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Case Study

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Carlos Haya Hospital gains peak efficiency through Aptio Automation with CentraLink

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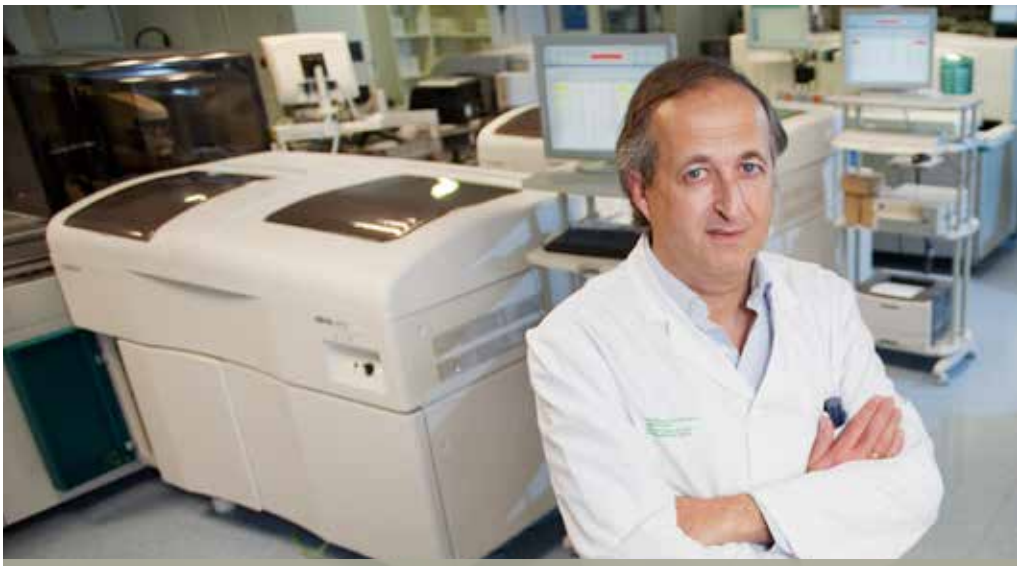
Rising along Spain's Mediterranean coast, Malaga is one of the world's oldest cities, as well as a dynamic, modern commercial and cultural center. The birthplace of Pablo Picasso, Malaga today has a population of approximately 600,000 through tourism, construction, and technology services. Its attractions include the beaches of Costa del Sol and a bustling port that has been active since at least 600 BC.

The healthcare needs of locals and tourists are met by the 1100-bed Universitario Carlos Haya Hospital. Part of the government-run Andalusian Public Health System, Carlos Haya is a regional institution with four hospitals: the General Hospital, Civil Hospital, CARE Joseph Estrada, and Hospital Materno Infantil. The latter, in addition to providing healthcare for mothers and infants, houses the core laboratory that serves as the reference lab for all four hospitals. The Carlos Haya General Hospital also operates a biochemistry lab and its own emergency lab.

The mission of the Carlos Haya labs is to support the healthcare needs of Malaga visitors and residents. The local population has grown approximately 2% annually over the past eight years, primarily due to tourists who chose to relocate to Malaga permanently. This population surge has challenged hospital labs operating under resource constraints during stressful economic times to meet increasing demands. Hospitals in Spain are classified into three tiers, depending on the complexity of the diseases they can treat. Materno Infantil holds the highest rating, Tier 3, which means it handles the most difficult cases. Its core lab provides testing across a wide spectrum of disease states, performing seven million tests a year for approximately 660,000 patients.

"We have practically every laboratory specialty, from the most basic routine tests to those that are much more specialized, including testing for a metabolic unit, assisted reproduction, emergency medicine, and immunosuppressants," says Dr. Vidal Perez, Carlos Haya lab director. "Besides providing hospital care, we are the referral center for many medical specialties in Andalusia."



Dr. Manuel Rodriguez
Biochemistry and Automation Lab Manager
Materno Infantil

"Aptio Automation strengthened our pre-analytical and analytical phases, giving us more capacity, more versatility, and overall, more possibility. CentraLink, meanwhile, makes it much easier to manage quality. It facilitates sample follow-up and management of repetitions as well as diffusions.

