Newsbytes

Glucometers act as ‘guardrail’ in hospital’s POC testing

December 2022—To safely and effectively extend the process of conducting point-of-care testing to staff from various hospital departments is no easy feat. That’s why four full-time employees at Children’s Hospital Los Angeles oversee POC testing, relying heavily on middleware, analytics, and exception-management tools.

The size of CHLA’s POC operations is one of its biggest challenges, says Edward Leung, PhD, core laboratory director at the hospital. CHLA has approximately 3,500 employees authorized to perform POC tests across its 401-bed hospital and six specialty care centers. And those who perform POC testing come from varied medical backgrounds and often juggle numerous responsibilities.

“The question is, what kind of guardrails can we put up so that these individuals can perform these tests and not take them in a direction that can cause harm to the patient?” Dr. Leung says. That’s where middleware, analytics, and exception-management tools come into play. “Now that we have started using these tools,” he adds, “I don’t know how we could effectively manage a point-of-care program without them.”

During the early days of the COVID-19 pandemic, when CHLA’s POC team needed to roll out rapid antigen tests for SARS-CoV-2, the hospital turned to its Nova Biomedical StatStrip glucometers to enter the test results. At the same time, it built safeguards into the testing process that focused on who was performing the tests and how the tests were performed, says Dr. Leung, who shared the benefits of using the glucometers for POC testing at the 2022 AACC annual meeting and with CAP TODAY.

Dr. Leung

“Using the glucometers,” he explains, “you are basically leveraging existing infrastructure to bring up these tests quickly. Once you set up your glucometer in your institution, you already have, I would say, 75 percent of your pipeline created.”

CHLA’s glucometers are connected to its Telcor POC middleware platform, which the hospital has been using for 12 years. The middleware consolidates POC testing data generated via the glucometers, such as data from lateral flow “dumb” tests, like the rapid antigen SARS-CoV-2 test. It also sends patient test results to the hospital’s electronic health record system and can implement exception-management rules, Dr. Leung says.

Before entering a test result into a glucometer, employees must scan their hospital ID badges. This prohibits employees who are not authorized to perform a test from entering test results. In the case of SARS-CoV-2 rapid antigen testing, those conducting the test must answer a question about whether the control line was present on the test before entering the test result. If the answer is no, the middleware will prohibit the test result from being added to the patient’s record in the EHR system. If a control line is confirmed, the middleware will automatically store a record of that confirmation for compliance purposes in the event that the hospital is audited.

Adding these types of automated controls for tests performed on disposable devices is critical for retaining proper records and enforcing procedures, Dr. Leung says. That’s because “once the test is done, you throw that device away.” In the past, he adds, the person administering the test had to write down that the control line was present, for tracking purposes. “[Otherwise] it would just be an assumption of faith that the person who ran the test did it

properly."

For such procedural and record-keeping purposes, among others, CHLA wants to connect as many of its POC tests to the glucometer as possible. "The glucometer data feeds into our middleware solution, which becomes our centralized database for all point-of-care test results," Dr. Leung reiterates. "Once that is all interfaced, we can track how many tests are performed down to which units and which individuals performed the tests."

CHLA has added about 10 types of dumb tests—including urine pregnancy, rapid strep, and rapid HIV—to the glucometer to leverage the instrument's connectivity to the middleware platform. Modifying the glucometer interface to add new types of tests is relatively easy, Dr. Leung says. After members of the POC team familiarize themselves with the glucometer software, they can typically add tests to the device's menu in a couple of hours.

It took the pathology department's informatics and data science team only a couple of weeks to make the necessary adjustments on the back end so the EHR could receive SARS-CoV-2 test results from the middleware. The required modifications included adding new fields to patient records in the EHR system to accommodate SARS-CoV-2 test result data. The team also ensured that the test disclaimers were visible to physicians in the notes field in patient records.

More recently, a data analyst and informaticist from that team have been developing complex rules for the glucometer that are customized to CHLA processes and procedures. For example, if a POC test is supposed to be used only in the emergency department and a tracking feature on the device indicates it has been taken somewhere else, workflow rules prevent the results generated at the other location from appearing in the patient record.

The team is also building a customized data analytics platform to leverage the consolidated POC data in the Telcor middleware. POC analytics, Dr. Leung explains, is still in its infancy. Yet the team can "export the data from our point-of-care middleware and write custom algorithms to generate the dashboards that we need," he adds.

In collaboration with the aforementioned group, Dr. Leung and the POC team are planning to implement dashboards to better view how many POC tests are being used in different areas. This would allow them to more quickly spot areas that have a sudden spike in one type of testing, for example. They are also planning to develop more sophisticated inventory-management analytics to better understand how much reagent should be ordered and what supplies are potentially being wasted.

