FDA Clears Waived CBC For Near-Patient Testing

➤Sysmex Granted First-Ever FDA Clearance of a CLIA-Waived CBC Analyzer for Hematology

➤➤CEO SUMMARY: Market clearance of the first-ever CLIA-waived analyzer for complete blood count and three-part differential tests could cut time-to-answer from days to mere minutes for one of the top 20 tests by volume performed at core laboratories. Developer Sysmex America, Inc., foresees its analyzer as a complement to central labs. Basic diagnostics would be performed in physician-operated laboratories while larger central labs continue to provide in-depth analysis and repeat testing.

FOR THE FIRST TIME in the United States, a CBC (complete blood count) lab test can be performed by in-house staff at CLIA-waived locations. On Nov. 6, the **Food and Drug Administration** cleared the **Sysmex** XW-100, making it the first CLIA-waived CBC hematological system available for use in near-patient settings.

While not intended to replace moderately complex laboratory testing, the analyzer is the latest example of a trend to bring more lab testing capabilities to the near-patient environment. The goal is to reduce time to answer while improving both the speed and accuracy of patient care.

"This undertaking was thoroughly researched and well thought through," stated Ralph Taylor, CEO of **Sysmex America, Inc.**, in an interview with THE DARK REPORT. "Sysmex worked closely with a number of groups to identify the needs and requirements for a CLIA-waived CBC test that would support clinical care for all the right reasons."

Some in the clinical laboratory profession will be concerned that a waived CBC test now has FDA clearance. In part, that's because there are examples of waived tests where untrained operators performed tests that produced inaccurate results for reasons ranging from an analyzer out of control and use of outdated reagents to failure to properly perform quality control.

These experiences are a reason why it is important to understand the story behind the FDA's clearance of a waived CBC. "Test processes were stripped to the essentials during the design process to meet requirements for ease-of-use, and to reduce risk, user error, and erroneous test results. Sysmex worked very closely with the FDA to obtain the CLIA-waiver," noted Taylor. "The objective was to develop diagnostic technology to meet well-documented, unmet needs that exist with how the current healthcare delivery model treats patients."

As cleared by the FDA, the Sysmex system provides both a CBC and a three-part White Blood Cell Differential—a technology that Sysmex says, "is built on the company's reliable, trusted, and proven technology honed by Sysmex scientists over nearly 50 years."

The CLIA-waiver does limit the range of diseases and patient profiles for which the machine is cleared for testing. The intended use for the XW-100 states it is "Not for use in diagnosing or monitoring patients with primary or secondary chronic hematologic diseases or disorders, oncology patients, critically ill patients, or patients under the age of two."

The new analyzer incorporates similar diagnostic technologies currently used in Sysmex-equipped hospital laboratories. However, it is simplified for the physician office laboratory (POL) environment or other Clinical Laboratory Improvement Amendment (CLIA) Certificate of Waiver facilities where use by operators at CLIA-waived locations is likely.

In its press release about the FDA action, Sysmex said the device "uses a 15µL sample size of venous blood to provide a CBC with a three-part white blood cell differential, offering 12 clinically useful results, all of which are available in as few as three minutes."

Speedy Result For Doctors

Sysmex sees opportunity in providing physicians with a CBC test that can generate a result in as little as three minutes. "For example with this system, patients can leave the doctor's office with a prescription written and waiting at the pharmacy," said Taylor. "We believe this helps serve an unmet need among healthcare providers in POL settings due to the ability to support the diagnosis of the patient and decide on therapy during the same visit, ultimately providing a better level of care."

Medical technologists working with hematology systems will notice key differences in the new Sysmex analyzer compared to moderately complex analyzers. Missing are bulk processing, comprehensive reporting, and integration with the LIS and/or EHR. "This was by design," noted Taylor.

The FDA clearance as a waived test allows operators in CLIA-waived facilities to operate the system. The new CBC analyzer has several innovative features. "This

Multi-Year Road to Obtaining Clearance for Waived CBC

"CLEARANCE OF THE **XW-100** as a waived test required rigorous scrutiny from the FDA," stated Peter Shearstone, Vice President of Regulatory Affairs, Quality Assurance, and Clinical and Medical Affairs at Sysmex America, Inc. "This is the result of multiple exchanges across multiple years to ensure no one was put at risk by bringing CBC tests to CLIA-waived facilities."

