## Abbott

# FMENCEAU MEDIC FRILLATED WITH JOHNS HOPKIE

# CASE STUDY: CLEMENCEAU MEDICAL CENTER

ACHIEVING PHYSICIAN SATISFACTION AND LAB PROFITABILITY THROUGH OPERATIONAL EXCELLENCE

#### OVERVIEW

- Established in 2006 in Beirut, Lebanon, to serve both local and international patients
- Performs approximately 500,000 tests per year with volumes increasing 17 % per year
- 158 patient beds; 11 operating theaters
- Joint Commission International accredited; affiliated with Johns Hopkins Medicine International
- Ranked 69 in the World's Best Smart Hospitals 2021, published by Newsweek<sup>1</sup>

#### **HOSPITAL GOALS**

- Introduce new medical specialties and optimize existing services
- Embrace and grow a resilient organizational culture
- Achieve excellence in personcentered care and experience
- Enhance patient safety outcomes and highest level of quality of care
- Improve and sustain hospital operations through digital health and technology

### SUCCESS FACTORS

- Adoption of a total lab solution that enhances operational efficiencies to drive improvements in laboratory key performance indicators (KPIs)
- Standardization of workflows and processes through automation and informatics
- Improvement of lab profitability and reduction of hidden costs

<sup>1</sup>The world's best smart hospitals, Newsweek. Retrieved Dec 29,2021, from https://www.newsweek.com/worlds-best-smart-hospitals-2021

# IMPLEMENTATION EXCELLENCE: SMOOTH PREDICTABLE GO-LIVE WITH CONSISTENT SERVICE LEVELS

Clemenceau Medical Center (CMC) identified laboratory transformation as a critical driver to achieve its hospital-wide goals and thrive in the dynamic healthcare environment. The hospital partnered with Abbott to achieve these objectives and demonstrate success. Beginning with an on-time implementation effort, the total Abbott solution helped the lab in its journey to enhance operational efficiencies, standardize workflows and improve lab profitability, as described below.

The lab at Clemenceau Medical Center undertook a major transformation, transitioning from its legacy system to a total Abbott solution, including analyzers, informatics and an automation track. During the installation process, the lab's main objective was to achieve **an on-time go-live** and avoid any service disruptions.

Abbott's resourceful advocates, along with the lab project team, managed this transition by creating a **personalized implementation plan.** This was designed through a series of workshops, involving installation and integration experts. Plan development included a workflow analysis, track design, pre-installation requirement checklist, detailed installation process map and post-installation support.

Implementation required a **highly skilled team** with diverse abilities working synergistically to achieve the desired outcomes. Key factors for successful implementation included:

**Proactive communication** on progress and alignment on subsequent steps achieved through regular meetings between the lab leadership and the project team

**Detailed project plan** with risk mitigation strategies and quick recovery procedures in the event of any unplanned disruption

**On-site support and prompt issue resolution,** along with a structured training program helped the lab to achieve confidence with the new solution

**Installation expertise** of Abbott's team of experts ensured success thorough completion of installation qualification (IQ), operational qualification (OQ) and performance qualification (PQ) as per the project plan



## IMPROVED PATIENT FLOW WITH REDUCED TURN AROUND TIME

As a premier medical tourism hospital, Clemenceau Medical Center is focused on initiatives that expedite and improve patient care. The laboratory plays a critical role in this process and has taken measures to improve result turnaround times (TAT) through the implementation of the Abbott total solution. This helped the lab increase the percentage of tests completed within 60 minutes by 36 %, even though the volume of tests increased by 33 % during the same period. Additionally, improvements in TAT were realized across the lab with the average weighted TAT improving by 17 % over legacy systems.



## IMPACT ON TAT AFTER IMPLEMENTATION OF TOTAL LABORATORY SOLUTION





#### PERCENTAGE OF TESTS COMPLETED WITHIN 60 MINUTES: LEGACY SYSTEMS VS 2021

# **17%** TAT IMPROVEMENT OVER LEGACY SYSTEMS



#### WEIGHTED AVERAGE TAT (MIN)

Several variables contributed to improved TAT performance, including:

CONTINUOUS LOADING	Ability to load reagents without disrupting sample processing
FLEXRATE	Extended linearity of enzymatic assays that increases first pass efficiency
AUTO-VERIFICATION	Automatic verification of results, as per laboratory defined protocols
ASSAY PERFORMANCE	Higher performing assays resulted in less troubleshooting, reruns and incremental quality controls



"Lab automation has decreased patients' length of stay in the ER by reducing lab TAT to 60 minutes, which facilitated patient flow, prevented ER congestion and had a positive impact on patient satisfaction. This has made the Emergency Department at CMC one of best in Lebanon."