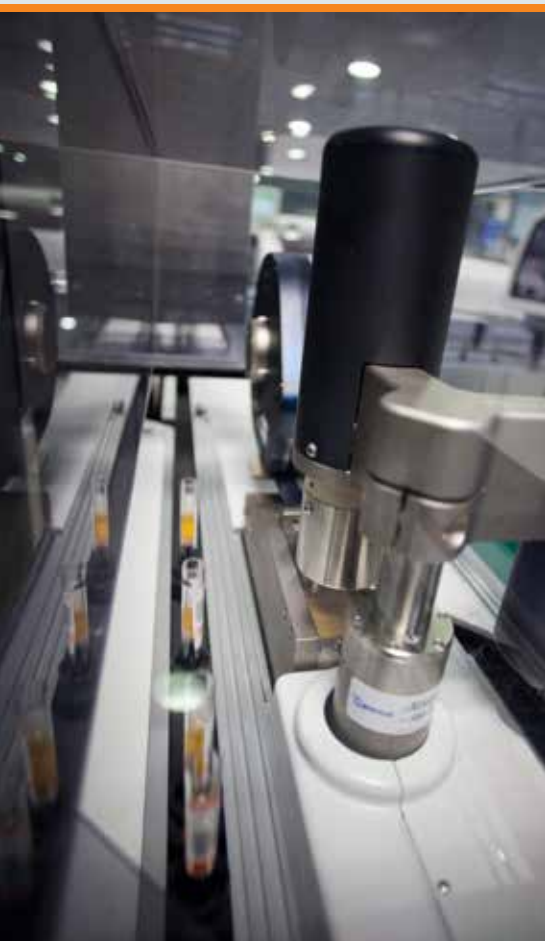
With CentraLink control over instrument alarms, we gain comprehensive information on the situation of a particular sample. What's more, the solution is simple, problem-free, and easy to use."

Siemens is a long-term partner

The Materno Infantil lab has enjoyed a long and successful history of partnership with Siemens Healthcare Diagnostics. The lab has leveraged the broad Siemens diagnostic solutions portfolio to meet evolving customer needs. In 1998, the lab deployed the Siemens Dimension® RxL Integrated Chemistry System for disease-state profiling on a single analyzer. Over the years, the Siemens flexible portfolio adapted to changes in lab needs. Testing volume was increasing approximately 3% a year in the Materno Infantil core lab at precisely the same time financial constraints urged managers to optimize use of staff time. The hospital accommodated growing demand and limited budgets while staying true to its mission to provide the highest-quality care. It did so through Siemens automation. In 2005, the lab deployed the Siemens StreamLAB® Automation Solution to streamline workflows with an easy-to-use, single-operator interface. StreamLAB links multiple analytical systems with automated sample handling and management. In 2007, the lab added the Dimension Vista® 1500 Intelligent Lab System, a new class of analyzer featuring operational simplicity and LOCI® advanced chemiluminescence technology. That year, the Materno Infantil core lab also deployed the ADVIA Centaur® XP Immunoassay System to handle both routine and specialized testing with dedicated STAT capabilities. It also implemented the IMMULITE® 2000 XPi Immunoassay System for specialty and allergy testing.

Carlos Haya at a glance:

- Founded in 1956, serves the district of Malaga, Spain
- Hospital has 1100 beds
- Classified as a Level 3 hospital in Spain due to complexity and difficulty of the diseases treated
- Maternal hospital has 6000 births/year
- Hospital does 175 heart transplants/year
- Laboratory handles 660,000 patients and over 7 million tests/year
- Diverse testing from basic routine to highly specialized disciplines such as assisted reproduction and immunosuppressant