Sysmex followed a two-step process to work with the FDA to achieve clearance for its analyzer for use in waived testing. In 2015, the XW-100 Automated Hematology Analyzer was originally cleared through the 510(k) pathway for use at the patient's point-of-care. The second step was to demonstrate to the FDA that the CBC waived test was substantially equivalent to the 2015 model, and, as stated in the FDA press release about the clearance, "that the submitted data demonstrated the test's ease of use and low risk of false results when used by operators at CLIA-waived locations."

"To support the CLIA-waiver application, Sysmex conducted a clinical study that paired six moderately complex clinical laboratory testing sites with six CLIA-waived testing sites," noted Shearstone. "Both Sysmex and the FDA analyzed CBC and three-part differential test results to compare accuracy and quality. Following an FDA-approved protocol, Sysmex gathered an extensive number of samples collected from patients ranging in age from two- to 92-years old.

"As part of this study, the CLIA-waived sites had a diverse population of patients covering a wide range of specialties, including family practice, internal medicine, and pediatrics," he continued. "The staff at each site were required to multi-task, and no individuals had formal laboratory training."

benchtop analyzer requires no additional training to set up upon arrival," explained Taylor. "Operator training consists of a brief video outlining basic features. Everything else is handled through on-screen prompts that walk operators step-by-step through the initial data-entry processes and starting the CBC test.

"When started, the analyzer connects to Sysmex to verify reagent authenticity and expiration dates, and check control values," he continued. "The instrument also stays connected to Sysmex and rechecks these after every eight hours of laboratory use, and when reagents are changed. "

Unlike more complex hematology analyzers, this system does not report to Sysmex outside of routine data checks. It also does not transmit data locally within the healthcare setting. Instead, it produces paper printouts of CBC and three-part differential results, which the physician uses to support diagnosis and treatment decisions. In addition to the print-out, the XW-100 stores the results of the last 100 tests on a first-in/first-out basis.

"Values outside of the normal ranges are flagged and reported. For results outside of critical ranges, the numerical results are not reported to the operator and follow-up steps are recommended instead, such as referring the specimen to a core laboratory for test completion," noted Taylor. "This ensures that erroneous data is not used to support the diagnosis or treat conditions."

Should tests return abnormal results due to machine error, or if the operator cannot bring the analyzer within standard control ranges, the machine locks out all operators, blanks out all viewable test data, and reports to Sysmex.

"What happens next is a unique feature of this system," added Taylor. "Sysmex will deliver a replacement analyzer the next day. Physicians return the malfunctioning unit using the box in which their new unit was delivered. This reduces maintenance and training requirements, ensures proper operation of the analyzer, and minimizes downtime for the physician."

What Taylor neglected to mention is that Sysmex has adopted the same replacement policy that consumers expect with their computers, printers, smart phones, and similar devices. Call the company, report the malfunction, and a replacement is immediately shipped with a return label so that the malfunctioning device can be sent back to the manufacturer.

Although the XW-100 is the first CLIA-waived hematology system available, it is not the first laboratory diagnostics analyzer to receive a CLIA-waiver or to be cleared to market by the FDA. For moderately complex labs that may worry about demand for one of its highest-volume tests shifting to POL and CLIA-waived environments—and taking revenue streams with them—Sysmex understands those concerns.

Samples To Core Lab

"This analyzer is designed so that samples will still be referred to central labs for either repeat testing or more detailed hematology tests that will give a greater level of information back to clinicians," stated Taylor. "Our goal with this analyzer is to deliver information within the POL environment that allows clinicians to respond quickly and rapidly to begin treatment. Meanwhile, central labs will continue to provide detailed information that will be used to further refine treatment. This doesn't change our commitment to the core lab market."

Value-based payment to physicians is one factor in the Sysmex strategy to introduce a CLIA-waived CBC test. Such payments encourage doctors to increase the efficiency of office visits by reducing time to answer and improving patient satisfaction. Thus, the ability to do CBC testing while patients are still in the office and to provide them with a diagnosis and a prescription before they leave is expected to be an important reason why clinicians may decide to adopt this system. TDR

—Jon Stone

For further information, use this URL: www.waivedcbctesting.com.