



Abbott

DIAGNOSTICS

Sunpasitthiprasong Hospital

โรงพยาบาลสุรพลสิทธิประสงค์

CASE STUDY: SUNPASITTHIPRASONG HOSPITAL

ACHIEVING LABORATORY TRANSFORMATION – IMPROVING LAB PRODUCTIVITY WITH FOCUS ON KEY PERFORMANCE INDICATORS

OVERVIEW

- Sunpasitthiprasong Hospital (SPS) is one of the leading tertiary care hospitals outside of the Bangkok region in Thailand, established in 1936
- 1,188 bed hospital offering super-specialty care including cardiology, oncology, neonatology and organ transplant services, along with extensive emergency services
- Acts as a referral center for all community hospitals in the Ubon Ratchathani Province in Thailand
- Performs 2.6 million tests per year with increasing volumes and a wide test menu

HOSPITAL GOALS

- Lower the mortality risk of major disease groups and reduce related complications
- Improve hospital performance continually
- Align cost and revenue to national standards
- Improve score for employee well-being to enhance happiness and sense of commitment

SUCCESS FACTORS

- Implementation of a total laboratory solution across departments to drive improvements in key performance indicators (KPIs)
- Standardization of processes and increased automation to reduce manual workload on staff and improve efficiency
- Focus on improving employee satisfaction through increased productivity and reduced training needs

IMPLEMENTATION EXCELLENCE: SEAMLESS AND PREDICTABLE GO-LIVE WITH CONSISTENT SERVICE LEVELS

The laboratory at SPS Hospitals undertook a major transformation, transitioning from its legacy solution to Abbott's total solution, including analyzers, automation track and an informatics solution. During the installation process, the lab's main objective was to ensure that patient needs are served in a reliable way and no service disruptions happen.

Their transition was carefully managed by a **skilled project implementation team**, comprised of members of the SPS laboratory and resourceful advocates from Abbott. These experts were equipped with diverse expertise in solution design, IT consulting and project leadership. The team worked synergistically to create a detailed plan for

the project execution during two pre-implementation workshops. The comprehensive plan for SPS laboratory included a workflow analysis, track design, a pre-installation requirement checklist, a detailed installation process map and post-installation support.

Quantitative measures were taken before and after implementation by the team, including test volumes and turnaround time (TAT). TAT remained consistent during implementation of Abbott's total solution - decreasing from 65 to 59 minutes, even though testing volumes increased marginally. This **consistency** was critical for the laboratory and helped to **build confidence and early buy-in from the clinicians**.



IMPROVED FROM

65 TO 59 minutes

CONSISTENT TAT DURING IMPLEMENTATION



KEY FACTORS FOR SUCCESSFUL IMPLEMENTATION INCLUDE:

- **Installation and integration expertise** from Abbott's representatives to ensure success by tracking against the project plan with measures of installation, operational and performance qualification
- **A comprehensive implementation plan** to ensure minimal disruption to operations during installation, achieved by clearly defining recovery procedures in risk mitigation strategies
- **Prompt issue reporting and resolution with on-site support** to provide a coordinated training program and instill user confidence in operating Abbott's total solution



“One of the biggest challenges and a source of anxiety for a lab is the need to maintain consistent service levels during a large implementation. We had a dedicated project team who worked extensively with the Abbott experts to ensure that the implementation was smooth and patient services were not affected.”

— Ms. Jiraphorn Nilsakul, Lab Director

“Since the laboratory at SPS Hospital upgraded to Abbott's total solution, the laboratory staff have been delighted with improved turnaround times that we can offer to clinicians. Any issues during installation were dealt with promptly by the Abbott team, thanks to the accessible support on-site.”

— Ms. Kannika Chaluaysri, CC/IA Lab Manager



CONSISTENT
SERVICE LEVELS



DEDICATED PROJECT
MANAGEMENT TEAM



INSTALLATION
AND INTEGRATION
EXPERTISE

FUTURE-READY SOLUTION TO MEET CHANGING LAB NEEDS

Demand for clinical laboratory services in Thailand is expected to grow at a CAGR of 6.2%¹. To manage this increasing load at nationally benchmarked costs, SPS laboratory focused on adopting a future-ready solution which allows it to provide for its current needs while remaining ready to adapt and scale up for the future.

The adoption of Abbott's total solution delivers the required uniformity and flexibility to the laboratory.

Open automation

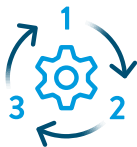
Having an open Total Laboratory Automation (TLA) system was a critical factor for the laboratory as they considered various solutions. The ability of Abbott's GLP systems track to connect both Abbott and non-Abbott analyzers supported the laboratories' goal of processing as many samples as possible on the track. This allowed the lab flexibility to connect all its analyzers to the track and help optimize sample management and improve productivity for both its current and future needs.

