



Achieving Operations Excellence in a Hospital's Clinical Laboratory

Executives from a hospital within a large Washington-Baltimore health network were concerned with inefficiencies in the hospital's clinical laboratories. The future holds an expansion of this hospital's facilities, which will result in a potential relocation of the lab. Furthermore, the healthcare system will soon be introducing new Lab Information Management System and new testing equipment across its medical centers. Performance levels falling below expectations, coupled with the upcoming changes, ultimately drove the need to review the lab's current operations to implement efficient processes and practices before moving to the new facility.

The project was structured in two segments: diagnostic and implementation. During the diagnostic, the Tefen team identified 34 improvement levers totaling \$1.3M to \$1.6M in savings. Improvements included alignment of staffing to demand (by time of day and day of week), elimination of non-value-added activities, consolidation of outpatient phlebotomy stations, introduction of zoning coverage for inpatient phlebotomists, and reduction of hemolyses rate for samples taken in the emergency department. During the 14-week implementation, upon identifying additional opportunities, the total potential savings was adjusted up to \$1.9M, while an annual (recurring) amount of \$681,000 had already been realized by the end of the implementation period. The balance of savings was incorporated into the following year's budgetary cycle.

Challenge

The hospital and corporate administration acknowledged the benefit of using Lean methodologies in its facilities to increase efficiencies, improve service levels, and enhance quality of care. The lab experienced challenges in several areas, including:

- Allocation of resources did not match demand for services across the various lab sections, including chemistry, hematology, lab data center, and phlebotomy service
- Multiple phlebotomy locations offered blood-draw services, whereas not all locations were fully utilized
- Ample non-value-added work was embedded in the current processes, diverting the lab technician's focus from testing activities
- Layout and handling of samples was sub-optimal, resulting in unnecessary motion and inefficient coverage of equipment
- Hemolyses rate of blood samples sent from the emergency department was at 14%
- Few tests were automatically resulted by the analyzing equipment, leading to unnecessary manual intervention
- Tests were outsourced to third-party labs, while similar service was offered within the health system's labs at cost price.

Ample of opportunities existed to allow improved operations for this hospital's lab.

How Tefen Helped

Tefen's team performed its diagnostic in eight weeks, followed by 14 weeks of implementation. Data was collected and analyzed, processes were mapped and observed, staff and customers were interviewed, and brainstorming sessions were held. As a result, the following improvements were applied:

- Staffing levels were aligned with the demand for lab services across lab sections (chemistry, hematology, lab data center, blood bank, etc.) by time of day and day of week. Schedules were developed and implemented to support satisfactory service levels, resulting in significant reduction of work-hours required to support current volumes.
 - New zoning coverage for inpatient phlebotomy services was introduced, incorporating volume of draws, space covered by each phlebotomist, and complexity of draws. Phlebotomists are now based
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in the zone they cover, resulting in reduced walking distances and increased throughput per phlebotomist.

- Outpatient phlebotomy stations were consolidated, following a thorough analysis of demand patterns by location, utilization by time of day and day of week, and adjacency to the various locations.
- Non-value-added work was eliminated from lab processes. For example, chemistry technicians routinely aliquoted blood samples prior to placing them in the analyzer, assuming that quantity in the vial was not sufficient (QNS). A study proved that over 98% of the samples had sufficient blood volume and that the aliquoting processes was non-value-added. The process has hence been discontinued. In another example, the hematology equipment was capable of auto-verifying results based on pre-defined ranges, although manual verification by supervisor prevailed. The Auto-V was introduced for applicable tests, resulting in a reduction of overall turnaround time using fewer resources. Lastly, use of barcode readers was enforced, eliminating manual logging of samples into the information system.
- New practices for blood drawing in the emergency department were introduced, including usage of appropriate gauges, employment of phlebotomists during peak hours, and continuing education to ED nurses and staff provided by the ED-dedicated phlebotomist.
- A new process was enforced to utilize in-network labs in lieu of third-party lab outsourcing. The Tefen team identified eight test types provided by sister facilities and implemented an SLA (Service Level Agreement) across the network labs, allowing testing at cost prices instead of higher outsourcing costs.
- A new layout for core lab processes was mapped, improving the flow of samples through the lab's three units: the lab data center, the hematology lab, and the chemistry lab. This new layout also allowed fewer resources to man existing equipment to support increased testing volume.
- New processes for reconciliation of blood product were realized, leveraging contract terms that allowed for rebates upon paying invoices within 15 days from receipt of the product.
- 5-S (workplace organization) was applied throughout sections of the lab, introducing an organized work environment.

Throughout the process, the team, alongside hospital lab personnel, communicated the change to lab members, anticipated potential challenges, and helped resolved the expected issues.

Performance Excellence Delivered

Tefen ultimately identified over \$1.9 million in recurring savings, \$681,000 of which were already realized during the implementation period. The balance savings was incorporated into the following year's budgetary cycle. Beyond the financial benefits, the project led to improvements in patient and staff satisfaction and in quality enhancements such as reduced turnaround time for lab tests and a reduction in rejected blood samples (hemolysis) from 14% to 2%.

About Tefen

Tefen is an international management consulting firm, committed to improving overall operational effectiveness for Fortune 500 companies around the world. The firm's main areas of focus include operations excellence, manufacturing, quality, customer service, research and development and supply chain management. With its "hands-on" approach philosophy, the company has achieved tremendous success in delivering quantifiable and value-driven results for its clients in a variety of industries, including healthcare, life sciences, general manufacturing, high-tech and financial services. All of Tefen's support programs are ISO 9001 certified. Tefen currently employs over 300 professionals worldwide.

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