



ASTA'S NEONATAL BLOOD SCREENING PROGRAM DEPLOYS STARLIMS PUBLIC HEALTH SOLUTION

In 1990 the Costa Rican Ministry of Health launched a neonatal mass screening program for the early detection and treatment of inherited metabolic diseases and related disorders, including phenylketonuria, maple syrup disease and galactosemia, and hormonal deficiencies including congenital hypothyroidism and congenital adrenal hyperplasia. The screening program is being carried out in collaboration with the Quality Assurance Program of the U.S. Centers for Disease Control (CDC).

The Costa Rican Association for the Screening and Prevention of Childhood Disabilities (ASTA) is responsible for implementation of the country's neonatal blood screening program for inherited metabolic diseases. About 1500 tests are processed every week at the National Neonatal Screening Laboratory, using heel stick blood samples taken from every baby, within three days of birth. The samples are transported to the laboratory from collection centers around the country.

In 2012 STARLIMS was deployed at the National Neonatal Screening Laboratory, to manage every aspect of the screening workflow. The system has streamlined analytical processing, data collection and reporting, and reduced the need for manual data entry. A full audit trail for each patient and sample is guaranteed. STARLIMS has allowed the laboratory to reduce the turnaround time from sample receipt to results reporting, from an average of 72 hours to just 28 hours.

“The tests that we carry out can be literally life saving, and so we needed a system that would highlight positive results and alert us when repeat testing might be needed. Critically, STARLIMS interfaces with other clinical departments so that the test results are automatically transmitted to the people who need to see them, without delay.”

Sergio Obando, Laboratory Coordinator

“STARLIMS has improved speed and security in the laboratory. All resulting data are now centralized in the same database. Processes that previously had to be carried out manually are now automated. System alerts highlight manual input errors, and flag up abnormal or inconclusive results so that repeat samples can be requested and tests can be scheduled, which is also automated.”

Alexander Campos, I.T. Coordinator

ASTA Challenge	STARLIMS Solution	ASTA Results
Identify a solution that would meet the needs of a specialist neonatal screening laboratory.	STARLIMS has been configured for the specialized activities and compliance-related procedural and reporting requirements of a dedicated screening laboratory.	<p>STARLIMS has enabled the laboratory to:</p> <ul style="list-style-type: none"> • accurately detect and identify samples • achieve better sample classification • digitize images • centralize demographic data alongside the results of each sample • integrate the LIMS with other key laboratory systems and equipment • improve quantity and quality of the information obtained from the database • ensure greater security in sample handling and traceability • implement an effective registry of communications with patients and collection centers, and between departments
Replace the ASTA legacy system with a robust LIMS to meet requirements for reporting and querying.	STARLIMS offers defined, configurable modules to establish querying and reporting rules and actions.	STARLIMS offers defined, configurable modules to establish querying and reporting rules and actions.
The need for a system that delivers automatic alerts in the case of abnormal results.	STARLIMS delivers real-time alerts that can be configured according to defined parameters.	Alerts are seen by relevant personnel and departments. This ensures security of knowledge that second samples will be automatically requested, and repeat testing scheduled.
The requirement for automated scheduling of second sample testing and tracking to avoid confusion between first and second samples.	STARLIMS provides automated scheduling and sample tracking to speed workflow and testing.	Barcoding and automated scheduling have removed all sample classification errors and reduced manual data input and errors. Second samples are now detected and processed automatically, reducing waste and repetition, and saving time.
A need for more effective communication between departments.	Seamless and transparent communication through the STARLIMS Communications and Notes / Attached Documents registry module	Staff in different departments can see when communications have been made to the patient's family, and follow communication between departments to confirm that all data, reports and alerts are seen by relevant people. Transparent communication also reduces duplication and conflicting messages.
The ability to automate the transfer of results from analytical equipment directly to the LIMS.	STARLIMS can be configured to interface with multiple types of instrumentation, to capture results from analytical equipment directly from a file and import each result to the LIMS using the sample number.	There is no need to key every result manually, which saves time and also reduces the potential for error.

“STARLIMS integrates with additional software and databases, which means that we can now much more easily manipulate and interpret data. This was something that wasn’t possible with our previous system. STARLIMS gives us access to coordinated information that is vital to decision making.”

Alexander Campos, I.T. Coordinator

“STARLIMS has dramatically improved the processing of first and, where necessary, second samples. Sample tracking errors have now been 100% removed, sample throughput increased and processing time decreased. Before STARLIMS the turnaround time for processing each sample was more than three days. Now we can have results in a day and a half.”

Sergio Obando, Laboratory Coordinator

“STARLIMS has significantly improved communications. This means that messages, alerts and reports don’t have to be repeated unnecessarily. Conversely, staff can verify that a vital communication, for example, to request a second sample, hasn’t been omitted or forgotten. The STARLIMS communications log module and associated notes / documents can be viewed by all laboratory personnel with the respective permissions, so that all the alerts, messages and registers associated with each sample can be displayed.”

Alexander Campos, I.T. Coordinator

STARLIMS BENEFITS

- STARLIMS connects directly to multiple analytical, clinical and administrative departments, allowing seamless communication and consultation:
- Registration and coding
- Digitization
- Hormones and hemoglobins
- Amino acids and acylcarnitines
- Biochemistry
- Genetics and metabolism service
- Quality management
- Information technology
- First and second samples for each patient are detected, scheduled and processed automatically. All activity associated with a patient’s identifier is logged and the data centralized. There is complete traceability for each sample, and no chance of confusion between first and second samples.

- Barcoding has reduced physical manipulation of the sample, and guarantees complete sample traceability.
- Results are imported through an interface with the laboratory equipment, so manual entry of results is unnecessary. This saves considerable time and removes the chance of manual error.
- 95% increase in laboratory efficiency: key processes have been optimized and automated, including results importation, registration and classification of samples, identification of second samples, reports and querying, sample traceability.
- Sample digitization time has been dramatically reduced, from 30 days, to one day. Using the previous system, for which there was a single license, digitization was carried out by just one individual. Using STARLIMS all personnel qualified for data entry can digitize images within the centralized system, and there is no need to access separate software to view the digitized files.
- Final reports are generated automatically, and instantly, rather than taking several hours.
- Sample tracking errors have been reduced by 100%, because processes that were previously carried out manually, such as sample drilling, have been eliminated.
- Processing time from sample receipt to results reporting has been dramatically reduced from 72 hours, to an average of just 28 hours.

“With STARLIMS there is no ambiguity when it comes to vital communication between departments and between the laboratory and a patient’s family. STARLIMS provides a communications log module so that all communications, notes, registers and other documents for each patient and sample can be accessed by all laboratory personnel with the required permissions. This has removed unnecessary repeat communications. Conversely, staff can verify that important communications have been made. For example, relevant staff are informed when a patient’s family has been contacted by another department to request a second sample.”

Sergio Obando, Laboratory Coordinator

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