Analyzers connected to the Total Lab Automation (TLA) System:

The legacy solution at SPS laboratory had 8 analyzers, 3 of which were standalone systems that could not be connected to automation and required manual processing. Abbott's total solution enabled the lab to reduce its operational complexity by consolidating its workload into 5 analyzers that are all connected to the GLP system, bringing the total percentage of assays performed on the automation system from 58% to 97%.

ASSAYS ON THE TOTAL LAB AUTOMATION SYSTEM:

	LEGACY SOLUTION	ABBOTT'S SOLUTION
ASSAY TYPE	Assays on TLA	Assays on TLA
Clinical chemistry	80 %	95 %
Immunoassay	29 %	100 %
Total	58 %	97 %



IMPROVED
AUTOMATION



ASSAYS ON TRACK IMPROVED FROM
58% TO **97%**



“With the new GLP system all our analyzers are now connected to the automation system. This has helped significantly reduce manual work and improved productivity of our employees. The intelligent car technology allows us to worry less about downtime and focus on providing great services to the clinicians”

— Ms. Wanpen Promcha, CC/IA Lab Supervisor

Auto-verification with informatics

Physicians often rely on the results of a hematology test to help hasten decision-making, render a more accurate diagnosis, and closely monitor ongoing treatment. Hematology laboratories, therefore, are under constant pressure to deliver results within defined timelines. SPS laboratory is committed to providing quality results quickly. To ensure quality, the laboratory previously performed blood film reviews on all CBC samples received in the lab, a post-analytical procedure which is costly in both time, labor and consumables. However, this policy of 100% reviews sacrificed CBC TATs unnecessarily.

SPS laboratory addressed this issue by revising their hematology workflow and implementing a middleware solution from Abbott - AlinIQ Analyzer Management System (AlinIQ AMS) - with the Alinity h*-series. A set of

customized, pre-configured rules for reflex testing and the auto-verification of 'normal' results were implemented in AlinIQ AMS according to guidelines from the International Consensus for Hematology Review of the International Society for Laboratory Hematology (ISLH).

Their goal was to reduce TAT, to a **target of 95%** of all samples completed and available for physicians in less than 90 minutes. The hematology laboratory was able to improve the percentage of samples meeting the defined TAT target from 57% to 100%, by implementing auto-verification with AlinIQ AMS. This also helped to reduce the higher cost associated with preparing, staining and reviewing 100% of blood smears, and subsequently minimized the manual steps for samples that no longer required microscopic reviews. **Automatic validation of test results successfully reduced the average total TAT of CBCs from 100 minutes to 55 minutes.**

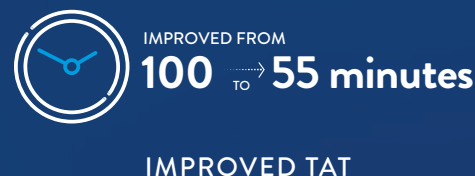
IMPACT ON HEMATOLOGY TURNAROUND TIME - 45% IMPROVEMENT



REASONS FOR IMPROVED TAT WITH AUTO-VERIFICATION:

- **Reduced analysis time** – Time in the analysis phase was reduced by 40 % from 15 minutes to 9 minutes. Auto-verification allows reduced manual intervention and quicker reporting of results to the laboratory information system (LIS).
- **Reduced slide review rate** – Blood film production was reduced from 100 % to 63 % using auto-verification, with the average time taken for completing blood film reviews falling from 63 minutes to 24 minutes.

This data clearly demonstrates the greater operational efficiencies and improved productivity of the laboratory resulting from the introduction of AlinIQ AMS middleware solution. Further customization of rules may also help reduce film preparation rates and TAT in the future.



Environmental impact

Healthcare institutions and laboratories are highly energy-intensive institutions and are becoming increasingly aware of the social responsibility to reduce their environmental impact. Laboratories are increasingly adopting good environmental practices and focusing on greener solutions to reduce energy consumption and waste production.

Less power is required to operate the Alinity ci-series than the legacy solution, making it an energy-efficient diagnostic system. This is due to reduced power consumption as well as less heat generated by Abbott's total solution reducing the cost of cooling the laboratory. Additionally, during downtime, the green mode can be engaged to further reduce power consumption.

As a result of implementing Abbott's total solution, energy and water consumption were reduced by 62% and 15% respectively at SPS laboratory.



REDUCTION
IN UTILITY
CONSUMPTION



REDUCTION
IN WATER
CONSUMPTION

UNIFORM SYSTEMS IMPROVED LAB PRODUCTIVITY AND REDUCED COMPLEXITY

Generalist staffing model reduced training needs

The uniform user interface for the Alinity family allowed for easier and faster staff training across disciplines and departments. The average time taken to train a staff member on Abbott's total solution has reduced from 2 weeks to 1 week. The SPS laboratory has been able to improve staff satisfaction and equip new hires with the required skills quickly.



