

REDUCE TURNAROUND TIME (TAT) AND INCREASE OPERATOR EFFICIENCY WITH A CONNECTED, PRE-ANALYTICAL AUTOMATION SYSTEM

Laboratory Profile:

- › 1,050-bed hospital located in Gaziantep, Turkey
- › Provides 24/7 service (inpatient, outpatient and emergency services)
- › Employs two professors, two associate professors, one specialist M.D. and eight operators
- › Capacity to process 4.5 million biochemistry and hormone tests annually
- › Routine biochemistry laboratory includes a Power Processor, online, pre-analytical system with a Beckman Coulter centrifuge, decapper, recapper, aliquoting unit, 10,880-tube refrigerated stockyard running in connection with one AU5822 Clinical Biochemistry System and two UniCel® DxI 800 Access® Immunoassay Systems
- › The emergency unit laboratory features a stand-alone AU680 Clinical Biochemistry System



Gaziantep University Faculty of Medicine Hospital

Gaziantep University Faculty of Medicine Hospital's Central Laboratory (GAUTF-ML) Routine Biochemistry Unit has been working with an automation system since 2010 to make its workflow more efficient.

We talked with Dr. Mehmet Tarakçıoğlu, the laboratory manager, about the benefits of laboratory automation. He expressed the improvement of his laboratory as follows:

“Automation systems are important for our university, which is the leading institution in the region that closely follows technological developments, primarily to produce standardized, high-quality results on the same day. Automation systems increase the efficiency of the laboratory and offer timely, high-quality service to patients while minimizing user errors. Many manual processing steps—and wasted labor associated with these steps—can be minimized by utilizing automated systems.”

Next step for the laboratory: a connected post-analytical unit

A post-analytical unit enables the archiving of tubes from connected disciplines and departments that are processed by the laboratory. The laboratory processes an average of 1,500 to 2,000 tubes daily.

Proper design of an online automation system

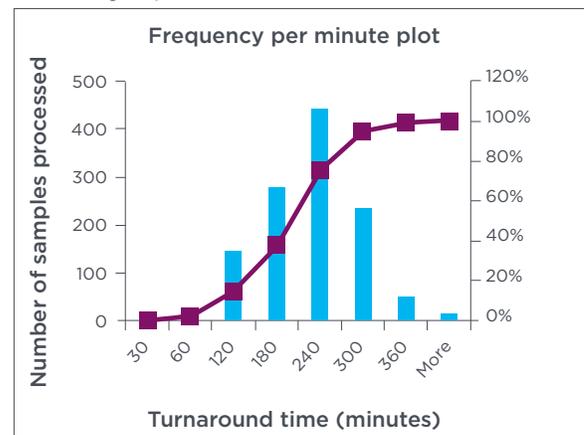
- 1 Tubes coming from reception are loaded onto the track using multiple-position racks and carried by the track one by one.
- 2 The throughput of both the modules connected to the track and the analyzers should be defined to avoid any bottleneck on the track itself. For example, the throughput of the post-analytical units (tubes per hour) should be greater than the throughput of all instruments connected to the track.
- 3 Hormone and clinical chemistry analyzers can be independently positioned on the track and operated by separate computers.
- 4 Instruments connected to the track can be front loaded in order to provide flexibility and a backup solution.
- 5 Tests are performed directly from primary tubes, and aliquots are created to perform offline testing only.
- 6 Online aliquoting of primary tubes performed by instruments connected to the track helps reduce the TAT of shared primary samples (parallel processing).
- 7 Tubes are recapped and archived; aliquoted tubes for other units are recapped with plastic caps.
- 8 Add-on tests or repeat tests can be managed automatically by the track tubes leave the post-analytical module of the lines are decapped and then routed automatically to analyzers and then are stored to the post-analytical module.

Beneficial outcomes of a proper automation design

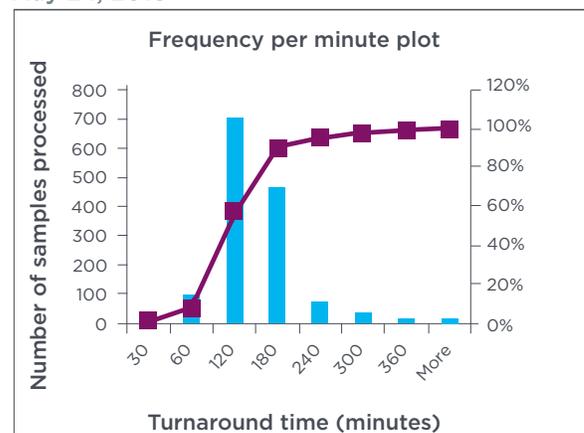
“We received significant professional support from Beckman Coulter employees while constructing the automation system. Bottlenecks were identified at our institution, based upon results of the laboratory workflow analysis, before the installation stage. Our needs, and the solutions for them, were also determined. We added two new units into our system that proved to be integral elements of our updated automation system. Thanks to a post-analytical (stockyard) unit with a 10,000-tube capacity, we have been able to process re-run and add-on tests automatically. Wasteful steps, such as the time and labor spent searching for tubes, were reduced,” said Dr. Mehmet Tarakçioğlu.

According to TATs from February 18, 2014, to May 24, 2016, the completion time for 90% of the samples received was 300 minutes or less. However, after installing the Power Processor and implementing recommendations for improvement, the completion time was reduced to 180 minutes. According to data from February 2014, TATs were reduced by 40% (120 minutes).

February 18, 2014



May 24, 2016



REMISOL Advance as the next automation improvement

To underscore their ongoing pursuit of innovation, Dr. Mehmet Tarakçioğlu said, “We are planning to employ an automated validation program in the upcoming months, since our university follows technological developments closely and recognizes the significance of automated solutions. Currently, according to the most recent analysts, we have an average time interval of 24 minutes between obtaining test results and their validation. Reducing that time further, and being able to return to the patient more rapidly, would make us even happier.”

Beckman Coulter’s REMISOL Advance program is capable of both delivering fast validations and sending tests for repeats by including parameters that are hard to monitor during assessment (e.g., clinical features, previous patient results, internal and external quality control comparisons). This expedites the transition to an efficient result-approval automation system that complies with the rules established by laboratory experts.

Each component of the automation system increases efficiency. When you implement the Power Processor system, your laboratory rapidly increases its efficiency by eliminating wasteful processes, particularly the number of steps that require operator interference and control. On their own, the superior

technological capabilities of UniCel® DxI 800 Access® Immunoassay Systems elevate quality results and optimize processes. Continuous reagent loading capability, an online aliquoting feature and a speed of 400 tests/hour on a single platform improve operator efficiency and enable an uninterrupted system run. When the DxI 800 is connected to an automation system, however, laboratory operations take a quantum leap forward.



Improving productivity

Improving TAT	Group	February 2014 to May 2016
		Average TAT % (according to validation dates)
	Hormone	21% decrease
	Biochemistry	45% decrease
	Total	40% decrease

“I would like to thank the Beckman Coulter team for their professional approach in constructing the optimal automation system that resolved our bottlenecks.”

Prof. Mehmet Tarakçıoğlu, M.D.