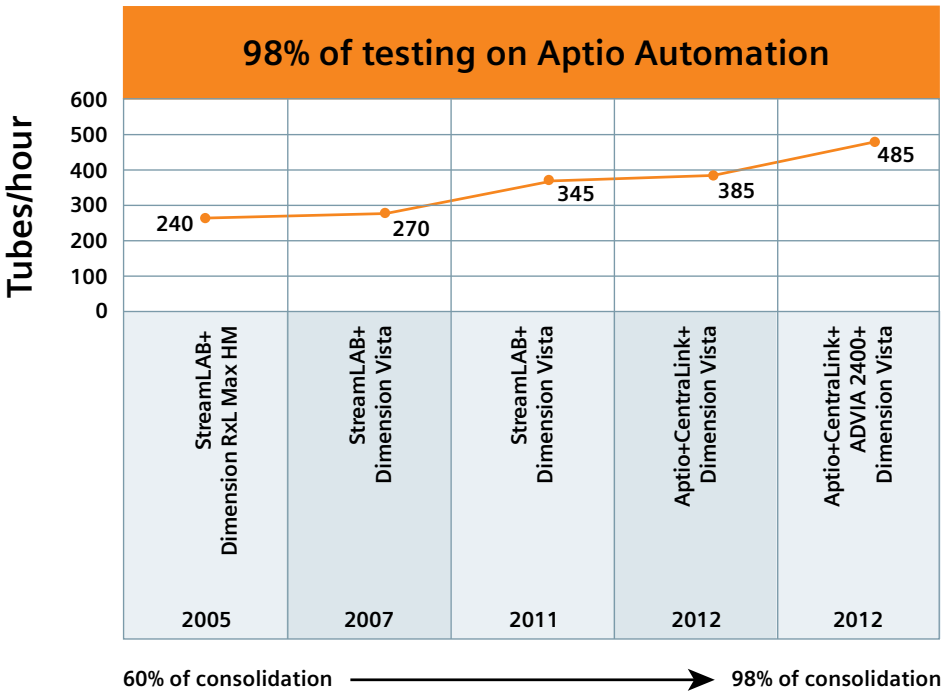
Aptio Automation delivers a unified solution

The next great leap forward occurred in 2012, with the implementation of Siemens Aptio™ Automation integrated with the Siemens CentraLink™ Data Management System. The solution delivers extensive automation, customization, and traceability.

Aptio Automation unifies connectivity to Siemens systems along a circular track, facilitating a multidisciplinary approach to testing. The ability to run cross-disciplinary tests along the Aptio track enables faster, more-comprehensive results reporting with less human intervention. The Materno Infantil core lab deployed IMMULITE, Centaur XP, and Dimension Vista systems on Aptio Automation and recently added two Siemens ADVIA® 2400 Clinical Chemistry Systems for testing drugs of abuse, therapeutic drugs, and new assays. Because of Aptio Automation's modular flexibility, the lab can adjust the mix of tests to meet fluctuating demand. Aptio Automation also provides point-in-space aspiration, which streamlines workflows by reducing the need to aliquot (or divide) samples. Its bar-code tracking system allows individual sample routing and tracking, along with STAT prioritization.

Aptio Automation and the CentraLink system together provide a highly integrated solution that eliminates the need for third-party informatics software. The CentraLink system connects ADVIA systems, lab instruments, and PC workstations via a single link. It provides the platform for centrally managing lab data and instruments, enabling efficient sample flow, auto-verification, quick access to samples, and proactive quality control (QC).

"Aptio Automation strengthened our pre-analytical and analytical phases, giving us more capacity, more versatility, and overall, more possibility," says Dr. Manuel Rodriguez, who is responsible for biochemistry and automation labs. "CentraLink, meanwhile, makes it much easier to manage quality. It facilitates sample follow-up and management of repetitions. With CentraLink control over instrument alarms, we gain comprehensive information on the situation of a particular sample. What's more, the solution is simple, problem-free, and easy to use."



"The bottom line for us at Carlos Haya's Materno Infantil core lab is that Aptio Automation with CentraLink works well and is easy to use. We've gained comprehensive analytics via powerful, centralized information technology, while having the flexibility to adapt cost-efficiently to changing patient needs."

Dr. Vidal Perez
Lab Director
Carlos Haya Hospital

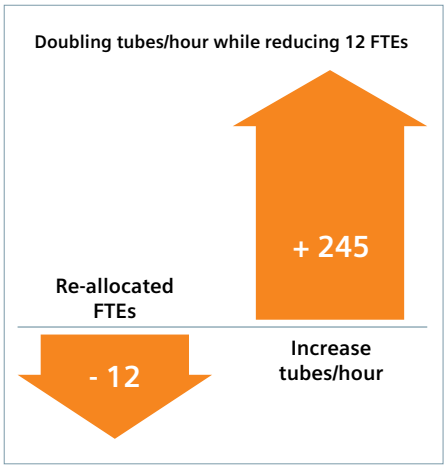
Lab improves performance metrics

Performance metrics bear out these assessments. Ninety-eight percent of total volume has been consolidated onto the Aptio Automation Solution in the Materno Infantil core lab, which processes 1500 tubes a day to run 4.6 million tests per year with 125 methods onboard. From 2005 to 2012, automation testing volume, measured in number of tubes, has doubled to 485 tubes per hour. Over the same time period, the lab was able to boost staff productivity and reduce full-time equivalents by 12, now allocated to other operational units; therefore, significantly lowering the Lab costs.

