

# Milwaukee Public Health Laboratory uses LEAN to lower the cost of Gonorrhea / Chlamydia Testing.

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## Objective

Objective. Milwaukee is ranked amongst the top 3 cities in the country for Gonorrhea / Chlamydia (G/C) infection. As a result, the Milwaukee Health Department Laboratory (MHDL) is responsible for high-volume G/C testing, which is performed via the Aptima Panther System. Although the system is fully automated, there still exist opportunities to lower the indirect costs of G/C testing for lab efficiency and sustainability purposes. The objective of this study is to use LEAN process improvement tools to lower the cost of performing high-volume G/C laboratory testing.

## Study Design

Sixty percent of Milwaukee Health Department Laboratory (MHDL) employees spent 1 week completing coursework for Quality 101, a training program designed by the American Society for Quality (ASQ) to introduce participants to the basics of quality improvement methodology. MHDL employees were trained in the 7 basic quality improvement tools including; cause and effect diagrams, check sheets, control charts, histograms, Pareto charts, scatter diagrams, and run charts. Afterwards, a survey was used to determine their attitudes towards quality improvement projects in the laboratory.

## Results

A spaghetti chart revealed that the location of G/C testing reagents and devices were not optimized for "ease of use". Using a 5S methodology, our staff was able to decrease movement and search waste by 41,563feet/year and 157min/year, respectively. This resulted in a 63% decrease in the staff time required to complete the pre-analytical phase of G/C testing. In addition to reducing movement and search waste, a Value Stream Map (VSM) identified numerous opportunities for process improvement. "Modular Kaizens" were performed to reduce the number of steps in the SOP, and fully utilize the random access capabilities of the Aptima Panther to reduce G/C specimen batch sizes and eliminate testing lag time from the VSM. Collectively, these efforts removed 97% (2657min/year) of the waste in the pre-analytical phase of G/C testing, and corresponded with a \$2,515 (personnel cost/year) decrease in the indirect annual cost of G/C testing at MHDL.

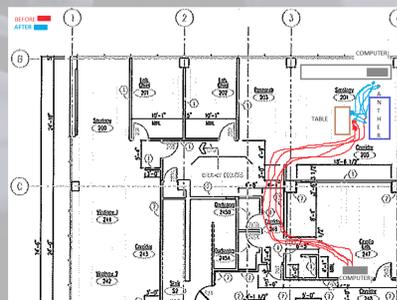


Figure 1. G/C Testing Spaghetti Diagram. MHDL Employees created a spaghetti diagram to collect data on the amount of motion is necessary to perform G/C testing

Figure 2. G/C Testing Value Stream Map.

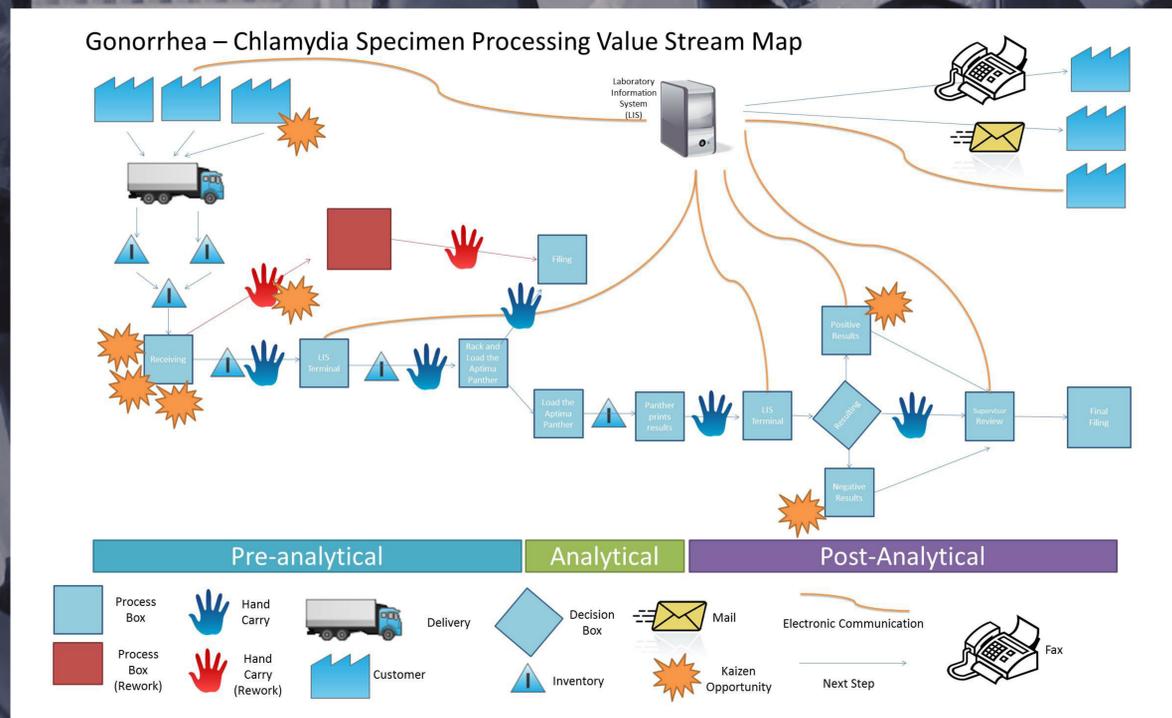


Figure 2. G/C Testing Value Stream Map. MHDL Employees created a value stream map to visual the G/C testing process from receiving samples to submitting results to the customers. This map was used to identify opportunities for change that can be implemented via a "modular kaizen" event. A modular kaizen is an improvement approach that integrates quality techniques into the busy schedule of everyday activities that can occupy a public health laboratory.

Figure 3. G/C Testing Modular Kaizen.



Figure 3. G/C Testing Modular Kaizen. (A) MHDL Employees participated in a 5S exercise to increase the organization and accessibility of G/C testing reagents and supplies. (B) After completing a value stream map, MHDL employees discussed changes that can be made to the G/C testing process in order to remove steps and improve workflow efficiency. (C) After changes to the G/C testing process were piloted, MHDL was able to remove 97% of the waste (motion, number of steps, searching for supplies) in the workflow.

## Conclusions

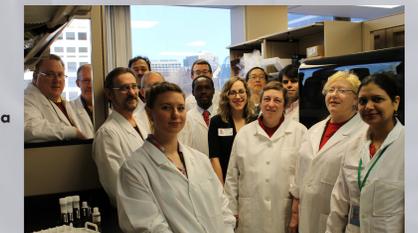
MHD used LEAN tools to perform "modular kaizens" that removed 97% of the waste present in the pre-analytical phase of G/C testing. This corresponded with a \$2,515 decrease in annual G/C testing costs. Utilizing LEAN tools in a "modular kaizen" methodology is recommended to identify, implement, and measure the cost effectiveness of changes to an SOP in a local health department laboratory.



Figure 4. MHDL and APHL LEAN Leaders.

## Acknowledgements

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LEAN Lab Group Photo Chlamydia Testing Area

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