– Eliane El Khoury Eid, MD ER Clinical Director, 2019



## ADAPTABLE SOLUTION SUPPORTED RELIABLE TAT DURING COVID-19 PANDEMIC

By adopting a future proof solution, Clemenceau Medical Center was able to proactively address the challenges presented by the COVID-19 pandemic. The laboratory experienced adversity during the pandemic, managing a high volume of testing with a significant reduction in workforce. Despite these obstacles, the average weighted TAT **improved by 18% during the COVID-19** peak compared to the previous year. Even though the percentage of tests completed within 60 minutes fell during the COVID-19 surge – due to manpower and scheduling challenges – **the 40% improvement over legacy systems** allowed the lab to provide reliable service to clinicians during the peak of the pandemic.



### **IMPACT OF COVID-19**

#### IMPACT OF COVID-19 PEAK ON TAT





COMPARING PRE-PANDEMIC TAT TO PANDEMIC PEAK TAT (MIN)

#### RELIABLE TAT DURING COVID PEAK

60% TESTS IN <60 MIN



PERCENTAGE OF TESTS WITH TAT < 60 MIN



WEIGHTED AVERAGE TAT IMPROVED BY 18% EVEN WITH REDUCED MANPOWER





### EFFICIENT LABORATORY SOLUTION TO RETAIN LAB STAFF

As a result of high attrition rates and **six-month lead times** to fill vacancies and onboard new staff, the hospital has placed an increased focus on **retaining staff through development and employee satisfaction programs.** To support this effort, the laboratory aimed to simplify workflows, automate monotonous tasks, and improve ease of use.

#### **ALINIQ AMS**

Auto-verification allows test results to be verified via a set of rules configured per laboratory defined parameters. If test results fall within these parameters, they are automatically released for reporting with no additional human intervention. This optimizes the use of a lab technologist's time by **reducing review time and effort.** Furthermore, auto-verification of results improves standardization, minimizes the potential for manual errors, and studies have also shown it can reduce staff screen fatigue.<sup>2</sup>

The lab at Clemenceau Medical Center has AlinIQ AMS interfaced with seven analyzers – from both Abbott and other providers. Auto-verification rules **configured** in AlinIQ AMS include reference range checks, delta checks, critical value flags, specimen acceptability and QC hold rules. The implementation of these middleware rules in AlinIQ AMS has **increased** the auto-verification rates to 60.5%.



<sup>2</sup> Krasowski MD et al. J Pathol Inform. 2014;5(1):13. doi:10.4103/2153-3539.129450



"The Abbott solution automated several steps, enabling more time to communicate with physicians and handle phlebotomy services for our inpatients."

– Ahmad Zein, Sr. Lab Technologist/Phlebotomist

## **READY TO USE ASSAYS**

Alinity ci-series assays are all liquid ready to use and require no additional preparation. The legacy assays on prior non-Abbott systems required a substantial number of manual steps and sample preparation times, as described below for HbA1c and TIBC.



BEFORE

As a result of adopting the Alinity ci-series, **all manual preparation steps of HbA1c and TIBC samples were eliminated.** Simplifying sample handling processes **saved the lab staff 742 hours annually.** 

### SYSTEM MAINTENANCE

Implementing Alinity ci-series systems **automated maintenance activities** that previously required manual intervention. As a result, hands-on maintenance was reduced by 87 % and total maintenance time decreased by 18 %.



AFTER

**PROCESS STEPS** 

### AUTOMATION

Transitioning from a standalone configuration to total lab automation enabled the laboratory to reduce sample processing manual procedures from 13 to 3 steps. Furthermore, automation has contributed to **reductions** in pre-analytical errors and misidentification of samples ultimately ensuring that samples are managed more efficiently.

#### Post Automation Workflow - Reduction in Manual Steps



Because of the time savings, laboratory staff were able to engage more directly with patients by taking on incremental phlebotomy responsibilities and providing greater support to physicians through results interpretation.

## IMPROVED LAB PROFITABILITY

The Clemenceau Medical Center is committed to continuous initiatives that improve its financial stability which include investment in new services and technology. In partnership with Abbott, the laboratory was able to improve space utilization and reduce expenses related to quality control, sample tube consumption and staffing. Furthermore, improved operational efficiency enabled the laboratory to reallocate resources and tap into new sources of revenue.