Operational and workflow improvements of the integrated Aptio Automation and CentraLink solution include robotic capabilities. The lab centrifuges approximately 1100 tubes a day on the automation line. Loading and unloading speed have doubled, from 400 tubes an hour to approximately 800; all tubes are loaded in 1.5 hours. Because of internal Aptio Automation capacity, the lab no longer has queues of waiting racks; the internal automation capacity has increased tenfold, and it is far easier to manage peak times. Aptio Automation processes serum and urine at the same time, 488 tubes an hour at the peak hour of 13:00.

The lab also benefits from refrigerated storage and sample archiving connected to Aptio Automation. Manual work has been drastically reduced. In the past, the lab had to place all the racks in a refrigerated storage unit 50 meters away. Technicians spent some 45 minutes looking for tubes for procedures such as re-runs. Now all that is automated, eliminating the need for a second technician. Now the entire automation is managed by a single technician.

"The main thing has been the efficiency of the process. That is what has been decongested," Dr. Perez says. "The solution works extremely well with the Vista analyzers. That's what speeded response times. Another great improvement is in the serum bank workflow. Before, we had to go looking for all the serum samples; everyone went at the same time, and there was a crowd of people seeking samples. Now it has been greatly simplified."

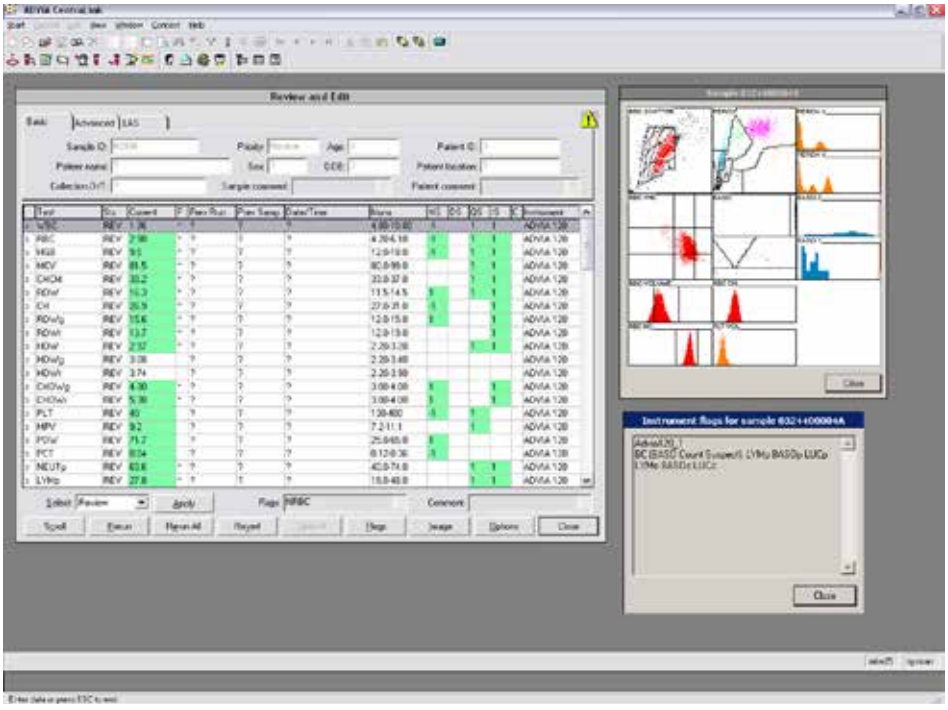


Long-term blueprint for lab automation

For other labs investigating automation solutions, Dr. Perez advises first understanding the current environment and loads, and taking a four- or five-year growth perspective. "Make the decision that best suits your current needs and human resources available, keeping in mind how those needs are evolving," he says. "The bottom line for us at Carlos Haya's Materno Infantil core lab is that Aptio Automation with CentraLink works well and is easy to use. We've gained comprehensive clinical analytics via powerful, centralized information technology, while having the flexibility to adapt cost-efficiently to changing patient needs."

Dr. Vidal Perez
Lab Director
Carlos Haya Hospital

"To labs that like us wish to automate, I'd advise considering how testing needs will evolve over the next five years—and choosing a solution that meets current needs with flexibility to expand."



CentraLink Data Management System provides extensive customization and traceability.

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