build on these strengths to help fight the world's most threatening diseases, improving the quality of outcomes, and enabling access to care.

We are a team of 66,000 highly dedicated employees across more than 70 countries passionately pushing the boundaries of what's possible in healthcare to help improve people's lives around the world.

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Product availability may vary from country to country and is subject to varying regulatory requirements. Please contact your local representative for availability.

Note: Siemens Healthineers recommends using proper protective equipment when running samples.

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