#### SPACE OPTIMIZATION

Availability of space in Beirut is limited and consequently the laboratory must leverage existing space efficiently. The compact footprint of the Alinity ci-series enabled the laboratory to grow its capacity by 33%, while increasing tests per square meter by 200%.

### QUALITY CONTROL CONSUMPTION

The laboratory reduced their quality control consumption by 40% by implementing the Alinity ci-series. This was made possible by a 50% reduction in the minimum aspiration volume and through better performing assays, which reduced the frequency of routine quality control and troubleshooting.



**33%** IMPROVEMENT IN TESTING CAPACITY WITHIN EXISTING SPACE







Control of the number Reduction in the number of assays requiring daily calibrations

#### SAMPLE MANAGEMENT

The implementation of AlinIQ AMS's sample management capabilities reduced laboratory sample tube consumption by 18%. This was the result of fewer pre-analytical errors, reduced sample misidentification and efficient sample management, particularly for send outs requiring aliquots.

The implementation of ACCELERATOR *a*3600 automation, including online storage, led to increased sample stability time – from 2 hours to 7 days. This allows easy sample retrieval and processing for add-on or missed tests and reduces incremental blood draws, particularly important in pediatric wards. The **increased sample storage time** contributed to a reduction in the number of collection tubes per patient, from 3 to 1.

### STAFFING

Laboratory staff achieved significant time savings resulting from reduced maintenance times and elimination of manual steps. In addition, implementing the harmonized Abbott solution produced greater staffing efficiencies. By introducing the Alinity ci-series and Alinity h-series<sup>3</sup> – designed with a common user interface, loading and operating processes – it was easier to train staff across various disciplines. As a result, the number of staff trained across immunoassay, clinical chemistry and hematology increased from 20% to 70%. Workflow improvements and employee cross training enabled the lab to **staff more efficiently**, resulting in a 70% reduction in overtime expenses and a 33% reduction in staff need during the primary shift.

<sup>3</sup> Alinity h-series is not commercially available in all countries, including the United States.





"Having a uniform user interface on the Alinity systems, including chemistry, immunoassay and hematology, has reduced the training burden across disciplines. Since the systems are so simple to use, we have found that we can invest equal time into training either experienced lab personnel or recent graduates."

- Rouba Trad, Lab Manager, Clemenceau Medical Center



### ENABLING NEW REVENUE SOURCES FOR THE HOSPITAL SYSTEM

The COVID-19 pandemic tested the resilience and flexibility of healthcare systems across the globe. Beyond affecting critical care, hospitals and labs experienced challenges in routine testing volume, health check-ups and elective procedures. To manage the variability, CMC focused on optimizing and reallocating resources to enable new or additional services. These initiatives, while focused on providing the best patient care, helped the hospital increase revenues and reduce costs.

#### NEW SOURCES OF INCOME CAPTURED BY THE LAB INCLUDED:

- Expanding home services for COVID and routine testing of COVID-19 patients and their relatives 24/7 at an additional service charge. This provided a convenient and safe environment for patients and contributed to incremental revenues.
- **Opening a new outdoor respiratory sampling unit 6 days/week.** This helped the lab manage the increased COVID load while future-proofing requirements for respiratory disease testing including COVID or influenza outbreaks.

#### THIS WAS ENABLED BY FLEXIBILITY IN RESOURCE ALLOCATION

• The lab reallocated 4 staff members to provide the expanded home testing services. The increased efficiency of the lab ensured this reallocation had no impact on operations despite staff scheduling challenges due to COVID-19 and a freeze on hiring new resources.

Uniformity of the Abbott solution allowed the lab to cross train staff across disciplines and employ a generalist model. This model proved invaluable as staff had to be shifted to other testing disciplines throughout the pandemic. Despite the challenges presented by COVID-19, the lab was able to improve service levels and margin by in-sourcing 9 additional tests in 2021.

# CONCLUSION

In partnership with Abbott, CMC has transformed its lab to better meet its operational and clinical goals. By implementing this total lab solution, it has made a significant leap in its journey towards optimized operational excellence through









IMPROVED WORKFLOW EFFICIENCIES UNIFORMITY AND STANDARDIZATION

AUTOMATION





IMPROVED TURN AROUND TIME



IMPROVED PATIENT FLOW IN THE EMERGENCY ROOM



HEIGHTENED PHYSICIAN SATISFACTION





IMPROVED LAB PROFITABILITY



REDUCED COSTS

#### CORELABORATORY.ABBOTT

All ARCHITECT analyzers are Class I laser products. Alinity h is not available in all countries, including the United States.

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