The team of informaticists and data analysts have also built a Web portal through which the POC team can access dashboards. Before launching a dashboard, the POC team undertakes an extensive validation process in which it compares data generated by the dashboard against expected results.

"We have had dashboards that have shown us data that clearly didn't reflect what we were doing in the lab, so we learned a lesson in always double-checking the fidelity of the data and the accuracy of the dashboard before using it," Dr. Leung says.

Furthermore, to help address the challenges of large numbers of staff across departments performing POC tests, the informatics and data science team is developing an automated system for managing employee competency training documentation.

Many systems for managing competency documentation are labor-intensive and not scalable enough to accommodate a POC program with 3,500 users, Dr. Leung explains. Yet working together, the informaticists and POC team are creating digital competency forms that will be accessible to employees through the hospital's SharePoint Web-based collaborative platform. As employees fill out the digital forms, the documents will be saved on SharePoint, and the information entered into them will be collected into a Microsoft Excel spreadsheet or Microsoft Access database so the POC team can easily access and analyze it.

"If an inspector comes to the site and asks for training and competency documentation, there will be two ways we can show it—by pulling the individual's digital form or by opening up the database," Dr. Leung says.

The database containing employee competency records is not linked to the middleware database in which much of the testing data are stored, although Dr. Leung doesn't rule out eventually connecting them.

"Maybe in the future," he says, "we can look at opportunities to at least have the two databases share common information. But for right now, because it's complex enough, we are taking baby steps."

—Renee Caruthers

SNOMED and Regenstrief announce joint project

The Regenstrief Institute, developers of LOINC, and SNOMED International are collaborating on a unified approach to adopting standardized health care terminology, with the goal of increasing interoperable health data exchange worldwide.

Under the agreement, SNOMED International and Regenstrief will coordinate their use of SNOMED CT (Systematized Nomenclature of Medicine Clinical Terms) and LOINC (Logical Observation Identifiers Names and Codes) while minimizing duplication among the terminologies. However, each organization will retain editorial control of its respective offering.

The agreement lays the foundation for developing a LOINC extension that aligns with the SNOMED CT model. This will allow the organizations to distribute both LOINC and SNOMED CT content to their respective users.

"The extension will create both SNOMED CT and LOINC codes for all concepts that are shared between the terminologies, making it easy for implementers to have a unified approach to implementing both standards and to meet clinical and regulatory requirements globally," according to a posting on the Regenstrief Institute website.

Xifin gains Hitrust certification for updated RCM software

Xifin has launched Xifin RPM 15, the latest version of its cloud-based revenue cycle-management platform, which has earned certified status for information security from the Hitrust Alliance.

"This significant investment and achievement of Hitrust risk-based, two-year certification demonstrates that Xifin RPM has met key regulations and industry-defined requirements for information security," said Marty Barrack, Xifin's chief legal and compliance officer, in a press statement.

Features introduced in Xifin RPM 15 include:

- an enterprise-grade business intelligence portfolio that provides quarterly metrics and industry benchmarks.
- a patient responsibility estimator that uses eligibility and coverage data at the payer and plan level to take into account different categories of benefits coverage.
- claim status workflow automation that enhances configurability by reason code to automate next and final actions.
- customized appeal letters that can be configured for any denial code or procedure code for most providers.

Xifin, 866-934-6364

UCLA researchers create miniaturized lab test kit

Researchers at the University of California, Los Angeles have developed technology for a handheld all-in-one laboratory kit that is intended to significantly increase the speed and volume of disease testing while reducing the cost and use of supplies.

The diagnostic kit uses pinhead-sized magnets to perform fully automated multiplexed and pooled testing. The automated tests can be easily manufactured, deployed, and performed in a timely manner at physician offices, clinics, or mass testing sites in airports and schools at the onset of a major infectious disease outbreak, according to a UCLA press statement.

In a paper published online in *Nature* last month (Lin H, et al. 2022;611:570–577), the researchers explained that the kits use a circuit board that controls a set of movable 1-mm magnetic disks, or "ferrobots," to transport samples through the diagnostic workflow of a nucleic acid amplification test. Because the steps to separate, sort, mix, and amplify testing samples are automated and performed at a miniaturized level inside the kit, the device can test dozens of patient samples at once using the materials employed to test one patient today.

In addition to being employed for diagnostics, the technology can be used for omics, drug development, and chemical and biomaterial synthesis, according to the *Nature* article.

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