UNIFORM INTERFACE
FOR OPERATIONAL
CONSISTENCY



NEW HIRE TRAINING
TIME REDUCED FROM
2 WEEKS TO 1 WEEK

Improved staff satisfaction for stronger workforce productivity

Abbott's total solution was designed with staff in mind, as maintaining and improving upon the satisfaction of employees – the backbone of the laboratory's operations – are key to a strong and productive workforce.

A staff satisfaction survey at SPS laboratory demonstrated improved satisfaction by 64%, when comparing “hands-on instrument time” perception with Abbott's total solution as compared to the legacy solution. Abbott's solution is designed to reduce hands-on time across parameters like maintenance, reagent load-up, troubleshooting and sample load-up time. This helped reduce manual tasks and improve staff satisfaction at the lab.

Abbott's uniform systems made “operating the system” easier, more intuitive and comfortable to use. This was demonstrated by a 37% improvement in satisfaction scores compared to legacy solution.

Further, perception of reliability improved significantly among the lab staff – 22% improvement over legacy solutions. This improved satisfaction was a result of reliable systems and proactive analytics providing alerts. For SPS laboratory, reliability of systems is very important to be able to provide on-time lab results to patients.



HANDS -ON INSTRUMENT
TIME SATISFACTION SCORE



EASE OF OPERATING THE
SYSTEMS SATISFACTION SCORE



RELIABILITY OF SOLUTIONS
SATISFACTION SCORE

Space optimization

The SPS laboratory has limited floorspace and it was a priority to optimize the space available. The occupied area was reduced by 57 % from 54.4 m² to 23.4 m², with the implementation of Alinity ci and GLP systems track as compared to the legacy solution. This was achieved through both the compact footprint of Abbott's total solution and the consolidation of three standalone analyzers.



57 % REDUCTION IN
OCCUPIED LABORATORY
SPACE



RESOURCE OPTIMIZATION AND IMPROVING OPERATIONAL EXCELLENCE

The laboratory has optimized existing workflows through implementation of Abbott's total solution, leading to significant process improvements.



Reduction in manual processes

The legacy solution required sample processing both on and off the automation track. Additionally, manual intervention was required to operate multiple workflows on different analyzers. For example, the legacy solution involved manual processing for tumor and infectious disease markers, HbA1C, and therapeutic drug monitoring (TDM) sample tubes. This led to longer processing times, higher staffing demands, and increased risk of handling errors.

The number of steps required – from Sample Accession to the Input Module on the track – was reduced from 23 in the legacy solution to six in Abbott's total solution, thanks to optimized workflows and the consolidation of assays on analyzers. Additionally, the time required to process a small batch from Sample Accession to Input Module dropped from 25 minutes to 5.25 minutes.



SAMPLE ACCESSION
TO INPUT MODULE
MANUAL STEPS



SAMPLE ACCESSION TO
INPUT MODULE TIME

Rerun rates

Abbott's Flex Rate technology increases the linearity of enzymatic assays, leading to an improvement in first-pass efficiency. This helps to minimize dilutions and reruns that might be necessary when results are outside the measurement range. Abbott's total solution allowed for a rate of reruns that was four times lower than the legacy solution. For every 10,000 tests, only 30 dilutions were required with Abbott's solution as compared to 126 for the legacy solution. These combined benefits contribute to cost savings and improved operational efficiency.

	LEGACY SOLUTION	ABBOTT'S SOLUTION
NO. DILUTIONS PER 10,000 TESTS WITH ENZYMATIC ASSAYS	126	30



Improved Calibration and Quality Control Processes

Calibration and quality control (QC) are performed to ensure that diagnostic systems produce high quality test results. Abbott's total solution offers several operational efficiencies to reduce QC step requirements and the number of necessary calibration runs, leading to savings in staff time.

The calibration process was simplified from 15 and nine steps with the legacy clinical chemistry and immunoassay system to five with Abbott's systems. The calibration time was further reduced from 36 to 11 minutes for clinical chemistry assays, and from 35 to 7 minutes for immunoassays.

Further, higher percentage of Abbott's assays perform at six-sigma compared to the legacy solution, and the resultant reduced requirement for QC runs can lead to cost savings and increased confidence.



CALIBRATION MANUAL
STEPS REDUCTION

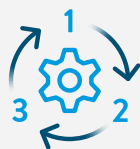
CALIBRATION TIME
REDUCTION FOR ASSAYS

CONCLUSION

In partnership with Abbott, the laboratory at SPS Hospitals has undergone a transformation to align more strongly with its operational and clinical goals. Implementation of Abbott's total solution has been a critical and fundamental step for the laboratory to achieve optimized operational excellence, through:



UNIFORMITY AND
STANDARDIZATION



IMPROVED
AUTOMATION



REDUCED
COMPLEXITY



OPEN
AUTOMATION



REDUCED
TURNAROUND TIME



IMPROVED STAFF
SATISFACTION



REDUCED
TRAINING
REQUIREMENTS



IMPROVED
PROCESSES
AND RELIABLE
WORKFLOWS

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CORELABORATORY.ABBOTT

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